North West and North Wales Coastal Group

North West England and North Wales Shoreline Management Plan SMP2

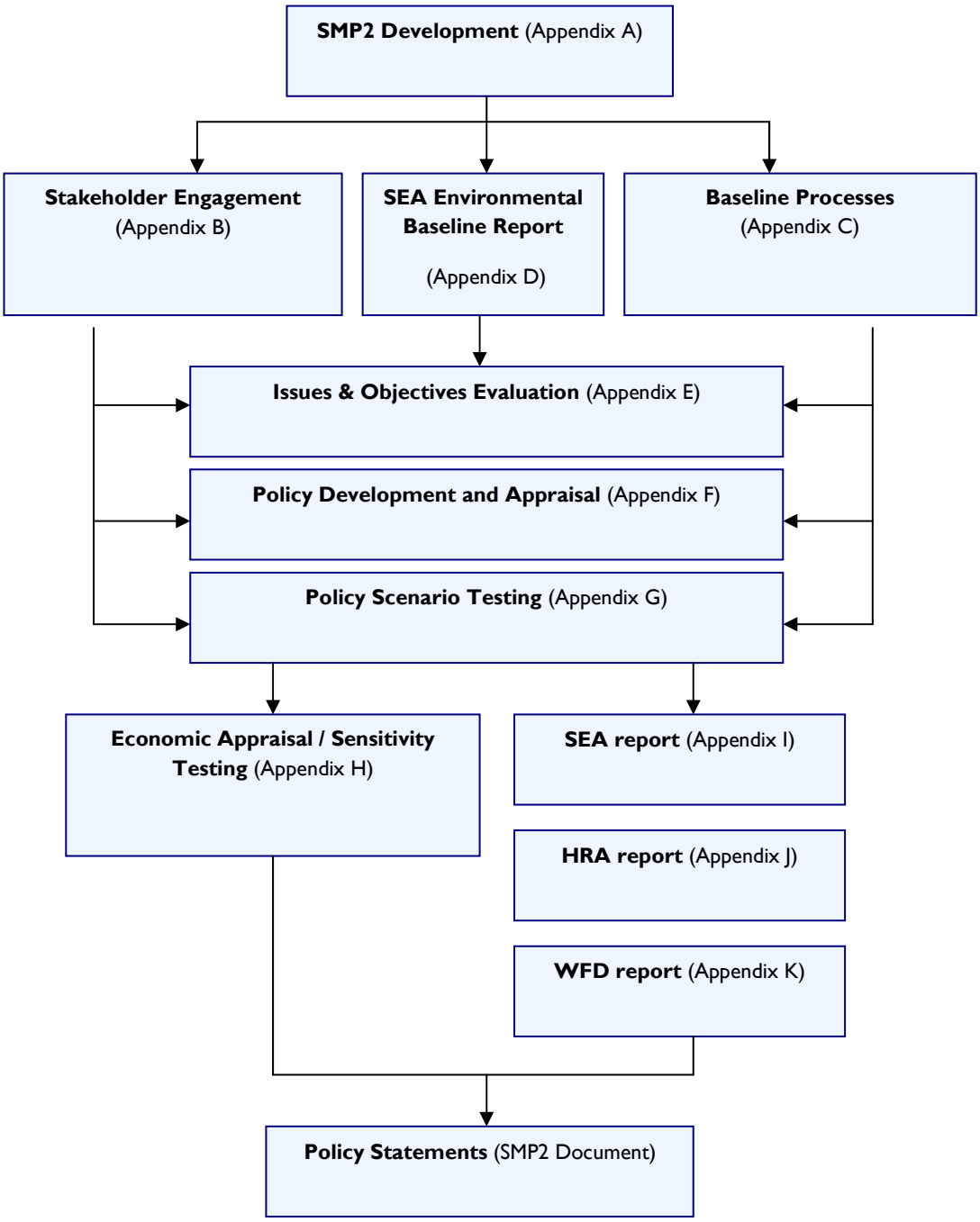
Appendix K –Water Framework Directive (WFD) Assessment Report

The Supporting Appendices

This appendix and the accompanying documents provide all of the information required to support the Shoreline Management Plan. This is to ensure that there is clarity in the decision-making process and that the rationale behind the policies being promoted is both transparent and auditable. The appendices are:

A: SMP2 Development	This reports the history of development of the SMP2, describing more fully the plan and policy decision-making process.
B: Consultation	All communications from the stakeholder process are provided here, together with information arising from the consultation process.
C: Baseline Process Understanding	Includes baseline process report, defence assessment, NAI and WPM assessments and summarises data used in assessments.
D: SEA Environmental Baseline Report (Theme Review)	This report identifies and evaluates the environmental features (human, natural, historical and landscape).
E: Issues & Objective Evaluation	Provides information on the issues and objectives identified as part of the Plan development, including appraisal of their importance.
F: Policy Scenario Identification	Presents the consideration of generic policy options for each frontage, identifying possible acceptable policies, and their combination into 'scenarios' for testing.
G: Policy Scenario Testing	Presents the policy assessment and appraisal of objective achievement towards definition of the Preferred Plan (as presented in the Shoreline Management Plan document).
H: Economic Appraisal and Sensitivity Testing	Presents the economic analysis undertaken in support of the Preferred Plan.
I: Strategic Environmental Assessment (SEA) Report	Presents an overview of the environmental assessment process and shows how the requirements of the EU Council Directive 2001/42/EC (the Strategic Environmental Assessment Directive) are met.
J: Habitats Regulations Assessment	Presents the results of a Habitats Regulations Assessment under the requirements of the EC Habitats Directive (92/43/EEC) and European Union Birds Directive (79/409/EEC).
K: Water Framework Directive (WFD) Assessment	Presents the results of the WFD Assessment.
L: Meta-database and Bibliographic	a database of supporting information used to develop the SMP2, referenced for future examination and retrieval

Within each appendix cross-referencing highlights the documents where related appraisals are presented. The broad relationships between the appendices are as below.



Contents Amendment Record

This report has been issued and amended as follows:

Issue	Revision	Description	Date	Approved by
1	0	1st Working Draft		
2	1	Incorporating comments from: Lee Swift (Environment Agency); Sarah Vincent-Piper (Environment Agency's Flood Risk Management); and Fiona Crayston (Blackpool Council)	2nd October 2009	A Parsons
3	0	Revised report taking account of issues raised during consultation and changes to final SMP2 policies	20th September 2010	A Parsons
4	0	Final	18th February 2011	A Parsons

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Glossary

Glossary

(Adapted from Environment Agency, 2009, The Water Framework Directive - Glossary of technical terms used in the draft river basin management plans and the Water Framework Directive)

Angiosperms	The flowering plants. In transitional and coastal waters they include sea grasses and the flowering plants found in salt marshes
Biological element	A collective term for a particular characteristic group of animals or plants present in an aquatic ecosystem (for example phytoplankton; benthic invertebrates; phytobenthos; macrophytes; macroalgae; phytobenthos; angiosperms; fish).
Biological indicators	A parameter that can be monitored to estimate the value of a biological quality element. Indicators may include the presence or absence of a particularly sensitive species.
Biological quality element	A characteristic or property of a biological element that is specifically listed in Annex V of the Water Framework Directive for the definition of the ecological status of a water body (for example composition of invertebrates; abundance of angiosperms; age structure of fish).
Characterisation (of water bodies)	A two-stage assessment of water bodies under the Water Framework Directive. Stage 1 identifies water bodies and describes their natural characteristics. Stage 2 assesses the pressures and impacts from human activities on the water environment. The assessment identifies those water bodies that are at risk of not achieving the environmental objectives set out in the Water Framework Directive. The results are used to prioritise both environmental monitoring and further investigations to identify those water bodies where improvement action is required.
Competent Authority	An authority or authorities identified under Article 3(2) or 3(3) of the Water Framework Directive. The Competent Authority will be responsible for the application of the rules of the Directive within each river basin district lying within its territory.
Ecological potential	The status of a heavily modified or artificial water body measured against the maximum ecological quality it could achieve given the constraints imposed upon it by those heavily modified or artificial characteristics necessary for its use. There are five ecological potential classes for Heavily Modified Water Bodies/Artificial Water Bodies (maximum, good, moderate, poor and bad).
Ecological status	Ecological status applies to surface water bodies and is based on the following quality elements: biological quality, general chemical and physico-chemical quality, water quality with respect to specific pollutants (synthetic and non synthetic), and hydromorphological quality. There are five classes of ecological status (high, good, moderate, poor or bad). Ecological status and chemical status together define the overall surface water status of a water

