## REVISION SCHEDULE

<table>
<thead>
<tr>
<th>Rev</th>
<th>Date</th>
<th>Details</th>
<th>Prepared by</th>
<th>Reviewed by</th>
<th>Approved by</th>
</tr>
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<tr>
<td>0</td>
<td>07/11/11</td>
<td>Draft for Consultation</td>
<td>Clare Postlethwaite (Senior Consultant - Water)</td>
<td>Dr John Pos (Associate) Jonathan Short (Assistant Engineer)</td>
<td>David Dales (Director – Water)</td>
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<tr>
<td>1</td>
<td>29/02/2012</td>
<td>Post Consultation Revision</td>
<td>Clare Postlethwaite (Senior Consultant - Water)</td>
<td>Dr John Pos (Associate Director) Jonathan Short (Assistant Engineer)</td>
<td>David Dales (Director – Water)</td>
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<tr>
<td>2</td>
<td>24/05/2012</td>
<td>LPRG submission</td>
<td>Clare Postlethwaite (Senior Consultant - Water)</td>
<td>Dr John Pos (Associate Director) Jonathan Short (Assistant Engineer)</td>
<td>David Dales (Director – Water)</td>
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<tr>
<td>3</td>
<td>10/09/2012</td>
<td>Post LPRG review revision</td>
<td>Clare Postlethwaite (Senior Consultant - Water)</td>
<td>Dr John Pos (Associate Director) Jonathan Short (Assistant Engineer)</td>
<td>David Dales (Director – Water)</td>
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<td>4</td>
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<td>Post LPRG review revision</td>
<td>Clare Postlethwaite (Senior Consultant - Water)</td>
<td>Dr John Pos (Associate Director) Jonathan Short (Assistant Engineer)</td>
<td>David Dales (Director – Water)</td>
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<td>5</td>
<td>23/11/2012</td>
<td>Final</td>
<td>Clare Postlethwaite (Senior Consultant - Water)</td>
<td>Dr John Pos (Associate Director) Jonathan Short (Assistant Engineer)</td>
<td>David Dales (Director – Water)</td>
</tr>
</tbody>
</table>
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1 INTRODUCTION

1.1 Purpose of report

This report represents an assessment of the Southampton Flood and Coastal Erosion Risk Management Strategy (‘The Strategy’) against the requirements of the Water Framework Directive\(^1\) (WFD), according to the requirements of the Environment Agency document ‘Assessing new modifications for compliance with WFD: detailed supplementary guidance\(^2\). This document provides detailed supplementary guidance on how to assess the impacts of new modifications in the water environment to ensure compliance with the WFD in line with ‘Assessing new modifications for compliance with WFD\(^3\).

As a part of the Strategy, an assessment of the implications of the Water Framework Directive (WFD) Regulations\(^4\) is required. The requirements of the WFD need to be considered at all stages of the coastal planning process, by reference to the River Basin Management Plans (RBMPs)\(^5\). This report has been subject to public consultation and will be subject to formal review/sign off by the Environment Agency, Southampton City Council (SCC) and Natural England (NE).

Please note, the term ‘surface water’ and ‘surface waters’ within this report refers to coastal and transitional waters, rivers, streams or lakes, as defined by the Water Framework Directive. It does not refer to surface water run-off or surface water ponding which may be caused by rainfall, which will be addressed separately by the Surface Water Management Plan.

1.2 The Southampton Coastal Strategy area

The Strategy frontage encompasses part of the area covered by the North Solent Shoreline Management Plan. The Strategy frontage includes the coastline around Southampton City Centre between Redbridge in the west and Woodmill in the east (Figure 1-1 below). The study area is comprised of varied land use, but is dominated by docks, industrial and commercial development, with smaller areas of residential development and natural areas.

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\(^2\) Assessing new modifications for compliance with WFD: detailed supplementary guidance, Environment Agency, 2010


\(^5\) http://www.environment-agency.gov.uk/research/planning/33106.aspx

APPENDIX H – WFD ASSESSMENT

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Where there are sites protected under other EU legislation (such as the Birds or Habitats Directives, Shellfish Waters Directive and others), the WFD aims for compliance with any relevant standards or objectives for these sites. Where a site is protected under another EU Directive, and the targets set by the WFD would be insufficient to meet the objectives of the other relevant environmental Directive, the more stringent targets would apply.

While there are no designated conservation sites within the majority of study area, there are sites nearby that could be affected by the results of the Strategy. The western edge of the Strategy area overlaps with the Solent & Southampton Water SPA and Ramsar site. Nationally and locally designated sites within the study area (such as the Lower Test Valley SSSI which also overlaps with the western edge of the strategy area) have not been assessed, as these are not covered by the remit of the WFD.

Within the Solent and Southampton Water, there are several Shellfish Waters Directive designated areas, and designated Shellfish Harvesting Areas, as shown below in Figure 1-2. The WFD requires all protected shellfish areas to comply with their individual standards. The Shellfish Waters Directive (2006/113/EC) requires compliance with mandatory standards for parameters including dissolved oxygen, suspended solids, metals and other contaminants.

In terms of the designated harvesting area, the EC Regulation 853/2004 (which replaces the EU Shellfish Harvesting Directive 91/492/EC) aims to protect consumers of foods including shellfish, and is implemented in England by the Food Hygiene (England) Regulations 2006. The requirements of these regulations will also be considered.
These sites and the other which could potentially be affected by the Strategy are shown in Table 1-1 below. Figure 1-2 shows their locations. See Appendix A for further information relating to the internationally designated sites shown in Figure 1-3.

**Table 1-1: Condition of Designated Areas that could be affected by the Strategy**

<table>
<thead>
<tr>
<th>Site</th>
<th>Condition/Status</th>
<th>Designated for</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solent &amp; Southampton</td>
<td>Classified</td>
<td>Importance for regularly occurring Annex 1 species</td>
</tr>
<tr>
<td>Maritime SPA and Ramsar site</td>
<td>Favourable condition</td>
<td>Importance for regularly occurring migratory species</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Importance for internationally important assemblage of waterfowl</td>
</tr>
<tr>
<td>Solent Maritime SAC</td>
<td>Grade A/B &amp; D</td>
<td>Annex I Habitat – Estuaries grade A/B</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Spartina swards grade A/B</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Atlantic salt meadows grade A/B/D</td>
</tr>
<tr>
<td>River Itchen SAC</td>
<td>Grade A/B Outstanding/Excellent example,</td>
<td>Annex I Habitat – Water course of plain to maintain levels with abundance of</td>
</tr>
<tr>
<td></td>
<td>maintain in favourable condition subject to natural change</td>
<td>water-crowfoots</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Annex II species – Southern Damselfly &amp; Bullhead</td>
</tr>
</tbody>
</table>

Figure 1-2: Designated Shellfish Waters in the Solent and Southampton Water

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6 http://www.jncc.gov.uk/ProtectedSites/
7 http://www.solentems.org.uk/sems/what_it_is/
8 http://www.natureonthemap.org.uk/map.aspx?m=rssi
Figure 1-3: Designated conservation sites in Southampton
1.3 Strategy objectives

The objectives of the Southampton Coastal Strategy are shown below.

<table>
<thead>
<tr>
<th>The Strategy objectives are to:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• provide appropriate sustainable coastal management mechanisms to manage coastal erosion and flooding of properties and the land around them;</td>
</tr>
<tr>
<td>• use sympathetic and robust solutions which wherever possible use existing defence corridors or features and are complimentary with the ‘City Vision’</td>
</tr>
<tr>
<td>• increase the potential for recreation and tourism; without compromising or where possible, enhancing the natural environment, especially the environmentally significant area of the Test Valley;</td>
</tr>
<tr>
<td>• provide a blueprint for future monitoring and programming of maintenance works;</td>
</tr>
<tr>
<td>• increase the understanding of the shoreline and to focus consultations in a strategic manner;</td>
</tr>
<tr>
<td>• consolidate and build upon information gathered within higher level plans to present a sustainable and holistic coastal management Strategy which dovetails with other relevant plans and programmes to deliver synergistic benefits to the City.</td>
</tr>
</tbody>
</table>

1.4 Option Development Units

Present day land uses, future land uses (redevelopment areas), ownership, defence types, and flood risk varies significantly along the Strategy frontage. These factors combine to provide constraints and opportunities when identifying and developing options for coastal management along the frontage.

On this basis, the frontage was divided into sub-areas in order to consider different options; these were termed Option Development Units (ODUs), as follows:

- Unit 1 - Upper Itchen / St Denys;
- Unit 2 - Bevois Valley;
- Unit 3 - Meridian Studios (Railway line to Northam Bridge);
- Unit 4 - Northam (Northam Bridge to Belvedere Wharf);
- Unit 5 - St Mary’s Wharves;
- Unit 6 - Crosshouse / Town Depot;
- Unit 7 - Ocean Village;
- Unit 8 - Eastern Docks/Dock Gate 4;
- Unit 9 - Mayflower Park / Major Development Quarter;
- Unit 10 - Western Docks; and
- Unit 11 - Redbridge.

Figure 1-4 shows the 11 ODUs for the Strategy frontage.
Figure 1-4: Map showing Option Development Units
1.5 The Water Framework Directive

The WFD was passed into UK law in 2003 and for the first time, combines water quantity and quality issues together. An integrated approach to the management of all freshwater bodies, groundwaters, transitional (estuarine) and coastal waters (TraC) at the river basin level has been adopted. It effectively supersedes all water related legislation which drives the existing licensing and consenting framework in the UK.

The Southampton Coastal Strategy (the Strategy) area lies in the Southampton Water transitional waterbody (GB520704202800), which lies in the South East River Basin District (RBD). In addition to this there is one surface waterbody, the Tanner’s Brook (GB107042016620), and one ground waterbody, the Central Hants Bracklesham Group (GB40702G500900), within the strategy area.

The overall requirement of the Directive is that all river basins must achieve “good ecological status” by 2015 unless there are grounds for derogation. It also requires that Environmental Objectives be set for all waterbodies; the River Basin Management Plans (RBMPs) set out the objectives for the waterbodies within the study area.

