# HAYLING ISLAND BEACH MANAGEMENT PLAN

## Environmental Statement



Working together - protecting our coastline

**Revision 1.0**
**March 2017**

Havant BOROUGH COUNCIL

EASTERN SOLENT | COASTAL PARTNERSHIP

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# EXECUTIVE SUMMARY

This Environmental Statement (ES) has been prepared to support the Planning and Marine Licence applications for the South Hayling Island Beach Management Plan (BMP). BMP activities have been taking place along this coastline historically without issue, however we are now seeking additional methods of working and an increased extent of works to include the entire South Hayling Island coastline.

This ES has been prepared to demonstrate that the South Hayling Island BMP can be delivered in its entirety, without adversely impacting the environment. It also sets out how it can enhance the environment. Other key supporting documents to this ES are the BMP's Habitat Regulations Assessment (HRA) and Water Framework Directive (WFD) assessment, which should be read in conjunction with this ES.

The South Hayling Island BMP is required to continue to protect 1555 homes, 170 commercial properties, businesses, infrastructure and key features of the terrestrial environment from coastal flooding and erosion.

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Appendix A – Beach Management Plan Technical Report

Appendix B – Environmental Scoping Opinion

Appendix C – Habitat Regulations Assessment

Appendix D – Water Framework Directive Assessment

# ACRONYMS

AA: Appropriate Assessment
AEP: Annual Exceedance Probability
AMS: Archaeological Mitigation Strategy
AOD: Above Ordnance Datum
AQMA: Air Quality Management Areas
BAP: Biodiversity Action Plan
BMP: Beach Management Plan
CD: Chart Datum
CEFAS: Centre for Environment, Fisheries and Aquaculture Science
CEMP: Construction and Environmental Management Plan
CIA: Cumulative Impact Assessment
CITES: Convention on International Trade in Endangered Species
CROW: Countryside and Rights Of Way Act
DEFRA: Department for Environment, Food & Rural Affairs
EA: Environment Agency
ECI: Early Contractor Involvement
EIA: Environmental Impact Assessment
ES: Environmental Statement
ESCP: Eastern Solent Coastal Partnership
FCERM: Coastal Flood and Erosion Risk Management Strategy
FDC: Flood Defence Consent
FRA: Flood Risk Assessment
HBIC: Hampshire Biodiversity Information Centre
HCC: Hampshire County Council
HE: Historic England
HGV: Heavy Goods Vehicle
HRA: Habitat Regulations Assessment
HTL: Hold The Line
IBA: Important Bird Areas
IFCA: Inshore Fisheries and Conservation Authority
IFCA: Inshore Fisheries and Conservation Authority
IROPI: Imperative Reasons of Overriding Public Interest
LAQM: Local Air Quality Management
LHB: Langstone Harbour Board

LNR: Local Nature Reserve
LPA: Local Planning Authority
LSE: Likely Significant Effect
LVIA: Landscape and Visual Impact Assessment
MHWS: Mean High Water Springs
MMO: Marine Management Organisation
MPS: Marine Policy Statement
NERC: Natural Environment and Rural Communities
NPI: North Portsea Island
NPPF: National Planning Policy Framework
NVC: National Vegetation Classification
PRoW: Public Rights of Way
pSPA: proposed Special Protection Area
RBMP: River Basin Management Plan
RHCP: Regional Habitat Creation Programme
RSPB: Royal Society for the Protection of Birds
SAC: Special Area of Conservation
SAM: Scheduled Ancient Monument
SEA: Strategic Environmental Assessment
SINC: Site of Importance for Nature Conservation
SMP: Shoreline Management Plan
SoP: Standard of Protection
SPA: Special Protection Area
SSSI: Site of Special Scientific Interest
TrAC: Transitional And Coastal
WFD: Water Framework Directive

# 1. INTRODUCTION

This Environmental Statement (ES) has been prepared to support the Marine Licence and Planning Applications for the nationally approved Beach Management Plan (BMP) for the South Hayling Island open coastline. Delivery of the BMP will protect 1555 homes, 170 commercial properties, businesses, infrastructure and key features of the terrestrial environment from coastal flooding and erosion. This is through the maintenance of critical beach profiles and shingle volumes to maintain the required standard of defence against flooding and erosion. The BMP is the preferred Flood and Coastal Erosion Risk Management (FCERM) approach for South Hayling, which is environmentally, economically and technically sound. The BMP Technical Report is included as **Appendix A**.

This document serves two key permitting regimes to enable delivery of the BMP:

- Issue of Planning Permission by Havant Borough Council (HBC);
- Issue of a Marine Licence by the Marine Management Organisation (MMO).

The scheme will be carried out under the Powers of Section 14 of the Land Drainage Act 1991.

Beach management activities already take place along part of the Hayling Island open coastline as the preferred and permitted historic FCERM approach. This application extends the area to include the full Hayling Island open coastline sediment cell (as illustrated by **Figure 1.4**) and clarifies all sources of material and methods of recycling and recharge to deliver the BMP. It therefore requires new permissions and consents, hence this application.

This document provides a summary of the Environmental Impact Assessment (EIA) for the BMP, and concludes with specific mitigation upon which we expect any conditions of permissions to be based on, ensuring the plan is delivered without

impact on the natural and built environment.

## 1.1 Location

Hayling Island is located on the south coast of England in the Eastern Solent (**Figure 1.0**). The study area covers the full 9km of open coastline from the entrance of Chichester Harbour, west along the open coast to the entrance to Langstone Harbour. This Environmental Statement delineates this coastline into a series of sections / management units (BMP Units [BMP Unit 1 to Unit 8]) to ease understanding of the proposed beach management activities and to allow assessment of impacts. These units are detailed in **Figure 1.1**, with details of each proposed activity set out in **Section 4 - Proposed Scheme**.

The Hayling Island open coast BMP is the approved delivery mechanism for FCERM along the South Hayling Island open coastline. Without FCERM, the main area of coast at flood and erosion risk is Eastoke, where the defences (shingle beach with groynes) currently protect 1,555 properties within a densely populated area. The defences / beach management activities also protect Sandy Point Local Nature Reserve, Hayling Island Sailing Club, Sparks Marina, an extensive number of holiday chalets and caravan parks and the primary road network on the Peninsula. **Figure 1.2** illustrates the flood risk to Hayling Island, labelling key features.

The area is ecologically very important with a wide range of International, National and Local nature conservation designations. **Figure 1.3** illustrates the International designations and **Chapter 8** provides detail on all other designated sites (national and local). The Internationally designated sites adjacent to the BMP include the Solent Maritime Special Area of Conservation (SAC), which covers the entire length of open coastline, in addition to the Chichester and Langstone Harbours Special Protection Area (SPA) and Ramsar site which covers the Harbours and their entrances. There is also a new Solent and Dorset Coast potential Special Protection Area (pSPA), which covers the entire South Hayling Island open coastline below mean high water springs. Langstone Harbour, Chichester Harbour and Sinah Common are designated as nationally important Sites of Special Scientific Interest (SSSI). Locally designated sites also feature in the area including Sites of Importance for Nature Conservation (SINCs), which include Beachland's East, Hayling Island Beach, Lifeboat Station Heath, Lifeboat Station Saltmarsh, Land east of Sandy Point and Sandy Point. A Local Nature Reserve (LNR) and countryside Heritage Site are also present in the vicinity of the BMP. Chichester Harbour is designated as an Area of Outstanding Natural Beauty (AONB), which is a designation for the area's important national landscape character. See **Chapter 8** for a full summary of all these designations, and **Chapter 9 – Information for HRA**,

specific to the European protected sites.

## 1.2 Need for and purpose of the Beach Management Works

Havant Borough Council (HBC) is the 'Risk Management Authority' (RMA) that uses its powers under the Floods and Water Management Act 2010 (FWMA), the Land Drainage Act 1991 (LDA) and the Coastal Protection Act 1949 (CPA) to manage the flood risk to this exposed open coastline from tidal surges and wave conditions. The Eastern Solent Coastal Partnership (ESCP) provides a shared service for HBC, Portsmouth City Council, Gosport Borough Council and Fareham Borough Council and is taking the lead on this project. Delivery of FCERM measures, proposed by this project, will contribute towards the Environment Agency's objectives for their National Flood and Coastal Erosion Risk Management Strategy (NFCERMS).

HBC / ESCP are responsible for managing the coastal defences on the South Coast of Hayling Island. The Strategic direction for the management of this stretch of coast has been set out in the:

- North Solent SMP (SMP, 2010).
- Eastoke Sectoral Strategy, which was undertaken in two stages:
  - Eastoke Sectoral Strategy Study, (Atkins, 2006);
  - Eastoke Point Coastal Defence Study. (HR Wallingford , 2008).

The North Solent SMP, which was approved in 2010, recommends a policy of 'Hold the Line' for the whole of the South Hayling Island open coastline. The Eastoke Sectoral Strategy (Atkins, 2006), which covers the whole of the Eastoke Peninsula was approved and adopted in 2006, also recommending 'Hold the Line' to a 1 in 200 year (0.5% annual) standard of tidal flood protection, through beach management along the main southern frontage. HBC have undertaken beach management activities at South Hayling Island since a large nourishment scheme in 1985 (import of shingle to enhance the height and width of beaches), but not along the full open coastline, hence this new application.

Beach Management activities in the form of recharge and recycling reduce the flood and erosion risks to the Hayling Island coastline in combination with existing revetments and groynes. Sediment is currently recycled from areas of accretion (generally from the west of the area) to areas of erosion (at Eastoke). When material is lost from the system, new material is required on occasion, via offshore dredges or by road (recharge). Whilst we have an existing Planning Permission for these

activities, it only covers part of the Hayling Island open coastline, seriously limiting our management activities and preventing a fully integrated approach.

Historically, beach management operations have been undertaken along BMP Units 2 to 5 only, under an ongoing planning permission, which runs until 2019 (see **Figure 1.4** – blue line). As part of this application, the area for beach management activities is being extended into BMP U1, 6, 7 and 8 (**Figure 1.4** – red line). BMP Units 6 and 7 have been used as emergency sources of shingle in the past (2014). BMP Unit 8 has been included in this application, as it will enable localised recycling of sediment to help resolve localised erosion issues to a local car park and other heritage assets. Material within BMP Unit 8 will be retained within this unit and not recycled back along the open frontage. BMP Unit 1 has been included in this application to enable localised movement of sand, working with Hayling Island Sailing Club to help maintain use of their pontoon. This application also ensures that we have access to a range of beach recycling and recharge options, as set out in **Chapter 4 – Proposed Scheme**. It's important to note that BMP Units 1 and 8 are not described in the BMP technical report itself (**Appendix A**), as they are additional operations that don't directly deliver flood protection to Eastoke, but deal with localised issues, hence highlighting them in this EIA. To clarify, we are seeking permissions for all activities set out in **Section 4 'proposed scheme'**, upon which this Environmental Impact Assessment has been undertaken.

As the process of recycling shingle and recharging the beach at Hayling Island has been undertaken historically without issue, the principle of beach management has been accepted as a sound FCERM approach. Given that the strategic policy and historic activities point to beach management as the preferred FCERM approach, this EIA has not considered alternative FCERM measures to this. Instead, it focusses on assessing the different sources of shingle, promoting the most sustainable and appropriate sources. For example, Planning Permission was granted for BMP works in 2003 for six years and again in 2009 for 10 years. The reason for time limiting historic activities has been '*to enable the LPA to re-assess the impact of the proposals'.*

The ESCP have carried out extensive research and monitoring, as well as developed approved strategies that support beach management as the agreed FCERM approach for the next 100 years. Therefore we are now looking for approvals into perpetuity, conditioned to reflect the mitigation presented in **Section 21 'Conclusions'**, which has been developed following our impact assessment. There will be a number of safeguards in place that will ensure that the BMP approach remains relevant and sustainable going forward:

- BMP funding will only be provided if the BMP works remain economically, technically and environmentally sound.
- The ESCP propose that conditions be imposed on the works that will ensure that the mitigation in **Section 21 'conclusions'** is adopted.
- The BMP technical report itself (**Appendix A**) sets out a monitoring programme to ensure sound and adaptable management of this extremely dynamic environment.

This application therefore seeks approvals for the following high level activities (as detailed in **section 4 of this ES**):

**Recycling of beach materials along the open coastline from areas of accretion to areas of depletion:** This will enable us to maintain critical beach levels along the full open coastline, when there is enough beach material in the system to enable this.

**Recycling of shingle dredged from Chichester Harbour Entrance (beneficial use of dredgings):** This enables us to beneficially re-use material dredged from the Chichester Harbour Approach channel. The arisings will be placed back onto the beach at Eastoke (where it will have originated from). This application **does not** seek permission for the dredge itself as this is carried out by Chichester Harbour Conservancy as part of their statutory duty to maintain safe navigational passage as stated in the Chichester Harbour Conservancy Act 1971, for your reference, section 36 (i) states: The Conservancy may:

(a) Deepen, dredge, scour, excavate and blast any rock in any portion of the harbour and the approaches thereto to the extent necessary to secure a sufficient waterway for vessels using or approaching the same or otherwise for the purposes of the undertaking; and

(b) Sell or otherwise dispose of or remove or deposit all sand, mud and other materials dredged up or removed as they think fit

This dredging operation clears a navigational hazard, and is supported by a Maintenance Dredging Protocol Baseline Document. The dredged material will be placed on the beach at Eastoke using a technique called 'rainbowing' and then re-profiled (as we have completed historically). The material dredged from the approach channel is from the same sediment cell and originates from the Eastoke frontage. The shingle in the approach channel has been tested using Particle Sediment Analysis (PSA) to ensure it is the suitable size prior to dredging and then rainbowing ashore. Rainbowing basically involved a specialist ship pumping the shingle onto the beach.

**Recharge of shingle from offshore marine based sources, either by sea or road.** Other offshore sources of material imported from licenced offshore aggregate sites may also be used, if other sources of material are not available for recycling within the sediment cell in any given year. This imported aggregate may be rainbowed ashore as in the Chichester Harbour dredge, or alternatively material may be brought to a local aggregates wharf and transported in by road. Again, the import material would match the resident shingle.

**Maintenance of beach profiles in BMP Units 1 and 8 (the harbour entrances).** In developing our overall BMP, and in preparing this application, we have worked closely with local stakeholders, landowners and business, to ensure their aspirations are tied into the overall BMP. In extending the BMP into the Harbour entrances, it will enable us to resolve localised erosion / accretion issues:

- In Langstone Harbour entrance, whereby some minor beach re-profiling will prevent erosion of a local car park, and prevent negative impacts on the harbour entrance channel.
- In Chichester Harbour entrance, whereby some minor extractions of sand will enable the Hayling Island Sailing Club to continue to operate its pontoon.

There are a number of conditions / safeguards that have been developed with stakeholders following discussions as part of the Environmental Statement preparation process. This is to ensure each of the above BMP activities can be undertaken without any Likely Significant Effects (LSE) on the environment. These measures are summarised at the end of each impact assessment chapter within this ES, with specific mitigation tables included in the Water Framework Directive Assessment, and Habitat Regulations Assessment.

## 1.3 Purpose of the Environmental Statement

This Environmental Statement (ES) has been prepared following the submission of an Environment Scoping Report to the Marine Management Organisation (MMO). This was not submitted to Havant Borough Council due to the planning department having limited resources to provide a scoping response at the time of submission. The MMO circulated the Environmental Scoping Report to statutory consultees and the ESCP also circulated the report to a wider number of stakeholders. The on-going and proposed BMP activities have been discussed with a number of people and organisations to ensure that all parties have had a chance to highlight any issues and concerns, both formally and informally. The Scoping opinion we received is included as **Appendix B**.

This ES presents the results of the Environmental Impact Assessment (EIA) for the proposed BMP activities along the full South Hayling Island open coastline.

The main purpose of the ES is to:

1. Identify and then reduce any impacts resulting from the works on the wider environment and its interest features, and identify opportunities to improve the environment through the works;
2. Fulfill the requirements under the following EIA legislation:
    a. The Marine Works (Environmental Impact Assessment) Regulations 2007 (as amended);
    b. Town and Country Planning (Environmental Impact Assessment) Regulations 2011;
3. Describe the proposal;
4. Document how the EIA process has influenced the methods and times of working and has enabled potentially significant impacts to be avoided;
5. Provide a description of the options selection process, how alternatives to the proposed scheme were considered and the reasons for promoting the preferred option (this has been documented in the past however the majority of these works are ongoing activities);
6. Identify, assess and evaluate potentially significant impacts resulting from the beach management activities, then determine the significance of the predicted residual environmental effects;
7. Identify appropriate mitigation and management measures required to avoid, reduce or remedy adverse impacts identified through the assessment process. These should be used to apply conditions to any approvals.

## 1.4 Legislative Framework

There are a number of consents that are required in order to undertake the BMP activities on the South Hayling Island coast (Set out in full detail in **Section 6**).

### 1.4.1 Environmental Scoping Report Screening Response:

The response received from the MMO is summarised below (see **Appendix B** for the full response). This sets the need for this ES:

*The Marine Management Organisation (MMO) has agreed with Havant Borough Council, pursuant to Regulation 5 of The Marine Works (EIA) Regulations 2007, as amended, that the proposed works constitute a development under Annex II 10(k) of*

*EU Directive 2011/92/EU Council (as amended): "Coastal Works to combat erosion and maritime works capable of altering the coast through construction, for example, of dykes, moles, jetties and other sea defence works, excluding the maintenance and reconstruction of such works".*

*Any subsequent application for the proposed works for a marine licence under Part 4 of the Marine and Coastal Access Act 2009 must be supported by an Environmental Statement ("ES") under the Marine Works (EIA) Regulations 2007, as amended. Your attention is drawn to Schedule 3 (information to be included in an ES) of the Regulations.*

### 1.4.2 Planning Permission and Marine Licence

For developments that cross the land/sea boundary, both Planning Permission from the Local Planning Authority [LPA] and a Marine Licence from the MMO is required, for works above and below Mean High Spring Tides, respectively. Both the MMO and the LPA will ideally make a decision as to who should be the lead authority for the application. It is expected that this document will be considered jointly through the Coastal Concordat. This Environmental Statement (ES) has been prepared to advise the Planning and Marine Licence Applications to fulfil the requirements of the following EIA Legislation:

- *The Town & Country Planning (Environmental Impact Assessment) Regulations 2011,*
- *The Marine Works ( Environmental Impact Assessment) Regulations 2007 (as amended)*

### 1.4.3 Other Consents and Compliances

In addition, the following consents and compliances have been considered:

- **Harbour Authority Consent from Langstone Harbour Board:** Harbour Authorities grant licences to construct, alter, renew or extend works within the harbour up to the mean high water springs mark. Works should not affect rights of navigation or other public rights. The Langstone Harbour Master has confirmed that we do not need consent from the Board to carry out the proposed works.

- **Chichester Harbour Works Licence:** The Chichester Harbour Conservancy (CHC) Act 1971 (Sections 45, 47 and 48) makes it an offence for any person to construct, alter, renew or extend any works on, under or over tidal waters or tidal lands below the level of high water in Chichester Harbour unless licensed to do so by the Conservancy. We liaise heavily with CHC prior to any beach management activity.

- **Flood Risk Activity Permit:** These are obtained from the Environment Agency (EA) for works adjacent to main rivers and / or FCERM defences, to ensure no negative impacts / increase in flood risk to adjacent areas. These will be obtained separately from the EA where they are required.

- **Wildlife Licence:** A Wildlife License is needed for anyone who wishes to undertake an action which is prohibited under wildlife legislation such as the Wildlife and Countryside Act, 1981 or The Conservation of Species and Habitats Acts, 2010. This can include the killing of, surveying of, disturbing of and/or damaging the habitat of certain protected species. Natural England are responsible for issuing wildlife licenses landward of the mean low water mark and aim to issue licenses within 30 working days. The Marine Management Organisation (MMO) is responsible seaward of the low water mark.

- **SSSI Works Notification:** As a public body or 28H Authority under the Wildlife and Countryside Act 1981 (as amended by the Countryside and Rights of Way Act 2000, the ESCP must ask for advice and 'Assent' from Natural England before carrying out works in line with our statutory duties that are likely to damage the condition or special features of a SSSI. This includes planned works on land outside the boundaries of a SSSI but likely to damage it. Natural England must consider the likely impact on the special features of the SSSI. They then decide whether to issue assent, issue assent with conditions or refuse assent. If you do not notify Natural England or carry out the works before getting assent from Natural England fines can be issued from £20,000 in a magistrate's court or unlimited in a Crown Court. If the works are covered under either a Planning Permission or a Marine Licence, a separate Assent will not be required from Natural England (NE).

- **Landowner Consent:** Landowner permission/consent will nearly always be required for any activity that disturbs the land or affects the owner's potential use of their land. The Crown Estate owns approximately 50% of the UK foreshore, defined as being between mean low and mean high water, and almost all of the sea bed below mean low water. The Crown Estate requires that all other necessary consents are obtained before it will issue landowner consent. On this stretch of coast there are also a number of private land owners where agreement has / is being sought, including:
  - Hampshire County Council (as landowner);
  - Hayling Golf Club (as landowner);

- Hayling Island Sailing Club (as landowner) – Works taking place in partnership;
- Inn-on-the-Beach (as landowner) – No works taking place on their land;
- Beachlands Funfair (as landowner) – No works taking place on their land, but access required;
- Crown Estate (as landowner).

- **Habitat Regulation Assessment (HRA):** The study area includes parts of several European Sites; internationally designated sites for nature conservation. Therefore within this application a section on the information to inform a HRA has been produced with all the relevant information included (**See section 9 for details**). HBC or the MMO in consultation with Natural England will need to decide if the project has a likely significant effect on the interest features of the designated site and therefore if an Appropriate Assessment would be required. The HRA sets out the specific implications of the scheme on the designated conservation features of the sites and assesses whether there will be an adverse effect on site integrity, in accordance with the Habitat Regulations 1994. A plan or project that may adversely affect the integrity of the site cannot be granted except under closely defined circumstances, which must include there being:
  - no alternative solutions;
  - imperative reasons of over-riding public interest (which in the case of sites hosting a priority habitat or species, must relate to benefits to human health or the environment); and
  - provision of compensatory measures.

- **Water Framework Directive Assessment:** The EU Water Framework Directive was transposed into law in England and Wales by the Water Environment (Water Framework Directive) (England and Wales) Regulations 2003. The WFD requires that Environmental Objectives are set for all surface and ground waters in each EU Member State. The overall objective of the WFD assessment is to consider whether the activity will have a non-temporary effect on status at water body level. It aims to achieve good qualitative and quantitative status of all water bodies (including marine waters up to one nautical mile from shore) by 2015.

  The purpose of the Water Framework Directive is to establish a framework for protecting inland surface waters, transitional waters, coastal waters and ground waters. The framework for delivering this Directive is through the River Basin Management Plans (RBMPs). The Environment Agency has divided England and Wales into eleven River Basin Districts (RBDs). The South Hayling Island

proposed Beach Management Works area falls entirely within the South East River Basin District. Each RBD has been characterized into smaller management units known as Water Bodies.

The Water Framework Directive (WFD) Assessment **(See section 12 for details)** has been prepared to determine if the proposed South Hayling Island Beach Management Works are able to take place without causing a deterioration of the WFD water bodies affected by the work. The effects of the proposed beach management works on the landscape, seascape, nature conservation interest and historic character have been considered within this document and are not considered to contravene any planning policies.

## 1.5 Report Structure

This Environmental Statement comprises the following Chapters:

- **Chapter 1 Introduction**: Provides an introduction to the proposed activities, the need for the Beach Management Activities, its purpose, location, and the content and format of the ES;
- **Chapter 2 Background**: Provides strategic context and the objectives of the Beach Management Activities;
- **Chapter 3 Consideration of Alternatives**: The ES initially considers the historic consideration of alternative to reach the preferred option of Beach Management. Then it considers the suitability and sustainability of various sources of shingle in order to carry out the Beach Management Activities into the future;
- **Chapter 4 Proposed Scheme**: describes the location and character of the overall site and provides a detailed description of the BMA, and the potential sources of shingle. It will also provide and overview of the anticipated construction programme each year and the proposed construction and operational activities;
- **Chapter 5 Consultation**: Summarises the consultation process, including activities undertaken, associated outputs and future actions;
- **Chapter 6 Legislative Framework, General Approach and Methods**: summarises the legislative requirements of the scheme and the general approach and methods, providing details of the EIA process;
- **Chapters 7 to 19**: **Environmental Impact Assessment [EIA],** providing details of the specialist environmental assessments undertaken assessment of the impacts, proposed mitigation and residual effects:
    - 7. Coastal Processes;
    - 8. Environmental Designations;

- 9. Information for HRA;
- 10. Fish and Shellfish Ecology;
- 11. Landscape and Visual Impact Assessment;
- 12. Water Environment;
- 13. Archaeology and Heritage;
- 14. Noise and Vibration;
- 15. Traffic and Transport;
- 16. Ground Conditions;
- 17. Health and Air Quality;
- 18. Amenity and Recreation;
- 19. Navigation and Commercial Fisheries;

o **Chapter 20: Cumulative Impacts**: summarises wider schemes, projects and activities in the project area, and the potential for wider impacts as a result;

o **Chapter 21: Conclusions, with Summary of Proposed Mitigation:** Concludes the environmental acceptability of the proposed works following the detailed EIA process. This section will include any restrictions, monitoring or mitigation resulting from conclusions drawn within the EIA process including any requirements from the HRA (Habitat Regulations Assessment) and WFD (Water Framework Directive) assessment and discussions with various consultees. This should be used to advise any Conditions on approvals.

## 1.6 The Applicant, further information and contact details

This Environmental Statement has been prepared by the Eastern Solent Coastal Partnership on behalf of Havant Borough Council as the Applicant.

All members of the ESCP team are employed directly by the partner authorities.
For further information, please contact either:

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Eastern Solent Coastal Partnership
c/o Havant Borough Council,
Southmoor Depot,
2 Penner Road,
Havant,
PO9 1QH

**The Eastern Solent Coastal Partnership (ESCP):** The ESCP consists of a team of specialist coastal officers and engineers who centrally manage coastal flood and erosion risk across 162km of coastline. The ESCP formed an alliance in 2012 to deliver a combined, efficient and comprehensive coastal management service across the coastline of four Local Authorities:

- Havant Borough Council
- Portsmouth City Council
- Fareham Borough Council
- Gosport Borough Council

The initiative of the Partnership was driven by the need for coastal management that recognises coastal flooding and erosion risk impacts are not exclusive to Local Authority Boundaries, with the overall vision of the ESCP initiative being to "reduce the risk of coastal flooding and erosion to people, the developed and natural environment by encouraging the provision of technically, environmentally and economically sustainable coastal defence and protection measures".

The ESCP undertake a broad range of coastal management activities including:

- Working at a strategic level to deliver Shoreline Management Plans [SMPs] and FCERM Strategies and policy;
- Designing and implementing on the ground FCERM schemes that improves the standard and flood and erosion protection for the people living around our shoreline;
- Undertaking regular management, inspections and maintenance of the sea defences across our region to ensure a safe standard of protection for our communities.
- Undertaking Environmental Impact Assessments, and detailed environmental studies to proactively explore environmental opportunities.

All members of the ESCP team are employed directly by the partner authorities.
For more information on the ESCP, including our upcoming and ongoing Flood and Coastal Erosion Risk Management works, please visit our website:
www.escp.org.uk

**Figure 1.0 Study Area - Location of the South Hayling Island BMP**

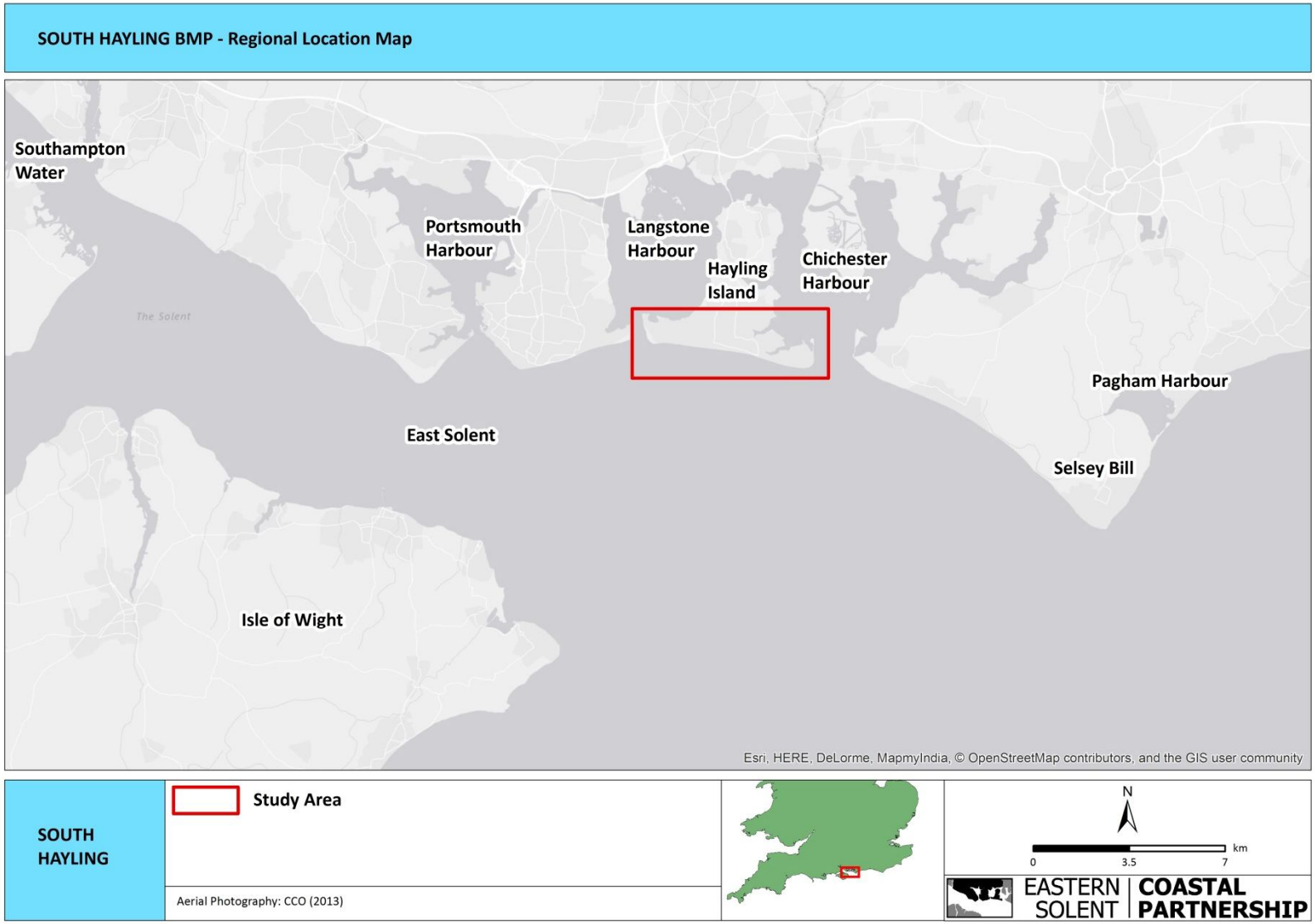


**Figure 1.1 Overview of BMP Management Units (BMP Unit 1 to Unit 8)**



**Figure 1.2 The 1 in 200 year flood risk and 20 year erosion zone under a 'Do Nothing' scenario**

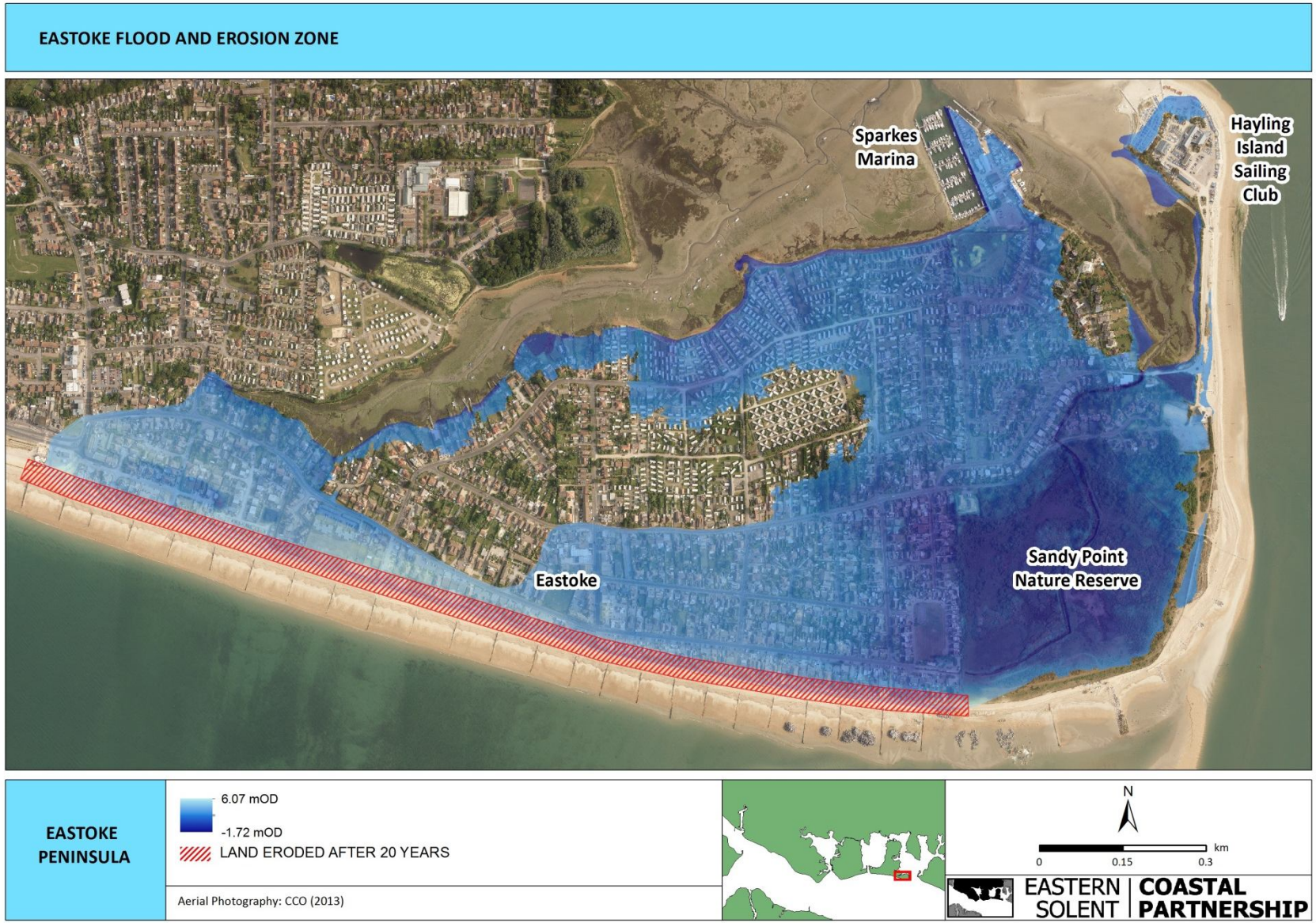


**Figure 1.3 International Conservation Designations**

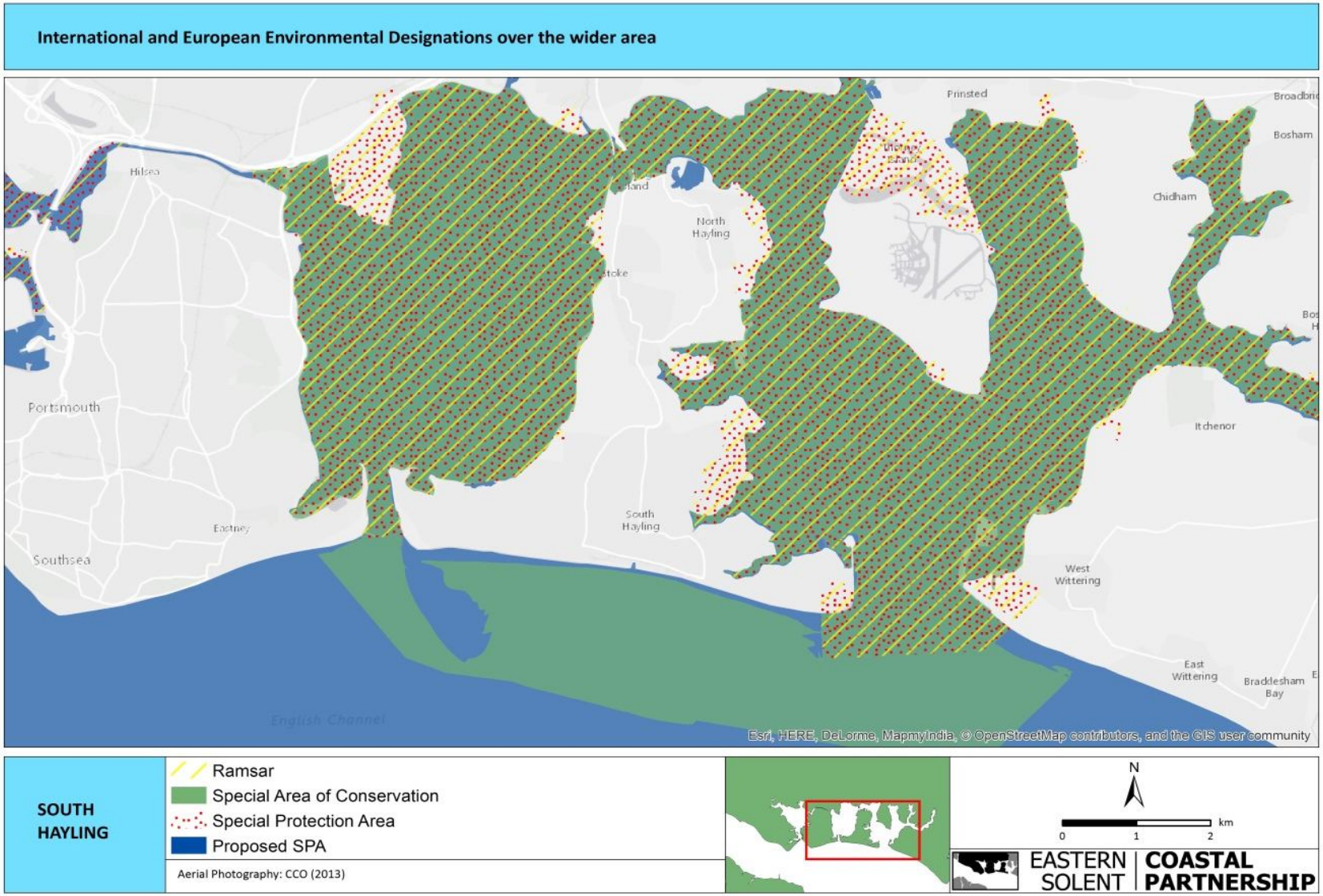


**Figure 1.4 Hayling Island BMP: Existing and proposed extent of operations**



# 2. BACKGROUND

## 2.1 Strategic Background

Decisions are made nationally on how the coastline can be sustainably managed for the next 100 years. We adopt Flood and Coastal Erosion Risk Management (FCERM) Strategies which set policy as to how each stretch of coast should be managed, as guided by recommendations in Shoreline Management Plans (SMPs). The adopted policy must be technically, economically and environmentally sound.

The beach management policy for the South Hayling coastline has been set at a strategic level, within the North Solent Shoreline Management Plan (SMP, 2010). The SMP, recommends a policy of 'Hold the Line' for the whole of the South Hayling Island coastline. The Eastoke Sectoral Strategy, which covers the whole of the Eastoke Peninsula was approved and adopted in 2006, recommending a 'Hold the Line' to a 1 in 200 year (0.5% annual) standard of tidal flood protection through beach management along the main southern frontage. Works have also been carried out on the northern frontage (Chichester Harbour side).

In 2012, and in line with the North Solent SMP and the Eastoke Sectoral Strategy, the 2012-2017 South Hayling Beach Management Plan (SHBMP, 2012) and the Eastoke Point Scheme were jointly approved by the Environment Agency (EA). The Eastoke Point Scheme, which was completed in 2013, consists of a rock revetment, three rock groynes and one shortened rock groyne. The purpose of this scheme was to stabilise a particularly mobile, but localised section of Eastoke's coastline. Since the scheme's completion, the South-east Regional Coastal Monitoring Programme has shown that the beach has held up well during a particularly stormy period (i.e. the recent stormy winters of 2013/14 and 2015/16). As recommended by the Scheme, Beach Management Activities are required to maintain the 1:200 year (0.5% annual) standard of tidal flood protection to Eastoke. The SHBMP (ESCP,

2012) has now been revised into the South Hayling Beach Management Plan (BMP) 2017-22 (Technical Report included as **Appendix A)**. It has been developed in accordance with the Construction Industry Research and Information Association's (CIRIA) Beach Management Manual (2nd Edition, 2010). Key activities to deliver the BMP are summarised in **Chapter 4 'Proposed Scheme'**.

An Outline Business Case (OBC) was submitted to the Environment Agency for funding for the next round of beach management activities on the South Hayling Island frontage. Funding was approved in February 2017, which will allow the SHBMP2017 to be implemented, subject to consents (i.e. Planning Permission and a Marine License).

### 2.1.1 South Hayling Beach Management Plan 2017-22

This newly updated BMP was submitted to the Environment Agency in 2017 (and is included as **Appendix A**). Whilst preparing the BMP document, a number of key stakeholders were consulted in order to agree the appropriate management approach. The Environment Agency, Natural England, Hampshire County Council, Chichester Harbour Conservancy and others have previously been supportive of our work. All of these organisations were supportive of our current approach.

The key technical objectives of the BMP are as follows:

- To reduce the risk of coastal erosion by providing protection against breaching of the defences and a reduction in coastal flooding;
- To reduce the risk of flooding from extreme surges;
- To provide clearly defined defences with good access for maintenance;
- To limit the impact of the scheme on people and property;
- To provide a scheme which is adaptable to sea level rise and climate change;
- To maintain the amenity benefit of the beach over the whole frontage for both the local population and the holidaymakers who visit the area.

The key environmental objectives of the BMP are as follows:

- Avoid damage to human health and population and where appropriate enhance human environment (human health, population and continued flood and coastal erosion risk management);
- Protect and enhance biodiversity (biodiversity, flora and fauna);
- Protect and enhance land quality (soils);
- Protect and enhance water quality (water);
- Protect existing infrastructure (material assets);
- Protect and enhance cultural heritage features (cultural heritage);

- Protect and enhance landscape character / visual amenity (landscape);
- Minimise disturbance to the community and natural environment through construction activities;
- Ensure no Likely Significant Effect (LSE) on the designated environment and its interest features;
- Work with natural coastal processes.

The BMP sets out how to deliver the above objectives in the most cost effective and environmentally acceptable manner with the minimum of disruption to the public and the environment.

## 2.2 Strategic Environmental Assessment

The North Solent SMP undertook a Strategic Environmental Assessment (SEA) at a very high level, across all North Solent SMP policy areas, to present an environmentally acceptable policy. A Hold the Line option was adopted at Policy Unit 5AHI05 (**Figure 2.1**), which covers the South Hayling Island open coast BMP frontage. The SEA made a number of conclusions about the impacts of HTL on the South Hayling Island coastline, with most impacts expected to be beneficial, negligible or minor adverse. These are summarised within **Table 2.1**.

**Figure 2.1 North Solent SMP highlighting the Policy Unit Areas (5aHI05 encompasses the current and proposed South Hayling BMP):**

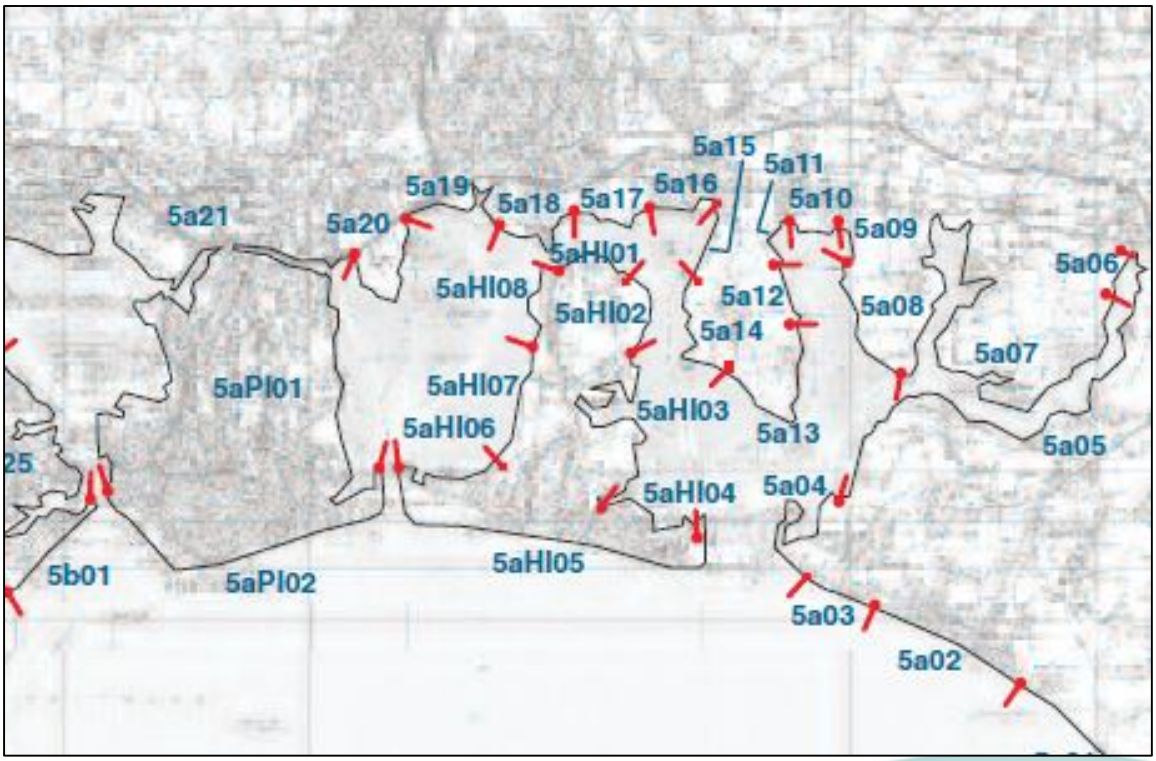


**Table 2.1 Summary of conclusions from the North Solent SMP SEA, relating to policy unit HaHI05 (South Hayling Island):**

| **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 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 re-nourishment. 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 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 SINCs, 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 |

## 2.3 History of flooding / erosion incidents

The history of flooding and erosion on the Eastoke Peninsula has arisen due to the development of an urbanised area on a low lying peninsula of land behind a retreating shingle barrier beach. Houses were constructed behind the retreating barrier beach. Shore parallel defences were constructed in the mid 1940s in response to both erosion and wave overtopping. These were replaced with much higher seawalls in the 1970s but over time the beach levels in front of these defences continued to drop. The incidence and severity of flooding increased prior to the Hayling Island Beach Replenishment Scheme in 1985. **Photos 2.1 and 2.2** show

flooding that occurred in 1978. **Photo 2.3** shows wave over topping and flooding in 1985. **Photos 2.4 – 2.8** show flooding that occurred in 2005.

**Photo 2.1 Storm damage to property behind the promenade, December 1978**



**Photo 2.2 Storm damage to properties behind the seawall, December 1978**



**Photo 2.3 Wave overtopping adjacent to Creek Road car park, pre Beach Replenishment 1985**

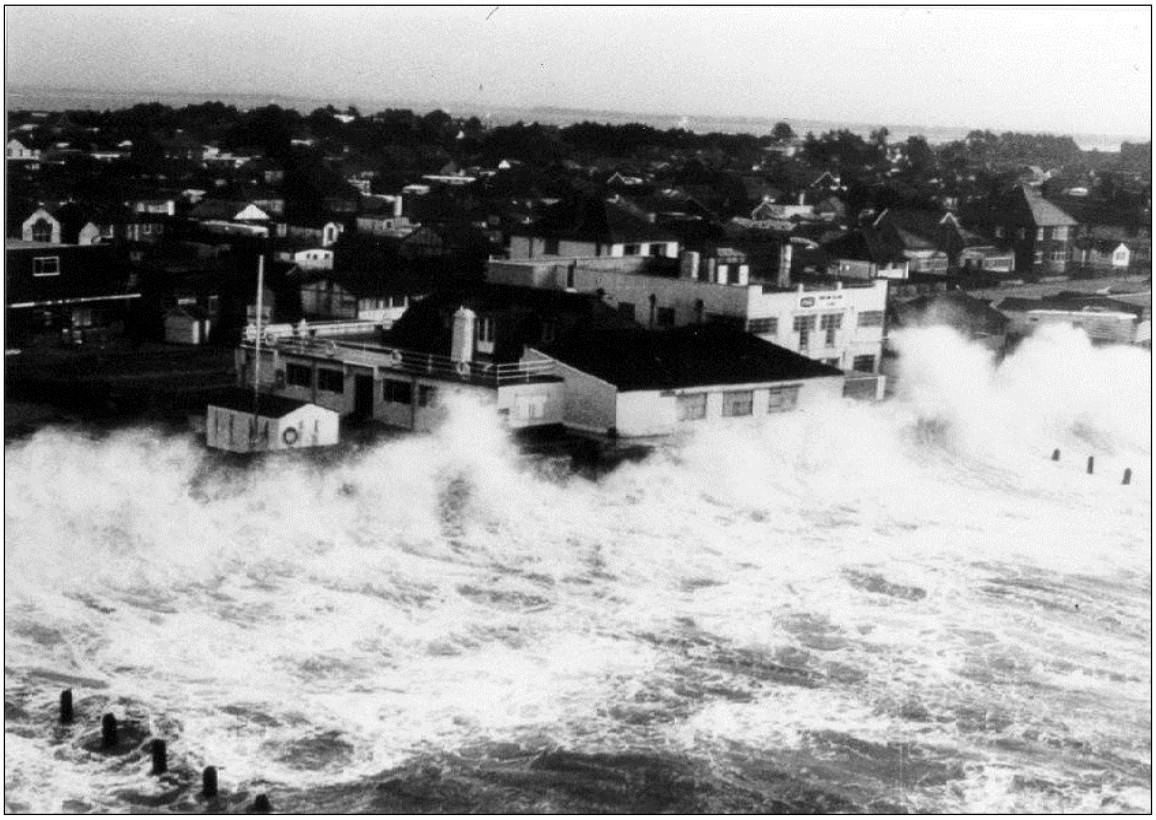


**Photo 2.4 Eastoke Nourished frontage, November 2005**



**Photo 2.5 Eastoke Nourished frontage, November 2005**



**Photo 2.6 Eastoke Nourished frontage, November 2005**



**Photo 2.7 Southwood Road looking west from Bosmere Road, November 2005**



**Photo 2.8 Southwood Road looking west from Bosmere Road, November 2005**



As can be seen on **Figure 2.2,** there has been serious flooding at Eastoke during the 2013/14 winter, in 2005 and on several occasions before the 1985 beach

replenishment scheme. Since the 1985 replenishment, the incidence of significant flooding along the South Hayling frontage has greatly reduced, and the flooding that has been recorded is usually associated with key erosion hotspots, giving rise to localised flooding. However, significant flooding occurred in November 2005 and during the winter storms of 2013/14, when the beach was overtopped along much of South Hayling. The extreme event that occurred on 3rd November 2005 was caused by very long period swell waves in combination with extreme water levels. The flooding resulting from this event was not on the same scale as those prior to the 1985 replenishment, but did serve as a stark reminder of the very real and prominent threat to this area from overtopping, and the likely effects if beach management were to cease.

Since the 3rd November 2005 storm, there have been storms that have generated larger waves and higher sea levels (although the 3rd November event was exceptional in terms of wave period). This includes the 10th March 2008 event and during the winter of 2013/14 (particularly early January 2014 and the 14th-15th February 2014 event). The November 2005 event had a greater impact than the March 2008 event on Hayling Island (floodwater was present on Creek Road, Nutbourne Road, Bosmere Road, and Southwood Road), although the opposite was true for the Solent as a whole. Most recently during 'Storm Katie' (28th March 2016) the highest wave height was recorded since deployment of the Hayling Island wave buoy (in 2003). As this event did not coincide with particularly high tides, there was no recorded flooding on Hayling Island.

**Figure 2.2 Incidence of flooding events at Eastoke, Hayling Island (adapted from (Ruocco A. C., 2011)). Severity is measured according to Table 2.2.**

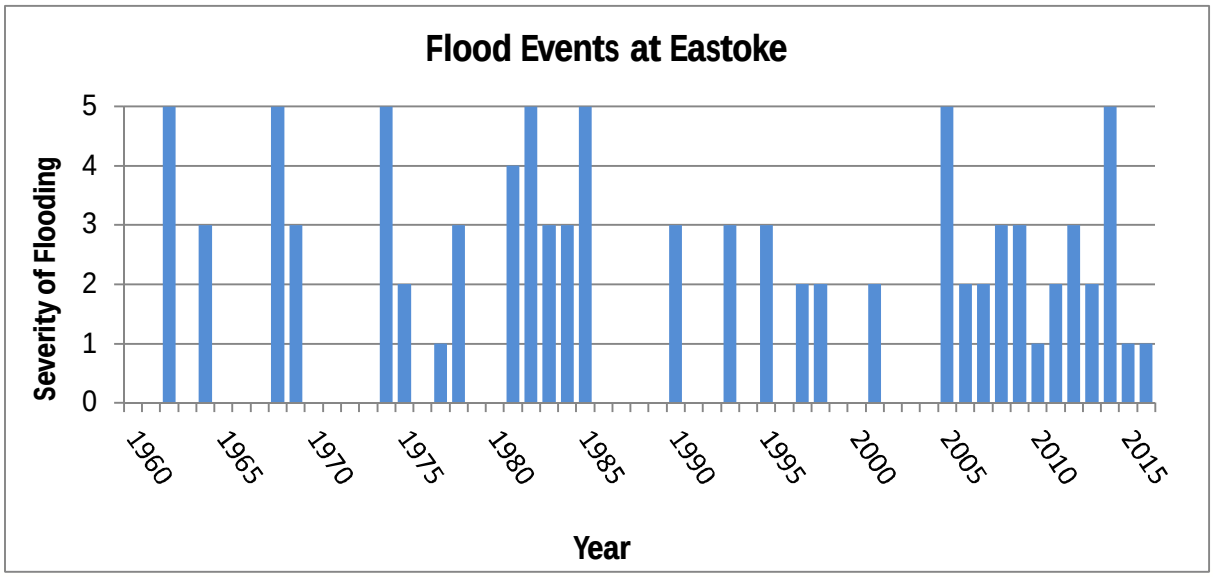


**Table 2.2 Severity of flooding presented in Figure 2.2.**

| Level of Severity | Description |
|---|---|
| 5 | Flooding over large areas. Significant pumping required by emergency services. Generally more than half a day disruption to homeowners and road users. More than 15 properties affected. |
| 4 | More than 5 properties affected by flooding. |
| 3 | More than 3 roads affected and/or at least one property affected. |
| 2 | Some road flooding - usually localised or shallow |
| 1 | Flooding in open areas/prom areas - no real structural damage or disruption. |

## 2.3 Managing Floods and Erosion

The most cost effective way of achieving the appropriate level of protection along the South Hayling Island frontage, maintaining the 'Hold the Line' policy (as stated in the North Solent SMP) and working with the natural environment, is to undertake beach management; moving material that has been accreting back to areas of erosion. This principle has been agreed in this location from a strategic level to a local level (current planning permissions).

Under historic beach management activities, the area of beach management has involved the movement of shingle within the area shown by the blue line in **Figure 1.4**. This newly proposed BMP proposes to increase the extent of beach management activities (see the red line on **Figure 1.4**). This will enable us to:

- Recycle material from Gunner Point (BMP Units 6 and 7 (**Figure 1.4)**), at the western tip of the south coast of Hayling Island. BMP U 6 has been used as an emergency source of single on one occasion in March 2014;
- Movement of excessive sand build up around the Hayling Island Sailing Club pontoon (BMP Unit 1 (**Figure 1.4**));
- Minor re-profiling of shingle at Langstone Harbour entrance to prevent localised erosion hot spots (BMP Unit 8 (**Figure 1.4**)).

These additional BMP Units are within the same sediment sub cell as the existing BMP extent. Material at Gunner Point has been accreting over a number of years following our beach management activities along the wider open coast. Material from Gunner Point will be transported back to Eastoke as an additional source of material available for recycling.

It's important to note that the large accumulations of shingle at Gunner Point have arisen from our historic beach recharge and recycling activities, whereby material we

have brought into the system has travelled via Longshore drift over time. Our historic beach management has provided significant opportunities for the establishment of vegetated shingle, given that our works aim to maintain healthy and stable beaches. If we were to cease the Beach Management Activities, the shingle would disappear over time, increasing flood and erosion risks to people and property, and damaging the important beach habitats.

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# 3. CONSIDERATION OF ALTERNATIVES

## 3.1 Historic Strategic Background and Context to Selection of Alternatives

This assessment of alternatives is slightly different to a straight forward EIA, since the beach management operations have been taking place for some time. This section will briefly describe the history of beach management activities along the South Hayling Island open coastline, the consideration of alternatives and the development of a preferred option.

The overall coastal defence policy for this frontage was established in 1996 in the East Solent Shoreline Management Plan (SMP) and reconfirmed during the North Solent SMP in 2010 as 'Hold the Line'. This was considered to be the preferred environmental, technical and economically viable strategic option, and was therefore adopted. In-between the two SMPs, a Sectoral Strategy study was also completed, focussing in detail on Eastoke itself (See **Figure 1.1** for location of Eastoke).

### 3.1.1 Eastoke Sectoral Strategy Study (2006)

This assessed and compiled the information and data to develop a comprehensive, sustainable strategy for which the aim was to promote technically, environmentally and economically sound defence measures for the coast. It promoted a 'Hold the Line' policy for the frontage and recommended that the defences are improved to give a standard of protection of 0.5%, i.e. protecting the assets at risk from storm events with a return period of 200 years through beach management. In order to do this, it underwent an options appraisal process, as set out below:

### 3.1.2 The long list of options

The following long list of options was examined in the Strategy: Beach Management, Rock Revetment & Rock Groynes, Replacement Seawall, Offshore Breakwater, Inland Flood Defences, Beach Recharge, and No Action. This long list option selection process identifies all potential options for management of this coastline, regardless of technical, economic and environmental feasibility.

### 3.1.3 Short list options

The shortlist takes forward the technically, environmentally and economically viable long list solutions for the frontage. The shortlist evaluates the use of Beach Management to adequately provide and maintain the required standard of coastal flood and erosion protection to Eastoke. This operation has been undertaken regularly since the 1985 Hayling Island Beach Replenishment Scheme and the methodology and associated risks with the works are well understood. Therefore the 'Do Something' option adopts a consistent approach to sourcing, transporting and placing beach material, to achieve the required standard of protection. The options were appraised based on cost, technical viability and environmental impact. Below is a summary of the technical assessment of the short list options:

- **Do Nothing:** This scenario is used as a baseline for calculating damages and the benefit cost ratio. Do-nothing is assessed as it assumes that no action is undertaken, thus the baseline has zero costs (costs here being defined as the capital or revenue costs of actions or interventions). It presumes that the defence is not maintained over its life. In this scenario there is a high likelihood of rapid beach drawdown, leading to heavy wave overtopping, putting the residents of Eastoke at great risk.

- **Do Minimum:** This scenario is used as a baseline for calculating damages and the benefit cost ratio. Do-Minimum considers the consequences of adopting a minimum level of investment using Havant Borough Council revenue funds only. In an attempt to protect the most vulnerable sections of the frontage at Eastoke Corner and Creek Road, beach material would be bulldozed up from the lower beach, to form a small beach crest. Thus this option has relatively low cost and would be limited to the most critical areas at Eastoke. This approach would lead to an overly steep beach profile and a crest of insufficient size, causing rapid beach draw-down, heavy overtopping, and putting the 1555 residential properties behind the defences at great risk.

- **Option 1 – Beach Management 1:75 SoP (1.33% AEP):** This option identifies the maintenance of a managed beach crest 9m wide in front of the existing sea wall to achieve a 1.33% AEP (1:75 year) standard of protection. Using the current approach to beach recycling, beach levels would be maintained through a combination of beach recycling from the open beach, dredging (local or offshore sources) and through import of marine gravel via road to meet any shortfall. These sources have all been successfully utilised in the past to maintain a healthy beach.

- **Option 2 – Beach Management 1:100 SoP (1% AEP):** Like Option 1, this option identifies the maintenance of a managed beach crest in front of the existing sea wall, but with an increased crest width of 14m to achieve a 1% AEP (1:100) Standard of Protection.

- **Option 3 – Beach Management 1:200 SoP (0.5% AEP):** Like Option 1, this option identifies the maintenance of a managed beach crest in front of the existing sea wall, but with an increased crest width of 18m to achieve a 0.5% AEP (1:200) Standard of Protection. Option 3 is the preferred option in the Eastoke Sectoral Strategy and the current preferred Beach Management Option in the 2012 and 2017 Beach Management Plan.

### 3.1.4 Preferred Option:

The preferred option to deliver the strategic policy of 'Hold The Line' is Beach Management, 1:200 SoP (0.5% AEP). Within this section we have not considered alternatives to Beach Management (I.e. have not repeated the strategic work), but have instead considered alternative sources of beach material / combinations of sources to effectively manage the beach. This is to ensure the BMP remains technically, environmentally and economically sound.

### 3.1.5 Eastoke Point Coastal Defence Study (2009):

It's important to highlight that a 'stand alone' FCERM scheme has been delivered at Eastoke Point, the area of the BMP frontage at greatest risk to flooding and erosion. A wide range of defence options were assessed for this. An initial long-list of techniques used around the UK and overseas were assessed for their suitability for the Eastoke Point frontage, based on specialist judgement, and were reduced in number to a short-list of potentially suitable methods.

This Initial screening of coastal defence 'elements' and of beach management methods identified several possible approaches for managing flood & erosion risks at Eastoke Point. However, it was concluded that no single element was sufficient on its own, mainly because of the variable nature of the hydrodynamic and sediment transport processes and thus of the beaches themselves. It was concluded that any successful scheme would need to be capable of adaptation in the light of changes to wave conditions, tidal levels and currents which are all affected by unpredictable changes to the nearshore seabed. As a result, the following combinations of coastal defence elements and management methods were short-listed:

- Option 0 – Do Nothing
- Option 1 – Do minimum
- Option 2 - Beach Recharge & recycling (alone)
- Option 3 - Timber groynes, recharge & recycling
- Option 4 - Rock groynes, recharge & recycling
- **Option 5 - Rock revetment with groynes, recharge and recycling**
- Option 6 - Seawall with groynes, recharge and recycling

The short-listed options were compared using a multi-criteria analysis that allowed consideration of their technical feasibility, their likely environmental acceptability (including sustainability) and their economic benefits. The study identified **Option 5** as the preferred coastal defence approach for Eastoke Point. This option was then developed further into a full detailed scheme, the 'Eastoke Point Coastal Defence Scheme', which was approved funding in 2012, with construction completed in November 2013. The scheme involved the construction of rock groynes and rock revetments but it also identified that beach management and beach recycling are critical elements of the scheme that would need to continue into the future to maintain the appropriate standard of protection to the low-lying residential areas at Eastoke. Therefore it is critical that beach management operations continue in order to protect this significant capital FCERM investment.

## 3.2 Historic and proposed Beach Management Activities

HBC have managed Beach Management Activities since a large scale re-nourishment scheme in 1985. The past ten years have seen efforts co-ordinated by the implementation of BMPs, providing more structure to regular maintenance and supported scientifically by a programmed monitoring regime.

As part of the process of developing this new BMP 2017-2022, to which this EIA relates, the ESCP have considered a number of alternative beach management options, as set out below:

### 3.2.1 Recycling Shingle within the Hayling Island open coast sediment cell

Recycling involves mechanically moving the material from areas of accretion back to areas of erosion to maintain the design height and structural integrity of the beach and therefore the flood defence.

There are six potential sourcing areas of shingle for recycling within the South Hayling Island open coast sediment cell; these are (Illustrated by Figure 3.1):

1. The Ness (open coast);
2. Coastguard Revetment (open coast);
3. The Open Beach;
4. West Beach (open coast);
5. Gunner Point (open coast);
6. Chichester Harbour Approach Channel (beneficial use of dredged material).

Our preference is always to recycle material from within the sediment cell; however there are ongoing natural losses from the sediment cell to offshore. From time to time, there is a requirement to bring in additional material from outside of the sediment cell, referred to as 'Recharge'. We also propose localised works at Chichester Harbour entrance and Langstone Harbour entrance (Units 1 and 8 respectively), however this is only to respond to localised issues (as set out in **Section 4 'proposed scheme'**).

### 3.2.2 Recharging Shingle from outside of the sediment cell

Recharging shingle onto the beach at Eastoke from outside the sediment cell, involves bringing material in from offshore licenced aggregate sites. This can be undertaken directly using a hopper barge, or indirectly where the material is transported to a local aggregates wharf, the material is then brought to the beach by road.

### 3.2.3 Mechanisms for Depositing the material onto the beach

There are two mechanisms for moving and then depositing material onto the beach within the deposition areas:

a) Mechanically moving shingle: Excavating the material from the areas of accretion, transporting the shingle in dumper trucks back to the areas of erosion. The material is then deposited on the beach and reprofiled using bulldozers. Alternatively for Beach Recharge, material is transported to site by road, deposited in the Eastoke carpark and then moved to the nourished frontage using dumper trucks.

b) Pumping Shingle ashore directly from a barge: Rainbowing (see **Photo 3.1**). This mechanism for moving shingle directly from the Marine Environment (both recycling and recharge) is carried out through a technique called Rainbowing. Here, sediment is pumped ashore directly from the dredging hopper barge. To allow the barge to get access to the shore this operation must take place at high tide (1 hour either side of high tide)

**Photo 3.1 Example of shingle being 'Rainbowed' ashore at Eastoke**



### 3.2.4 Assessment of utilising the different sources of shingle in beach management (See Figure 3.1 for spatial representation)

**1) Recycling from the Ness (BMP Unit 1):** The "Ness" is just north of the Nature Reserve at Eastoke Point. Extensive monitoring, undertaken in-house by the ESCP,

has shown that this area historically accumulates material carried easterly from the drift divide at Creek Road. Material protruding into the channel is removed to make the navigation safe and to avoid it being eroded by the ebb dominant tide and deposited on the bar across the entrance channel. Material from this area has a higher sand content and tends to cliff if left exposed on the front face of the nourished beach. Extraction of this material now depends on the quality (coarseness) of the material and whether a haul route needs to be constructed over the Eastoke Point rock revetment for the plant to access the "Ness".