Good ecological potential	Those surface waters which are identified as Heavily Modified Water Bodies and Artificial Water Bodies must achieve 'good ecological potential' (good potential is a recognition that changes to morphology may make good ecological status very difficult to meet). In the first cycle of river basin planning good potential may be defined in relation to the mitigation measures required to achieve it.
Good ecological status	The objective for a surface water body to have biological, structural and chemical characteristics similar to those expected under nearly undisturbed conditions.
Good status	Is a term meaning the status achieved by a surface water body when both the ecological status and its chemical status are at least good or, for groundwater, when both its quantitative status and chemical status are at least good and show no signs of deterioration.
Groundwater	All water which is below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil.
Heavily Modified Water Body	A surface water body that does not achieve good ecological status because of substantial changes to its physical character resulting from physical alterations caused by human use, and which has been designated, in accordance with criteria specified in the Water Framework Directive, as 'heavily modified'.
High ecological status	Is a state, in a surface water body, where the values of the hydromorphological, physico-chemical, and biological quality elements correspond to conditions undisturbed by anthropogenic activities.
Hydromorphology	Describes the hydrological and geomorphological processes and attributes of surface water bodies. For example for rivers, hydromorphology describes the form and function of the channel as well as its connectivity (up and downstream and with groundwater) and flow regime, which defines its ability to allow migration of aquatic organisms and maintain natural continuity of sediment transport through the fluvial system. The Water Framework Directive requires surface waters to be managed in such a way as to safeguard their hydrology and geomorphology so that ecology is protected.
Inner protection zone	Zone 1 of a ground water Source Protection Zone - Any pollution that can travel to the borehole within 50 days from any point within the zone is classified as being inside zone 1. This applies at and below the water table. This zone also has a minimum 50 metre protection radius around the borehole. These criteria are designed to protect against the transmission of toxic chemicals and water-borne disease
Macroalgae	Multicellular algae such as seaweed.
Macrophyte	Larger plants, typically including flowering plants, mosses and larger algae but not including single-celled phytoplankton or diatoms.

Measure	This term is used in the Water Framework Directive and domestic legislation. It means an action which will be taken on the ground to help achieve Water Framework Directive objectives.
Morphology	Describes the physical form and condition of a water body, for example the width, depth and perimeter of a river channel, the structure and condition of the riverbed and bank.
Natura 2000 sites	Protected Areas established for the protection of habitats or species under the Birds Directive (79/409/EEC) (Special Protection Areas) and the Habitats Directive (92/43/EEC) (Special Areas of Conservation).
No deterioration (in water body status)	None of the quality elements used in the classification of water body status deteriorates to the extent that the overall status is reduced.
Outer protection zone	Zone 2 of a ground water Source Protection Zone - The outer zone covers pollution that takes up to 400 days to travel to the borehole, or 25% of the total catchment area – whichever area is the biggest. This travel time is the minimum amount of time that we think pollutants need to be diluted, reduced in strength or delayed by the time they reach the borehole.
Phytobenthos	Bottom-dwelling multi-cellular and unicellular aquatic plants such as some species of diatom.
Phytoplankton	Unicellular algae and cyanobacteria, both solitary and colonial that live, at least for part of their lifecycle, in the water column.
River basin	A river basin is the area of land from which all surface run-off and spring water flows through a sequence of streams, lakes and rivers into the sea at a single river mouth, estuary or delta. It comprises one or more individual catchments.
River Basin District	A river basin or several river basins, together with associated coastal waters.
River Basin Management Plan	For each River Basin District, the Water Framework Directive requires a River Basin Management Plan to be published. These are plans that set out the environmental objectives for all the water bodies within the River Basin District and how they will be achieved. The plans will be based upon a detailed analysis of the pressures on the water bodies and an assessment of their impacts. The plans must be reviewed and updated every six years.
Total catchment	Zone 3 of a ground water Source Protection Zone - The total catchment is the total area needed to support removal of water from the borehole, and to support any discharge from the borehole.
Transitional water	A Water Framework Directive term for waters that are intermediate between fresh and marine water. Transitional waters include estuaries and saline lagoons.
Water body	A manageable unit of surface water, being the whole (or part) of a stream, river or canal, lake or reservoir, transitional water (estuary) or stretch of coastal water. A 'body of groundwater'

	is a distinct volume of underground water within an aquifer.
Water Framework Directive	European Union legislation – Water Framework Directive (2000/60/EC) – establishing a framework for European Community action in the field of water policy.
Abbreviations	
BQE	Biological Quality Element
FWB	Freshwater Body
GWB	Groundwater Body
HTL	Hold the Line
MR	Managed Realignment
NAI	No Active Intervention
ROPI	Reasons of Overriding Public Interest
RBD	River Basin District
RBMP	River Basin Management Plan
SPZ	Source Protection Zone
WFD	Water Framework Directive
TraC	Transitional and Coastal Water Bodies

K.1 Introduction

K.1.1 Purpose of the report

The Water Framework Directive (WFD) came into force in 2000 and is the most substantial piece of EC water legislation to date. As such the Directive will need to be taken into account in the planning of all new activities in the water environment.

The Environment Agency (the competent authority in England and Wales responsible for delivering the Directive) has issued guidance that explains how to build the environmental objectives of the WFD into Shoreline Management Plans (Environment Agency, 2009a)(K.5). The guidance describes the methodology for assessing the potential hydromorphogical changes and consequent ecological impact of SMP2 policies.

This report uses the guidance and highlights compliance of the Directive's environmental objectives by the **North West England and North Wales Shoreline Management Plan** (SMP2). The assessment was conducted in the later stages of the SMP2 process thus making it a semi-retrospective assessment i.e. policy decision had already been proposed in draft when the WFD assessment was undertaken. Non-compliance issues were able to inform the final policy decision making process. As stated in the guidance (Environment Agency, 2009):

"*By taking into account the environmental objectives of the Directive in policy making, future decisions will already have had consideration of requirements of the Directive and potential for failure to meet the objectives will have been highlighted*".

K.1.2 Background

The Directive was transposed into English and Welsh law as the Water Environment (Water Framework Directive) (England and Wales) Regulation, 2003. Its purpose is to establish a framework for the protection of inland surface waters, transitional waters, coastal waters and groundwaters.

The framework for delivering the WFD is through River Basin Management Planning (RBMP). For the North Wales and North West SMP2 the following River Basin Districts (RBD) are relevant:

(i) Western Wales;

(ii) Dee;

(iii) North West; and,

(iv) Solway Tweed.

For all water bodies in these districts the Directive requires the setting of environmental objectives. These are based on the default objectives as summarised in **Table 2**.