Ecological Status is expressed in terms of five status classes (high, good, moderate, poor or bad) which are defined using biological, physico-chemical and hydromorphological criteria. The biological assessment criteria uses numeric measures of communities of plants and animals (e.g. fish, rooted plants). The physico-chemical assessment uses elements such as temperature and nutrient levels, which support the biological communities. The hydromorphological assessment uses water flow, sediment composition and movement, continuity (in rivers) and the structure of physical habitat. The overall ecological status of a waterbody is determined by whichever of these criteria is assessed to be the poorest. For example, if a waterbody achieved ‘Good status’ for chemical and physico-chemical assessments, but only achieved ‘Moderate status’ for the biological assessment; it would be classed overall as having ‘Moderate ecological status’. To achieve the overall aim of good surface water status, the WFD requires that surface waters be of at least Good ecological status and Good chemical status.

The WFD recognises that some waterbodies have been physically altered, for example for navigation or flood defence, and allows for these water bodies to be designated as Heavily Modified Water Bodies (HMWB) or Artificial Water Bodies (AWB) and need to achieve good ecological potential rather than ecological status. Ecological potential means that the waterbody is managed to achieve the biology that can be achieved given its modified condition. HMWBs are classified by:

- identifying the impacts of physical modification affecting the water body;
- identifying possible mitigation measures necessary to ensure the hydromorphological characteristics of a water body are consistent with Good or maximum ecological potential; and
- assessing whether all of those measures have been taken.

The Southampton Water transitional waterbody is a HMWB, due to the presence of extensive hard coastal defences along the length of the Strategy frontage and reclaimed land in the dock areas. The waterbody is therefore classified as being at Moderate overall potential with an objective of reaching ‘Good potential’ status by 2027. It has been deemed to be
disproportionately expensive and technically infeasible to achieve Good potential by 2015. The Central Hants Bracklesham Group groundwater body is currently classed as Good status, with an overall objective of Good chemical and quantitative status by 2015.

In the case of the Southampton Water transitional waterbody, the mitigation measures identified by the RBMP are given below in Table 1-2.

**Table 1-2: Mitigation measures identified by the RBMP**

<table>
<thead>
<tr>
<th>Mitigation measure identified</th>
<th>Is the measure in place?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduce impact of dredging</td>
<td>In Place</td>
</tr>
<tr>
<td>Prepare a dredging / disposal strategy</td>
<td>In Place</td>
</tr>
<tr>
<td>Avoid the need to dredge (e.g. minimise under-keel clearance; use fluid mud navigation; flow manipulation or training works)</td>
<td>In Place</td>
</tr>
<tr>
<td>Alter timing of dredging / disposal</td>
<td>In Place</td>
</tr>
<tr>
<td>Reduce sediment resuspension</td>
<td>In Place</td>
</tr>
<tr>
<td>Structures or other mechanisms in place and managed to enable fish to access waters upstream and downstream of the impounding works.</td>
<td>In Place</td>
</tr>
<tr>
<td>Indirect / offsite mitigation (offsetting measures)</td>
<td>Not In Place</td>
</tr>
<tr>
<td>Operational and structural changes to locks, sluices, weirs, beach control, etc</td>
<td>Not In Place</td>
</tr>
<tr>
<td>Preserve and where possible enhance ecological value of marginal aquatic habitat, banks and riparian zone</td>
<td>Not In Place</td>
</tr>
</tbody>
</table>

**WFD objectives**

The WFD contains five Environmental Objectives, which aim to prevent a negative change to the status of water bodies, which could be caused by a deterioration of any of the biological, physico-chemical or hydromorphological Quality Elements listed in Annex V of the WFD, as shown in Table 1-3 below. The Environmental Objectives taken from Article 4 of the Water Framework Directive (WFD) are shown below in Table 1-4.¹

**Table 1-3: Biological, physico-chemical or hydromorphological Quality Elements**

<table>
<thead>
<tr>
<th>Quality Elements</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biological assessment</td>
<td>Uses numeric measures of communities of plants and animals (for example fish and rooted plants)</td>
</tr>
<tr>
<td>Physico-chemical assessment</td>
<td>Looks at elements such as temperature and the level of nutrients, which support the biology</td>
</tr>
<tr>
<td>Hydromorphological assessment</td>
<td>Looks at water flow, sediment composition and movement, continuity (in rivers) and the structure of physical habitat</td>
</tr>
</tbody>
</table>

¹ Table 11 of Assessing shoreline management plans against the requirements of the Water Framework Directive, Guidance and Background Information, Environment Agency, 2009

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Table 1-4: Environmental Objectives in the WFD

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>WFD1</td>
<td>No changes affecting high status sites</td>
</tr>
<tr>
<td>WFD2</td>
<td>No changes that will cause failure to meet surface water Good Ecological Potential or result in a deterioration of surface water Ecological Potential</td>
</tr>
<tr>
<td>WFD3</td>
<td>No changes which will permanently prevent or compromise the environmental objectives being met in other waterbodies</td>
</tr>
<tr>
<td>WFD4</td>
<td>No changes that will cause failure to meet good groundwater status or result in a deterioration in groundwater status</td>
</tr>
</tbody>
</table>

There is also a duty to enhance and restore water bodies where possible and by implication there is a need to ensure that actions do not prevent water bodies from reaching a good status and potential. In order to meet the objectives, any activity which has the potential to have an impact on any of the Quality Elements must be assessed. The preferred Strategy options will therefore be considered to ensure there are no future failures in meeting the Environmental Objectives, and any failures that do occur can be defended.

1.6 Other legislation

Where sites are protected under other European Legislation, such as the Habitats Directive\(^{10}\), Birds Directive\(^{11}\) or the Shellfish Waters\(^{12}\) and Shellfish Harvesting\(^{13}\) Directives, the WFD also sets standards to ensure compliance with any relevant objectives for these sites. For sites where more than one quality standard applies, compliance with the stricter standard is required.

1.7 North Solent Shoreline Management Plan

The North Solent Shoreline Management Plan\(^{14}\) (SMP2) provides broad scale assessment of the coastal flooding and erosion risks and advice to operating authorities and private landowners on the management of their defences. The SMP covers 386 km of coastline, extending from Selsey Bill in the east to Hurst Spit in the west, and includes Portsmouth, Langstone and Chichester Harbours, Southampton Water and the tidal extent of the main rivers within the SMP area (the Test, Itchen, Hamble and Meon).

The majority of the Southampton Coastal Strategy area is covered by policy unit 5C12 Woodmill Lane to Redbridge. However, the western section of the Strategy is covered by policy unit 5C13 Lower Test Valley.

Tables 1-5 and 1-6 below show the preferred policies for these units.

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\(^{13}\) European Commission, 2004, EC Regulation 853/2004 (which replaces the EU Shellfish Harvesting Directive 91/492/EC), Brussels

Table 1-5 Preferred policy for unit 5C12 Woodmill Lane to Redbridge

<table>
<thead>
<tr>
<th>Year 0 – 20 (2025)</th>
<th>Year 20 - 50 (2055)</th>
<th>Year 50 - 100 (2105)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hold the Line</td>
<td>Hold the Line</td>
<td>Hold the Line</td>
</tr>
</tbody>
</table>

Coastal Defence
The west bank of the River Itchen is protected by a collection of both publicly and privately owned structures such as quay walls, seawalls, piling, concrete and stone revetments. Due to the condition and residual life, these defences will require ongoing maintenance and repair to continue to provide flood protection to significant areas of Southampton City. The port frontage, with vertical seawalls and short lengths of revetments, will require continued maintenance for operational purposes and to manage any flood risk to assets within the hinterland, such as key transport links.

Shoreline Response
Continuation of the current management policy is unlikely to significantly affect coastal processes at this location and will have no obvious effects to the foreshore at adjacent policy units over this epoch.

Table 1-6 Preferred policy for unit 5C13 Lower Test Valley

<table>
<thead>
<tr>
<th>Year 0 – 20 (2025)</th>
<th>Year 20 - 50 (2055)</th>
<th>Year 50 - 100 (2105)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Active Intervention</td>
<td>No Active Intervention</td>
<td>No Active Intervention</td>
</tr>
</tbody>
</table>

Coastal Defence
The Lower Test Valley, upstream of the transport infrastructure at Redbridge, is a naturally contained tidal floodplain and there has been and will be no requirement for flood or coastal defence structures to protect any properties or assets. There are extensive transitional estuarine habitats.

Shoreline Response
Although there are limited coastal processes within Southampton Water, under rising sea levels it is anticipated that there will continue to be natural and unimpeled landward migration of estuarine habitats.
1.8 North Solent SMP WFD assessment

The North Solent SMP2 was assessed under the requirements of the WFD\textsuperscript{15}. For all Water Bodies in the North Solent SMP2 area, the hydromorphological parameters that potentially could be changed by SMP policies, with potential impact on the BQEs, were identified. BQEs that potentially could be affected by SMP policies for each waterbody were identified and the potential impact of the SMP policy for each Policy Unit was assessed in relation to aspects of the WFD.

The WFD assessment for the 5C13 Lower Test Valley unit did not identify any potential failures of WFD objectives from the preferred policy. However, the assessment concluded that for the Woodmill Lane to Redbridge policy unit:

‘The recommendation to continue to maintain and improve flood defences would provide considerable economic and societal benefits to the heavily developed and populated conurbations of Southampton City within the extensive area of coastal flood risk. The commercial and industrial dominated frontage extending northwest from the River Itchen, is principally owned and the defence structures maintained by the port authority. The west bank of the River Itchen is wholly developed with substantial numbers of residential and commercial properties, heritage sites, transport networks and other associated city centre infrastructure. Maintenance of defence structures would continue to contribute towards the erosion and lowering of intertidal foreshore habitats. This could impact on the fish, benthic invertebrate and macroalgal BQEs through potential changes in heterogeneity of habitat, continuity for migration routes, substrate conditions, accessibility to nursery area, presence of macrophytes, connectivity with riparian zone, availability of organic debris, groundwater connectivity, light, beach water table, in abrasion and salinity. Whilst this SMP policy may result in potential short term deterioration in surface water Ecological Potential, the policy would not prevent obtaining good groundwater status or result in deterioration in groundwater status.’