**2) Recycling from the Coastguard Revetment; 3) the Open Beach; 4) West Beach (BMP units 3 to 5):** The wide shingle storm beach in the centre of Hayling Bay is a good source of material, especially the coarse berm that often forms just above MHW. The ESCP undertake surveys before any beach management operation to identify areas that have accreted over the previous year. Beach material can be extracted from the face of the storm beach and care must be taken not to reduce the berm height or width, particularly just east of Inn-On-The- Beach. In addition, there is vegetated shingle on the beach crest which must not be disturbed during recycling operations. This will be surveyed prior to any Beach management operations to protect the vegetated shingle (highlighting areas where access and extraction of material must be avoided).

There are two main extraction areas behind sloping revetments in the study area; one at the coastguard station and one at west beach (to the west of the "Inn on the Beach"). Material is periodically thrown over the structures by storm waves and thereby removed from the sediment transport system. This material is usually coarser, well sorted gravel that performs well as a front face to the nourished beach crest. This source may reduce if the remaining sections of timber revetment west of the "Inn on the Beach" are removed on health and safety grounds. The same applies to the Coastguard revetment, if this structure were deemed to be redundant and removed on health and safety grounds. In both incidences, material would initially be released into the system but no longer provide a possible recycling store. The beach profile would be more natural however.

**5) Recycling from Gunner Point (BMP units 6 and 7):** Gunner Point at the far western end of Hayling Island has been a sediment store since the beginning of the 20th century. With a large proportion of imported material travelling west from the drift divide at Eastoke, Gunner Point has accreted substantially since the 1985 replenishment and continued BMP activities (approximately 20,000 $m^3$ per year since 2003). Gunner Point is therefore an excellent source of material for recycling

back to Eastoke given the mix of native and imported material that has built up largely as a result of our historic beach management activities.

**6) Recycling from Chichester Harbour Approach Channel – Beneficial use of dredged material:** This material is only available when the Chichester Harbour Master requires the Chichester Harbour Approach channel to be dredged. This in turn is dependant on maintaining a safe navigable depth into the Harbour. Bathymetric surveys will determine when the dredge is required.

This EIA and the BMP will not consider the implications of the dredge itself, as this is undertaken by the Chichester Harbour Master under the powers for safe navigation. Only the deposition of the sediment and the beneficial reuse of the dredged material will be considered within this report. The material will be deposited on the beach at high tide by rainbowing it ashore. This material is then either re-profiled using bulldozers, or left for the natural processes to reshape. The material found within the approach channel is also from within the same sediment cell. The material moves into Chichester Harbour mouth at the Ness and is then transported out to the approach channel (**Figure 3.2**). For this reason it is an excellent native and clean source of material.

**7) Recharge directly via Hopper Barge:** If required, marine based sediment can be transported in by barge and rainbowed ashore. Such offshore sources of sediment will be chosen ensuring that the sediment properties are as close as possible to those already found on the beach.

**8) Recharge Indirectly by Road**

If required, additional marine based sediment can be transported in by road from aggregate wharfs in close vicinity. Sediment will be chosen ensuring that the sediment properties are as close as possible to those already found on the beach. However this option adds to the impact on the highway and also is more costly, so is less preferable.

## 3.3 Summary of preferred recycling and recharge operations

Where possible, the BMP will opt for recycling sediments from within the sediment cell, rather than importing new material. This will very much depend on how the potential recycling source areas accrete, and how much material is available for

recycling / needed in any given operation. Where there is not enough material to recycle within the sediment cell, recharge will be utilised. The possible sources will be assessed on an annual basis but all sources discussed within this chapter may be utilised in order to appropriately maintain critical beach levels in line with the approved BMP (as set out in **Section 4 'proposed scheme'**). The ESCP has been, and will continue to carry out a detailed monitoring programme to determine where and how the sediment is moving, as set out in the BMP itself (see **Appendix A**). The monitoring will also assess how the nourished beach is reacting to storms to determine how much sediments are required and when. This information will then inform the decision in any one year where the most appropriate source of shingle will be. One of the key aspects of the beach management activities is to monitor the levels and the profile of the beach at Eastoke to determine how much material is required to be recycled or recharged to maintain the approved standard of flood and erosion protection. It is then possible to determine in any one year which source is the most suitable, sustainable and cost effective.

**Table 3.1** summarises the advantages, disadvantages and impacts of each potential source of shingle to help demonstrate how we would consider each source in turn to balance activities per BMP operation.

**Table 3.1 Advantages and disadvantages of different sources of material**

| Sources of material | Advantages | Disadvantages | Impacts | Conclusions |
|---|---|---|---|---|
| **Recycling** | | | | |
| 1) The Ness (BMP Unit 1). | If extraction does not take place, the sediment builds up and is then transported to the offshore Chichester Bar.<br><br>Preventing this offshore transport provides additional benefits of removing a navigational hazard at the same time as utilising the material for recycling. | Can have a high sand content.<br><br>Access to the Ness, with machinery can be difficult. | Potential impacts on vegetated shingle and nesting birds. Surveys will be carried out prior to works to ensure no impact, as set out in **Section 9 'information for HRA'.** | Potential source for recycling if accretion levels adequate. |
| 2), 3), 4) Coast guard Revetment, Open Beach and West Beach (BMP units 3 to 5). | Area of build up behind existing revetments. These accretions occur during storm conditions where shingle is thrown above the timber coastal defence structures (I.e. above MHWS). This shingle is then effectively lost from the system if not recycled. The material is well sorted and of large size. | Material that has built up behind revetments previously will not form a future store as the timber revetments are likely to be removed due to health and safety concerns.<br>Care has to be taken not to impact the vegetated shingle in this area (there are safeguards in place). | Potential impacts on vegetated shingle and nesting birds. Surveys will be carried out prior to works to ensure no impact, as set out in **Section 9 'information for HRA'.** | Potential source for recycling if accretion levels adequate |
| 5) Gunner Point (BMP units 6 and 7). | Material grading closer to Eastoke beach material than offshore source (reduced losses).<br><br>Local source of material. Possibility to remove smaller volumes on an annual basis.<br><br>Reduced impacts on local | Effectively recycling material within littoral system so may not be as beneficial to overall Hayling Island volumes as land based or offshore sources.<br>Not a guaranteed supply of material as landowner / Natural England consent required. | Potential impacts on vegetated shingle, vegetated drift line habitats and roosting / breeding birds.<br><br>Significant liaison with Natural England has been undertaken through their Discretionary Advice | If material is available in September and landowner agrees to the quantity to be extracted, then this is a valuable source of resident beach recycling material, which should be built into our annual operations. |

| Sources of material | Advantages | Disadvantages | Impacts | Conclusions |
|---|---|---|---|---|
| | transport network.<br><br>Large sediment store, it is a mix of native and imported material, as a large amount of material form the previous works has ended up at Gunner Point.<br><br>Allowing the nourished material to travel further along the frontage before recycling it back to Eastoke benefits the wider South Hayling frontage, as opposed to trapping the material on the nourished frontage and starving the adjacent sections of coastline.<br><br>This material originates from our historic activities, and is therefore an excellent source for recycling.<br><br>To access the material, we need to maintain a haulage route fronting the golf course, which prevents landward erosion. If source not used, erosion could occur here. | Quantities to be extracted dependent on accretion in front of annual vegetation of drift line habitats.<br><br>Source limited to month of September (and first two weeks in March) only due to wider environmental factors. | Service (DAS) to ensure appropriate mitigation is adopted when extracting from this sensitive location.<br><br>Surveys will be carried out prior to works to ensure no impact, as set out in **Section 9 'information for HRA'.** Significant constraints apply to ensure no impact on this environment of European importance. | |
| 6) Chichester Approach Channel (Beneficial use of | Material grading closer to beach material than offshore source (reduced losses). | Effectively recycling material within littoral system so may not be as | Potential impacts on roosting birds, as can only be pumped ashore at high | If dredging must take place due to removal of hazard to navigation, this |

| Sources of material | Advantages | Disadvantages | Impacts | Conclusions |
|---|---|---|---|---|
| dredge materials). | Cheaper source of material.<br><br>Possibility to remove smaller volumes on an annual basis under term agreement.<br><br>No impact on transport network. The sediment in the entrance channel is a good match to the current beach material.<br><br>This method avoids resident beach material being disposed of offshore. Beneficial reuse of dredged material should be promoted where possible. | beneficial to overall Hayling Island volumes as land-based or offshore source, which would increase volumes.<br><br>Not a guaranteed quality or supply of material, as this material can only be utilised if a navigation dredge is taking place.<br><br>Disruption to residents due to 24hr high tide working. Susceptible to down-time due to poor weather conditions.<br><br>Less control on placement of material as 'rainbowed' ashore.<br><br>Losses due to fines are still estimated at 30-40%. | tide. Historic activities have had ornithological watching briefs, which have confirmed that the activity does not negatively impact roosting birds. Each Activity is short term (I.e. 1 hour either side of High tide) and extremely localised (I.e. pumping ashore within one to two groyne bays at any one time). This does not have any Likely Significant Effect on roosting birds. This is detailed further within **Section 9 'information for HRA.** | option is extremely beneficial and good value, preventing offshore losses of resident beach material from the system. |
| **Recharge** | | | | |
| 7) Import by road. | Guaranteed supply of material.<br><br>Coarser grading of material improves beach performance.<br><br>Able to profile material on the beach crest without need to | Increased vehicle movements onto Hayling Island.<br><br>Requires stockpiling prior to placement on beach.<br><br>More expensive than offshore marine-based | Main impacts are to residents and road users. This activity is more expensive and less preferable that recycling materials from within the sediments cell. | Suitable as a source to maintain overall beach volumes but not a preferred source due to high financial cost. And Impact on highway network and residents. |

| Sources of material | Advantages | Disadvantages | Impacts | Conclusions |
|---|---|---|---|---|
| | bring in additional plant.<br><br>Non-weather dependent delivery.<br><br>Able to procure jointly with Beach Recycling operations under Minor Works Framework.<br><br>Able to import smaller volumes on an annual basis, reducing losses due to overfilling of groyne bays.<br><br>No Fines, as we specify material. | material above approx. 45,000 cu. m. overall volume.<br><br>Potential impact on transport network and local residents. | | |
| 8) Import directly by barge from offshore licensed sites, and rainbowing ashore. | Guaranteed supply of material.<br><br>No impact on transport network. | Higher mobilisation costs make smaller annual operations unviable.<br><br>Disruption to residents due to 24hr working.<br><br>Susceptible to down-time due to poor weather conditions.<br><br>Less control on placement of material as 'rainbowed' ashore.<br><br>Material grading less similar to beach material than | Although a guaranteed supply of material, this can only be used when the barge is available. This can push the operation into winter months. We have undertaken ornithological surveys historically to ensure overwintering birds are not impacted by this operation, which has demonstrated no significant effect. To ensure there is no negative effect on overwintering birds, surveys will be carried out prior to works, as set out in **Section** | Suitable as a source to maintain overall beach volumes but not preferred source due to limited availability of barge. |

| Sources of material | Advantages | Disadvantages | Impacts | Conclusions |
|---|---|---|---|---|
| | | Chichester Entrance source.<br><br>Increased losses due to fines (estimated at around 20-30%).<br><br>Limited access to barge, due to limited barges nationally that are able to pump shingle ashore. | **9 'information for HRA'.** Significant constraints apply to ensure no impact on this environment of European importance. | |

**Figure 3.1 Areas of accretion and erosion and extraction and deposition points**

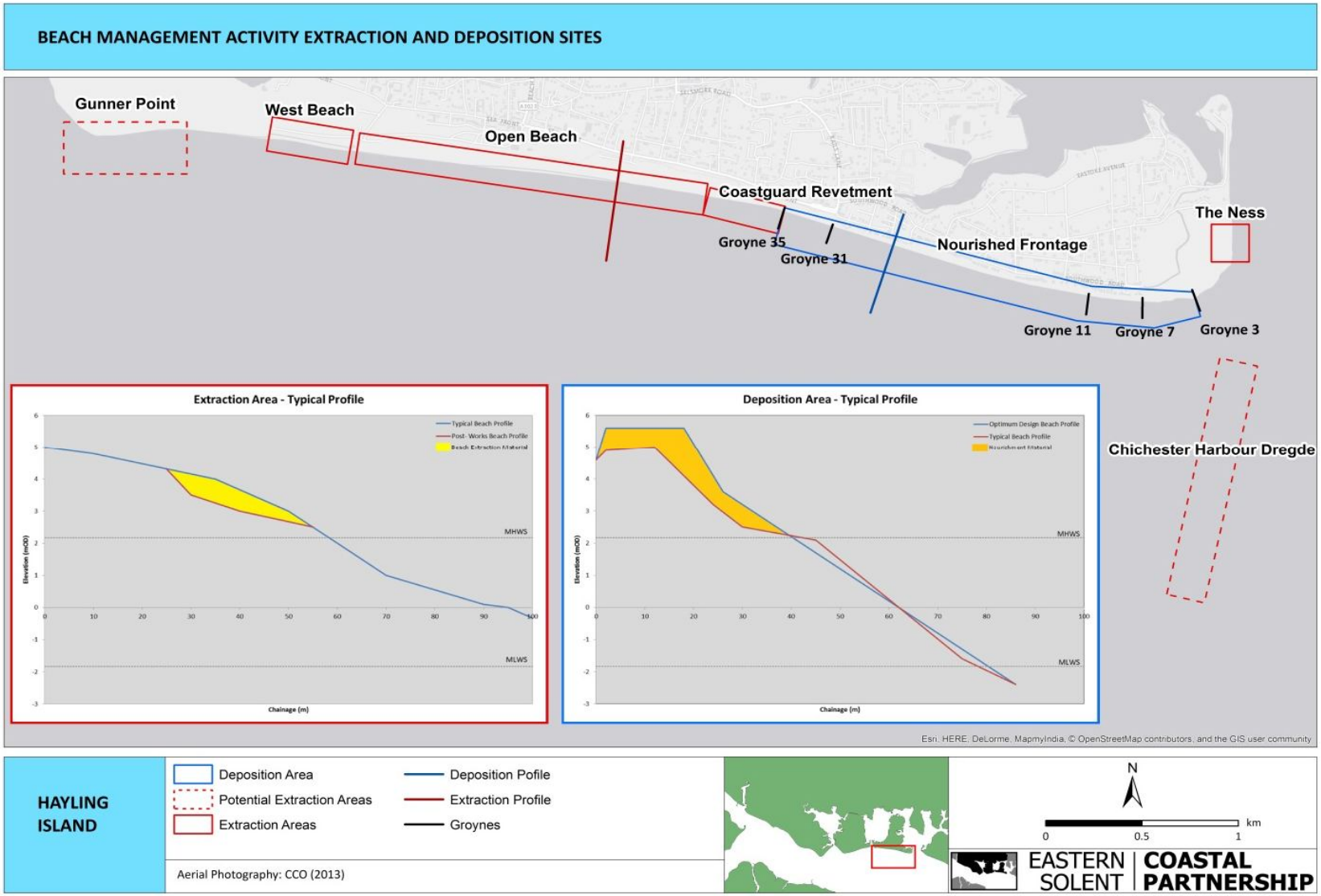


**Figure 3.2 Movement of sediment around Eastoke Point, The Ness and Black Point Spit**



# 4. PROPOSED SCHEME

## 4.1 Introduction

Havant Borough Council (HBC) is proposing to continue the beach management activities, as agreed at a strategic level to protect 1555 homes, 170 commercial properties and important infrastructure from flooding in Eastoke, acting within its powers under the Land Drainage Act 1991. Without this work, the existing standard of protection at Eastoke would deteriorate leading to extensive flooding and the erosion of residential and commercial properties and important terrestrial habitats. Extending the boundaries of the current planning permission to include the whole South Hayling Island frontage will allow more efficient management, cost savings for each campaign and a more natural beach to form by utilising additional sources of material from within the sediment cell. This approach allows the continuation of natural coastal processes as opposed to trapping the material on the nourished frontage and starving the adjacent sections of coastline. The flood risk is low outside of the residential area at Eastoke, therefore areas of sediment accretion can be used as extraction areas, without creating an unacceptable flood risk elsewhere. Extending the boundaries of the current planning permission also allows the ESCP to work with the local community and businesses in the area to develop an integrated solution for the whole of the South Hayling Island frontage.

The coastal processes, sediment volumes and transport rates are highly dynamic and unpredictable on the open coast of Hayling Island, therefore an adaptive approach to the Beach Management Activities is required. This iteration of the BMP has been costed on the requirement to recycle / recharge 207,000$m^3$ of material in total over the 5 year phase for the Outline Business Case (2017-22) in order to meet the 1 in 200 year Standard of Protection detailed in **Section 4.2.1**. This will comprise 51,000$m^3$ of material in year 1 to bring the beach volume back up to 1 in 200 year

Standard of Protection, after which it is estimated that 39,000 $m^3$ will be required on an annual basis for year 2, 3, 4 and 5. This current BMP will work on the assumption that some of the material from the Eastoke drift divide is being transported east, thereby feeding Eastoke Point before being transported to The Ness and West Pole Sands in Chichester Harbour. The potential sediment sources are detailed in **Section 4.3**. The full BMP Technical Report is included as **Appendix A**.

The ESCP aims to ensure that Beach Management Activities on South Hayling Island are adaptable so the Coastal Manager can be flexible in choosing solutions to manage the risk into the future. This is complex due to the dynamic nature of the beach and exposed coastal location, the factors associated with a changing climate and increases in storminess and unpredictability. Instead of taking a prescriptive approach, it is proposed that an adaptive approach based on sound scientific evidence is taken, where management decisions from year to year are informed by the results of ongoing monitoring.

One of the key aspects of this new proposal will be a Management and Monitoring Plan which will pull together all the research that has been undertaken and demonstrate that the works are not having any negative impacts. Three reports will be produced each year; a Beach Management Report, a Beach Monitoring Report and a Vegetated Shingle/Bird monitoring Report. If any unforeseen impacts are uncovered due to the monitoring, adaptations to the operations can take place, in consultation with the statutory bodies. The Beach Management Plan in its entirety will be reviewed every five years to ensure it remains sustainable.

The proposed works will extend the area covered by the existing Planning Permission/MMO Licence to cover the entire sediment cell as identified in the SMP. The boundaries of the BMP have been extended, although there will be restrictions on the activities in certain areas. This is in line with discussions that have been held with Natural England and others to ensure that the sensitive environmental receptors are protected; in particular the high tide roost sites and the fragile vegetated shingle habitats. The extension is illustrated by **Figure 1.2**, whereas **Section 9 'Information for HRA'** sets out the environmental restrictions.

## 4.2 General Construction Information

Although the South Hayling Beach Management Plan (BMP) considers the wider Hayling frontage from Hayling Island Sailing Club round to the Ferry Boat Inn, the scheme is focused on delivering flood and coastal erosion protection to the Eastoke Frontage, as this is the area of greatest flood risk (see **Figure 1.2**).

The 5 year BMP aims to maintain the beach at Eastoke to the same design profile as the previous BMP (**Section 4.2.1**); a level where it can provide a 1 in 200 year Standard of Protection to homes, properties and infrastructure on the Eastoke Peninsula. This will be achieved through beach recycling and replenishment, using various sources of material which are described in **Section 4.3**. A summary of the works relating to these sources of material is outlined in **Section 4.4** for each BMP unit. In future years, the design profile may be altered following studies into the impacts of bi-modal waves (see **Section 7.3.1**).

### 4.2.1 The Design Profile

The design profile along the Eastoke frontage is broken down into three sections: Eastoke Corner, Eastoke Beach and Eastoke Point Scheme, each with a slightly different design profile. These are summarised in **Table 4.1**. In addition, **Figure 4.1** and **Figure 4.2** present the design profiles and **Figure 4.3** shows where these are located. More information on the design profile is located in Section 3 of the BMP Technical Report (included as **Appendix A)**.

**Table 4.1 The dimensions of the different design profiles at each section of beach**

| Section | Groyne No.'s | Crest height | Crest width | Front slope |
|---|---|---|---|---|
| **Eastoke Point Scheme** | 3 – 11 | 4.6m (rock has 5.6m crest) | N/A | 1:12 |
| **Eastoke Beach** | 11 – 31 | 5.6m | 18m | 1:4, then 1:10 |
| **Eastoke Corner** | 31 – 35 | 5.6m | 10m | 1:4, then 1:10 |

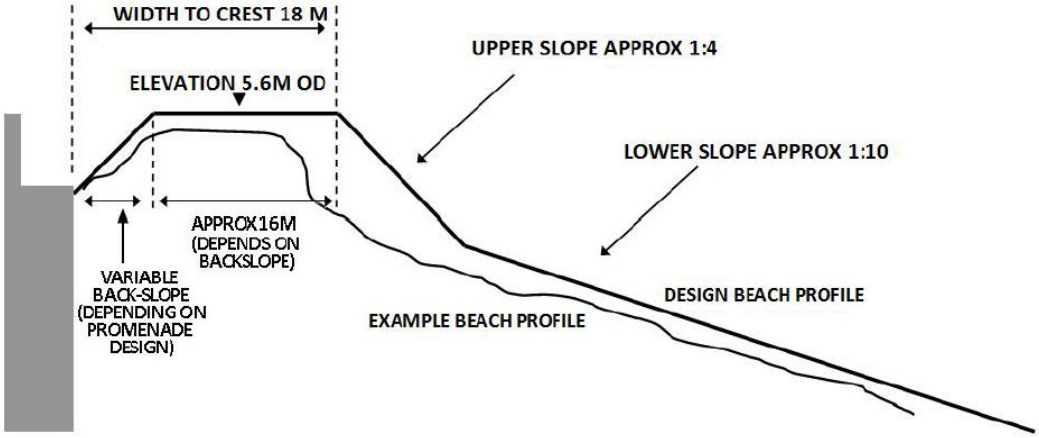



**Figure 4.1 The design profile along the Eastoke Beach section**

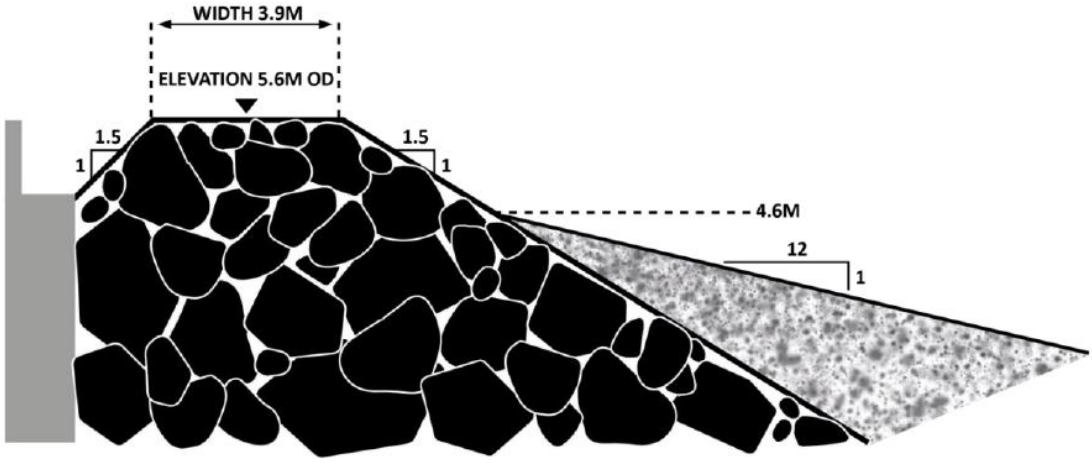



**Figure 4.2 The design profile along the Eastoke Point Scheme section**

### 4.2.2 Trigger Levels

Corresponding with the 2012 Hayling BMP and the experience gained in the 2013/14 storms, trigger levels have been implemented to assist with deciding when close monitoring and emergency works (Section 3.4 of the BMP) are to be carried out. The application of trigger levels is not absolute, and consideration should also be given to sea conditions at the time of the assessment. The trigger levels identified below are provided as a basis for assessing the requirement for emergency works. Each instance should be assessed on its own merits taking into account other factors such as the time until the next planned works.

There are two distinct types of triggers identified for managing the Eastoke frontage; volumetric and profile based. The volumetric thresholds are designed to ensure there is adequate material on the nourished frontage to maintain the design profile. The profile based trigger levels are designed to maintain the required standard of flood and erosion protection, and have been in place since the 1992 BMP. The two thresholds are applied independently, so for example the beach crest will still require topping up to maintain the 1 in 200 year profile even if the overall nourished beach volume is above the required standard.

Alarm

- Three or more consecutive groyne bays depleted below a 1 in 10 year SoP. (ACTION: The area shall be monitored daily by suitable officer to assess whether the area is deteriorating or naturally regenerating. If the area is regenerating then daily monitoring shall continue until the standard of protection is in excess of the 1 in 10 year standard.
- The nourished frontage volume falls within 10,000 $m^3$ of the design volume. ACTION: Volume of the nourished frontage to be monitored to establish if low levels are a result of a single anomalous survey, e.g. event drawing material down below toe of surveys, or a longer term erosional trend.

Crisis

- Three or more consecutive groyne bays depleted below a 1 in 10 year SoP AND deemed to be deteriorating. ACTION: Emergency works triggered, along with the appropriate ongoing monitoring.
- The nourished beach volume continues to fall below 10,000 $m^3$ of the design volume before the end of the BMP period. ACTION: Emergency works triggered, along with the appropriate ongoing monitoring.
- Individual bay drops below 1 in 1 year SoP ACTION: Emergency works triggered, along with the appropriate ongoing monitoring.
- 50% of frontage falls below 1 in 100 year SoP. ACTION: Emergency works triggered, along with the appropriate ongoing monitoring.

## 4.3 Sources of material

The following sections describe the sources of material and methodologies for extraction at each site.

**Figure** 4.3 The divisions of the beach, based on the design profiles

Figure 4.4 shows where each of these sources is located.

### 4.3.1 Beach recycling

Over the five year period of the BMP, beach recycling from West Beach, Open Beach, Coastguard Revetment and the Ness is anticipated to take place annually every March (not necessarily every source in every year), over approximately a 4 week period (see **Figure 4.4**). These are all land based recycling areas and due to the ease, cost and fact that it is native material, they are the preferred sources for beach management. Material gets periodically thrown over the Coastguard and West Beach Revetments which effectively removes it from the system, providing a good source of shingle. Material that moves east from the drift divide at the Creek Road Car Park moves round into Chichester Harbour. The coarse material gets deposited first, accumulating at The Ness and some of this gets flushed out into the approach channel by the ebb tide (**Section 4.3.2 and Figure 4.4**). The ESCP undertakes surveys prior to each campaign to identify how much material has accreted since the previous works and can therefore be extracted from these sites. Excavators are used to extract the material at these locations and transported along the haul routes along the beach using dump trucks. A bulldozer then re-profiles the beach to ensure that the design profile is implemented. Minor recycling activities are also proposed north

of the Ness, at Hayling Island Sailing Club (HISC), to enable continued use of their pontoon (not for flood and erosion protection), as discussed in **Section 4.4.1 (BMP Unit 1)**.

### 4.3.2 Chichester Harbour Approach Channel

Havant Borough Council objects in principle to any dredging close to the Hayling coast but will utilise the material from the Chichester Harbour maintenance dredge rather than lose it from the littoral system. Filling in of the approach channel presents a navigational hazard and therefore must be dredged. As described in **Section 4.3.1** above, some material from The Ness ends up in the approach channel, presenting the opportunity for the beneficial use of dredged material from within the sediment cell. Dredging of the approach channel would typically be on a passing basis, but where possible will be timed to avoid school summer holidays. In the past, these works have taken place in the autumn. A barge is used to dredge the accreted material off the Chichester Harbour Approach Channel and then pumped ashore through a process known as 'rainbowing'. This takes place over high tides to ensure that the barge can come in close enough to the beach to make sure that material lands in the right place. Again, a bulldozer is used to re-profile the beach. During these operations, a 24 hour working window over 7 days a week is necessary. As agreed with the Chichester Harbour Conservancy, the approach channel is dredged to a maximum of -2mCD.

### 4.3.3 Gunner Point

Situated at the western end of the South Hayling frontage, this area has been accreting over the past century. With the introduction of beach replenishment, it has grown rapidly and now presents a good source of coarse material. The land is privately owned, so an agreement has been made in principle for the use of this material. Havant Borough Council will request permission and agree a quantity of material with the landowner (Hayling Golf Club) prior to any recycling campaign from Gunner Point. To access this material, a haul route must be constructed which passes in front of the Hayling Golf Club driving range. Given the potential for Gunner Point being a high tide roost site between October to mid-March and the requirement for drift line vegetated shingle establishment between mid-March and August, September is the preferable month where extraction from Gunner Point can take place at all states of the tide. Works can take place from October to March providing no works take place 1.5 hours before and 1 hr after high tide and no works take place during extreme cold periods (i.e. frozen ground conditions for more than 1 week). Additional survey work has been undertaken by the ESCP and will continue into the future to determine the bird usage of this area. Given the environmental significance of this location, this activity is considered in detail in **Chapter 9**

**'Information for HRA'**, to ensure the material can be extracted without any Likely Significant Effect on the designated environment. Gunner Point is a land-based source of material and so the methods for extraction and transportation of material are the same as beach recycling.

### 4.3.4 Recharge

Import by road may be necessary during any beach recycling campaign. The coarse material can be used to top up and increase the sediment grading of the groyne bays. This material is sourced from marine offshore dredging and then graded ashore – specified at 20-63mm. This material is brought in via road by trucks and stock piled in the western end of the Eastoke Corner Car Park and transported from there by trucks to the Eastoke Frontage.

Material can also be dredged from offshore licenced sites and pumped directly ashore. This means that the material is not sorted and losses of fines can occur. Similar to when material from the Chichester Harbour Approach Channel is used, material from marine offshore sources is 'rainbowed' onto the beach and then re-profiled using a bulldozer.

Beach recharge provides guaranteed sources of material. Still, they are more expensive than the recycling options and bring in material from outside of the sediment cell, so are therefore not the preferred option.

## 4.4 Summary of proposed scheme and construction details

### 4.4.1 Summary of Works

The following sections provide an overview of the works that will be undertaken in each BMP Unit, as seen in **Figure 1.1**.

On top of the works on the beach, a Monitoring and Maintenance program is in place as well as some ongoing studies; these include Tracer Studies along the Hayling frontage and the production of bi-modal extremes (combination of long period swell waves with locally generated storm waves) which can be used to test the design profile.

The Reporting Programme (Section 6 of the BMP Technical Report (**Appendix A**)) will incorporate the annual reporting of the various logs and data collected as part of the Monitoring and Maintenance Programme. This is presented in three different reports:

- Annual Beach Management Report
- Annual Beach Monitoring Report
- Annual Vegetated Shingle/Bird Monitoring Report.

An overall environmental mitigation plan is included within **Section 21 'conclusions'**, which ensures the works, are delivered in a sustainable way. We expect the works to be conditioned as per this mitigation plan.

**BMP Unit 1**

This Unit covers the area between the Hayling Island Sailing Club and the Eastoke Point Scheme (**Figure 1.1**). In recent years the sand has accreted at the pontoon to a point where it is no longer functional. If permission is granted, any sand removed from the pontoon must remain in the SAC system, as agreed with Natural England. Intertidal sand will be extracted in the vicinity of the HISC pontoon and deposited at Eastoke, east of the drift divide, where it will move back towards Black Point, continuing to feed the spit. By carrying out works in this way, the size and extent of the SAC feature will not be altered and the sand will only have temporarily moved location. Ideally the Sailing Club would want to return to the 2007 beach profile when the pontoon was accessible at all states of tide. **Figure 4.5** shows the Mean High Water Spring Contours between 2003 and 2012 at Black Point Spit. Still, this may be unrealistic due to associated costs, so as a minimum the Sailing Club would like to ensure they have access to the hammer head at all states of the tide. The Sailing Club are also looking at a number of other options or combination of options for managing the access to the water including a possible walkway with a bridge to a hammer head which will be 10 metres north from the current position. Due to these uncertainties this EIA will only be considering the impact of moving sand in the vicinity of the pontoon to be deposited at Eastoke Point. The quantity of material to be extracted in any one campaign should be mindful of longshore drift rates to Black Point Spit which were approximately 2,000 $m^3$ per year between 2003 and 2013. If this is acceptable in principle, the details of this can be conditioned to be developed within a site specific Construction and Environmental Management Plan (CEMP) at a time when the Sailing Club have made a decision on the way forward.

Extraction from the Ness (using an excavator) will continue dependant on the quality (coarseness) of the material and whether a haul route needs to be constructed over the Eastoke Point rock revetment for the plant to access the Ness.

Clearance of sediment using a launching tractor from the RNLI slipway when it is blocked will also continue.

**BMP U2 – Eastoke Point Scheme**

The Eastoke Point Scheme was built in 2013 (**Figure 4.6**). The section of beach

covered by the Eastoke Point Scheme contained 9 timber groynes that were vulnerable to rapid failures due to the low and dynamic beach levels in this area. Therefore, 5 of the timber structures were removed and replaced with 3 rock groynes and 1 shortened rock groyne. The Eastoke Point scheme was designed with a beach acting as the primary defence to minimise overtopping. The scheme was completed in November 2013 to bring the standard of protection up to the required 1 in 200 year level for 100 years. This frontage will be managed within the holistic approach of the wider South Hayling frontage.

Beach Management will continue as it has on a planned and reactive basis. It is anticipated over the next 5 years that material will not be required to be placed directly into these groyne bays, provided material is placed east of the drift divide at Eastoke, thereby feeding Eastoke Point. The beach levels in this area will continue to be monitored and if necessary, will be directly nourished to bring the beach back up to the required Standard of Protection. Any impacts resulting from continued beach management have already been identified and mitigated for as part of the Eastoke Capital Scheme.

This area will only be nourished by land-based recycling sources or from import via road as the foreshore is too shallow for a barge to pump material ashore (some material pumped onto the drift divide at Creek Road Car Park will however naturally move round into these bays). A haul route would be required along the top of the revetment to allow access.

**BMP Unit 3**

This Unit is comprised of the main nourished frontage, stretching between Groyne 7 and Groyne 35 (**see Figure 4.3**). Along this section, there are two different design profiles to be maintained – the Eastoke Beach and Eastoke Corner Car Park. Details of these are given in **Section 4.2.1**. Material will be deposited here from any of the available sources of material. Material from the land-based recycling sources and the import sources can be deposited using the dump trucks and material brought in from the Chichester Harbour Approach Channel and offshore sources will be deposited by ‘rainbowing’. Material will be reprofiled using a bulldozer.

**BMP Unit 4**

This Unit contains two sources of land-based recycling sources: the Coastguard Revetment and the Open Beach (**Figure 4.4**). Material is taken from these sites using an excavator and transported back to the nourished frontage using the marked haul routes. There is a small patch of beach in front of the Funland Amusement Park where extraction is not allowed to take place, but it is allowed to be used by plant to transport material.

**BMP Unit 5**

The West Beach revetment acts as a source of material as during storms, material is thrown over the structure and it is therefore then effectively lost from the system. As Inn-on-the-Beach is directly east of this Unit, plant must track behind the building in order to access the shingle.

The adopted policy is to maintain the structure where reasonably practical, and remove sections of the structure when they become a health and safety risk. A 75m section at the western end was removed in March 2012 due to a significant structural failure, triggered by falling beach levels exposing the degraded lower section of the structure. The remaining structure and the existing timber groynes will be monitored and removed as their condition deteriorates.

**BMP Unit 6**

This Unit experiences localised erosion, particularly along the Golf Club driving range. The area will be used as a haul route pending landowner's permission to recycle material to Eastoke from Gunner Point. The haul route will be constructed by a bulldozer prior to extraction of material at Gunner Point.

**BMP Unit 7**

Material has only been extracted from Gunner Point by HBC for emergency works in 2014. Following approval in principle by the landowners and Natural England, this iteration of the BMP has identified Gunner Point as a new source of material for recycling, pending landowner permission prior to any Beach Management campaign. The proposal is to utilise this large source of sediment with a number of safeguards in place to protect Vegetated Shingle Communities, Drift line Communities and the future evolution of these communities. Other restrictions are in place to protect SPA birds, including nesting and roosting birds (as summarised in **Section 9 Information for HRA**).

Extraction of material will be limited to the seaward side of the vegetated shingle and at certain times during the year and tidal cycle (see Mitigation Tables at the end of each Chapter for further detail on the mitigation at Gunner Point). Extraction volumes will be agreed with the landowners and Natural England prior to any recycling campaign.

**BMP Unit 8**

Works in this Unit are limited to targeting localised patches of erosion. There are pockets of erosion around the car park which require nourishment. Cyclic pulses of material move north up this stretch of coastline, which reduce the linear alignment of the beach. This can introduce the risk of undermining the seawall fronting the Havant

Borough Council car park. Material from within the sediment cell will be brought in to reduce erosion, which will buy time before the next pulse of sediment comes through, naturally addressing the problem.

The material can be transported along the haul route on the beach round from Gunner Point, but it is more likely that it will be brought in via Ferry Road on road due to the gradient, width and composition of the beach (mostly shells rather than shingle).

If and when the erosion threshold depicted in **Figure 4.7** is met, material will be deposited in front of the redundant structure from within the sediment cell to further prevent erosion. I.e. if the beach profile erodes towards the red line, we will move shingle from areas of accretion within this BMP unit, to the erosion hotspots). There is currently one pocket of erosion to be addressed circled on **Figure 4.7**. If this is acceptable in principle then the details of this can be conditioned to be developed within a site specific Construction and Environmental Management Plan (CEMP).

### 4.4.2 Assessing the Required Volumes

Prior to each recycling and recharge operation the volume of material required on the nourished frontage must be calculated. A digital terrain model of the beach to be nourished will be compared to the beach design surface. The volume of fill required to bring the beach up to the design surface will be calculated and broken down into individual groyne bays. The volume of fill required will be sought from the potential sources. If there is insufficient suitable material to be extracted from recycling areas, then additional imported material will be used to top up the volume.

During each recycling campaign, we aim to extract any material which has accreted since the previous recycling operation. This is identified through the comparison of pre- and post- works surveys. By taking only the material which has accreted since the previous campaign, we are keeping the sediment active within the system and ensuring that the remaining beach levels still provide adequate flood protection. The suitability of material will be assessed visually prior to the start of any recycling operation. Due to the dynamic nature of the beach there must be some flexibility in allocating extraction targets. Engineering judgement will be used on site to avoid over extraction from the beach face.

## 4.5 Implementation

Beach management campaigns are planned every year for March and/or September, as these times have the least working constraints (see **Figure 8.12**, which illustrates temporal constraints on BMP activities to prevent negative impacts

on the natural environment) and disruption to beach users. Sediment sources and quantities will be dependent on the condition of the Eastoke frontage and the accretion of the extraction sites in any given year. Whilst the timings of works are restricted due to environmental constraints (As illustrated by Figure 8.12), we will also plan to only work at the following time:

- Delivery of shingle to site by road and tracking on the foreshore with machinery: 6am to 10pm Monday to Friday (unless there is an emergency response required which could require 24 hour working).
- Delivery of machinery to undertake beach management: unrestricted due to logistics. Machinery only being brought to site at the beginning of each beach management campaign, and removed at end, with machinery left on site for the duration of each campaign.
- Rainbowing Shingle ashore: unrestricted, as pumping ashore can only occur at high tide, for 2 – 4 hours per discharge. When barge in area, need to make use of every consecutive high tide period, for recharging to be financially viable.

Beach recycling will typically be carried out using an excavator to extract material, dump trucks to transport the material along the frontage and a tracked bulldozer to reprofile the beach. These must be delivered to site using the designated access routes and any haul routes used to access the compound and areas of the beach should be in place before recycling works begin. Compounds must be properly set up before works are carried out.

### 4.5.1 Access Routes

There is a set route that must be used by delivery of plant and material to the site. This is illustrated in **Figure 4.8**. From the A27, it follows the A3023 down to the seafront. From here, the Gunner Point compound and Eastoke Corner car park can be accessed. Plant then accesses the HBC compound via the beach and road vehicles will use Southwood Road.

On the completion of works and where applicable, the compounds and haul routes will be remediated and restored to at least their pre-works condition. No footpaths or areas of the beach will be closed for recycling campaigns. Sections of the promenade will need to be shut off for public safety during the pump-ashore (rainbowing) phases of a dredge. However, this will only be for a maximum of two hours at a time. The access points between Southwood Road and the promenade will provide an alternative route.

### 4.5.2 Compounds

For the works, the ESCP are able to utilise the HBC compound at Plot 74,

Southwood Road. This has an area to store plant, direct access onto the beach and welfare units. During campaigns in which material is being recycled from Gunner Point, a secondary compound will be set up in the West Beach car park. This will have enough room for approximately two trucks and an excavator as well as a welfare unit. When imported material is brought in by road, it is stockpiled in the Eastoke Corner car park and then distributed from there. The location of the compounds and stockpiling area can be seen in **Figure 4.8**.

### 4.5.3 Haul routes

Prior to moving shingle, haul roads must be set up to provide a suitable route for the plant to move around the beach. These must all be above Mean High Water (MHW) and avoid any vegetated shingle or nesting birds. Haul roads that are marked on **Figure 4.8** are only indicative and will depend on the site at the start of works and conditions prior to the campaign, based on surveys undertaken (I.e. vegetated shingle surveys). Haul roads will be marked out by cones on the beach.

Access to the Gunner Point compound and round the back of the Inn on the Beach requires the removal of timber parking bollards. This is also necessary at Eastoke Corner car park to move the stockpiled shingle onto the beach.

For access into BMP U8, two routes are possible: along the road and along the beach. Both will be a considered a possibility, but due to the nature of the beach (narrow, steep and largely composed of shells rather than shingle), it is more likely that the road will be used to transport shingle into BMP U8. The haul and access routes for any activities within Unit 1, north of “The Ness” will be agreed on the submission of a separate Construction and Environmental Management Plan.

## 4.6 Programme for the Works

Once the new Planning Permission and Marine Licence are in place, implementation of the Beach Management Activities will have greater flexibility. Due to the variety of shingle sources and permissions required for the extraction of some of these sites, an adaptive approach is to be adopted. The intended delivery of works and volumes of material to recycle over the next 5 years is available below.

This iteration of the BMP has been costed on the requirement to recycle / recharge 207,000$m^3$ of material in total over the 5 year phase for the Outline Business Case (2017-22). This will comprise 51,000$m^3$ of material in year 1 to bring the beach volume back up to 1 in 200 year SoP, after which 39,000 $m^3$ will be required on an annual basis for year 2, 3, 4 and 5. This current BMP will work on the assumption that some of the material from the Eastoke drift divide is being transported east, thereby feeding Eastoke Point before being transported to The Ness and West Pole

Sands in Chichester Harbour.

In terms of estimating the volumes of material which may be available from various sources, the following summarises the average quantities per year utilised between 2006 and 2016:

**Recycling ~ average 30,000 $m^3$ per year**

~3,000 $m^3$ from 'West Beach'

~16,000 $m^3$ from the 'Open beach'

~3,000$m^3$ from behind the Coastguard Revetment

~11,000 $m^3$ from the 'Eastoke Point and the Ness'

**Recharge ~ average 11,000 $m^3$ per year**

~2,000 $m^3$ road import

~9,000 $m^3$ offshore dredge (one off campaign between 2007 and 2009)

**Alternative material ~ average 13,000 $m^3$ per year**

~2,540 $m^3$ from Gunner Point (one off emergency works in 2014)

~10, 500 $m^3$ from the Chichester Harbour maintenance dredge

Monitoring data will confirm how much material is available from the sources above prior to any campaign. Based on this information, the coastal manager will estimate the quantities to be extracted from within the sediment cell. Where there is a shortfall within the sediment cell, recharge will be utilised.

The aim in the first year of the 2017 – 2022 BMP is to build the beach up to design profile in Year 1 through extraction from Gunner Point in September 2017. Where it is not possible to extract material from Gunner Point, recharge in the form of road import or an offshore dredge will be implemented.

### 4.6.1 Annual reporting

Annual reporting is scheduled for July to prepare the information necessary for any September campaign. This will incorporate the various logs and data collected as part of the Monitoring Programme (Section 4.4 of the BMP Technical Report (**Appendix A**)) and the Maintenance Regime (Section 5 of the BMP Technical Report (**Appendix A**)). Section 6 of the BMP Technical Report (**Appendix A**) details the reports that will be produced annually to inform the BMA, providing recommendations if change is required. These include the Annual Beach Management Report, Annual Beach Monitoring Report and the Annual Vegetated Shingle/Bird Monitoring Report.

### 4.6.2 Emergency works

Although regular campaigns are planned for March and/or September each year, emergency beach management works may take place at other times during the year in response to low beach levels and/or particularly stormy periods. These works would be carried out in accordance to the trigger levels (**Section 4.4.2**). To avoid having to apply for consents separately should Emergency Works need to be undertaken in the future, the impacts have been assessed as part of this Environmental Impact Assessment (EIA). Precautions and mitigation developed as part of this EIA are also applicable to Emergency Works, therefore any possible impacts have been assessed. More information on Emergency Works is detailed in Section 5.2 of the BMP Technical Report **(Appendix A)**.

**Figure 4.3 The divisions of the beach, based on the design profiles**

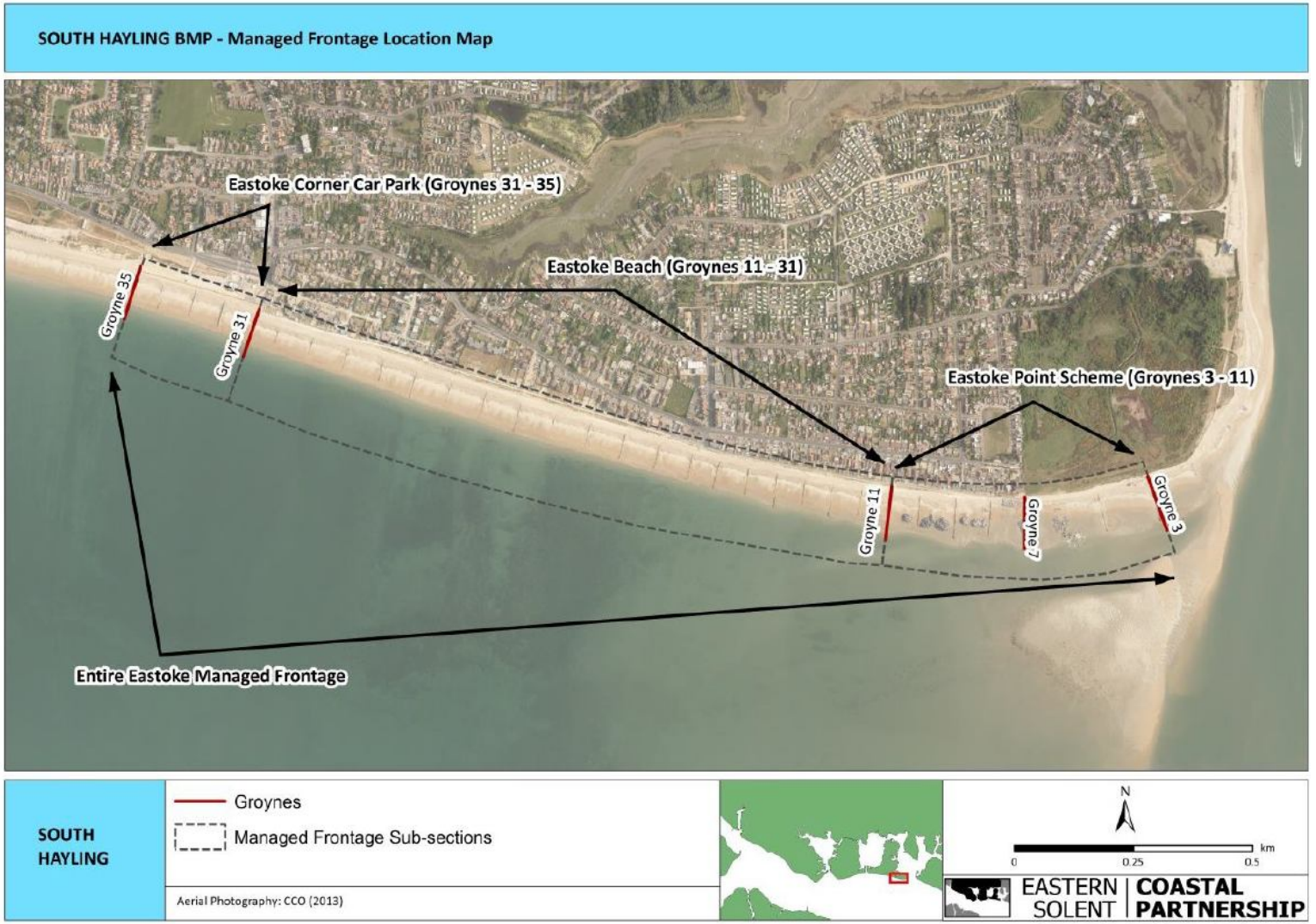


**Figure 4.4 The areas used for extraction and deposition for Beach Management Activities**

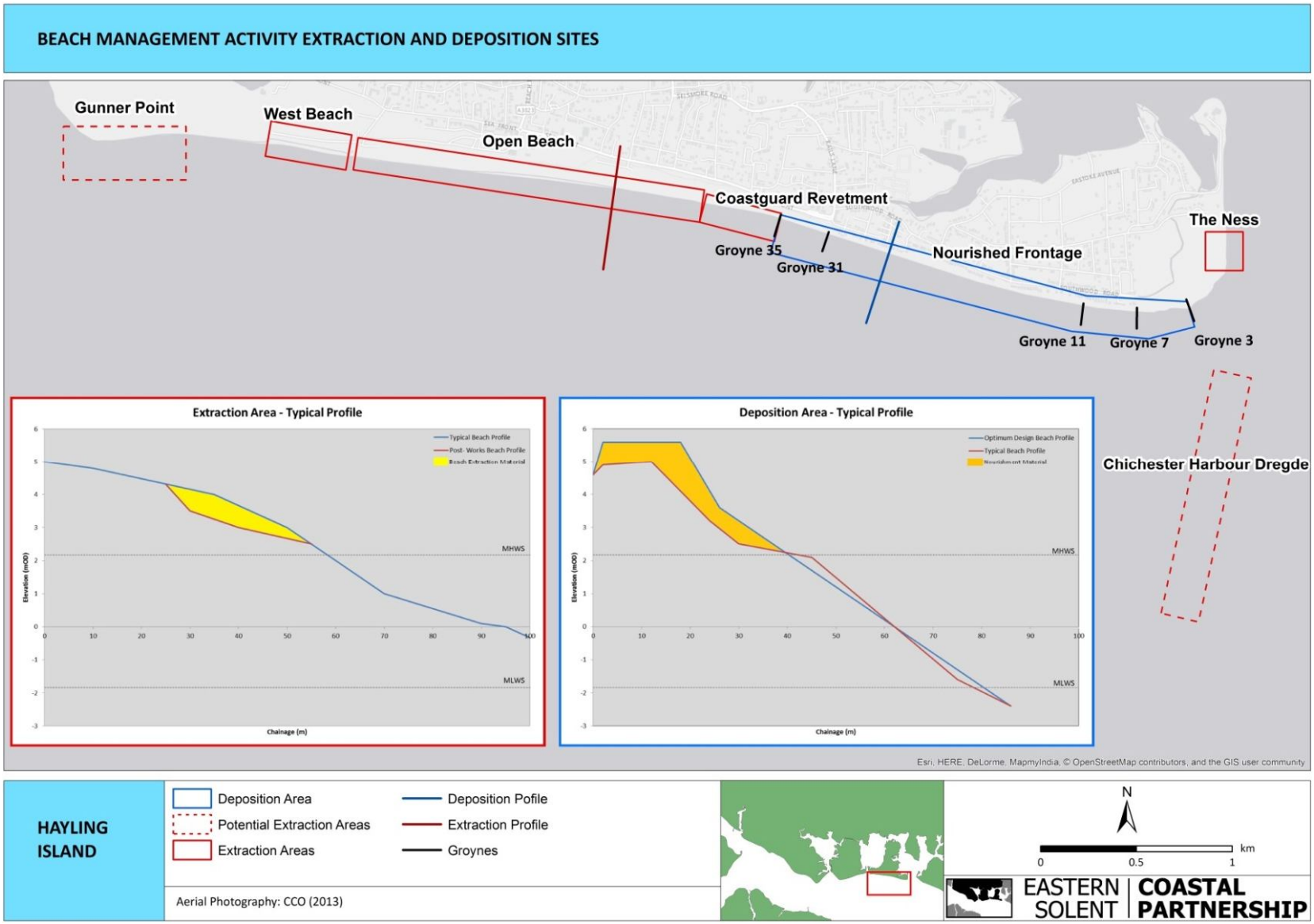


**Figure 4.5 Shows the Mean High Water Springs Contours from 2003 – 2012 at Black Point**



**Figure 4.6 Eastoke Point Scheme design**

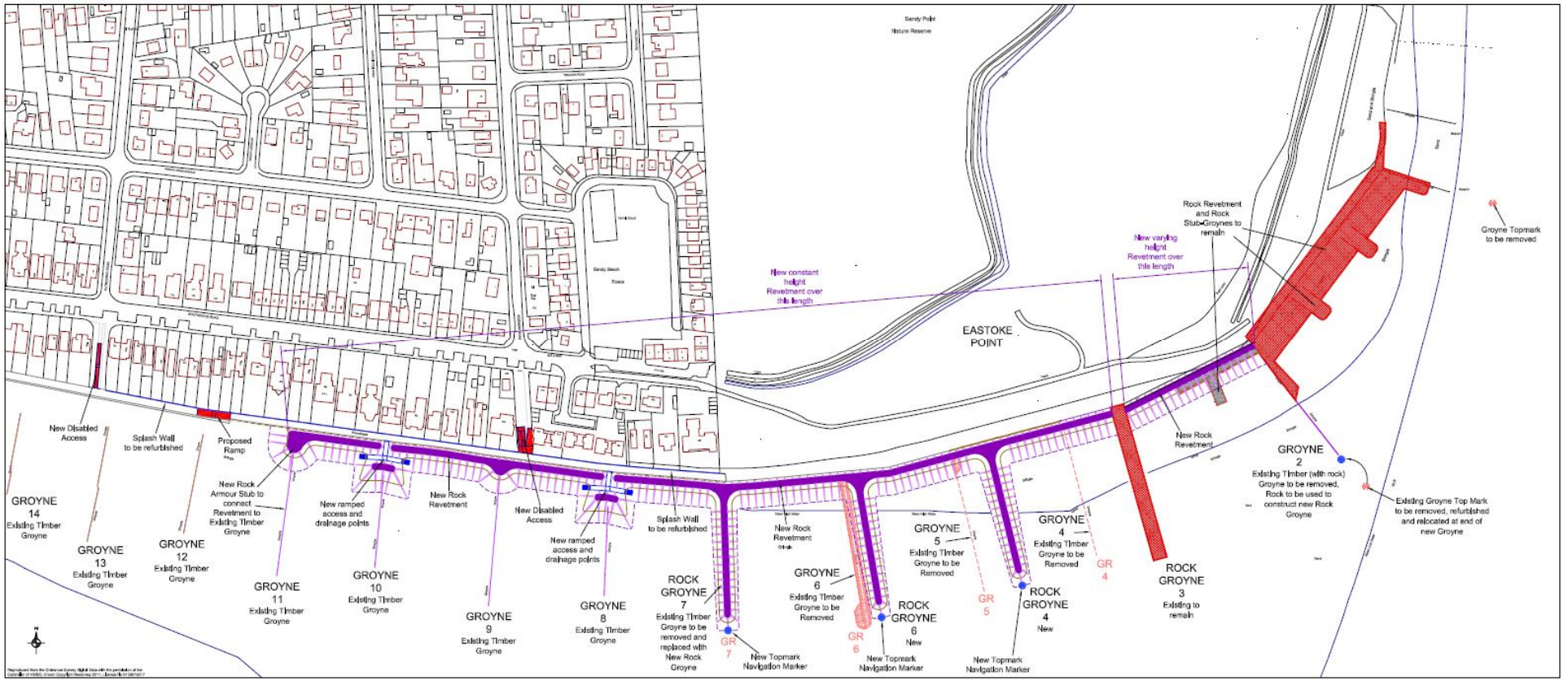


**Figure 4.7 Erosion threshold at Ferry Road car park, Hayling Island. The hotspot of erosion currently present is circled in blue**



**Figure 4.8 Site areas to carry out Beach Management Activities across the Hayling Island frontage**



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# 5. CONSULTATION

## 5.1 Consultation during Option Selection / Outline Design

During the development of our Beach Management Plan (BMP) 2017 – 2022, a communication and collaboration plan was developed (See BMP Technical Report - **Appendix A**). This details how and when organisations and individuals have been, and will be consulted as part of the on-going works.

BMP activities have been taking place along the South Hayling Island frontage for many years, and the concept of Beach management is accepted and appreciated locally for the flood and erosion protection it provides. In the past there have been various public consultations. Given that this application is an updated application for ongoing beach management activities, we have not reconsulted specific to this application. Prior to any operations on the beach, the ESCP inform the public of times and activities that will take place via our social media platforms (Facebook, Twitter etc.). Posters, letter drops, web announcements, and tourist information centres are also used to inform the public.

The experience of flooding in the area is still very real and therefore residents are well aware of how essential the beach management works are, to manage the flood and erosion risks along the South Hayling Island frontage.

### Statutory Bodies

Throughout the development of this Environmental Statement (ES) and the development of the Hayling Island BMP 2017-22, the ESCP have consulted an extensive number of organisations both directly and indirectly through the EIA scoping process, jointly with the MMO including:

- Natural England. Specific and separate consultation has also been undertaken with Natural England with regards to potential impacts to environmentally protected sites. Natural England has provided pre-planning advice on the BMP

proposal through their Discretionary Advice Service (DAS) and advised safeguards to ensure that the integrity of the designated sites is maintained. These are set in **Section 9 'Information for HRA'**.

- Environment Agency.
- MMO.
- Havant Borough Council:
    - Planning Department;
    - County Ecologist;
    - Environmental Health.
- County Archaeologist.
- Highways.
- CEFAS.
- Southern Inshore Fisheries and Conservation Advisors (IFCA).
- Historic England.

## 5.2 Environmental Scoping Opinion

An Environmental Scoping Report was prepared for the scheme under the following regulations:

- The Marine Works (Environmental Impact Assessment) Regulations 2007 (as amended);
- Town and Country Planning (Environmental Impact Assessment) Regulations 2011.

This was to scope the opinions of our statutory and wider environmental stakeholders to determine the environmental acceptability of the proposed scheme options and mitigation required. The scoping opinion is included as **Appendix B**, and the Environmental Scoping Report is available on request. The scoping opinion has advised the completion of this Environmental Statement (ES) and its Habitat Regulations Assessment / Water Framework Directive Assessment.

Consultation with key stakeholders has continued following the submission of the Scoping Report and throughout the pre application process to inform them of the proposed project and capture potential issues, concerns and relevant information to be considered.

## 5.3 Coastal Concordat

Although Havant Borough Council (HBC) is not currently signed up to the Coastal Concordat, the principle of cooperation is inherent in all government working. The aim of the concordat is to provide a single point of contact for coastal schemes that

require multiple consents. As both planning permission and a marine licence will be required for the Hayling Island BMP, it is hoped that the MMO and HBC (as the Local Planning Authority) will agree a single point of contact for the application. This removes the need for consultees to be consulted multiple times for the same scheme. We expect this application to be considered, working under the coastal concordat.

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# 6. LEGISLATIVE FRAMEWORK

The fully proposed South Hayling Island Beach Management Plan (BMP) will be carried out under the powers of Section 14 of the Land Drainage Act 1991.

There are a number of consents (and also exemptions) that are required in order to undertake the Beach Management activities on the South Hayling Island coast.

The current Beach Management Activities have been taking place since 1985, as described in **Section 2**. The on-going beach recycling has been taking place under the Planning Permission granted in 2009 (09/53949/008), in accordance with the Town and Country Planning Act 1990. It was granted for a ten year period, which runs until 30/09/2019.

## 6.1 Coastal Concordat

In November 2013, central government introduced the Coastal Concordat. The concordat provides a framework within which the separate processes for the consenting of coastal developments in England can be better coordinated. Havant Borough Council are not signed up to the Coastal Concordat, however it is hoped that the MMO and HBC (as the Local Planning Authority) will agree a single point of contact for the application. This removes the need for consultees to be consulted multiple times for the same scheme.

## 6.2 Planning Permission

Planning permission is required from the LPA for this development, part of which is above Mean Low Water [MLW], in accordance with the Town and Country Planning Act 1990.

This application takes account of the National Planning Policy Framework [NPPF] 2012 (see **section 6.13**), which sets out the UK Government's planning policies for England and the Havant Borough Plan (2011), which is the local plan for the

Borough. Planning permission for the existing BMP, which is valid until late 2019 will be superseded by this revised permission, which extends the BMP area.

## 6.3 Marine Licence

A Marine Licence is required from the Marine Management Organisation [MMO] for works carried out below Mean High Water Springs [MHWS] under the Marine and Coastal Access Act 2009.

The on-going beach management works do not require a Marine License, as they are considered to be maintenance activities. However, the geographical extension of the BMP into Chichester and Langstone Harbour entrances (areas that have not been actively recycled before as part of a BMP) will require an MMO licence. In addition, we have included provision for recharges of shingle as part of the revised BMP, which involves the importation of sediment from outside the sediment cell (via road or sea). This too requires a Marine Licence. We are therefore submitting the full BMP for approval to the MMO, however we are not expecting consideration of the ongoing beach management recycling activities.

Additional details on what activities do, and do not require a Marine Licence are clarified under Article 19 of the Marine Licensing (Exempted Activities) Order 2011, which states;

**Maintenance of coast protection, drainage and flood defence works**

**19.** (1) Article 4 applies—

(a) to an activity carried on by or on behalf of the Environment Agency for the purpose of maintaining any—

(i) coast protection works;

(ii) drainage works; or

(iii) flood defence works;

(b) to an activity carried on by or on behalf of a coast protection authority (within the meaning of Part 1 of the Coast Protection Act 1949(a)) for the purpose of maintaining any coast protection works.

(2) Paragraph (1) is subject to the condition that the activity is carried on within the existing boundaries of the works being maintained.

(3) But article 4 does not apply in relation to any such activity which consists of beach replenishment.

This exemption applies to the maintenance of coast protection, drainage or flood

defence works by the Environment Agency and to the maintenance of coast protection works by a coast protection authority.

The MMO defines ‘maintenance’ as the upkeep, repair or reasonable improvement of works. Any such activity must not constitute a **significant alteration to the works.**

In the context of beach management, ‘maintenance’ would usually include the following works where they are in line with previous management activities on that beach:

- re-profiling works where beach material within the beach area is moved laterally up the beach, and
- recycling works where beach material within the extent of the beach feature is used.

Maintenance may also include recycling works where beach material from the same littoral sub-cell is used, subject to that material being of the same or similar aggregate class and origin, being functionally linked to the receiving beach.

Therefore, for beach management the boundaries of works and the purpose of the activity are linked and should be considered together. Managing natural dynamic features such as beaches involves greater consideration of the system as a whole as the boundaries of previous re-profiling or recycling works may change within that system.

The MMO would not usually consider a beach management activity to be ‘**maintenance**’ if it involved:

- re-profiling or recycling in an area that has **not previously been subject to such activities**
- a material significantly different in aggregate class or origin from the natural material present on the receiving beach
- a material not functionally linked to the receiving beach
- material sourced from outside the littoral sub-cell of the receiving beach
- a significantly different quantity of recycled material that is considered by the MMO to substantially alter the dynamic equilibrium of the receiving beach or donor areas.

As the area of the BMP extent is being increased, and we are including the option to recharge beach material from outside of the sediment cell, it would suggest that the

exemption is not met and therefore a Marine Licence is required for the South Hayling Island BMP.

The Marine Licence Consent application will have regard to the South Inshore Marine Plan Area, for which the consultation has just closed (Jan 2017), however until the plan is formally adopted, the Marine Licence application will have regards to the Marine Policy Statement.

## 6.4 Land Drainage Act 1991 and Water Resources Act 1991 and associated byelaws

Flood Risk Activity Permits may be required from the Environment Agency under the, Land Drainage Act 1991 and Water Resources Act 1991 and associated byelaws. Formally known as Flood Defence Consent [FDC] under the Water Resources Act 1991 and/or the Southern Region Byelaws, any works within 15m on a sea defence or 8m of a main river may require consent from the Environment Agency, this has now been amalgamated under the Environmental Permitting regulations. Following changes to the Marine and Coastal Access Act, administered by the MMO, the Environment Agency can in certain circumstances waive the requirement for a Flood Risk Activity Permit where a Marine Licence is also required. These will be applied for from the Agency once Planning Permission and MMO consent has been granted. This will also be included within the CEMP (Construction and Environmental Management Plan).

In addition, where a development is proposed within an area shown to be located within a flood risk zone a Flood Risk Assessment [FRA] usually needs to be submitted with the planning application. However in this instance, a FRA is not required to be submitted to support this application as the aim of the scheme is to provide flood and erosion protection. Instead, a Flood Risk Statement will be included within the Planning Statement as agreed with the Planning Department and the Environment Agency.

## 6.5 Landowner Consent

Landowner's permission/consent will be required for any activity that disturbs the land or affects the owner's potential use of their land.

There are a number of landowners within the boundaries of the temporary working area of the BMP. Some have written agreements with Havant Borough Council, as to how these ongoing works will be managed, others have a agreement per operation, but all landowners are informed in writing when the works are going to take place

and what this will entail, with permissions obtained prior to works

The Crown Estate owns approximately 50% of UK foreshore, defined as being between mean low and mean high water, and almost the entire seabed below mean low water. Havant Borough Council has been in contact with the Crown Estate to confirm their land ownership boundaries. Permission will be sought from the Crown Estate to undertake these works in advance of any works.

## 6.6 Environmental Impact Assessment [EIA]

The Marine Management Organisation (MMO) has agreed with Havant Borough Council, pursuant to Regulation 5 of The Marine Works (EIA) Regulations 2007, as amended, that the proposed works constitute a development under Annex II 10(k) of EU Directive 2011/92/EU Council (as amended): “Coastal Works to combat erosion and maritime works capable of altering the coast through construction, for example, of dykes, moles, jetties and other sea defence works, excluding the maintenance and reconstruction of such works”.