Table 1 Environmental Objectives in the Directive (adapted from Environment Agency, 2009, *Water Framework Directive: overview for assessing Shoreline Management Plans*, 81_09)

Objectives (taken from Article 4 of the Directive)	Reference Article
Implement the necessary measures to prevent deterioration of the status of all bodies of surface water.	4.1(a)(i)
Protect, enhance and restore all bodies of surface water, subject to the application of subparagraph (iii) for artificial and heavily modified bodies of water, with the aim of achieving good surface water status by 2015.	4.1(a)(ii)
Protect and enhance all artificial and heavily modified bodies of water, with the aim of achieving good ecological potential and good surface water chemical status by 2015.	4.1(a)(iii)
Progressively reduce pollution from priority substances and cease or phasing out emissions, discharges and losses of priority hazardous substances.	4.1(a)(iv)
Prevent 'Deterioration in Status' and prevent or limit input of pollutants to groundwater.	4.1(b)(i)

In order to achieve these environmental objectives, a set of mitigation measures for each RBD has been proposed in draft. These mitigation measures are proposed to return the existing environment to a position of good status defined as part of the Good Ecological Potential (GEP) classification. These mitigation measures are included in the RBMP programme of measures.

D.1.2.1 Achieving objectives for EU protected sites

Where there are sites protected under other EU legislation (such as the Birds or Habitats Directives), the WFD aims for compliance with any relevant standards or objectives for these sites. Therefore, where a site which is water dependant in some way is protected via designation under another EU Directive and the Good Ecological Status/Potential targets set under the Directive would be insufficient to meet the objectives of the other relevant environmental Directives, the more stringent targets would apply.

All Natura 2000 designated sites were identified from the existing Habitats Regulations Assessment (Appendix J) of the SMP2.

K.2 Assessment Methodology

The methodology used in this assessment follows the Environment Agency's guidance. This guidance breaks the assessment down into a series of clearly defined steps, to provide a transparent and auditable account of the assessment of SMP2 policies. These steps are summarised below (section 2.1 to 2.4). For a full account of the process the reader should refer to the guidance.

K.2.1 Step 1: Scope the SMP2- Data collation

To make the assessment as comprehensive as possible, a data collation exercise was undertaken to identify all Transitional and Coastal (TraC) water bodies present in the North West England and North Wales SMP2 area area, highlighted in Figure 1. In addition, all river and lake water bodies were identified that may be influenced by SMP2 policies through the Environment Agency's Flood Map (Environment Agency, 2009b) (K.5). For each water body the following information was sourced:

- WFD ID number;
- Classification details (including Biological Quality Element[1] (BQE) information and Artificial/Heavily Modified Water Body designation);
- Environmental objective; and,
- Programme of Measures for each relevant RBMP (Environment Agency, 2009c) (K.5).

These actions were repeated for groundwater bodies with risk of saline intrusion and locations of groundwater abstraction source protection zones quoted in addition to the above.

Where there were discrepancies between water body boundaries and SMP2 boundaries, these were highlighted. Recommendations were recorded, where appropriate, to change the SMP2 boundaries to attain consistency with water body boundaries.

K.2.2 Step 2: Define WFD features and issues

From the water bodies highlighted as relevant in step 1, the impact of generic SMP2 polices (No Active Intervention, NAI and With Present Management, WPM) was assessed on the physical and hydromorphological features outlined in **Table 6**. This was used to identify the parameters on which the biology is dependent on and therefore the relevant BQE.

Table 7 expanded on key features and issues identified in Table 6 by adding water body specific knowledge of the physical factors that BQEs are dependant on. In addition, water body classification and WFD environmental objectives were highlighted, based on Article 4.1 of the Water Framework Directive (Table 2), and specific Programme of Measures for the relevant RBMP.

[1] The assessment of ecological status or potential of water bodies is carried out with the use of biological indicators from several groups of organisms – biological quality elements. For example: inland surface water (river and lake ecosystems), the water quality assessment will include measurement of several parameters of phytoplankton, macrophytes, benthic and macro invertebrates and fish.

Table 2 Generic environmental objectives to be used in Table 7 (adapted from Environment Agency, 2009, *Water Framework Directive: overview for assessing Shoreline Management Plans*, 81_09)

Objective	Description
WFD1	No changes affecting high status sites.
WFD2	No changes that will cause failure to meet surface water Good Ecological Status/Potential (delete as appropriate) or result in a deterioration of surface water Ecological Status/Potential (delete as appropriate).
WFD3	No changes which will permanently prevent or compromise the environmental objectives being met in other water bodies.
WFD4	No changes that will cause failure to meet good groundwater status or result in a deterioration of groundwater status.

K.2.3 Step 3: Assess preferred SMP2 Policies against WFD environmental objectives

In this stage of the assessment the potential changes to physical and hydromorphological parameters from SMP2 policies are assessed against WFD environmental objectives. For each Policy Unit, potential changes to relevant physical and hydromorphological parameters were identified and recorded in **Table 8**.

The impact on river and lake water bodies and on groundwater bodies was considered at this stage, paying particular attention to areas where the preferred policy was 'No Active Intervention' (NAI) or 'Management Realignment' (MR). These policies could potentially result in saline intrusion.

Following this assessment the cumulative effects of SMP2 polices were assessed against WFD water bodies and recorded in **Table 9.** Where it was demonstrated that an environmental objective had not been met for one or more policy units a Water Framework Directive Summary Statement was completed (as outline in step 4).

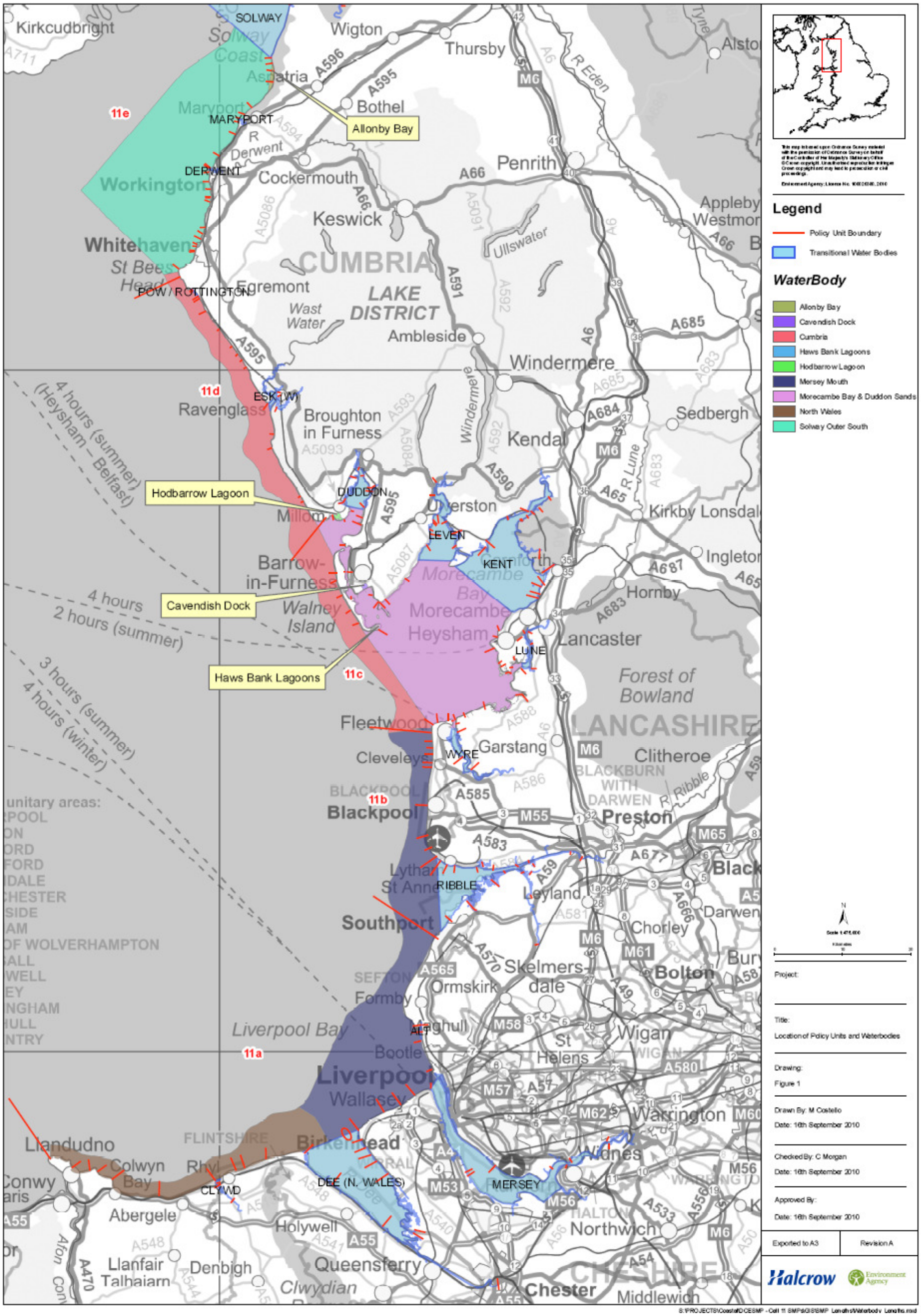
K.2.4 Step 4: Complete WFD summary statement