The assessment concluded that environmental Objective 2, ‘Protect, enhance and restore all bodies of surface water, with the aim of achieving good surface water status in 2015’, would not be met by the proposed policy for the Woodmill Lane to Redbridge policy unit. A Summary Statement was therefore completed for the Southampton Water TraC waterbody, which could be adversely affected by the proposed policy. The Summary Statement outlined the reasons behind selecting the final SMP policy and any mitigation measures that have been incorporated into the policies. It concluded for the Southampton Water TraC waterbody:

- **Mitigation measures:** No Active Intervention (NAI) and Managed Realignment (MR) policies at other units will improve hydromorphological conditions and contribute towards offsetting the localised coastal squeeze impacts predicted at the HTL sites.

- **Overriding public interest:** The policy of maintaining defences is required to protect property, heritage, commercial, industrial and agricultural developments, transport and cross-harbour infrastructure assets and designated habitats and sites.

- **Better environmental options:** NAI and MR have been discounted for the developed areas due to the need to protect the properties, infrastructure and assets along these frontages.


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• **Effect on other Water Bodies:** SMP policies which will modify coastal, estuarine and groundwater processes will only do so in localised areas and no effects on adjacent waterbodies or frontages in Dorset/Hampshire and Sussex are expected as a result of SMP2 policies.

• **Other issues:** SMP Appendix J (Appropriate Assessment) sets out the conclusions of the assessments of the potential for the SMP policies to have significant effects on any internationally designated site within the SMP study area.

In effect, for each waterbody where a failure to meet one of the WFD environmental objectives has been recorded, the Summary Statement concludes that there is overriding public interest, no environmentally better options which would meet the required public interest and no significant effects on any internationally designated nature conservation site, designated fishery or shellfishery, or other water body.
2 ASSESSMENT METHODOLOGY

The methodology used for this assessment has been taken from the Environment Agency document ‘Assessing new modifications for compliance with WFD: detailed supplementary guidance, Environment Agency, 2010’. This follows an 8 step process which is illustrated below in Figure 2-1.

Figure 2-1: Overview of 8 step process

Step 1. Collect Water body baseline data
Step 2. Collect proposed scheme baseline data

Step 3. Preliminary assessment
Could the project cause deterioration or failure to meet GES/GEP?

Step 4: Design and Options appraisal
WFD considerations when choosing preferred option and building mitigation into design

Step 5: Detailed Impact assessment
Will the scheme cause deterioration or failure to meet GES/GEP?

Step 6: Application of Article 4.7 tests
Step 6.1 – Can the Article 4.7 defence be used?

Step 7. Reporting

Step 8. Follow-up post project appraisal work

Mitigation measures informed by impact assessment can feed into design of scheme and reduce/remove impacts

If no residual impact - No further assessment required

6.2 All practicable mitigation
6.3 Significantly better environmental options
6.4 Overriding public interest and/or benefits comparison
6.5 Reasons for the modifications or alterations
6.6 Consideration of impacts on other water bodies and ensuring compliance with other legislation

No defence available – scheme is not compliant with WFD

No further assessment required - check if scheme can deliver improvement measures and report results

Yes

Yes

No
3 COLLECT WATER BODY BASELINE DATA

The first stage of the WFD assessment process is to collect the WFD data on the current status of the water body in which the development is proposed. This involves identifying the waterbodies present within the study area and then to identify the Biological Quality Elements (BQEs) within the waterbodies that may be affected by the Strategy. It also involves identifying if there are any internationally protected sites that could be impacted by the Strategy and any planned water body measures.

3.1 Waterbodies present within the study area

As identified above in Section 1.4, there is one TraC (coastal waters) waterbody within the Strategy area, Southampton Water (GB520704202800). The Southampton Water TraC unit is currently classified as having Moderate potential, with a proposed overall objective of reaching Good potential by 2027.

There is one surface water body within the Strategy area that has been classified under the WFD, the Tanner’s Brook (GB107042016620). This is a HMWB (Heavily Modified Water Bodies) which is currently at Moderate potential, with a status objective of Good potential by 2027. However, the Tanner’s Brook can be scoped out of this assessment. As discussed in Section 1.6 of this report the preferred option for the coastal defences is to ‘Hold the Line’ by monitoring and maintaining the existing defences. As the Brook flows into Southampton Water at the Western Docks (under which it is culverted for approximately the last 200 m of its course) and the tidal limit of the Brook lies within the culverted stretch, the policy of Hold the Line by maintaining the existing defences will ensure there is no change to the current situation. This waterbody will therefore not be considered further in this WFD assessment.

In addition, there is another surface water body within the Strategy area that has not been classified under the WFD, namely Luggy Creek, which forms a tributary of the Tanner’s Brook. There is a pond on the Luggy Creek, which lies within the ABP managed area. As with the Tanner’s Brook, the Luggy Creek will not be considered further under this WFD assessment, as it is considered that the policy of Hold the Line by maintaining the existing defences will ensure there is no change to the current situation.

There is also one ground waterbody within the strategy area, the Central Hants Bracklesham Group (GB40702G500900), which is currently at Good status, with an objective of maintaining Good status to 2015. However, no groundwater Source Protection Zone (SPZ) is defined within the Southampton Coastal Strategy study area and it is therefore unlikely that the Strategy will have an impact on the groundwater in the Central Hants Bracklesham Group. Therefore, groundwater has been scoped out of this WFD assessment.

Biological Quality Elements

Table 3-1 below shows the BQEs within the Coastal Strategy area that could be affected by changes to hydromorphology as a result of the Strategy. It is based on WFD Assessment Table 1 from ‘Assessing shoreline management plans against the requirements of the Water Framework Directive’16.

Table 3-1: BQEs to consider within the Coastal Strategy area

<table>
<thead>
<tr>
<th>BQE</th>
<th>Potential for change in hydromorphological or physical parameter</th>
<th>Southampton Water</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phytoplankton</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Residence time</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Water depth</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Thermal regime</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Turbidity</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Macroalgae</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Longitudinal position</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Shoreline complexity or heterogeneity</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Light quality and quantity (for macroalgae and bryophytes)</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Episodicity of flows and inundation</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Turbidity</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Baseflow (in chalk streams)</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Riparian shade and structure</td>
<td></td>
<td>?</td>
</tr>
<tr>
<td>Substrate conditions</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Phytobenthos (diatoms only)</td>
<td>No hydromorphological elements determined</td>
<td>x</td>
</tr>
<tr>
<td>Macroalgal</td>
<td>Episodicity (at low end of velocity spectrum)</td>
<td>✓</td>
</tr>
<tr>
<td>Salinity</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Abrasion (associated to velocity)</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Angiosperms</td>
<td>Inundations (tidal regime)</td>
<td>✓</td>
</tr>
<tr>
<td>Sediment loading</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Land elevation</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Salinity</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Abrasion (associated to velocity)</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Benthic/macroinvertebrates</td>
<td>Beach water table (TraC)</td>
<td>✓</td>
</tr>
<tr>
<td>Light</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Groundwater connectivity</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Availability of leaf litter/organic debris</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Connectivity with riparian zone</td>
<td></td>
<td>?</td>
</tr>
<tr>
<td>Fish</td>
<td>Heterogeneity of habitat (substrate, provision of shelter)</td>
<td>✓</td>
</tr>
<tr>
<td>Continuity for migration routes</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Substrate conditions</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Presence of macrophytes</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Accessibility to nursery areas (elevation of saltmarsh, connectivity with shoreline/riparian zone)</td>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>

✓ = Applies to waterbody x = Does not apply to waterbody ? = Might apply and hence included
Phytoplankton are photosynthetic organisms that live free-floating within the water column. They are included as a BQE as they are an indicator organism for the levels of nutrients within the water. Seasonal changes that result in algae blooms during March to May and a second smaller peak between August and October (in temperate altitudes) are thought to be largely driven by anthropogenic influences such as nutrient rich runoff near outfalls from rivers, agriculture runoff or coastal sewage treatment works. Changes in phytoplankton populations therefore usually occur on a large spatial scale and it is unlikely that localised changes to water depth, turbidity and thermal regime (linked to water depth in this case) could result in community changes in the immediate and sheltered coastal fringe. Therefore, it is not considered that the preferred Strategy options will impact on phytoplankton significantly at the water body level, thus this BQE will not be considered any further.

Macrophytes are large photosynthetic plants, of which there is a range living in the coastal fringe. These could be affected by changes such as habitat loss or changes in salinity, frequency of submersion, exposure or sea spray.

Phytobenthos is the photosynthetic plant community living close to the bed of a water body. As macroalgae and macrophytes are classified separately under the WFD assessment guidance, this category assesses benthic diatoms (i.e. single celled siliceous organisms) only. Benthic diatoms are not a TraC water body BQE and have therefore been scoped out of this assessment as there are no freshwater bodies to be considered in the Strategy area.

Macroalgae are photosynthetic, nonvascular plants commonly known as seaweeds. Seaweeds are adapted to the present conditions along the coastline and will therefore be susceptible to changes in current velocity, abrasion/sediment dynamics or salinity levels. However, it is unlikely that any policy type will result in any significant changes in salinity at the water body level and salinity is therefore not considered any further with respect to macroalgae.

For the purposes of this assessment, angiosperms are defined as native seagrasses by the WFD UK TAG, namely Zostera and Ruppia spp. They are adapted to shallow sheltered areas with little wave action and grow in sand and mud, and can form dense beds. UK TAG WFD Type Specific Reference Condition Descriptions for Transitional and Coastal Waters for the UK states that these are found in Transitional Type 4 (which is the waterbody type for Southampton Water). Angiosperms have therefore been considered, although as with macroalgae, it is unlikely that any policy type will result in any significant changes in salinity at the water body level and salinity is therefore not considered any further with respect to angiosperms.

Benthic/macro invertebrates that inhabit the coastal fringe will be sensitive to changes in their habitat structure, such as changes in the plant (macroalgae and macrophyte) communities. Changes to plant communities, through changes in current velocity, abrasion/sediment dynamics or salinity levels as discussed above, could therefore impact on the invertebrates living within the plant communities. Benthic/macro invertebrates could also be directly affected by changes in current velocity, abrasion/sediment dynamics or salinity levels as discussed above.