Any subsequent application for the proposed works for a Marine Licence under Part 4 of the Marine and Coastal Access Act 2009 must be supported by an Environmental Statement (“ES”) under the Marine Works (EIA) Regulations 2007, as amended. Your attention is drawn to Schedule 3 (information to be included in an ES) of the Regulations.

In addition, Havant Borough Council have concluded that the proposed development constitutes a project that falls under Schedule 2, Infrastructure Project, 10 (m) of the Town & Country Planning (Environmental Impact Assessment) Regulations 2011: *'Coastal work to combat erosion and maritime works capable of altering the coast through the construction, for example, of dykes, moles, jetties and other sea defence works, excluding the maintenance and reconstruction of such works'.*

The MMO and Havant Borough Council have determined that a statutory Environmental Impact Assessment [EIA] under the Marine Works (Environmental Impact Assessment) Regulations 2007 (as amended) and the Town & Country Planning (Environmental Impact Assessment) Regulations 2011 is required for the proposed project.

## 6.7 The Convention of Species and Habitats Regulations 2010

Langstone and Chichester Harbours and the Solent are protected by a number of

national and international nature conservation designations, including Special Protection Areas [SPAs], Special Areas of Conservation [SACs] and Ramsar sites. Consequently, the development will be subject to the provisions of EC Directive (92/43/EEC) on the conservation of natural habitats and of wild fauna and flora (the Habitats Directive), implemented in the UK through The Conservation of Species and Habitats Regulations 2010 (the Habitats Regulations).

In accordance with Section 61 of the Habitats Regulations, a Habitats Regulations Assessment (HRA) and potentially Appropriate Assessment (AA) is required for any plan or project, not connected with the management of a European site, which is likely to have a significant effect on the site either alone or in combination with other plans and projects. European sites comprise SPAs, as designated under EC Directive 79/409/EEC (the Birds Directive), or SACs as designated under the Habitats Directive. An AA is also required as a matter of government policy for potential SPAs, candidate SACs and listed Ramsar sites for the purpose of considering development proposals affecting them.

The HRA will be undertaken by the competent authority, guided by this ES and in particular **Chapter 9 'Information for HRA'**. It is not envisaged that an AA will be required for the South Hayling Island BMP, given the rigid strategic and scheme level options appraisal processes. We are promoting the least impacting viable option and we do not believe this will have a Likely Significant Effect on the environment given the mitigation that has been identified.

## 6.8 Water Framework Directive

For this scheme, permission is sought from the Environment Agency to ensure that the full scheme complies with the Water Framework Directive [WFD] (2000/60/EC), with no deterioration to the existing status of the relevant water bodies. A WFD Assessment has been prepared to demonstrate that the works can be delivered, without resulting in WFD deterioration. See **Chapter 12** for further details.

## 6.9 Waste Framework Directive (2008)

The Waste Framework Directive (Directive 2008/98/EC) (WaFD) was adopted in 2008 and consolidates earlier EU legislation regulating waste. The WaFD contains the general rules applying to all categories of waste. The WaFD provides a general duty to ensure that waste is dealt with in an environmentally friendly way, without endangering human health and harming the environment, and in particular without risk to water, air, soil, plants or animals, without causing a nuisance through noise or odours, and without adversely affecting the countryside or places of special interest. The way this is assessed is through the Waste hierarchy. The main objective of the

waste hierarchy is the prevention of waste. Where waste cannot be avoided, the hierarchy aims for the re-use, recycling or recovery of waste.

**Waste Hierarchy**

**Prevention**
There is no production of waste as part of this scheme. The activities being applied for are to manage the beach shingle from locations of accretion to areas of erosion within the same sediment cell. Therefore prevention is not relevant to this proposal.

**Re-Use**
The principle of all the Beach Management Activities is to re-use the same sediment within the sediment cell so to make the process as sustainable as possible:

- Financially sustainable: minimising costs by reusing shingle within the same sediment cell.
- Environmentally sustainable: re-using material so that sediment is not lost from the system. Sediment would be lost from the sediment cell if dredged material was disposed of at sea from the Chichester Harbour dredge, rather than rainbowed onto the foreshore along the South Hayling Island frontage (this is only done if the Particle Size Analysis (PSA) shows that the shingle is suitable).
- Socially sustainable: maintaining the beach at Hayling Island provides the community with a valuable beach which is a social resource for tourism and well-being of residents.

All the other areas of the waste hierarchy (preparing for reuse, recycling, recovery and disposal) are not relevant to this proposal. The proposal to continue with beach management activities is therefore compliant with the Waste Framework Directive and will not be considered further within this EIA.

## 6.10 Wildlife and Countryside Act (1981)

Under the terms of Section 28(4)b of the Wildlife and Countryside Act 1981 as amended by Schedule 9 to the Countryside and Rights Of Way Act [CROW] 2000, any operations within, or adjacent to, a Site of Special Scientific Interest [SSSI] require consent from Natural England.

Approval under Section 28 of the Wildlife and Countryside Act 1981 (as amended by the CROW Act 2000) would be included in Natural England's overall advice regarding the requirement (or otherwise) for an AA under the Habitats Regulations and also Natural England's response to a Marine License application and planning

application.

## 6.11 Natural England and Rural Communities [NERC] Act 2006

The Natural Environment and Rural Communities [NERC] Act 2006 requires 'every public authority must, in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity'. It is deemed that by complying with the EIA regulations and other legislation set out above this project will address the requirements of the NERC Act 2006.

## 6.12 Other Plans Relevant to the Project

### 6.12.1 National Planning Policy

The National Planning Policy Framework (NPPF, March 2012) and planning practice guidance aims to make the planning system less complex and more accessible, to protect the environment and to promote sustainable growth.

### 6.12.2 Marine Policy Statement

The Marine Policy Statement [MPS] is the framework for preparing Marine Plans and taking decisions affecting the marine environment.

### 6.12.3 Local Planning

The Havant Local Development Framework Core Strategy was adopted in March 2011. This is the local plan for the whole of the Havant Borough Council administrative area and together with the supplementary planning documents (which are deemed to be relevant to this project) forms the wider Local Development Framework for the Borough.

The Development Plan for Havant Borough comprises:

- Havant Borough Local Plan (Core Strategy) (1 March 2011)
- Havant Borough Local Plan (Allocations) ( 23 July 2014)
- Hampshire Minerals and Waste Plan (2013)

The other directly relevant document that has been a material consideration is the **Hayling Seafront Masterplan.**

### Additional plans

Other plans and strategies that have been considered include:

- Eastoke Sectoral Strategy
- Shoreline Management Plans, specifically North Solent SMP2 (March 2010);
- Hampshire Biodiversity Action Plans;
- Hampshire Minerals and Waste Plan;
- Solent Coastal Habitat Management Plan [CHaMP];
- Solent European Marine Site [SEMS] Management Plan;
- Solent Waders and Brent Goose Strategy;
- The Solent Disturbance and Mitigation Project;
- The PUSH Green Infrastructure Strategy (2010) and Implementation Plan (2012)
- South Inshore Marine Plan Area. The MMO expects to release a consultation draft of the marine plan for formal representation late 2016.

## 6.13 General Approach and Methods of the EIA

The EIA, which forms the core of this ES, is set out in **Chapters 7 to 19**. Each chapter is structured in the following way:

- **Introductions**: Describes the specific environmental elements being assessed;
- **Baseline conditions**: Details the baseline environment of each environmental element, expanding on the work of the Environmental Scoping Report. Additional data has been included to fill identified gaps in the baseline information, including results from field surveys and investigations.
- **Potential Impacts**: Details any impacts the proposed scheme could have on the baseline environment.
- **Mitigation and Residual Impacts**: Presents mitigation that has been identified to remove or reduce the identified impacts of the proposed scheme on the baseline environment, highlighting any residual impact.
- **Conclusions**: Confirms whether the full works are considered environmentally acceptable following the implementation of any required mitigation. Highlights any Conditions that should be applied to the works.

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# 7. COASTAL PROCESSES

## 7.1 Baseline Coastal Processes

### 7.1.1 History of the South Hayling Frontage

The geology of the study area is comprised of a mixed sand and shingle storm beach overlying Upper Eocene deposits of the Barton, Bracklesham and Bagshot beds.

The offshore area of Hayling Island in the East Solent, between the entrances of Chichester and Langstone Harbours, forms part of the much larger Solent Estuarine system. This area consists of many gravel and sand deposits from ancient river terraces. Some 10,000 years ago sea-levels started to rise from approximately -120m to -30m below present level during the Holocene transgression. This postglacial rise eventually separated the Isle of Wight from the mainland.

Chichester and Langstone Harbours were formed when the ancient 'Solent River' flowed through wide, un-constricted valleys forming extensive shallow tidal inlets. Rising sea levels drowned these valleys and created conditions similar to those found today, with large areas of the sea-bed covered with gravel, sandy-grassland and sand (www.soton.ac.uk/~imw/ship.htm).

### 7.1.2 Flooding at Eastoke

The frontage to be protected from flooding is Eastoke, located at the south-eastern corner of Hayling Island on the Eastoke peninsula (**Figure 1.2**). Eastoke is home to a densely populated, low lying, urban community which has 1,555 residential properties and 170 commercial properties at risk of flooding, under a 'Do Nothing' scenario. Without the Beach Management Plan and Beach Management Activities,

the concrete seawall will be exposed, leading to heavy wave overtopping and subsequent widespread flooding to properties.

Following the 1985 replenishment scheme at Eastoke the incidence of significant flooding has greatly reduced, and the flooding that has been recorded is usually associated with key erosion hotspots (**Section 7.4**), giving rise to localised flooding. Since the construction of the nourished beach, significant flooding occurred in November 2005 and during the winter storms of 2013/14, when the beach was overtopped along much of South Hayling. The extreme event that occurred on the 3rd November 2005, included very long period swell waves in combination with extreme water levels. The flooding resulting from this event was not on the same scale as those prior to the 1985 replenishment scheme but did serve as a stark reminder of the very real and prominent threat to this area from overtopping, and the likely effects if beach management were to cease.

### 7.1.3 Coastal processes

Coastal processes is the term that covers the action of natural, physical, oceanographic and meteorological forces on the morphology, composition and stability of the shoreline and near shore seabed.

Natural forces such as waves, tidal currents and wind, drive changes in the coastal morphology and therefore affect the rate, scale and direction of sediment transport. In order to achieve Sustainable Shoreline Management it is vital to understand the dynamic nature of the coast, and the rate and scale of shoreline evolution.

#### 7.1.3.1 Hydro-dynamic conditions

- **Wind**

The prevailing wind direction within the Solent is west-south-westerly, with the average wind speed at 6.2m/s (Windfinder, 2015).

- **Tidal Regime**

The typical spring tidal range at Eastoke is 4m (**Table 7.1**).

**Table 7.1 Typical Tide Levels at Chichester Harbour (Ref 2.1)**

| | Tide Level | |
|---|---|---|
| | **Chart Datum (mCD)** | **Ordnance Datum Newlyn (mOD)** |
| Highest Astronomical Tide Level (HAT) | 5.3 | 2.56 |
| Mean High Water Springs (MHWS) | 4.9 | 2.16 |
| Mean High Water Neaps (MHWN) | 4.0 | 1.26 |
| Mean Sea Level (MSL) | 2.9 | 0.12 |
| Mean Low Water Neaps (MLWN) | 1.9 | -0.84 |
| Mean Low Water Springs (MLWS) | 0.9 | -1.84 |
| Lowest Astronomical Tide Level (LAT) | 0.2 | -2.54 |

- **Extreme Still water Levels**

Extreme still water levels can cause coastal flooding, or allow waves to cause flooding by reducing the freeboard (difference between top of defences and the still water level). Extreme sea levels can occur due to a large astronomical tide, surge or both.

It is surges associated with south-westerly storms that pose the greatest threat to the open coast at Hayling, since the extreme sea level will be accompanied by large waves. This was the case for the 2nd highest sea level event recorded at Hayling on the 14th February 2014 (from 25 years worth of data from the British Oceanographic Data Centre database) of 5.54 mCD when an almost 0.9m skew surge accompanied by large waves caused flooding and erosion to Eastoke.

Still, it is notable that on 3rd November 2005 houses flooded severely at Eastoke when the sea level was much lower at 5.17 mCD (approx. 1 in 1 year return period, with a 0.3m surge). This was due to energetic swell waves overtopping the beach which highlights the importance of wave run-up and other factors such as drainage and initial beach levels.

- **Wave Height, Direction and Near Shore Waves Climate**

The processes of wave generation and transformation from offshore to inshore are particularly complex in the East Solent. Storm waves reaching the coast can be generated locally under winds from the south-west through to the east, or in the English Channel. Swell waves generated further afield will also penetrate the area, though heights will be modest.

Most waves along the central sector of Hayling Island approach normal to the shoreline, except when propagated across south-east and east-south-east fetch directions. Wave focusing is highest at the Eastoke frontage under swell waves approaching from the south-south-west.

There was a 4.4m significant wave height recorded during the Easter 2016 storm, which is the highest recorded at the Hayling wave buoy since its deployment in 2003. It is equivalent to approximately a 1 in 30 year wave height. The next largest wave height recorded, on the 5th February 2014 at 4.13m, was downgraded from a 1 in 50 year to a 1 in 10 year event following the Easter 2016 storm (*Channel Coastal Observatory, personal* comment, 2016), (ESCP , 2017).

- **Bi-Modal Waves**

Hayling Island has been identified as a site influenced by a bi-modal wave climate, where there is a combination of wind waves as well as swell waves. SCOPAC research (Bradbury, 2008) identifies that the current methods for scheme design do not tend to account for bi-modal wave conditions. Coastal flood forecasts often fail to predict these significant events which result in unexpected wave overtopping, leading to flood damage and a need for substantial maintenance. During the November 2005 event, long period swell waves within a bi-modal wave climate, played a key role in overtopping the nourished beach, with a dominant wave period of over 18 seconds. This was in combination with a high spring tide and tidal surge, causing the extensive overtopping.

The CCO report that the average occurrence of bi-modal wave conditions for the month of December for the Hayling Island wave buoy is 11%. During December 2015 this rose to 38%, which is the highest ever recorded by the South-east Regional Monitoring Programme (Channel Coastal Observatory personal communication, January 2016) and coincides with beach draw down.

SHINGLE-B is an output from physical model tests to establish the response of barrier beaches to bi-modal waves. The model was developed by HR Wallingford as

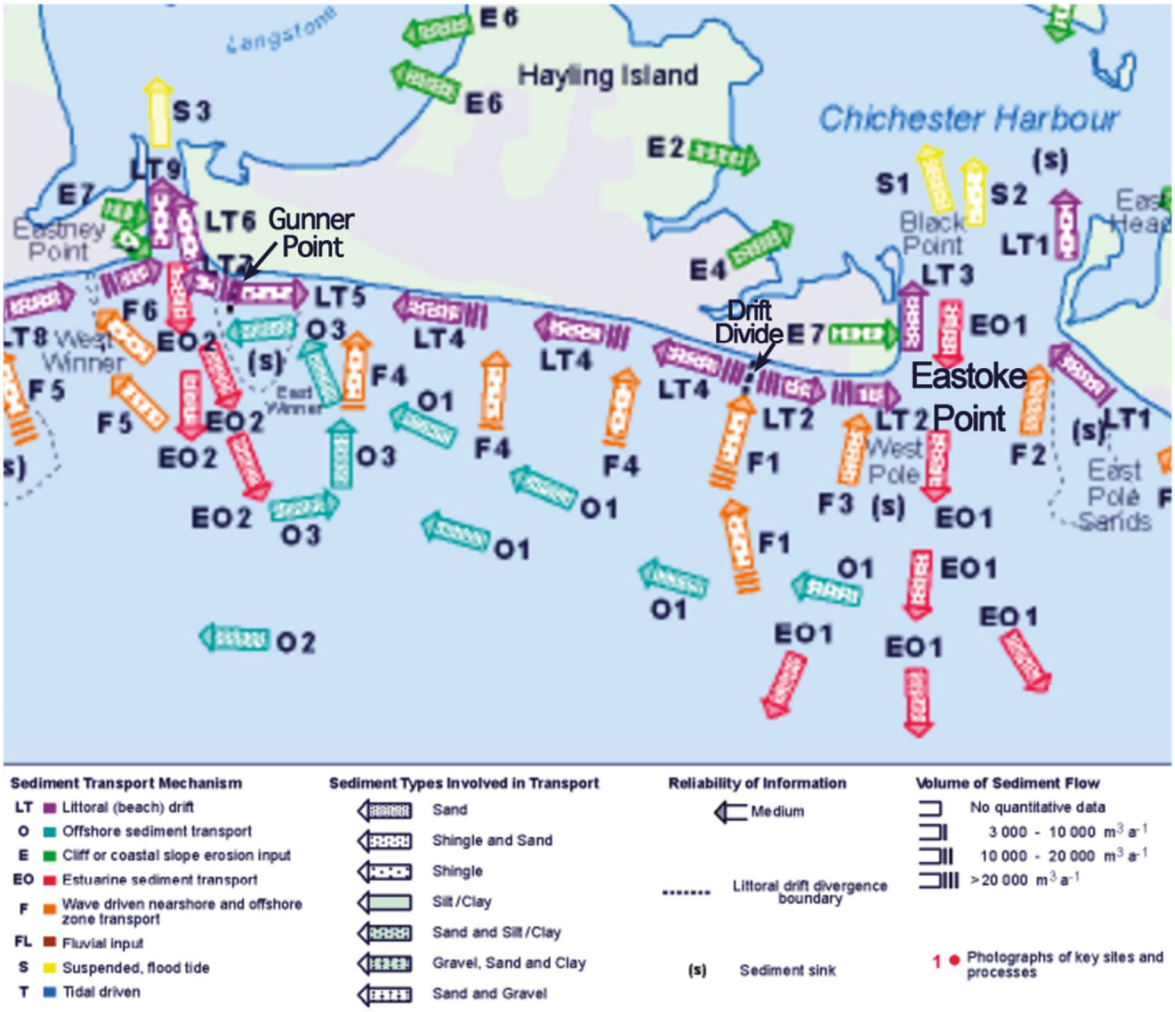
part of a CCO led FDGiA (Flood Defence Grant in Aid) project. SHINGLE-B will be used to establish whether any changes are required to the existing Hayling Island design profile to ensure it has a 1 in 200 year standard of protection against bi-modal wave events.

#### 7.1.3.2 Sediment transport

The coastal processes operating on Hayling Island are monitored through the South-East Regional Coastal Monitoring Programme. The Eastern Solent Coastal Partnership (ESCP) is also active in undertaking continual research to increase understanding of the coast and these processes. A number of studies have investigated the geomorphology and sediment transport around the Hayling coastline, covering both pre- and post-nourishment periods. The SCOPAC Sediment Transport Study (SCOPAC , 2004) provides a review of the available research up to 2004. Further detailed studies have been carried out by the Eastern Solent Coastal Partnership to improve the understanding of sediment transport from the nourished Eastoke frontage around the wider frontage. This includes tracer studies, where a new technique has been developed using Radio-Frequency Identification (RFID) technology to track pebbles moving around the coastline. The pebbles are collected from the study area, drilled and a tag inserted, before being measured and deployed back onto the beach. Each tracer pebble has a unique identification number, and can be detected up to a metre deep within the beach without the need to dig up the pebble. This technique has helped to develop a greater understanding of the sediment transport direction in this area.

The main sediment transport pathways around the BMP frontage are illustrated in (**Figure 7.1.**).

**Figure 7.1. Sediment Transport Pathways (adapted from (SCOPAC , 2004)**




The Hayling open coast has a drift divide located at the centre of the nourished frontage, close to Creek Road car park, where the natural supply of material onshore (**F1, Figure 7.1.**) is not sufficient to maintain the beach to the required levels. Beach sediment is transported both east and west off the nourished frontage at the drift divide by wave action. Beach recycling and import is now the main source of shingle to the wider south Hayling frontage, and the Futurecoast Study identified Gunner Point as a potential beneficiary of the ongoing artificial recharge and recycling operations.

The aim of the beach management activities on the south Hayling Island coast is to maintain an appropriate level of protection at Eastoke to reduce the risk of flooding and erosion, protecting 1555 homes, 170 commercial properties and important infrastructure. The most cost effective way of achieving this, whilst working with the

natural environment, is to undertake beach recycling; to move material that has been accreting back to areas of erosion at Eastoke, in the vicinity of the drift divide. The Beach Management Activities, extract material from areas that are naturally accreting ensuring the volume extracted does not leave the land / properties behind unacceptably vulnerable to flooding. There are two areas of accretion at the end of the Island – Gunner Point and Chichester Harbour Bar where a portion of the material lost from the managed frontage accumulates (**Figure 7.2**).

**Figure 7.2** shows the difference plot using 2005 and 2015 Lidar data from the South-East Regional Coastal Monitoring Programme[1]. A decrease in beach elevation is shown in red and an increase in beach elevation is shown in blue and includes management activities. The extent of the difference plots is depicted with a yellow boundary. Despite the Beach Management Activities on the frontage, the key areas of accretion and erosion can be identified. The accretion of sand at the tip of Black Point spit is evident (BMP U1), as is the import of material to the Eastoke Point scheme (BMP U2). The Eastoke frontage (BMP U3) itself appears to be lower than 2005, with the open beach showing both accretion and erosion (BMP U4). West Beach (BMP U5) shows the roll back of beach following removal of the western part of the revetment. The substantial accretion of shingle at Gunner Point (BMP U7) is evident with pulses of accretion and erosion moving north into Langstone Harbour (BMP U8). The Langstone Harbour channel appears to have moved further east in this difference plot.

The South Hayling beach has been influenced by manmade structures over the years (1930s) and more recently beach recharge and recycling. The entire south Hayling Island frontage has now benefitted from the material nourished at Eastoke as it has been transported across the wider BMP study area since the original Hayling Island Beach Replenishment Scheme in 1985.

More detailed information on the coastal processes in operation across the south Hayling frontage can be found in **Section 2 of the BMP (Appendix A)**.

### 7.1.4 Working with Coastal Processes to deliver the BMP

The following section is broken down into each BMP Management Unit depicted in **Figure 7.2** and describes how the proposed BMP will work with the coastal processes. It also flags erosion hotspots, watch spots and other issues within each BMP unit (**Figure 7.3**).

#### 7.1.4.1 BMP U1: Black Point to Sandy Point including the Ness

[1] Year on year changes and changes from baseline (2003) can be found in Appendix A of the BMP Technical Report.

This area has a northerly direction of sediment transport. It becomes progressively finer in size from coarse shingle at the Ness to fine sand at Black Point Spit.

Extensive monitoring, undertaken in-house by the ESCP, has shown that the Ness, at the southern end of BMP U1, historically accumulates material carried east from the drift divide at Creek Road. The Ness at Sandy Point appears to represent a point where the influence of wave action and strong tidal flows counteract each other. Sediment transport north past this point still occurs (mainly sand) but a large proportion of beach material moving onto the Ness is either stored as an accumulation of material or lost into the adjacent deep water channel. In future the extraction of material at the Ness will be dependent on the quality (coarseness) of the material and whether a haul route needs to be constructed over the Eastoke Point rock revetment for plant access.

The accumulation of material on the Chichester Bar protruding into the channel is dredged when proving a navigational hazard. Recycling of this material back to Eastoke provides an excellent source of material from within the system.

There is currently ongoing accretion of sand occurring on Black Point Spit highlighted as 'Other Issues' on **Figure 7.3**, suggesting that the transport of shingle toward the distal end of the spit slows due to the drop in wave energy in the harbour entrance. A similar situation is occurring at Cakeham and West Wittering on the other side of the harbour. The levels of accretion at the Hayling Island Sailing club have become a problem; to such an extent the sailing club is now unable to use its pontoon. Constructed in 1993, it had boat access at all states of tide but has recently been removed as it was sitting on top of sand at all states of tide.

Sediment transport within Chichester Harbour is driven by two processes: fine material is transported by tidal currents, while both fine and coarse material are transported by wave action (HR Wallingford, 1997). South Hayling Island is an exposed coast, and therefore subject to very high wave attack. The turbulent wave and tide conditions at the harbour entrance can transport sand in suspension and during storms it can be carried further into the harbour. Some deposition occurs on the flood tide; however the dominant transport pathway is seaward out to the ebb tide delta, known as Chichester Tidal Delta. Small volumes of sand are carried into the harbour and deposited as narrow beach deposits in areas subject to wave attack. Localised erosion along the shoreline provides additional material for these deposits (HR Wallingford, 2011).

The natural movement of shingle moving up towards Black Point forms a ridge of shingle across the RNLI slipway which is currently buried beneath the beach (this is highlighted as 'Other Issues' on **Figure 7.3**). This prevents the RNLI from launching, and therefore the shingle is pushed down the beach using a launching tractor. This keeps the sediment within the system, whilst allowing the lifeboat station access to remain functional (personal communication, 2017).

- **Control Structures**

There *are* various timber groynes owned and maintained by private organisations, which are mainly in fair condition or buried beneath the beach. A rock revetment constructed around the Hayling Island Sailing Club is in good condition.

- **Proposal for BMP U 1**

Extraction from the Ness will continue dependant on the quality (coarseness) of the material and whether a haul route needs to be constructed over the Eastoke Point rock revetment for the plant to access the Ness.

Clearance of sediment using a launching tractor from the RNLI slipway when it is blocked will also continue.

One of the new areas of extraction is the area surrounding the Hayling Island Sailing Club (HISC) pontoon. If permission is granted, any sand removed from the pontoon must remain in the SAC system, as agreed with Natural England. Intertidal sand will be extracted in the vicinity of the HISC pontoon and deposited at Eastoke, east of the drift divide, where it will move back towards Black Point, continuing to feed the spit. By carrying out works in this way, the size and extent of the SAC feature will not be altered and the sand will only have temporarily moved location. Ideally the sailing club would want to return to the 2007 beach profile when the pontoon was accessible at all states of tide. **Figure 4.5** shows the Mean High Water Spring Contours between 2003 – 2012 at Black Point Spit. Still, this may be unrealistic due to associated costs, so as a minimum the Sailing club would like to; ensure that they have access to the hammer head at all states of the tide. The sailing club are also looking at a number of other options or combination of options for managing the access to the water including a possible walkway with a bridge to a hammer head which will be 10 metres north from the current position. Due to these uncertainties this EIA will only be considering the impact of moving sand in the vicinity of the pontoon, to be deposited at Eastoke Point. The quantity of material to be extracted in any one campaign should be mindful of longshore drift rates to Black Point Spit which were approximately 2,000 $m^3$ per year between 2003 and 2013. If this is acceptable in principle then the details of this can be conditioned to be developed

within a site specific Construction and Environmental Management Plan (CEMP) at a time when the sailing club have made a decision on the way forward.

#### 7.1.4.2 BMP U2: Eastoke Point

Eastoke Point (BMP U2) at the eastern end of the island is historically an area of instability with major changes in size and orientation of the beach having taken place over the last century**.**

This area along with BMP U3 is the only area actively managed by Havant Borough Council and the ESCP. The beach in this location is highly dynamic. The original capital beach nourishment in 1985 rapidly eroded in this area and beach recycling alone was not capable of maintaining the required standard of protection. This then led to the construction of a terminal rock groyne in the early 1990s. The resulting downdrift erosion led to emergency works, involving the construction of a rock revetment and stub groynes to prevent a breach forming into the Eastoke Point Nature Reserve. This served as a good illustration of the risks associated with completely cutting off the supply of sediment and the merits of allowing material to be recycled from further along the system.

The Eastoke Point Scheme was built in 2013. The section of beach covered by the Eastoke Point Scheme contained 9 timber groynes that were vulnerable to rapid failures due to the low and dynamic beach levels in this area. Therefore, 5 of the timber structures were removed and replaced with 3 rock groynes and 1 shortened rock groyne. This has helped to stabilise this section of coastline, and reduce the loss of nourished material east of the frontage. It should be noted that a feed of material eastwards must be maintained to avoid erosion on the drift aligned section of beach from The Ness up to Black Point. As such, the rock structures are not designed to act as terminal structures for the nourished beach but will slow the loss of material around Sandy Point.

The Eastoke Point scheme was designed with a beach acting as the primary defence to minimise overtopping. The scheme was completed in November 2013 to bring the standard of protection up to the required 1 in 200 year level for 100 years. This frontage will be managed within the holistic approach of the wider South Hayling frontage.

- **Control Structures**

The scheme design is shown in **Chapter 4 Figure 4.6** and the cross sectional area of the rock revetment and beach is shown in **Chapter 4 Figure 4.2**.

- **Proposal for BMP U 2**

Beach Management will continue as it has on a planned and reactive basis. It is anticipated over the next 5 years that material will not be required to be placed directly into these groyne bays, provided material is placed east of the drift divide at Eastoke, thereby feeding Eastoke Point. The beach levels in this area will continue to be monitored and if necessary, will be directly nourished to bring the beach back up to the Standard of Protection depicted in **Figure 7.6**. Any impacts resulting from the continued beach management have already been identified and mitigated for as part of the Eastoke Capital Scheme.

#### 7.1.4.3 BMP U3: The Eastoke Nourished Frontage (groynes 7-35)

BMP U3 and BMP U2 are the only areas actively managed by HBC and the ESCP. The beach in this location is highly dynamic with the nourished beach acting as the primary defence. There are two key erosion hot spots where the beach crest is often drawn down below the design standard as depicted on **Figure 7.3**; these are Eastoke Corner and the area in front of the Creek Road car park where there is currently a sediment drift divide. Historically there was a natural supply of material onshore, but this is no longer sufficient to maintain the beach to the required levels. The Eastoke frontage has been subject to a steady rate of recession given the wave focusing and location of this drift divide. The general pattern of erosion along the Eastoke frontage is predicted to continue into the future. If nourishment were to cease, the main Eastoke beach would overtop heavily, accelerating beach erosion, leading to the eventual collapse of the previously buried seawall. In turn the beach would roll back, eroding the Eastoke Peninsula. As the hinterland is low-lying, little additional material would be supplied to the wider frontage as the beach rolled back. As the nourished frontage is the supply of material to the wider frontage, cessation of nourishment activities would lead to erosion becoming prevalent around the wider frontage until a more stable plan shape was attained.

- **Control Structures**

The shingle beach is the primary flood defence in this location. The design profile for this section of beach is shown in **Chapter 4 Figure 4.1**. There are a series of timber groynes along this frontage, currently in fair to good condition. As the seawall is buried, its condition is unknown. The splashwall behind the beach and the promenade is in fair condition with a residual life of 1 – 10 years.

- **Proposal for BMP U3**

It is critical that the beach levels and volume are retained in this location to maintain

the Standard of Protection depicted in **Figure 4.1**. It is also essential that the permissions sought allow for flexibility in managing this area of the coast as it reacts very differently to various storm conditions. This flexibility will allow coastal managers to utilise different sources of shingle to maintain the beach, and give protection to the 1555 residential properties and 170 commercial properties at risk at Eastoke.

#### 7.1.4.4 BMP U4: Open Beach Section

Sediment along the Open Beach moves from east to west, with different areas of the open beach showing both accretion and erosion. The central beachlands open coast has no hard defences other than a single timber groyne to the east of the unit which is in 'fair' condition. The beach here is generally healthy and is therefore an extraction area for recycling when beach levels accrete.

- **Control Structures**

In this unit, there is a timber groyne in fair condition and a timber revetment in poor condition.

- **Proposal for BMP U4**

This beach will be utilised as an area of sediment for extraction should the beach monitoring programme identify significant areas of build up which would be suitable for recycling back to Eastoke.

#### 7.1.4.5 BMP U5: Inn-on-the-Beach to driving range

Along West Beach, sediment transport is from east to west. The sloping timber breastwork to the west of Inn on the Beach is in a generally poor structural condition, and heavily dependent on the beach levels in front of it. During some years there is a build-up of sediment behind the timber sloping revetment which has and will continue to be used as a source of shingle extraction.

The adopted policy is to maintain the structure where reasonably practicable, and remove sections of the structure when they become a health and safety risk. A 75m section at the western end was removed in March 2012 due to a significant structural failure, triggered by falling beach levels exposing the degraded lower section of the structure. The remaining structure and the existing timber groynes will be monitored and removed as their condition deteriorates.

- **Control Structures**

This section contains a timber revetment in poor condition and a small number of timber groynes in good condition.

- **Proposal**

This area will continue to be used as an extraction area where monitoring shows a build up of material behind or in front of the timber revetment. Still, where extraction from Gunner Point is permitted by the landowner, less material will be extracted from West Beach, thereby allowing continued sediment feed to Gunner Point where it will be recycled back to Eastoke.

#### 7.1.4.6 BMP U6: Driving range to Gunner Point

This unit has suffered erosion over the past decade but has stabilised since 2014 following construction of a short haul route.

- **Control Structures**

There are three privately owned timber groynes in poor condition along this frontage.

- **Proposal**

The area will be used as a haul route pending landowners permission to recycle material to Eastoke.

#### 7.1.4.7 BMP U7: Gunner Point

The beach lies in the lee of a significant ebb-tidal shoal, the East Winner. This area has historically been an area of accretion characterised by a series of relic shingle ridges. These shingle ridges have built seaward by some 350m since 1832 (**Figure 7.4**). The SCOPAC Sediment Stores and Sinks Project (2014) shows that this area has accreted by nearly 250,000m$^3$ in the last 10 years.

Within the SCOPAC Sediment Transport Study (2004), there is an ephemeral drift divide identified at Gunner Point. Still, tracer studies undertaken in 2011 by the ESCP demonstrated the net drift direction is from east to west along the frontage (**Figure 7.5**).

Material has only been extracted from Gunner Point by HBC for emergency works in 2014. Following approval in principle by the landowners and Natural England, this iteration of the BMP has identified Gunner Point as a new source of material for recycling, pending landowner permission / Natural England agreement (in line with the **HRA – Section 9**) prior to any Beach Management campaign.

- **Control Structures**

There are no control structures in this unit.

- **Proposal**

The proposal is to utilise this large source of sediment pending landowner permission / Natural England agreement (in line with the **HRA – Section 9**) prior to extraction and a number of safeguards in place to protect Vegetated Shingle Communities, Drift line Communities and the future evolution of these communities. Other restrictions are in place to protect SPA birds and including nesting and roosting birds (see the HRA for this project).

#### 7.1.4.8 BMP U8: Gunner Point to Ferry Boat

Sediment pathways in this location are northwards. The sediment in this unit has a high shingle content although material to the north of the unit has a significant component of slipper limpet shells. Once inside the harbour entrance transport rates fall and beach material either slowly moves north towards the Ferryboat Inn or is flushed seaward onto the East Winner on the ebb currents.

This BMP management unit contains a variety of redundant sea defences and man-made structures that are now buried within the beach. There is currently some localised erosion to the north of the unit associated with the advance of pronounced pulses of sediment moving northwards up the eastern flank of the entrance channel in to Langstone Harbour (**Figure 7.6**).

- **Control Structures**

In this unit, there is a variety of redundant structures.

- **Proposal**

It is anticipated that in time pules of sediment will feed potential hotspots of erosion forming in front of the Havant Borough Council car park at Ferry Road. In the meantime, it is proposed that small amounts of shingle from within the sediment cell will be utilised to work with coastal processes to resolve these issues. If and when the erosion threshold depicted in **Chapter 4 Figure 4.7** is met, material will be deposited in front of the redundant structure from within the sediment cell to further prevent erosion. There is currently one pocket of erosion to be addressed circled on **Figure 4.7**. If this is acceptable in principle then the details of this can be conditioned to be developed within a site specific Construction and Environmental Management Plan (CEMP).

### 7.1.5 Potential Sources of Sediment

- **Beach Recycling**

The current scheme proposes to increase recycling material sources to include the stores at Gunner Point at the western tip of the south coast of Hayling Island and Black Point at the eastern end of Hayling Island (blue line area in **Figure 1.4**). Material from these areas will be transported back to Eastoke where longshore drift will then return the material back to the original sediment stores over a number of years. This works in collaboration with the coastal processes by recycling material from within the sediment cell.

- **Recycling from Chichester harbour approach channel**

If a maintenance dredge becomes necessary to remove the Chichester Bar from the Chichester entrance channel, this material will be utilised rather than lost as part of the wider sediment budget feeding the Eastoke frontage. It is proposed that, as has been done in the past, this material will be intermittently reintroduced by pumping sediment ashore when the channel is dredged by Chichester Harbour Conservancy on navigational safety grounds.

In the past this channel has been dredged on a large scale on an infrequent basis. It is now proposed to carry out smaller, more regular dredges. The sediment will then be 'rainbowed' ashore from a barge nourishing the beach. This is an excellent beneficial re-use of material; material that has arisen from within the sediment cell.

- **Re-nourishment from other marine sources**

Where there is insufficient material to maintain the standard of protection at Eastoke from recycling material from within the sediment cell, marine based sediment will be transported in via road or barge from outside the sediment cell. This material will be dredged from local, licensed dredging sites. The Environmental impacts of these licensed sites will have been considered within the EIA when the site was licenced and therefore these impacts will not be considered within this report.

Any recharge via road should be shingle-size graded 20-63mm aggregate transported to site by lorry. The material is dredged at licenced offshore sites before being landed and graded ashore. The material is therefore of a similar type and appearance to the coarser fraction of material already on the beach. This material performs well on the nourished beach, and has been used as part of previous operations to armour the front face of the beach crest.

Where the material is delivered by barge, as with local dredging from the Chichester

Bar, it can be ‘rainbowed’ ashore directly onto the beach at Eastoke.

Recycling of material from within the sediment cell is the preferred option, still, as with previous iterations of the BMP, re-nourishment from licensed dredge sites provides a fall back option.

## 7.2 Coastal Processes: Impact Assessment

Potential impacts on coastal processes whilst undertaking the works will be considered as construction impacts; any impacts after construction will be considered as operational impacts. As the aim of the scheme is to maintain a healthy, natural beach and work with the sediment dynamics, the operational impacts are not considered to have a negative impact. Any impacts from construction are included in **Table 7.2**. **Table 7.3** then presents any impacts that require specific mitigation in order to control / reduce the impact to acceptable levels.

**Table 7.2 Potential Impacts of delivery of the BMP on coastal processes. Highlighted Orange if requiring mitigation (See Figure 1.1 for location of BMP units, and Section 4 for details of proposed unit by unit activities):**

| Potential Effects of Beach Management Operations | BMP U1 | BMP U2 | BMP U3 | BMP U4 | BMP U5 | BMP U6 | BMP U7 | BMP U8 |
|---|---|---|---|---|---|---|---|---|
| **Temporary increase in suspended sediments during construction from rainbowing or recycling. (See Water Framework Directive – Section 12 for further consideration of this impact).** | Sand extraction around Hayling Island Sailing Club: Very localised potential for impacts during extraction of sand material. Operation only undertaken at low tide (not directly connected with the water body). Shingle extraction from The Ness: Coarse Material extracted from the beach - not expected to increase suspended sediments in the waterbody. | Sand would be deposited from the BMP U1 extraction. Material would be placed on beach at low tide to minimise any water quality impacts. Potential for land based shingle recharge, should groyne bays be starved. Will not impact coastal processes as placed within existing groyne bays – no fines. | Short term potential for elevation in suspended sediments following placement of recycled or recharged materials. The shingle placed here is specified to be low in fines, so it settles out quickly. Material is placed directly on the beach (outside of the waterbody itself). Rainbowing only occurs in one to two groyne bays for a couple of hours per high tide, so localised, short term impact. | Material is recycled from the beach at these locations (extracted). There is a very low level of fines, with the material being extremely coarse. Not expected to impact water body. | | | | Very localised movement of shingle to improve beach profile. This will prevent erosion of areas that could result in the release of additional fines into the water body. |
| **Change in beach profile causing issues on the open coastline.** | The BMP (**Appendix A**) sets out critical beach levels along the entire Hayling Island coastline, in order to provide the correct standard of flood and coastal erosion protection to Eastoke. The BMP has been carefully developed based on historic research and a clear understanding of the way in which coastal processes operate along this coastline. The beach profile will be managed along the full sediment cell to ensure a strong balance between flood protection, the stability of beaches for vegetated shingle habitats fronted by annual vegetation of drift lines, and providing local businesses with the opportunity to continue to operate along the coastline (I.e. Hayling Island Sailing Club). The BMP is considered to have a positive impact on beach profiles for the benefit of all aspects. Without control measures, Gunner Point (BMP Unit 6 and 7) would be the most sensitive to significant changes in beach profile, due to the protected vegetated shingle / annual vegetation of drift line habitats that reside here. For this reason, strict control measures have been presented in the **HRA (see Section 9 of this ES)** to prevent negative impacts on these important habitats. | | | | | | | |
| **Impacts on adjacent sections of the coast.** | This BMP frontage covers a single sediment cell, and due to the harbour entrances at either side of the sediment cell, there is limited opportunity for impacts on adjacent sections of coastline (I.e. this open coastline is effectively disconnected from the beaches at Eastney or the Witterings). The BMP has been carefully developed to prevent impacts to the wider environment. | | | | | | | |
| **Positive impact from working with natural coastal processes (the concept of beach management).** | The BMP works with natural coastal processes and is considered a preferable form of flood and erosion defence in comparison to additional hard defences such as sea walls, which could result in beach draw down and wider consequences. By maintaining critical beach levels, we are also enabling the establishment of vegetated shingle habitats through the provision of stable beaches. The wider open coastline is also important to the tourism aspects of Hayling Island, with people attracted to the beach here. None of this would be possible without active beach management. | | | | | | | |
| **Tracking on the beach, and moving material along it - compaction of shingle on beach crest, impacting future free movement of shingle.** | There is a risk of compaction of sediments where main haul routes are established; however this impact is considered negligible due to the beach being such a dynamic environment, where the beach will be quickly reworked and compaction avoided. | | | | | | | |

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## 7.3 Coastal Processes: Mitigation and Residual Impacts

**Table 7.3** details specific mitigation for the impacts identified in **Table 7.2** (those which are highlighted orange), to ensure the BMP works can be delivered without a significant negative effect on coastal processes. A Construction and Environmental Management Plan (CEMP) will be developed and submitted in advance of each BMP campaign.

**Table 7.3 Mitigation for impacts identified in Table 7.2 and residual impacts**

| Impact | Mitigation | Resultant/Residual Impact |
|---|---|---|
| Change in beach profile causing issues on the open coastline | We have specified specific mitigation within the **HRA (see Section 9**) to prevent impacts on this sensitive environmental area i.e.:<br>• Vegetated shingle / Annual Vegetation of Drift Lines will be demarcated out and machinery will not be allowed to cross the line.<br>• Machinery will track along the beach below MHWS at Gunner Point to protect vegetated shingle**.**<br>• The monitoring and mitigation plan in **Section 21 'Conclusions'** will need to be followed to ensure appropriate measures are taken to protect future evolution of the beach (especially Gunner Point). | Minimal resultant risk of impact |
| Tracking on the beach and moving material along it – compaction of shingle on beach crest, impacting future free movement of shingle. | • Beach is naturally very dynamic so unlikely to be a major problem.<br>• Construction and Environmental Management Plan will be developed and adhered to, ensuring tracking on the beach has minimal impact on coastal processes, i.e. minimum width so that the smallest possible area is impacted. | Minimal resultant risk of impact |

## 7.4 Coastal Processes: Conclusions

When considering the impacts of this scheme on the coastal processes along the South Hayling Island frontage, there is not considered to be a negative impact. The scheme aims to work with and manage the natural processes of the beach. It is recognised at regional and local levels that beach recycling in this location is the most effective method of maintaining a healthy beach for flood protection. The expansion of the recycling area is still within existing sediment cells and therefore will not impact sediment supply further along the coast.

This BMP has been developed in-line with the existing management of this coastline, with the area of works increased both east and west to include the full South Hayling Island open coastline. This will enable full management of the Hayling Island open coastal sediment cell, providing a complete plan for the benefit of the whole frontage. Strict control measures are recorded in **Section 9 'Information for HRA'** to ensure there are no negative impacts of beach management operations on the internationally designated environmental areas of this coastline.

The BMP works with natural coastal processes and is considered a preferable form of flood and erosion defence in comparison to additional hard defences such as sea walls, which could result in beach draw down and wider consequences. By maintaining critical beach levels, we are also enabling the establishment of vegetated shingle habitats through the provision of stable beaches. The wider open coastline is also important to the tourism aspects of Hayling Island, with people attracted to the beach here. None of this would be possible without active beach management.

**Figure 7.2 Difference plots showing beach change between 2005 and 2015**

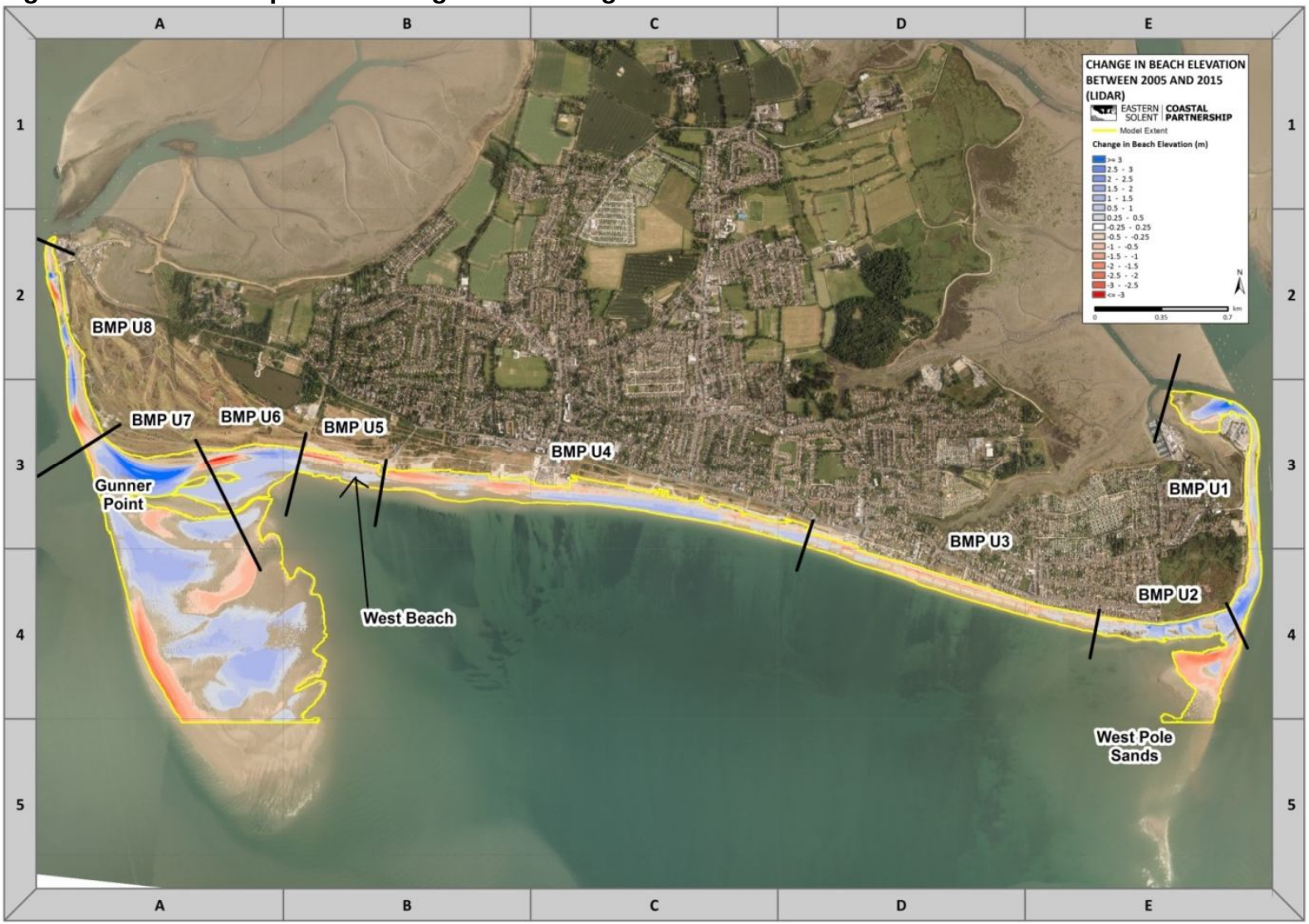


**Figure 7.3 ‘Erosion hotspots’, ‘Erosion watchspots’ and ‘Other issues’**



**Figure 7.4 Mean High Water at Gunner Point, 1832 – 2015**

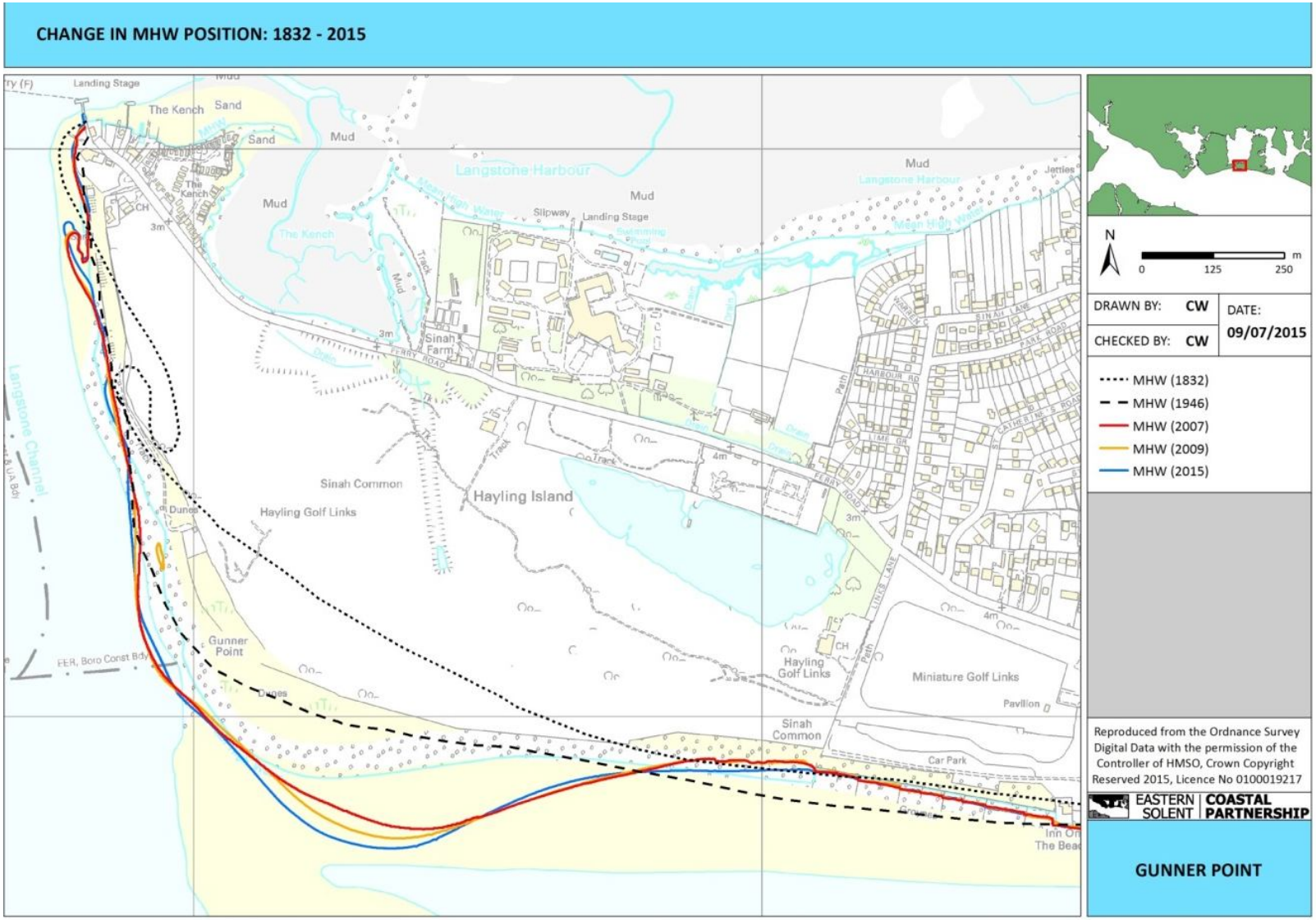


**Figure 7.5 Results of the Tracer Study for Gunner Point deployment (pebbles deployed in January 2011)**

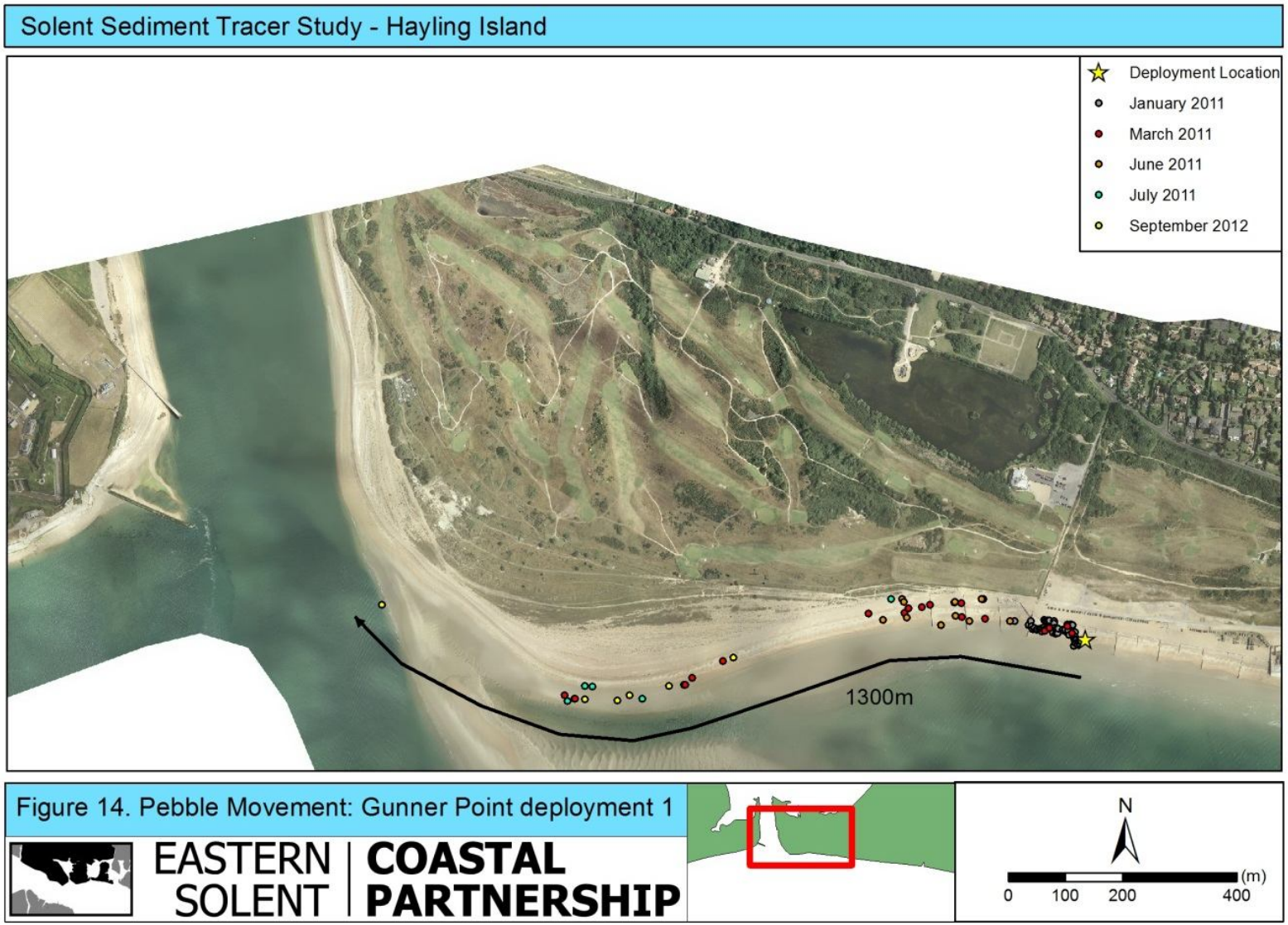
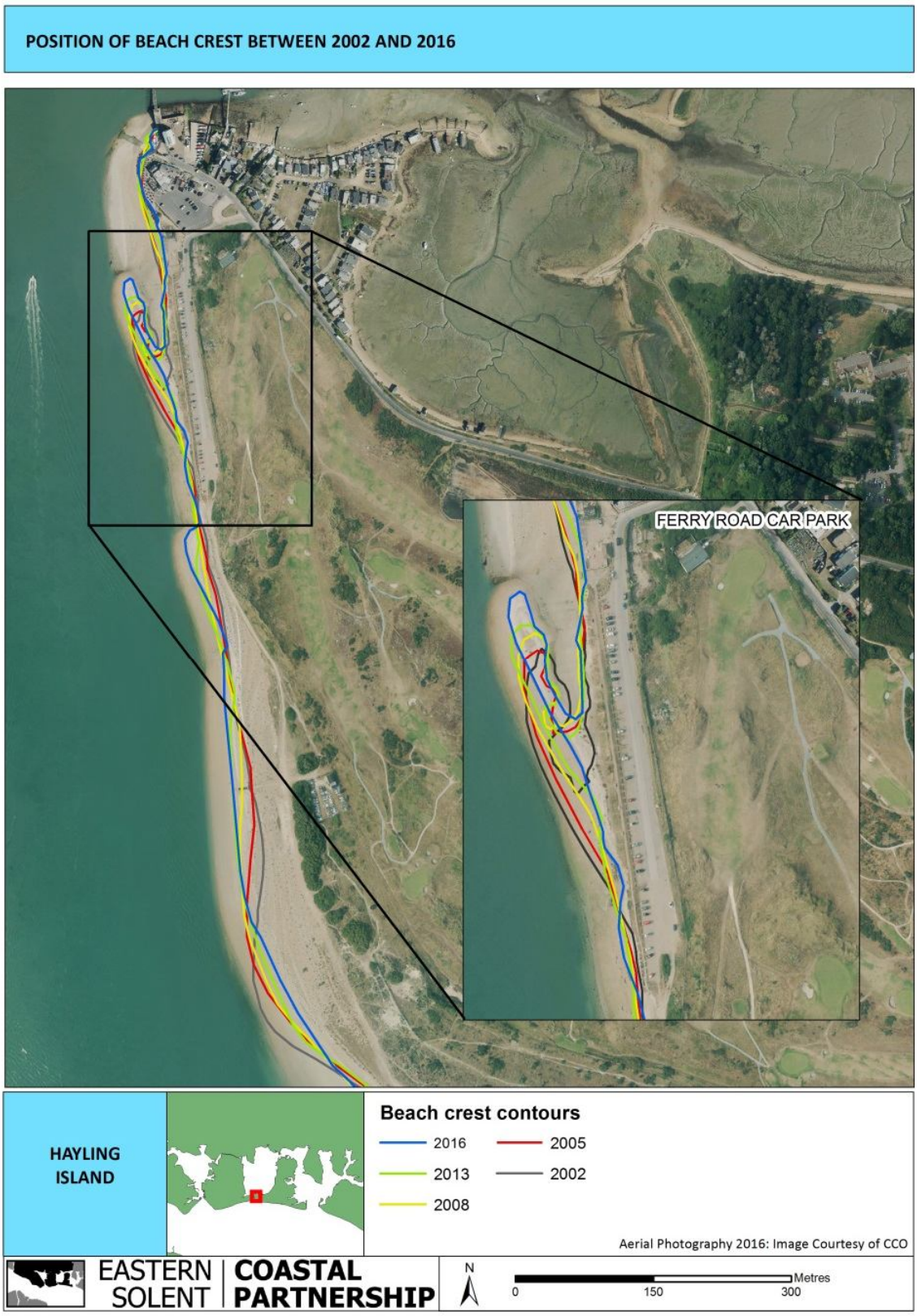


**Figure 7.6 Pulses of sediment moving north in Langstone Harbour since 2002 – beach crest digitised.**



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# 8. ENVIRONMENTAL BASELINE

## 8.1 Introduction

This section summarises the flora and fauna around Hayling Island that could be impacted by the proposed works. Hayling Island and its surroundings support a host of habitats and species of significant ecological and nature conservation importance. This is reflected in the number of sites that have gained European and National designation status, both within and adjacent to Hayling Island.

Following desk-based research and targeted surveys, this chapter will set out the overall scheme's Baseline Environment status of the following:

- Internationally designated environmental sites (Ramsar);
- European designated environmental sites (SPA and SAC);
- Nationally designated environmental sites (SSSI);
- Locally designated sites (SINC and LNR);
- Intertidal and sub-tidal areas;
- Presence of Marine Mammals;
- Ornithological interests;
- Terrestrial Ecology;
- Protected Species and Habitats.

The full scheme proposal is not directly connected with, or necessary to the conservation management of Chichester and Langstone Harbour SPA and Ramsar site, or the Solent Maritime SAC. Therefore the scheme requires assessment under the Conservation of Habitats and Species Regulations 2010, a process referred to as a Habitats Regulations Assessment ('HRA').

A scheme level HRA, to demonstrate the overall environmental acceptability of the full scheme is included as **Section 9 of this ES**. It is important to demonstrate that this scheme alone or in combination can be delivered in an environmentally acceptable way.

In summary the assessment of the potential impacts upon species within the works

area has been completed in the following way:

**Section 8 (this section)**, including its scheme specific surveys has assessed:

- The species concerned from the background data above;
- The population level at the site affected by the proposal;

The **Information for HRA (Section 9)** has:

- Assessed the direct and indirect effects of the works on the species present;
- Provided full details of any mitigation or compensation required;
- Concluded whether the impact is acceptable and / or licensable and therefore whether the BMP could have any Likely Significant Effect (LSE) on the environment

## 8.2 Baseline Environment

The following section details the designated sites in or adjacent to the application area and the criteria under which they qualify. This Environmental Statement to support the new Planning / Marine License Application covers the open South Hayling Island open coastline, which extends from Black Point, Chichester Harbour to the east to the Ferry Point, Langstone Harbour in the West. The area of interest is located within or adjacent to a number of designated sites.

### 8.2.1 Internationally Protected Species

All relevant information on the International designations within 2km of the revised South Hayling Island BMP are detailed in the 'Information to inform a Habitats Regulations Assessment (HRA)' - **Section 9.** They are therefore not discussed in detail within this Section. The HRA includes information on the following internationally designated sites, which are illustrated on **Figure 8.1**:

- Chichester and Langstone SPA
- Chichester and Langstone Ramsar Site
- Solent and South Downs proposed pSPA
- Solent Maritime SAC

### 8.2.2 National and Local Designations

There are also a number of national and local designations within 2km of the revised South Hayling Island BMP. **Figure 8.2** illustrates these. These are discussed in detail within this Section, as they are not considered in **Section 9 'Information for HRA'.** They include:

**Sites of Special Scientific Interest (SSSI):**

- Chichester Harbour SSSI
- Sinah Common SSSI
- Langstone Harbour SSSI

**Local Nature Reserves (LNR):**

- Sandy Point Local Nature Reserve and Countryside Heritage Site
- *The Kench, Hayling Island Local Nature Reserve (outside the area of interest)*

**Sites of Importance for Nature Conservation (SINC):**

- Beachland's East SINC
- Hayling Island Beach SINC
- Lifeboat Station Heath SINC
- Lifeboat Station Saltmarsh SINC
- Land east of Sandy Point SINC
- Sandy Point SINC

## 8.3 Details of the Nationally Important Sites of Special Scientific Interest (SSSI)

Below is a summary of all the SSSI Units within 2km of the revised BMP frontage. This summarises the proximity of each designated site to the proposed works, the main habitat types, what condition they were in during their last assessment, a description of the site, and a summary of any potential impacts of the scheme on the site.

### 8.3.1 Chichester Harbour SSSI

Chichester Harbour SSSI Unit 1 – Sandy Point

Proximity to BMP area: This is directly landward of 'The Ness' extraction area. Adjacent to but directly outside the working area of BMP units 1 and 2 (Spatial extent illustrated by Figures 8.4 and 8.5 at the end of this Section).

Main Habitat: Dwarf Shrub Heath

Condition: Favourable (13th Jan 2009)

Description: The site supports a mosaic of dune heath, areas of acid grassland, dense and scattered patches of gorse and bramble scrub, and a permanent pond within the centre of the site, surrounded by hard and soft rush. A fringe of marram grass occurs around the seaward edge of the unit adjacent to the shingle, which over a very short distance grades into the dune heath inland. The heath is dominated by ling with some bell heather, and supports a good variety of species including herbs such as sheep's sorrel and heath bedstraw, bryophytes such as Rhytidiadelphus

squarrosus, Pseudoscleropodium purum and Dicranum scoparium, and a good cover of lichens (Cladonia spp). The heath is managed by Hampshire County Council, involving grazing by ponies and Highland cattle maintaining the grass ward on average at 5 – 10 cm height, and some gorse and bramble clearance. The site is also subject to rabbit grazing, which is not considered to be having a significant adverse impact on the site.

Impact of the works:

This area of SSSI will not be impacted by the works and vehicles will not enter the SSSI unit.

### 8.3.2 Chichester Harbour SSSI Unit 2 – Eastoke Foreshore

Proximity to BMP area: This is part of 'The Ness', 'Black Point' and 'Sailing Club' extraction area. This area is within Beach Management Plan Units 1 and 2. (Spatial extent illustrated by Figures 8.4 and 8.5 at the end of this Section).

Main Habitat: Littoral Sediment

Condition: Unfavourable Recovering (29th Nov 2010)

Description: This is a large area of intertidal mud with extensive areas of pioneer salt marsh (This area cannot be impacted by the works as it is geographically separated by an access road, which will not be used as part of these works.) The habitats are affected significantly by sea level rise and 'coastal squeeze' as much of the unit is backed by hard sea defences so that the habitats are unable to retreat landward as levels rise. This means that the extent of habitat exposed at low tide will be declining and the area of salt marsh is likely to be diminishing. Changes in water level may also be having adverse impacts on the distribution and extent of biotopes associated with the intertidal sediments. The issue is being addressed through the creation of compensatory habitat and coastal re-alignment at Medmerry. Bird numbers, as elsewhere in the wider Solent, are declining for reasons which are unclear. This aspect is under investigation.

Impact of the works:

This small area of unit 2 is characterised by shingle and sandy sediment progressively getting finer moving into Chichester Harbour towards Black Point. This area is an area of accretion (see Section 7 for details). This area may be impacted by the recycling of sediment from Hayling Island Sailing Club pontoon (HISC) back to Eastoke, the following impact pathways have been considered;

1) Direct loss of over-wintering bird feeding habitat: Removal of sediment will not result in a net loss of feeding area, just a lowering of ground level. It is also considered that the immediate area is sub-optimal as a bird feeding area, due to the close proximity of the pontoon reducing clear sight lines for birds.