Table 10 was completed for each policy unit identified as presenting a risk of failing to meet the Water Framework Directive's objectives by undertaking the following steps:

- Assess whether appropriate mitigation measures for potential new modifications have been included in SMP2 policies;
- Provide evidence for justifying the SMP2 policy in terms of Reason of Overriding Public Interest (ROPI);
- Discuss why other SMP2 options which might present an environmentally better option have been ruled out for this stretch of coast;
- Demonstrate that the effect on water bodies outside the SMP2 study area have been considered; and,

Highlight any other overriding issues that should be considered. Where environmental objectives were not met in or within close proximity to a Natura 2000 site, reference was made to the potential impact of the policy, recommended preventative measures and implications of the integrity of the site as recorded in the Appropriate Assessment.

Figure 1 Location of Waterbodies and Policy Units



K.3 Results

K.3.1 Step 1: Scoping the SMP2- Data Collation

Transitional and Coastal Water Bodies

The transitional and coastal water bodies (TraC water bodies) within the North West England and North Wales SMP2 area are shown on **Error! Reference source not found.**. These include five major coastal water bodies – North Wales, Mersey Mouth, Morecambe Bay and Duddon Sands, Cumbria and Solway Outer South. There are also four small coastal water bodies – Cavendish Dock, Hodbarrow Lagoon (both artificial water bodies), Allonby Bay and Haws Bank Lagoons. The transitional water bodies in the SMP2 area are Clwyd, Dee (north Wales), Mersey, Alt, Ribble, Wyre, Lune, Kent, Leven, Duddon, Esk (W), Pow/Rottington, Derwent, Maryport, and Solway.

These waterbodies are shown on Figure 1.

River and lake water bodies

After consulting the Environment Agency's Flood Map, it was concluded that there are a number of river and lake water bodies where there may be potential consequences of SMP2 policies. Such water bodies present in the flood zone are identified in Table 3. The majority of these water bodies are potentially impacted through changes in salinity, inundation, presence of macrophytes through change in longitudinal position, which would also affect fish BQEs. There are a number of water bodies that were ruled out from further assessment for the following reasons:

- The river mouth is protected via flood defences through all three epochs of the SMP2 or there is a backing dune field;
- The water body discharges through a steep sloped channel either man made or a natural geological feature; or,
- No floodplain or potential for rollover of the mouth of the water body.

Table 3 FWBs in the North West England and North Wales that are potentially impacted by SMP2 policies

FWB potentially impacted by SMP2 policies (grouped by river catchment)	Associated issue
L.Clwyd/Waeeler/Glan (GB11006606000, GB110066060010), Greenfield Stream (GB111067056990)	Dee (North Wales) River Catchment – potential for saline inundation, change in longitudinal position result in impact to macrophytes, angiosperms and fish BQEs
Whittle Brook (GB112069060990), (GB112069061400), Rams Brook (GB112069060890)	Mersey River Catchment- Potential for saline inundation of the flood plan and continuation from landfill sites
River Yarrow (GB112070064870), Carr Brook (GB112070064890), Hall Carr Brook (GB112070064900), T Ribble/Savick (GB112071065450, GB112071065720), Poole Stream (GB112071065660)	Ribble Estuary- Potential for saline inundation and salt marsh accretion.
Hillylaid Pool (GB112072066120, GB112072066120)	Wyre Estuary- Potential for saline inundation and salt marsh accretion.

FWB potentially impacted by SMP2 policies (grouped by river catchment)	Associated issue
Bela (GB112073071030), Kent (GB112073071290), Leighton Beck (GB112073071040), Keer (GB112073064490)	Kent Estuary – Potential inundation of the flood plain.
River Eea (GB11207307270), Skelwith Pool (GB112073071260), Carter Pool(GB112073071160)	Duddon Estuary - Potential saline inundation of the flood plain and flooding of the hinterland.
Esk (GB112074069860), Whitrow Beck (GB112074069870), Broadoak Beck, River Mita (GB112074070080)	Ravenglass complex- Potential inundation of the flood plain.
Siddick Ponds (GB31228837)	Derwent Estuary- potential changes in salinity and impacts to macrophytes, macroalgae, and fish BQEs, saline inundation leading to a loss of freshwater habitat.
Mealo Beck, Allonby Beck, Black Dub (GB112075073670)	Allonby Bay – Potential inundation of the hinterland.
Creeks of Moricambe, Pow Drain, Grass Dyke, Powburge Beck, River Esk	Inner Solway Firth –Potential saline inundation, salt marsh accretion.

Groundwater Bodies

The groundwater bodies (GWBs) are presented within Figure 2 for the North West England and North Wales SMP2 area. Sixteen are described as having good chemical quality and four are described as having poor chemical quality. All of the GWBs are listed as at risk or potentially at risk from saline intrusion.

SMP2 policy has the potential to impact three GWBs. Fylde Permo-Triassic Sandstone Aquifers, described as of poor chemical quality and designated 'at risk from saline intrusion'; Dee Carboniferous Limestone, described as of poor chemical quality and 'at risk from saline intrusion'; and, Rufford Permo-Triassic Sandstone Aquifers, described as of poor chemical quality and 'at risk from saline intrusion'.

Boundary Issues

In undertaking a comparison between North West England and North Wales SMP2 area TraC water boundaries and the applicable SMP2 boundaries, the scale of the SMP2 area denotes a broad spectrum of complex boundary issues. The majority of SMP2 boundaries are inconsistent with water body boundaries and as these have been set as a result of coastal processes it is often not appropriate to adjust them. However, there are four locations where the SMP2 boundary could be moved to incorporate the total extent of the water body boundary and these are highlighted in Table 5.