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17 UK TAG WFD (July 2004) Type Specific Reference Condition Descriptions for Transitional and Coastal Waters for the UK.
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The rivers Test and Itchen, which flow into Southampton Water, are both important salmonid fisheries and are designated as such under the Freshwater Fisheries Directive\(^{19}\). It is therefore considered to be appropriate to assess the possible impacts of the Strategy on migration routes for fish. There could be some localised impacts on fish communities from changing sediment patterns (movements, quantities, type and changing current patterns influencing fish habitat), which will therefore be assessed further.

**Definition of WFD features and issues**

The key physical parameters which are important for the BQEs of each waterbody and may be affected by decisions made within the Strategy are shown below in Table 3-2. Environmental Objective WFD1, as given above in Table 1-3, is not applicable as there are no high status waterbodies within the Strategy area. Environmental Objectives WFD4, as given above in Table 1-3, is not applicable as there are no groundwater bodies to be assessed within the Strategy area. Objectives WFD1 and WFD4 are therefore not listed below in Table 3-2 below.

**Table 3-2: Features and Issues within the Coastal Strategy area**

<table>
<thead>
<tr>
<th>BQE</th>
<th>Potential for change in hydro-morphological or physical parameter</th>
<th>Water body classification and environmental objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Macrophytes</td>
<td>Potential changes to macrophytes due to changes in slope, light quality and quantity (for macroalgae and bryophytes), episodicity of flows and inundation, turbidity and substrate conditions.</td>
<td>Classification: Moderate Ecological Potential (Heavily Modified Water Body) Environmental objectives:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- WFD2: No changes that will cause failure to meet surface water Good Ecological Status or Potential or result in a deterioration of surface water Ecological Status or Potential.</td>
</tr>
<tr>
<td>Macroalgae</td>
<td>Potential changes to macroalgae through changes in episodicity (at low end of velocity spectrum) and abrasion (associated to velocity).</td>
<td></td>
</tr>
<tr>
<td>Angiosperms</td>
<td>Potential changes to angiosperms due to changes in inundations (tidal regime), sediment loading, land elevation and abrasion (associated to velocity)</td>
<td></td>
</tr>
<tr>
<td>Benthic/macronvertebrate</td>
<td>Potential changes to benthic/macro invertebrates through changes in the beach water table, availability of leaf litter/organic debris and connectivity with the riparian zone</td>
<td></td>
</tr>
<tr>
<td>Fish</td>
<td>Potential changes to fish through changes in heterogeneity of habitat (substrate, provision of shelter) substrate conditions, continuity for migration routes, substrate conditions, presence of macrophytes and accessibility to nursery areas (elevation of saltmarsh, connectivity with shoreline/riparian zone)</td>
<td></td>
</tr>
</tbody>
</table>

\(^{19}\) Directive 2006/44/EC of The European Parliament and of the Council of 6 September 2006 on the quality of fresh waters needing protection or improvement in order to support fish life
3.2 Internationally protected sites

For the study area, the following internationally and nationally designated sites are present (see Table 1-1 and Figure 1-3 above for designated conservation sites), for which additional standards will apply:

- Solent & Southampton Water SPA and Ramsar site;
- Solent Maritime SAC; and
- River Itchen SAC.

Further information on the designated sites is provided in Appendix A.

3.3 Designated Shellfish Waters

For the study area, the following designated Shellfish Water is present (see Figure 1-2 above), for which additional standards will apply:

- Southampton Water Shellfish Water.
4 COLLECT PROPOSED STRATEGY DATA

The aim of this stage of the report is to collect information on the proposed development. The preferred options, selected from the appraisal process discussed in the Interim Strategy Report\textsuperscript{20}, are summarised below for each ODU.

4.1 Unit 1 - Upper Itchen / St Denys

Summary of preferred options

2015 to 2060 – Community and property level flood resistance and resilience

2060 to 2110 – Flood wall near the front line

For the short to medium term (up to 2060), the flood risk envelope from a 1:200 year event is relatively narrow and the flood depths of the assets affected are typically less than 0.75m. Consequently, the economic case to attract public funding for costly front line defences until this time is not strong. In addition, a major drawback of implementing raised flood defences along the frontage to provide a 1:200 year standard of protection up to 2110 is that it would fundamentally alter the character of the frontage. River views and access to the river from many properties and gardens would be compromised and this option would be aesthetically undesirable. Front line defences may also increase the risk from surface water flooding as the defences would prevent surface water running off into the river as the land slopes upwards away from the river.

Therefore the preferred option to manage flood risk in this ODU until 2060 is property level flood resistance (stop water entering) and resilience (reduce damages / clear up when water enters). By 2060, the flood risk will have increased significantly and the flood envelope and depths could be greater and the case for a front line flood defence much stronger by this time. Therefore for longer term flood protection, the preferred option would be to implement a concrete floodwall (at 2060) to provide protection against tidal flooding up to a 1:200 year event at 2110. This would require a wall of typically 1.4 m in height. The wall would ideally run close to the front line and would need community support to ensure a continuous defence is achieved so that there are no weak points where breaching of the defence could occur.

4.2 Unit 2 - Bevois Valley

Summary of preferred options

2015 to 2030 – Maintain existing defence structures

2030 to 2110 – Steel sheet pile wall at the front line

The frontage will continue to be protected to a 1:200 year standard of protection until 2030 by the existing defence structures as their crest heights are sufficiently high. After 2030 the flood risk increases significantly as the existing structures crest heights are exceeded.

Under a “Do Nothing” scenario, critical infrastructure of the railway and other industrial assets would be at significant risk of flooding by 2060. Due to the topographic basin behind the front

\textsuperscript{20} Southampton Coastal Flood and Erosion Risk Management Strategy, Interim Report, URS/Scott Wilson, June 2011 (DRAFT)
line there is the potential for significant pooling of flood water here. By 2060 if no additional defences were implemented, flooding in this ODU would also rapidly inundate the adjacent areas. The intertidal area is immediately in front of the railway line and there is little room for defences, hence the selection of a steel sheet pile wall at the front line as this defence option has a minimal footprint.

4.3 Unit 3 - Meridian Studios (railway line to Northam Bridge)

Summary of preferred options

2015 to 2060 – Intermediate height floodwall forming the spine of defence until raised land undertaken through redevelopment supersedes the wall as the main defence by 2060

2060 to 2110 – Defence by a continuous strip of raised land achieved through redevelopment to form a robust flood defence

The flood mapping demonstrates the need to ‘do something’ in the short term to protect against flooding in this unit. Land raising is the most robust defence solution and therefore a preference which best achieves the objectives of the Strategy; however, due to the current industrial land use in parts of this ODU adjacent to the railway, the land raising and redevelopment is not appropriate in these areas until the current properties reach the end of their service life.

However, part of this area is currently cleared awaiting redevelopment (former Meridian Studios site). There is an opportunity for some of this site to be raised during redevelopment in the near future and this should form part of the flood defence in this ODU to provide flood protection within the ODU until land in other areas can be raised in the future. A relatively low flood wall (typically 0.9 m above existing ground levels) would be required near the front line to provide a 1:200 year standard of protection till 2060. This wall would need to tie into the land raising undertaken previously at the former Meridian Studios site.

As flood risk increases in the longer term (by 2060), and buildings in the area to the west of the Meridian Studios reach the end of their current service life, land should be raised during redevelopment to supersede the flood wall as the defence.

4.4 Unit 4 - Northam (Northam Bridge to Belvedere Wharf)

Summary of preferred options

2015 to 2060 – Intermediate height floodwall forming the spine of defence until raised land undertaken through redevelopment supersedes the floodwall as the main defence by 2060

2060 to 2110 – Defence by a continuous strip of raised land achieved through redevelopment

The flood mapping demonstrates the need to ‘do something’ in the short term to protect against flooding in this ODU. Land raising is the most robust defence solution and therefore a preference which best achieves the objectives of the Strategy; however, due to the current commercial, industrial and residential land uses this ODU, land raising and redevelopment is not appropriate in these areas until the current properties reach the end of their service life.
Therefore to provide flood protection within the ODU until land in other areas can be raised in the future, an intermediate height flood wall (typically 0.7 m above existing ground levels) is required near the front line to provide a 1:200 year standard of protection till 2060.

4.5 Unit 5 - St Mary’s Wharves

Summary of preferred options

2015 to 2060 – Intermediate height floodwall forming the spine of defence until raised land undertaken through redevelopment supersedes the floodwall as the main defence by 2060

2060 to 2110 – Defence by a continuous strip of raised land achieved through redevelopment

The flood mapping demonstrates the need to ‘do something’ in the short term to protect against flooding in this ODU, especially as this area provides a flow path for flooding through towards the City Centre. Land raising is the most robust defence solution and therefore a preference which best achieves the objectives of the Strategy; however, due to the current land use of operational wharves in this ODU, land raising and redevelopment is not appropriate until the current operations reach the end of their service life or owners look to redevelop. Until land can be raised in the future, an intermediate height flood wall (typically 0.8m above existing ground levels) is required near the front line to provide a 1:200 year standard of protection till 2060.

4.6 Unit 6 - Crosshouse / Town Depot

Summary of preferred options

2015 to 2110 – Defence by raised land implemented through redevelopment

The flood mapping demonstrates the need to ‘do something’ in the short term to protect against flooding in this ODU, especially as this area provides a flow path for flooding through towards the City Centre. Land raising is the most robust defence solution and therefore a preference which best achieves the objectives of the Strategy.

This area is currently comprised of the City Council’s waste collection and recycling depot. The area is earmarked for redevelopment and with this considered, the preferred approach to providing flood protection in the ODU is land raising through redevelopment.

4.7 Unit 7 - Ocean Village

Summary of preferred options

2015 to 2060 – Maintain existing quay walls and defence structures

2060 to 2110 – Defence by raised quay walls with floodwall defences along perimeter of ABP land

With the implementation of robust coastal defences along the Itchen frontages to the north of this ODU from 2015, no additional raised flood defences are required at Ocean Village until the longer term (2060). To provide a 1:200 year standard of protection until 2110 the preferred
option for this ODU is to implement a relatively low floodwall (typically 0.7m above existing ground levels) near the front line around Ocean Village at 2060. This could be undertaken by raising existing quay walls or setting back slightly a landscaped flood retaining wall.