2) Reduction in extent of high tide roosting areas: Extracting material from the foreshore at Hayling Island Sailing Club, could intercept material that would have previously fed the Black Point High Tide Roost Site. Coastal monitoring has shown (Chapter 7) that the Black Point High Tide Roost Site is a historic geological feature and may only receive a very small amount of sediment from coastal processes passing the HISC pontoon. As any material removed will remain in the system there will be no long term impact from this minor potential operation.

3) Damage to sand infauna communities: tracking of machinery on the beach from Black Point to Eastoke could have a minor negative impact on the infauna communities in the sandflats. Ensuring the works do not take place on a regular basis, there will be time for the infauna communities to recover between operations. A Construction and Environmental Management Plan (CEMP) will be prepared and agreed with Natural England prior to any sand extraction within BMP unit 1 to ensure any such impacts are mitigated for. It should be noted that the Pontoon was constructed in 1989, before the site was designated as an SPA and SAC, and the levels of accretion have been so high that the pontoon is now no longer functional. This is seriously impacting activities at the Sailing Club, hence their desire to include this operation within this BMP.

Specific mitigation along these frontages is set out in Chapter 9 – Information for HRA.

### 8.3.3 Sinah Common SSSI

Sinah Common SSSI Unit 1

Proximity to BMP area: This is part of the ‘open beach’ and ‘Inn on the Beach’ extraction areas. This area is within BMP units 4 and 5. (Spatial extent illustrated by Figures 8.7 and 8.8 at the end of this Section).

Main Habitat: Supra-littoral sediment

Condition: Unfavourable Recovering (24th March 2010)

Description: There is a mosaic of short turf maritime grassland communities behind the shingle bank. There are areas of quite species-rich grassland with Aira praecox, Agrostis capillaris, Carex arenaria, Cladonia spp., Festuca ovina, Hypochoeris radicata, Lotus corniculatus, Pilosella officinarum, Plantago coronopus, Plantago lanceolata, Rumex acetosella and Trifolium repens all quite frequent. In addition, species such as Silene uniflora, Armeria maritima and Glaux maritima are locally common where there is a stronger maritime element. The uncommon Trifolium suffocatum is locally frequent in several dune hollows. Coarse grasses such as Dactylis glomerata are locally abundant in a few areas suggesting localised raised nutrient levels or where scrub has been cleared in the past. Several key targets are met; bare ground is <5% overall (not shingle) and sward height 2-30 cm (average

<10 cm), however, cover of scrub is still above target, particularly in the north-west section north of the golf course lake, north of the miniature golf links and to the west of Norfolk Crescent. There is evidence of recent clearance (probably of Holm Oak) but there is a need for further clearance to ensure it is kept to target level. The unit also supports vegetated shingle. The shingle bank in the southern part of the unit is remarkably species-rich despite the high visitor pressure. Apart from in front of the amusement park and cafe where most trampling occurs, the high ridge holds good quality perennial shingle communities with frequent Cakile maritima, occasional Atriplex prostrata, patches of Silene uniflora and occasional Crithmum maritimum. Glaucium flavum is also present in the western part.

Impact of the works:

The beach management works have been taking sediment from areas of accretion and transporting them back along the route of the long shore drift to Eastoke since 1985. This principle of recycling the sediment has been agreed at strategic and local levels. Restrictions are in place to protect vegetated shingle communities, as set out in Section 9 (Information for HRA). No previous concerns about these works on the SSSI have been identified. Only areas of accretion are extracted, to ensure a healthy beach still remains along these frontages.

### 8.3.4 Sinah Common SSSI Unit 2

Proximity to BMP area: This is part of the 'Gunner Point' extraction area and the Langstone Harbour entrance re-profiling area. This area is within BMP units 5, 6, 7 and 8. (Spatial extent illustrated by Figures 8.8 to 8.11 at the end of this Section).

Main Habitat: Supra littoral sediment

Condition: Unfavourable Recovering (24th March 2010)

Description: This part of the site is within a golf course and has a complex mosaic of scrub, heath, acid grassland, fixed dune grassland, maritime grassland and neutral grassland. The healthy grassland alongside the fairways is generally quite species rich and meets several key targets. Plants noted here include Lotus corniculatus, Armeria maritima, Carex arenaria, Deschampsia flexuosa, Rumex acetosella, Hypochaeris radicata, Plantago lanceolata, Plantago coronopus and Cladonia spp. Where dune heath is more predominant, species such as Erica cinerea, Teucrium scorodonia, Jasione montana and Ulex minor are more typical. All of these are indicators of good condition.

Seawards, there are areas of tall dune grassland dominated by Ammophila arenaria and Elytrigia arenaria with frequent Carex arenaria. There is evidence of recent tree and scrub clearance but overall cover is still above target level. Gorse and other scrub and trees including sycamore, willow and oak remains an issue however, and cover is estimated at 5-10% of the unit. Scrub is invading the dune grassland in the

north of the unit. Outside the golf course, there are some rich shingle communities with frequent Cakile maritima, Atriplex patula and Beta maritima. Also present are Raphanus maritimus, Echium vulgare, Glaucium flavum, Ononis repens, Matricaria maritima, Armeria maritima and Rumex crispus. All of these are typical of the vegetation and indicators of good condition. However, there are also heavily trampled areas, particularly along the fence line next to the golf course and there are areas with indications of raised nutrient levels dominated by Arrhenatherum elatius, Bromus sterilis and patches of Rubus fruticosus scrub.

Impact of the works:

This section of the SSSI had sediment extracted from it for recycling to Eastoke as part of the beach management works in 2014. It was extracted for emergency purposes following the severe storms of that year. Emergency assent was given by Natural England.

Mitigation measures will be put in place to protect the vegetated shingle / annual vegetation of drift line habitats communities being impacted both directly by the machinery on site and also indirectly by adequate sediment being available for the formation of appropriate habitat. These are recorded in Section 9 (Information for HRA). This area of Gunner point is the largest area of accretion on the whole south coast of England (Section 7). This is in part due to the historic beach nourishment activities at Eastoke and ongoing BMP activity.

Options for tracking routes at Gunner Point:

Ideally the machinery will access the shingle from the lower sandy beach, infaunal communities will naturally be impoverished in this area due to the dynamic nature of the shingle beach that covers the sand at regular intervals.

Alternative access to this area can take place from the crest of the beach. Protection will be given to vegetated shingle communities; however we have also considered impacts of the risk of compacting the shingle, thereby allowing easier future access to this area of the beach by pedestrians and dog walkers. At the current time it is hard work to walk on the beach so people tend to walk much further inland; leaving this area undisturbed. If this was a concern after monitoring, machinery could ‘scuff’ the top layers of the beach at the end of the works to dislodge any previously compacted material.

Protection of the high tide roost site: although there is very little data on the bird usage in this area, there is anecdotal evidence to suggest that birds do use this area as a high tide roost site. So taking a very precautionary approach, the ESCP have agreed with Natural England not to access the site 1.5 hours before high tide and 1 hour after high tide between October and February inclusive, to prevent any interaction with the overwintering birds that use the site. This overwintering tidal

restriction may be lifted in future years following ongoing recorded monitoring of bird numbers and behaviours. Between Mid March and August inclusive, no extraction can occur at Gunner point to avoid potential impacts to ground nesting birds. Details on this mitigation are included within Section 9 – Information for HRA.

### 8.3.5 Langstone Harbour SSSI Unit 9

Proximity to BMP area: This area is within BMP Unit 8 (Spatial extent illustrated by Figure 8.11 at the end of this Section).

Main Habitat: Littoral sediment

Condition: Unfavourable Recovering (29th November 2010)

Description: This is a large area of mainly intertidal mud with some areas of pioneer salt marsh. The habitats are affected significantly by sea level rise and 'coastal squeeze' as much of the unit is backed by hard sea defences so that the habitats are unable to retreat landward as levels rise. This means that the extent of habitat exposed at low tide will be declining and the area of salt marsh is likely to be diminishing. Changes in water level may also be having adverse impacts on the distribution and extent of biotopes associated with the intertidal sediments. The issue is being addressed through the creation of compensatory habitat and coastal re-alignment at Medmerry. Bird numbers, as with elsewhere in the wider Solent, are declining for reasons which are unclear. Disturbance to feeding and roosting birds is being addressed through the Solent Bird Disturbance Project.

Impact of the works:

The proposed works in this location would be very small scale to help to resolve a very localised erosion issue with a public car park and heritage assets. It would involve the small scale recharge of sediment from within the same sediment cell, to prevent further erosion of the car park. Access would be from the public highway instead of the beach.

There will be minimal very small scale impacts of the works in this area, although specific mitigation is set out in Chapter 9 (Information for HRA).

### 8.3.6 Langstone Harbour SSSI Unit 10

(The Kench)

Proximity to BMP area: This is over 250m east of the ‘Gunner Point’ extraction area over land and nearly 1km along the coast from the interest area. This are is outside of the BMP area (Spatial extent illustrated by Figure 8.11 at the end of this Section).

Main Habitat: Littoral sediment

Condition: Favourable (17th September 2010)

Description: Spartina maritima present, but not totally displacing native species

Impacts of the Works

This area is located outside the area of works within Langstone Harbour, 'behind' the Langstone Harbour re-curve spit. There will be no direct impact of the works in this location. The sediment at the Kench is fine sediment - very different from that found on the open coast.

### 8.3.7 Requirements for working in a SSSI

As a public body or 28H Authority under the Wildlife and Countryside Act 1981 (as amended by the Countryside and Rights of Way Act 2000), the ESCP must ask for advice and 'Assent' from Natural England before carrying out works in line with our statutory duties that are likely to damage the condition or special features of a SSSI. This includes planned works on land outside the boundaries of a SSSI but likely to damage it. Natural England must consider the likely impact on the special features of the SSSI. They then decide whether to issue assent, issue assent with conditions or refuse assent. If you do not notify Natural England or carry out the works before getting assent from Natural England fines can be issued from £20,000 in a magistrate's court or unlimited in a Crown Court.

The list of Operations with potential to damage SSSI interest features;

Sinah Common SSSI:

20) Extraction of minerals, including shingle, hard rock, sand and gravel, topsoil and subsoil

26) Use of vehicles or craft.

Chichester Harbour SSSI:

20) Extraction of minerals, including shingle, sand and gravel, hard rock, topsoil, subsoil, shells and spoil.

26) Use of vehicles or craft likely to damage or disturb features of interest.

There are also a number of Priority Habitats and Protected and Notable Species within the interest area (as set out in Section 9 – Information for HRA). The precautions and restrictions placed on the works will ensure that all the relevant habitats and species are protected as part of these on-going works.

## 8.4 Details of the Local Nature Reserves (LNRs)

Below is a summary of all the Local Nature Reserves within 2km of the revised BMP frontage. This summarises the proximity of each reserve to the proposed works, the

main habitat types, what condition they were in during their last assessment, a description of the site, and a summary of any potential impacts of the scheme on the reserve.

### 8.4.1 Sandy Point Local Nature Reserve and Countryside Heritage Site

**Proximity to BMP area**: This is directly landward of 'The Ness' extraction area and is the same location as Chichester Harbour SSSI Unit 1, therefore the area is covered by BMP units 1 and 2 (Spatial extent illustrated by **Figures 8.4 and 8.5** at the end of this Section).

**Description**: The Nature Reserve is a sensitive area of rare maritime heathland, sand dunes and grassland grazed in summer by cattle. Some plants found here occur nowhere else in Hampshire and much of the ground is covered in fragile lichens. The Reserve is a Site of Special Scientific Interest (SSSI). Habitat: Scrub and Grassland - many birds make their nests in gorse and thorn scrub. Whitethroats fly here from Africa, whilst Linnet are a year-round resident. Dartford Warblers breed on the site. This long-tailed warbler prefers undisturbed heathland sites and cannot tolerate severe winters and Sandy Point is one of the few sites in Hampshire where it successfully breeds. The site is also important for migrant birds with a rough hedgerow acting as a migration corridor.

**Impacts of the Works**

This area is inland of the proposed works. The on-going BMP works on the south Hayling Island coastline are protecting this area from being flooded and eroded by the sea. Therefore these works are having a beneficial impact on the current habitats in this area.

### 8.4.2 The Kench, Hayling Island Local Nature Reserve

**Proximity to BMP area**: This is over 250m east of the 'Gunner Point' extraction area over land and nearly 1km along the coast from the interest area (same location as Langstone Harbour SSSI Unit 10). This area is outside of the Bach Management Plan area. (Spatial extent illustrated by **Figure 8.11** at the end of this Section).

**Description**: A small area of inter-tidal mud and saltmarsh within Langstone Harbour. This shallow tidal inlet alongside Ferry Road on Hayling Island is used by many birds as a feeding area while the tide is out and when it is high the shingle ridge between the inlet and the main harbour is used as a roost by waders. It's important not to disturb this roost area while the birds are using it. Most of the birds

can be identified from the road. The path down the eastern edge and the copse alongside are worth investigating for wild flowers.

**Impacts of the Works**

There is no impact from the works as the Kench is isolated from the works. See note on Langstone Harbour SSSI Unit 10 above.

## 8.5 Hampshire Sites of Importance for Nature Conservation (SINC)

### 8.5.1 Beachland's East SINC

SINC No. 20 (Spatial extent illustrated by **Figures 8.6 and 8.7** at the end of this Section).

SZ72009870. Area 11088Ha

SINC Criteria 4A/6A;

**Species supported that meet Section 6 of SINC Selection Criteria**

- *Carex arenaria* (Sand Sedge) [CS]
- *Medicago polymorpha* (Toothed Medick) [NS]
- *Moenchia erecta* (Upright Chickweed) [nHS]
- *Sedum anglicum* (English Stonecrop) [CS]
- *Trifolium suffocatum* (Suffocated Clover) [NS]
- *Tripleurospermum maritimum* (Sea Mayweed)

**Proximity to BMP area**: This is landward of the beachland's open beach extraction site.

**Impacts of the works**: There will be no impact of the beach management works, as there is no access onto the SINC.

### 8.5.2 Hayling Island Beach SINC

SINC No. 24 (Spatial extent illustrated by **Figure 8.6** at the end of this Section).

SZ74609800. Area 13.70 ha

SINC Criteria 4A/6A

**Species supported that meet Section 6 of SINC Selection Criteria**

- *Crassula tillaea* (Mossy Stonecrop) [NS]
- *Hypochaeris glabra* (Smooth Cat's-Ear) [NR]
- *Polygonum maritimum* (Sea Knotgrass) [NR]
- *Vulpia fasciculata* (Dune Fescue) [NS]
- *Vulpia unilateralis* (Mat-Grass Fescue) [NS] plus various other notable plants

**Impacts of the works:** Any vegetated communities on the beach will be protected and coned off from the works as specified in the **Information for HRA – Section 9 of this ES**.

### 8.5.3 Lifeboat Station Heath SINC

SINC No. 26 (Spatial extent illustrated by **Figure 8.4** at the end of this Section).

SZ75009830

SINC Criteria 3A Area 0.33ha

**Proximity to BMP area**: This is landward of the Lifeboat Station Heath and will not be accessed as part of the scheme

**Impacts of the works:** There will be no impact of the beach management works, as there is no access onto the SINC.

### 8.5.4 Lifeboat Station Saltmarsh SINC

SINC No. 27 (Spatial extent illustrated by **Figure 8.4** at the end of this Section).

SZ75009860 Area 0.26ha

SINC Criteria 4A/6A

**Species supported that meet Section 6 of SINC Selection Criteria**

- *Ammophila arenaria* (Marram) [CS]
- *Salicornia europaea agg.* (Common Glasswort) [CR]
- *Tripleurospermum maritimum* (Sea Mayweed)

**Proximity to BMP area**: This is landward of the Lifeboat Station SINC and will not be accessed as part of the scheme

**Impacts of the works:** There will be no impact of the beach management works, as there is no access onto the SINC.

### 8.5.5 Land east of Sandy Point SINC

**SINC No. 28** (Spatial extent illustrated by **Figure 8.4** at the end of this Section).

SZ75059841 Area 0.82ha

SINC Criteria 4A/6A

**Species supported that meet Section 6 of SINC Selection Criteria**

- *Calystegia soldanella* (Sea Bindweed) [CR]
- *Glaucium flavum* (Yellow Horned Poppy) [CS]
- *Moenchia erecta* (Upright Chickweed) [nHS]
- *Phleum arenarium* (Sand Cat's-Tail) [CR]
- *Trifolium suffocatum* (Suffocated Clover) [NS]

**Proximity to BMP area**: This is landward of the Sandy Point SINC and will not be accessed as part of the scheme

**Impacts of the works:** There will be no impact of the beach management works, as there is no access onto the SINC.

## 8.6 Other Designations

**8.6.1 Chichester Harbour AONB,** this will be assessed within the Landscape and Visual Impact Section of this report (**Section 11**).

### 8.6.2 Vegetated Shingle Communities

There are patches of vegetated shingle along the entire length of the beach on South Hayling Island. There are a number of restrictions and methods of working that have taken place to protect these communities in the past and will continue into the future working as part of this revised BMP. These are set out in **Section 9 'Information for HRA'**. As can be seen in the HRA, at Gunner point there will be additional restrictions to protect the evolution of the Shingle beach, although at a reduced rate from the currently unnaturally high accretion rate which is benefitting from historic beach management works.

### 8.6.3 Marine Conservation Zones

The Marine and Coastal Access Act (2009) created a new type of Marine Protected Area (MPA) called a Marine Conservation Zone (MCZ). MCZs protect a range of nationally important marine wildlife, habitats, geology and geomorphology. On the 21st November 2013, 27 new MCZ's were announced following the culmination of a process closely involving stakeholders. There are no MCZs within the study area. The nearest designated MCZ is Pagham Harbour MCZ, which lies more than 16km

away. The recommended Marine Conservation Zones (rMCZ) that were not included within 27 new MCZs are further than 10km away. There are also Sites of Special Scientific Interest (SSSI) and Ramsar sites that protect marine areas and will be included in the MPA network. These will be assessed under the individual SSSI and Ramsar sites if applicable. Whilst it is important to consider what the key features of the study are, it is not necessary to undertake any kind of assessment relating to impacts on the rMCZs at this time, and therefore the MCZs are not considered any further.

### 8.6.4 Locally Protected Sites

#### Biodiversity and Priority Habitats and Species

Biodiversity Action Plans have been superseded by changing International priorities for habitats and species; these are detailed in the 'Strategic Plan for Biodiversity 2011- 2020.' Five strategic goals have been identified as setting the direction of biodiversity into the future, which are detailed in **Table 8.1** below:

**Table 8.1 Strategic goals identified in the Strategic Plan for Biodiversity up to 2020**

| **Strategic Goal** | |
|---|---|
| A | Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society |
| B | Reduce the direct pressures on biodiversity and promote sustainable use |
| C | Improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity |
| D | Enhance the benefits to all from biodiversity and ecosystem services |
| E | Enhance implementation through participatory planning, knowledge management and capacity building |

The Strategic Plan for Biodiversity 2011- 2020 states that:

*'By 2020, we will see an overall improvement in the status of our wildlife and will have prevented further human-induced extinctions of known threatened species.'*

In England many of our rarest and most threatened species are listed under Section 41 (S41) of the 2006 Natural Environment and Rural Communities (NERC) Act.

**Natural Environment and Rural Communities (NERC) Act 2006**

The Natural Environment and Rural Communities (NERC) Act 2006 extends the biodiversity duty conferred by Section 74 of the Countryside and Rights of Way (CRoW) Act 2000 'to have regard' to the purpose of conserving biological diversity to include all public bodies, including local authorities, local planning authorities and statutory undertakers.

**Section 41 Species**

Section 41 of the Act requires that the Secretary of State publishes a list of species of flora and fauna considered to be of principal importance for the purpose of conserving biodiversity in England. The list is intended to be used to guide decision-makers such as public bodies, including local and regional authorities, in implementing their duty under section 40 of the NERC Act 2006 'to have regard' to the conservation of biodiversity in England, when carrying out their normal functions.

The UK BAP list of 1149 species, published in 2007, was used to draw up a list of 938 priority species, also known as the 'England Biodiversity List', comprising those species found in England which have been identified as requiring action under the UK BAP.

National planning policy 'Planning Policy Statement 9: Biodiversity and Geological Conservation' (PPS9) indicates that local authorities should also take steps to further the conservation of species of principal importance through their planning function and identify opportunities to enhance and add to them. PPS9 also requires that these species are treated as 'material considerations' and as such are protected from the adverse effects of development, where appropriate, by using planning conditions or obligations. Licences may also be needed where species are affected by development. The list of species of principal importance was first published in 2002 by DEFRA under Section 74 of the Countryside and Rights of Way (CRoW) Act 2000, and was identical to the UK BAP list at that time. Protecting and enhancing England's S41 species is key to delivering this outcome.

The mitigation measures that are in place to protect the internationally designated interest features of the SAC, SPA and Ramsar are considered to be adequate to also protect the priority species present in the area of the BMP activities (as set out in **Chapter 9 – Information for HRA**)**.** The main area of potential impact is within the open beach, where the shingle is highly mobile and there are limited opportunities for stable habitats to be formed, the risk of impact to the priority species is considered to be low. Areas behind the active area are more stable but will not be impacted by the works.

## 8.7 Intertidal and Sub tidal Interests

Due to the dynamic nature of the beach and the extreme storm events experienced, the intertidal and sub tidal communities are considered to be naturally impoverished.

Within the intertidal sections, the mobile shingle beach will have very limited ecological interest, as there is very little stability to enable species to colonise. Above the high tide mark stability is improved enabling vegetated shingle communities to develop. The lower beach consists of sand, and it is expected that the sand infauna communities will have greater potential for more diverse communities being present, however this will also still be naturally degraded due to the dynamic sediment in this exposed location.

Tracking of machinery will generally remain on the beach crest and will therefore have very limited impact on the habitats on either side. Tracking on the lower sandy beach will have a larger effect and it is considered that from the Ness to Black Point the habitat potential is the greatest as it is the most stable, even though accretion rates are very high. Tracking will damage infaunal communities in this location. However, it is believed that there will be enough recovery time between operations to recycle sediment from the Hayling Island Sailing Club to Eastoke, with the community able to recover between operations. Therefore the impact will be minimal, especially as the area for tracking is much localised along a large feature.

## 8.8 Marine Mammals

### 8.8.1 Introduction

This section of the Environment Statement considers impacts from the proposed works on marine mammals. There are two groups of marine mammals found in the Solent area, Cetaceans and Pinnipeds.

### 8.8.2 Cetaceans

A number of cetaceans have been reported within the Solent, these include Bottle nosed dolphins *Tursiops truncates*, Harbour porpoise *Phecoena phocoena*, Common Dolphin *Delphinus delphis* and the long finned pilot whale *Globicephala melas*. Very little is known about how these species use the Solent area; however the low level of cetacean observations would indicate activity levels are relatively low, in the Solent and particularly within the inshore areas.

The works will be taking place in the intertidal zone with minimal impacts experienced on a localised and temporary basis. The proposals do not include any operations e.g. percussive pilling, which can emit harmful levels of noise into water

body, which could harm marine mammals and therefore it can be concluded that these works would not have any impact on Cetaceans in the area.

### 8.8.3 Pinnipeds

The word pinniped means fin or flipper-footed and refers to the marine mammals that have front and rear flippers. This group includes seals, sea lions, and walruses. Both Langstone and Chichester Harbours are regularly used by Common/Harbour seals and to a lesser extent Atlantic Grey Seals. A detailed study was carried out as part of the Solent Seal tagging Project (2010). The Solent Seal project is a partnership project, led by the Wildlife Trusts South East Marine Programme in partnership with Chichester Harbour Conservancy, Sea Mammal Research Unit, and Natural England. This study has provided a large amount of data on the movements of seals within the Solent, from which most of the information in this section has been collated.

The main findings from this report concluded that:

- Numbers of harbour seals are currently estimated at 23-25, with 18 being the most recorded at any one time. Being a small population makes them more vulnerable to impacts.
- Only two significant haul-out sites exist, one in Langstone Harbour and one in Chichester Harbour.
- Both haul-out sites are used on a more or less daily basis but Chichester Harbour is used by larger numbers of seals.
- The seals display individual foraging behaviour and individuals are faithful to their preferred foraging sites.
- The seals predominately forage in the Eastern Solent, between Southampton and Selsey Bill, often in the harbours, and regularly cross to the Isle of Wight.

### 8.8.4 Haul Out sites

Seals come ashore to rest, mate, give birth and moult, a process known as hauling out. Harbour and grey seals typically have differing habitat preferences for hauling out. Grey seals tend to favour remote and exposed islands and coastlines, often on rocky shores. In contrast, harbour seals often occupy sheltered sandy and muddy bays, estuaries, harbours and offshore banks. However, the two species do overlap in some areas and harbour seals can be found in rocky areas and grey seals can be found in sandy and muddy areas. Seals are generally faithful to their haul-out sites and will return to the same one after foraging trips, however, grey seals may travel to

new haul out sites and forage from there.

Both species of seal are not thought to routinely haul out on exposed frontages such as the south coast of Hayling Island. Any impact of the works on haul out sites of both species of seal can be ruled out.

### 8.8.5 Feeding Behaviour

Seals are adaptive, opportunistic feeders and are able to hunt in very varied habitats. As their prey suggests they are able to hunt in mid-water or on the sea bed and in murky conditions are able to use their long and sensitive whiskers to help locate prey. Although seals do use the area along the south coast of Hayling Island, the impact of the works is not considered to be significant due the short duration of the works and the adaptability of the seals to feed in various locations.

**Figure 8.3** (at the end of this chapter), extracted from the Wildlife Trust Report (Chesworth, 2010) indicates where seals have been tracked to show the spatial intensity of dives where the number of dives are aggregated into 100 x100m grid squares.

### 8.8.6 Conclusions for Marine Mammals:

The works are not considered to impact on marine mammals. The works will be taking place on the intertidal with minimal impacts experienced on a localised temporary basis. The works are considered to have no likely significant effect on marine mammals and therefore the assessment will go no further.

## 8.9 Ornithology

The bird usage of the area is important, as highlighted by the SPA, and Ramsar designations on the extremities of the area of interest.

Black Point, within Chichester Harbour is an extremely important high tide roost site with, on occasions, several thousands of birds using it. When the mudflats are covered by the tide this area remains uncovered and therefore creates a favourable high tide roost site.

An annual Bird Report is produced by Andy Johnson (local ornithologist) for the Sandy Point area. It includes bird counts for the Black Point High Tide Roost Site. **Table 8.2** below shows the monthly maximum of different bird species at Black point, at High tide for 2016.

**Table 8.2** Shows the monthly maximum at Black point at High tide for 2016.

| | Jan | Feb | Mar | Apr | May | Jun | July | Aug | Sept | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oystercatcher | 130 | 100 | 36 | 15 | 11 | 3 | 2 | 23 | 98 | 114 | 138 | 149 |
| Ringed Plover | 140 | 107 | 22 | 30 | 8 | - | 9 | 100 | 164 | 76 | 42 | 96 |
| Grey Plover | 55 | 54 | 51 | - | - | - | - | 14 | 35 | 38 | 49 | 54 |
| Knot | 270 | 1000 | 60 | - | - | - | - | - | 1 | 1 | 400 | 120 |
| Sanderling | 100 | 141 | 120 | 470 | 27 | - | - | 60 | 1 | 30 | 90 | 120 |
| Dunlin | 8000 | 4000 | 2000 | 22 | - | - | 24 | 20 | 90 | 800 | 5000 | 15000 |
| Bar Tailed Godwits | 6 | 7 | - | - | - | - | - | 1 | - | - | 1 | 3 |
| Curlew | 1 | 1 | 1 | 1 | - | 1 | 1 | 2 | 1 | 1 | 2 | 2 |
| Redshank | 3 | 2 | 3 | - | 1 | - | - | 1 | - | - | 3 | 5 |
| Turnstone | 40 | 21 | 12 | 5 | 3 | 5 | 13 | 21 | 2 | 15 | 43 | 13 |

Although the bird usage in the winter months is at a maximum, birds are using the site throughout the year. In consultation with two local bird experts (Andy Johnson, a local ornithological expert and Pete Potts Senior Ranger at Hampshire County Council), both suggested that a blanket seasonal restriction to avoid the over-wintering period may not be appropriate, but that restricting work during the sensitive tidal period may be more appropriate.

The other important area is thought to be Gunner point. There is very little robust evidence for this site as WeBS (Wetland Bird Survey) does not survey this area and the Solent Waders and Brent Goose Strategy only surveys the area inland of the beach on areas with historic use or potential use by Brent Geese, however the anecdotal evidence from the local experts suggested that birds use the site as a high tide roost site especially in severe weather conditions. Although there is very little evidence for this, the ESCP have taken an extremely precautionary approach in order to protect the birds at Gunner Point. Due to the strong evidence at Black Point it was considered appropriate to restrict usage in both locations, whilst allowing greater access on the open coast where bird usage is much lower.

The following section details the evidence that has been collated relating to relevant bird species, in order to present a proposed solution to protect the birds whilst they are using the site. The ESCP will be continuing with a series of bird surveys at the site to increase our understanding of bird usage in the area. The results will feed into the Management and Monitoring report set out in the BMP (**Appendix A**), and help refine our ongoing operations.

### 8.9.1 Ringed Plover

Ringed Plovers do breed in the Solent and may in some areas act as a resident population; however the majority are winter visitors or passage migrants. Passage migrants and winter visitors start to arrive in this area from July onwards and large numbers are thought to leave this area in early winter. The resident population breed in the UK. These birds start to set up territories in late March /April. They will start to lay eggs from April onwards until July. Ringed Plovers nest directly on the shingle and are very well camouflaged which makes them very vulnerable to trampling and disturbance. Should the first nesting get destroyed / disturbed, they will often attempt to re-nest.

Ringed Plover are known to regularly use the southern area of Hayling Island, in particular both extremities at the mouth of the harbours (Gunner Point and the Ness to Black Point). These two areas are considered to be one of the remaining strong holds used by nesting Ringed Plover within the Solent. In the past, Ringed Plover have successfully bred or have tried to breed in both locations. Once Ringed Plover have breeding success in an area they will return to that area to breed year after year. Having good nesting habitat adjacent to good feeding areas is very important, as is minimum human disturbance, ideally by creating areas where there is no access. Disturbance in both locations at Gunner Point and at the Ness is a major factor affecting Ringed Plover breeding success. Due to the level of both disturbance and direct loss of nest through trampling and dog predation breeding success has been very limited or non-existent in recent years.

The BTO website states that ‘Ringed Plovers that choose beaches for nesting are especially vulnerable to human disturbance on beaches, which severely affects the suitability of this habitat to nesting plovers. The marked increase in nest failures at the egg stage has earned Ringed Plover a place on the Nest Record Scheme (NRS) concern list.

Wintering numbers of Ringed Plover have been in decline since the late 1980s. A significant roost of over-wintering birds can occur on the beach frontage at Eastoke; this behaviour typically commences in July, peaks in September and October and is often not observed later in the winter. Ornithological watching briefs have been undertaken during previous beach management campaigns and no significant disturbance has been recorded from the activity, due to its localised nature.

#### 8.9.1.1 Conclusions for Ringed Plover

Ringed Plover’s main use of the of the site in BMP Units 1, 6, 7 and 8 are;

- a high Tide roost site and
- a breeding site.

In order to prevent disturbance to roosting or nesting ringed plover, specific mitigation has been promoted. This is set out in **Table 5.1 of the Information for HRA in Chapter 9**.

### 8.9.2 Sanderling

Sanderlings are known to use the Estuary mouth of Chichester and Langstone Harbour but also regularly use the open coast for both feeding and roosting. They are considered to be a common (although declining) winter visitor and a migrant, in particular the area from Eastoke Corner to Eastoke Point, BMP Unit 3. Local bird experts have observed Sanderling feeding and roosting in areas where machinery is undertaking beach management activities. It was discussed and concluded that Sanderling do not seem to be adversely affected by machinery operating on the beach. The ESCP has under taken additional bird surveys during recent works on the beach and this data supports the anecdotal conclusion that birds habituate to the machinery. Baseline surveys and a watching brief were undertaken for the October/November 2015 beach replenishment operation 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). 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. The surveys will continue and will feed into the monitoring plan to help refine the ongoing BMP works.

The following table shows the data from the Sandy Point, Hayling Island 2016 Bird Report by Andy Johnson (Hampshire Ornithological Society - HOS) – see the relevant numbers (**Table 8.3**) for Sanderling – monthly maxima.

**Table 8.3 Sanderling – monthly maxima**

| Sanderling | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| for Black Point high tide roost maxima | 100 | 141 | 120 | 470 | 27 | - | - | 60 | 1 | 30 | 90 | 120 |
| Maxima at Sandy Point or along the seafront | _ | - | 45 | 111 | 80 | 4 | 300 | 200 | 159 | 270 | 175 | - |

The lack of numbers doesn't necessarily indicate their absence, but may be a result of the way the data is presented. The key period is late July to October when it would be very unlikely that any work would take place at this time of year. However expert opinion has suggested that Sanderling are not significantly affected by machinery operating or moving along the beach. Additional evidence over future years will help further understanding on this issue

Studies have shown that human disturbance can shift Sanderlings' activity budgets away from resting behaviour. The area that Sanderling seems to prefer is also an open access beach which is heavily used throughout the year for beach goers and dog walkers, and frequent recreational disturbance events have been recorded during watching brief surveys. The works will restrict dog walkers for the duration of the works to some extent, which will help reduce any cumulative effect; however it is not possible to completely close the beach.

#### 8.9.2.1 Conclusions for Sanderling

Both bird experts have recommended that there was no need for restrictions on the beach management works in relation to Sanderling over and above those set out for other bird species and set out in **Table 5.1 of the Information for HRA in Chapter 9**.

### 8.9.3 Terns

#### 8.9.3.1 General Notes on the use of South Hayling Island by Terns

Chichester and Langstone Harbour SPA is notified for three species of breeding tern; Little, Common and Sandwich. Sandwich Tern also over-winters in small numbers in the Solent.

Terns do not breed on the South of Hayling Island beaches; instead they have breeding colonies within the Langstone and Chichester Harbours. However Black Point is a particularly important pre and post breeding high tide roosting area for all three species of tern. Terns will use the open coast for foraging; however this behaviour is more common outside of the nesting period when foraging is focussed in closer proximity to nesting colonies.

Data from Sandy Point, Hayling Island 2016 Bird Report A. C Johnson – see the relevant numbers (**Table 8.4**) for Terns for Black Point high tide roost monthly maxima.

**Table 8.4 Terns monthly maxima**

| *Terns* | *Jan* | *Feb* | *Mar* | *Apr* | *May* | *Jun* | *Jul* | *Aug* | *Sep* | *Oct* | *Nov* | *Dec* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Little Tern*** - *Sternula albifrons* | *-* | *-* | *-* | *12* | *28* | *?* | *50* | *32* | *-* | *-* | *-* | *-* |
| ***Sandwich Tern*** *S. sandvicensis* | *6* | *6* | *5* | *80* | *100* | *?* | *25* | *15* | *23* | *10* | *9* | *6* |
| ***Common Tern*** *S. hirundo* | | | | *2448* | | | *480* | | | | | |

### 8.9.3.2 Conclusions for Terns

It was concluded that as the Terns use the Black Point site as a high tide roost primarily in the summer months restricting the use of machinery at Black Point over the high tide period forms an appropriate mechanism to protect terns. This is set out in **Table 5.1 of the Information for HRA in Chapter 9**.

## 8.10 General Bird usage

There are a number of birds which are known to use the area of Gunner Point and also the Ness to Black Point. In the winter, during storm conditions, this area is used by Oystercatchers, Grey Plover, Turnstones and Dunlin. At high spring tides, birds may leave Langstone Harbour and roost at Gunner Point and Black Point, returning to the Harbours to feed at low tide. This is why the restrictions over high tide have been proposed within the **HRA (Section 9)**. It is considered that the bird usage within this area is much more sensitive to the state of the tide rather than the time of year.

The high tide period is the critical time where bird species use these areas. It is therefore proposed that to protect all bird species, the seasonal over-winter restriction condition will be removed and replaced with a condition to restrict works from 1.5 hours before to 1 hour after high tide within the environmentally sensitive areas at the appropriate time of year (BMP Unit 1, 6, 7 and 8). These restrictions are set out within **Table 5.1 – Information for HRA (Chapter 9)**.

The removal of sediment at the sailing club will only reduce beach levels locally and will not stop the supply of sediment to the high tide roost site at Black Point (as set out within **Section 7**).

The scope and scale of the works needs to be placed in the context of the general disturbance caused by beach goers and dog walkers. The works only last for 3-4 weeks, normally once but possibly twice a year. The work generally takes place within localised areas of the beach at any one time, which will limit disturbance. Birds

may be temporarily displaced but this is not considered to be significant, as there will be other areas of the beach that are un-impacted at any one time. From the information from the local bird experts, it is also apparent that beach management activity has little effect on roosting and feeding bird populations.

A detailed analysis of the potential impacts on internationally protected species has been undertaken in the information to inform a Habitats Account assessment, **Section 9.**

The ESCP will be undertaking continued bird surveys at the site to increase our understanding of bird usage in the area, as set out in the BMP and HRA (**Appendix A and Section 9 respectively**).

## 8.11 Terrestrial Ecology

There are a number of areas where there is the potential for reptiles in the hinterland behind the beach, in particular Sandy Point and Sinah Common. In order to protect these areas and prevent any disturbance, particular attention will be made when setting out the haul route in any one year, to avoid these areas completely. If there is any risk that the route would impact on any potential habitat, then additional surveys would be undertaken in line with the good practice requirements; ESCP would carry out six survey visits between the end of March and October and avoiding the mid summer. Then if necessary, we would undertake appropriate mitigation or Reasonable Avoidance Measures to avoid harm to protected reptiles. The first principle will always be to take all measures to avoid any potential habitat.

## 8.12 Updating the baseline data with scheme specific information

The ESCP will be continuing with a series of ecological surveys at the site to increase our understanding of bird populations in the area. The results will feed into the Management and Monitoring report (which will remain a live tool, see the BMP itself and the HRA (**Appendix A and Section 9 respectively**).

A protected species and priority habitat risk assessment walkover was undertaken in July 2016, the purpose of the survey was to identify any risk areas for protected species and undertake species level mapping of vegetated shingle communities. During the survey the species composition and quality of discrete compartments of vegetated shingle were recorded. In addition the site was assessed for the presence of suitable habitat and field signs for a range of protected species (including reptiles, amphibians, breeding birds, over-wintering birds, hazel dormouse and badger). This confirmed already identified issues including ground nesting birds that use shingle

habitats and over-wintering SPA bird for which avoidance strategies have been developed and already addressed within this document. In addition possible nesting habitat for scrub nesting bird species and potential habitat for common reptile species was identified. These areas were mapped and will form part of constraint maps used for future operation to avoid harm to these potential receptors. These maps are included within the **HRA (See Chapter 9)**.

## 8.13 Conclusions

A range of potential impacts on Nature Conservation have been identified in relation to the Beach Management plan. These will all be minimised by restrictions to the working practices which have been developed as part of this ES. For example, protecting the high tide roost sites and the nesting sites of Ringed Plover and the vegetated shingle communities. There will still be some small scale residual impacts but these are considered to be minimal. The overall scheme represents a good balance of adequate coastal protection, with appropriate protection of habitats and allowing natural processes to continue. The final mitigation and monitoring plan is detailed in **Chapter 9 (information for HRA)**, which summarises all the potential impacts of the scheme on important habitats and species, proposing mitigation to prevent these, and ongoing monitoring to check their effectiveness. **Figure 8.12** below illustrates the environmental restrictions that are discussed within this chapter and **Chapter 9 (Information for HRA).**

**Figure 8.1 European and International environmental designations**

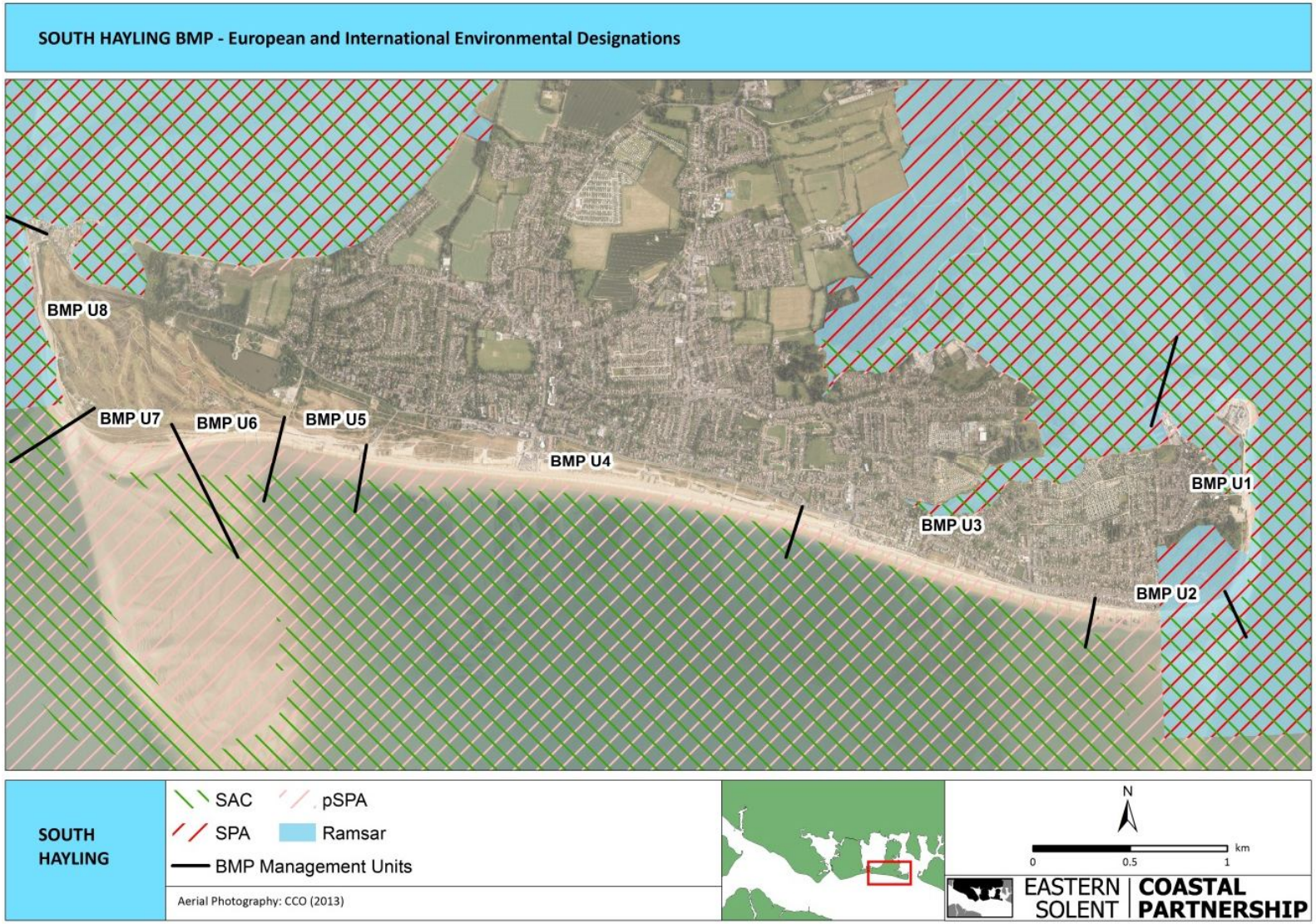


**Figure 8.2 Local and national environmental designations**

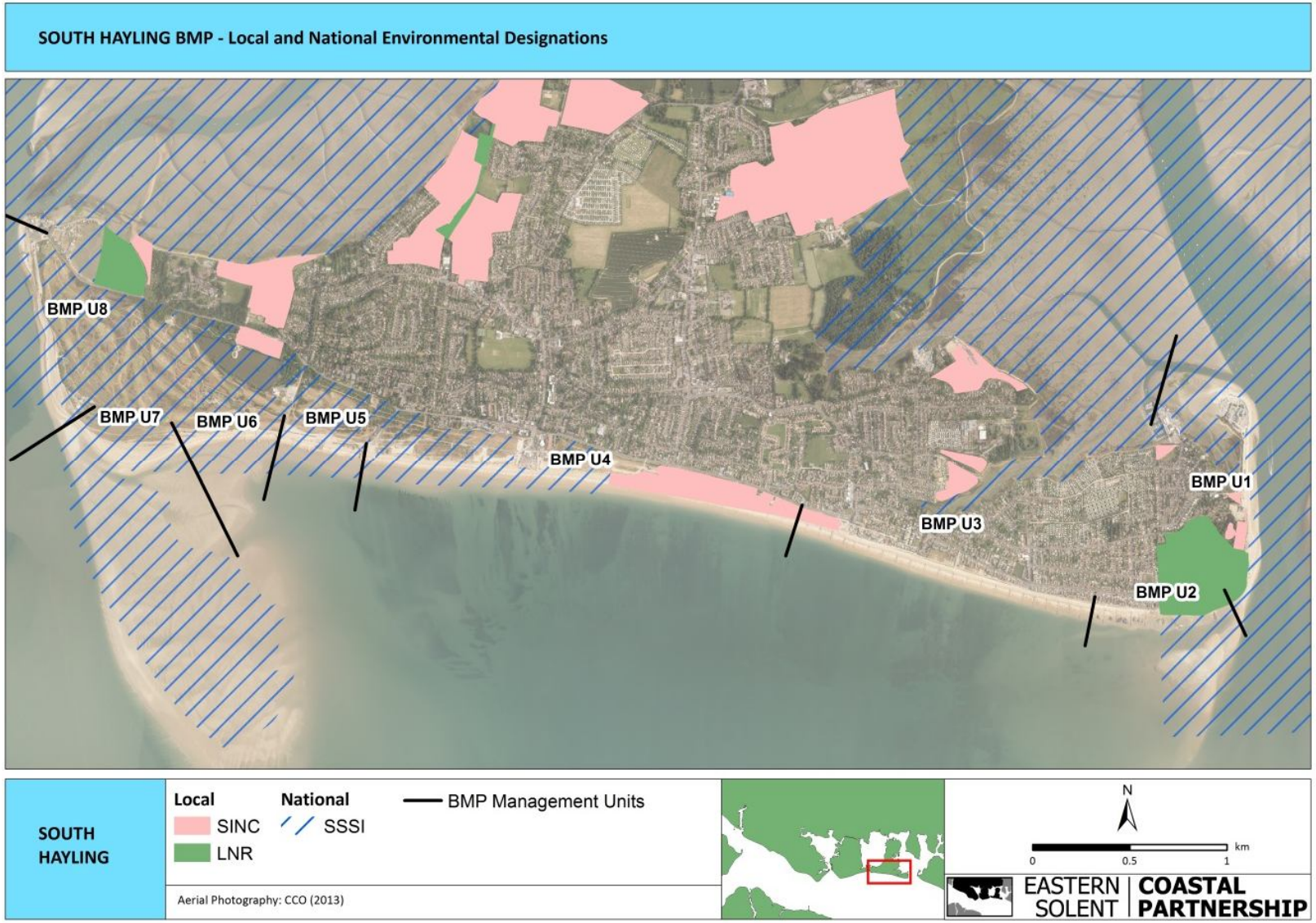


**Figure 8.3 – Seal tracks, showing the number of dives © British Crown and Sea Zone Solutions Limited. All rights reserved. Products Licence 032009.008.**