Figure 2 Location map of the Groundwater bodies of the North West England and North Wales SMP2 area

Table 4 Boundary issues between SMP2 boundaries and water body boundary

SMP2 Policy Unit	Water body	Recommended movement of the boundary
11a1.1	Anglesey North/Cowry Bay coastal water body	The SMP2 boundary could be aligned with the Anglesey North Boundary by moving it northward.
11b2.9	Mersey Mouth coastal water body, Cumbria coastal water body and Morecambe Bay and Duddon Sands	The policy unit incorporates three water body boundaries. The SMP2 boundary could be moved to provide consistency. Preferred scenario is HTL for the policy units.
11d3.3	Esk (W) transitional water body (Ravenglass complex)	Align the SMP2 boundary with the mouth of the Ravenglass complex by moving it to the east.
11d7.1	Cumbria coastal water body/ Solway Outer South Coastal water body	The SMP2 boundary of 11d7.1 could be moved northward to encompass the boundary of Cumbria coastal water.

The movement of these boundaries has been considered in this SMP2 process. 11a1.1 was moved to exclude Anglesey North from this assessment. In other boundary issues the coastal processes that were originally used to define the boundaries were considered to be a priority.

International nature conservation sites

The North West England and North Wales SMP2 area includes, and is in the vicinity of, a number of International Sites for nature conservation designated as Special Protection Areas (SPA), Ramsar sites and Special Areas of Conservation (SAC). The International Sites are:

- Liverpool Bay pSPA[2] and pRamsar[3] Site;
- Dee Estuary SPA and Ramsar Site;
- Mersey Narrows and North Wirral Foreshore SPA and Ramsar Site;
- Mersey Estuary SPA and Ramsar Site;
- Martin Mere SPA and Ramsar Site;
- Ribble and Alt Estuaries SPA and Ramsar Site;
- Leighton Moss SPA and Ramsar Site;
- Morecambe Bay SPA and Ramsar Site;
- Duddon Estuary SPA and Ramsar Site;
- Upper Solway Flats and Marshes SPA and Ramsar Site;
- Great Ormes Head SAC;
- Creuddyn Peninsula Woods SAC;
- Menai Strait and Conwy Bay SAC;
- Deeside and Buckley Newt Site SAC;

[2] pSPA are proposed Special Protection Areas.

[3] pRamsar are proposed Ramsar Sites.

- River Dee and Bala Lake SAC;
- Dee Estuary SAC;
- Manchester Mosses SAC;
- Sefton Coast SAC;
- Morecambe Bay Pavements SAC;
- Witherslack Mosses SAC;
- Yewbarrow Woods SAC;
- Roudsea Woods and Mosses SAC;
- Morecambe Bay SAC;
- Drigg Coast SAC;
- Solway Firth SAC;
- South Solway Mosses SAC; and
- River Eden SAC.

In the Water Framework Directive guidance (Environment Agency, 2009d) the following reference is made to the protection of the International Sites for nature conservation:

'Where there are sites protected under other EU legislation (such as the Birds or Habitats Directives, Shellfish Water Directive and others), the Directive aims for compliance with any relevant standards or objectives for these sites.

Therefore, where a site which is water-dependent in some way is protected via designation under another EU Directive, and the GES or GEP targets set under the Directive would be insufficient to meet the objectives of the other relevant environmental Directive, the more stringent targets would apply'

Compliance with the EU legislation has been considered through Appendix J of this SMP2 and recorded through *Other Issues* in Table 9 of this assessment.

K.3.2 Step 2: Define WFD features and issues

BQEs that are affected by hydromorophological and physical features of the TraC water bodies of the North West England and North Wales SMP2 area that in-turn could influence SMP2 policies are listed in **Table 6**. Features and issues are further explored in **Table 7** which also presents water body classifications and relevant WFD environmental objectives. Coastal water bodies' features and issues are consistent along the North West England and North Wales SMP2 area. Transitional water bodies attract a wide range of differing impacts on the BQEs although all the water bodies may potentially experience an impact on macrophytes, which will subsequently impact on fish.

Table 5 Biological Quality Elements within waterbodies that could be affected by changes to hydromorphology as a result of SMP policies (Denoted in the Water Framework Directive: step by step process for assessing Shoreline Management Plan as Assessment Table 1)

Legend: (no entry denotes no known impact)

✔ = Applies to water body
? = Might apply and hence included

Feature	Issue	North Wales	Mersey Mouth	Morecambe Bay & Duddon Sands	Cumbria	Solway Outer South	Cavendish Dock	Haws Bank Lagoon	Hodbarrow Lagoon	Allonby Bay	Clwyd	Dee (N Wales)	Mersey	Alt	Ribble	Wyre	Lune	Kent	Leven	Duddon	Esk (W)	Pow/Rottington	Derwent	Maryport	Solway
Biological Quality Element (BQE)	**Potential for change in hydromorphological or physical parameters**																								
Phytoplankton	Residence time										?	✓													
	Water depth	?	?	?	✓	?		✓	✓			✓	✓				✓	✓	✓						
	Thermal regime																								
	Turbidity											✓								✓					
Macrophytes	Slope	✓	✓	✓	✓	✓				✓		✓			✓		✓	✓	✓	✓			✓	✓	
	Longitudinal position										✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓
	Shoreline complexity or heterogeneity	✓	✓	✓	✓	✓				✓	✓	✓			✓	✓	✓	✓	✓	✓			✓	✓	✓
	Light quality and quantity (for macroalgae and bryophytes)										✓	✓						✓	✓		✓				
	Episodicity of flows and inundation	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Turbidity										✓	✓	✓					✓	✓		✓				
	Baseflow (in chalk streams)											✓								✓					
	Riparian shade and structure										✓						✓								
	Substrate conditions											✓			✓	✓		✓	✓						
Phytobenthos (diatom only)	No hydromorphological elements determined																								
Macroalgae	Episodicity (at low end of velocity spectrum)										✓	✓	✓		✓	✓	✓	✓	✓	✓	✓				
	Salinity						✓	✓	✓																
	Abrasion (associated with Velocity)										✓	✓	✓		✓	✓	✓	✓	✓						
Angiosperms	Inundations (tidal regime)						✓	✓	✓		✓	✓	✓		✓	✓	✓	✓	✓	✓			✓		✓
	Sediment loading										✓	✓	✓		✓										
	Land elevation salinity						✓	✓	✓																
	Abrasion (associated with Velocity)	?									✓	✓	✓		✓	✓	✓	✓	✓						
Benthic/macro invertebrate	Beach water table (TraC)	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓					✓	✓	✓						

	Light										✓																	
	Groundwater connectivity																											
	Availability of leaf litter/organic debris										✓	✓																
	Connectivity with riparian zone																											
Fish	Heterogeneity of habitat (substrate, provision of shelter)										✓	✓					✓											
	Continuity for migration routes										✓	✓																
	Substrate conditions										✓	✓	✓			✓		✓	✓									
	Presence of macrophytes	✓	✓	✓	✓	✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Accessibility to nursery areas (elevation of saltmarshes, connectivity with shoreline/riparian zone										✓	✓	✓		✓	✓	✓	✓	✓	✓								✓

Table 6 Features and issues table for forward looking assessment (Denoted in the Water Framework Directive: step by step process for assessing Shoreline Management Plan as Assessment Table 2)