4.8 Unit 8 - Eastern Docks/Dock Gate 4

Summary of preferred options

2015 to 2060 – Do nothing. The area behind Port protected against flooding by the existing quay walls in the Port and the Strategy defences along the Itchen frontage to the north

2060 to 2110 – Defended by a floodwall around Ocean Village and along the boundary of the Port

With the implementation of robust coastal defences along the Itchen frontages to the north of this ODU from 2015, no additional raised flood defences are required within this ODU until the longer term (2060).

To provide a 1:200 year standard of protection against flooding until 2110, the preferred option for this ODU is to implement a floodwall (typically 0.9m above existing ground levels) along the boundary of ABP Port.

Provisions for maintaining access would need to be made with ramping over the low flood walls. Ramps are the preferable approach where possible in order to reduce the residual risk of a breach which remains with demountable defences or flood gates which rely on manual deployment in advance of a flood event.

4.9 Unit 9 - Mayflower Park / Major Development Quarter

Summary of preferred options

2015 to 2060 – Land raising through development of Royal Pier Site and the Major Development Quarter preferred. Implementation of a floodwall forming the spine of the flood defence by 2030 if a continuous strip of raised land is not achieved by this time

2060 to 2110 – Defended by a floodwall and or raised land

Presently the existing quay walls and defences protect against tidal flooding however by 2060, there is tidal flood risk within this ODU. To ensure that at least a 1:200 year standard of protection against flooding is achieved until 2110, flood defences would need to be implemented by 2030.

The area to the northwest of Mayflower Park is also earmarked as a Major Development Quarter and it is intended that this area is redeveloped over the coming years. The policy should be to raise land through redevelopment here to form a continuous strip of raised land (at least 50m in width and 4.45 m ODN in height) to provide a robust flood defence behind the Port area. This would need to tie into the defences of ODU10 by 2060 to form a continuous defence by this time.

Options for redeveloping the former Royal Pier site and surrounding area are currently being explored and there is continuing liaison and discussions with the Masterplanners for this site.
The potential to incorporate a flood defence within the development has been recognised and this should ideally form part of the strategic flood defence solution for this ODU.

4.10 Unit 10 – Western Docks

**Summary of preferred options**

**2015 to 2060 – Do nothing. The area behind Port protected against flooding by the existing quay walls in the Port**

**2060 to 2110 – Area behind the Port defended against flooding by a floodwall along the boundary of the Port and ramps / demountables on access points**

By 2060, there is flood risk within this ODU. With the assumption that ABP do not implement formal raised flood defences in the Port area (see Interim Strategy Report²¹), a low floodwall (typically 0.6 m above existing ground levels) would be required around the Port boundary to provide areas behind the Port with at least a 1:200 year standard of protection against flooding until 2110. Provisions for maintaining access would need to be made with the preferable approach being to ramp access roads over low flood walls where possible in order to reduce the residual risk of a breach.

4.11 Unit 11 - Redbridge

**Summary of preferred options**

**2015 to 2030 – Defended by current land levels and existing structures**

**2030 to 2060 – Community and property level flood resistance and resilience**

**2060 to 2110 – Floodwall along the seaward side of the railway embankment**

Until 2030, the risk of tidal flooding is low with a relatively narrow flood envelop from a 1:200 year event and flood depths typically less 0.25 m at 2030 and up to 0.25 to 0.5m by 2060. Therefore the preferred option to manage flood risk in this ODU from 2030 until 2060 is property level flood resistance (stop water entering) and resilience (reduce damages / clear up when water enters).

By 2060, the flood risk will have increased significantly and the flood envelope is more extensive and depths greater and the economic case for raised flood defences therefore much stronger by this time. Therefore for longer term flood protection, the preferred option would be to implement a concrete floodwall (at 2060) utilising the existing infrastructure corridor of the railway line to provide protection against tidal flooding up to a 1:200 year event at 2110. This would require a wall of typically 1.3 m in height above existing ground levels.

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²¹ Southampton Coastal Flood and Erosion Risk Management Strategy, Interim Report, URS/Scott Wilson, June 2011 (DRAFT)
5 PRELIMINARY ASSESSMENT

The aim of this stage is to screen out the preferred options of the Strategy from further assessment if they are unlikely to have any impact on the WFD objectives. If it is envisaged that no deterioration will occur across any of the WFD quality elements as a result of the preferred options and that they will not prevent the water body from meeting its status or potential objectives, then no further WFD compliance assessment is required. The following step by step process is used in the following preliminary assessment of each of the preferred options for each of the ODUs:

Figure 5-1: The preliminary assessment

In terms of the preliminary assessment of deterioration, there are certain activities that are considered not to be at risk of causing deterioration or failing to achieve WFD status/potential objectives. These are listed in the below Table 5-1:

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APPENDIX H – WFD ASSESSMENT
November 2012
### Table 5-1: Activities not requiring WFD compliance assessment

<table>
<thead>
<tr>
<th>Types of modification not requiring WFD assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintenance activities</td>
</tr>
<tr>
<td>Re-pointing (block work structures)</td>
</tr>
<tr>
<td>Void filling (‘solid’ structures)</td>
</tr>
<tr>
<td>Re-positioning (rock or rubble or block work structures)</td>
</tr>
<tr>
<td>Re-facing</td>
</tr>
<tr>
<td>Skimming/covering</td>
</tr>
<tr>
<td>Blockage removal</td>
</tr>
<tr>
<td>Removal of management of in-stream debris/rubbish from culverts and trash screens (not woody debris)</td>
</tr>
<tr>
<td>Vermin control</td>
</tr>
<tr>
<td>Linear flood defences</td>
</tr>
<tr>
<td>Temporary flood defences</td>
</tr>
</tbody>
</table>

If the preferred options fall in to the above activities then they can be screened out of further WFD assessment. If a quality element is not likely to be affected by the preferred options then it can also be scoped out of any further assessment.

If there are no impacts likely across any of the quality elements, then it is necessary to move to the second step which involves a consideration of cumulative impacts within a water body. Whilst an individual scheme may have an insignificant impact on WFD quality elements within a reach, the combined effect of several small-scale schemes within a water body may cause deterioration.

The third step involves checking if the proposed development is located on habitats that are critical to the individual biological quality elements or on particularly sensitive habitats then further investigation is required. It may also be necessary to carry out further investigation if the proposed development is predicted to negatively impact on any salt marsh or seagrass habitat in transitional/coastal waters.

If it is determined that no deterioration of sensitive critical habitats will occur then water bodies of GES/GEP can be scoped out of any further assessment. If the water body is not of GES/GEP then the fourth step is required. This involves considering if the Strategy will impact on proposed WFD improvement/mitigation measures by causing a deterioration or failure to meet the water body objectives.

In terms of the fifth step, for water bodies that are of less than good status, it is necessary to consult the RBMP to ascertain whether the required measures can be built into the Strategy so as to meet GES/GEP.

#### 5.1 Unit 1 - Upper Itchen / St Denys

**Preliminary assessment of deterioration**

The short to medium term (2015 to 2060) option for ODU 1 is to implement community and property level flood resistance and resilience. At 2060 a floodwall will be constructed near the front line will be required. The short to medium term option will therefore not cause any change or deterioration to WFD objectives and does not require further consideration. However, the longer term option of a floodwall is screened in to the WFD compliance assessment as the construction works would involve an upgrade to the existing defences and/or creation of new defences.
The morphology screening tables in the Environment Agency guidance do not apply to TraC water bodies such as Southampton Water, so expert judgement is required to ascertain whether any quality elements will be affected by the scheme. It is considered that Environmental Objective WFD3 will be met. However, the preferred option for this ODU requires more detailed assessment as it is possible that Objective WFD2 will not be met. Therefore, this preferred option requires further assessment and is taken forward to the detailed impact assessment stage.

5.2 Unit 2 - Bevois Valley

Preliminary assessment of deterioration

The preferred option for this ODU is the maintenance of existing defences in the short term (2015 to 2030) with the construction of new sheet pile front line defences at the front line in 2030 providing flood protection until 2110 for the critical infrastructure (railway line) immediately adjacent to the shoreline and the area behind. There is little available land in front of the railway at this point, hence the preference for the sheet pile option which requires a minimal footprint. It is considered that Environmental Objectives WFD2 and WFD3 will be met by the proposed scheme. ODU2 is just 350 m in length and while the effects of the proposed piling may reduce the intertidal area at this point due to a landward movement of the low tide mark, the length of shore to which this applies will be too small to have an effect on the overall status of the Southampton Water waterbody. It is therefore considered that both WFD2 and WFD3 will be met by the proposed scheme and it is necessary to move to the second step of the preliminary assessment.

Cumulative impacts

The assessment of cumulative impacts has considered existing pressures on the waterbody, any recent schemes, local knowledge and other planned schemes that may introduce similar pressures to those already experienced by the waterbody. The proposed sheet pile defence will be located behind the current front line defence and the extent of coastal squeeze will therefore be limited. No other proposed schemes within Unit 2 which could cause similar pressures were known of at the time of writing this assessment and it is therefore considered that there is no likely cumulative effect with the other stretches of front line defence proposed for other ODUs within the study area. The preferred option for this ODU therefore does not require more detailed assessment.

Critical/sensitive habitats

Mudflats are a protected habitat under the Southampton City Council Biodiversity Action Plan23 (BAP) and are found within ODU2. Southampton City Council’s policy for biodiversity protection, from the adopted local plan, includes policy NE5 on Intertidal Mudflat Habitats. The policy states:

‘Development will not be permitted which would result in the reclamation of, or disturbance to, the remaining intertidal mudflat habitat and land along the River Itchen, the River Test and Southampton Water and Weston Shore outside of the SPA as shown on the Proposals Map unless:

1. there is no adverse affect on nature conservation interests;

2. there is no damage to the open character of the riverside and landscape;
3. there is no damage to water-based recreation or leisure interests; and
4. there is no net loss of intertidal mudflat habitat.

It is thought that the proposed policy for ODU2 will meet policy NE5, as the construction of defences will follow the present alignment of the defences so will not increase the potential for coastal squeeze and the loss of mudflat habitat and the preferred option for this ODU therefore does not require more detailed assessment.

Is the water body at GES/GEP?