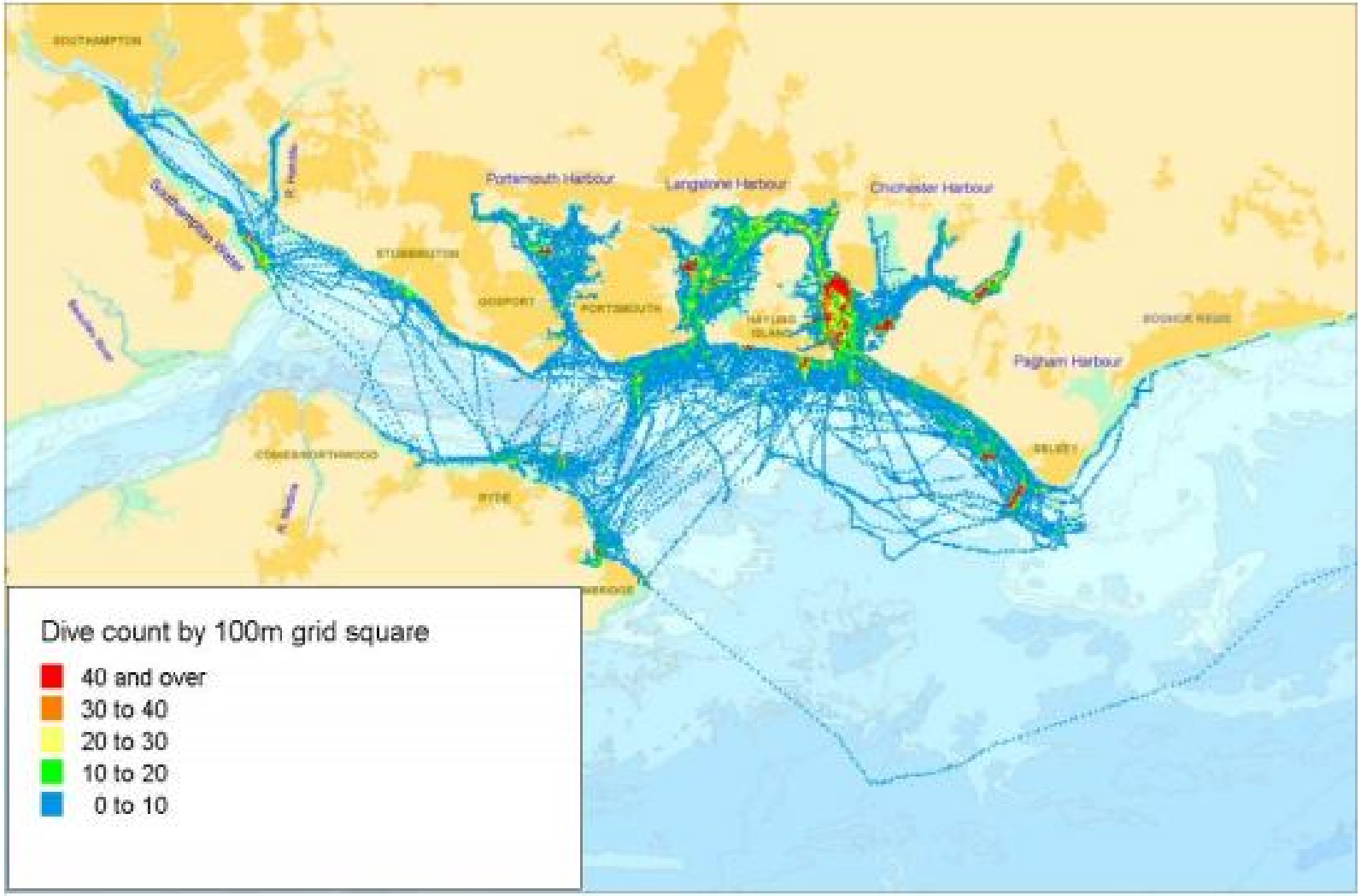


**Figure 8.4 BMP U 1 National and Local Designations present**



**Figure 8.5 BMP U 2 National and Local Designations present**

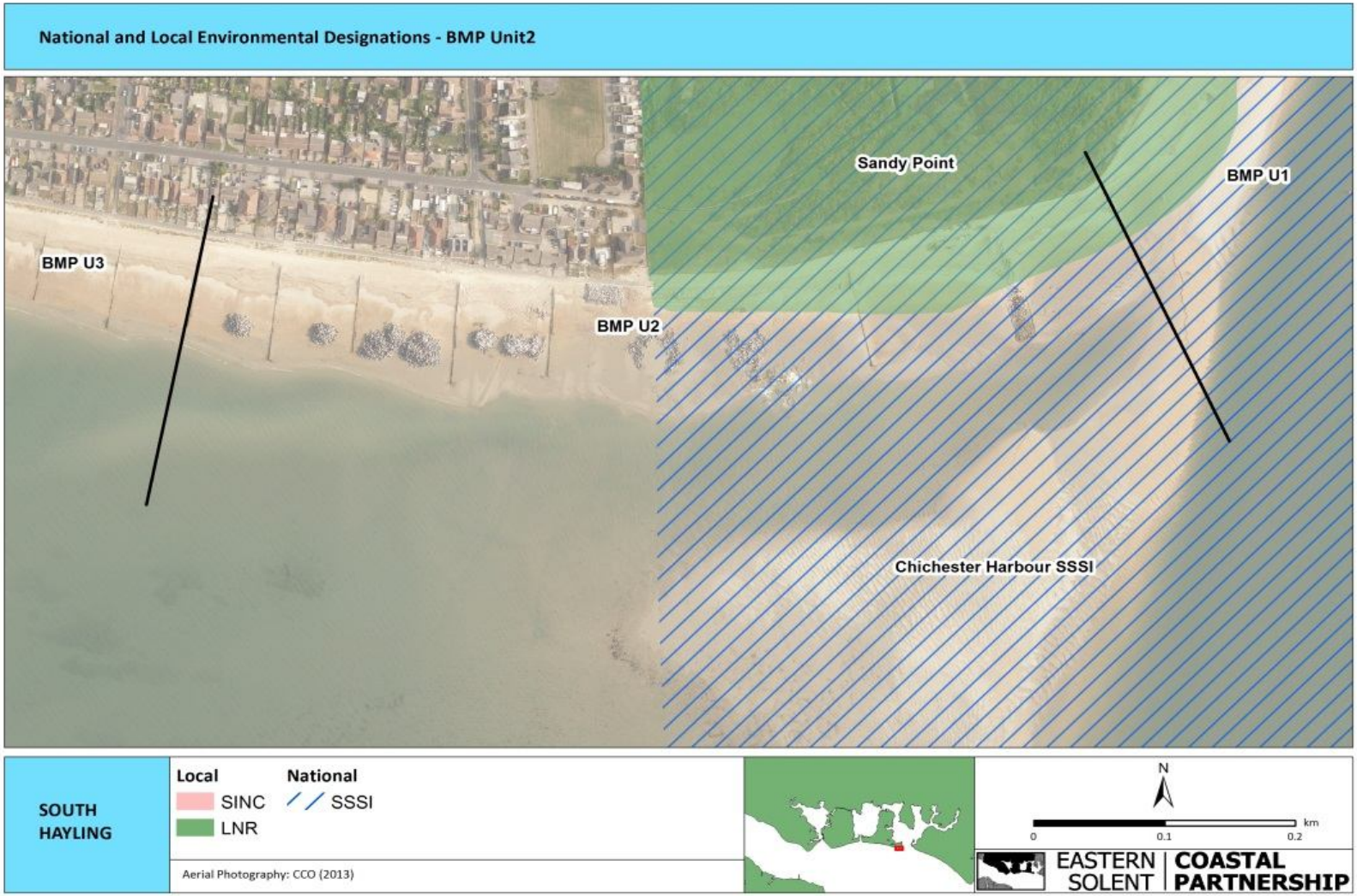


**Figure 8.6 BMP U3 National and Local Designations present**

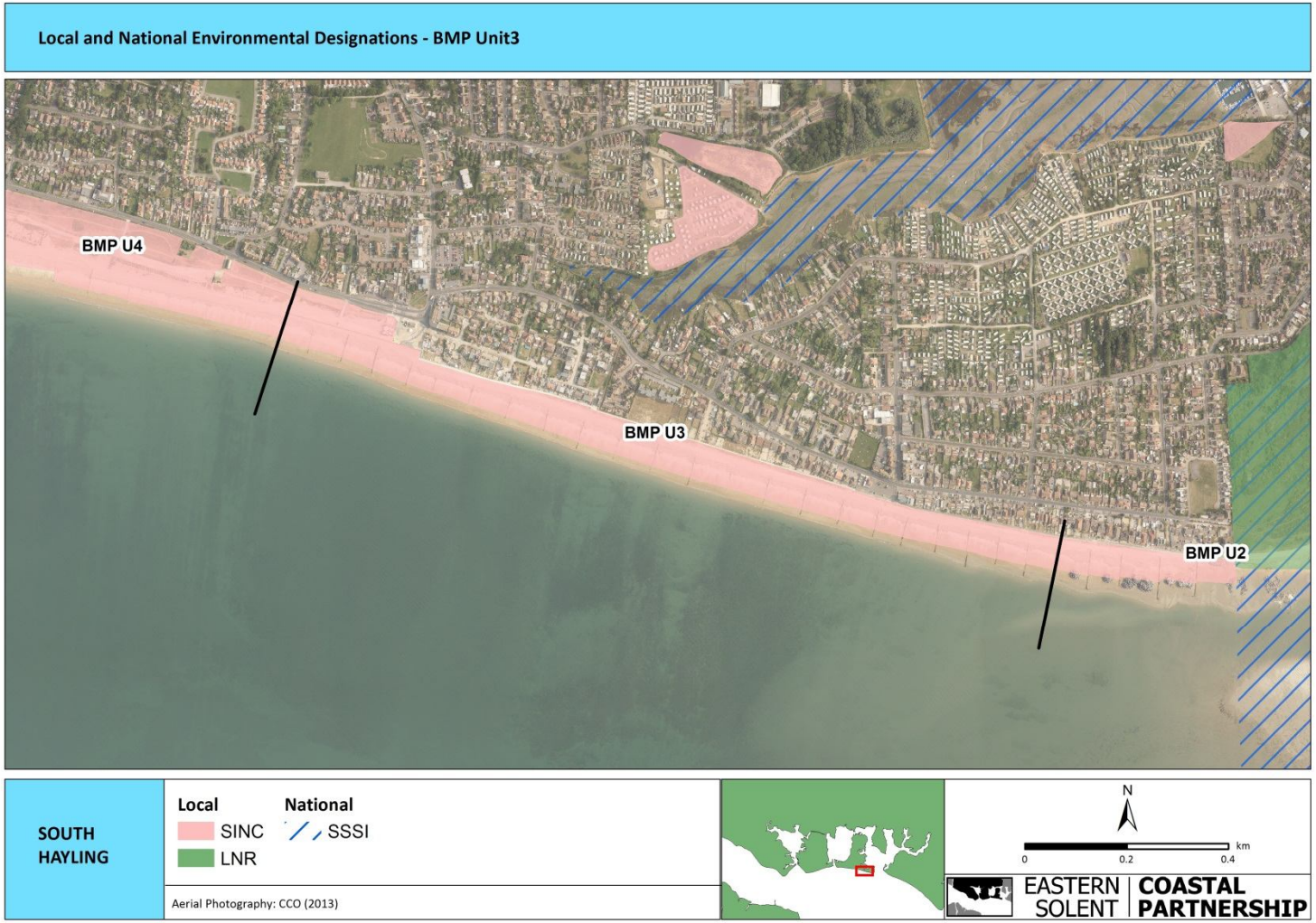


**Figure 8.7 BMP U 4  National  and Local Designations present**

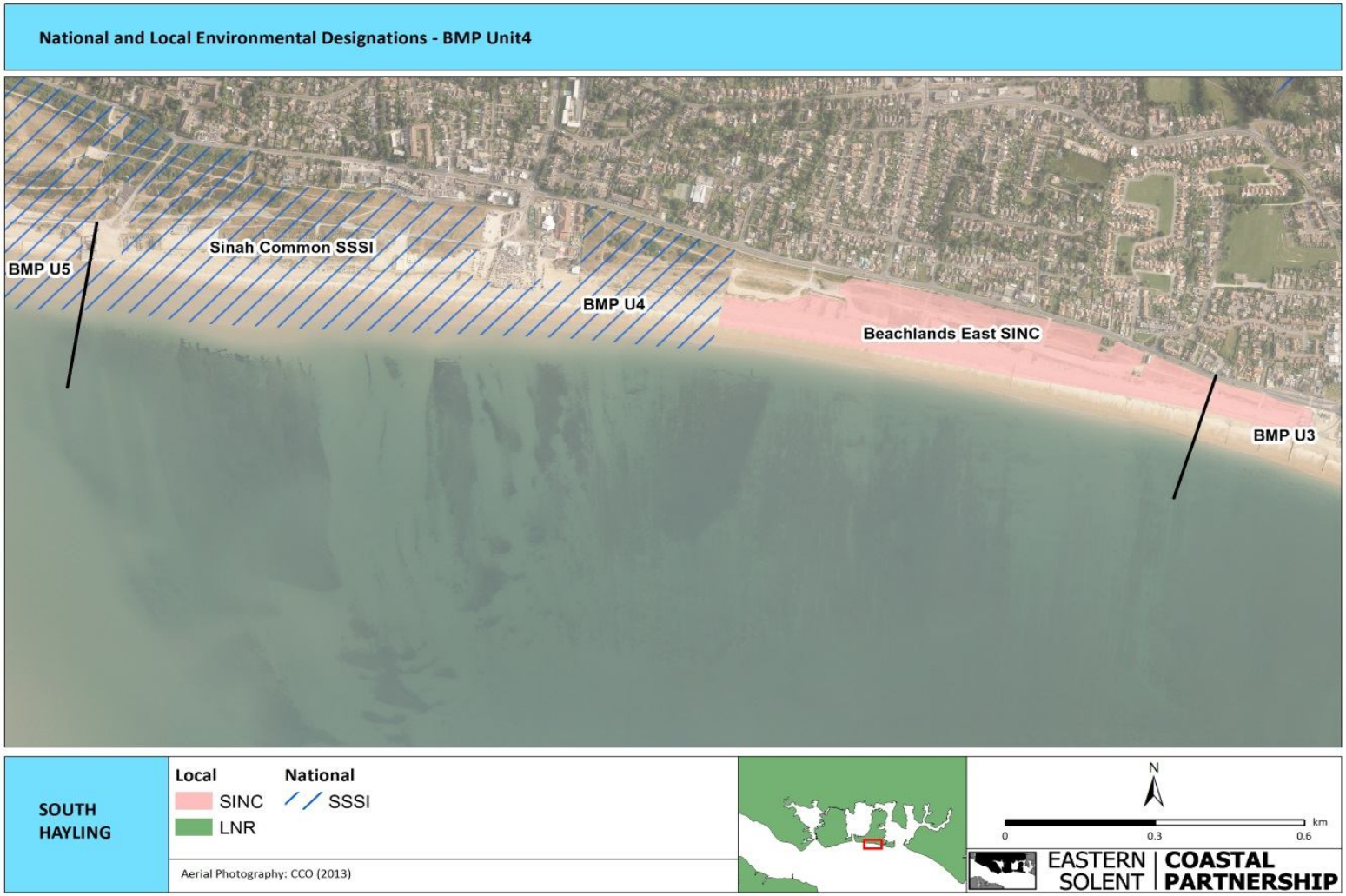


**Figure 8.8 BMP U 5 National and Local Designations present**

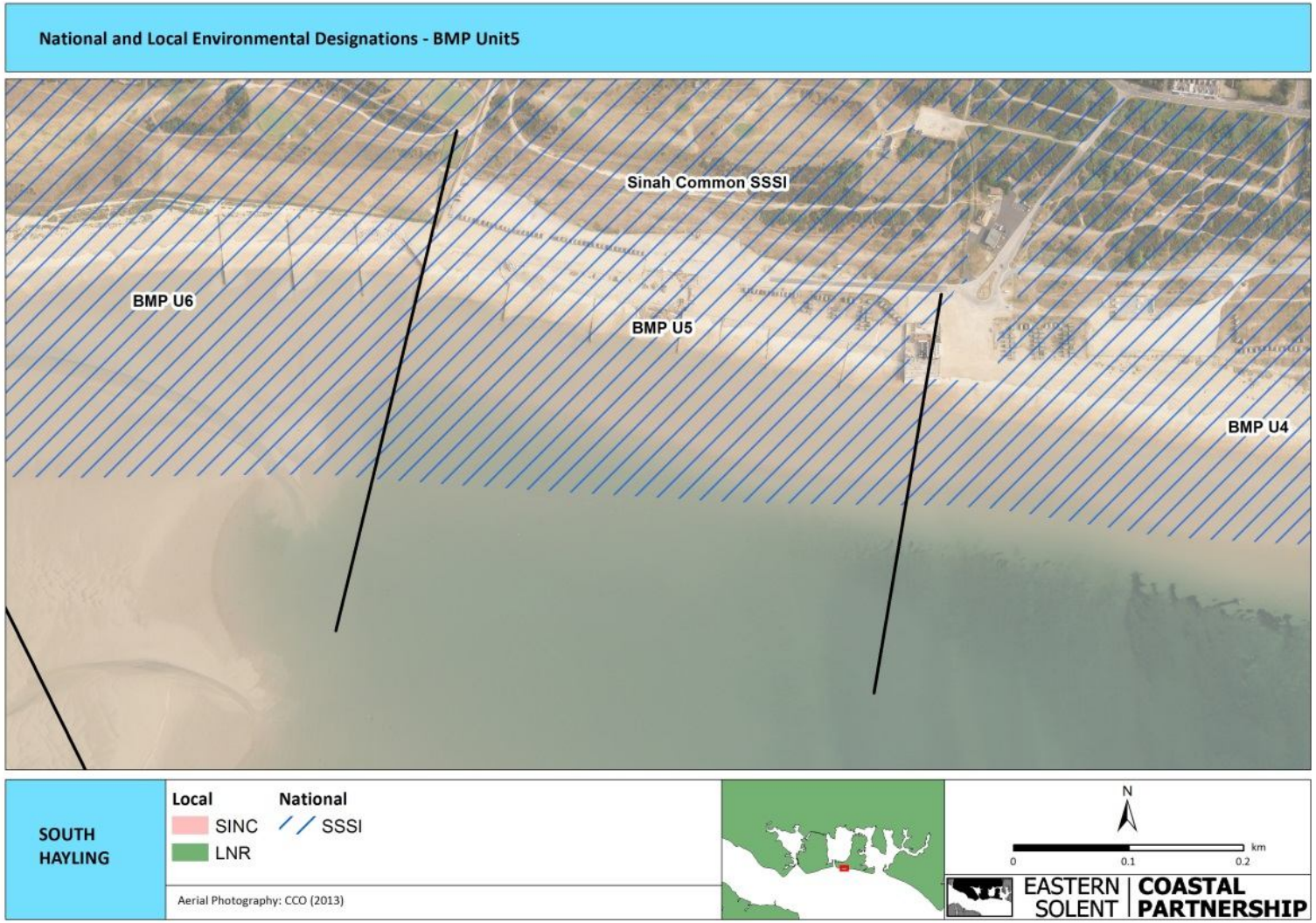


**Figure 8.9 BMP U 6 National and Local Designations present**

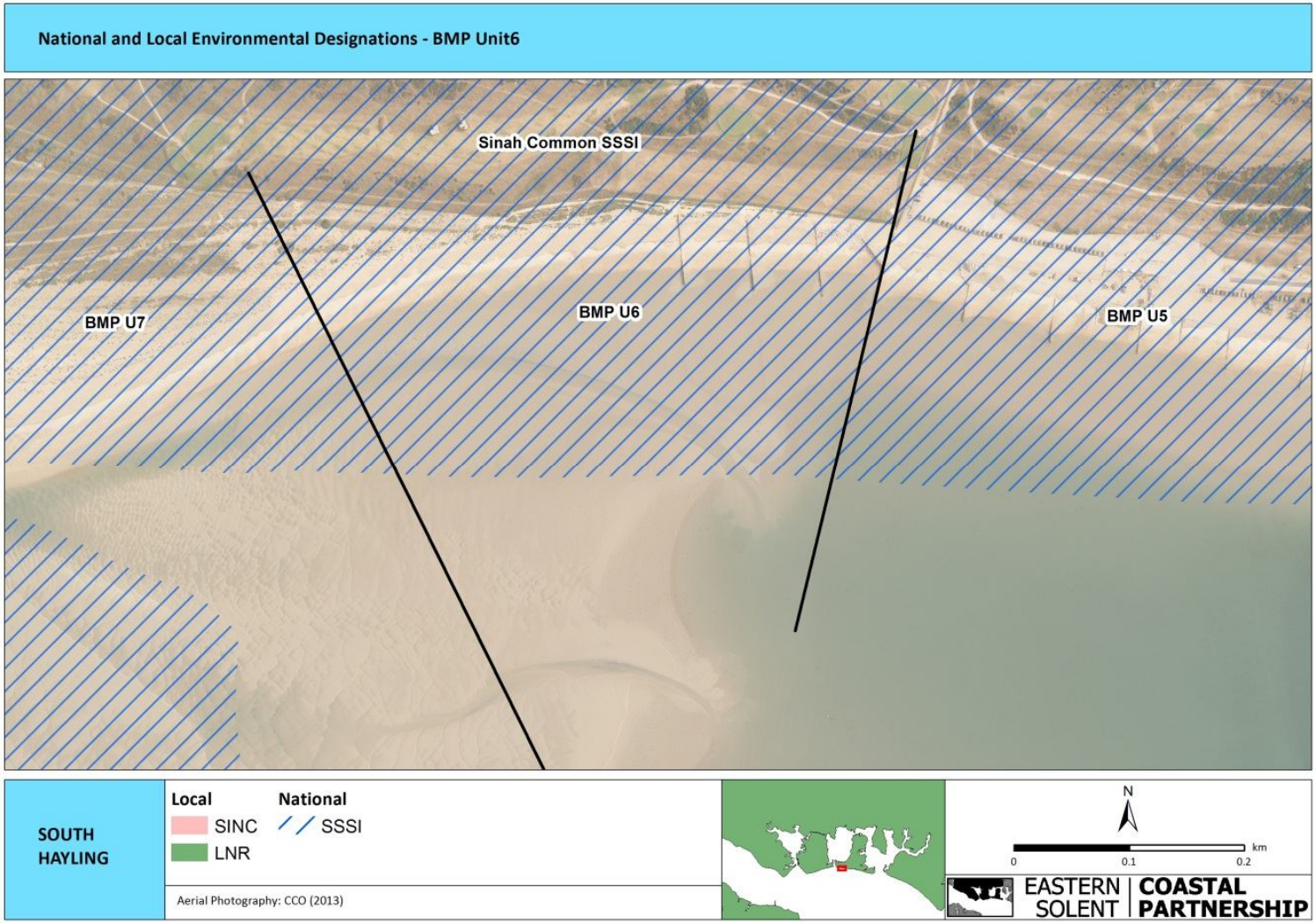


**Figure 8.10 BMP U 7 National and Local Designations present**

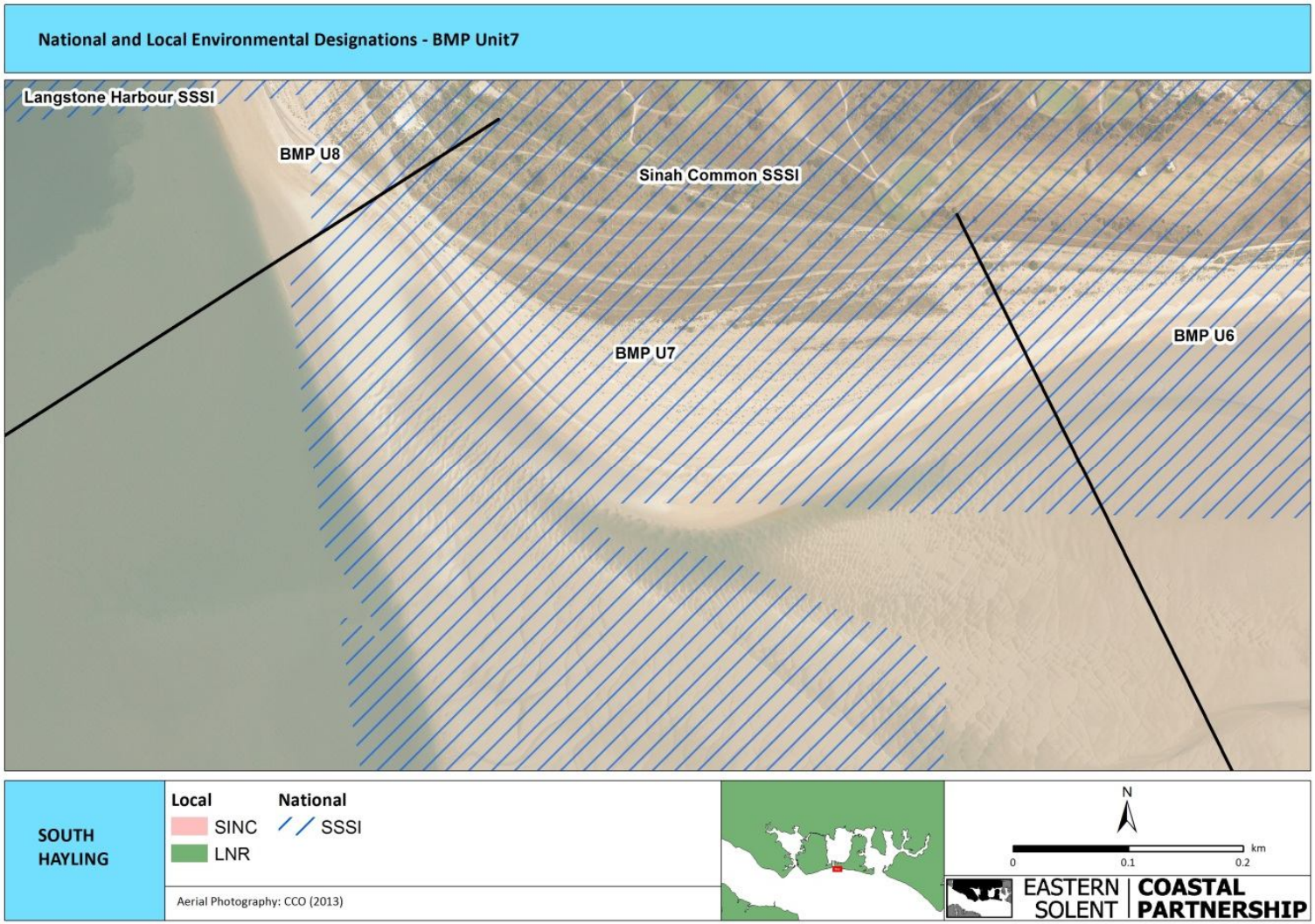
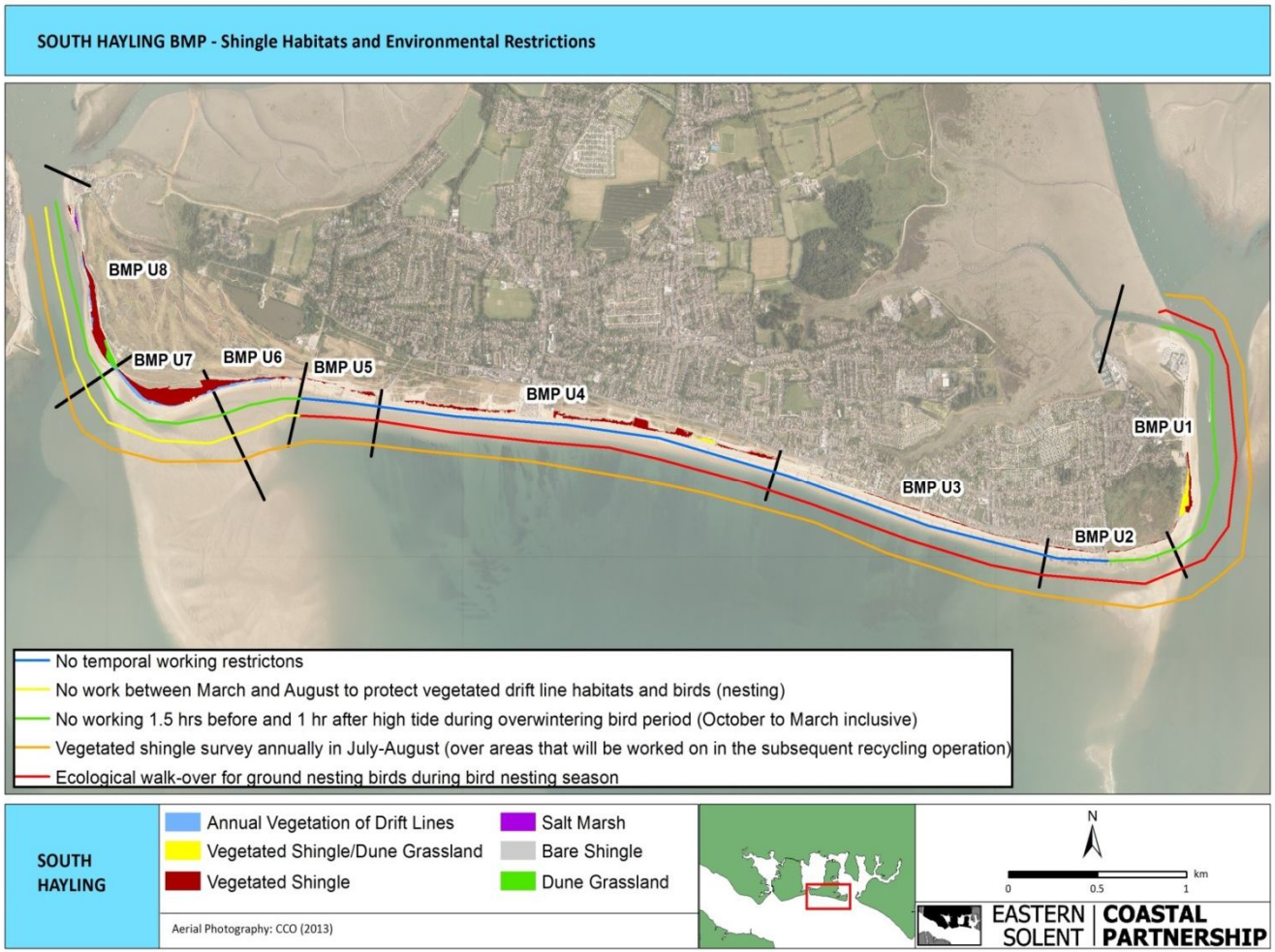


**Figure 8.11 BMP U 8 National and Local Designations present**



## Figure 8.12 Environmental restrictions



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# 9. INFORMATION FOR HRA

**Section 8** summarised the International and European designations that could be impacted by the proposed beach management activities. A HRA has been developed for the works to demonstrate that in combination and alone, the works will not result in a Likely Significant Effect on the European sites and interest features, and are deliverable and compliant with the Habitats and Birds Directives. The HRA has been produced as a stand alone document and is included as **Appendix C**; therefore information within the HRA will not be repeated in this section. The mitigation measures presented within the HRA conclude that there will be no Likely Significant Effect on the environment.

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# 10. FISH AND SHELLFISH ECOLOGY

## 10.1 Introduction

This section of the Environmental Statement considers the impact of the proposed scheme on fish and shellfish within the vicinity of South Hayling Island. The impacts on the commercial fisheries within the study are detailed in **Section 19.**

All information on the fish and shellfish in the study area has been collated from the Southern and the Sussex Inshore Fisheries and Conservation Authority (IFCA), the Marine Management Organisation (MMO) and Centre for Environment and Fisheries and Aquaculture Science (CEFAS). Reference has also been made to various online data sources on particular species.

## 10.2 Baseline Conditions

The Solent is an important area for both spawning and nursery grounds for a number of species. It is classified as an important sea fishery for commercial and non-commercial fish species.

### 10.2.1 Species of interest in Chichester and Langstone Harbours

#### 10.2.1.1 Clams

The Solent Clam fishery takes place throughout the Solent in the harbours, typically focused on the intertidal areas.

#### 10.2.1.2 American hard shelled clams *(Mercenaria mercenaria*) –

These are dredged from within Langstone Harbour.

#### 10.2.1.3 Oyster – Native Oyster (*Ostrea edulis*)

The Solent oyster fishery used to be one of the largest native oyster fisheries in Europe but it has recently been in decline. For the past two years Southern IFCA has

used its temporary closure of shellfish beds byelaw to reduce the season due to the low stock levels. In the 2013/14 season the wider Solent was closed and oyster fishing restricted to 4 weeks in Portsmouth and Langstone Harbours, in the 2014/15 season it was reduced again to 2 weeks in Portsmouth and Langstone Harbours. The Southern IFCA is working with the Blue Marine Foundation on the potential restoration of the native oyster stock levels throughout the Solent.

Chichester Harbour falls mostly under the Sussex IFCAs district and as such they lead on the management of the harbour and manage fishing activity through different mechanisms to the Southern IFCA. In February 2010 a unique partnership between Sussex IFCA, Chichester Harbour Conservancy, Natural England and the local fishermen, named the Chichester Harbour Oyster Partnership Initiative (CHOPI), was established to tackle the issue of Oyster (*Ostrea edulis)* population decline. There was evidence to suggest recruitment failure and it is believed that low density was restricting fertilisation success. A lack of common agreement amongst the stakeholders also existed. The initiative was to create pockets of brood-stock by relaying adult oysters at high density in a number of areas to boost fertilisation success and kick-start wider repopulation (these areas being voluntarily closed to fishing). In November 2010 the local fishermen participated in catching 2.3 tonnes of brood-stock and relaying over approximately 30$m^2$. During spring/summer 2011, monitoring by Southampton University indicated successful reproduction was occurring. The final alliance is with the Local Council Environmental Health teams who are enabling CHOPI to gather information on fishing effort and population size structure during their classification monitoring regime, long-term this will monitor the success of the initiative.

#### 10.2.1.4 Bass

The inshore waters of the Solent are important spawning grounds for bass (*Dicentrarchus labrax)*. It is thought to be one of the most important bass nursery areas in the English Channel. In order to protect the Bass population, both Chichester and Langstone Harbours have been designated bass nursery areas under the Bass (Specified Areas) (Prohibition of Fishing) (Variation) Order 1999 which prohibits fishing for bass, or fishing for any fish using sand-eels as bait, by any fishing boat within any defined Bass nursery area, between 30th April and 1st November. Both Chichester and Langstone Harbours are defined as bass nursery areas under the order.

Cefas has been undertaking bass surveys twice a year in May and September since 1983. The primary aim of the survey is to monitor the abundance of young bass. Information on other fish caught is also recorded which have provided useful

information on the populations of a variety of species in the study area. Since 1983 a total 86 species have been found at the 35 core stations throughout the Solent including Chichester and Langstone Harbour. During the 2015 Bass Survey, 34 species of fish were recorded. A total of 893 bass were caught; 761 within the harbours and 219 outside. The overall recent trend of the Bass survey is for a large reduction in year class strength from 2008 to 2012 followed by an improvement in the 2013 year-class to around the average since 1983 (Brown, 2015). **Table 10.2.1** illustrates the percentage abundance of species found over the last 5 years (2009 – 2015), which shows that bass are the most abundant followed by sprat then sand smelt, where a total of 53 species were recorded. **Figure 10.2.1 at the end of this chapter** illustrates the Fish Survey location of each trawl that forms the Solent Bass Survey.

Both Southern and Sussex IFCA impose byelaws prohibiting the use of towed fishing gear, digging, collection and hand gathering of marine fisheries resources in specified areas of the Solent to protect Sea grass (*Zostera spp.*) and therefore prevent damage or deterioration to the Solent European Marine Site.

Other species considered that use the area for spawning and nursery grounds include, Plaice, Sole, Cod, Thornback Ray, Undulate Ray, Sand Eels and Tope Shark. (Ellis *et al.,* 2012 CEFAS published Technical Report no. 147). See **Figures 10.2.2 and 10.2.3 at the end of this chapter** that illustrates these areas.

Other species found within the Solent region include Whelks, Scallops and Lobsters.

**Table 10.2.1 - Species composition from 2009 to 2015 Solent Bass Survey. Percentage of total numbers of fish caught** (Brown, 2015)

| Common Name | Scientific Name | Length Range (mm) | Number recorded over 5 years | Percentage of total numbers of fish caught |
|---|---|---|---|---|
| EUROPEAN SEABASS | DICENTRARCHUS LABRAX | 30-510 | 9716 | 55.46 |
| SPRAT | SPRATTUS SPRATTUS | 40-110 | 3140 | 17.92 |
| SAND-SMELTS | ATHERINIDAE | 30-150 | 1179 | 6.73 |
| WHITING | MERLANGIUS MERLANGUS | 60-330 | 1166 | 6.66 |
| HERRING | CLUPEA HARENGUS | 40-290 | 769 | 4.39 |
| BLACK SEABREAM | SPONDYLIOSOMA CANTHARUS | 10-320 | 386 | 2.20 |
| WHITING-POUT (BIB) | TRISOPTERUS LUSCUS | 10-220 | 358 | 2.04 |

| Common Name | Scientific Name | Length Range (mm) | Number recorded over 5 years | Percentage of total numbers of fish caught |
|---|---|---|---|---|
| POLLACK | POLLACHIUS POLLACHIUS | 30-230 | 103 | 0.59 |
| CORKWING WRASSE | SYMPHODUS (CRENILABRUS) MELOPS | 20-480 | 87 | 0.50 |
| STARRY SMOOTH HOUND | MUSTELUS ASTERIAS | 270 -1140 | 80 | 0.46 |
| SAND GOBY | POMATOSCHISTUS MINUTUS | 30-60 | 61 | 0.35 |
| BAILLONS WRASSE | SYMPHODUS (CRENILABRUS) BALLONI | 30-600 | 54 | 0.31 |
| HORSE-MACKEREL (SCAD) | TRACHURUS TRACHURUS | 40-450 | 49 | 0.28 |
| EUROPEAN PLAICE | PLEURONECTES PLATESSA | 120- 540 | 45 | 0.26 |
| SANDEELS | AMMODYTES SPP | 50-170 | 41 | 0.23 |
| SOLE (DOVER SOLE) | SOLEA SOLEA | 60-400 | 37 | 0.21 |
| RED MULLET | MULLUS SURMULETUS | 60-290 | 29 | 0.17 |
| GOLDEN MULLET | LIZA AURATA | 230-450 | 19 | 0.11 |
| THORNBACK RAY (ROKER) | RAJA CLAVATA | 140-960 | 19 | 0.11 |
| GILT-HEAD SEABREAM | SPARUS AURATUS | 160-310 | 15 | 0.09 |
| GREAT PIPEFISH | SYNGNATHUS ACUS | 90-410 | 15 | 0.09 |
| BALLAN WRASSE | LABRUS BERGYLTA | 30- 210 | 13 | 0.07 |
| LESSER SPOTTED DOGFISH | SCYLIORHINUS CANICULA | 500-610 | 13 | 0.07 |
| STICKLEBACKS | GASTEROSTEIDAE | 70-120 | 12 | 0.07 |
| UNDULATE RAY | RAJA UNDULATA | 260-480 | 12 | 0.07 |
| (EUROPEAN) MACKEREL | SCOMBER SCOMBRUS | 230-360 | 11 | 0.06 |
| COMMON DRAGONET | CALLIONYMUS LYRA | 110-170 | 10 | 0.06 |
| FLOUNDER (EUROPEAN) | PLATICHTHYS FLESUS | 150-360 | 9 | 0.05 |
| POOR COD | TRISOPTERUS MINUTUS | 30-50 | 9 | 0.05 |
| EELS | ANGUILLIDAE | 270- 730 | 8 | 0.05 |
| SOLENETTE | BUGLOSSIDIUM LUTEUM | 40-90 | 8 | 0.05 |
| TUB GURNARD | TRIGLA (CHELIDONICHTHYS) LUCERNA | 90-320 | 5 | 0.03 |

| Common Name | Scientific Name | Length Range (mm) | Number recorded over 5 years | Percentage of total numbers of fish caught |
|---|---|---|---|---|
| TWO-SPOT GOBY | GOBIUSCULUS FLAVESCENS | 30-40 | 5 | 0.03 |
| JOHN DORY | ZEUS FABER | 200-270 | 4 | 0.02 |
| ROCK GOBY | GOBIUS PAGANELLUS | 70-90 | 4 | 0.02 |
| SPOTTED RAY | RAJA MONTAGUI | 410-540 | 4 | 0.02 |
| FIVE-BEARDED ROCKLING | CILIATA MUSTELA | 90-120 | 3 | 0.02 |
| LESSER WEEVER FISH | ECHIICHTHYS (TRACHINUS) VIPERA | 80-100 | 3 | 0.02 |
| GARFISH | BELONE BELONE | 360-540 | 2 | 0.01 |
| THREE-BEARDED ROCKLING | GAIDROPSARUS VULGARIS | 70-150 | 2 | 0.01 |
| TRANSPARENT GOBY | APHIA MINUTA | 30 | 2 | 0.01 |
| WORM PIPEFISH | NEROPHIS LUMBRICIFORMIS | 120-260 | 2 | 0.01 |
| ATLANTIC COD | GADUS MORHUA | 600 | 1 | 0.01 |
| BULLROUT | MYOXOCEPHALUS SCORPIUS | 90 | 1 | 0.01 |
| BUTTER FISH | PHOLIS GUNNELLUS | 50 | 1 | 0.01 |
| GOBIES | GOBIUS SPP | 40 | 1 | 0.01 |
| GREAT SANDEEL | HYPEROPLUS LANCEOLATUS | 80 | 1 | 0.01 |
| NILSSON'S PIPEFISH | SYNGNATHUS ROSTELLATUS | 120 | 1 | 0.01 |
| RETICULATE DRAGONET | CALLIONYMUS RETICULATUS | 130 | 1 | 0.01 |
| SAND SOLE | PEGUSA (SOLEA) LASCARIS | 170 | 1 | 0.01 |
| SMOOTH SANDEEL | GYMNAMMODYTES SEMISQUAMATUS | 180 | 1 | 0.01 |
| STREAKED GURNARD | TRIGLOPORUS (CHELIDONICHTHYS) LASTOVIZA | 270 | 1 | 0.01 |
| THICK LIPPED MULLET | CHELON (CRENIMUGIL) LABROSUS | 500 | 1 | 0.01 |

*Note:* the data has been quality assured; however there are some limitations with this long term data set (Brown, 2015)

### 10.2.2 Information extracted from the EA's Solent and South Downs Area Fish Monitoring Report 2015

Under the Southampton Water Transitional and Coastal (TrAC) Fish Monitoring Programme 2015, the EA have been monitoring Southampton Water's fish community for WFD purposes since 2007.

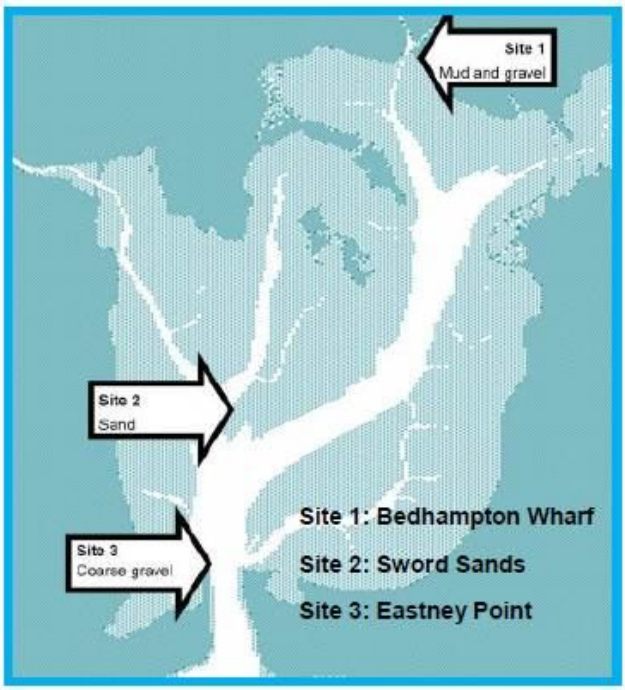
The greatest number of species recorded in any one year is 58 (2009); the lowest is 12 (2008). A total of 40 species were caught in Southampton Water in 2015, which included the first instance of juvenile sea trout in these surveys. Overall catches were down on average in 2015, which is probably due to lower summer sea surface temperatures. During the 2015 survey, a total of 6,758 fish from Southampton Water were caught; 3,105 in the spring surveys, 3,206 in the autumn and an additional 417 in the annual Coastal Survey Vessel [CSV] otter trawl. The spring survey yielded average catches when compared to previous surveys undertaken since 2007. However, the numbers of juvenile bass were the highest recorded over the nine years, which is likely due to the predominantly mild, settled conditions over the previous winter period. The autumn survey was less positive, with numbers much lower than previous surveys; this is also probably down to climatic conditions.

Whilst some of the survey data is a significant distance from the proposed scheme frontage, it provides an indication of the pressures on fish in the Solent area. Many of these pressures will not be influenced by the scheme, e.g. sea temperatures and damage to the seabed, etc. The full survey results are available on the EA's website. (Environment Agency, 2015)

### 10.2.3 Langstone Harbour Board Fish Surveys (Langstone Harbour Board, 2016)

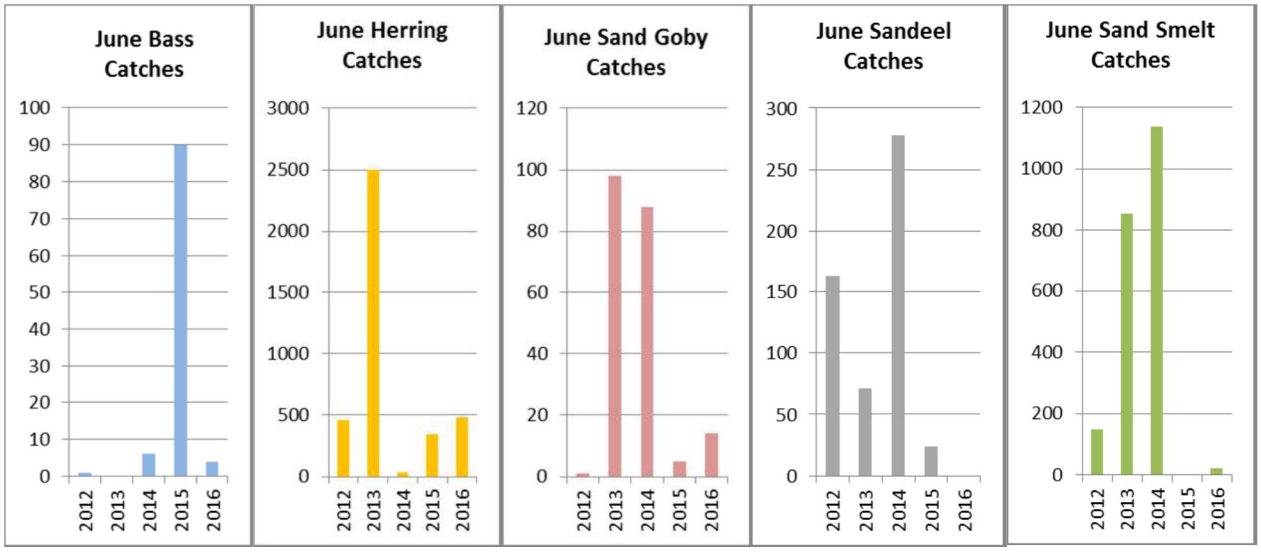
The majority of the study area is outside of Langstone Harbour Entrance. However the surveys carried out by the Langstone Harbour board each year give a very useful indication of general trends in fish populations, and background information on species found in the harbour. The Langstone Harbour Board Fish Survey 2016 recorded a total of 2563 fish, down on the 5280 fish caught in 2015. In 2016 a total of 23 species were caught within Langstone Harbour across the 3 sample sites (see **Figure 10.2.4** for location of the sample sites). Both numbers of fish caught and species diversity were at the lowest level of all surveys to date (2012 – 2016).

**Figure 10.2.4 Location of fish monitoring points within Langstone Harbour**



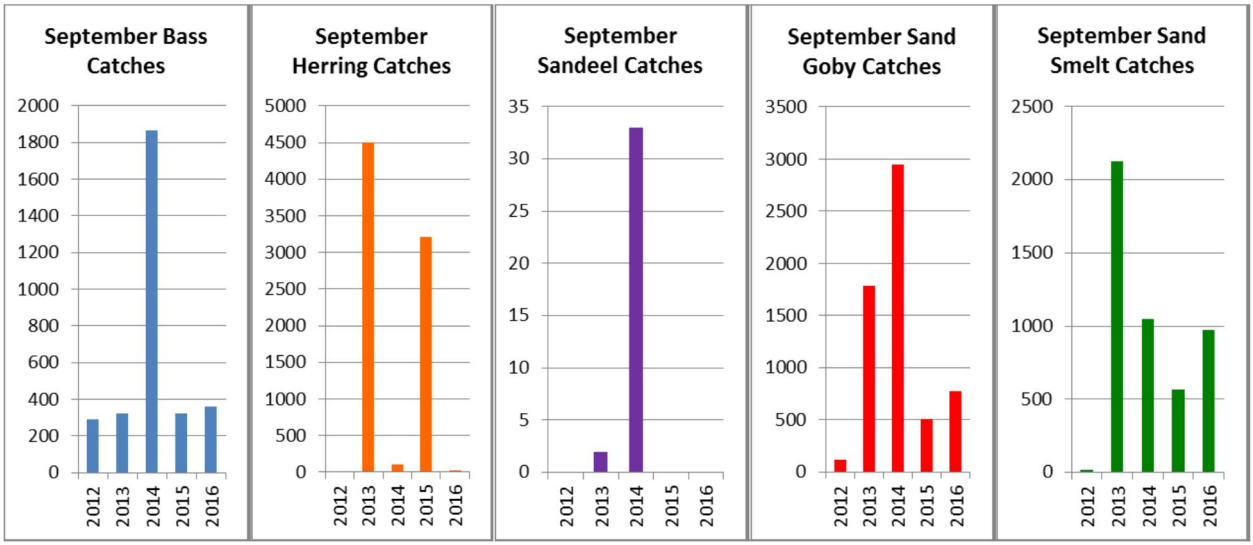

Monitoring data from the Langstone Harbour Board Fish survey is provided in **Graphs 10.2.1 and 10.2.2,** showing fish species which represent an important stock commercially and/or are an important seabird feeding resource.

**Graph 10.2.1 shows Fish species which represent an important stock commercially and/or are an important seabird feeding resource recorded in June Surveys (extracted from the Langstone Harbour Board Fish Survey)**



The following information is related specifically to the Langstone Harbour Board Surveys and provides further evidence as to fluctuations in fish populations, as do the other surveys referred to above. During the September surveys bass numbers were very similar to those seen during 2012 and 2013, indicating a less successful spawning year than that of 2014. Herring were seen in much smaller numbers during the September catches, while sand goby and sand smelt numbers were similar. There were no sand-eel caught during the 2015 September surveys or at all in both surveys. Mean fish lengths for Herring and Sand Goby are similar to those seen during 2014. Mean Sand Smelt length was similar to previous year.

**Graph 10.2.2 shows Fish species which represent an important stock commercially and/or are an important seabird feeding resource recorded in September surveys (extracted from the Langstone Harbour Board Fish Survey)**




It is difficult to make direct comparisons from sampling points within Langstone Harbour and the Hayling Island Beach Management works area. Instead this data provides an indication as to the general status of various fish populations in the area. As a precautionary approach, it has been assumed for the purpose of this report that fish within Langstone Harbour move along the coastline of Hayling Island. All precautions will be taken to protect all fish species that are potentially within the area of the Beach Management Activities.

The beach management works along the South Hayling frontage are located on the open coast, therefore minimal impacts are expected within the intertidal areas utilised by fish. Minor disturbance of sediments may temporarily improve feeding resources, through localised disturbance of silts and fauna, which could be considered a slight benefit to fish communities.

### 10.2.4 Spawning and Nursery grounds

Evidence based maps for spawning and nursery grounds for selected fish species in the UK were produced in 1998 (Coull, 1998) and were later revised in 2012 (Ellis. J, 2012). They show that there are spawning and nursery grounds for several species of fish adjacent to the works area (see **Figures 10.2.2** and **Figure 10.2.3** respectively). The boundaries for spawning and nursery areas presented in the maps should be seen as indicative only since species move around their preferred areas. Bass, lemon sole, sand-eel, plaice, cod and sprat are all known to have spawning grounds within the wider study area and **Table 10.2.2** gives an indication of the peak spawning periods for the main species. It is notable from **Table 10.2.2** that the majority of species have a peak spawning period in the earlier part of the year.

High levels of suspended sediments can damage eggs and planktonic larvae, as well as cause abrasion or clogging of the fragile gills of larval and juvenile fish, resulting in mortality or reduced growth rates. Although spawning adults and juvenile fish can move to avoid adverse conditions, eggs and larvae are unable to avoid areas of elevated suspended sediments. Any reduction in spawning success and any sub-lethal or lethal effect in juveniles can have implications for fish populations.

Impacts as a result of these works will be limited due to the location on the open coast, short term and temporary nature of the works. Although there will be some elevated levels they are not expected to be outside the normal levels that occur during storm conditions. The materials to be renourished or recycled as part of the BMP are course, clean materials with little fines, again reducing the potential for fines to be released into the water body.

**Table 10.2.2 Main spawning periods for fish species in the study area (after Coull et al 1998 and Ellis et al 2012)**

| Species | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sole | | | | * | | | | | | | | |
| Lemon Sole | | | | | | | | | | | | |
| Sandeel | | | | | | | | | | | | |
| Plaice | * | * | | | | | | | | | | |
| Cod | | * | * | | | | | | | | | |
| Sprat | | | | | * | * | | | | | | |
| Bass | | | | | | | | | | | | |

* denotes peak spawning period

### 10.2.5 Migratory species and those of conservation importance

Common seasonal visitors that frequent the estuaries of the Solent during their annual migrations are sprat, whiting, pouting, bass, herring and flounder.

Diadromous species sea trout, lamprey and eel are all known to pass through Portsmouth Harbour and Southampton Water at various times (see Table 10.2.3), but the area near Hayling Island is much more open and therefore, the opportunity to take an alternative route is ample. All three species are of conservation concern and are listed as a Species of Principle Importance under section 41 of the Natural Environment and Rural Communities [NERC] Act 2006.

**Table 10.2.3 Migratory movements of diadromous species**

| Species | | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sea trout | U | | | | | | | | | | | | |
| Sea trout | D | | | | | | | | | | | | |
| Sea lamprey | U | | | | | | | | | | | | |
| Sea Lamprey Juvenile | D | | | | | | | | | | | | |
| Eel | D | | | | | | | | | | | | |
| Elvers | U | | | | | | | | | | | | |

U – Upstream movement
D - Downstream movement

Activities that may create underwater sound have the potential to affect the behaviour of migratory fish species; depending on their sensitivity to sound and the level of sound created. Sound travels much faster in water (approximately 1,500 m/s) than in air (340 m/s). Since water is a relatively incompressible, dense medium, the pressures associated with underwater sound tend to be much higher than in air. Such levels in air would be considered to be hazardous. However, marine mammals and fish have evolved to live in this environment and are thus relatively insensitive to sound pressure compared with terrestrial mammals. Fish species can be classified into; hearing generalists and hearing specialists depending on the structure of the swim bladder and its connection with the auditory structures. Species with swim bladders connected to such structures are known as hearing specialists and are sensitive to underwater sound (Popper. A.N., 2009). Salmonids are considered to be hearing generalists and are not especially sensitive to a variety of sound frequencies.

#### 10.2.5.1 Sea-trout

Sea Trout are known to move up into the River Wallington, River Meon, River Test and River Itchen. Their exact route is not well known or understood, however they seem to be affected in closed 'narrow' areas for example where an impact is considered to 'block' a migratory route. If 50% (or more) of the estuary/ migratory route is 'blocked' or impacted, the impact is considered to be unacceptable. The study area is on the open coast and it is therefore not appropriate to consider in any more detail, as the proposal will not cause this level of impact.

Potential impacts to Sea-trout are expected to be negligible. Impacts of noise and vibration which can affect seatrout are low and sea trout are not considered to be in the vicinity.

#### 10.2.5.2 European eel

European eels breed in the Atlantic Ocean southeast of Bermuda and the post larvae stage cross the Atlantic changing into Juvenile eels (elvers) in British coastal waters. Migratory eels can be found in the lower reaches of a number of rivers within the Solent. Elvers generally enter coastal waters and migrate up rivers into freshwater from March/April through to September. Adult silver eels migrate seawards on their spawning migrations from July through to December. Eels are understood to follow the saltwater/freshwater interface and move close to the riverbank during strong river currents. It is believed that seaward movements take place at varying depths. The location of the works is in a fully marine environment.

The European eel is also listed as Critically Endangered on the IUCN Red List and is protected by EU legislation under Annex ll of CITES (Convention on International Trade in Endangered Species). The eel is also a species of principal importance for the purpose of conservation of biodiversity under the Natural Environment and Rural Communities Act 2006 (Natural England, 2013). Being hearing generalists the eel is not sensitive to relatively high sound levels, although they are considered to be sensitive to lower sound frequencies such as distant shipping noise or at a lower frequency, earthquakes.

#### 10.2.5.3 Lamprey Species

Species of Lamprey (*Petromyzontidae*) have been recorded during Environment Agency surveys in 2004 in a number of fluvial locations in the Solent area (Environment Agency , 2004). Sea lamprey migrate up rivers to spawn in freshwater during May and June and after hatching young larvae (ammocoetes) settle downstream in suitable habitats and remain in these nursery areas for up to eight years. After transforming into pre-adults they migrate to sea during the late autumn. Lamprey species have not been recorded since 2004.

#### 10.2.5.4 Seahorse (Hippocampus spp.)

Seasearch Marine Surveys have recorded the Short-snouted seahorse in the Solent, just outside Portsmouth Harbour, but it is unknown if they have been found in the Hayling Island area. It is considered unlikely due to the high wave energy of this location. This species is protected under the Wildlife and Countryside Act (1981) and it is therefore an offence to intentionally or recklessly harm or disturb any seahorse as well as cause damage, destroy or disturb their places of shelter. Seahorses in British waters are generally found in seagrass (Zostera) and shallow kelp habitat. The occurrence of Seagrass beds has been extensively surveyed by the Hampshire Wildlife Trust Marine Team and there are extensive beds consisting of the intertidal occurring species within Chichester, Langstone and Portsmouth Harbours, but there are no known locations along the open coast of the study area. These intertidal areas are now protected by the byelaws introduced by the Marine Management Organisation [MMO] and subsequently the Sussex and Southern Inshore Fisheries and Conservation Authorities (IFCA), which prevent the use of Bottom Towed Fishing Gear with the aim of protecting eelgrass habitat. Potential Impacts to seahorses are considered negligible, and therefore are not considered any further within this assessment.

#### 10.2.5.5 Shellfish resources

Historically, large oyster beds have been found in the Solent, mainly within the sheltered areas of the harbours, and have been exploited since Roman times for the native oyster *Ostrea edulis*. These oyster beds, usually found close to the main subtidal channels in the study area were once known to be the largest self-sustaining stock in Europe but have had a chequered history. The population of oysters was devastated in the early 20$^{th}$ century as a result of the discharge of effluent into the harbours. The industry was subsequently dormant until the 1960's and since then has had several setbacks with the introduction of the competitor species, the slipper limpet, predation by sting winkle and the disease *Bonamia ostrea*.

Recent reports have described the severe reduction in numbers of oyster compared to just five years ago and as a result of this the Solent oyster fishery including Southampton Water is subject to a temporary closure from 1$^{st}$ November 2013 to 31$^{st}$ October 2014 (SIFCA Byelaw, 2013). Designated shellfish waters are illustrated by **Figure 10.2.5 and 10.2.6** (Chichester and Langstone Harbours respectively). Native oyster is listed as a Species of principal importance for the purpose of conservation of biodiversity under the Natural Environment and Rural Communities Act 2006 and is also on the OSPAR list of threatened and declining species and habitats and can be considered to be of national importance.

The native oyster beds in the Solent are also partially within the Solent European Marine Site network of protected areas. Under the shellfish hygiene legislation, shellfish harvest areas are classified according to the level of *E.coli* and faecal coliforms contamination. The area immediately adjacent to the works has since 2012 been left as unclassified as a Shellfish Fishery, due to a number of poor test results, this means that shellfish are not legally allowed to be collected from this area for human consumption.

The intertidal mudflats adjacent to the study area support a large diversity of bivalves including clams and mussels together with whelk as well as many other invertebrates which provide a food source for birds and some fish species.

## 10.3 Impacts of the proposed works

**Section 4** of this report details the proposed BMP activities. It's important to highlight that in terms of any beach recharge, we are only considering the deposition of dredged material rather than any dredging as these activities are either undertaken by Chichester Harbour Conservancy under their navigation powers and on safety grounds as a Harbour Authority, or by licensed offshore contracts. Only the beneficial reuse of the dredged material is considered within this report (I.e. placement on the beach).

### 10.3.1 The Impacts on the Spawning and Nursery Grounds

As stated in **Section 10.2.4**, the proposed works are within a broad area used as nursery grounds by plaice, sole, thornback ray, undulate ray, lemon sole, tope, sprat and bass. However, CEFAS have identified that both the nursery and spawning grounds were considered to be of a low intensity usage. The proposed works have the potential to impact these local fish resources due to elevated levels of suspended sediment arising from the rainbowing activity. However, these impacts are likely to be minimal, localised, temporary in nature and analogous to a storm event, and therefore these works represent a low risk of harm to fish spawning and nursery areas.

### 10.3.2 Shellfish

Potential impacts to shellfish are considered low as a result of the proposed works. Potential impacts include reduced feeding ability and growth, restricted respiratory functioning and in extreme cases, mortality. However the following factors should be taken into account:

- Due to the high-energy environment, the area supports a relatively impoverished

resident community of bottom living animals that are adapted to unstable conditions;

- The impact of storms can be expected to have a greater effect over a much wider area than the process of moving sediment on the foreshore through recycling, transportation, deposition and re-profiling;

Therefore it is considered that the works represent a low potential for harm to shell fisheries in the areas.

### 10.3.3 Fish, including migratory species and those of conservation importance

Most fish are highly mobile and can be expected to move away from areas of elevated turbidity for example the potential elevated levels of suspended solids whilst rainbowing and beach nourishment are taking place. This effect would only be localised and temporary. Juvenile fish may be vulnerable to increased mortality as a result of smothering by recharge sediment, however given that recharge is focused above the water line, and is extremely unlikely.

The dredging operations may result in the direct removal of pelagic species and of benthos on which fish feed. The only area that is dredged is the Chichester harbour approach channel, which has regular low quantities of sediment removed. The sediment originates from the Hayling Island open coastline, and is course, large shingle. It is unlikely that any significant colonisation of benthic organism would take place in the intervening period. However, this EIA is not considering the impacts of the dredge but the beneficial use of the dredged material, as the material would be lost from the system if not re-used on the beached at Hayling Island.

### 10.3.4 Potential impacts of changing water quality and elevated turbidity on Fish and Shellfish

The impacts resulting from elevated turbidity from either recycling of beach material, deposition of dredged material into the intertidal and also the re-nourishment from aggregate brought in by road, has to be set in the context of the natural and very dynamic high energy environment of South Hayling Island. We have undertaken beach management operations historically without issue.

The material used within the beach management activities is coarse material (size of aggregate used approximately 27mm - 35mm). The majority of the material is shingle although there is a small percentage of sand present. The coarser the material the quicker it will settle out of the water column. Sediment transport within Chichester Harbour comprises of two processes. Fine material is transported by tidal currents, while both fines and coarse material are transported by wave action (HR Wallingford 1997).

South Hayling Island is an exposed coastline, subjected to high wave exposure; therefore the ecology of the area including shellfish and fish will be adapted to high levels of turbidity in the water column, especially in storm conditions.

The turbulent wave and tide conditions at the harbour entrance can transport sand in suspension. During storm events, sand can be carried further into the harbour. Some deposition occurs on the flood tide however the dominant transport pathway is seaward out to the ebb tide delta, known as Chichester Tidal Delta. Small volumes of sand are carried into the harbour and deposited as a narrow beach in areas subject to wave attack. Localised erosion along the shoreline provides additional material for these deposits (HR Wallingford 2011).

During the rainbowing of material from the Chichester Harbour approach channel dredge, the hoppers deposit the material at high tide onto the upper beach above the high tide mark. There is a low risk that any fines from the dredge will enter the water column, after draining through the beach. However, these fines will be transported on the ebb tide away from any sensitive habitats and species within both Chichester and Langstone Harbours.

The MMO have highlighted that in the production of the South Marine Plan, concerns have arisen about beneficial use projects in estuaries (e.g. Southampton Water) due to the potential impacts of temporarily increased suspended sediment concentrations on water quality, fish interests (particularly migratory salmonids) and achievement of WFD thresholds. The equipment used to discharge dredged materials can also cause temporary damage to existing habitats. However, the MMO goes on to highlight that such initial (potentially negative) impacts need to be considered against the longer term benefits of a given project. Beneficially using dredged material from Chichester Harbour Entrance presents many benefits, such as avoiding loss of resident shingle from the sediment cell, and preventing the longer journeys necessary for offshore disposal at licensed disposal sites.

Overall potential impacts of the proposed beach management activities on fish and shellfish are recorded in **Table 10.3.1**.

**Figure 10.2.1 Fish Survey location of each trawl that forms the Solent Bass Survey** (Brown, 2015)

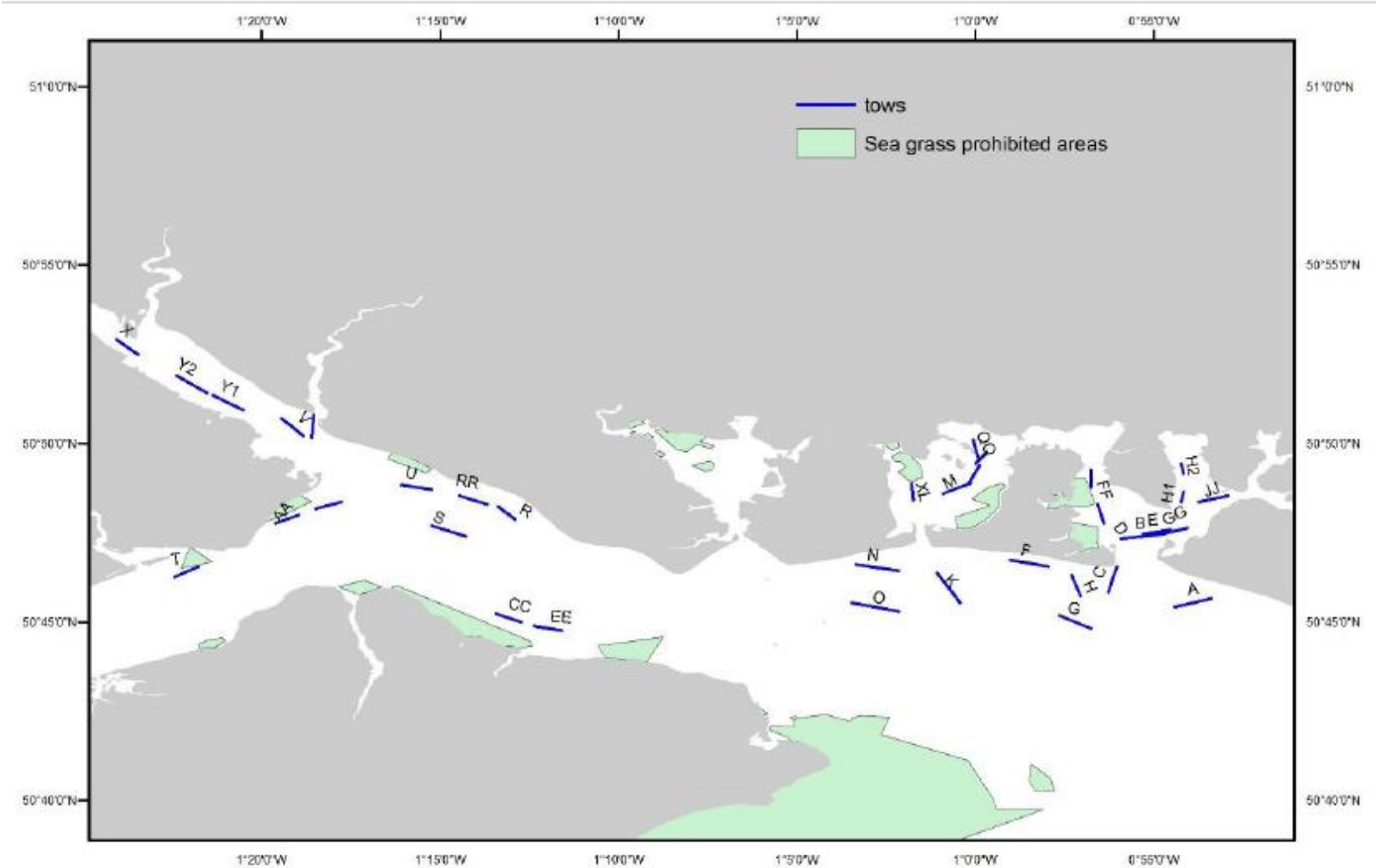


**Figure 10.2.2 Nursery ground for fish in the study area:**

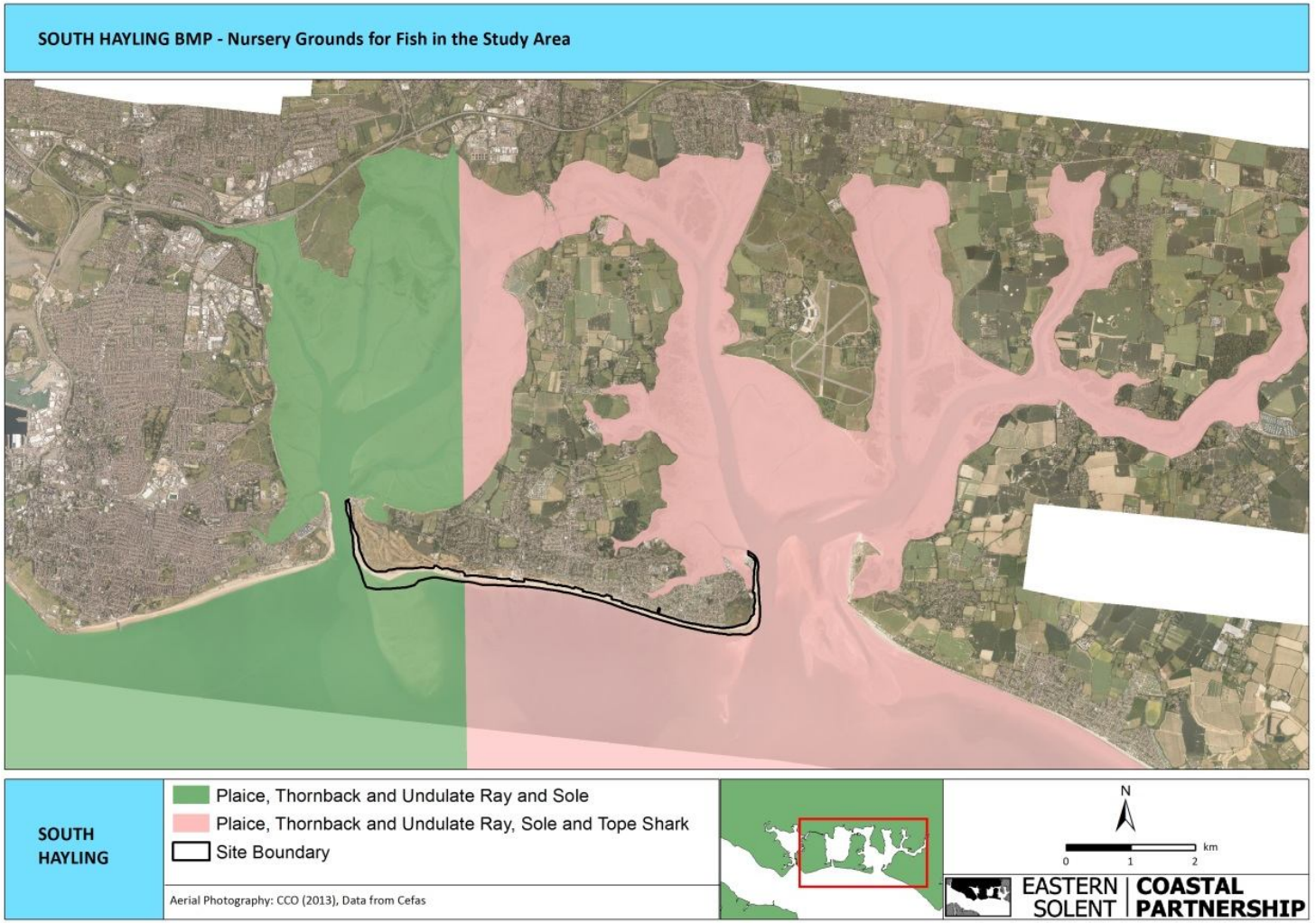


**Figure 10.2.3 Spawning grounds for fish in the study area:**

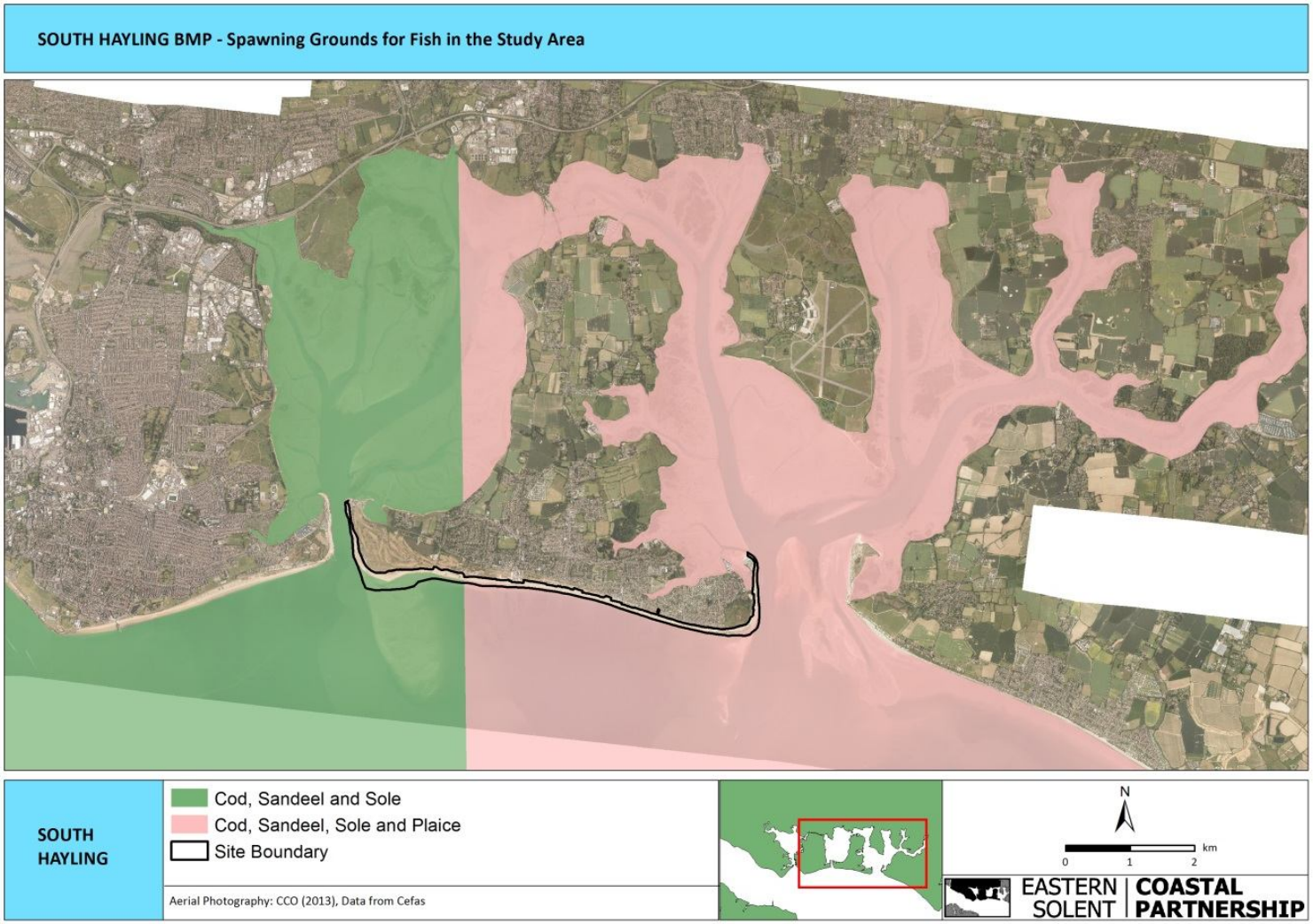


**Figure 10.2.5 Chichester Harbour Designated Shellfish Waters**

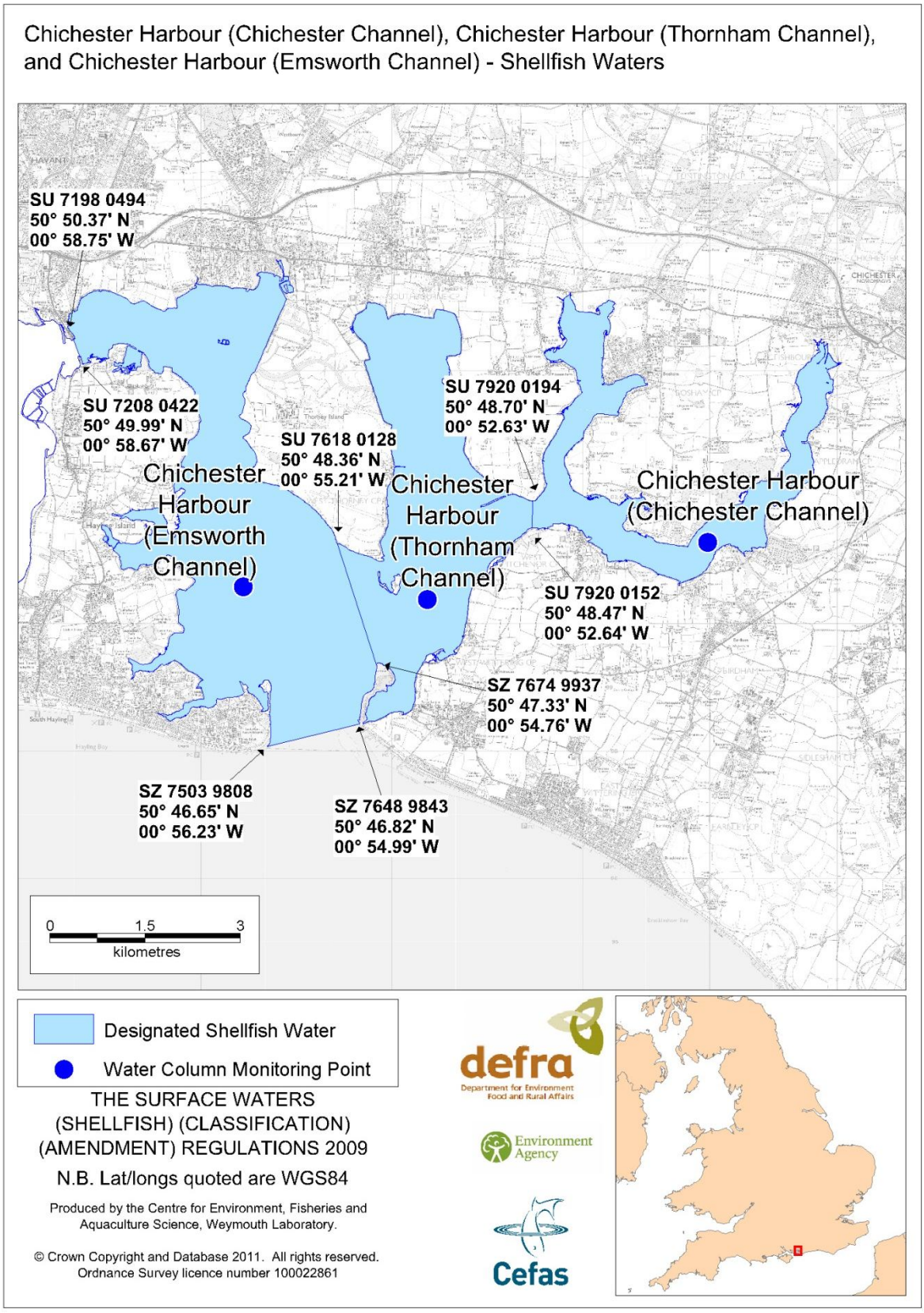


**Figure 10.2.6 Langstone Harbour Designated Shellfish Waters**

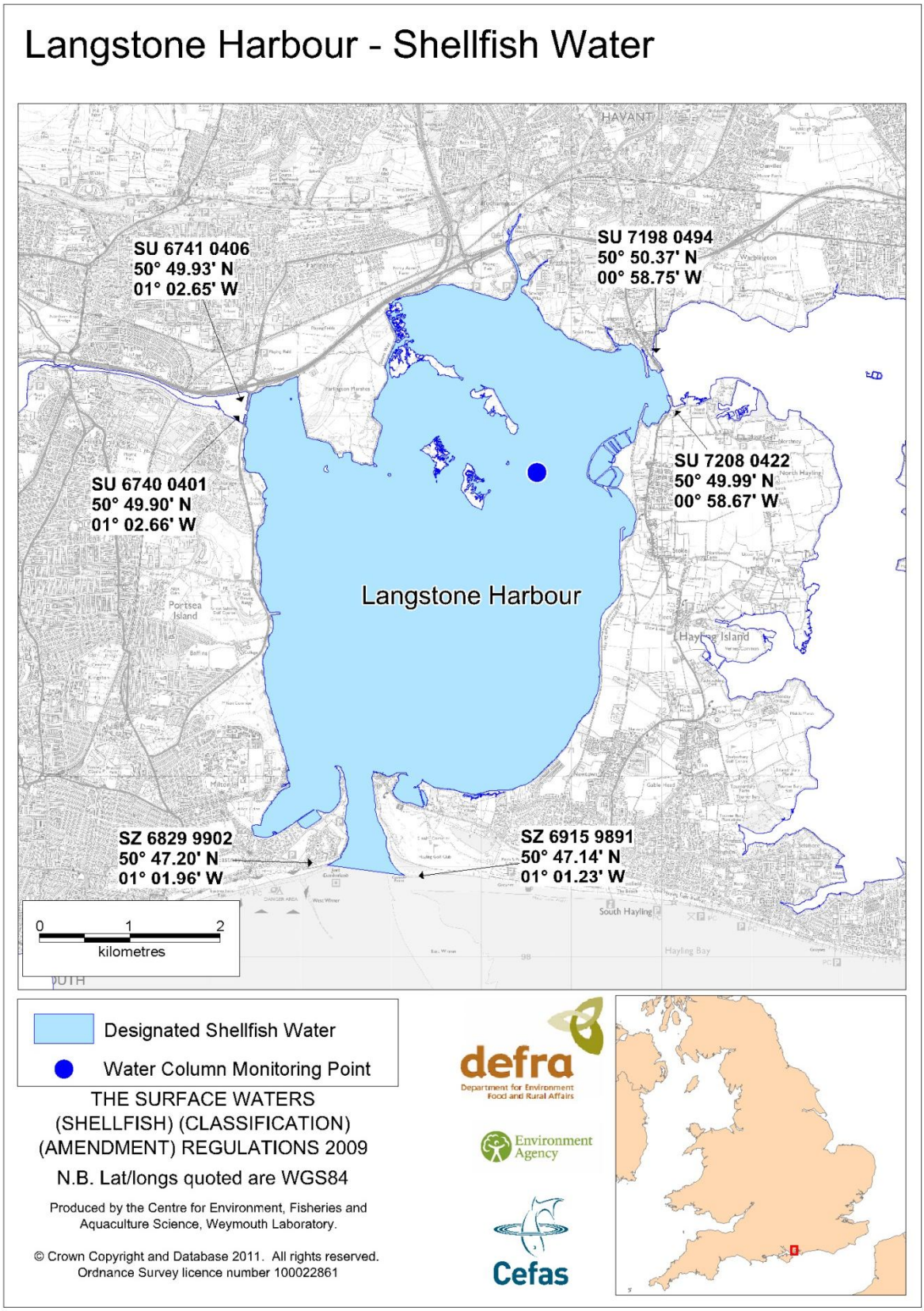


**Table 10.3.1 Potential impacts of delivery of the BMP on Fish and Shellfish. Highlighted orange if requiring mitigation (See Figure 1.1 for location of BMP units, and Section 4 for details of proposed unit by unit activities)**

| Potential Effects of Beach Management Operations | BMP U1 | BMP U2 | BMP U3 | BMP U4 | BMP U5 | BMP U6 | BMP U7 | BMP U8 |
|---|---|---|---|---|---|---|---|---|
| **Recycling of resident beach material impacting fish and shellfish through increased suspended sediments (see Water Framework Directive Assessment, Section 12 for full consideration of this impact).** | Sand extraction around Hayling Island Sailing Club: Material from the Hayling Island Sailing Club pontoon to be extracted and depositied within BMP U2, east of the drift divide. Operation only undertaken at low tide (not directly connected with waterbody). Shingle extraction from the Ness: Coarse material extracted from the beach – not expected to increase suspended sediments. No material to be desposited in this unit. No impacts to fish and shellfish expected. | Material will be deposited on the upper levels of the beach, outside of the waterbody. Material is coarse with low levels of fines present. No impacts expected to fish and shellfish. | | Material extracted from areas of accretion (subject to permissions at Units 6 and 7) from the upper levels of the beach, outside of the waterbody. Material is coarse with low levels of fines present. No impacts expected to fish and shellfish. | | | | Very small and localised movement of shingle. Material is coarse with low levels of fines present. No impacts expected to fish and shellfish. |
| **Rainbowing of material from dredging** | No material to be rainbowed ashore into these units. No impact expected. | | Minimal impacts expected. Material deposited on the upper area of the beach, outside of the waterbody. Material will only be rainbowed into one or two groyne bays at a time over high tide, leaving the majority of the unit free of works. Material is coarse with low levels of fines present. Any fine sediment expected to settle quickly out of the water column. The dilution factor along the open coast is significant. | No impact expected. No material to be rainbowed ashore in to these units. | | | | |
| **Import by Road** | No material to be imported in via road for this unit. No impacts to fish and shellfish expected. | Material will be deposited on the upper levels of the beach, outside of the waterbody. Material is coarse with low levels of fines present. No impacts expected to fish and shellfish. | | Material will be recycled from these units. No material will be imported in by road. No impacts to fish and shellfish expected. | | | Material may be brought in by road here, if there is lacking shingle within the unit to prevent localised erosion issues. Any material would be deposited on the upper levels of the beach outside of the waterbody. No | |

| Potential Effects of Beach Management Operations | BMP U1 | BMP U2 | BMP U3 | BMP U4 | BMP U5 | BMP U6 | BMP U7 | BMP U8 |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | impacts on fish and shellfish expected. |
| **Tracking on the beach; moving material along the beach** | Machinery will only be tracking on the upper levels of the beach, outside of the waterbody when transporting material or reprofiling material. No impact to fish and shellfish expected. This will be strictly controlled to avoid vegetated shingle impacts, and summarised as part of our construction and environmental management plans. | | | | | | | |
| **Risk of pollution incidents** | Risk of pollution will been minimised as much as possible through contract specification and the requirement for a Construction and Environmental Management Plan detailing all pollution prevention measures taken by the contractors including, but not limited to, the use of biodegradable hydraulic oils and spill kits on all machinery. No impacts to fish and shellfish expected. | | | | | | | |
| **Any Operational Impacts** | No operational Impact from maintaining a healthy shingle beach. | | | | | | | |

## 10.4 Mitigation and Residual Impacts

**Table 10.4** details specific mitigation for the impacts identified in **Table 10.3.1** (those which are highlighted orange), to ensure the BMP works can be delivered without a significant negative effect on fish and shellfish. A construction and Environmental Management Plan (CEMP) will be developed and submitted in advance of each BMP campaign.