Feature		Issue	Water body classification and environmental objectives	Opportunity to deliver mitigation measures from the Programme of Measures and/or recommendations on preferred policy
Water body (and designation)	**Biological Quality Element**	**Potential for change in hydro-morphological or physical parameters**		
North Wales **(Heavily Modified Water Body – coastal protection)**	Phytoplankton	Potential changes to phytoplankton as inshore water depths increase. The potential mechanism for this deepening is through the application of control structures (as a result of SMP2 policy) which reduce sediment availability from the backing cliffs. Inshore water levels are thereby potentially, where there is overlying sediment, reduced via erosion in order to move towards re-establish the equilibrium in the coastal system.	**Classification: Good Potential** • **WFD2** *No change that will cause failure to meet surface water Good Ecological Potential or result in a deterioration of surface water Ecological Potential.* • **WFD 3** *No changes which will permanently prevent or compromise the Environmental Objectives being met in water bodies.* **Predicted Ecological Quality by 2015: Good**.	No specific hydromorphological measures for this water body in the Western Wales or Dee RBMPs. Already meets Good potential so general measures from the RBMPs do not apply.
	Macrophytes	There is potential for changes to macrophytes through alteration in the slope of the cliffs and changes in shoreline complexity or heterogeneity through erosion. There is also the potential for increased inundations through sea level rise.		
	Angiosperms	Potential change to Angiosperms through changes in abrasion (associated with velocity) as a result of SMP2 policies. The application of control structures may see a change in hydrodynamics leading to changes in abrasion.		
	Benthic/macro invertebrate	Benthic/macro invertebrate may be impacted through a lowering of the beach water table. Changes in coastal processes (erosion) through the construction of coastal defence may see a reduction in beach levels which would lower the beach water table.		
Mersey Mouth **(Heavily Modified Water Body – coastal protection; navigation)**	Phytoplankton	Potential changes to phytoplankton as inshore water depths increase. The potential mechanism for this deepening is through the application of control structures (as a result of SMP2 policy) which reduce sediment availability from the backing cliffs. Inshore water levels are thereby potentially, where there is overlying sediment, reduced via erosion in order to move towards re-establish the equilibrium in the coastal system.	**Classification: Moderate Potential** • **WFD2** *No change that will cause failure to meet surface water Good Ecological Potential or result in a deterioration of surface water Ecological Potential* • **WFD 3** *No changes which will permanently prevent or compromise the Environmental Objectives being met in water bodies.* **Predicted Ecological Quality by 2015: Moderate**.	No specific hydromorphological measures for this water body in the North West RBMP. General measures from the North West RBMP that could be considered in SMP2 development or in scheme resulting from SMP2 policies: Improve connection to the floodplain; promote the use of soft engineering; reduce impact from hard bank reinforcement; develop local partnerships on a small scale to look at shoreline management issues and share best practice; provide a better habitat for wading birds such as waterfowl; progress work to create new saltmarsh habitat at candidate sites by managed realignment; and, develop guidance on whether
	Macrophytes	There is potential for changes to macrophytes through alteration in the slope of the cliffs and changes in shoreline complexity or heterogeneity through erosion. There is also the potential for increased inundations through sea level rise.		

Feature		Issue	Water body classification and environmental objectives	Opportunity to deliver mitigation measures from the Programme of Measures and/or recommendations on preferred policy
Water body (and designation)	**Biological Quality Element**	**Potential for change in hydro-morphological or physical parameters**		
	Angiosperms	Potential change to Angiosperms through changes in abrasion (associated with velocity) as a result of SMP2 policies. The application of control structures may see a change in hydrodynamics leading to changes in abrasion.		obsolete defence structures are currently being used as a place of shelter by a protected species before removal is considered.
	Benthic/macro invertebrate	Benthic/macro invertebrate may be impacted through a lowering of the beach water table. Changes in coastal processes (erosion) through the construction of coastal defence may see a reduction in beach levels which would lower the beach water table.		
Morecambe Bay & Duddon Sands **(Heavily Modified Water Body – finfishery; shellfishery)**	Phytoplankton	Potential changes to phytoplankton as inshore water depths increase. The potential mechanism for this deepening is through the application of control structures (as a result of SMP2 policy) which reduce sediment availability from the backing cliffs. Inshore water levels are thereby potentially, where there is overlying sediment, reduced via erosion in order to move towards re-establish the equilibrium in the coastal system.	**Classification: Moderate Potential** • **WFD2** *No change 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* • **WFD 3** *No changes which will permanently prevent or compromise the Environmental Objectives being met in water bodies.* **Predicted Ecological Quality by 2015: Moderate.**	No specific hydromorphological measures for this water body in the North West RBMP. General measures from the North West RBMP that could be considered in SMP2 development or in scheme resulting from SMP2 policies: Improve connection to the floodplain; promote the use of soft engineering; reduce impact from hard bank reinforcement; develop local partnerships on a small scale to look at shoreline management issues and share best practice; provide a better habitat for wading birds such as waterfowl; progress work to create new saltmarsh habitat at candidate sites by managed realignment; and, develop guidance on whether obsolete defence structures are currently being used as a place of shelter by a protected species before removal is considered.
	Macrophytes	There is potential for changes to macrophytes through alteration in the slope of the cliffs and changes in shoreline complexity or heterogeneity through erosion. There is also the potential for increased inundations through sea level rise.		
	Angiosperms	Potential change to Angiosperms through change in abrasion (associated with velocity) as a result of SMP2 policies. The application of control structures may see a change in hydrodynamics leading to changes in abrasion.		
	Benthic/macro invertebrate	Benthic/macro invertebrate may be impacted through a lowering of the beach water table. Changes in coastal processes (erosion) through the construction of coastal defence may see a reduction in beach levels which would lower the beach water table.		

Feature		Issue	Water body classification and environmental objectives	Opportunity to deliver mitigation measures from the Programme of Measures and/or recommendations on preferred policy
Water body (and designation)	**Biological Quality Element**	**Potential for change in hydro-morphological or physical parameters**		
Cumbria **(Not designated)**	Phytoplankton	Potential changes to phytoplankton as inshore water depths increase. The potential mechanism for this deepening is through the application of control structures (as a result of SMP2 policy) which reduce sediment availability from the backing cliffs. Inshore water levels are thereby potentially, where there is overlying sediment, reduced via erosion in order to move towards re-establish the equilibrium in the coastal system.	**Classification: Moderate Status** • **WFD2** *No change that will cause failure to meet surface water Good Ecological Status or result in a deterioration of surface water Ecological Status* • **WFD 3** *No changes which will permanently prevent or compromise the Environmental Objectives being met in water bodies.* **Predicted Ecological Quality by 2015: Moderate.**	No specific hydromorphological measures for this water body in the North West RBMP. General measures from the North West RBMP that could be considered in SMP2 development or in scheme resulting from SMP2 policies: Improve connection to the floodplain; promote the use of soft engineering; reduce impact from hard bank reinforcement; develop local partnerships on a small scale to look at shoreline management issues and share best practice; provide a better habitat for wading birds such as waterfowl; progress work to create new saltmarsh habitat at candidate sites by managed realignment; and, develop guidance on whether obsolete defence structures are currently being used as a place of shelter by a protected species before removal is considered.
	Macrophytes	There is potential for changes to macrophytes through alteration in the slope of the cliffs and changes in shoreline complexity or heterogeneity through erosion. There is also the potential for increased inundations through sea level rise.		
	Angiosperms	Potential changes to Angiosperms through change in abrasion (associated with velocity) as a result of SMP2 policies. The application of control structures may see a change in hydrodynamics leading to changes in abrasion.		
	Benthic/macro invertebrate	Benthic/macro invertebrate may be impacted through a lowering of the beach water table. Changes in coastal processes (erosion) through the removal or construction of coastal defence may see a reduction in beach levels which would		
Solway Outer South **(Not designated)**	Phytoplankton	Potential changes to phytoplankton as inshore water depths increase. The potential mechanism for this deepening is through the application of control structures (as a result of SMP2 policy) which reduce sediment availability from the backing cliffs. Inshore water levels are thereby potentially, where there is overlying sediment, reduced via erosion in order to move towards re-establish the equilibrium in the coastal system.	**Classification: Moderate Status** • **WFD2** *No change that will cause failure to meet surface water Good Ecological Potential or result in a deterioration of surface water Ecological Potential.* • **WFD 3** *No changes which will permanently prevent or compromise the Environmental Objectives being met in water bodies.* **Predicted Ecological Quality by 2015: Moderate.**	No specific hydromorphological measures for this water body in the North West RBMP. General measures from the North West RBMP that could be considered in SMP2 development or in scheme resulting from SMP2 policies: Improve connection to the floodplain; promote the use of soft engineering; reduce impact from hard bank reinforcement; develop local partnerships on a small scale to look at shoreline management issues and share best practice; provide a better habitat for wading birds such as waterfowl; progress work to create new saltmarsh habitat at candidate sites by managed realignment; and, develop guidance on whether obsolete defence structures are currently being used as a place of shelter by a protected species before removal is considered.
	Macrophytes	There is potential for changes to macrophytes through alteration in the slope of the cliffs and changes in shoreline complexity or heterogeneity through erosion. There is also the potential for increased inundations through sea level rise.		
	Angiosperms	Potential changes to Angiosperms through change in abrasion (associated with velocity) as a result of SMP2 policies. The application of control structures may see a change in hydrodynamics leading to changes in abrasion.		
	Benthic/macro invertebrate	Benthic/macro invertebrate may be impacted through a lowering of the beach water table. Changes in coastal processes (erosion) through the construction of coastal defence may see a reduction in beach levels which would lower the beach water table.		