The Southampton Water TraC waterbody is currently classified as having Moderate potential, with a proposed overall objective of reaching ‘Good Potential’ status by 2027. In order to achieve Good potential, the RBMP has identified a series of proposed improvement and/or mitigation measures to bring the waterbody up to Good potential. For Southampton Water the measures relevant to this Strategy are given in Table 1-2 above, which shows that the following identified mitigation measures are not currently in place:

- Indirect / offsite mitigation (offsetting measures);
- Operational and structural changes to locks, sluices, weirs, beach control, etc; and
- Preserve and where possible enhance ecological value of marginal aquatic habitat, banks and riparian zone.

Of these, the first option is not considered to be relevant but operational changes to beach control and the preservation of marginal aquatic habitat, banks and riparian zone could be affected by The Strategy. However, while the preferred option for Unit 2 would reduce the intertidal area at this point due to a landward movement of the low tide mark, the length of shore to which this applies will be too small to have an effect on the overall status of the Southampton Water waterbody. It is therefore not considered that the proposed option for ODU2 would compromise the above measures and therefore the Strategy should not prevent the achievement of Good potential within ODU2.

5.3 Unit 3 - Meridian Studios (railway line to Northam Bridge)

Preliminary assessment of deterioration

The preferred option for this ODU in the short to medium term (2015 to 2060) is an intermediate height floodwall, which will form the spine of defence until land raising as and when sites are brought forward and cleared for redevelopment. The raised land will then provide robust flood protection from 2060 to 2110. In the case of the former Meridian Studios site, the land has already been cleared and would be suitable for raising in the immediate future.

As with ODU3, it is considered that Environmental Objectives WFD2 and WFD3 will both be met by the proposed scheme. ODU3 is just 400 m in length and while the effects of the proposed flood wall may reduce the intertidal area at this point due to a landward movement of the low tide mark, the length of shore to which this applies will be too small to have an effect on the overall status of the Southampton Water waterbody. It is therefore considered that both WFD2 and WFD3 will be met by the proposed scheme and it is necessary to move to the second step of the preliminary assessment.
**Cumulative impacts**

The assessment of cumulative impacts has considered existing pressures on the waterbody, any recent schemes, local knowledge and other planned schemes that may introduce similar pressures to those already experienced by the waterbody. The only planned scheme in Unit 3 that was known of at the time of writing this assessment is the redevelopment of the former Meridian studios site. However, as this redevelopment is integrated within the preferred option for Unit 3, it has been included within this assessment. In addition, the proposed intermediate flood wall will be located behind the current front line defence and the extent of coastal squeeze will therefore be limited. It is therefore considered that there are no likely cumulative impacts with the other stretches of front line defence proposed for other ODUs within the study area. The preferred option for this ODU therefore does not require more detailed assessment.

**Critical/sensitive habitats**

Mudflats are a protected habitat under the Southampton City Council Biodiversity Action Plan²⁴ (BAP) and are found within ODU3. Southampton City Council’s policy for biodiversity protection, from the adopted local plan, includes a policy on Intertidal Mudflat Habitats, as discussed above in section 5.2.

It is thought that the proposed policy for ODU2 will meet policy NE5, as the setting back of defences will minimise the potential for coastal squeeze and the loss of mudflat habitat and the preferred option for this ODU therefore does not require more detailed assessment.

**Is the water body at GES/GEP?**

The Southampton Water TraC waterbody is currently classified as having Moderate potential, with a proposed overall objective of reaching ‘Good Potential’ status by 2027. In order to achieve Good potential, the RBMP has identified a series of proposed improvement and/or mitigation measures to bring the waterbody up to Good potential. For Southampton Water the measures relevant to this Strategy are given in Table 1-2 above, which shows that the following identified mitigation measures are not currently in place:

- Indirect / offsite mitigation (offsetting measures);
- Operational and structural changes to locks, sluices, weirs, beach control, etc; and
- Preserve and where possible enhance ecological value of marginal aquatic habitat, banks and riparian zone.

Of these, the first option is not considered to be relevant but operational changes to beach control and the preservation of marginal aquatic habitat, banks and riparian zone could be affected by The Strategy. However, while the preferred option for Unit 3 would reduce the intertidal area at this point due to a landward movement of the low tide mark, the length of shore to which this applies will be too small to have an effect on the overall status of the Southampton Water waterbody. It is therefore not considered that the proposed option for ODU3 would compromise the above measures and therefore the Strategy should not prevent the achievement of Good potential within ODU3.

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5.4 Unit 4 - Northam (Northam Bridge to Belvedere Wharf)

**Preliminary assessment of deterioration**

The preferred option for this ODU is land raising as and when sites are brought forward and cleared for redevelopment. However, the area is currently occupied by businesses and light industrial uses and may not be available for land raising for some time. It is therefore proposed that an intermediate height floodwall is implemented in the short to medium term (2015 to 2060). Raised land would then provide robust flood protection from 2060 to 2110.

It is considered that Environmental Objective WFD3 will be met by the proposed scheme. The proposed concrete wall would only be a short to medium term defence, with the proposed land raising providing adequate flood resilience for the ODU in the long term. It is therefore anticipated that the design life of the wall would be 50 years (lasting until 2060), which would mean that a reduced crest height would be required. This reduced crest height would allow for continuity from the City to the water and help maintain access to the waterfront. It is not anticipated that any adverse effects will result and Environmental Objectives WFD2 and WFD3 will both be met by the proposed scheme. It is therefore necessary to move to the second step of the preliminary assessment.

**Cumulative Impacts**

The assessment of cumulative impacts has considered existing pressures on the waterbody, any recent schemes, local knowledge and other planned schemes that may introduce similar pressures to those already experienced by the waterbody. As this preferred option represents an extension to the existing situation in the ODU, it is not anticipated that there are likely to be any cumulative impacts with any recent schemes or other planned schemes in the area.

Although redevelopment is proposed within Unit 4, as with Unit 3, the longer term land raising is integrated within the redevelopment and has therefore been included within this assessment.

**Critical/sensitive habitats**

There are no critical or sensitive habitats within this ODU, as intertidal mudflats are not present within this ODU.

**Is the water body at GES/GEP?**

The Southampton Water TraC waterbody is currently classified as having Moderate potential, with a proposed overall objective of reaching ‘Good Potential’ status by 2027. In order to achieve Good potential, the RBMP has identified a series of proposed improvement and/or mitigation measures to bring the waterbody up to Good potential. For Southampton Water the measures relevant to this Strategy are given in Table 1-2 above, which shows that the following identified mitigation measures are not currently in place:

- Indirect / offsite mitigation (offsetting measures);
- Operational and structural changes to locks, sluices, weirs, beach control, etc; and
- Preserve and where possible enhance ecological value of marginal aquatic habitat, banks and riparian zone.
Of these, the first option is not considered to be relevant but operational changes to beach control and the preservation of marginal aquatic habitat, banks and riparian zone could be affected by The Strategy. However, the long term (from 2060 to 2110) preferred option for Unit 4 of land raising would not involve operational changes to beach control and would minimise the impact on the foreshore in this Unit and therefore preserve its ecological value.

It is therefore not considered that the proposed option for ODU4 would compromise the above measures and therefore the Strategy should not prevent the achievement of Good potential within ODU4.

5.5 Unit 5 - St Mary’s Wharves

**Preliminary assessment of deterioration**

The preferred option for this ODU is land raising as and when sites are brought forward and cleared for redevelopment. However, the area is currently occupied by businesses and light industrial uses and would not be available for land raising for some time. It is therefore proposed that an intermediate height floodwall is constructed to provide short to medium term flood protection (2015 to 2060). This floodwall will form the spine of defence until a continuous strip of raised land, undertaken through redevelopment, supersedes the floodwall as the main defence by 2060.

As this preferred option represents an extension to the existing situation in the ODU, it is not anticipated that any adverse effects will result and Environmental Objectives WFD2 and WFD3 will both be met by the proposed scheme. It is therefore necessary to move to the second step of the preliminary assessment.

**Cumulative Impacts**

The assessment of cumulative impacts has considered existing pressures on the waterbody, any recent schemes, local knowledge and other planned schemes that may introduce similar pressures to those already experienced by the waterbody. No other proposed schemes within Unit 5 which could cause similar pressures were known of at the time of writing this assessment.

In addition, as this preferred option represents an extension to the existing situation in the ODU, it is not anticipated that there are likely to be any cumulative impacts with any recent schemes or other planned schemes in the area.

**Critical/sensitive habitats**

There are no critical or sensitive habitats within this ODU, as intertidal mudflats are not present within this ODU.

**Is the water body at GES/GEP?**

The Southampton Water TraC waterbody is currently classified as having Moderate potential, with a proposed overall objective of reaching ‘Good Potential’ status by 2027. In order to achieve Good potential, the RBMP has identified a series of proposed improvement and/or mitigation measures to bring the waterbody up to Good potential. For Southampton Water the measures relevant to this Strategy are given in Table 1-2 above, which shows that the following identified mitigation measures are not currently in place:

- Indirect / offsite mitigation (offsetting measures);
Operational and structural changes to locks, sluices, weirs, beach control, etc; and

Preserve and where possible enhance ecological value of marginal aquatic habitat, banks and riparian zone.

Of these, the first option is not considered to be relevant but operational changes to beach control and the preservation of marginal aquatic habitat, banks and riparian zone could be affected by The Strategy. However, the long term (from 2060 to 2110) preferred option for Unit 4 of land raising would not involve operational changes to beach control and would minimise the impact on the foreshore in this Unit and therefore preserve its ecological value.

It is therefore not considered that the proposed option for ODU5 would compromise the above measures and therefore the Strategy should not prevent the achievement of Good potential within ODU5.

5.6 Unit 6 - Crosshouse / Town Depot

Preliminary assessment of deterioration

The preferred option for this ODU is land raising and as this area is earmarked for redevelopment there is an opportunity to raise the site from 2015, which will need to tie in to the defences in the adjacent Unit to the north to form a continuous defence line. It is considered that Environmental Objectives WFD2 and WFD3 will both be met by the proposed scheme, which will not involve hard structures seawards of the current front line structures or significant alterations to the foreshore for the majority of the 600 m frontage of the ODU.