**Table 10.4 Mitigation for impacts identified in Table 10.3.1 and residual impacts**

| Impact | Mitigation | Resultant/Residual Impact |
|---|---|---|
| **Elevated Levels of Suspended Solids** | Sediment Sizes are large, so effects of turbidity are low risk as sediment will settle out quickly. Material will be deposited on the upper areas of the beach, outside of the waterbody, which will minimise the risk of elevated levels of suspended solids / turbidity. This impact is considered to be minimal, localised and temporary. Background levels are considered to be greater than those resulting from the scheme. The area supports a relatively impoverished resident community of bottom living animals that are adapted to unstable conditions. | Minimal risk of impact |
| **Elevated levels of suspended solids resulting from the rainbowing of dredged material on to the beach** | Material rainbowed on to the upper beach to allow any fines or suspended solids to drain 'through' the beach back into the sea. Material is placed high on the beach at high tide so any fines will be transported away from sensitive habitats and species within Chichester Harbour on the ebb tide. | Minimal risk of impact – considered to be temporary, localised and minimal in nature. |
| **Risk Of Pollution causing impact of fish and Shellfish** | Pollution control measures will be implemented to safeguard aquatic Fish and Shellfish and all marine ecology. Good work management practices would be employed to ensure that there are no significant residual impacts. The relevant codes of practice for construction sites will be implemented, to protect water quality during works from disturbance of sediment and potential spillage of construction material. This will include | Minimal risk of impact |

| Impact | Mitigation | Resultant/Residual Impact |
|---|---|---|
| | adherence to all relevant legislation including the water pollution prevention measures set out in the Environment Agency's Pollution Prevention Guidelines: PPG1 (General Guide to the Prevention of Water Pollution), PPG5 (Works In, Near or Liable to Affecting Watercourses) and PPG6 (Working at Construction and Demolition Sites). For example, the use of spill kits and biodegradable hydraulic oils (which will be confirmed in the CEMP). | |

## 10.5 Conclusions

The potential impacts to fish and shellfish as a result of the beach management works are relatively minor compared to effects naturally experienced during storm events. The impacts are considered to be short term and localised due to the size of sediment being transported within these operations and the time taken to settle out of the water column; the Water Framework Directive Assessment (**Section 12**) will consider the potential impacts further. Where potential impacts have been identified, appropriate mitigation has been investigated to remove or reduce these impacts. Any residual impact resulting from the delivery of the scheme, after mitigation measures have been adopted; have been presented to demonstrate environmental acceptability.

# 11. LANDSCAPE AND VISUAL ENVIRONMENT

This section of the Environmental Statement examines the potential for impacts on the Landscape and Visual Environment of the South Hayling frontage resulting from the BMP activities.

## 11.1 Introduction

Beach Management Activities are ongoing activities, so many of the potential impacts have been assessed in the past. However for completeness, all impacts are considered below. Both the landscape and seascape will not change as a result of the ongoing works. There are temporary impacts during the works which are detailed in this section.

The study area consists of a shingle barrier beach, bounded by two distal recurved spits adjacent to the Langstone and Chichester Harbour entrances. There are man-made sea defences at various locations along the frontage, with the largest natural sections of beach around Gunner Point (BMP Units 6 and 7) and central Beachlands (BMP Unit 4). The beach frontage consists of shingle and a mixture of sand and gravel overlaying Bracklesham Beds. Urban development close to the beach is mainly confined to the Eastoke Peninsula, with a few individual properties located within the active beach zone e.g. the Inn-on-the-Beach (BMP Unit 5) & the Ferryboat Inn (BMP Unit 8).

## 11.2 Baseline Conditions

### 11.2.1 Landscape Character Assessments

The study area lies within the South Coast Plain & Hampshire Lowlands National Character Area (NCA) and is comprised entirely of the generally open and often featureless landscape of the coastal plain.

A Landscape and Seascape Character Assessment was completed in February 2007, providing an integrated assessment of the rural and urban landscape and seascape. It explored the historical and contemporary events and influences that

have shaped the Borough's development and will shape its future, bringing together the different urban, rural and marine environments.

The aim of the project was to provide a clear framework to guide the future development and management of the Borough landscape, townscape and seascape. It will ensure that the distinctive character of the Borough is retained and change is accommodated in a positive way to the benefit of the people who live and work in the Borough (I.e. the ecological and historical value of the Borough and of the overall condition of the landscape and built form).

The prime objectives of the study were to:

- produce a landscape character assessment that could be readily understood by both the public and professionals and within which the characteristics of the landscape are clearly identified;
- ensure a fully integrated approach to characterisation informed by using landscape, ecological, historical and cultural assessments and weaving them together to define landscape types and landscape character areas;
- bring current methodologies employed by landscape practitioners, historians and ecologists together in one study;
- reflect fully the role of settlement pattern and development, and built form and design, in determining the landscape, townscape and seascape form and the intimate relationship between the built form and the surrounding countryside from which it developed;
- assist in the conservation, enhancement and restoration of a viable and healthy landscape within Havant Borough through landscape management guidelines;
- assist in the conservation, enhancement and restoration of the landscape, townscape and seascape through well founded character based built form and development guidelines;
- inform the emerging Borough Local Development Framework;
- use the process to identify areas that require further work;
- involve the general public in the landscape, townscape and seascape character assessment process in a practical and valuable way;
- use this process of better understanding and communication to enable the public and stakeholders to effectively inform the identification of influences on the landscape, management strategies and planning policy;
- provide the basis for a district level Landscape Sensitivity assessment for the Borough, as part of Hampshire County Council's development of a county wide approach to landscape sensitivity. This will create a tool to direct and inform decision makers in future land use and land management change. (HBC Character Assessment , 2007)

Detailed below are the relevant Landscape Character Areas within the South Hayling Frontage that could be impacted by the BMP activities. These are spatially represented on Figure **11.1**.

- LCA34 - Sinah Common and the Kench
- LCA35 - West Town, Hayling Island
- LCA36i - South Hayling
- LCA36ii – Eastoke
- LCA37 – Black, Sandy and Eastoke Points
- LCA38 – Langstone Harbour Mouth
- LCA39 – South Coast Hayling Island
- LCA40 – Chichester Harbour Mouth

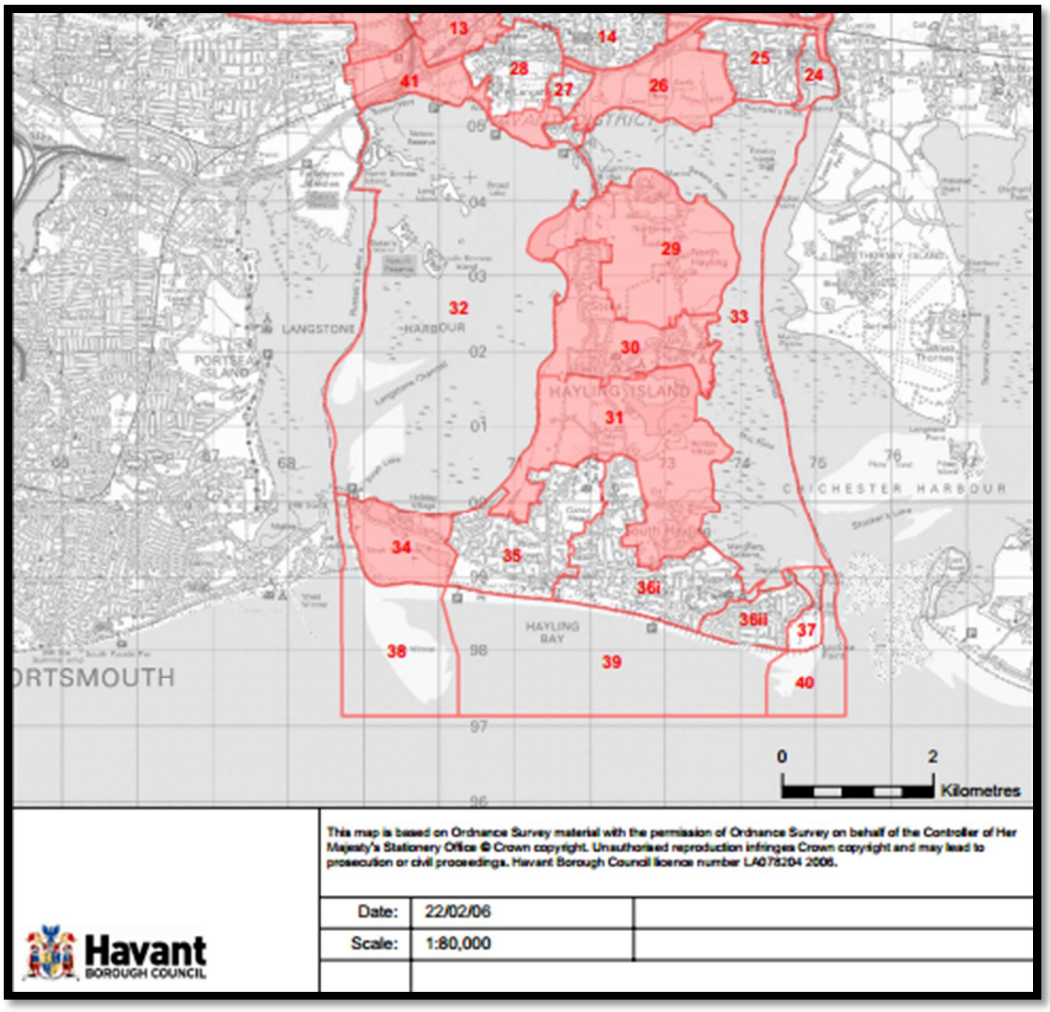



**Figure 11.1 Landscape Character Areas as set out in Havant BC Landscape Character Assessment**

**Table 11.1** details the landscape types identified in the Landscape Character Assessment and highlights vulnerabilities, sensitives and issues which were identified in the assessment. It then identifies relevant land management guidelines

in order to retain the local character into the future when considering development proposals. Only landscape areas that could be impacted by BMP activities are summarised in **Table 11.1.**

**Table 11.1 Landscape types identified in the Landscape Character Assessment to advise BMP Impact Assessment**

| Landscape Character Area | Landscape Character Types | Local issues identified in the Havant Landscape Character Assessment | Relevant Land Management Guidelines |
|---|---|---|---|
| **LCA34 Sinah Common and the Kench** | • Enclosed Lower Harbour Plain<br>• Harbour Basin Lowland and Open Coastal Plain | • Fragile dune systems are rare in Hampshire and need careful long term management. | • Ensure that the coastal habitats are maintained, enhanced and remain unaffected by any local development. |
| **LCA35 West Town, Hayling Island** | • Open Lower Harbour Plain Lowland Coastal Settlement<br>• Lowland Open Coastal Plain | • Fragile dune systems are rare in Hampshire and need careful long term management;<br>• Sand dune habitats and salt marshes, a priority habitat, are at risk from erosion due to sea level rise and flood defence management (the salt marsh is located to the north of Hayling Island within the harbour and not on the open coast) | • Ensure that the coastal habitats are maintained, enhanced and remain unaffected by any local development either directly through the loss of the habitats or indirectly through, for example, pollution or run off from roads;<br>• Be aware of changing wave patterns and how these may affect the sand dune systems as they are susceptible to changes that occur on the foreshore and rely on wave action for their nutrition. |
| **LCA36i South Hayling** | • Lowland Coastal Settlement<br>• Lowland Open Coastal Plain | • Poor quality recreation and tourism development within open coastal plain;<br>• Poor quality management of open coastal plain with a mix of structures;<br>• Climate change may lead to sea level rise which could impact upon the coastal habitats. | • Ensure that the coastal habitats are maintained and enhanced and remain unaffected by any local development;<br>• Be aware of changing wave patterns and how these may affect the sand dune systems as they are susceptible to changes that occur on the foreshore and rely on wave action for their nutrition. |
| **LCA36ii Eastoke** | • Lowland Coastal Settlement;<br>• Minor Inlets. | • N/A | • N/A |
| **LCA37 Black, Sandy and** | • Lowland Open Coastal Plain Minor | • Intrusive character of sea defences on natural alignment of the beach; | • Protect fragile system of habitat mosaic which is at risk from impacts of natural |

| | | | |
|---|---|---|---|
| **Eastoke Points** | Inlets. | • Public access creating pressures on the biodiversity resource;<br>• Impacts of climate change on the mosaic of habitats;<br>• Impacts of pollution from the sea, such as spillages;<br>• Salt marsh, a priority habitat, are at risk from erosion due to sea level rise and flood defence management (the salt marsh is located to the north of Hayling Island within the harbour and not on the open coast) | erosion, visitor pressure and sea level rise;<br>• Conserve and enhance the complex mosaic of coastal habitats;<br>• Be aware of changing wave patterns and how these may affect the sand dune systems. |
| **LCA38 Langstone Harbour Mouth** | • Harbour Mouth Open Coast | • Visual impact of adjacent LCAs;<br>• Climate change may lead to sea level rise which could impact upon the coastal habitats which in turn would lead to bigger coastal defences. | • Be aware of changing wave patterns and how these may affect the sand dune systems;<br>• Ensure that the coastal habitats are maintained and enhanced and remain unaffected by any local development. |
| **LCA39 South Coast Hayling Island** | • Open Coast | • Visual impact of sea defences;<br>• Oil spill as a threat to water quality;<br>• Climate change may lead to sea level rise which could impact upon the coastal habitats;<br>• Coastal movement and erosion could have a damaging impact on submerged wrecks. | • Avoid structures on the storm beach which would be visible from the sea;<br>• Be aware of changing wave patterns and how these may affect the sand dune system. |
| **LCA40 Chichester Harbour Mouth** | • Harbour Mouth Open Coast | • Visual impact of groynes;<br>• Climate change may lead to sea level rise which could impact upon the coastal habitats. | • Avoid structures on the storm beach which would be visible from the sea;<br>• Be aware of changing wave patterns and how these may affect the sand dune systems. |

**Chichester Harbour Area of Outstanding Natural Beauty**

To the east of the study area is Chichester Harbour, part of which has been designated an Area of Outstanding Natural Beauty (AONB). The main characteristics of the landscape are described below:

- A unique blend of land and sea – especially the combination of large open water areas, narrow inlets and creeks;
- Frequently wooded shoreline;
- The flatness of the landscape accentuates the significance of the sea/land intersection and highlights distant landmarks across both land and water. This is an unusual feature of AONBs;
- The open water in the central area of the harbour is a microcosm of the open sea beyond the harbour mouth, reflecting the clouds and sky, the wind and rain;
- A sense of wilderness within the seascape;
- Particularly strong historic character and associations;
- Picturesque harbour-side settlements;
- A rich flora and fauna, notably flocks of wading birds, adds to the diversity of the landscape;
- Unspoilt character and unobtrusive beauty; and
- A harbour offering a very special sense of peace and tranquillity.

### 11.2.2 Relevant Landscape Planning Policies

Detailed below are the relevant Planning Policies from the Havant Core Strategy:

**Policy CS11**
**Protecting and Enhancing the Special Environment and Heritage of Havant Borough**
Planning permission will be granted for development that:

1. Ensures the key landscape and built form principles set out in the Havant Borough Townscape, Landscape and Seascape Character Assessment are protected and where possible enhanced by partnership working with developers, groups and the wider community.
2. Protects and where possible enhances the borough's statutory and non-statutory designated landscape, habitats and features of biological, hydrological or geological interest.

**Policy CS12**
**Chichester Harbour Area of Outstanding Natural Beauty (AONB)**
Development will be permitted where it:

1. Carefully assesses the impact of individual proposals, and their cumulative effect, on the Chichester Harbour AONB, and its setting.
2. Is appropriate to the economic, social and environmental wellbeing of the area or is desirable for the understanding and enjoyment of the area.
3. Conserves and enhances the special qualities of the Chichester Harbour AONB (as defined in the Chichester Harbour AONB Management Plan).
4. Meets the policy aims of the Chichester Harbour AONB Management Plan and Havant Borough Core Strategy March 2011.
5. Provides mitigation of any detrimental effects including where appropriate the improvement of existing damaged landscapes relating to the proposal.

## 11.3 Potential Impacts

In 2013 the capital engineering works at Eastoke Point were assessed for impacts on the character of the landscape within the study area and the visual impacts of the works on people living, working or travelling through the area. It was assessed in the following order of sensitivity:

- **High sensitivity**: Private dwellings and gardens where viewers are likely to view the study area frequently;
- **Medium – high sensitivity**: Public rights of way, country parks and other informal recreational facilities where viewers gain a prolonged view due to a slower passage through the area and where the quality of the view forms part of the amenity;
- **Medium – low sensitivity**: commercial premises, public facilities and schools where the viewer may be familiar with the scene but holds it in lower regard than viewers from residential properties and the surroundings are secondary to the purpose of the visit; and
- **Low sensitivity**: Surrounding road and rail networks where the viewer gains brief glimpses of the view whilst in motion.

The magnitude of the visual effect of the proposals is assessed according to the following scale;

- **Substantial adverse or beneficial impact:** the development would cause a significant deterioration (or improvement) in the existing view;
- **Moderate adverse or beneficial impact**: the development would cause a noticeable deterioration (or improvement) in the existing view;
- **Slight adverse or beneficial impact:** the development would cause a barely perceptible deterioration (or improvement) in the existing view;
- **Neutral:** the development would cause no discernible deterioration or improvement in the existing view.

The overall significance of the visual effect is a function of the values for the sensitivity of the visual receptor and for the magnitude of the visual effect.

### 11.3.1 Visual Impact from Land

The visual impacts of any new coastal defences and the ongoing beach management works are most apparent to those living behind the eastern end of the promenade just to the west of Eastoke Point, and to those walking along the beaches around Eastoke Point. These impacts are considered to be slight adverse. The beach re-nourishment works would enhance the existing beachscape, by covering the existing groynes, increasing the beach width and resulting in a more attractive beach profile (minor beneficial impact). There are visual impacts for the residents of the properties bordering the beach, where beach levels may obscure views. Beach users have an elevated view due to the raised beach levels and these could be considered to be slightly beneficial.

### 11.3.2 Visual Impact from the sea

The visual impacts of the new coastal defences from the Eastoke Point Scheme were apparent from sea by boats travelling into Chichester Harbour. The landscape strategy is to conserve and enhance the local character and it states that there should be an aim to 'avoid structures on the storm beach which would be visible from the sea.'

It was considered at the time that the visual impact of the construction of the rock groynes was less prominent on the skyline than the previous decaying timber groynes because only a maximum of 1 metre of large rocks protrude above the beach material. Because of this, the visual impacts of the capital defence works were regarded as of medium-high or high sensitivity. The design of the defence scheme took this level of sensitivity into account with a view to keep visual impact of the finished construction to a minimum. The continual beach management activities to maintain a specific height of shingle on the beach and around the groynes will continue to keep the visual impact at a minimum. Therefore the ongoing beach management works will have a beneficial effect to minimise the exposure of the rock groynes therefore minimising the visual impact of the works.

For the Eastoke works, the Landscape and Visual Impact Assessment concluded that 'the proposed sea defences could be successfully accommodated within the landscape without causing significant harm to the surrounding landscape character, visual amenity or landscape elements of the area. Therefore the ongoing beach management activities will not have any additional effect but will however help to maintain a shingle beach and prevent the exposure of both new and old defence

structures.

### 11.3.3 Impacts on Tourism

Tourism is an important feature of Havant borough's economy. It attracted c.2.9 million visitors in 2013 which was valued at c. £155 million providing employment for 4,265 people (Tourism South East , 2013). Many of these jobs are seasonal and part-time, therefore any operation would be timed to avoid peak visitor periods during the summer unless in exceptional circumstances, for example in an emergency.

Additional signage should be erected at the western end of the beach to highlight when and why the works are going to take place, to try to inform beach hut owners and the public about the importance of the ongoing works.

The beach management approach maintains the beach at Eastoke, one of the main draws to the area. Other defence options could heavily impact the beach's integrity which would have far reaching consequences for the tourism and therefore economy of Hayling Island. For example, a "Do Nothing" approach would lead to the eventual loss of the beach and therefore a potentially devastating loss of the primary attraction to the area.

The annual beach recycling operations aim to maintain the beach frontage as far as is practically possible and does not propose to significantly alter the appearance of the Eastoke frontage. Therefore it can be concluded that the impact is neutral.

### 11.3.4 Impacts on residents and recreational users

During the construction period, visual impacts would be experienced by residents and recreational users on the coastal frontage and sea-farers, as a result of the presence of construction plant (notably bulldozers, excavators and barges), heavy goods vehicles, personnel and stored materials/site compounds. These temporary local impacts are very subjective and could be considered as slight adverse by local residents and recreational users. The visual impacts are not considered to be significant, except if works were undertaken during the main holiday season.

Sea-farers would have a distant view of the re-nourishment operation and the temporary impact is therefore considered to be slight adverse to neutral.

Should material be brought in by road, it would be stored in piles at the Eastoke Corner car park until it can be transported along the beach, as it has been in past operations. There will be a temporary slight adverse impact resulting from shingle piles in the carpark.

The contractor's compound will be located in the site compound as indicated on **Figure 4.8**. There will be no additional impact as a result of the ongoing activities.

The annual beach recycling operations aim to maintain the beach frontage as far as is practically possible and does not propose to significantly alter the appearance of the South Hayling Island frontage. The South Hayling Island frontage is a very dynamic environment, the beach profile can dramatically change over a stormy period. The BMP activities will endeavour to create a natural looking beach in areas of recycling and deposition, any temporary effects will be very quickly 'naturalised' by the active geomorphology.

The Landscape and Visual Impact Assessment concludes that the proposed sea defences could be successfully accommodated within the landscape without causing significant harm to the surrounding landscape character, visual amenity or landscape elements of the area. Any potential impacts are summarised in **Table 11.2** and **Table 11.3** highlights any necessary mitigation to reduce the impact / make the impact acceptable.

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**Table 11.2: Potential impacts of delivery of the BMP on the landscape and visual amenity. Impacts highlighted orange require further mitigation (See Figure 1.1 for location of BMP units and Section 4 for details of proposed unit by unit activities).**

| Potential Effects of Beach Management Operations | BMP U1 | BMP U2 | BMP U3 | BMP U4 | BMP U5 | BMP U6 | BMP U7 | BMP U8 | Other areas of Impact |
|---|---|---|---|---|---|---|---|---|---|
| **Overall works during construction** | The visual impacts are considered to be short term and temporary, therefore impacts are negligible. The works are thought to be minor beneficial as they will help to maintain a healthy shingle beach that prevents the exposure of both new and old defence structures. It will increase the beach width and result in a more attractive beach profile. Sea-farers would have a distant view of the re-nourishment operation and the temporary impact is therefore considered to be slight adverse to neutral. | | | | | | | | |
| **Recycling and recharge activities** | Short term and temporary effect on visual amenity for the duration of the works due to plant machinery on site. | Short term and temporary effect on visual amenity for the duration of the works. Plant Machinery on site, beach material stockpiled temporarily in carpark and on beach then immediately re-profiled. Rainbowing ashore can provoke interest from passers by, however beach access will be restricted for public safety. | | Short term and temporary effect on visual amenity for the duration of the works due to plant machinery on site. | | | | Minimal works within this unit, therefore negligible impact. | The presence of machinery during the construction works would temporarily impact upon the local landscape character and the AONB. This impact could be considered to be minor adverse.<br><br>The raising of beach levels may enhance the view of the beach gained by pedestrians walking along the coastal footpath or crest of the beach if the composition of material used is appropriate. This impact could be considered as slight beneficial. |
| **Tracking on the Beach; moving material along the beach** | Short term and temporary effect on visual amenity for the duration of the works; machinery on beach. | | | | | | | Minimal works within this unit, therefore negligible impact. | The contractor's compound located within area U3 is hidden within the existing housing bordering the beach. There will be no additional impact as a result of the ongoing activities |
| **Operational impacts following BMP activities** | No operational impact – Beneficial for functioning of the sailing club | Beneficial Impact; by increasing the amount of shingle, the sea defence structures will be covered creating a more 'natural' beach viewed from both land and sea. This also benefits tourism and use of the beach | | | No operational Impact | | | | The beach re-nourishment works would enhance the existing beachscape by covering the existing groynes, increasing the beach width and resulting in a more attractive beach profile (minor beneficial impact).<br>The South Hayling Island frontage is a very dynamic environment, the beach profile can dramatically change over a stormy period. The beach management activities will endeavour to create a natural looking beach in areas of recycling and deposition, any temporary effects will be very quickly 'naturalised' by the active coastal processes |

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## 11.4 Landscape and Visual Amenity: Mitigation and residual impacts

**Table 11.3** details specific mitigation for the impacts identified in **Table 11.2** (those which are highlighted orange), to ensure the BMP works can be delivered without a significant negative effect on Landscape and Visual Amenity. A Construction and Environmental Management Plan (CEMP) will be developed and submitted in advance of each BMP campaign.

**Table 11.3 Potential Impacts on Landscape and Visual Amienty, necessary mitigation and residual impacts**

| Impact | Mitigation | Resultant/Residual Impact |
|---|---|---|
| **Temporary effect on visual amenity for the duration of the works. Plant machinery on site, beach material storage mounds immediately prior to re-profiling** | • Length of construction works will be limited to as short a time as possible. The works will not take place over the weekend or on public holidays or during the main tourist season (unless there is a need for emergency works), limiting the impacts on visitors to the area;<br>• A tidy site policy would be employed by the contractor and consequently there would be no significant residual impacts; | • Negligible risk of impact. |

## 11.5 Conclusions

For the capital works at Eastoke (completed in 2013), the Landscape and Visual Impact Assessment concluded that the proposed sea defences could be successfully accommodated within the landscape without causing significant harm to the surrounding landscape character, visual amenity or landscape elements of the area. Therefore the ongoing beach management activities will not have any additional negative effect. There will be a minor beneficial effect as it will help to maintain a beach that has shingle on it and prevent the exposure of both new and old defence structures. It will increase the beach width and result in a more attractive beach profile.

The length of the construction works will be limited to as short a time as possible. The works will not take place over the weekend or on public holidays or during the main tourist season (unless there is a need for emergency works), limiting the impacts on the landscape and visual amenity of the area as well as on residents and visitors to the area.

# 12. WATER ENVIRONMENT

## 12.1 Introduction

The water environment impacts associated with the proposed works are considered in detail in the Water Framework Directive (WFD) Assessment as a 'stand alone' document to this Environmental Statement. It has been prepared to demonstrate that the Beach Management Activities can continue to be delivered and adapted whilst still being compliant with the EU Water Framework Directive. The WFD Assessment can be found in **Appendix D.**

## 12.2 Baseline Conditions

**Section 4** of the WFD assessment (**Appendix D**), provides the background status of all the potentially affected WFD water bodies and protected areas. The four WFD Water Bodies are:

- Langstone Harbour
- Chichester Harbour
- The Solent
- East Wight

The relevant protected areas include;

- Bathing Waters
- Shellfish Waters
- Nitrates Directive
- Habitats Directive - Natura 2000 sites Solent Maritime Special Area of Conservation (SAC).
- Conservation of Wild Bird Directives - Natura 2000 sites – Chichester and Langstone Special Protection Area (SPA) and Ramsar Sites

## 12.3 Potential Impacts, Mitigation and Residual Impacts

The WFD Assessment thoroughly considers potential impacts of the on-going Beach Management activities that have been taking place since 1985 and also the potential additional impacts from the extension of the works to include both extremities of the South Hayling Coastline, as detailed in **Section 4** of this Environmental Statement. The assessment considers any impacts that could prevent the WFD water bodies achieving good ecological potential and will ensure that the chemical status of the water bodies does not lead to deterioration as a result of the works. Any opportunities where these works could contribute towards the River Basin Management Plan objectives have been identified in **Section 6** of the WFD assessment (**Appendix D**)**.**

## 12.4 Conclusions

Impacts have not been considered to be a problem in the past, there have been no failures in Bathing water quality or Shellfish water or pollution events as a result of the works which have been taking place since 1985. Restrictions and precautions on all future works will be equivalent or tighter than previously to ensure that the works will not have an impact in the future. Any impacts on the Natura 2000 (and SSSI) sites have been mitigated for through other proposed restrictions on the timings and not accessing sensitive areas when the SPA birds are using the site. This has been detailed within the Habitat Regulations Assessment (**see Section 9 of this ES**).

It has been concluded both alone and in combination that the on-going beach management works on the South Coast of Hayling Island will not;

- cause a deterioration or change that could cause a failure for the four water bodies to meet good ecological potential.
- cause or permanently prevent or compromise the Environmental Objectives being met in other water bodies' WFD objectives.
- trigger a non-temporary failure of the water body for any priority hazardous substances at water body scale (including dissolved oxygen)

Any resultant impacts after the restrictions and mitigation measures have been adopted will be of a minimal, localised and temporary nature.

# 13. ARCHAEOLOGY AND HERITAGE

## 13.1 Introduction

This section of the Environmental Statement considers the impacts of the proposed BMP on any archaeological and heritage assets.

Given that the proposed BMP activities are located either onshore or on the foreshore (intertidal zone), the focus of this assessment is on the known designated terrestrial and intertidal archaeological and historic resource, located within, or in the vicinity of the beach management activities.

The term 'heritage assets' is taken to include both built assets, such as buildings and monuments, and landscape assets such as designated Conservation Areas.

There is naturally some overlap between heritage and archaeology, and the heritage impacts are discussed later in this section.

## 13.2 Baseline Information for Archaeology

### 13.2.1 Historic Character - Archaeology

The Eastern Solent coastline and adjoining harbours comprise historic landscapes which have been utilised from pre-historic periods to the present day. Successive phases of sea level rise have created the Solent and enabled archaeological deposits to be inundated and preserved.

As a flooded former river valley drowned during the Holocene marine transgression, Chichester Harbour is known to be an area of particularly high archaeological potential.

The coastline was up to 40 km seaward of its current location during some parts of the Mesolithic period and the coastal zone is rich in evidence of Mesolithic activity.

However the valley/bowl that is now Langstone Harbour was an area of freshwater fen and a route between the coast and the chalk. The archaeological evidence is consistent with repeated short lived hunting visits by small parties.

#### 13.2.1.1 Prehistoric Period (c. 500,000 BP – 43 AD)

A prehistoric settlement site was identified at East Head (West Wittering, West Sussex) and at Gutner Common (North Hayling, Hampshire). A thin layer of black burnt material extending 23m along a low sea cliff contains burnt flint pot boilers sealed by alluvium which have been interpreted as representing prehistoric land clearance.

Within the Solent, many Mesolithic (12,000 – 4,000 BC) artefacts have been found on the shore and from dredged material, however these artefacts could have originated from camps and settlements on the coastal plain some distance from the shore which has eroded back to release them into the intertidal zone.

The potential for the recovery of prehistoric archaeology is unknown. There could be moderate to high potential for archaeological sites below or inland from the mobile shingle, but within the mobile shingle the provenance of any finds would be impossible to determine as they would have been moved along the coast and therefore any finds have very limited archaeological value.

There are no mechanisms in the works which will impinge on artefacts found 'under' the beach as the works will only be impacting the upper layers of the beach within the mobile section. Nor will there be works inland from the beach.

#### 13.2.1.2 Bronze Age (2,000 – 600 BC)

In the Early Bronze Age Chichester Harbour was used for seasonal grazing and perhaps butchery and hide preparation. From the mid to late Bronze Age there is extensive evidence of settlement and farming systems with enclosures. Roundhouses have been found on the coastal plain at Creek Field, Hayling Island and a rare Late Bronze Age structure consisting of timbers and an area of wattle has been found on the north coast of the island. A hoard of six mid Bronze Age palstaves (bronze axe) were found on the east coast of Hayling Island in 1985 which may be associated with an urnfield, where the cremated remains were placed in pottery vessels (cinerary urns) and buried. Bronze axes have also been found on Hayling Island which may have come from France, suggesting trading took place.

The potential for the recovery of Bronze Age archaeology is unknown although if works are undertaken within the location of human activity, the potential may be moderate to high for archaeological sites below or inland from the mobile shingle, but

within the mobile shingle. The provenance of any finds would be impossible to determine and therefore any finds have very limited archaeological value.

There are no mechanisms in the works which will impinge on artefacts found 'under' the beach as the works will only be impacting the upper layers of the beach within the mobile section. There will also be no works inland from the beach.

#### 13.2.1.3 Iron Age (600 BC – AD 43)

A small rise in sea levels in the Iron Age is likely to have had a significant impact on the study area and the ingress of saltwater would have meant that saltmarsh became more established in Chichester Harbour. There are important links between salt workings and sites on Hayling Island including Tourner Bury Hill fort which commanded the western part of the entrance to Chichester Harbour (first documented in AD 1518 as land called Tornors).

The potential for the recovery of Iron Age archaeology is unknown. There could be a high potential for archaeological sites below or inland from the mobile shingle. Within the mobile shingle, the provenance of any finds would be impossible to determine as they would have been moved along the coast and therefore any finds have very limited archaeological value.

There are no mechanisms in the works which will impinge on artefacts found 'under' the beach as the works will only be impacting the upper layers of the beach within the mobile section, nor will there be works inland from the beach.

#### 13.2.1.4 Roman Period (43BC - AD410)

The Roman invasion of AD43 resulted in major changes in social and economic conditions and the location of the landing spot has been the subject of much debate with Richborough in Kent being favoured, although locations in the Chichester/Solent area have also been suggested. There is some evidence of an early Roman military presence in Chichester and many artefacts have been found in the area including a bronze helmet (Coolus type F helmet) dredged up from Chichester harbour and stray finds of pottery.

The potential for the recovery of Roman archaeology is unknown. There could be moderate high potential for archaeological sites below or inland from the mobile shingle, but within the mobile shingle. The provenance of any finds would be impossible to determine as they would have been moved along the coast and therefore any finds have very limited archaeological value.

There are no mechanisms in the works which will impinge on artefacts found 'under'

the beach as the works will only be impacting the upper layers of the beach within the mobile section, nor will there be works inland from the beach.

#### 13.2.1.5 Early Medieval Period (AD410 - 1066)

The Early Medieval period contrasted greatly to the Roman period. It is possible that there may have been trade in Chichester Harbour in this period. Chichester was one of the five fortified sites mentioned in the Burghal Hidage, an Anglo- Saxon document that was probably compiled in c. AD 919. Chichester developed into a major town in the 10th century and increasing trade is likely to have led to the revival of the harbour as a port.

The potential for the recovery of early medieval archaeology is unknown. There could be moderate high potential for archaeological sites below or inland from the mobile shingle, but within the mobile shingle. The provenance of any finds would be impossible to determine as they would have been moved along the coast and therefore any finds have very limited archaeological value.

There are no mechanisms in the works which will impinge on artefacts found 'under' the beach as the works will only be impacting the upper layers of the beach within the mobile section, nor will there be works inland from the beach.

#### 13.2.1.6 Later Medieval Period (AD1066-1550)

During this period, the medieval landscape would have comprised of villages scattered around parish churches. The harbour industries would have consisted of fishing, oyster farming, saltworking and boat building, and trade would have been an important aspect of the harbour's economy. Wool seems to have been an important commodity passing through the Port of Chichester in the 13th century.

By the end of the 13th century, there seems to have been a period of increased flooding within the area linked to growing storminess and a slight rise in sea level. A considerable area of land belonging to the Priory on Hayling Island was lost to the sea in the 14th century.

In South Hayling three salterns are known; one medieval and two post-medieval. The medieval example was the largest, known as Menghams (Hants SMR 23,332.00) and recorded in the Domesday Book as paying 6/8d. The salterns went out of use in the 1870s and by the 1950s there were no recognisable traces of them.

The potential for the recovery of late medieval archaeology is unknown. There could be moderate high potential for archaeological sites below or inland from the mobile shingle, but within the mobile shingle. The provenance of any finds would be

impossible to determine as they would have been moved along the coast and therefore any finds have very limited archaeological value.

There are no mechanisms in the works which will impinge on artefacts found ‘under’ the beach as the works will only be impacting the upper layers of the beach within the mobile section, nor will there be works inland from the beach.

#### 13.2.1.7 Post-Medieval (AD1550-1800) and Modern Period (AD 1800+)

The area comprises a number of post-medieval and industrial features that include mills (e.g. Hayling Island Tide Mill), harbour piles, salterns in North Hayling, historic gardens and oyster beds.

The Saxton’s map of 1575 is one of the earliest maps of the AONB and shows Hayling Island as detached from the mainland, with channels shown as extending to Chichester.

In World War II, many shorelines in the harbours were defended with concrete blocks, used as anti-invasion defences. A boom was placed across the mouth of the Chichester Harbour, secured to underwater concrete pillars. There were also a number of pillboxes and machine gun placements installed along the coast.

The potential for the recovery of post medieval and modern archaeology is unknown. There is some potential to encounter archaeological evidence associated with the military defence of the coast in the last war. However the provenance of any finds would be impossible to determine as they would have been moved along the coast and therefore any finds have very limited archaeological value.

There are no mechanisms in the works which will impinge on artefacts found ‘under’ the beach as the works will only be impacting the upper layers of the beach within the mobile section. Where the extraction of mobile shingle or the process of depositing shingle reveals archaeological evidence of the military coastal defence these are likely to be large scale and robust and the operation will adapt to avoid damage or removal of these items, although they may be reburied during the process.

Although situated further into the mouth of the Harbour than the BMP extends, the Mulberry Harbour; a large concrete structure which is now partially submerged is a historically significant structure (**Photo 13.1**). It is a 'Type Phoenix Unit' and was part of a caisson built to form part of the outer breakwater for the Harbour at Arromanches in Normandy in support of the D-Day landings. The structure was built on Hayling Island, just south of the Ferry Boat Inn within BMP Unit 8, and the concrete remains of the launching ramps and mooring blocks can still be seen within

BMP Unit 8 (**Photo 13.2**). These structures will not be touched or disturbed as part of the very small scale works within BMP Unit 8. The launch ramps will however on occasions be more exposed than others when more material will have accreted on them, but this is the natural sediment changes encountered on a dynamic coastal location. Preventing localised landward erosion within BMP unit 8 will help protect these structures.



**Photo 13.1: Section of Mulberry Harbour within Langstone Harbour**



**Photo 13.2: Concrete remains of launching ramps at Entrance to Langstone Harbour (BMP Unit 8).**

**Table 13.1** contains information on any potential features of archaeological interest,

highlighting their proximity to the proposed BMP frontage. It also assesses any potential impacts that the BMP activities could have on these.

### 13.2.2 Historic Landscape Character

The central and southern Open Coastal Plain was a landscape predominantly of informal piecemeal enclosures, an irregular pattern of wavy boundary, medium sized, rectilinear fields. Modern 20th century agricultural practices of grubbing out hedges and huge coastal housing development has dramatically altered and degraded the original informal enclosure landscape. Today the fields are generally large with few hedges and in places relic mature oaks survive as indicators of old hedgerows.

### 13.2.3 Built Environment

Leisure interest on the coast from late Georgian times sparked gradual development on South Hayling, first at Westfield with grand developments such as the Crescent and Royal Hotel and associated villas. It was not until the rail extension (the Hayling Billy) in the mid1860s, and later mass car ownership particularly in the 1930s that development exploded particularly at Mengham and Eastoke. Buildings of more significant stature are concentrated in the southwest, i.e. arts and craft style residencies at Westfield and near West Town and the 1930s cubist houses on Sinah lane and Hayling Island golf clubhouse. Recent housing developments have been very varied in style and size resulting in an eclectic architectural mix. The island's popularity continued until the 1970s. There are several large camping and static caravan sites with a central and eastern distribution, the larger ones include sites at Tye, Newtown and Eastoke.

There are numerous pill boxes and other coastal defences of Second World War origin. These are particularly concentrated on the south west coastline protecting the entrance to Langstone Harbour. However the works in this area are so limited they will not be impacted in any way

## 13.3 Baseline Information for Heritage Assets

### 13.3.1 Scheduled Monuments

#### 13.3.1.1 Conservation Areas Ancient Monuments and Archaeological Areas Act 1979 (as amended)

Under the terms of the act an archaeological site or historic building of national importance can be designated as a Scheduled Monument and is registered with the Department of Culture, Media and Sport [DCMS]. Any development that might affect

either the Scheduled Monument or its setting is subject to the granting of Scheduled Monument Consent. Historic England [HE] advises the government on individual cases for consent and offers advice on the management of Scheduled Monuments. It is an offence to disturb a Scheduled Monument by carrying out works without consent, cause reckless or deliberate damage to a monument, use a metal detector or remove an object found at a Scheduled site without a licence from HE.

Historic England has confirmed that there are no Scheduled Monuments within the study area. There is a Scheduled Monument located on the landward side of Sinah Common, however the proposed works are approximately 500 meters away and there is no risk of impacts. There are no Scheduled Monuments located within the area of interest. And therefore will not be considered any further.

### 13.3.2 Planning (Listed Buildings and Conservation Areas) Act (1990)

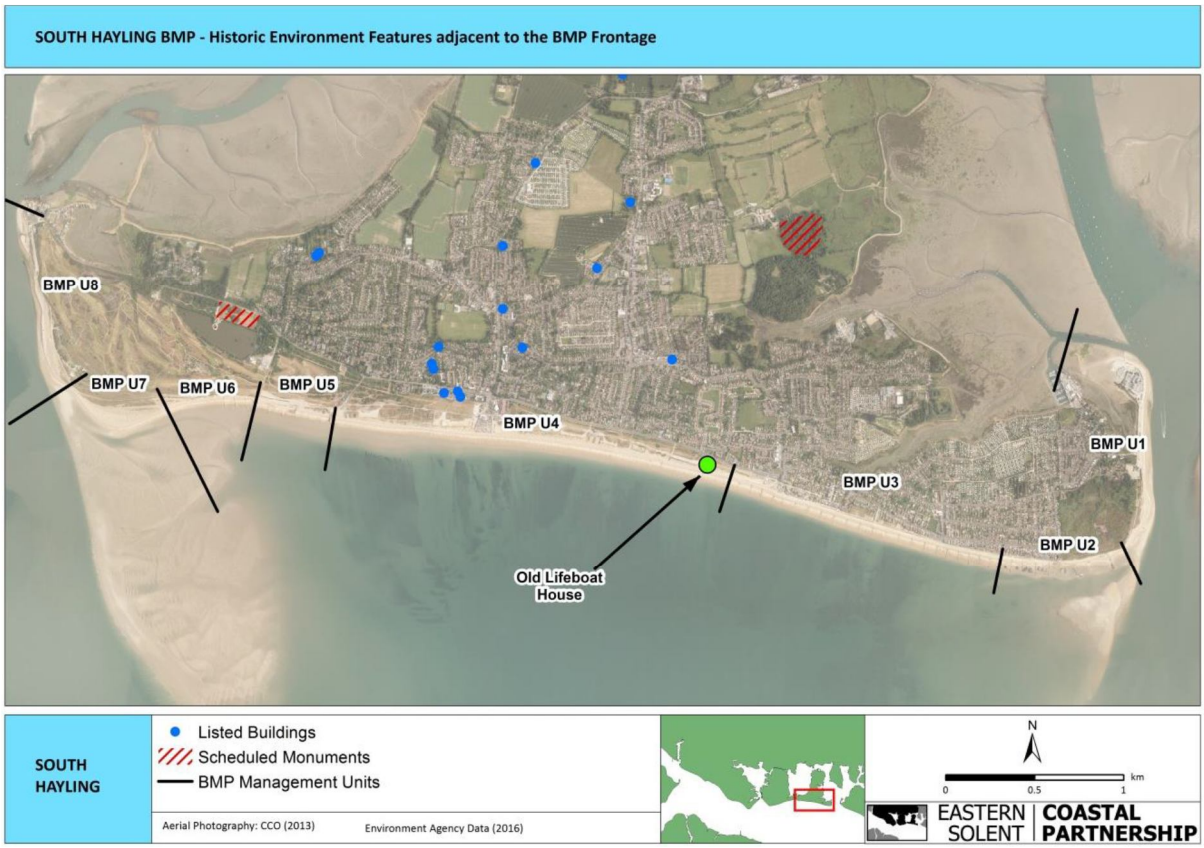
The Planning (Listed Buildings and Conservation Areas) Act 1990 covers the registration of Listed Buildings (buildings that are seen to be of special architectural or historic interest) and designation of Conservation Areas (areas of special architectural or historic interest the character or appearance of which it is desirable to preserve or enhance).

A Listed Building may not be demolished, altered or extended in any manner which would affect its character as a building of special architectural or historic interest without Listed Building Consent being granted. There are three grades of listing (in descending order):

- Grade I: buildings of exceptional interest;
- Grade II*: particularly important buildings of more than special interest; and
- Grade II: buildings of special interest, warranting every effort to preserve them.

There are no listed Buildings within the study area, however The Old Lifeboat House, is a building of local interest located 50 metres behind the active beach. **Figure 13.1** illustrates the Listed Buildings and Scheduled Monuments located on the South of Hayling Island Peninsula. All of these features are outside the influence of the works and are therefore not considered in any more detail within this ES.

**Figure 13.1 Heritage Assets in the area of the proposed South Hayling Island BMP**




### 13.3.3 National Planning Policy Framework

Section 12 (paragraphs 126 – 141) of the National Planning Policy Framework (Conserving and enhancing the historic environment) outlines policies relating to the historic environment and the key role it plays in the Government's definition of sustainable development, the principle which underpins the document.

The Framework recognises that 'heritage assets are an irreplaceable resource' and should be conserved 'in a manner appropriate to their significance' and requires that planning applicants should 'describe the significance of any heritage assets affected' by their application, 'including any contribution made by their setting'.

Although the Framework replaces Planning Policy Statement 5, Planning for the Historic Environment, which previously dealt with the historic environment within the planning process, the Historic Environment Planning Practice Guide (revision note in June 2012) which accompanied that document, remains in force for the time being to assist in the interpretation of National Planning Policy Framework policies relating to the historic environment.

### 13.3.4 Historic England Register of Parks and Gardens in England

The Register of Parks and Gardens of Special Historic Interest in England is maintained by Historic England and divides the sites into three grade bands similar to those used for Listed Buildings. There are no registered parks and gardens within the area where Beach Management Activities take place.

### 13.3.5 Conservation Areas

No Conservation Areas (an area of special architectural or historic interest, the character or appearance of which it is desirable to preserve or enhance) lie within the study area.

### 13.3.6 Non-designated Archaeology

There are a number of World War II defence remnants on the beach which are classified as coastal crust infrastructure. These consist of remnants of pillboxes, antitank blocks and anti-tank obstacles, which are generally found in the mobile section of the beach. These remnants have also, in the past, been incorporated into flood defence structures.

There are two old lifeboat stations; the oldest is the public house Inn On the Beach and the newer of the two is the Army cadet hall behind the current Coastguard station. The old lifeboat station is a building of local interest which is located meters behind the active beach (**Figure 13.1**). It will not be impacted by the operational works, but will benefit from the added protection provided by the continued Beach Management Activities.

### 13.3.7 Heritage Statement

The risk of impacting any unknown archaeology or heritage assets is low, therefore there is no requirement to produce a Heritage Statement in support of the works. However, appropriate measures will be put in place, as detailed later in this chapter of the Environment Statement, which will minimise any risk of impacting archaeology or heritage assets known or unknown.

## 13.4 Archaeological Features of Interest

**Table 13.1** summarises information from Hampshire County's Archaeologist / Havant Borough Council's Archaeological Advisor (Feb 2015). It contains an assessment of the potential impacts of BMP activities on these features of interest.

**Table 13.1** Information from Hampshire County Archaeologist / Havant Borough Council Archeologically advisor (Feb 2015). Includes assessment of potential impacts (maps available on request).

| Ref Number | Details | Source | Within area of tracking route – Impacted by Tracking Route | Deposition | Extraction |
|---|---|---|---|---|---|
| 26064 | Tank Trap<br>1) 45 concrete anti tank blocks.<br>Probably not in their original positions, may have been reused as sea defences. | Defence Line Survey (South) Hampshire County Museums Service | If reused within or built into sea defences – These will now remain in 'new' position, therefore no mechanism for impact.<br><br>The beach management operations will not interfere with these structures. | | |
| 26088 | Tank Trap<br>69 concrete anti tank blocks in a line between two pillboxes. "Aug 1940" scratched on one of them. | Defence Line Survey (South) Hampshire County Museums Service | Area to be used as an access track into Gunner Point – Archaeological remains likely to be within the intertidal area. No tracking in intertidal area in this specific location, therefore no mechanism for impact | Entrance to Sinah Common Deposition at the top of the beach – then used as a track. Archaeological remains likely to be within the intertidal area. No tracking in intertidal area in this specific location, therefore no mechanism for impact | N/A - no extraction in this location, therefore no mechanism for impact |
| 27691 | Pillbox<br>Pillbox - type 22. "Y" shaped internal blast wall. | Defence Line Survey (North) Aldershot Military Historical Trust | Very unlikely to be affected as outside area designated as a tracking route, therefore no mechanism for impact | N/A - there will be no deposition in this location, therefore no mechanism for impact | Very unlikely to be affected as outside area of extraction below the mean High Water Mark, therefore no mechanism for impact |
| 27692 | Pillbox<br>Pillbox - type 22. Remains of external blast wall. | Defence Line Survey (North) Aldershot Military Historic Trust | Very unlikely to be affected as outside area designated as a tracking route, therefore no mechanism for impact | N/A - there will be no deposition in this location, therefore no mechanism for impact | Very unlikely to be affected as outside area of extraction below the mean High Water Mark, therefore no mechanism for impact |
| 28020 | Pillbox | Defence Line Survey | Remains considered to be | N/A - there will be no | Remains considered to be |

| Ref Number | Details | Source | Within area of tracking route – Impacted by Tracking Route | Deposition | Extraction |
|---|---|---|---|---|---|
| | Pillbox - type 22. Loopholes and door block. Some attempt has been made to demolish. Loopholes are at ground level. | (North) Aldershot Military Historical Trust | higher up the beach and not impacted by any Beach Management Activities, therefore no mechanism for impact | deposition in this location, therefore no mechanism for impact | higher up the beach and not impacted by any Beach Management Activities, therefore no mechanism for impact |
| 28023 | Mary Ann - WRECK Abandoned Post Medieval "Mary Ann", British merchantman, stranded on the beach at "Wollsteners", Hayling Island, in 1851. | Hampshire and Wight Trust for Maritime Archaeology SMR | No works to take place in the sub-tidal area, therefore no mechanism for impact | | |
| 28024 | Surprise - WRECK "Surprise", vessel foundered two miles off Hayling Island, Solent, in 1853. | LARN Index | No works to take place in the sub-tidal area, therefore no mechanism for impact | | |
| 28027 | Longest Day - WRECK "Longest Day", British ketch, stranded on Eastoke Point, Hayling Island, in 1890 | LARN Index | No works to take place in the sub-tidal area, therefore no mechanism for impact | | |
| 28028 | Fairy King - WRECK "Fairy King", British schooner, stranded on the East Winner shoal, Hayling | LARN Index | No works to take place in the sub-tidal area, therefore no mechanism for impact | | |

| Ref Number | Details | Source | Within area of tracking route – Impacted by Tracking Route | Deposition | Extraction |
|---|---|---|---|---|---|
| | Island, in 1903. | | | | |
| 28101 | Pillbox<br>Pillbox - unclassified. Built into sea wall. Entrance through hatch in top. Locals advised that others were removed when the boat park was enlarged. | Defence Line Survey (North) Aldershot Military Historical Trust | If reused within or built into sea defences – These will now remain in 'new' position, therefore no mechanism for impact.<br>Therefore no potential impact from beach management activities | | |
| 64933 | WWII Pillbox on the Sea Front, Hayling Island (interpretation by South East RCZAS). | A survey of aerial photographs was carried out by Wessex Archaeology as part of the South East Rapid Coastal Zone Assessment Survey. SERCZAS number (Wessex Archaeology) | Pillbox thought to be located above the mean high water mark and outside of the active beach area therefore it will not be impacted by the beach management activities and therefore there is no mechanism for impact | | |
| 64934 | WWII Pillbox on the Sea Front, Hayling Island (interpretation by South East RCZAS). | A survey of aerial photographs was carried out by Wessex Archaeology as part of the South East Rapid Coastal Zone Assessment Survey. SERCZAS number (Wessex Archaeology) | Pillbox thought to be located above the mean high water mark and outside of the active beach area therefore it will not be impacted by the beach management activities and therefore there is no mechanism for impact | | |
| 64935 | WWII Pillbox on the Sea Front, Hayling Island (interpretation by South East | A survey of aerial photographs was carried out by Wessex Archaeology as part of | Pillbox thought to be located above the mean high water mark and outside of the active beach area therefore it will not be impacted by the beach management activities and therefore there is no mechanism for impact | | |

| Ref Number | Details | Source | Within area of tracking route – Impacted by Tracking Route | Deposition | Extraction |
|---|---|---|---|---|---|
| | RCZAS). | the South East Rapid Coastal Zone Assessment Survey. SERCZAS number (Wessex Archaeology) | | | |
| 64941 | Possible WWII gun pit, Hayling Island (interpretation by South East RCZAS). | A survey of aerial photographs was carried out by Wessex Archaeology as part of the South East Rapid Coastal Zone Assessment Survey. SERCZAS number (Wessex Archaeology) | The beach frontage in this location is very mobile. This will have been filled in by longshore drift over time and therefore will not be present on the beach, therefore no mechanism for impact | | |
| 65041 | Site of a WWII Pillbox variant FW3/22 (interpretation by South East RCZAS). | A survey of aerial photographs was carried out by Wessex Archaeology as part of the South East Rapid Coastal Zone Assessment Survey. SERCZAS number (Wessex Archaeology) | Archaeological remains likely to be within the intertidal area. The only area accessed by machinery in this location is above the high water mark, therefore there is no impact. | Entrance to Sinah Common Deposition at the top of the beach – then used as a track, therefore no mechanism for impact | Very unlikely to be affected as outside area of extraction, therefore no mechanism for impact |
| 65042 | WWII Anti Tank Defence<br>Tank Trap<br>Site of a WWII anti tank defence obstacle (interpretation by South East RCZAS). | A survey of aerial photographs was carried out by Wessex Archaeology as part of the South East Rapid Coastal Zone Assessment Survey. SERCZAS number (Wessex Archaeology) | Archaeological remains likely to be within the intertidal area. The only area accessed by machinery in this location is above the high water mark, therefore there is no impact. | Entrance to Sinah Common Deposition at the top of the beach – then used as a track, therefore no mechanism for impact | Very unlikely to be affected as outside area of extraction, therefore no mechanism for impact |
| 65043 | WWII Anti Tank | A survey of aerial | Area to be used as an | Entrance to Sinah Common | Very unlikely to be affected |

| Ref Number | Details | Source | Within area of tracking route – Impacted by Tracking Route | Deposition | Extraction |
|---|---|---|---|---|---|
| | Defence<br>Tank Trap<br>Site of a WWII anti tank defence obstacle (interpretation by South East RCZAS). | photographs was carried out by Wessex Archaeology as part of the South East Rapid Coastal Zone Assessment Survey. SERCZAS number (Wessex Archaeology) | access track into Gunner Point – Archaeological remains likely to be within the intertidal area. No tracking in intertidal area this specific location, therefore no mechanism for impact | Deposition at the top of the beach – then used as a track, therefore no mechanism for impact | as outside area of extraction, therefore no mechanism for impact |
| 65058 | Bomb Crater<br>Site of a WWI/WWII bomb crater (interpretation by South East RCZAS). | A survey of aerial photographs was carried out by Wessex Archaeology as part of the South East Rapid Coastal Zone Assessment Survey. SERCZAS number (Wessex Archaeology) | The beach frontage in this location is very mobile. This will have been filled in by longshore drift over time and therefore will not be present on the beach , therefore no mechanism for impact therefore no potential impact | | |
| 65153 | Site of life boat station, Hayling Island<br>Site of lifeboat station shown on historic mapping(interpretation by south east RCZAS) | A survey of aerial photographs was carried out by Wessex Archaeology as part of the South East Rapid Coastal Zone Assessment Survey. SERCZAS number (Wessex Archaeology) | Vehicles will exit the beach prior to this location and use road ‘behind’ the beach. – , therefore no mechanism for impact | | |

**English Heritage Search Information**

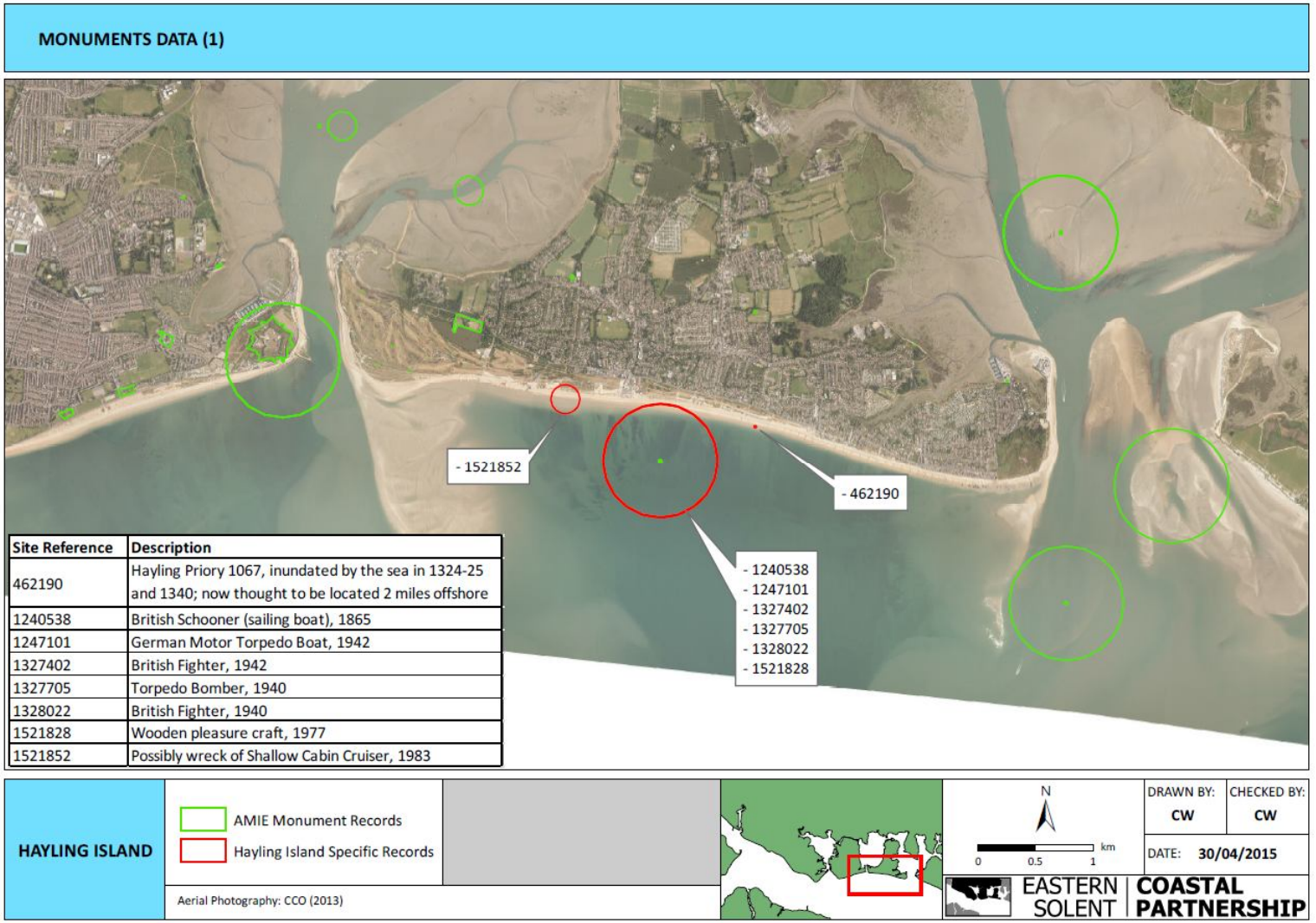
**Monuments 1** (see **Figure 13.2** for spatial location of these assets)

| English Heritage Ref Number | Details | Within area of tracking route – Impacted by Tracking Route | Deposition | Extraction |
|---|---|---|---|---|
| 1521852 | Possibly wreck of Shallom Cabin cruiser 1983. | No potential Impacts – in 10 meters of water depth. No works to take place within the sub-tidal zone | | |
| 462190 | Hayling Priory 1067, inundated by the sea 1324-5 and in 1340. | No potential Impacts – thought to be located 2 miles off shore.<br>No works to take place within the sub-tidal zone, therefore no mechanism for impact | | |
| 1327402 | British Fighter Plane 1942 | No potential impacts thought to be located off shore<br>No works to take place within the sub-tidal zone, therefore no mechanism for impact | | |
| 1240538 | British Schooner 1865 – Sailing Boat | | | |
| 1327705 | Torpedo Bomber 1940 | | | |
| 152828 | Wooden Pleasure craft 1977 | | | |
| 1247101 | German Motor Torpedo Boat 1942 | | | |
| 1328022 | British Fighter Bomber 1940 | | | |

**Monument 2 (**see **Figure 13.3** for spatial location of these assets**)**

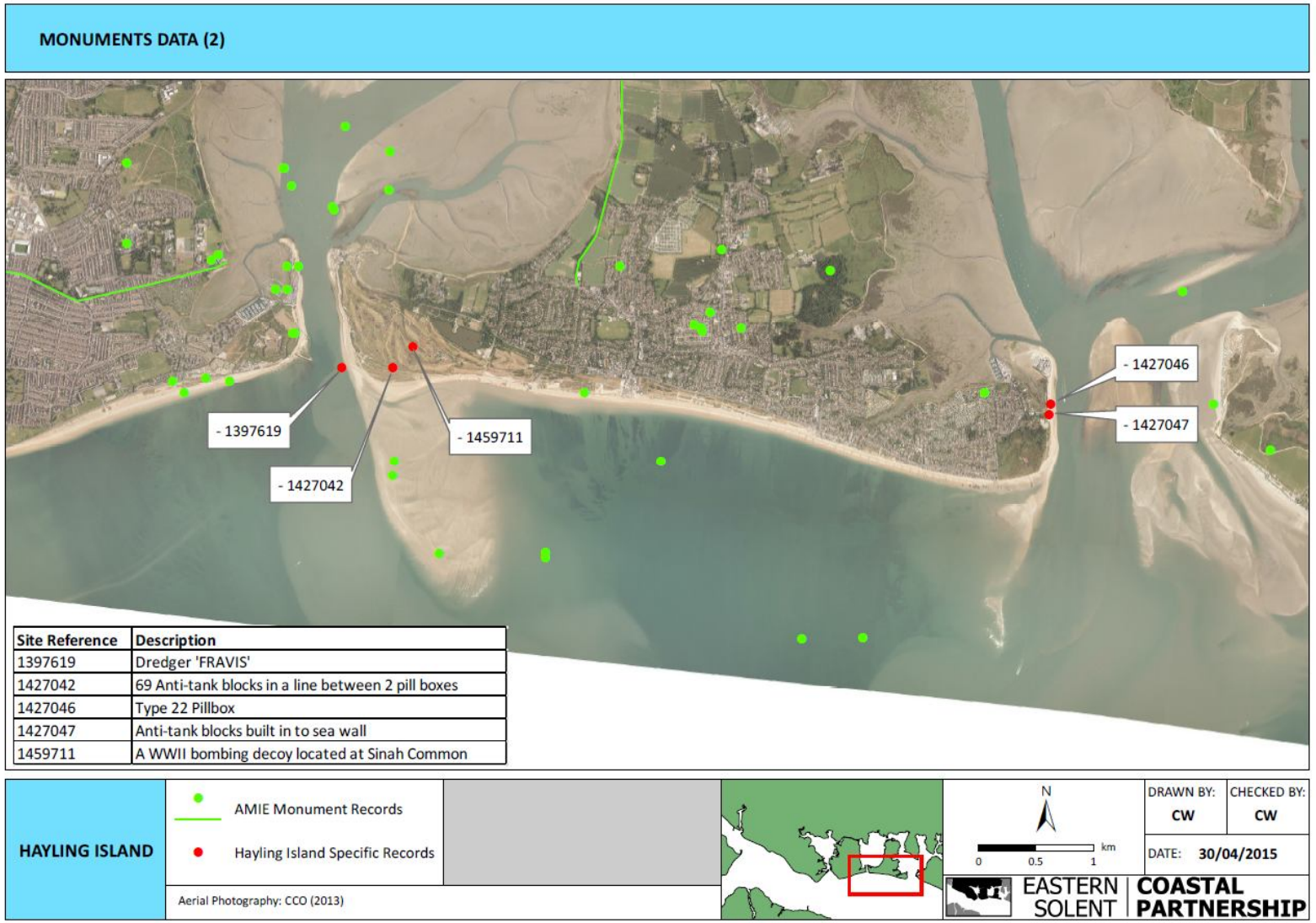
| English Heritage Ref Number | Details | Within area of tracking route – Impacted by Tracking Route | Deposition | Extraction |
|---|---|---|---|---|
| 1427046 | Type 22 Pillbox | No potential Impacts –in 10 meters of water depth<br>No works to take place within the sub-tidal zone, therefore no mechanism for impact | | |
| 1427047 | Anti-tank Blocks built into sea wall. | No potential Impacts – thought to be located 2 miles off shore.<br>No works to take place within the sub-tidal zone, therefore no mechanism for impact | | |
| 1397649 | Dredger 'Fravis' | No potential impacts thought to be located off shore<br>No works to take place within the sub-tidal zone, therefore no mechanism for impact | | |
| 1427042 | 69 Anti-tank blocks in a line in-between 2 pill boxes | Area to be used as an access track into Gunner Point – Archeologically remains likely to be within the intertidal area. No tracking in intertidal area this specific location, therefore no mechanism for impact | Entrance to Sinah Common<br>Deposition at the top of the beach – then used as a track<br>, therefore no mechanism for impact | Very unlikely to be affected as outside area of extraction. , therefore no mechanism for impact and therefore no potential impact |
| 1459711 | A Second World War bombing decoy located at Sinah Common on Hayling Island | No potential impacts as this decoy is located further inland. | | |

**Figure 13.2 Historic Monuments in the vicinity of the proposed Hayling Island BMP**




| Site Reference | Description |
|---|---|
| 462190 | Hayling Priory 1067, inundated by the sea in 1324-25 and 1340; now thought to be located 2 miles offshore |
| 1240538 | British Schooner (sailing boat), 1865 |
| 1247101 | German Motor Torpedo Boat, 1942 |
| 1327402 | British Fighter, 1942 |
| 1327705 | Torpedo Bomber, 1940 |
| 1328022 | British Fighter, 1940 |
| 1521828 | Wooden pleasure craft, 1977 |
| 1521852 | Possibly wreck of Shallow Cabin Cruiser, 1983 |

**Figure 13.3 Historic Monuments in the vicinity of the proposed Hayling Island BMP**



## 13.5 Assessing the mechanisms for impacts on archaeological remains

***1)*** **Extraction of beach sediment**

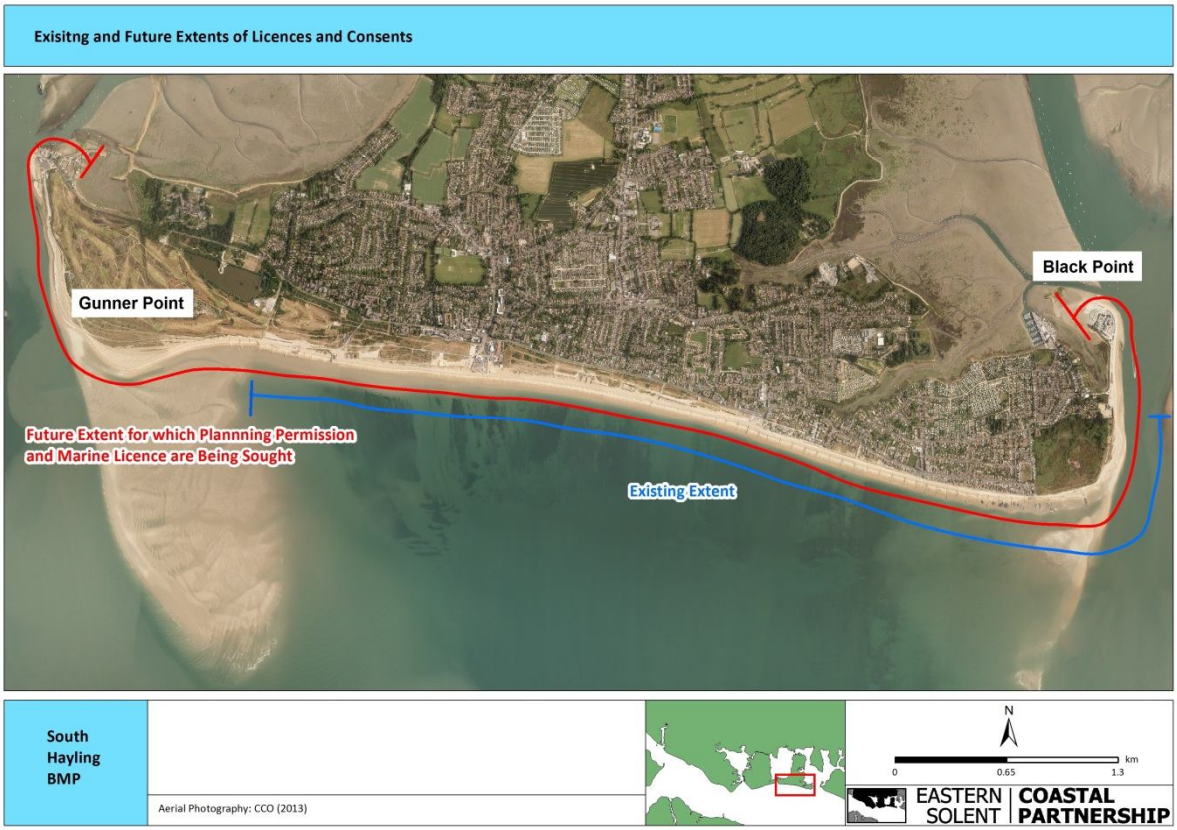
Due to the high level of human activity in the vicinity of the area, within Chichester and Langstone Harbours from the Mesolithic period onwards, there is a high likelihood of potential archaeological remains within the beach. However due to the evolution of the coast, these remains are likely to be intact inland or buried deep within the beach. Any extraction of material will only move sediment from the upper layers of the beach; therefore it is likely that any archaeological potential will remain undisturbed. It can therefore be concluded that there is no potential mechanism of impact for the high potential archaeological remains that will remain buried deep within the beach.