Feature		Issue	Water body classification and environmental objectives	Opportunity to deliver mitigation measures from the Programme of Measures and/or recommendations on preferred policy
Water body (and designation)	**Biological Quality Element**	**Potential for change in hydro-morphological or physical parameters**		
Allonby Bay **(Heavily Modified Water Body – coastal protection)**	Phytoplankton	Macrophytes are potentially impacted by changes in shoreline complexity or heterogeneity (through the SMP2 Policies) and episodicity of flows and inundation.	**Classification: Moderate Potential** • **WFD2** *No change that will cause failure to meet surface water Good Ecological Potential or result in a deterioration of surface water Ecological Potential.* • **WFD 3** *No changes which will permanently prevent or compromise the Environmental Objectives being met in water bodies.* **Predicted Ecological Quality by 2015: Moderate.**	No specific hydromorphological measures for this water body in the North West RBMP. General measures from the North West RBMP that could be considered in SMP2 development or in scheme resulting from SMP2 policies: Improve connection to the floodplain; promote the use of soft engineering; reduce impact from hard bank reinforcement; develop local partnerships on a small scale to look at shoreline management issues and share best practice; provide a better habitat for wading birds such as waterfowl; progress work to create new saltmarsh habitat at candidate sites by managed realignment; and, develop guidance on whether obsolete defence structures are currently being used as a place of shelter by a protected species before removal is considered.
	Macrophytes	Increases in inundations (tidal regime) may impact on the colonisation potential of angiosperms.		
	Angiosperms	Increased may lower the beach water table reducing opportunities for benthic/macro invertebrates.		
	Benthic/macro invertebrate	Fish have the potential to be impacted by SMP2 polices through the reduced presence of macrophytes by the use of control structures or increased natural processes.		
Cavendish Dock **(Artificial Water Body)**	Phytoplankton	Potential changes to phytoplankton as a result of increase in salinity of saline lagoon habitat due to increased seawater inundation.	**Classification: Good Potential** • **WFD2** *No change that will cause failure to meet surface water Good Ecological Potential or result in a deterioration of surface water Ecological Potential.* • **WFD 3** *No changes which will permanently prevent or compromise the Environmental Objectives being met in water bodies.* **Predicted Ecological Quality by 2015: Good.**	No specific hydromorphological measures for this water body in the North West RBMP. As an Artificial Water Body, general measures from the North West RBMP are not applicable.
	Macrophytes	Potential changes to macrophytes as a result of increased water depth and increase in salinity of saline lagoon habitat due to increased seawater inundation.		
	Angiosperms	Potential changes to angiosperms as a result of increased water depth and increase in salinity of saline lagoon habitat due to increased seawater inundation.		
	Benthic/macro invertebrate	Potential changes to invertebrates as a result of increase in salinity of saline lagoon habitat due to increased seawater inundation.		
Hodbarrow Lagoon **(Artificial Water Body)**	Phytoplankton	Potential changes to phytoplankton as a result of increase in salinity of saline lagoon habitat due to increased seawater inundation.	**Classification: Good Potential** • **WFD2** *No change that will cause failure to meet surface water Good Ecological Potential or result in a deterioration of surface water Ecological Potential.* • **WFD 3** *No changes which will permanently prevent or compromise the Environmental Objectives being met in water bodies.* **Predicted Ecological Quality by 2015: Good.**	No specific hydromorphological measures for this water body in the North West RBMP. As an Artificial Water Body, general measures from the North West RBMP are not applicable.
	Macrophytes	Potential changes to macrophytes as a result of increased water depth and increase in salinity of saline lagoon habitat due to increased seawater inundation.		
	Angiosperms	Potential changes to angiosperms as a result of increased water depth and increase in salinity of saline lagoon habitat due to increased seawater inundation.		
	Benthic/macro invertebrate	Potential changes to invertebrates as a result of increase in salinity of saline lagoon habitat due to increased seawater inundation.		

Feature		Issue	Water body classification and environmental objectives	Opportunity to deliver mitigation measures from the Programme of Measures and/or recommendations on preferred policy
Water body (and designation)	**Biological Quality Element**	**Potential for change in hydro-morphological or physical parameters**		
Haws Bank Lagoons **(Not designated)**	Phytoplankton	Potential changes to phytoplankton as a result of increase in salinity of saline lagoon habitat due to increased seawater inundation.	**Classification: Good Status** • **WFD2** *No change that will cause failure to meet surface water Good Ecological Potential or result in a deterioration of surface water Ecological Potential.* • **WFD 3** *No changes which will permanently prevent or compromise the Environmental Objectives being met in water bodies.* **Predicted Ecological Quality by 2015: Good.**	No specific hydromorphological measures for this water body in the North West RBMP. Already meets Good status so general measures from the North West RBMP do not apply.
	Macrophytes	Potential changes to macrophytes as a result of increased water depth and increase in salinity of saline lagoon habitat due to increased seawater inundation.		
	Angiosperms	Potential changes to angiosperms as a result of increased water depth and increase in salinity of saline lagoon habitat due to increased seawater inundation.		
	Benthic/macro invertebrate	Potential changes to invertebrates as a result of increase in salinity of saline lagoon habitat due to increased seawater inundation.		
Clywd **(Heavily Modified Water Body – coastal protection)**	Phytoplankton	Potential change to Phytoplankton with an increase in residence time of the estuary. Without dredging the estuary mouth has the potential to silt-up increasing the residence time of the water body.	**Classification: Moderate Potential** • **WFD2** *No change that will cause failure to meet surface water Good Ecological Potential or result in a deterioration of surface water Ecological Potential* • **WFD 3** *No changes which will permanently prevent or compromise the Environmental Objectives being met in water bodies.* **Predicted Ecological Quality by 2015: Moderate.**	Specific hydromorphological measures for this water body in the Western Wales RBMP that could be considered in SMP2 development or in scheme resulting from SMP2 policies: Retain marginal aquatic and riparian habitats (channel alteration); Preserve and where possible enhance ecological value of marginal aquatic habitat, banks and riparian zone; Managed realignment of flood defence; Increase in-channel morphological diversity; Removal of hard bank reinforcement / revetment, or replacement with soft engineering solution
	Macrophytes	Erosion at the mouth of the estuary has the potential to change its longitudinal position and shoreline complexity or heterogeneity which may affect macrophytes. Erosion and inundation, which could further influence light quality/quantity (for macroalgai and bryophytes) and turbidity, may affect macrophytes. These processes have the potential to impact riparian shade in the inner estuary which may also affect macrophytes.		
	Macroalgae	The cyclical pattern of closure and re-opening the estuary mouth will affect episodicity (at low end of velocity spectrum) which may affect macroalgae. In addition, there are increased flow rates associated with the re-opening of the estuary mouth that will increase abrasion and may affect macroalgae formation.		
	Angiosperms	Angiosperms may be impacted by increased inundation and abrasion (associated with velocity). Increased turbidity may also lead to an increased sediment load which may impact Angiosperms.		
	Benthic/macro invertebrate	Increases in turbidity will affect light penetration and may impact benthic/macro invertebrate. Increased inundations may see a reduction in availability of leaf litter and/or organic debris which may also impact benthic/macro invertebrate.		