Cumulative impacts

The assessment of cumulative impacts has considered existing pressures on the waterbody, any recent schemes, local knowledge and other planned schemes that may introduce similar pressures to those already experienced by the waterbody. The only planned scheme in Unit 3 that was known of at the time of writing this assessment is the redevelopment of the Town Depot site. However, as this redevelopment is integrated within the preferred option for Unit 6, it has been included within this assessment.

Critical/sensitive habitats

Mudflats are a protected habitat under the Southampton City Council Biodiversity Action Plan25 (BAP) and are found within ODU6. Southampton City Council’s policy for biodiversity protection, from the adopted local plan, includes a policy on Intertidal Mudflat Habitats, as discussed above in section 5.2.

It is thought that the proposed policy for ODU6 will meet policy NE5, as the land raising will occur behind current front line structures and will not increase the potential for coastal squeeze and the loss of mudflat habitat and the preferred option for this ODU therefore does not require more detailed assessment.

Is the water body at GES/GEP?

The Southampton Water TraC waterbody is currently classified as having Moderate potential, with a proposed overall objective of reaching ‘Good Potential’ status by 2027. In order to

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achieve Good potential, the RBMP has identified a series of proposed improvement and/or mitigation measures to bring the waterbody up to Good potential. For Southampton Water the measures relevant to this Strategy are given in Table 1-2 above, which shows that the following identified mitigation measures are not currently in place:

- Indirect / offsite mitigation (offsetting measures);
- Operational and structural changes to locks, sluices, weirs, beach control, etc; and
- Preserve and where possible enhance ecological value of marginal aquatic habitat, banks and riparian zone.

Of these, the first option is not considered to be relevant but operational changes to beach control and the preservation of marginal aquatic habitat, banks and riparian zone could be affected by The Strategy. However, the long term (from 2060 to 2110) preferred option for Unit 4 of land raising would not involve operational changes to beach control and would minimise the impact on the foreshore in this Unit and therefore preserve its ecological value.

It is therefore not considered that the proposed option for ODU6 would compromise the above measures and therefore the Strategy should not prevent the achievement of Good potential within ODU6.

5.7 Unit 7 - Ocean Village

Preliminary assessment of deterioration

Due to the presence of sufficiently high quay walls and land levels, no work other than maintenance of the existing quay walls and structures will be required on this ODU until 2060, when the raising of quay walls within the marina and the construction of defences along the perimeter of ABP land and demountable defences / ramps on access points will be required. As this preferred option represents an extension to the existing situation in the ODU, it is not anticipated that any adverse effects will result and Environmental Objectives WFD2 and WFD3 will both be met by the proposed scheme. It is therefore necessary to move to the second step of the preliminary assessment.

Cumulative Impacts

The assessment of cumulative impacts has considered existing pressures on the waterbody, any recent schemes, local knowledge and other planned schemes that may introduce similar pressures to those already experienced by the waterbody. The only planned scheme in Unit 3 that was known of at the time of writing this assessment is the development of a proposed hotel adjacent to marina. However, this would not impact on the defences at this point and as this preferred option represents an extension to the existing situation in the ODU, it is not anticipated that there are likely to be any cumulative impacts with any recent schemes or other planned schemes in the area.

Critical/sensitive habitats

There are no critical or sensitive habitats within this ODU, as intertidal mudflats are not present within this ODU.

Is the water body at GES/GEP?

The Southampton Water TraC waterbody is currently classified as having Moderate potential, with a proposed overall objective of reaching ‘Good Potential’ status by 2027. In order to
achieve Good potential, the RBMP has identified a series of proposed improvement and/or mitigation measures to bring the waterbody up to Good potential. For Southampton Water the measures relevant to this Strategy are given in Table 1-2 above, which shows that the following identified mitigation measures are not currently in place:

- Indirect / offsite mitigation (offsetting measures);
- Operational and structural changes to locks, sluices, weirs, beach control, etc; and
- Preserve and where possible enhance ecological value of marginal aquatic habitat, banks and riparian zone.

Of these, the first option is not considered to be relevant but operational changes to beach control and the preservation of marginal aquatic habitat, banks and riparian zone could be affected by The Strategy. However, this preferred option represents an extension to the existing situation in the ODU and therefore does not involve changes to structures. In addition, the preferred option would not alter the current form of the marginal aquatic habitat, banks and riparian zone and would therefore preserve it. Obviously, this does not allow for enhancement measures but this is not considered to compromise the above measures and therefore the Strategy should not prevent the achievement of Good potential within ODU7.

5.8 Unit 8 – Eastern Docks / Dock Gate 4

Preliminary assessment of deterioration

Due to the presence of sufficiently high quay walls and land levels no work will be required in this ODU until 2060, when the preferred option is to implement a floodwall (typically 0.9m above existing ground levels) along the boundary of ABP Port to provide flood protection until 2110. It is not anticipated that any adverse effects will result, and Environmental Objectives WFD2 and WFD3 will both be met by the proposed scheme. No further WFD compliance assessment is therefore needed.

5.9 Unit 9 - Mayflower Park / Major Redevelopment Quarter

Preliminary assessment of deterioration

The preferred option for ODU 9 is to raise land through redevelopment to form a continuous strip of raised land to provide a robust flood defence behind the Port area. As discussed in the Interim Strategy Report\textsuperscript{26}, liaison with ABP has screened out the option of front line defence options which ABP are currently not exploring as the flood risk is not till the longer term in the docks area. The preferred option therefore involves the creation of a defence line behind the ABP owned land, which would ensure the protection of the Major Redevelopment Quarter, whilst accommodating access and operational requirements for the Port. The proposed work would therefore be at some distance from the actual shoreline and it is therefore considered that there would no effect on the waterbody from the preferred strategy.

This preferred option can be screened out of any further WFD assessment.

\textsuperscript{26} Southampton Coastal Flood and Erosion Risk Management Strategy, Interim Report, URS/Scott Wilson, June 2011 (DRAFT)  
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November 2012
5.10 Unit 10 – Western Docks

Preliminary assessment of deterioration

As with ODU9, liaison with ABP has screened out the option of front line defence options which ABP are currently not exploring as the flood risk is not till the longer term in the docks area. The preferred option therefore involves the creation of a defence line behind the ABP owned land, which would ensure the protection of the land behind the 5.9 km of ABP owned frontage, whilst accommodating access and operational requirements for the Port. The proposed work would therefore be at some distance from the actual shoreline and it is therefore considered that there would no effect on the waterbody from the preferred strategy.

This preferred option can be screened out of any further WFD assessment.

5.11 Unit 11 – Redbridge

Preliminary assessment of deterioration

Existing land levels and current structures are sufficiently high to provide flood protection until 2030. As sea levels rise and the flood risk increases by 2030, the preferred option for ODU 11 is to implement community and property level flood resistance and resilience which will manage the flood risk until 2060. This option will include providing warnings to residents of potential flood events in good time, along with flood resistance measures at the property level (flood gates, waterproof air brick covers and paint, non return valves etc.). This option will have considerably less disruption on the designated conservation sites in the vicinity (Solent and Southampton Water SPA/Ramsar and Solent Maritime SAC) than front line defence options.

At 2060, a floodwall along the seaward side of the railway line is required. The construction of a hard defence such as that proposed could reduce morphological and ecological diversity within the floodplain and reduce the tidal range while increasing the subtidal area. However, it must be noted that the railway embankment forms an existing infrastructure corridor and is maintained by Network Rail.

Due to the construction of a hardened front line from 2060 the preferred option for this ODU therefore requires more detailed assessment as it is possible that Objective WFD2 will not be met, although it is considered that Environmental Objective WFD3 will be met.

5.12 Summary of preliminary assessment

Table 5-2 below shows the outcome of this preliminary assessment, in terms of whether WFD environmental objectives will be met for Southampton Water and whether detailed assessment is required.

Table 5-2: ODUs requiring detailed assessment

<table>
<thead>
<tr>
<th>ODU</th>
<th>Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>ODU1 - Upper Itchen / St Denys</td>
<td>Possible failure to meet WFD2 due to floodwall construction at 2060</td>
</tr>
<tr>
<td>ODU11 - Redbridge</td>
<td>Possible failure to meet WFD2 due to floodwall along the railway line at 2060</td>
</tr>
</tbody>
</table>
6  DESIGN AND OPTIONS APPRAISAL AND SELECTION OF PREFERRED OPTION

During the design and options appraisal stages, the WFD objectives set out in Table 1-1 should be considered. If any of the preferred options in this Strategy are likely to cause deterioration then suitable mitigation or alternative options should be considered. If impacts are still unavoidable and the Strategy is still likely to cause deterioration or prevent a water body from meeting its WFD objectives then it is necessary to consider the Article 4.7 condition which asks whether there are any significantly better environmental options.

The preferred options for each management unit are outlined in Section 4 of this report and reasons are provided for their selection. All potential Coastal Strategy options have been considered during the development of these preferred options. A Strategic Environmental Assessment (SEA)\(^27\) of the options has been carried out to formulate and evaluate options for maintenance and improvement of defences, based on careful consideration of all technical issues, economics, stakeholder interests, future developments and environmental impacts. The preferred options therefore represent the lowest impact, most economic and above all most sustainable of the assessed options.

\(^{27}\) Appendix F - Strategic Environmental Assessment Environmental Report, Scott Wilson 2011
7 DETAILED IMPACT ASSESSMENT

If any of the preferred options in this Strategy have reached this stage of the assessment, then they have either been identified as potentially causing deterioration in WFD status/potential or preventing a water body from meeting its ecological objectives. In the case of this Strategy, the preferred options in the following ODUs have reached this stage and have been subject to a detailed impact assessment as set out in Section 7.1:

- ODU1 - Upper Itchen / St Denys; and
- ODU11 - Redbridge.

The preferred Strategy options for these management units either do not meet objective WFD2 on their own, or have the potential to cause a failure of WFD2 when considered in combination with other ODUs within the Strategy area.

7.1 Will the strategy prevent the achievement of GES / GEP

This assessment has identified that based on the preferred options, there is not anticipated to be a negative impact on the ecological status of the coastal water body for the majority of the frontage. However, within ODU 1 and ODU11 there could be possible impacts caused by the preferred Strategy options in the longer term.