Due to the nature of this mobile location, if discovered these remains will not be in context and their origin impossible to establish and therefore the archaeological value would be reduced. The Beach Management Activities could potentially move these remains, however the impact of moving them has little or no consequence on the archaeological value, as they are already located within the active beach sediment, and therefore no impacts are expected.

If archaeological remains associated with military defence during World War II, known as the ‘coastal crust’, are encountered, these are likely to be large scale and robust. The extraction would be adapted to leave them in-situ. They would not be broken up.

The current scheme for recycling of beach sediment from areas of accretion to areas of erosion proposes to increase recycling from two sediment sinks. These are located at Gunner Point, the western tip of the South coast of Hayling Island (used as a emergency source of shingle in 2015) and Black Point, the eastern end of Hayling Island (which has not been included within the recycling activities in the past) See **Figure 13.4** for location details. Material from these areas will be transported back to Eastoke, where by longshore drift, it will return to the sinks over a number of years.

**Figure 13.4 Existing and proposed extent of BMP, highlighting the extension to Gunner Point and Black Point.**




### 13.5.1 Gunner Point

Gunner point is located at the western tip of the South Hayling Island open coast (see **Figure 13.4**). The Channel Coastal Observatory's Sediment Stores and Sinks Project has shown that this area has accreted nearly 250,000m$^3$ of material in the last ten years. At Gunner Point, the shoreline has moved seaward by some 200m since the 1830s resulting in the development of multiple shingle ridges. **Figure 13.5** shows the movement of the Mean High Water Mark (MHWM) from 1832 until 2007. Only the active part of this sediment sink will be utilised where the sediment has built up within the last 10 years (identified through rigorous monitoring). Any archaeological remains within the beach will remain untouched and any artefacts within the active beach sediment will have moved from its original location by longshore drift and therefore have limited archaeological value.

If archaeological remains associated with military defence during World War II, known as the 'coastal crust', are encountered, these are likely to be large scale and

robust. The extraction would be adapted to leave them in-situ. They would not be broken up.

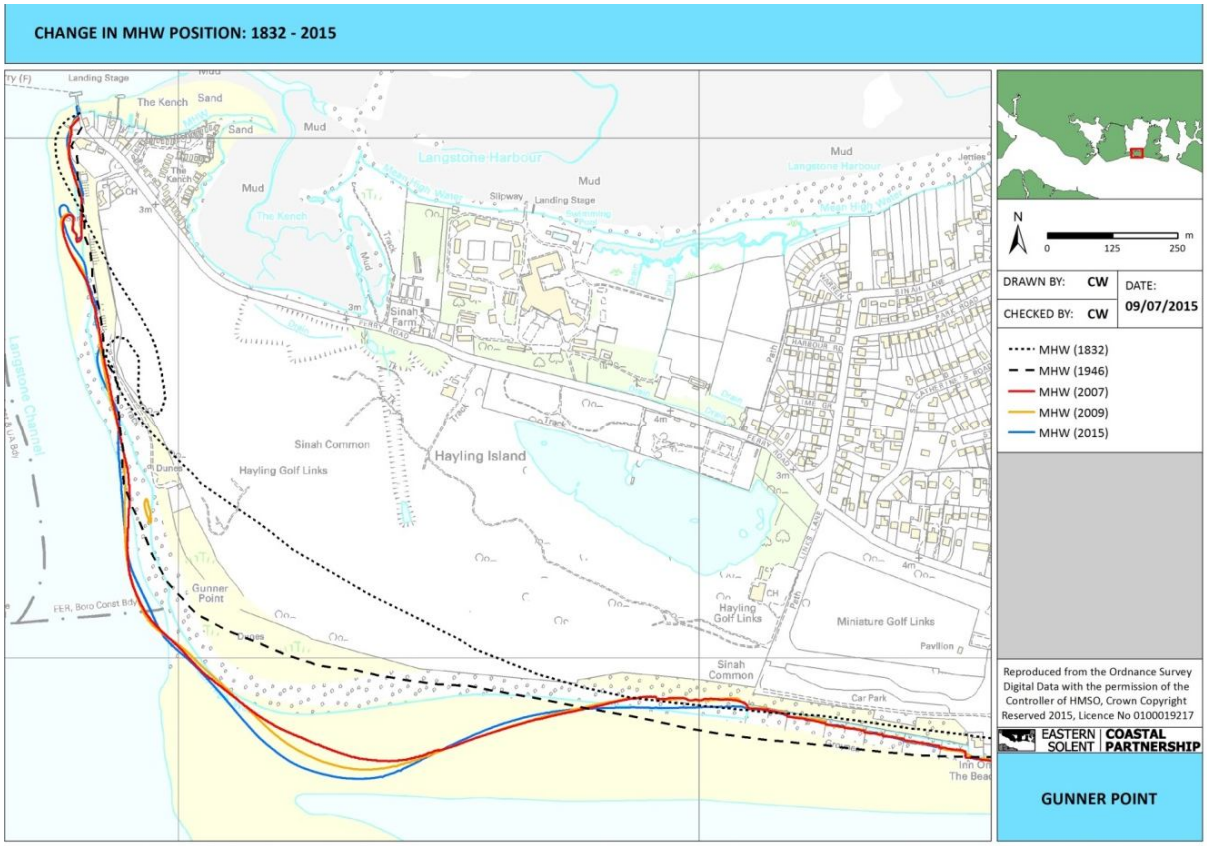



**Figure 13.5 South West Hayling Island MHW 1832 - 2015**

### 13.5.2 Black Point

Black Point is located at the very eastern end of Hayling Island, into the mouth of Chichester Harbour (western red line on **Figure 13.4**). The sediment at Black Point has been building up in a similar way to Gunner Point, although the sediment at Black Point is mainly sand, rather than shingle. Extraction from this location would take levels back to those when the pontoon was constructed in 1989, as detailed in **Section 4,** to allow the Hayling Island Sailing Club to use the facilities as they did when constructed. The sand will be transported to the area of Eastoke Point. This could be considered to have no impact on archaeological interest features, as only recently accreted sediment is being moved.

*2)* **Tracking along the beach**. There is a low potential risk that the tracking of heavy plant material could impact any archaeological features on or in the beach. Impacts could include crushing or compressing/ damaging interest

features. There are a number of Coastal Crust features from World War II on the beach in various locations which include anti-tank defence traps, anti-tank blocks, Pill boxes (or remnants of) and bomb craters. The bomb crater would already have been filled in due to the mobile nature of the beach. The access routes generally follow the crest of the beach where material was recently been deposited. The machines will avoid beach defence structures and other military structures if they are on the line of tracking, for example these structures will not be needlessly or thoughtlessly impacted.

Generally, archaeological potential for buried intact remains in the area are likely to be within the lower levels of the beach. Machines will be operated in such a manner as to avoid penetration to these lower levels by rutting, digging or scraping. If intact surfaces are currently exposed and are not covered by overlying sediment, they will be inspected by an archaeologist. Any archaeological evidence will be recorded and great care will be taken in the initial stages to ensure the remains are buried intact and not adversely impacted by the rutting or tracking of machines. As only the active beach material is to be moved and re-profiled on the beach, the potential impact of affecting buried archaeological interest is minimal.

*3)* **Deposition of sediment onto the beach either by machinery on the beach or rainbowing ashore:** Sediment can be sourced from three potential sources

a. The open beach - recycling
b. Off Shore Licenced aggregate sites. This is already an activity licensed by the MMO and has therefore already been assessed to be able to extract aggregates from the seabed. The licence would depend on the site where the material comes from.
c. The Chichester Harbour Approach channel dredge – This is undertaken by the Chichester Harbour Master under the duty for safe navigation and has been assessed under the Chichester Harbour Baseline Document to inform the dredging protocol which has been approved by the MMO. This project utilises the material back onto the beach through an operation known as rainbowing.

The method of deposition from the above sources is considered within this report. All these methods create mounds of sediment which is then re-profiled by bulldozers. The material is brought to the area by either:

- deposition by trucks from recycling activities,
- from material transported in by road or
- from sediment rainbowed onto the shore from a barge.

Although recycling material could impact buried archaeological features below the current beach levels, provision will be made as described above to avoid such penetration to the underlying levels. This build-up of material can be seen as having the potential to protect any underling archaeology from erosion or direct damage from the beach management works.

The level of flood protection along the South Hayling Frontage must remain at a certain level which has an unintended beneficial consequence on any potential archaeological interests. If the beach levels start to drop, trigger levels will be reached and another round of management works will be required. The beach works have to be carried out on a regular basis to maintain effective flood and erosion protection, which results in an unintended consequence of ensuring that any potential archaeological remains will remain covered and not exposed to erosion.

There is a potential that sea level rise and increased storminess will result in beach levels needing to be increased further to maintain the same level of protection (1:200). This will again protect any archaeology from erosion, ensuring that it remains deep within the beach.

**Table 13.2** summarises the potential impacts of the proposed BMP on the baseline historic environment, enabling the consideration of any necessary mitigation, which is set out in **Table 13.3**.

**Table 13.2 Potential impacts of the delivery of the BMP on archaeology and heritage. Impacts highlighted orange if requiring mitigation (See Figure 1.1 for location of BMP units and Section 4 for details of proposed unit by unit activities).**

| Potential Effects of Beach Management Operations | BMP U1 | BMP U2 | BMP U3 | BMP U4 | BMP U5 | BMP U6 | BMP U7 | BMP U8 | Other areas of Impact |
|---|---|---|---|---|---|---|---|---|---|
| Recycling materials through the excavation and placement of materials on the beach – uneathing potential archaeological interest features. | Removal of Sediment - Sediment has been accreting over a number of years. Only recently accreted material would be impacted, no or very low risk of impacting archaeology<br><br>There has been considerable accretion since the construction of the Hayling Island Sailing Club Pontoon in 1989.<br><br>Two archaeological assets identified. 28101 – Pillbox identified - Built into seawall. 26064 – 45 anti-tank blocks, identified that | Deposition of Sediment - There are a number of WWII remains, two possible pillboxes, a search light and defence works. These are above the high water mark within the boundaries of Sandy Point nature reserve and therefore no potential mechanism for impact from the works, therefore no impact.<br><br>Beneficial effect as beach management works aim to protect Sandy Point Nature reserve from erosion and flooding and therefore any as yet undiscovered archaeological remains.<br><br>One sub-tidal find spot has been identified however this was considered to have been as a result of deposition of | Deposition of sediment - Archaeological unknown material could be covered by additional material – beneficial effect from additional protection of archaeological remains. | Removal of Sediment - Various Coastal Crust infrastructure – e.g. WWII Tank defence obstacles, pill box remnant's and bomb crater. The access routes generally follow the crest of the beach where material was recently deposited. The machines will avoid beach defence structures and other military structures if they are on the line of tracking. For example these structures will not be needlessly or thoughtlessly be impacted. The archaeological potential will lie deep below the present accreted material. Machines will be operated in such a manner as to avoid penetration to these lower levels by rutting, digging or scraping. It is only the active beach that is managed. | | | | Very minor works in this unit to protect erosion of the hinterland. This will protect local assets. | Although moderate to high archaeological potential deep within the beach, there is no mechanism to impact on archaeological assets as a result of the recycling activities, therefore it can be concluded with confidence that there are no impacts.<br>Due to the nature of this mobile location, and remains discovered would be very hard to identify as they would not be in context and would have limited archaeological merit. The beach management activities could be seen to move these remains, however the impact of moving them has no consequence on the archaeological value, as they are already located within the active beach sediment. Therefore if any of the sediment extraction is taking place within this mobile part of the beach it can be considered to have no impact. |

| Potential Effects of Beach Management Operations | BMP U1 | BMP U2 | BMP U3 | BMP U4 | BMP U5 | BMP U6 | BMP U7 | BMP U8 | Other areas of Impact |
|---|---|---|---|---|---|---|---|---|---|
| | are now probably not in their original position. May have been reused within the sea wall. We will not impact either of these sites. | dredged material from Selsey Bill many years ago and therefore not relevant to these works | | | | | | | |
| Recharging materials via barge – rainbowing ashore | Rainbowing will not occur within this unit. | | This method of recharging beach materials does not have an impact on Archaeology. This method pumps new material on top of the existing beach material sediment which is then re-profiled by bulldozers. | Rainbowing will not occur within these units. | | | | | None. |
| Tracking on the Beach – damage to military structures | There is a potential although low risk that the tracking of heavy plant material could impact any archaeological features on or in the beach. Impacts could include crushing or compressing / damaging interest features. There are a number of Coastal Crust features from World War II on the beach in various locations this includes anti-tank defence traps, anti-tank blocks, Pill boxes (or remnants of), and bomb craters which have since been filled in. The access routes generally follow the crest of the beach where material has recently been deposited. The machines will avoid beach defence structures and other military structures if they are on the line of tracking, for example these structures will not be needlessly or thoughtlessly impacted. The archaeological potential will lie deep below the present accreted material. Machines will be operated in such a manner as to avoid penetration to these lower levels by rutting, digging or scraping. It is only the active beach material that is moved and re-profiled on the beach. This will again reduce any potential impact of affecting archaeological interests to the very minimum. | | | | | | | | None. |
| Operational Impacts | Maintaining healthy beach levels thought the proactive BMP activities will protect any archaeological assets of interest as discussed within this section. | | | | | | | | |

## 13.6 Archaeology and Heritage: Mitigation and residual impacts

**Table 13.3** details specific mitigation for the impacts identified in **Table 13.2** (those which are highlighted orange), to ensure the BMP works can be delivered without a significant negative effect on Archaeology and Heritage. A Construction and Environmental Management Plan (CEMP) will be developed and submitted in advance of each BMP campaign.

**Table 13.3 Mitigation for impacts identified in Table 13.2 and residual impacts**

| Impact | Mitigation | Resultant/Residual Impact |
|---|---|---|
| Recycling materials through the excavation and placement of materials on the beach – uneathing potential archaeological interest features. | The machines will avoid beach defence structures and other military structures if they are on the line of tracking/areas to be excavated or deposited.<br><br>The archaeological potential will lie below the present accreted material. Machines will be operated in such a manner as to avoid penetration and risking impact to buried artefacts by rutting, digging or scraping into the lower levels of the beach material. Material will only be moved that is within the active part of the beach i.e. material that has built up over the last five years, as a | If in the unlikely event that any archaeological remains are uncovered the site manager will contact the Havant Borough Council Archaeological advisor to determine the cause of action.<br><br>The Havant Borough Council Archaeological Advisor would determine if:<br><br>a) The finds were of sufficient merit to take further action or not<br>b) If finds of sufficient merit, they may need to be recorded and left in situ.<br>c) the finds are of sufficient merit to be recorded and excavated, to be preserved in an alternative location. |

| | | |
|---|---|---|
| | maximum. | |
| Tracking on the Beach – damage to military structures | The contracts will state that machines working on site will avoid beach defence structures and other military structures if they are on the line of tracking. No artefacts will be needlessly or thoughtlessly impacted. | No residual impacts. |

## 13.7 Archaeology and Heritage Conclusions

Although there is a high archaeological potential at levels under the beach, there is no mechanism by which these works could cause impacts on these remains, as the beach management works will only be moving the recently accreted material within the active layers of the beach. Care will be taken in the use and operation of the machinery.

Should the beach management works not be undertaken, which would likely result in erosion to the beach, it is likely that the risk to archaeological potential would increase. Therefore the beach management works are a key benefit to potential archaeological assets, by burying the potential remains, protecting them from the risk of erosion.

Any archaeological artefacts found within the mobile section of the beach could be impacted however these remains have limited archaeological merit as they are not in context to their surroundings due to the mobile nature of the environment. Archaeological evidence of the coastal crust, the defences of the last war, if encountered will not be needlessly or thoughtlessly damaged or destroyed, but left in situ.

The risks of impacting archaeological value of any artefacts as part of these works have been ruled out.

# 14. NOISE AND VIBRATION

## 14.1 Introduction

This section of the Environmental Statement examines the potential for noise and vibration impacts as a result of the Beach Management Plan (BMP) Activities.

There are a number of operations which can cause increased noise and vibration as part of the works, these include:-

- Deposition of material via;
  - Transportation of material by road to the Eastoke Corner car park and associated vehicle movements;
  - Material brought in via barge, with material rainbowed on to the beach;
- Tracking of machinery along the beach;
- Extraction of sediment and re-profiling of sediment on the beach;
- Vehicle movements in general including within the site compound.

There are a number of sensitive receptors to both noise and vibration in the vicinity of the works:

- Residents in houses adjacent to the beach, in particular along Southwood Road;
- Residents in close vicinity to the site compound, (situated on Southwood Road);
- Birds, including those roosting/nesting and overwintering. In particular those associated with the Chichester and Langstone Harbour Special Protection Area (SPA) See **Section 9 'Information for HRA'**;
- Beach hut users at the western end of the beach;

### 14.1.1 Policy, legislation and guidance in relation to onshore noise

The following policy, legislation and guidance will be applicable with regard to any assessment of noise in terms of the potential for onshore impacts.

- The Control of Pollution Act, 1974 (COPA): Section 60 of the Act provides powers to local planning authority officers to serve an abatement notice in respect of noise nuisance from construction works.
- Environmental Protection Act, 1990 (EPA): Section 79 of the Act defines statutory nuisance with regard to noise and determines that local planning authorities have a duty to detect such nuisances in their area
- National Planning Policy Framework: The National Planning Policy Framework states that planning policies and decisions should aim to:
    - avoid noise giving rise to significant adverse impacts on health and quality of life as a result of new development;
    - mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from new development, including through the use of conditions;
    - recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put on them because of changes in nearby land uses since they were established; and
    - identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.
- Noise Policy Statement for England (NPSE): This document was published by DEFRA in 2010 and has three policy aims with regard to management of noise:
    - avoid significant adverse impacts on health and quality of life;
    - mitigate and minimise adverse impacts on health and quality of life; and
    - where possible, contribute to the improvement of health and quality of life.

## 14.2 Baseline Conditions

### 14.2.1 Noise and Vibration

Noise levels within the area of interest are typical of those associated with a shingle coastal location, dominated by the natural sounds of the sea, waves and movement of the shingle as well as wind and wildlife.

### 14.2.2 Deposition of material, into the Eastoke Corner carpark

This refers to lorries bringing in material by road and the associated manoeuvring within the carpark. Residents in this location are approximately 70 meters away and located on the landward side of the main sea front road of the depositional area (Eastoke Corner Carpark).Increased noise levels to residents are considered to be low or negligible, with no works during public holidays, weekends or the main tourist season. The exception to this is if emergency works are required, which are likely to be very short duration. Given that the car park is located away from the beach, impacts on birds are not expected and have not occurred historically.

### 14.2.3 Deposition of material from barges

Deposition of material from barges has been undertaken in the past by rainbowing sediment onto the beach. The vessel activity takes place either side of high water and will generally operate on all tides during a campaign including during the night. There is the potential of elevated noise levels whilst the vessels discharge their load onto the beach by rainbowing, where material is sprayed ashore. Each discharge duration typically lasts 60 minutes. If timing restrictions were placed on this element of the works, the cost of the beneficial reuse would be expected to double making it financially unviable. The rainbowing process is short lived and this therefore minimises the potential impact to the residents. The residents who are most likely to be impacted by the work (those of Southwood Road) benefit from the works, it is therefore considered that the potential disruption is acceptable, particularly as no complaints have been received during past campaigns. Mitigation has been adopted to prevent impacts on birds (see **Section 9 Information for HRA**). Historic watching briefs have concluded that these works do not impact birds due to their localised and short term nature.

In future there is an option to minimise this impact further by piping the sediment ashore, which would lower the noise impacts. This will be dependent on the contractor's equipment availability and associated cost at the time. However all other impacts from the process are considered to be very similar.

### 14.2.4 Tracking of machinery along the beach

The residents who live in the Eastoke area of the wider South Hayling frontage are the most sensitive receptor to the operational machinery tracking along the beach due to their close proximity of properties to the beach. Any noise impact is minimised by restricting the times of the works to between 7.00 and 19.00 and works not taking place at weekends, during holidays or in the peak tourist months (unless emergency

works are required). The movement of operational machinery and the construction works may also cause an impact through vibration disturbance; however this will be short term and temporary. **Section 9 (Information for HRA)** promotes a number of additional timing constraints to prevent noise disturbance to birds (i.e. in sensitive locations during overwintering periods). These restrictions will take priority over the time restrictions noted here.

### 14.2.5 Extraction and Re-profiling of the Beach

The beach re-nourishment activities would result in short-term moderate adverse impacts from localised increases in noise and vibration associated with vehicle movements and the use of mechanical plant and equipment. Particularly noisy operations would be associated with bulldozers and excavators, as the material is redistributed following pumping ashore into piles or deposited from the extraction areas when recycling sediment. Impacts are short term and temporary. **Section 9 'Information for HRA'** promotes a number of additional timing constraints to prevent noise disturbance to birds (i.e. in sensitive locations during overwintering periods). These restrictions will take priority over the time restrictions noted here.

### 14.2.6 Vehicles in the Site Compound

The movement of operational machinery and the construction works may cause an impact through vibration disturbance. Those dwellings neighbouring the compound at 74 Southwood Road (**Figure 14.1**) (where plant will be stored) will be the most impacted. To ensure that this is minimised contractors have to follow specific procedures. No tracked vehicles can be parked or driven north of the concrete lego blocks. Only lorries delivering temporary site offices can enter the compound through the main gate. All plant must be delivered to site at Eastoke Corner car park and enter from the beach entrance.

Tracked plant must be parked on the eastern side of the compound, and driven very slowly to reduce any vibrations. The dump trucks are parked on the west of the compound. Plant will be delivered to the public car park at Eastoke Corner well away from any buildings and then tracked/driven along the beach to be stored at the council compound.

### 14.2.7 SPA Birds

Consideration is given to the likely effects on the protected bird species by vehicles working on site and the impacts of noise and vibrations during the operations. Seasonal timing restrictions will be placed on the works so that impacts will be limited, as agreed in advance with Natural England. These are discussed and

detailed within the Nature Conservation (**section 8**) and **HRA section 9** of this EIA.

The ESCP has carried out watching briefs on recent operations to determine the usage of the area by birds in general and also monitoring the impacts whilst the various works were taking place. Early indications, which are also backed up by anecdotal evidence from local birds watchers, is that the birds habituate to machinery on the beach and do not seem to be impacted by it. This monitoring will continue until we have a robust evidence base upon which to lessen the restrictions, if deemed appropriate in consultation with Natural England. See **Section 9 (HRA)** for specific mitigation to avoid disturbance impacts to birds.

## 14.3 Assessment Method

The significance of a predicted impact has been based on both the sensitivity of the receptor and the magnitude of the impact from both noise and vibration. This assessment method is the same as used to determine the impacts caused by increased traffic to the site. The criteria used to define receptor sensitivity and impact magnitude are set out in **Table 14.1** and **14.2**. A matrix combining these factors to determine the resultant significance of the impact is shown in **Table 14.3**.

**Table 14.1 Receptor Sensitivity Criteria**

| Sensitivity | Criteria |
|---|---|
| **High** | **People**<br>High levels of children or elderly residents, quiet local streets and communities with low levels of background noise; quiet rural areas. High numbers of residents at home during the day. |
| | **SPA Birds**,<br>Sensitive to noise – birds may be displaced and may reduce usage of an area.<br>Nesting Birds - less likely or unable to move to a new location. If disturbance increases birds may abandon nests and chicks. |
| **Medium** | **People**<br>Urban and suburban streets with moderate background noise. Some households at home during the day. |
| | **SPA Birds**<br>Moderately sensitive to noise – birds may be displaced by noise levels and move away from source. |
| **Low** | **People** |

| | |
|---|---|
| | City residential areas with already high traffic noise and volumes. Houses mostly empty in the day. No children playing in the street. Significant distance from the works so very little impact felt by residents. |
| | **SPA Birds**<br>Less sensitive to the noise, may be displaced but quickly return to same location. Or potentially may not disturbed by noise at all. |

**Table 14.2 Magnitude of the impacts**

| Magnitude | Criteria |
|---|---|
| **High** | Heavy and prolonged site traffic causing a nuisance through both noise and vibration. Large volumes of HGV traffic. Long Term works or loss of views. |
| **Medium** | Measurable increase in noise and vibrations levels. Intermittent or short term loss of views or amenity. |
| **Low** | Slight increase in noise and vibration. Little or no loss of views |
| **Negligible** | Vehicles restricted to times so to manage noise and vibration to cause no or limited increases in noise and vibration. |

**Table 14.3 Significance of Impacts**

| Magnitude | Sensitivity | | |
|---|---|---|---|
| | **High** | **Medium** | **Low** |
| **High** | **Moderate to major adverse** | **Moderate Adverse** | **Minor to moderate adverse** |
| **Medium** | **Moderate Adverse** | **Minor to moderate adverse** | **Minor Adverse** |
| **Low** | **Minor to moderate adverse** | **Minor Adverse** | **Minor Adverse** |
| **Negligible** | **Negligible** | | |

By combining the sensitivity of the receptor group with the magnitude of the effects of increased noise and vibration, an assessment of impact can be made as shown in **Table 14.4**.

**Table 14.4 Assessment of Impacts from increased noise and vibration from the beach management activities**

| | | Sensitivity | Magnitude | Impact |
|---|---|---|---|---|
| **Deposition of Sediment** | Residents of Southwood Road | Medium | Medium | Minor to moderate Adverse |
| | Residents in close vicinity of the site Compound | Medium | Medium | Minor to moderate Adverse |
| | Other Residents | Low | Negligible | Negligible |
| | Commercial properties | Low | Negligible | Negligible |
| | Beach Hut Users | Low | Negligible | Negligible |
| | SPA Birds | Medium | Low | Minor Adverse |
| **Rainbowing - Anytime day or night but only for a relatively short time frame** | Residents of Southwood Road | Medium | Medium | Minor to moderate Adverse |
| | Residents in close vicinity of the Site Compound | Medium | Medium | Minor to moderate Adverse |
| | Other Residents | Low | Negligible | Negligible |
| | Commercial properties | Low | Negligible | Negligible |
| | Beach Hut Users | Low | Negligible | Negligible |
| | SPA Birds | Low | Negligible | Negligible |
| **Tracking along the Beach** | Residents of Southwood Road | High | Medium | Moderate Adverse |
| | Residents in close vicinity of the Site | High | Medium | Moderate |

| | | Sensitivity | Magnitude | Impact |
|---|---|---|---|---|
| | Compound | | | Adverse |
| | Other Residents | Low | Negligible | Negligible |
| | Commercial properties | Low | Negligible | Negligible |
| | Beach Hut Users | Low | Negligible | Negligible |
| | SPA Birds | Medium | Low | Minor Adverse |
| **Extraction and Re-profiling** | Residents of Southwood Road | High | Medium | Moderate Adverse |
| | Residents in close vicinity of the Site Compound | Medium | Medium | Medium to minor Adverse |
| | Other residents | Low | Negligible | Negligible |
| | Commercial properties | Low | Negligible | Negligible |
| | Beach Hut Users | Low | Negligible | Negligible |
| | SPA Birds | Medium | Low | Minor Adverse |
| **Vehicles in site Compound** | Residents of Southwood Road | Low | Low | Minor Adverse |
| | Residents in close vicinity of the Site Compound | High | Medium | Moderate Adverse |
| | Other Residents | Negligible | Negligible | Negligible |
| | Commercial properties | Negligible | Negligible | Negligible |
| | Beach Hut Users | Negligible | Negligible | Negligible |
| | SPA Birds | Negligible | Negligible | Negligible |

### 14.3.1 Additional information

The Havant Borough Council Environmental Health Officer has carried out an extensive search of their complaints database and has not returned any cases relating to dust, noise, pollution or vibration that could reasonably be associated with previous beach replenishment or flood protection works at South Hayling. Records date back to 2003.

The Havant Borough Council Environmental Health officer stated that '*Whilst the current arrangements allow for beachfront operations over a working period that exceeds that normally recommended by Environmental Health for the protection of amenity and prevention of nuisance - it can be assumed that either the mitigation arrangements & timings of work adequately mitigate disturbance from noise & vibration, or that local residents recognise the benefit of the work and are willing to tolerate it*'.

## 14.4 Potential Impacts, Mitigation and Residual Impact

**Table 14.5** summarises the potential noise and vibration impacts of the Hayling Island BMP unit by unit. Mitigation has been identified for any significant potential impacts, to reduce / avoid the impact, as illustrated in **Table 14.6**.

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**Table 14.5 Potential impacts of delivery of the BMP on noise and vibration. Impacts highlighted orange require mitigation (See Figure 1.1 for location of BMP units and Section 4 for details of proposed unit by unit activities**

| Potential Effects of Beach Management Operations | BMP U1 | BMP U2 | BMP U3 | BMP U4 | BMP U5 | BMP U6 | BMP U7 | BMP U8 |
|---|---|---|---|---|---|---|---|---|
| **Recycling of resident beach material – potential noise and vibration impacts to residential / commercial / tourist receptors.** | No impacts expected to due to the distance from the proposed works. | Residential and commercial receptors of Southwood Road and in close vicinity to the site compound may experience elevated levels of noise and vibration throughout the duration of the works. However works are carried out during reasonable hours and are short term and temporary in nature. Plant in the compound area will be stored at the southern end, away from adjacent houses. The local community will be fully informed prior to any works taking place. No impacts expected. The works are planned to occur in March (and possibly September) each year, thereby avoiding the main tourist season, unless required in an emergency situation. | | No impacts expected to residents, due to distance from proposed works. Works planned to avoid the main tourist season. Impacts on commercial receptors considered negligable. | | | | |
| **Recycling of resident beach material – potential noise and vibration impacts to birds** | Should works be required during the overwintering bird period (October to March inclusive), no recycling operations will be undertaken 1.5 hrs before and 1hr after high tide.<br><br>An ecological walkover will be undertaken immediately prior to works in nesting season (March to August inclusive). Provide exclusion area if nesting birds discovered (minimum of 5 meter buffer distance). Additional surveys will be carried out if required to ensure that birds have not nested in the meantime. No noise and vibration impacts expected. This mitigation is clearly set out in Section 9 (Information for HRA). | | An ecological walkover will be undertaken immediately prior to works in nesting season (March to August inclusive). An exclusion area will be established if nesting birds discovered (minimum of 5 meter buffer distance). Additional surveys will be carried out if required to ensure that birds have not nested in the meantime. No noise and vibration impacts expected. | | | Should works be required during the overwintering bird period (October to February inclusive), no recycling operations will be undertaken 1.5 hrs before and 1hr after high tide. No works to be undertaken between March and August inclusive as birds are known to nest in these areas (hence the reduced overwintering bird period). | | |
| **Rainbowing of dredged material – potential noise and vibration impacts to residential, tourist and commercial receptors.** | No material depositied via dredge within these units. | Residential, tourist and commercial receptors of Southwood Road may experience elevated noise and vibration due to material being rainbowed ashore via a dredger. However, as this part of the beach management works will only occur over high tide (daytime and night time); works are of a short duration. | | No material depositied via dredge within these units. | | | | |
| **Rainbowing of dredged material – potential noise and vibration impacts to birds.** | No material depositied via dredge within these units. | An ecological walkover will be undertaken immediately prior to works in nesting season (March to August inclusive). An exclusion area will be established if nesting birds discovered (minimum of 5 meter buffer distance). Additional surveys will be carried out if required to ensure that birds have not nested in the meantime. No noise and vibration impacts expected. In addition, as these works can only take place at high tide, a watching brief will be adopted per campaign to ensure there are no impacts on roosting birds (as set out in **Section 9 Information for HRA).** | | No material depositied via dredge within these units. | | | | |
| **Import of shingle by road, impacting residential / tourist /** | No material to be imported via road to these units for storage. No impacts expected. | Material imported by road will be stored in the Eastoke Corner car park until it is transported onto the beach. Residents and commercial | | No material to be imported via road to these units for storage. No impacts expected. | | | | |

| Potential Effects of Beach Management Operations | BMP U1 | BMP U2 | BMP U3 | BMP U4 | BMP U5 | BMP U6 | BMP U7 | BMP U8 |
|---|---|---|---|---|---|---|---|---|
| **commercial receptors.** | | | properties along Southwood Road may experience elevated levels of noise and vibration for the duration of these works, however works and are short term and temporary in nature. No works are permitted on weekends and bank holidays (unless in an emergency). The local community will be fully informed prior to any works taking place. No impacts expected. | | | | | |
| **Tracking on the beach – potential impacts to residential, commercial and tourist receptors** | No impacts to residential / commercial receptors expected due to the distance from the proposed works. The Hayling Island Sailing Club would request and fudn works in this unit should there be a need, so they will be expecting the works. | Residential, tourist and commercial receptors of Southwood Road and in close vicinity to the site compound may experience elevated levels of noise and vibration as a result of machinery tracking on the beach. However works will be short term and temporary in nature. Machines will be restricted to a 10mph speed limit. No impacts expected. Generally (unless there is an emergency), works will not be undertaken during the main tourist season. | | No impacts to residential / commercial receptors expected to due to the distance from machines tracking. Impacts avoided to tourists by programming the works to take place outside of the main tourist season, unless emergency works are required. | | | | |
| **Tracking on the beach – potential noise and vibration impacts to birds** | Should works be required during the overwintering bird period (October to March inclusive), no recycling operations will be undertaken 1.5 hrs before and 1hr after high tide.<br><br>An ecological walkover will be undertaken immediately prior to works in nesting season (March to August inclusive). Provide exclusion area if nesting birds discovered (minimum of 5 meter buffer distance). Additional surveys will be carried out if required to ensure that birds have not nested in the meantime. No noise and vibration impacts expected. This mitigation is clearly set out in Section 9 (Information for HRA). | | An ecological walkover will be undertaken immediately prior to works in nesting season (March to August inclusive). Provide exclusion area will be established if nesting birds discovered (minimum of 5 meter buffer distance). Additional surveys will be carried out if required to ensure that birds have not nested in the meantime. No noise and vibration impacts expected. | | | Should works be required during the overwintering bird period (October to February inclusive), no recycling operations will be undertaken 1.5 hrs before and 1hr after high tide. No works to be undertaken between March and August inclusive as birds are known to nest in these areas (hence the reduced overwintering bird period). | | |
| **Operational impact** | No operational Impact | | | | | | | |

## 14.5 Noise and Vibration: Mitigation and residual impacts

**Table 14.6** details specific mitigation for the impacts identified in **Table 14.5** (those which are highlighted orange), to ensure the BMP works can be delivered without a significant negative effect on noise and vibration. A Construction and Environmental Management Plan (CEMP) will be developed and submitted in advance of each BMP campaign.

**Table 14.6 Mitigation for impacts identified in Table 14.5 and residual impacts**

| Impact | Mitigation | Resultant/Residual Impact |
|---|---|---|
| Elevated noise and vibration causing disturbance to residents in the vicinity of the works | Timing controls on activities (note that other restrictions apply in sensitive areas), as set out in Section 9 'Information for HRA':<br>• Delivery of shingle to site by road and tracking on the foreshore with machinery: 6am to 10pm Monday to Friday (unless there is an emergency response required which could require 24 hour working).<br>• Delivery of machinery to undertake beach management: unrestricted due to logistics. Machinery only being brought to site at the beginning of each beach management campaign, and removed at end, with machinery left on site for the duration of each campaign.<br>• Rainbowing Shingle ashore: unrestricted, as pumping ashore can only occur at high tide, for 2 – 4 hours per discharge. When barge in area, need to make use of every consecutive high tide period, | Minimal residual impact, whilst enabling the works to take place. |

| | | |
|---|---|---|
| | for recharging to be financially viable. | |
| | Limiting the time of year to be outside the Tourist Season. We would only work within the tourist season if an emergency response is required. | Minimal residual impact. |
| | Limiting vehicles to 10mph on site will minimise noise disturbance. | Minimal residual impact |
| | Restrict drop-height to a minimum when loading the dump-truck hopper from an excavator bucket (or conveyor). Minimising drop height would also serve to minimise noise from initial filling of a steel dump-truck hopper with course pebble aggregate, which is likely to be a noisy operation. | Minimal residual impact |
| | Plant will be stored in the Southern end of the compound only, away from adjacent houses. | Minimal residual impact |
| | The local community (local residents and property owners) would be kept fully informed about the nature and timing of construction activities prior to implementation of the works via letter drops, posters along the seafront and newspaper adverts. | Minimal residual impact |
| | To avoid impacts on SPA Birds, works will take place in sensitive bird areas when the birds are not using them, see section on nature Conservation (**Section 8**) and HRA (**Section 9**), which includes specific mitigation that has been agreed with Natural England. In summary:<br>• An ecological walkover will be undertaken immediately prior to works in nesting season (March to | Minimal residual impact, given extensive mitigation. |

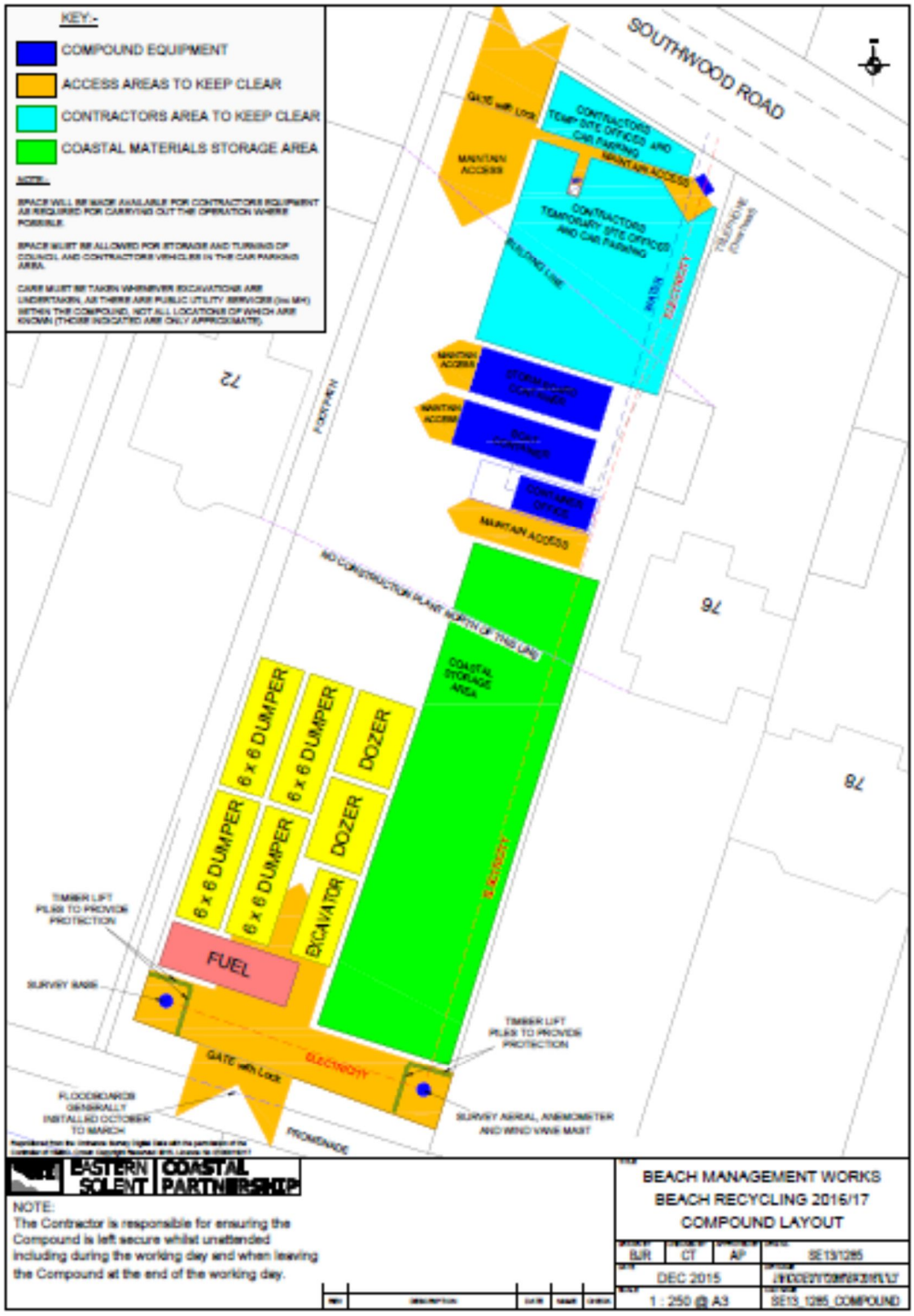
| | | |
|---|---|---|
| | August inclusive). Provide exclusion area will be established if nesting birds discovered (minimum of 5 meter buffer distance). Additional surveys will be carried out if required to ensure that birds have not nested in the meantime. No noise and vibration impacts expected (Units 1 to 5 only).<br>• Should works be required during the overwintering bird period (October to March inclusive), no recycling operations will be undertaken 1.5 hrs before and 1hr after high tide (Units 1, 2 and 6 to 8 only).<br>• In units 6 to 8, no works will be undertaken between March and August inclusive as birds are known to nest in these areas. | |

## 14.6 Conclusions

Although there will be an impact to residents in close proximity to the beach by increased noise and vibration, the benefits of the scheme (i.e. increased protection against flooding and erosion risk) and ongoing beach management activities/ operations outweigh the potential impacts.

The appropriate precautions will be taken to minimise the impact to the SPA birds, resulting from potential disturbance from both noise and vibrations as a result of the works (as detailed in **Sections 8 and 9** of this ES).

**Figure 14.1 Site Compound**



# 15. TRAFFIC AND TRANSPORT

## 15.1 Introduction

This section of the Environmental Statement considers the potential impacts of the Beach Management Plan (BMP) activity on traffic and transport, including impacts on navigation from the proposed Beach Management Activities.

## 15.2 Baseline Environment

### 15.2.1 Traffic to/from site by road

The only major road onto Hayling Island is the A3023 which is approximately 7km in length. This will be the access route for all the machinery and road transported beach material onto site, as shown on (**Figure 15.1**). This is the same route that has been used for other works, such as the existing BMP and the Eastoke Point Scheme in previous years.

Southwood Road runs parallel along the length of the nourished Frontage with various minor roads, such as Eastoke Avenue, Creek Road and Nutbourne Road, leading to the residential areas north of the beach along the South Hayling frontage. The main existing sources of traffic in the area are from residents and those accessing recreational activities.

All machinery to be used for the Beach Management Activities will be brought onto site at the beginning of the 2-4 week window of works, and will then be kept on site in the site compound at 74 Southwood Road. All machinery will then be transported off site at the end of the works. The transportation of machinery on and off site must comply with the regulations of abnormal loads. The Road Vehicles (Authorisation of Special Types) (General) Order 2003 SI No 1998 sets out the regulations for

abnormal loads. For a typical recycling campaign the following plant is required:

- 4x 40 tonne dumper trucks
- 2x bulldozers
- 1x excavator

For a typical dredge, 1x bulldozer is required to reprofile the beach. The above is based on typical campaigns and plant requirements will change depending on the amount of material to be moved. Each will need its own lorry to deliver it on/off site.

The ESCP is requesting that the previous planning conditions are altered to give slightly greater flexibility about delivery of the Beach Management Plan in line with that which was recommended by the Havant Highway Engineer.

### 15.2.2 Deliveries (of Heavy Trucks)

The Construction and Environmental Management Plan (CEMP) will include measures to reduce any impacts on traffic and transport, although any impact will be short term and temporary. The CEMP will take account of and manage any construction and operational impacts, and will be flexible to allow for adaptive management. The CEMP will be a live document and updated as and when required. Measures within the CEMP include:

- The quantity of material required to be brought onto site by road (this will change with each campaign and will be dependant on assessment of all other sources of shingle available and the quantity of material required to return the beach to the required profile);
- Existing traffic 'hot spots' e.g. schools (drop off and pick up times), and likely traffic on the roads going forward.
- Any other potential impacts that may develop over time. The CEMP will be developed and adapted to these changes as they develop, and if issues arise, to ensure that any disruption caused to the traffic on Hayling Island and further afield is kept as minimal as possible.

Vehicles will only deliver plant to site at the beginning of the works, they will then be stored on site and then taken away after the works are completed. Duration of the works is typically approximately 2 - 4 weeks, once or twice a year. This will depend on the condition of the beach and how much material is needed during each campaign.

All vehicles will take the route onto Hayling Island and to the site as shown on **Figure 15.1**.

### 15.2.3 Deliveries of Aggregates by Road

Should the import of material be required by road, the shingle/aggregate will be brought onto site using the same methods as those on previous beach management works. Lorries will bring material from local aggregates wharves to the site and store material at the Eastoke Corner carpark until it can be transported onto the beach. The western end of Eastoke Corner car park will be shut off to stock pile the imported material. On completion of works, the car park surface will be made good. The import of material by road from local aggregate wharves will only be used if there is insufficient material available from other sources, e.g. recycling, to maintain the Standard of Protection along the South Hayling frontage. For a standard operation, four to six trucks would drop off shingle per hour; however this could increase to eight trucks per hour if enough vehicles are available. A higher frequency of lorries would reduce the duration of the activity. These lorries do not all arrive at the same time, rather they are phased across the hour to enable effective loading and drop off.

Proposed hours for delivery of shingle to site by road: 6am to 10pm Monday to Friday (unless there is an emergency response required which could require 24 hour working).

### 15.2.4 Transportation along the Beach

The main haulage route for the recycling and any other traffic movements once on site is along the beach. **Figure 4.8** details approximate tracking routes. The haul route will be kept above MHWS and be marked with cones. Restrictions will be placed on the beach haul route in order to avoid:

- Damage to vegetated shingle communities, by demarcating areas with cones so that there is a physical barrier in between vehicles and plant communities;
- Damage or disturbance to Nesting Ringed Plover. Timing restrictions will be put into place so that vehicles will not be allowed to travel on sections of the beach if Ringed Plovers are nesting;
- Disturbance to high tide roost sites. Vehicular access to roost sites will be restricted for an agreed period of time over the tidal cycle. This is true at Gunner Point to Langstone Harbour Entrance (BMP Units 6, 7 and 8) and the Ness to Black Point (BMP Unit 1).

The haul route will be determined on a yearly basis, as this will depend on the

location of the vegetated shingle and nesting birds.

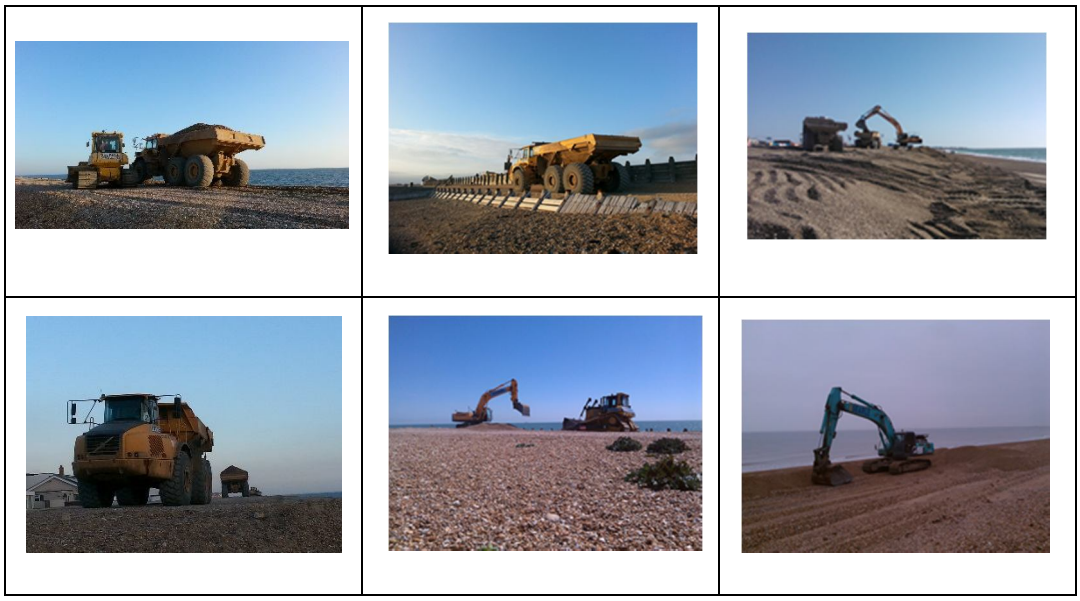
Proposed hours for tracking on the foreshore with machinery: 6am to 10pm Monday to Friday (unless there is an emergency response required which could require 24 hour working).

### 15.2.5 Beach Management Activities

Traffic working along the beach for the duration of the works is likely to consist of (**see photo 15.1**):

- 1 x 38 tonne 360 tracked excavator
- 4 x 40 tonne dump trucks
- 2 x tracked bulldozers

**Photo 15.1: Photos of machinery on the beach, implementing BMP activities during historic BMP campaigns at South Hayling Island.**



### 15.2.6 Rainbowing Sediment Ashore

Prior to the works taking place, the ESCP liaises with the Chichester Harbour Master, who will then issue a 'Notice to Mariners' highlighting where the dredger will be located and when.

Material brought ashore from the dredging of the Chichester Harbour Approach Channel is pumped ashore through a process called 'rainbowing' from a hopper

barge (**photo 15.2**). Once material has been pumped ashore, bulldozers will be used to reprofile the beach crest.

**Photo 15.2 Rainbowing sediment ashore**



A Navigational Risk Assessment will be completed by the dredging company and submitted to the ESCP as part of the tender submission. The Navigational Risk Assessment will then form part of the Construction and Environmental Management Plan (CEMP) in any one year.

In the past there have been a number of restrictions on the rainbowing work to ensure that both safety of users of the beach and sea are adequately covered, for example:

- If the waves on the beach are more than 1.5m high or there is too much swell then the works cannot take place;
- The bay where material is being pumped into. a bay either side of this and the promenade behind are temporarily closed for the duration of the works for safety purposes. ESCP personnel and signage to warn members of the public are also located at the access points to ensure public safety. Should a member of the public not take notice of the signage and ESCP staff, the master of the dredging barge will be notified via radio and the rainbowing of material ashore will be stopped. Works can resume once the member of the public has moved outside of the closed off area.

## 15.3 Methodology for receptor impact assessment

The significance of a predicted impact has been based on both the sensitivity of the road and the magnitude of the impact. The criteria used to define receptor sensitivity and impact magnitude is set out in **Tables 15.1** and **15.2** below. A matrix combining these factors to determine the resultant significance of impact is shown in **Table 15.3**. **Table 15.4** summarises key impacts on receptors described within this Section.

**Table 15.1: Receptor sensitivity criteria**

| Sensitivity | Criteria |
|---|---|
| High | **Roads:**<br>Highly sensitive areas include roads that run past schools, nursing homes, parks and hospitals. Normally low traffic levels with few delays.<br>**Motorists:**<br>Emergency or essential services vehicles, school transport.<br>**Pedestrians and cyclists:**<br>High sensitivity groups, including children and the elderly. High levels of pedestrians. No cycle facilities separated from the road. Few or no pedestrian or other controlled crossings.<br>**Residents:**<br>High levels of children or elderly residents, quiet local streets with low traffic flows. Residential streets or housing estates with high levels of children playing or play facilities nearby. Quiet, rural areas with low levels of background road traffic and related noise. High numbers of residents at home during the day.<br>**Leisure users:**<br>Users of well-maintained and mapped Public Rights of Way with high usage rates. Users of designated leisure facilities, such as football pitches, golf courses, outdoor sports facilities close to the works.<br>**Mariners** that would be prevented from accessing specific areas for an extended period of time. |
| Medium | **Roads:**<br>Areas include residential areas, town centres and rural roads in which traffic flows are moderate.<br>**Motorists**:<br>Moderate traffic flows with moderate risk of driver stress and delays.<br>**Pedestrians and cyclists**:<br>Moderate numbers of children or elderly users, some cycle routes segregated from the road.<br>**Residents:**<br>Urban and suburban streets with moderate traffic volumes, few children playing in the street and few play facilities. Moderate levels of traffic noise and nuisance. Some households at home during the day.<br>**Leisure users:**<br>PRoWs that have moderate flows of recreation users but are not known as being the major routes within an area. Users of nearby sports facilities.<br>**Mariners** that would be prevented from accessing specific areas for |

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| | a limited length of time |
| Low | **Roads:**<br>Motorways, A roads and busy main roads are low in sensitivity as they have capacity to accommodate additional vehicles and pedestrian safety measures are already high.<br>**Motorists:**<br>Traffic flows are high and delays can be frequent.<br>**Pedestrians and cyclists**:<br>Low numbers of sensitive users, most or all of cycle network segregated from the road. Adequate numbers of pedestrian and other controlled crossings.<br>**Residents:**<br>City residential areas with already high traffic flows, houses mostly empty during the day, no children playing in the street.<br>**Leisure users:**<br>Users of PRoWs that are poorly maintained and have low pedestrian flows. Users of indoor sports facilities in any location or outdoor facilities well away from the road network.<br>**Mariners** that would be not be prevented from accessing specific areas, but may be asked to take specific action e.g. stay clear of a dredger by x meters. |

**Table 15.2: Magnitude of impact criteria**

| Magnitude | Criteria |
|---|---|
| High | **Roads**:<br>Changes in traffic will result in a major shift away from the baseline conditions, particularly through levels of HGV traffic and abnormal loads.<br>The levels of HGVs travelling on local roads will increase by over 30%. Changes in traffic may cause a decrease in the quality of the road and increase levels of dirt and debris.<br>**Motorists:**<br>Long delays increase driver stress and road surfaces deteriorate to a sufficient degree to cause damage to vehicles.<br>**Pedestrians and cyclists:**<br>Permanent construction or related activities on or close to the network will result in long term disruption. Long term closure of links or impacts to the surface, surroundings or views.<br>**Residents:**<br>Heavy and prolonged site traffic causes a nuisance through vibration, increased dust and dirt levels in the area and on the streets. Site |

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|---|---|
| | traffic disrupts local network leading to long diversions to either motorised and non-motorised traffic, or severance between communities or areas. Large volumes of HGV traffic cause damage to road or other surfaces or buildings. Long term and dramatic reduction in air quality due to site traffic. Long term or permanent loss of views.<br>**Leisure users:**<br>Long term or permanent loss of leisure facilities. Impact of site traffic (noise, dust, vibration etc.) means users no longer wish to use facilities. Long term or permanent loss of views<br>**Mariners** that would be prevented from accessing specific areas for an extended period of time, that could impact on safety of vessels at sea |
| Medium | **Roads:**<br>A measurable increase in traffic, particularly HGVs.<br>The levels of HGVs would increase by 10%. Construction traffic will have a moderate impact on the quality of the road.<br>**Motorists:**<br>Moderate delays leading to increased driver stress.<br>**Pedestrians and cyclists**:<br>Works result in a measurable disruption to the network through diversions and delays. Measurable deterioration in air quality and moderate nuisance caused by increased dust, noise and vibration levels. Intermittent and short term loss of views.<br>**Residents:**<br>Measurable increase in noise, dust and vibration levels. Intermittent or short term loss of views or amenity. Temporary and short term disruption to local network. Increased traffic flows leading to deterioration in air quality.<br>**Leisure users**:<br>Short term or temporary loss of facilities, reduction in desirability of facilities through increased noise, dust and vibration. Short term or intermittent loss of views.<br>**Mariners** that would be prevented from accessing specific areas for an limited period of time, that could impact on safety of vessels at sea |
| Low | **Roads:**<br>Minor and temporary increases in road traffic.<br>**Motorists:**<br>Short delays lead to slight or no increase in driver stress.<br>**Pedestrians and cyclists:**<br>Intermittent, short term and minor changes to local network. Short delays to journeys, slight deterioration in air quality and slight |

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|---|---|
| | increase in dust, noise and vibration levels.<br>**Residents:**<br>Slight increase in dust and dirt that is controlled by the Contractor. Little or no loss of views, slight increase in noise and vibration. Intermittent loss of local network links, traffic operates at restricted times.<br>**Leisure users:**<br>Slight increase in dust and dirt levels, little or no increase in noise and vibration levels, little or no reduction in air quality. No impact on views.<br>**Mariners** that would be not be prevented from accessing specific areas, but may be asked to take specific action e.g. stay clear of a dredger by x meters. This is unlikely to impact on safety of vessels at sea. |
| Negligible | **Roads:**<br>Very slight increases in construction traffic such that no discernible effect upon local traffic is expected.<br>**Motorists:**<br>No delays or impact in road quality will be caused.<br>**Pedestrians and cyclists**:<br>The works are located away from the network and any changes will be small and temporary.<br>**Residents:**<br>Traffic operates at restricted times and is managed to cause little or no increase in noise, dust, vibration and pollutant levels. All interfaces between site and local traffic properly managed to minimise risk of accidents.<br>**Leisure users:**<br>No noticeable impact.<br>**Mariners** - No or very limited impact restricting access to the whole navigational channel. |
| Beneficial | **Roads:**<br>The scheme will have a beneficial impact on the road network though reduction in delays and improvement in road quality.<br>**Motorists:**<br>Road condition is improved and journey times reduced.<br>**Pedestrians, cyclists and leisure users:**<br>The works will result in an improvement to the network through increasing the number of routes, improving access or improving the surface and surroundings of the route and increasing the amenity value of the site.<br>**Residents:**<br>Local network is improved or enhanced, long term improvements to |

| | |
|---|---|
| | amenity value, views and safety.<br>**Mariners** – improve access to specific areas by removing a navigational hazard. |

By combining the sensitivity of the receptor groups with the magnitude of the effect of increased traffic, an assessment of impact can be made, as shown in **Table 15.3**.

**Table 15.3: Significance of impacts**

| **Magnitude** | **Sensitivity** | | |
|---|---|---|---|
| | **High** | **Medium** | **Low** |
| **High** | Moderate to major adverse | Moderate adverse | Minor to moderate adverse |
| **Medium** | Moderate adverse | Minor to moderate adverse | Minor adverse |
| **Low** | Minor to moderate adverse | Minor adverse | Minor adverse |
| **Negligible** | Negligible | | |

## 15.4 Potential Impacts, Mitigation and Residual Impacts

### 15.4.1 Impacts on Roads and Motorists

The previous planning permission for beach recycling along the South Hayling frontage includes guidance for traffic restrictions during any operation. This guidance was also successfully implemented during the Eastoke Point Construction Works in 2013, therefore it is recommended that any future recycling operations adopt a similar proposal, as set out below.

Restrictions will be placed on any contractor to only allow beach recycling works via trucks between 6am and 10pm on weekdays. No machinery would be allowed to be operated outside of these hours. In addition to this, no weekend or bank holiday working is permitted except in the case of emergency working. Due to tidal

restrictions, the provision of material via seaborne delivery would be omitted from these restrictions: a 24 hour working window is adopted, 7 days a week, the same with the delivery of machinery to the beach (for logistical reasons).

Impacts of construction traffic on the highway will follow best practice guidelines. Within the terms of the contract, the contractor will be obliged to reduce the potential for dust pollution and also to reduce the risk of construction debris being deposited on surrounding roads. This could be achieved through dousing vehicles with water during particularly dry spells to reduce the excessive movement of dust. Vehicles could also be checked and cleaned as they leave the site to make sure beach debris is not deposited on the surrounding roads. This will be minimal as vehicles will remain on site for the duration of the works.

As noted previously, the Area Principle Engineer for Hampshire Highways stated that if the works conform to the guidance on traffic movement in the area and if restrictions remain and are enforced as in previous campaigns at Eastoke, then the works are unlikely to have a significant effect on traffic and transportation within the surrounding highways (pers comms 2015).

### 15.4.2 Pedestrians / Public Rights of Way

All roads where plant will access Hayling Island and the site have pedestrian footways running alongside them either separated by a grass verge or directly adjacent to the road. All pedestrian formal footways are considered to be low sensitivity. Works are relatively short term and will be carried out at a time of year outside the main holiday periods (unless emergency works are required). There will be a speed limit placed on all plant on site which restricts them to 10mph to reduce risk of incidents; however the beach will not be closed off and pedestrians will still have access to the beach. The appropriate measures will be in place for the health and safety of the public, e.g. banksmen and signage, for the full duration of the works.

There are three Public Rights of Way within the area of works which are located towards the Black Point end of the frontage and the eastern end. They are all defined as Footpaths 104, 504 and 515 (**See Figure 15.1**).

There is public access to the beach along the entire length of the works. The management of this is a safety concern. Where rainbowing works are taking place the beach will be cordoned off. Banksmen will be in place for public health and safety where vehicles are tracking recycled material along the beach. Pedestrian access is

considered to be **low sensitivity** due to the control measures presented.

For Rights of Way and pedestrians walking on the beach is also considered to be **low sensitivity**.

### 15.4.3 Cyclists

The Hayling Billy abandoned railway line which runs down the western coast of Hayling Island provides a dedicated cycle route onto the Island. This provides an alternative route for cyclists rather than using the roads. The short stretch of road along the sea front does not however have a dedicated cycle path available. The Hayling Promenade Cycleway runs in an east/west direction along the Eastoke Beach frontage within the study area, this will be directly impacted by the works, however alternative routes are available. Cycle access is therefore considered to be **low sensitivity.**

### 15.4.4 Residents

There are a number of residents that need to be considered within this assessment. These include residents in close vicinity of the access routes, to and from the site or along main roads, and those in very close vicinity to the works. Potential impacts to residents are summarised in **Table 15.4**.

### 15.4.5 Leisure users

A key leisure attraction in the area is the Hayling Island Sailing Club. This will be impacted by the works in the short term, however the long term effects will be beneficial to the functioning of the sailing club. Therefore these users are considered to have **low sensitivity**. Hayling Island has a strong tourism industry; however the works are not programmed to take place in the tourist season (except in response to an emergency). There should therefore be no impact on these users, or in-combination impacts with the increased tourist traffic.

### 15.4.6 Impacts on Navigation

The only access to the site from the sea is to deposit the material that has been dredged from the Chichester Harbour approach channel / offshore dredge sites. In the past Chichester Harbour channel has been dredged in large scale, sporadic dredges, however now it is proposed to carry out much smaller, more regular dredges. The sediment will then be nourished back onto the beach from the barges through rainbowing as it has been in the past. The rainbowing process is relatively short lived, with delivery of any material only lasting approximately an hour around high water. This activity has no time limits, as it can only occur at high tide.

The route used by the hopper dredger will be agreed in advance with the Harbour Master at the Chichester Harbour Conservancy, who will disseminate the restrictions to local harbour users including fishermen and pleasure craft, as has been done in the past as a 'Notice to Mariners'. The impact of the proposed dredging activities on navigation of boats in the harbour is relatively minor. All harbour users will have to take extra caution whilst navigating past the dredger barge which will be correctly lit to indicate their presence in or near the approach channel to Chichester Harbour. The sensitivity of impacts on mariners is **low sensitivity**.

### 15.4.7 Safety

In the interest of safety, works will be carried out in accordance with the Construction Design and Management Regulations (2007). A speed limit of 10mph will be put in place for the on-site plant, to reduce risk of incidents. Clear signage is to be placed at all access points to the beach warning visitors of the works in progress. The haul road used by the dump trucks will be marked out using cones at 50m intervals.

**Table 15.4 Impacts of BMP activities on traffic and transport**

| Link | Receptor | Sensitivity | Magnitude | Impact |
|---|---|---|---|---|
| Site delivery by road | | | | |
| A3023 | Roads | Low | Negligible | Negligible |
| | Motorists | Low | Negligible | Negligible |
| | Pedestrians | Low | Negligible | Negligible |
| | Cyclists | Low | Negligible | Negligible |
| | Residents | Low | Low | Minor Adverse |
| | Leisure Users | Low | Negligible | Negligible |
| Sea Front | Roads | Low | Negligible | Negligible |
| | Motorists | Low | Low | Minor Adverse |
| | Pedestrians | Medium | Low | Minor Adverse |

| | | | | |
|---|---|---|---|---|
| | Cyclists | Low | Low | Minor Adverse |
| | Residents | Low | Low | Minor Adverse |
| | Leisure Users | Low | Negligible | Negligible |
| **Smaller Residential Roads**<br><br>Southward Road<br><br>Bosmere Road<br><br>Bracklesham Road | Roads | Medium | Low | Minor Adverse |
| | Motorists | Low | Low | Minor Adverse |
| | Pedestrians | Medium | Low | Minor Adverse |
| | Cyclists | Medium | Low | Minor Adverse |
| | Residents | Medium | Low | Minor Adverse |
| | Leisure Users | Low | Negligible | Negligible |
| Link | Receptor | Sensitivity | Magnitude | Impact |
| Haulage Road along the beach | | | | |
| BMP Unit 1 | Pedestrians | Low | Low | Minor Adverse |
| | Residents | Low | Negligible | Negligible |
| BMP Unit 2 | Pedestrians | Low | Low | Minor Adverse |
| | Residents | Low | Negligible | Negligible |
| BMP Unit 3 | Pedestrians | Low | Low | Minor Adverse |
| | Residents | High | Medium | Moderate Adverse |
| BMP Unit 4 | Pedestrians | Low | Low | Minor Adverse |

| | | | | |
|---|---|---|---|---|
| | Residents | Low | Negligible | Negligible |
| BMP Unit 5 | Pedestrians | Low | Low | Minor Adverse |
| | Residents | Low | Negligible | Negligible |
| BMP Units 6, 7 and 8 | Pedestrians | Low | Low | Minor Adverse |
| | Residents | N/A | N/A | N/A |
| Navigation | | | | |
| Areas within 500 meters of the shore ( MU2, MU3, MU4) | Marinas<br><br>Fishermen | Low. Outside main navigation channel | Negligible | Negligible |

**Table 15.4** presents the overall impact assessment of the traffic and transport impacts that could arise from delivery of the BMP, set out per beach management unit. **Table 15.5** picks out the BMP impacts that may require specific mitigation, to confirm whether there will be any resultant significant effects.

**Figure 15.1 Access routes and Public Rights of Way**



**Table 15.5 Potential impacts of delivery of the BMP on Traffic and Transport. Impacts highlighted orange require specific mitigation (see Figure 1.1 for location of BMP units and Section 4 for details of proposed unit by unit activities).**

| Potential Effects of Beach Management Operations | BMP U1 | BMP U2 | BMP U3 | BMP U4 | BMP U5 | BMP U6 | BMP U7 | BMP U8 |
|---|---|---|---|---|---|---|---|---|
| **Recycling of resident beach material** | All recycling operations will be undertaken from within the beach itself, therefore no impact on the traffic and transport. Pedestrian access maintained throughout the works, with banksmen to enforce health and safety. | | | | | | | |
| **Impact to the highway network** | Negligible impacts to the highway network expected. Working hours will be restricted in the following way:<br>• Delivery of shingle to site by road and tracking on the foreshore with machinery: 6am to 10pm Monday to Friday (unless there is an emergency response required which could require 24 hour working).<br>• Delivery of machinery to undertake beach management: unrestricted due to logistics. Machinery only being brought to site at the beginning of each beach management campaign, and removed at end, with machinery left on site for the duration of each campaign.<br>• Rainbowing Shingle ashore: unrestricted, as pumping ashore can only occur at high tide, for 2 – 4 hours per discharge. When barge in area, need to make use of every consecutive high tide period, for recharging to be financially viable. | | | | | | | |
| **Rainbowing of material from dredging** | No impacts expected. No material to be rainbowed ashore within this unit. Unit is outside of the main navigation channel. | | Minimal impacts expected. Material will be rainbowed ashore into one groyne bay at a time. One groyne bay either side of this will be closed to public access on health and safety grounds. The remainder of the unit will be free from works. Chichester Harbour Conservancy and Chichester Harbour Master will issue notices to mariners and also directly to local fisherman to minimise the impact to all Harbour users. | No impacts expected. No material will be rainbowed ashore within these units. Units are outside of the main navigation channel. | | | | |
| **Tracking on the Beach /Haulage route - pedestrians** | A speed limit of 10mph will be put in place for the on-site plant, to reduce risk of incidents. Clear signage is to be placed at all access points to the beach warning visitors of the works in progress. The haul road used by the dump trucks will be marked out using cones at 50m intervals. Pedestrian access maintained throughout the recycling works. | | | | | | | |
| **Tracking on the Beach /Haulage route – residents** | No impact expected due to distance of receptors from haulage routes. | | Machinery will track in close proximity to residential receptors, however works are short term and temporary in nature. Residents will be notified prior to works taking place. Minimal impacts expected. | No impact expected due to distance of receptors from haulage routes. | | | | |
| **Operational Impacts** | Beneficial effect for leisure users gaining access to the shore. No operational impacts expected. | | | | | | | |

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## 15.5 Traffic and Transport: Mitigation and residual impacts

**Table 15.5** details specific mitigation for the impacts identified in **Table 15.4** (those which are highlighted orange), to ensure the BMP works can be delivered without a significant negative effect on traffic and transport. A Construction and Environmental Management Plan (CEMP) will be developed and submitted in advance of each BMP campaign.

### Table 15.6 Mitigation for impacts identified in Table 15.5 and residual impacts

| Impact | Mitigation | Resultant/Residual Impact |
|---|---|---|
| **To prevent negative impact to the highway network** | Working hours will be restricted in the following way:<br>• Delivery of shingle to site by road and tracking on the foreshore with machinery: 6am to 10pm Monday to Friday (unless there is an emergency response required which could require 24 hour working).<br>• Delivery of machinery to undertake beach management: unrestricted due to logistics. Machinery only being brought to site at the beginning of each beach management campaign, and removed at end, with machinery left on site for the duration of each campaign.<br>Rainbowing Shingle ashore: unrestricted, as pumping ashore can only occur at high tide, for 2 – 4 hours per discharge. When barge in area, need to make use of every consecutive high tide period, for recharging to be financially viable. | Limited impacts due to low frequency of vehicle movements during working hours. Works are a short duration, limiting potential impacts. |
| **Pedestrians – Reduced access to the Beach** | Access along the beach will be maintained. Works are relatively short term and will be carried out at a time of year outside the main holiday periods, except in an emergency. | Minor impact - it is unavoidable on safety grounds |
| **Rainbowing of material** | Chichester Harbour Conservancy and | Minimal Impact – |

| | | |
|---|---|---|
| **from dredging impacting navigation** | Chichester Harbour Master will issue notices to mariners and also directly to local Fisherman to minimise the impact to all Harbour users. | Safety restrictions will apply |
| **Disturbance to Residents** | Moderate Adverse impacts from the works; however the residents have the most to gain from the works, so no complaints have been raised from any of the past works. Residents will be notified prior to any works taking place. | Minimal impact expected. |

## 15.6 Conclusions

It can be concluded that the residual impact is considered to be negligible in terms of traffic movements as a result of the works.

The impacts of moving along the beach will have a short term and temporary impact on local residents; however the works will benefit the residents. Previous works have not resulted in any complaints from local residents.

There will be minimal impact upon navigation during the works. Although not assessed in this application, the ongoing dredge of the Chichester Harbour approach channel results in a key benefit to navigational safety into the future.

# 16. GROUND CONDITIONS

## 16.1 Introduction

This section of the ES considers the potential impacts of the proposed scheme on land quality and hydrogeology.

## 16.2 Methodology

A preliminary desk based investigation was necessarily high level due to the large area which Hayling Island encompasses. The methodology applied is in accordance with the National Planning Policy Framework (NPPF).

The National Planning Policy Framework (NPPF) (Department for Communities and Local Government (DCLG), 2012) provides guidance on the management of land contamination through the planning regime. This states that *"to prevent unacceptable risks from pollution and land instability, planning policies and decisions should ensure that new development is appropriate for its location. The effects (including cumulative effects) of pollution on health, the natural environment or general amenity, and the potential sensitivity of the area or proposed development to adverse effects from pollution, should be taken into account. Where a site is affected by contamination or land stability issues, responsibility for securing a safe development rests with the developer and/or landowner".*

The NPPF notes that:

"*Planning policies and decisions should also ensure that:*

- *the site is suitable for its new use taking account of ground conditions and land instability, including from natural hazards or former activities such as mining, pollution arising from previous uses and any proposals for mitigation including land remediation or impacts on the natural environment arising from that remediation;*

- *after remediation, as a minimum, land should not be capable of being determined as contaminated land under Part IIA of the Environmental Protection Act 1990; and*
- *adequate site investigation information, prepared by a competent person, is presented"*.

## 16.3 Baseline Conditions

### 16.3.1 Issues Relating to Land Contamination

Within the area of interest there are no current or historic landfill sites. There are three historic landfill sites to the north of the study area (see **Figure 16.1**). There are no contamination pathways from these historic landfill sites to the open beach, and no new contamination pathways will be opened as a result of the beach management works. Any material brought in by road will be clean, certified material suitable for the marine environment.

This was scoped out as part of the scoping phase for this project, therefore will not be considered any further in this assessment.

**Figure 16.1 Historic Landfill Sites**



## 16.4 Conclusion

The size of sediment on the beach is considered to be fairly large (60mm +), as such there is a very low risk of any contaminants binding to the sediment. The South Hayling frontage is a dynamic part of the coastline; therefore the material on the beach is constantly flushed by the tide. The risk of contaminant entering the water body is low, therefore this will not be considered any further in this assessment. Any potential impacts to water quality as a result of the beach management works are considered in **Chapter 12** (Water Environment) and the Water Framework Directive Assessment (**Appendix D**).

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# 17. HEALTH AND AIR QUALITY

## 17.1 Introduction

This section of the Environmental Statement provides an impact assessment of the proposed Beach Management Plan (BMP) activities on both Health and Air Quality around South Hayling Island.

## 17.2 Baseline Conditions

The National Planning Policy Framework [NPPF] (Department for Communities and Local Government (DCLG), 2012) refers to the Local Air Quality Management (LAQM) processes. It recognises that 'Planning policies should sustain compliance with and contribute towards EU limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas (AQMAs) and the cumulative impacts on air quality from individual sites in local areas.'

Planning decisions should ensure that any new development in Air Quality Management Areas [AQMAs] is consistent with the local air quality action plan, however on Hayling Island there are no Air Quality Management Areas.

### 17.2.1 Existing sources of atmospheric pollution

Existing sources of air pollution in the study area include road transport and marine vessels. The main pollutants of concern from these emission sources are likely to be those relating to fuel combustion, such as Nitrogen Dioxide (NO2), Particulate Matter (PM10), Carbon Monoxide (CO), and Carbon Dioxide (CO2). NO2 and PM10 levels are least likely to meet the Air Quality Strategy objectives near roads. **Table 17.1** provides an overview of NO2 and PM10, it highlights that PM10 can also be found naturally in sea salt crystals, and in coastal locations a proportion of airborne particles are typically sea salt.

**Table 17.1 An overview of Particulate Matter and Nitrogen Dioxide (DEFRA 2017)**

| Pollutant | Properties | Anthropogenic Sources | Natural Sources | Potential Effects |
|---|---|---|---|---|
| Particles($PM_{10}$) | Tiny particulates of solid or liquid nature suspended in the air | Road transport; Power generation plants; Production processes e.g. windblown dust | Soil erosion; Volcanoes; Forest fires; **Sea salt crystals** | Asthma; Lung cancer; Cardiovascular problems |
| Nitrogen Dioxide ($NO_2$) | Reddish-brown coloured gas with a distinct odour | Road transport; Power generation plants; Fossil fuels – extraction & distribution; Petroleum refining | No natural sources, although nitric oxide (NO) can form in soils | Pulmonary oedema; Various environmental impacts e.g. acid rain |

The Daily Air Quality Index [DAQI] describes levels of air pollution and provides recommended actions and health advice. The index is numbered 1-10 and divided into four bands, low (1) to very high (10), to provide details about air pollution levels in a simple way.

DEFRA monitor air pollution levels from the information obtained from the DAQI. Background pollution levels on South Hayling Island (National Grid Reference 474500 98500) are forecasted as very low, therefore potential health risks from air quality are considered minimal. See **Table 17.2** below.

**Table 17.2 Background pollutant levels at South Hayling (DEFRA 2017)**

| Annual Mean Concentration | Pollutant | | | |
|---|---|---|---|---|
| | Nitrogen Dioxide *Concentrations are as ug.m-3 NO2* | Daily Air Quality Index DAQI – Subsequent advice. | PM10 Concentrations are as ug.m-3 gravimetric PM10 | Daily Air Quality Index DAQI – Subsequent advice. |
| 2015 | 10.16 | *Very Low (1) 0-67* **Enjoy** your usual outdoor activities | 11.75 | *Very Low (1) 0-16* **Enjoy** your usual outdoor activities |
| 2014 | 9.36 | | 11.75 | |
| 2013 | 10.25 | | 13.26 | |
| 2012 | 11.30 | | 12.29 | |
| 2011 | 11.67 | | 15.07 | |

It is evident that estimated pollution concentrations along South Hayling Island fall within recommended UK standards, therefore the potential for air quality to increase the risk of health issues is considered to be negligible, particularly as the works will last for such a short duration (maximum length of time for the works is 4 weeks).

### 17.2.2 Sensitive Receptors

#### 17.2.2.1 Human

A human 'receptor', refers to any location where a person may experience the annoyance effects of airborne dust, dust soiling, or exposure to PM10 over a time period relevant to the air quality objectives, as defined in the Government's technical guidance for Local Air Quality Management.

Areas of specific sensitivity which need additional assessment include residential dwellings, schools, nursing homes and hospitals. There are residential properties on the Eastoke (eastern) end of the beach within close vicinity of where the works are taking place.

#### 17.2.2.2 Ecological Receptors

There are a number of ecological receptors, namely environmentally designated sites, within/adjacent to the proposed beach management works; these include:

- Solent Maritime SAC
- Chichester and Langstone Harbours SPA and Ramsar
- Chichester Harbour SSSI
- Langstone Harbour SSSI
- Sandy Point Local Nature Reserve and Countryside Heritage Site
- Southern Eastoke Frontage SINC
- Beachlands SINC
- Sinah Common SSSI

These are spatially illustrated on **Figures 8.1 and 8.2**, and **Section 8** provides a complete list of the habitats and species they protect, and the additional locally designated sites.

These sites can be classed as sensitive receptors due to their ecological importance, and may be affected by gaseous and particulate pollutants and by disposition of these pollutants, in particular onto plant surfaces such as leaves.

#### 17.2.2.3 Dust Emissions

The Institute of Air Quality Management [IAQM] regularly publishes guidance on potential ecological and human impacts during site works. IAQM recommend that if ecological receptors exist within 100 metres of the works area, these ecological

receptors should be assessed.

The most sensitive ecological receptors that exist within the 100m boundary of the works area are the vegetated shingle communities. However, due to the short duration of the beach management activities and best practice methods adopted on site, impacts are expected to be minimal and temporary. Dust particles are likely to be washed or blown off by sea spray/rain shortly after the works are completed.

IAQM guidance also recommends a distance of 350m from construction activities in which human receptors should be considered. There are existing human receptors within 350m of the beach management works, namely residential dwellings at Eastoke, where there is minor potential for an increase in dust emissions.

#### 17.2.2.4 Site Traffic Emissions

Traffic and transport impacts are considered in **Section 15**, which highlights the key access routes. There are existing receptors located adjacent to all main roads and the beach area. The IAQM highlight that their experience of assessing exhaust emissions from on-site plant and site traffic suggests that they are unlikely to make a significant impact on local air quality. In the vast majority of cases they will not need to be quantitatively assessed.

## 17.3 Potential Impacts

The Background pollutant levels assessed at Hayling Island are very low and any temporary increase would have only a very limited effect but overall would remain in the low category. All construction activities would result in short-term minor adverse impacts from localised increases in exhaust emissions from mechanical plant and potential dust associated with the vehicle movements during prolonged dry weather periods. However, dust levels would be limited due to the damp and course nature of materials worked within the intertidal zone. Given that the works themselves take place on the open coastline, any increases would also be expected to rapidly dissipate.

Health and air quality impacts associated with the beach management works once works have been completed are negligible; therefore no further impacts have been considered with no impact table presented within this section.

## 17.4 Mitigation and Residual Impacts

The main impacts of the beach management works revolve around the potential increase in dust levels and exhaust emissions. These impacts are minimal and

temporary due to the short timescale of the beach management works and other than good practice working / using well maintained equipment, no additional mitigation has been identified.

## 17.5 Conclusion

It can be concluded that potential impacts to health and air quality as a result of the beach management works will be localised, short term and temporary.

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# 18. AMENITY AND RECREATION

## 18.1 Introduction

This section provides an assessment of impacts from the proposed works on the Amenity and Recreation along the South coast of Hayling Island.

## 18.2 Baseline Conditions

The South Hayling Island Coastline is an important recreational attraction for local residents and visitors alike as public open space.

The island continues to cater for summer trippers, resulting in an increase in the summer-time population on the island. The seafront's recreational activities include jet skiing, wind and kite-surfing, golf, fishing, funfair and amusements, swimming and sailing, etc. The blue flag beaches are popular for general amenity, especially in the summer. More passive past times include walking, cycling, sea-bathing and eating & drinking at the pubs and café kiosks. Hayling Island Sailing Club [HISC] (BMP Unit 1) is a very active sailing club with 3018 Members. Beach management works may take place in this unit, if commissioned by HISC, to keep their pontoon operational.

Tourism is an important feature of Havant Borough's economy, the coastline being the prominent feature. Tourism attracted c.2.9 million visitors in 2013, which was valued at c.£155 million providing employment for 4,265 people (Tourism South East , 2013) Many of these jobs are seasonal and part-time, therefore any operation would be timed to avoid peak visitor periods during the summer unless in exceptional circumstances, for example in an emergency.

One of the main attractions along the Hayling Island coastline is the beach. The use of the beach varies depending on the season and facilities such as car parks and water use zoning provide a focus for amenity use and access onto the beach. The peak tourism season is between April (Easter) and September. The BMP itself helps

maintain this healthy beach asset for the enjoyment of tourists and residents.

Chichester Harbour, adjacent to the east coast of Hayling Island, is a designated Area of Outstanding Natural Beauty [AONB]. Over 1.5 million people are attracted to the AONB each year, for both activities on and off the water, as well as the picturesque landscape.

### 18.2.1 Bathing Waters

The EU Bathing Water Directive (76/160/EEC) imposes statutory objectives on bathing waters. Its two main objectives are:

- To improve or maintain the quality of bathing water for reasons of amenity; and
- To protect human health.

Samples taken during the past ten years from the sampling point closest to the study area have consistently achieved an excellent rating for all parameters. West Beachlands Central beach, which is located to the west of the study area, currently holds a “Blue Flag” which is a symbol of high environmental standards as well as good sanitary and safety facilities at beaches and marinas.

Along the South Hayling Island frontage, there are three areas designated under the Bathing Waters Directive, which are illustrated on **Figure 18.1**:

- Beachlands West
- Beachlands Central
- Eastoke

Also illustrated on **Figure 18.1** is the Eastney Bathing Water (to the west of the BMP works) and West Wittering Bathing Water (to the east of the BMP works). These are both within 2km of proposed BMP works so have therefore been scoped in to this impact assessment.

Potential impacts to all the bathing waters are considered low. The recycling works will be undertaken outside of the water body; therefore elevated levels of suspended sediments are unlikely. Material is coarse with low levels of fines present. Works will be undertaken outside of the main tourist season (except in an emergency).

Any potential water quality impacts are assessed further within Chapter 12 (Water Environment) and the Water Framework Directive Assessment (**Appendix D**).

## 18.3 Potential Impacts

The beach re-nourishment works enhance the existing beachscape by covering the existing groynes, increasing the beach width and resulting in a more attractive beach profile, which is one of the main draws to the area and therefore a beneficial impact. A “Do Nothing” approach to management along this frontage would lead to eventual loss of the beach, therefore a potentially devastating loss of the primary attraction in the area and a significant impact on the Hayling Island economy.

During the construction works there will be restricted access to the beach, for safety reasons, although pedestrian access along the beach will be maintained with a restricted width and possible diversion route at specific times of the works. These impacts will be temporary, and providing they are undertaken outside of the peak tourist season, minimal impacts are expected.

All impacts for the works are temporary, the works tend to take place in March and September and take from 2 – 4 weeks to complete. Therefore only temporary visual impacts would be experienced by residents and recreational users on the coastal frontage and sea-farers as a result of the presence of construction plant (notably bulldozers, excavators and barges), heavy goods vehicles, personnel and stored materials/site compounds. These temporary local impacts are very subjective and could be considered as slightly adverse by local residents and recreational users. There is anecdotal evidence that the beach management works themselves draw people to the beach to see the works taking place. The recreational and amenity impacts are not considered to be significant providing the works take place outside of the main holiday season.

Indirect impacts to amenity and recreation include increased levels of traffic due to construction vehicles, noise and potential impacts on air quality. These impacts are considered further in the relevant chapters, but are all considered to be minimal due to the temporary nature and scale of the works.

The beach nourishment works are of a significant benefit to the area. The removal of material at HISC will significantly improve access to the water for boat users. The amenity value of the beach at Eastoke is maintained, therefore upholding the recreational value in the area.

In the event of extreme weather events, it may be necessary to undertake emergency works which could potentially impact upon the peak tourist season. However, it should be noted that emergency works will only be undertaken when deemed absolutely necessary, when the beach is not at an adequate level of

protection. The beach is helping to protect 1550 properties from flooding and erosion.

**Table 18.1** illustrates the impacts of the proposed BMP activities on amenity and recreation along the South Hayling Island open coastline. **Table 18.2** then presents any impacts requiring mitigation, to set out whether there is any resultant impact, and whether this is acceptable.

**Figure 18.1 Designated Bathing Beaches along the Hayling Island coastline**



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**Table 18.1: Potential impacts of delivery of the BMP on Amenity and Recreation. Impacts highlighted orange require specific mitigation (See Figure 1.1 for location of BMP units, and Section 4 for details of proposed unit by unit activities.**

| Potential Effects of Beach Management Operations | BMP U1 | BMP U2 | BMP U3 | BMP U4 | BMP U5 | BMP U6 | BMP U7 | BMP U8 |
|---|---|---|---|---|---|---|---|---|
| *Loss of amenity due to visual intrusion of the works along the seafront* | Temporary and short term; works last for a short duration. Can be mitigated, with clear advanced public communication. People may travel to see the works, therefore potential benefit. Generally undertaken outside of tourist season (unless in an emergency). | | | | | | | |
| *Disruption to leisure / recreational interests within the study area* | Short term disruption to Hayling Island Sailing Club. They will decide whether to fund extraction as part of our overall BMP works (per campaign). Works in this unit would be for the benefit of the Sailing Club. | Minimal and temporary disruption; works last for a short duration. The beach management activities will endeavour to create a natural looking beach in areas of recycling and deposition, any temporary effects will be very quickly 'naturalised' by the active coastal processes. Works are timed to avoid the main tourist season (unless there is an emergency and unavoidable need for works). | | | | | | |
| *Disturbance to beach users and local businesses* | The operation would be timed to avoid peak visitor periods during the summer unless in the event of an emergency. The maintenance of the beach ensures an important local tourist attraction is maintained. | | | | | | | |
| *Benefits to amenity and recreation* | The works will be a direct benefit for Hayling Island Sailing Club. Removal of material around the sailing club's pontoon will significantly increase access for boat users to the water. | Beach at Eastoke maintained due to the works, therefore maintaining an important local tourist attraction. The beach re-nourishment works would enhance the existing beachscape, by covering the existing groynes, increasing the beach width and resulting in a more attractive beach profile from the land and sea. | Limited direct benefits, however ongoing BMP activities enable the health of this beach along the whole forntgage, which would eventually experience erosion if BMP activities were to cease. | | | | | The works will be of a direct benefit to local assets, such as car parks. |

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## 18.4 Mitigation and Residual Impacts

The main impacts of the proposed works on both formal and informal recreation relate to the disruption and disturbance caused during the construction phase. These impacts are both minimal and temporary providing they do not take place during the peak tourist season (April to September), except in an emergency.

Any impacts can be mitigated by reducing the time that the beach has reduced access.

Table 18.2 summaries the potential impacts on amenity and recreation that could result from the beach management works. Where impacts have been identified, appropriate mitigation has been presented to remove or reduce this impact where applicable to an acceptable level.

**Table 18.2 Mitigation for impacts identified in Table 18.1 and residual impacts**

| Impact | Mitigation | Resultant/Residual Impact |
|---|---|---|
| Temporary effect on amenity and recreational access to the beach for the duration of the works | Length of construction works will be limited to as short a time as possible (2- 4 weeks). The works will not take place over the weekend or on public holidays or during the main tourist season limiting the impacts on visitors to the area, except in an emergency situation. A tidy site policy would be employed by the contractor and consequently there would be no significant residual impacts. | Negligible risk of impact |

## 18.5 Conclusions

It can be concluded that the impacts on amenity and recreation, both direct and indirect, in the area of interest will have a temporary and minimal adverse impact. Overall, the proposed works will have a beneficial impact by protecting and maintaining an amenity beach at Eastoke.

Despite there being a minor temporary impact for the duration of the works within BMP Unit 1, the works have a direct beneficial impact upon HISC by increasing access to the water for boat users.

The works in BMP Unit 8 would have a beneficial impact on reducing the potential risk of erosion of a local carpark which will have a beneficial impact on all recreational users of the car park.

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# 19. NAVIGATION AND COMMERCIAL FISHERIES

## 19.1 Introduction

This section of the Environmental Statement considers the impact of the proposed scheme on navigation and particularly commercial fisheries working within the vicinity of south Hayling Island. There is significant common ground between this section and the section on Fish and Shellfish which are described in **Section 10,** however this section focuses on the potential effects on commercial fishing operations and navigation rather than effects on fish stocks.

## 19.2 Baseline Conditions

The need for safe navigation within the Solent is paramount, with high levels of shipping including busy sea lanes for commercial and passenger transport, commercial fishing activity, charter angling and recreational boating. It is vital that the beach management scheme does not significantly affect safety or rights of navigation through and around the area.

The Solent is classified as an important sea fishery for commercial and non-commercial fish species. There are currently (March 2015) 5 commercial fishing vessels of less than 10 meters registered to Langstone Harbour as their home port, however fishermen from other ports will fish within the harbour and in the Eastern Solent. In Southampton 11 vessels are registered less than 10m in length and 3 vessels are registered greater than 10m in length. In Portsmouth, 48 vessels are registered as less than 10m in length and 8 vessels are registered as greater than 10m in length**.** A large number of recreational anglers can be seen on the shores when the weather is good. However, there are no accurate numbers on recreational fishing intensity

Commercial fisheries within the area of interest, the East Solent and both Chichester and Langstone Harbours include;

### 19.2.1 Langstone Harbour

**19.2.1.1 American hard shelled clam Fishery** (*Mercenaria mercenaria*). These clams are dredged in Langstone Harbour, typically focused on the intertidal areas providing the substrate is appropriate.

**19.2.1.2 Oyster Fishery** – Native Oyster (*Ostrea edulis*). The Solent oyster fishery used to be one of the largest native oyster fisheries in Europe, but recently, it has been in decline. For the past two years, Southern Inshore Fisheries and Conservation Authorities (IFCA) have used its temporary closure of shellfish beds byelaw to reduce the season due to the low stock levels. In the 2013/14 season the wider Solent was closed and fishing restricted to 4 weeks in Langstone Harbour. In the 2014/15 season it was reduced again to 2 weeks in Langstone Harbour. The Southern IFCA is working with Blue Marine Foundation to try to restore the native oyster stock levels throughout the Solent.

**19.2.1.3 Bass Fishery-** Langstone Harbour is considered to be a very important bass nursery, and has also been designated as a bass nursery with restrictions on fishing activities. The legislation prohibits certain methods of fishing for bass during a closed season.

### 19.2.2 Chichester Harbour

**19.2.2.1 Oyster Fishery** - Native Oyster (*Ostrea edulis*) once a significant industry in the harbour, but has been in decline, although efforts are being made through the Chichester Harbour Oyster Partnership Initiative (CHOPI) programme to revive the fishery. Chichester Harbour falls mostly under Sussex IFCAs district, and as such they lead on their management within the harbour.

**19.2.2.2 Bass Fishery-** Chichester Harbour is considered to be a very important bass nursery, and has also been designated as a bass nursery with restrictions on fishing activities. The legislation prohibits certain methods of fishing for bass during a closed season.

### 19.2.3 The Open Coast

**19.2.3.1 Whelk Fishery –** are fished throughout the Solent, caught using whelk pots.

**19.2.3.2 Scallop Fishery** – there is a scallop fishery located on the North East side of the Isle of Wight. This is considered to have no impacts from the works as it is not within a likely zone of influence of the scheme.

**19.2.3.3 Lobster Fishery** - Pots are laid outside the Harbours.

Other species exploited within the area include Plaice, Sole, Cod, Thornback Ray, Undulate Ray, Sand Eels and Tope Shark.

## 19.3 Potential Impacts

The fully proposed Beach Management Plan (BMP) activities are summarised in **Section 4**, unit by unit along the coastline. All activities take place on the beach itself to maintain critical beach levels, therefore providing the correct standard of flood and erosion protection. It is important to note that this ES is only considering the deposition of dredged material rather than the actual dredging itself as this is undertaken by Chichester Harbour Conservancy under their navigation powers and on safety grounds as a Harbour Authority, to ensure that there is a safe navigational depth. The dredging operation is carried out in line with a baseline document on dredging within Chichester Harbour that the MMO have approved.

The dredging operation would take place on navigational safety grounds regardless of whether this scheme could utilise the dredged material as a beneficial reuse and it is only the beneficial reuse of the dredged material that is being considered within the report.

It is considered that the beach management scheme has limited potential for impacts to navigational safety and the operation of commercial fisheries. The potential impacts upon fish stocks have been considered in full within **Section 10 'Fish and Shellfish'.** This section is principally concerned with potential impacts to the operation of fisheries and navigational safety for both commercial and recreational shipping.

The sections below detail the potential impacts of the South Haling Island BMP activities (as summarised in **Section 4**), on navigation and commercial fisheries. **Table 19.1** then presents any impacts that may require mitigation, highlighting what this mitigation is, and any resultant impacts.

### 19.3.1 Disruption to navigation

There are two mechanisms whereby beach management operations could affect navigation; Plant and vessels engaged in beach management disrupting/endangering access to fishing areas or navigable routes and the deposition/movement of sediment reducing navigable access or safety of navigation.

i) Plant working on beach; there is no beach launched fishing fleet, and very

few access points for boat launching along the entire frontage (I.e. Hayling Island Sailing Club). It is not considered that plant working on the beach will have any effect on commercial fisheries and navigation, but possibly some short-term minor disruption of access for small recreational vessels. Due to the temporary and localised nature of the works this is likely to be negligible. Also, if works are undertaken around HISC, this will be completed on their instruction, which will be funded by them. The works would bring a direct benefit to HISC, allowing the maintenance of their pontoon access.

ii) Vessels engaged in beach management (principally rainbowing) will pose a risk of navigation during operations. Prior to any beach management campaign involving rainbowing, a Navigational Risk assessment will be completed by the dredging company and submitted to the ESCP as part of the tender Submission. The Navigational Risk Assessment will then form part of the Construction and Environmental Management Plan (CEMP) in any one year. This will include Chichester Harbour Master issuing a 'Notice to Mariners' highlighting when and where the dredger will operate, contact radio details, etc. Due to the localised and temporary nature of the operation and the mitigation put in place, the residual impact is considered to be negligible.

iii) The main risk to navigation is the accretion of sediment within navigable channels. Although managed under a separate approval by Chichester Harbour Conservancy, the source of material for rainbowing is the beneficial use of arisings from dredging operations to maintain safety of navigation to Chichester Harbour. The recycling of material will also reduce the flow of material potentially entering Langstone Harbour entrance. Through the monitoring programme in the Technical BMP itself (see Appendix x), beach profiles and approach channels are regularly surveyed and any issues can be identified and managed appropriately.

iv) Beach management activities could lead to changes in levels in navigable areas, e.g. shallowing or creation of isolated hazards. It is noted that the beach management activity is principally on the open coast area, in shallow inshore waters in a naturally very dynamic environment that shipping is aware of and takes appropriate action. It is not considered that beach management activity represents an additional risk over and above the natural processes. Regular monitoring will identify any risks which can be communicated to harbour authorities and the UK Hydrographic Office as required.

### 19.3.2 Direct and indirect effects on fishing activity

We were able to conclude within **Section 10 'Fish and Shellfish'** that the beach management activity represents limited potential to harm fish stocks both in terms of reducing recruitment through harm to nursery areas and juvenile fish or impacts upon shellfish populations. However there is potential for the operation to directly affect fishing activity through disruption/damage/destruction of gear or operations displacing fish populations through acoustic disturbance or suspended solids.

The beach management is within shallow inshore waters in a high-energy environment. The area supports a relatively impoverished resident community of bottom living animals, and fewer still are species of commercial interest. The impact of storms can be expected to have a greater effect over a much wider area than the beach management operations of recycling, transportation, deposition and re-profiling. The acoustic disturbance may generate some small scale displacement, but this is considered to be very limited, particularly due to the short duration and localised extent of the activity, the majority of which takes place outside of the waterbody.

## 19.4 Mitigation and Residual Impacts

**Table 19.1 Potential Impacts on Commercial Fisheries, necessary mitigation and residual impacts**

| Impact | Mitigation | Resultant/Residual Impact |
|---|---|---|
| **Disruption of navigation** | Navigation safety plan included within CEMP.<br>Notice to mariners issued when necessary. | Minimal risk of impact |
| **Direct/indirect effects on fishing activity.** | Limited potential for effects, but maintain engagement with stakeholders to ensure they are aware of planned beach management activity. | Minimal risk of impact |

## 19.5 Conclusions

When considering the impacts to navigation and commercial fisheries as a result of this scheme, the negative impacts are relatively minor compared to changes due to storm events and any impacts will be temporary and localised in nature.

It is not considered that the activity represents an additional risk to safe navigation and indeed acts to facilitate the beneficial use of material dredged to maintain safe

navigation. For the duration of rainbowing operations, fishermen and all mariners will be informed by the Chichester Harbour Master that works are taking place in the approach channel and must be avoided. The Harbour Master is the Fisheries Liaison Officer and also issues Notices to Marinas.

The only measurable impact is that fishing boats may have to travel further to locate fish temporarily dispersed due to elevated sediment levels. This is considered to be a very minor impact due to the dynamic nature of the coast and the coarseness of the material managed in this location and this impact has not been reported to be problem in the past.

It is therefore concluded that the scheme has negligible potential for adverse effects on navigation and commercial fisheries, and indeed in terms of safety of navigation represents a minor benefit.

# 20. CUMULATIVE IMPACTS

## 20.1 Introduction

This Cumulative Impact Assessment (CIA) considers wider projects and activities that in-combination with the Hayling Island Beach Management Plan (BMP) could result in additional impacts on any of the elements discussed within this Environmental Statement (ES). The development of this ES has included the accumulation of all the information required to carry out a Habitat Regulations Assessment (HRA) and a Water Framework Directive (WFD) Assessment. These assessments identify overall impacts of delivery of the ongoing and extended beach management activities on the Natura 2000 sites and the WFD water bodies.

Both of these assessments have concluded that with mitigation, the proposed Beach Management Works at South Hayling Island can be delivered in an environmentally acceptable way, which is legally compliant with both the Habitats Regulations and the Water Framework Directive (WFD). Within these assessments an in-combination assessment has been carried out, which has concluded that there are not expected to be any likely significant effects on the Natura 2000 sites either alone, or in-combination, on the integrity of the designated sites. With regard to the WFD, all impacts were considered to be minimal, localised and temporary in nature so could not be considered to have a permanent impact at a water body scale. No significant in-combination impacts were identified.

In line with agreed practice, the present in-combination assessment is 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). The Hayling Island BMP is a long term plan, and mitigation has been promoted throughout the ES and supporting documents to prevent negative impacts on the community and the environment. Future projects and plans along the

South Hayling Coastline will need to take account of these works to prevent negative in-combination impacts.

## 20.2 Projects Identified

There are a number of currently proposed projects that have been identified as having the potential to have an environmental impact in-combination or cumulatively with the proposed beach management works. These have been extracted from the Havant Local Plan (Allocations), and the Marine Management Organisation (MMO) / Local Planning Authority public registers, to identify projects for further assessment. These projects are outlined in **Table 20.1**.

**Table 20.1 Plans and Projects to be considered in this 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.<br>• Southsea FCERM Scheme. |
| **From MMO Licences:** |
| • Chichester Harbour Dredging Protocol, including:<br>o Sparks Marina and Approach Channel maintenance dredging (L/2014/00144/3 and MLA/2014/000004/4). End date April 2024.<br>o Southsea outer Holding Pontoon Dredge (MLA/2012/ 00497).<br>o Treloar Hole Beneficial Dredge placement (MLA/2013/00485/2 and 34997/101125/2).<br>• 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).<br>• Archaeological Investigations: warship hazardous prize project group ship wreck (MLA/2014/004761). |

## 20.3 Background to CIA Investigations

European Commission (1999) and IEMA (2004) standard guidance has been used for this CIA, 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;
- impacts of the proposed scheme that have the potential to affect receptors in-combination with other proposed activities;
- Significance of any potential interactions/effects identified (as well as relevant mitigation).

Each of the projects and activities identified in **Table 20.1**, are discussed below in turn, to confirm whether in-combination with the beach management works, there could be cumulative impacts to communities and the environment.

### 20.3.1 Local Planning Authority / Local Plan projects:

#### 20.3.1.1 Housing Allocations in Havant Local Plan HY45 Beachlands

The Havant Borough Council Local Housing Allocations Plan has identified Beachlands as a potential redevelopment site for the construction of 50 – 125 dwellings (see **Figure 20.1** for location details). This is the only proposed development site within the Local Plan that is considered to have the potential to result in 'in-combination' impacts on the community and/or the environment.

The development is likely to be mixed use, including leisure, tourism and housing, with the potential to create a quality landmark building. During the construction of this site, construction related impacts could be additive to those of the beach management works. However, the works (and therefore the likely impacts) would be set back from the beach. The beach management works are limited in duration (two to four weeks, once or twice a year) so even if this site was under construction at the same time as undertaking beach management activities, the period of time would be very limited and therefore the impacts would be limited. The development would be required to mitigate any impacts on European and International wildlife sites and the adjacent SSSI, as highlighted by the policy. It would also be required to consider and mitigate in-combination impacts in relation to approved beach management works.

If this site is developed in the future, there would be potential for more regular visitors to the beach, although the site is currently used as an amusement park. The redevelopment should feed into the Solent Disturbance and Mitigation project to self mitigate such impacts. The development itself would need to be designed to prevent the need for additional flood defence works in future.

Given that no development has currently been confirmed at this site, and in-combination impacts are expected to be minimal, no further mitigation has been proposed.

#### 20.3.3.2 North Portsea Island FCERM Scheme

The majority of the North Portsea Island FCERM scheme is not in close vicinity to the South Hayling Island BMP works.

These works are undergoing phased construction and are located within Langstone and Portsmouth Harbours, some distance from the open Hayling Island coastline. The only expected interaction is in relation to the disturbance to SPA birds, given the links between feeding and roosting areas. In sensitive areas, the South Hayling Beach management works will only be undertaken when birds are not using the site i.e. not at high tide where the beach is used as a bird roost (refer to Section 9, information for HRA). The Portsea Island scheme is being constructed with numerous mitigation measures to ensure disturbance levels are kept to a minimum (I.e. no overwinter working). It can therefore be concluded that there will be no interaction between the two sets of works, and no additional in-combination impacts. The ESCP are undertaking additional bird surveys to ensure that our predictions and assessments hold true as we continue to undertake beach management works.

#### 20.3.3.3 Southsea FCERM Scheme:

The proposed works along the Southsea open coastline have the potential to interact with the Hayling Island beach management works. The Southsea scheme is at a very early stage of detailed design and cannot currently be assessed with any certainty as the impact and design of the scheme are not yet developed. The Southsea scheme will take account of the beach management works when it is being developed, to ensure there are no in-combination impacts. As the Southsea scheme is expected to require beach management works in itself, there is the potential for 'in-combination' benefits (I.e. co-ordinating offshore beach recharge by barge). See **Figure 20.2** which illustrates the location of the NPI and Southsea schemes in relation to South Hayling Island BMP works.

### 20.3.2 MMO Licenced projects (all illustrated by Figure 20.3):

#### 20.3.2.1 Chichester Harbour Dredging Protocol, including:

- Sparks Marina and Approach Channel (L/2014/00144/3) maintenance dredging.
- Southsea outer Holding Pontoon Dredge (MLA/2012/ 00497).
- MLA/2013/00485/2 Treloar Hole Beneficial Dredge placement.

These Marine Licenses within Chichester Harbour form part of the Chichester Harbour Dredging protocol that has been developed by Chichester Harbour Conservancy to retain sediment within the Harbour and allow the saltmarshes to keep pace with sea level rise.

Due to the ebb dominated tide within Chichester Harbour, there is not considered to be an interaction with the placement of sediment along the Hayling Island open coastline, and the placement of beneficial use of dredge material into Treloar Hole. The type and size of sediment particles between the two operations is also very different, so impacts are considered to be quite different, therefore there is no potential for in-combination impacts. A baseline document produced by HR Wallingford in 2011, concluded that the placement of fine silty material within Treloar Hole (within the mouth of Chichester Harbour between Eastoke Point and Black point), would not have a likely significant effect on the designated sites, alone or in-combination with other works within Chichester Harbour (including the beach management works)

The annual sediment load carried into the Harbour on flood tides has been estimated to be 490,000 tonnes (HR Wallingford 2004). Assuming that quantity placed in the hole annually is 7000 tonnes it is less than 1.5% of the total load. HR Wallingford state that this is calculated making a number of assumption however it is used to provide an order of magnitude.

#### 20.3.2.2 MLA/2016/000407 West Wittering Estates PLC Management of excessive sand build up on the shoreline of West Wittering / East Head:

These works have been planned in order to deliver the adopted FCERM policy of adaptive management along this coastline, on the opposite side of Chichester Harbour entrance. The works at West Wittering / East Head involve the recycling / movement of sediments. This is to respond to excessive build up of sand at West Wittering, vs. depletion of sand at East Head. These works are similar to the Hayling Island BMP works, proposed within BMP Unit 1, whereby sand will be excavated and removed from where it builds up around the Sailing Club's slipway, to ensure the local sailing club can continue to operate. The West Wittering / East Head works are intermittent, similar to the Hayling Island works. If both activities were to take place at the same time on either side of the harbour, it is considered unlikely that levels of sediment in the water column would increase over levels already naturally present in the water body, due to the exposed nature of this section of coast, and the small quantities of activity. Therefore the West Wittering / East Head works are considered unlikely to cause any in-combination impacts with the Hayling Island BMP works.

As a matter of best practice, we will communicate with West Wittering Estates / Chichester District Council to avoid both operations taking place at the same time to

ensure there are no ‘in-combination’ impacts. This action will be incorporated into the Construction and Environmental Management Plan (CEMP).

#### 20.3.2.3 Archaeological Investigations: warship hazardous prize project group ship wreck (MLA/2014/004761).

Although these works are ongoing they are very minor and cannot be considered to have a significant in-combination effect with the Hayling Island beach management works.

## 20.4 Strategic considerations

The BMP works have been assessed at the strategic level to ensure they are the preferred FCERM option for this stretch of coastline. The BMP itself is considered the most technically, environmentally and economically sound option to protect Hayling Island from the risks of Coastal flooding and erosion. The FCERM policy within the adopted North Solent Shoreline Management Plan is to Hold the Line, which this BMP will enable. The Eastoke Point Sectoral Strategy Study also concluded that beach management was required to deliver Hayling Island’s FCERM needs.

## 20.5 Conclusions

The projects and activities described within this section are not expected to have any ‘in-combination’ impacts with the South Hayling Island BMP Works. This is due to the fact that the Beach Management Works are for relatively short periods in any given year. All impacts were considered to be minimal, localised and temporary in nature, and therefore will not add to the impacts of the other schemes identified, particularly following the mitigation that has been proposed. In addition, extensive environmental mitigation has been promoted, to ensure the BMP in itself will not result in negative impacts. Therefore, the project’s ‘self mitigation’ reduces the potential for in-combination impacts.

The BMP’s management and monitoring plan will keep a watching brief on other projects as they develop over the time period of these works, to ensure that future projects do not overlap, spatially or temporally with the beach management works. Where they do, additional mitigation will be considered, if ‘in-combination’ impacts could occur.

**Figure 20.1 Beachlands potential redevelopment site, extracted from Havant Borough Council's Local Housing Allocation Plan**.

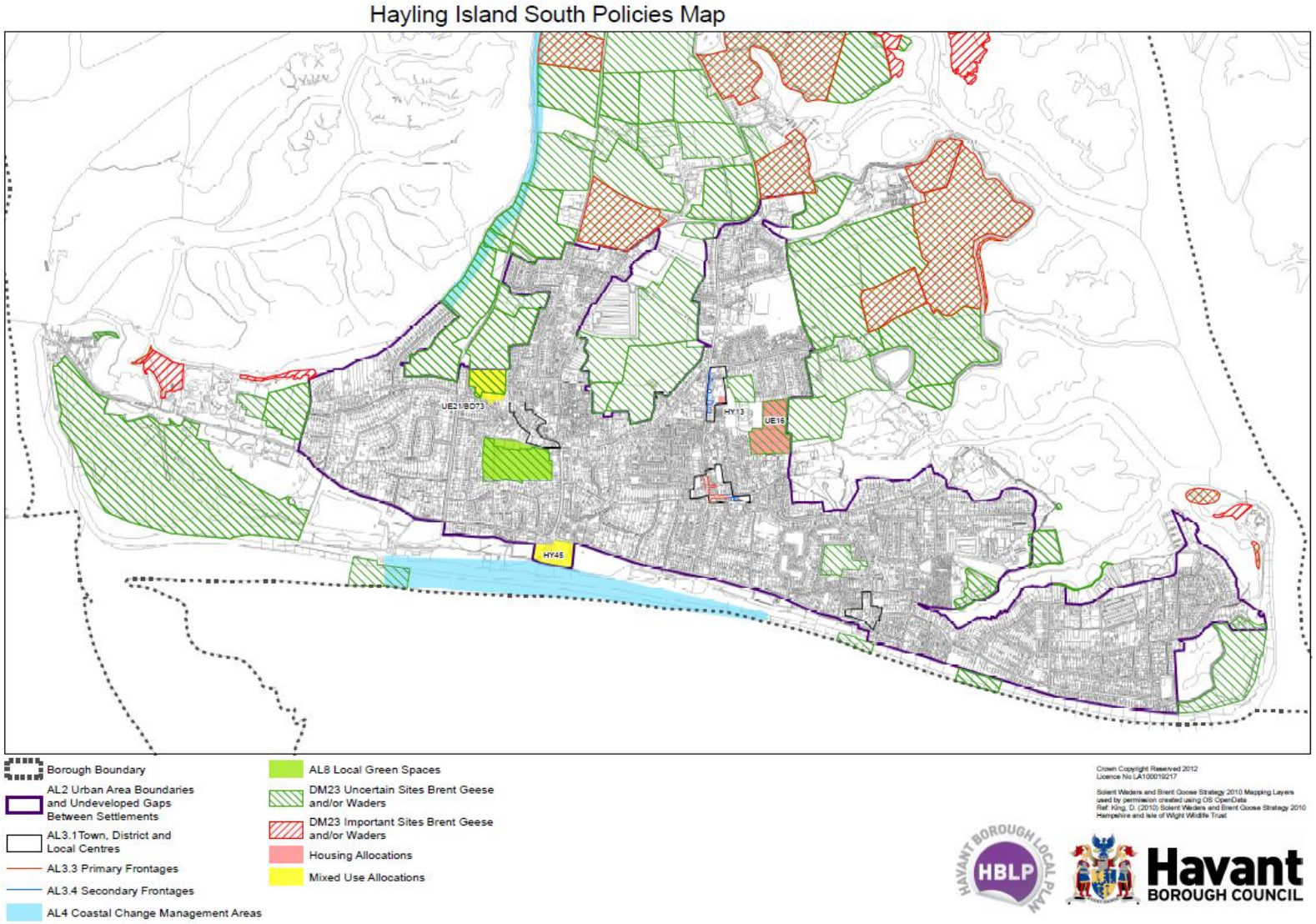


**Figure 20.2 locations of the NPI and Southsea schemes in relation to the South Hayling Island BMP works**



**Figure 20.3 Location of MMO Licensed activities in the vicinity of the works.**



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# 21. CONCLUSIONS

An **Environmental Mitigation Plan** has been developed (**Table 21.1**), which summarises the potential environmental impacts, mitigation and any residual impacts from delivery of the proposed South Hayling Island Beach Management Plan (BMP). Key restrictions are spatially summarised on **Figure 21.1**. The mitigation plan summarises all the impacts and mitigation from the respective chapters of this Environmental Statement, including the Habitat Regulations Assessment, and Water Framework Directive Assessment. This table should be used to inform the Conditions that are attached to any BMP approval, as considerable time has been spent, working with stakeholders and advisors to establish these restrictions, whilst still enabling viable works.

The Environmental Mitigation Plan has identified all mitigation measures required during the construction phase. These requirements will be taken forward as a condition of the construction contract and considered in detail as part of the Construction and Environmental Management Plan (CEMP), which will be developed upon appointment of contractors. It is suggested that a CEMP is submitted and agreed prior to each beach management campaign (unless works are required in an emergency situation). The CEMP will then set out the sources of recharge and recycling we are adopting for each campaign, and the specific mitigation that will be applied to prevent impacts on all aspects of the environment, as advised by Table 21.1.

The Environmental Mitigation Plan will ensure the delivery of an environmentally acceptable solution along the full South Hayling Island frontage.

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**Table 21.1 Environmental Mitigation Plan**

| Impact no. | Impact category | Impact | Mitigation | Resultant Impact |
|---|---|---|---|---|
| 1. | • HRA | Damage and disturbance to breeding and ground nesting birds, and visual / auditory disturbance to roosting birds from open beach recycling. Damage to vegetated shingle and drift line habitats through tracking machinery. Applies to the full Hayling Island Coastline (BMP Units 1-8). | • 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.<br>• 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 eastern Eastoke and Gunner Point frontages only (BMP Units 1, 2 (eastern half), 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.<br>• 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.<br>• 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 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 coarse, and activities take place on the beach, not directly within the waterbody itself. | Due to the avoidance measures identified, no resultant impact expected.<br><br>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). |
| 2. | • HRA | Damage and disturbance to breeding and ground nesting birds, and visual / auditory disturbance to roosting birds from rainbowing marine dredged | • 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 | Due to the avoidance measures identified, no resultant impact expected. |

| Impact no. | Impact category | Impact | Mitigation | Resultant Impact |
|---|---|---|---|---|
| | | shingle ashore at Eastoke via barge (BMP unit 3 only). | distance). Additional surveys will be carried out if required to ensure that birds have not nested in the meantime.<br>• 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.<br>• 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, 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.<br>Note: Marine sourced materials will only be sourced from licensed dredge sites / permitted navigational activities that would provide this beneficial material for reuse. This ES relates to placement only. | 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. See HRA (Appendix C) for details observations from historic watching briefs of rainbowing shingle ashore at this location. |
| 3. | • HRA<br>• ES Coastal processes | 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. | • 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).<br>• 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 | Due to avoidance measures identified, no resultant impact expected. The appropriateness of the mitigation has been agreed with Natural England during preparation of this HRA. Liaison with Natural England will continue going forward. |

| Impact no. | Impact category | Impact | Mitigation | Resultant Impact |
|---|---|---|---|---|
| | | | 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).<br>• 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 21.1). 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 campaign, advised by vegetation surveys and details of accretion.<br>• 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. | • HRA<br>• WFD | Impacts of recycling and recharge activities on Water Quality I.e. increased suspended solids in the waterbody. Potential impact on foraging visibility for terns. | • 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.<br>• 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. | Due to the avoidance measures identified, no resultant impact expected. |
| 5. | • HRA<br>• ES Coastal | Damage and disturbance to breeding and ground nesting birds, and visual / | • To avoid damage and disturbance to breeding and ground nesting birds, including terns: ecological walkover immediately | Due to the avoidance measures identified, no resultant impact |

| Impact no. | Impact category | Impact | Mitigation | Resultant Impact |
|---|---|---|---|---|
| | Processes | 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. | 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.<br>• 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.<br>• To avoid impacts on vegetated shingle: 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.<br>• A drift line habitat / vegetated shingle survey was undertaken in 2016 (see Figure 21.1). 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.<br>• 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 pontoon 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 LSE on this feature.<br>• To avoid impacts on natural coastal processes: There will be on-going detailed monitoring of beach levels to guide operations. | expected. The appropriateness of the mitigation has been agreed with Natural England during preparation of this HRA. Liaison with Natural England will continue going forward. |

| Impact no. | Impact category | Impact | Mitigation | Resultant Impact |
|---|---|---|---|---|
| | | | We are working with natural coastal processes. | |
| 6. | • HRA;<br>• ES Coastal processes. | 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. | • 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).<br>• 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.<br>• 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 (see Figure 21.1). No works along this frontage between March and August to protect drift line habitat development.<br>• 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. 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). | Due to the avoidance measures identified, no resultant impact expected. The appropriateness of the mitigation has been agreed with Natural England during preparation of this HRA. Liaison with Natural England will continue going forward. |
| 7. | • HRA;<br>• ES Coastal processes. | Benefits of BMP activities on the wide South Hayling Island open coastline | • Beach management and working with natural 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.<br>• 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.<br>• Utilising material accreting on the beach will reduce the need for importing additional sediment from outside the sediment cell, | Due to the avoidance measures identified, it is believed that the delivery of the BMP will have likely significant benefits to the South Hayling Island coastline. |

| Impact no. | Impact category | Impact | Mitigation | Resultant Impact |
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| | | | 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. | |
| 8. | • HRA;<br>• WFD;<br>• ES In combination impacts. | In-combination impacts from other activities within / adjacent to the European designated sites. | • As discussed in Chapter 20 of the ES, the HRA and WFD, other potential activities that could affect 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. | Due to the avoidance measures identified, no resultant impact expected. |
| 9. | • ES Coastal processes<br>• HRA | Change in beach profile causing issues on the open coastline.<br>• Impacts on the natural evolution of Gunner Point | The BMP has been carefully developed based on historic research and clear understanding of the way in which coastal processes operate along this coastline. This mitigation plan includes control measures that will be implemented to protect important habitats (Gunner Point – BMP Units 6 & 7) including:<br>• Vegetated shingle / annual vegetation drift lines will be demarcated. Machinery will be prohibited to cross the line<br>• Machinery will track along the beach below MHWS at Gunner Point to protect vegetated shingle | Due to the avoidance measures identified, no resultant impact expected. |
| 10. | • ES Coastal processes | Tracking on the beach and moving material along it.<br>• Compaction of shingle on crest, impacting future free movement of shingle | • The beach is naturally a very dynamic environment, so compaction of material is unlikely<br>• The Construction Environmental Management Plan will include measures to ensure tracking along the beach has minimal impact on coastal processes i.e. minimising the width of the haul route as much as possible so the smallest possible area is impacted. | Due to the avoidance measures identified, no resultant impact expected. |
| 11. | • WFD;<br>• HRA;<br>• ES Fish and Shellfish;<br>• ES Coastal Processes. | Increased suspended sediments in the water body during construction | • Material is coarse with low levels of fines present. Effects of turbidity are low risk and any fines present are expected to settle quickly out of the water column. Recycling works will take place outside of the water body, therefore minimal impacts expected.<br>• Material rainbowed ashore (BMP Unit 3 only) will be deposited on the upper levels of the beach, outside of the water body. Material will be rainbowed ashore at high tide; therefore any fines present will be transported away from sensitive habitat areas on the ebb | Due to the avoidance measures identified, no resultant impact expected. |

| Impact no. | Impact category | Impact | Mitigation | Resultant Impact |
|---|---|---|---|---|
| | | | tide. | |
| 12. | • WFD;<br>• HRA<br>• ES Fish and Shellfish. | Impacts on water quality due to pollution incidents from construction machinery. | • A Construction and Environmental Management Plan will be developed prior to each campaign, which will be a legally binding document to ensure best practice working;<br>• All plant to use biologically degradable hydraulic oils;<br>• All plant to be equipped with suitable spill kits and operatives trained in use;<br>• All refuelling and fuel storage to be undertaken within the compound area (Southwood Road), away from the beach;<br>• These avoidance measures are confirmed within the WFD assessment (Appendix D). | Due to the avoidance measures and best practice working adopted, no resultant impact expected. |
| 13. | • ES Landscape and Visual Impact | Impact on visual amenity for the duration of the works:<br>• Plant machinery on site<br>• Mounds of material on the beach immediately prior to re-profiling | • Works are short term and temporary in nature;<br>• A tidy site policy will be employed by the contractor;<br>• Works will not be undertaken at weekends, recognised bank holidays or during the main holiday season (except in an emergency). | Due to the avoidance measures identified, no resultant impact expected. |
| 14. | • ES Archaeology and Heritage | Unearthing archaeological interest features. | • The likelihood of unearthing archaeological features is extremely low as only the active beach material will be worked; however the precautionary approach will be taken.<br>• Machines will be operated in such manner to avoid penetration and risking impact to potential buried artefacts by rutting, digging or scraping into the lower levels of beach material. Only material within in the active layers of the beach will be worked.<br>• Should any archaeological artefacts be discovered, works will be stopped and Havant Borough Councils Archaeologist will be contacted who will determine if:<br>  • The finds are of sufficient merit to take further action;<br>  • If finds are of sufficient merit, they may need to be recorded and left in situ<br>  • the finds are of sufficient merit to be recorded and excavated, to be preserved in an alternative location.<br>• Machinery working on site will avoid beach defence structures and other military structures if they are on the line of tracking. No artefacts will be needlessly or thoughtlessly impacted. | Due to the avoidance measures identified, no resultant impact expected. |
| 15. | • ES Noise and Vibration;<br>• HRA | Elevated noise and vibration levels causing disturbance to residents and birds in the vicinity of the works. | • Working hours restricted to minimise disturbance to residential and commercial receptors.<br>  • Delivery of shingle to site by road and tracking on the foreshore with machinery: 6am to 10pm Monday to Friday (unless there is an emergency response required | Due to the avoidance measures identified, no resultant impact expected. |

| Impact no. | Impact category | Impact | Mitigation | Resultant Impact |
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| | | | which could require 24 hour working).<br>• Delivery of machinery to undertake beach management: unrestricted due to logistics. Machinery only being brought to site at the beginning of each beach management campaign, and removed at end, with machinery left on site for the duration of each campaign.<br>• Rainbowing Shingle ashore: unrestricted, as pumping ashore can only occur at high tide, for 2 – 4 hours per discharge. When barge in area, need to make use of every consecutive high tide period, for recharging to be financially viable.<br>• Works will not be undertaken at weekends, recognised Public Holidays or within the main tourist season, unless in an emergency.<br>• Plant stored within the compound (situated along Southwood Road) will be stored at the southern end of the compound area away from adjacent houses.<br>• Construction vehicles will be restricted to a 10mph speed limit<br>• Restrict drop height to a minimum when loading the dump truck hopper from an excavator bucket (or conveyor). This would also reduce noise levels from initial filling of steel dump truck hopper with coarse aggregate.<br>• The local community (local residents, commercial and property owners) will be kept fully informed about the nature and timing of construction activities prior to each campaign. This consists of letter drops, posters and newspaper adverts.<br>• Should works be required during the overwintering bird period (October to March inclusive), no recycling operations will be undertaken 1.5 hrs before and 1hr after high tide (BMP Units 1, 2 (easetrn half), 6, 7 & 8).<br>• An ecological walkover will be undertaken immediately prior to works in nesting season (March to August inclusive). Provide exclusion area if nesting birds discovered (minimum of 5 meter buffer distance). Additional surveys will be carried out if required to ensure that birds have not nested in the meantime. No noise and vibration impacts expected. In units 6 to 8, no works will be undertaken between March and August inclusive as birds are known to nest in these areas. | |
| 16. | • ES Traffic and Transport | Impacts to the highway network | Working hours will be restricted in the following way:<br>• Delivery of shingle to site by road and tracking on the foreshore | Due to the avoidance measures identified, no resultant impacts expected. Works are of a short |

| Impact no. | Impact category | Impact | Mitigation | Resultant Impact |
|---|---|---|---|---|
| | | | with machinery: 6am to 10pm Monday to Friday (unless there is an emergency response required which could require 24 hour working).<br>• Delivery of machinery to undertake beach management: unrestricted due to logistics. Machinery only being brought to site at the beginning of each beach management campaign, and removed at end, with machinery left on site for the duration of each campaign.<br>• Rainbowing Shingle ashore: unrestricted, as pumping ashore can only occur at high tide, for 2 – 4 hours per discharge. When barge in area, need to make use of every consecutive high tide period, for recharging to be financially viable. | duration, limiting potential impacts. |
| 17. | • ES Traffic and Transport | Reduced pedestrian access to the beach | • Access along the beach will be maintained. Works are relatively short term and will be carried out at a time of year outside the main holiday periods, except in an emergency. | Due to the avoidance measures identified, no resultant impacts expected. |
| 18. | • ES Traffic and Transport | Rainbowing of material from dredging impacting navigation | • Chichester Harbour Conservancy and Chichester Harbour Master will issue notices to mariners and also directly to local Fisherman to minimise the impact to all Harbour users. | Due to the avoidance measures identified, no resultant impact expected. |
| 19. | • ES Traffic and Transport | Disturbance to residents | • Moderate Adverse impacts from the works; however the works are a key benefit to residents. Works are short term and temporary. Residents will be notified prior to any works taking place. | Works are short term and temporary in nature, no resultant impact expected. |
| 20. | • ES Amenity and Recreation | Temporary effect on amenity and recreational access to the beach for the duration of the works | • Length of construction works will be limited to as short a time as possible (2- 4 weeks per campaign). The works will not take place over the weekend or on public holidays or during the main tourist season limiting the impacts on visitors to the area, except in an emergency situation. A tidy site policy would be employed by the contractor and consequently there would be no significant residual impacts. | Due to the avoidance measures identified, no resultant impact expected. |
| 21. | • ES Navigation and Commercial Fishers | Disruption to navigation | • Navigation safety plan will be included as part of the CEMP<br>• A notice to mariners will be issued when necessary | Due to the avoidance measures identified, no resultant impact expected. |
| 22. | • ES Navigation and Commercial Fisheries | Direct / indirect effects on fishing activity | • Engagement with stakeholder maintained to ensure they are aware of planned beach management activity | Due to the avoidance measures identified, no resultant impact expected. |

**Figure 21.1 Spatial summary of key environmental restrictions:**