Until 2060, flood risk in ODU 1 and 11 will be managed through property level flood resistance measures (flood gates, waterproof air brick covers and paint, non return valves etc.) along with flood warnings, incident response and resilience measures at the property level. The flood resistance and resilience option and assumed maintenance of private ‘ad-hoc’ defences in the short to medium term in ODUs 1 and 11 will not affect the overall classification of the Southampton Water waterbody and would not prevent the target status of Good potential being achieved by 2027.

In order to protect the residential and commercial properties and critical infrastructure (Portswood Wastewater Treatment Works) in ODU 1 after 2060, upgrading of the defences is essential. A hard defence (floodwall) is proposed for ODU 1 at 2060 and this will replace the current informal and often ‘piecemeal’ private defences with varying type, condition and standards.

The construction of a hard defence such as the proposed floodwall at 2060 could reduce morphological and ecological diversity within the floodplain. Beach narrowing and steepening and an overall reduction in the non-designated intertidal area may result from increased sea levels resulting from climate change. While ODU 1 lies adjacent to the Solent and Southampton Water SPA, the designation does not cover the western shore of the tidal Itchen, which reflects the commercial and heavily modified nature of the waterbody at this stage. In the context of the wider Southampton Water waterbody, this stretch represents just 2.5km of the overall >100 km waterbody length and is not considered to be of significant ecological importance.

Within ODU11, the floodwall defences proposed along the railway line after 2060 has the potential to prevent approximately 0.2 Ha of intertidal habitat from being created at Redbridge, subject to the realisation of sea level rise predictions. ODU11 lies within the Solent and Southampton Water SPA and Ramsar site and adjacent to the Solent Maritime SAC, which could potentially be affected by the proposed Strategy. As the flood wall follows the embankment, it would lie within the existing footprint of the railway infrastructure and
consequently the effects of the wider Southampton Water body are not anticipated to be significant as this is a relatively short section of defence (~1km), especially in the context of the rest of the 10km lower Test valley area which falls under the SMP policy of ‘No Active Intervention’.

Cumulative effects across the Southampton Water waterbody as a whole were assessed by the North Solent SMP, as discussed above in section 1.8. The SMP concluded that the recommended policy of Hold the Line in policy unit 5C12 (Woodmill Lane to Redbridge) could contribute towards the erosion and lowering of intertidal foreshore habitats, which in turn could impact on the fish, benthic invertebrate and macroalgal communities of the foreshore. The SMP also concluded that the SMP policy may result in potential short term deterioration in surface water Ecological Potential for the 5C12 unit and the following policy units within the Southampton Water waterbody could also be at risk of failing WFD objective 2:

- 5C03 Swanwick Shore to Road Bursledon Bridge – beach narrowing and lowering along marina frontage;
- 5C07 Hamble Oil Terminal to Ensign Industrial Park – narrowing and loss of fronting beach due to maintaining the standard of privately owned defences;
- 5C09 Cliff House to Netley Castle – beach narrowing and lowering due to maintaining the current standard of defence;
- 5C11 Weston Point to Woodmill Lane – continued maintenance of defence structures would cause the erosion and lowering of intertidal foreshore habitats;
- 5C14 Redbridge to Calshot Spit – the maintenance and upgraded standard of protection of the defences along this stretch of coast would allow for the continued erosion and lowering of the designated intertidal foreshore habitats; and
- 5C15 Calshot Spit – the continued maintenance of defence structures would cause the erosion and lowering of intertidal foreshore habitats.

The preferred strategy options in policy unit 5C12 could therefore have a cumulative effect.

It is considered that in the context of the wider Southampton Water waterbody, potential impacts of the Strategy options on ecological elements will be localised and they are unlikely to prevent the achievement of GES or GEP within the water body as a whole. As the frontage is currently mostly defended by significant structures, intertidal habitat will be lost due to coastal squeeze due to a landward movement of the low tide mark. However as strategy preferred options fall within existing defence footprints or behind existing defences coastal squeeze impacts will not be exacerbated by the strategy, except potentially at Redbridge from 2060, but the length of shore to which this applies is too small to have an effect on the overall status of the Southampton Water waterbody. It is therefore not considered that The Strategy would compromise the mitigation measures and therefore The Strategy should not prevent the achievement of Good ecological potential.

Opportunities for mitigation against intertidal habitat loss beyond 2060 are limited within The Strategy area, due to the urban nature of the shoreline, but should be investigated further in the future. Where possible, mitigation opportunities should be identified within The Strategy area, but where this is not possible other mitigation options within the Southampton Water waterbody should be investigated. The mainly undefended Lower Test Valley and the western flank of Southampton Water could present opportunities for mitigation in the future; this should be...
explored further by other strategies in these areas where there is greater scope for mitigation provision.

7.2 Impacts on other water bodies

This assessment has included all landward waterbodies that have the potential to be impacted by the preferred Strategy options and the adjacent coastal water bodies will not be affected by the preferred Strategy options.

7.3 Other European legislation

WFD article 4.8 requires any new scheme to be consistent with other European environmental legislation. As discussed above in sections 1.2 and 1.6, and as shown in Figure 1-2, there is a designated Shellfish Water within Southampton Water, namely Southampton Water Shellfish Water.

There is the possibility that there is contamination present in the soils along the strategy frontage. However, as the preferred Strategy options do not allow for the erosion of these soils, there is no possibility that any contamination present could be released. Temporary construction effects do not require assessment and the release of contaminated soils by construction works required to maintain and upgrade coastal defences has not been assessed. It is therefore concluded that there would be no impact on the designated Shellfish Waters from the Strategy.

In addition, the Strategy would ensure continued protection of inland sites, which would have the potential to cause pollution of the Shellfish Waters if allowed to flood from the sea e.g. sewage treatment works.
It is concluded that overall the Strategy is unlikely to have any significant adverse effects on the waterbodies present as scheme works are generally within, or often landwards, of existing defence footprints. The effects of the Strategy on other European Directives have also been considered and it is concluded that standards set by the Habitats and Shellfish Waters Directives will not be affected.

In the short to medium term (until 2060) there will be no significant adverse impacts resulting from the Strategy options; however, as a result as a result of the detailed assessments, two ODUs were identified as areas where there is the potential for the longer term schemes (2060 implementation) to cause adverse impacts. These were identified as ODU 1 and ODU11. Here the potential for failure of Environmental Objectives was identified as a result of the planned construction of a floodwall defence.

The construction of hard structures (i.e. floodwalls / sheet piling) has the potential to reduce morphological and ecological diversity within the floodplain. This in turn can reduce sediment mobilisation, which could result in the water column ceasing to be the provider of sediment onto mudflats and sandflats, especially in natural or semi-natural catchments. Coastal squeeze in the form of beach narrowing and steepening and an overall reduction in the intertidal area may result from increased water levels due to climate change and sea level rise.

However, ODU1 is not considered to be of ecological significance, as the designation of the Solent and Southampton Water SPA does not cover the western shore of the tidal Itchen, which reflects the commercial and heavily modified nature of the waterbody at this stage. On a wider catchment scale the loss of small sections of the intertidal area in these units would not be significant. Also the floodwall in the Unit is likely to be within or behind the existing defence footprints.

It is concluded that this impact will be minimal as the ODUs represent a very small section of the overall Southampton Water waterbody; ODUs 1 and 11 represent just 4 km of the overall >100 km waterbody length. Therefore placing the local impact of the ODU1 and ODU11 Strategy options within the context of the wider water body and heavily modified catchment, and given that the implementation of these options is planned for 2060, any potential effect on ecological elements is unlikely to prevent the achievement of GES or GEP within the water body as a whole. The Strategy has the potential to prevent approximately 0.2 ha of intertidal habitat from being created at Redbridge post 2060, although in the context of the wider habitat losses across Southampton Water (figures unavailable) this is considered to be insignificant and would not cause a failure to reach Good ecological potential.

Opportunities for mitigation against intertidal habitat loss beyond 2060 are limited within The Strategy area, due to the urban nature of the shoreline, but should be investigated further in the future. Where possible, mitigation opportunities should be identified within The Strategy area, but where this is not possible other mitigation options within the Southampton Water waterbody should be investigated. The mainly undefended Lower Test Valley and the western flank of Southampton Water could present opportunities for mitigation in the future; this should be explored further by other strategies in these areas where there is greater scope for mitigation provision.

For all ODUs, it was noted that there may be localised and temporary water quality impacts as a result of maintenance or construction works, although it is anticipated that this will be minimal and can be further reduced with sensitive construction techniques and reference to the
Environment Agency’s Pollution Prevention Guidelines. In addition, works should be timed to avoid sensitive times such as bird breeding seasons. In any case, impacts resulting from construction are unlikely to cause a permanent change in the ecological status or ecological potential of the water body.
APPENDIX A - DESIGNATED CONSERVATION SITES

9.1 Solent and Southampton Water SPA and Ramsar site

The site comprises a series of estuaries and harbours with extensive mud-flats and saltmarshes together with adjacent coastal habitats including saline lagoons, shingle beaches, reedbeds, damp woodland and grazing marsh. The mud-flats support beds of Enteromorpha spp. and Zostera spp. and have a rich invertebrate fauna that forms the food resource for the estuarine birds. In summer, the site is of importance for breeding seabirds, including gulls and four species of terns. In winter, the SPA holds a large and diverse assemblage of waterbirds, including geese, ducks and waders. Dark-bellied Brent Goose Branta b. bernica also feed in surrounding areas of agricultural land outside the SPA.

9.2 Solent Maritime SAC

The Solent encompasses a major estuarine system on the south coast of England with four coastal plain estuaries (Yar, Medina, King’s Quay Shore, Hamble) and four bar-built estuaries (Newtown Harbour, Beaulieu, Langstone Harbour, Chichester Harbour). The site is the only one in the series to contain more than one physiographic sub-type of estuary and is the only cluster site. The Solent and its inlets are unique in Britain and Europe for their hydrographic regime of four tides each day, and for the complexity of the marine and estuarine habitats present within the area. Sediment habitats within the estuaries include extensive estuarine flats, often with intertidal areas supporting eelgrass Zostera spp. and green algae, sand and shingle spits, and natural shoreline transitions.

The Solent contains the second-largest aggregation of Atlantic salt meadows in south and south-west England. Solent Maritime is a composite site composed of a large number of separate areas of saltmarsh.