Feature		Issue	Water body classification and environmental objectives	Opportunity to deliver mitigation measures from the Programme of Measures and/or recommendations on preferred policy
Water body (and designation)	**Biological Quality Element**	**Potential for change in hydro-morphological or physical parameters**		
	Fish	In the mechanisms discussed above fish may be impacted by the reduction in the heterogeneity of habitats (through increased inundations), continuity of migration routes (closure of the estuary mouth), substrate conditions (erosion and inundation) and reduced presence of macrophyes. The spatial extent of nursery areas in the estuary may be reduced through saltmarsh elevation.		
Dee (N Wales) **(Heavily Modified Water Body – navigation; shellfishery)**	Phytoplankton	Potential change to phytoplankton may occur through an increase in residence time via an increase in tidal prism, an increase in water depth, through salt marsh accretion in response to sea level rise and an increase in turbidity through erosion.	**Classification: Moderate Potential** • **WFD2** *No change that will cause failure to meet surface water Good Ecological Potential or result in a deterioration of surface water Ecological Potential* • **WFD 3** *No changes which will permanently prevent or compromise the Environmental Objectives being met in water bodies.* **Predicted Ecological Quality by 2015: Moderate**.	No specific hydromorphological measures for this water body in the Dee RBMP. General measures from the Dee RBMP that could be considered in SMP2 development or in scheme resulting from SMP2 policies: Habitat management work to improve eel habitat; promote the use of soft engineering; reduce impact from hard bank reinforcement; progress work to create new saltmarsh habitat at candidate sites by managed realignment; and, develop guidance on whether obsolete defence structures are currently being used as a place of shelter by a protected species before removal is considered
	Macrophytes	Potential changes to macrophytes through erosion affecting the slope of the cliff and the longitudinal position of the estuary mouth. Macrophytes may also be impacted by SMP2 policies that may change shoreline complexity or heterogeneity. Control structures developed as a result of SMP2 2 policies can alter erosion rates which influence turbidity, light quality and quantity which may impact on macrophytes. Further affects on macrophytes may be seen through changes in baseflow (in chalk streams), in tributaries on the west bank of the Dee and changes in substrate conditions through inundations.		
	Macroalgae	Potential change to macroalgae through changes in abrasion (associated with velocity) and episodicity as a result of SMP2 policies. The application of control structures may see a change in hydrodynamics leading to changes in abrasion and episodicity.		
	Angiosperms	There is the potential for change in the tidal inundations, sediment loading (through change in turbidity), land elevation and abrasion which may affect angiosperms. SMP2 policies that recommend the use of control structures may affect the dune evolution of dune fields in the outer and middle estuary reducing opportunities for angiosperm establishment.		
	Benthic/macro invertebrate	Benthic/macro invertebrate may be impacted through a lowering of the beach water table. Changes in coastal processes (erosion) through the construction of control structures may see a reduction in beach levels which would lower the beach water table. Changes in erosion and inundations may affect light and availability of leaf litter/organic debris which influences invertebrate populations.		

Feature		Issue	Water body classification and environmental objectives	Opportunity to deliver mitigation measures from the Programme of Measures and/or recommendations on preferred policy
Water body (and designation)	**Biological Quality Element**	**Potential for change in hydro-morphological or physical parameters**		
	Fish	Fish have the potential to be impacted by SMP2 polices through the altering the heterogeneity of habitats, substrate conditions, presence of macrophytes and the accessibility of nursery areas. Changes in hydrodynamics, instigated by the use of control structure or increased natural processes has the potential to influence these parameters		
Mersey **(Heavily Modified Water Body – finfishery; shellfishery; navigation)**	Phytoplankton	Potential change to phytoplankton through increases in water depth via increases in sea levels and vertical accretion of salt marshes	**Classification: Moderate Potential** • **WFD2** *No change that will cause failure to meet surface water Good Ecological Potential or result in a deterioration of surface water Ecological Potential* • **WFD 3** N*o changes which will permanently prevent or compromise the Environmental Objectives being met in water bodies.* **Predicted Ecological Quality by 2015: Moderate**.	No specific hydromorphological measures for this water body in the North West RBMP. General measures from the North West RBMP that could be considered in SMP2 development or in scheme resulting from SMP2 policies: Improve connection to the floodplain; promote the use of soft engineering; reduce impact from hard bank reinforcement; develop local partnerships on a small scale to look at shoreline management issues and share best practice; provide a better habitat for wading birds such as waterfowl; progress work to create new saltmarsh habitat at candidate sites by managed realignment; and, develop guidance on whether obsolete defence structures are currently being used as a place of shelter by a protected species before removal is considered
	Macrophytes	Erosion at the mouth of the estuary has the potential to change its longitudinal position, through a process of stratigraphic rollover. Erosion may also affect turbidity which may impact macrophytes. Inundations are predicted to increase in frequency which may also affect macrophytes.		
	Macroalgae	Potential change to macroalgae through changes in abrasion (associated with velocity) and episodicity as a result of SMP2 policies. The application of control structures may see a change in hydrodynamics leading to changes in abrasion and episodicity.		
	Angiosperms	There is the potential for change in the tidal inundations, sediment loading (through change in turbidity) and abrasion which may affect angiosperms.		
	Benthic/macro invertebrate	Increased erosion at the estuary mouth may lower the beach water table reducing opportunities for benthic/macro invertebrates.		
	Fish	Fish have the potential to be impacted by SMP2 polices through the altering of the heterogeneity of habitats and the presence of macrophytes . Changes in wave and tidal dynamic, instigated by the use of control structure or increased natural processes has the potential to influence these parameters		
Alt **(Heavily Modified Water Body – flood protection)**	Macrophytes	Potential impacts on macrophytes through changes in longtitudal position of the estuary mouth and increased inundations. SMP2 polices may alter these impacts.	**Classification: Moderate Potential** • **WFD2** *No change that will cause failure to meet surface water Good Ecological Potential or result in a deterioration of surface water Ecological Potential* • **WFD 3** *No changes which will permanently prevent or compromise the Environmental Objectives being met in water bodies.* **Predicted Ecological Quality by 2015: Moderate**.	Specific hydromorphological measures for this water body in the North West RBMP that could be considered in SMP2 development or in scheme resulting from SMP2 policies: Indirect / offsite mitigation (offsetting measures); Operational and structural changes to locks, sluices, weirs, beach control etc.; Preserve and where possible enhance ecological value of marginal aquatic habitat, banks and riparian zone; Structures or other mechanisms in place and managed to enable fish to access waters upstream and downstream of the impounding works; Removal of hard bank reinforcement / revetment, or replacement
	Benthic/macro invertebrate	Increased erosion at the estuary mouth may lower the beach water table reducing opportunities for benthic/macro invertebrates.		
	Fish	Potential impacts on fish through reduction in macrophytes populations.		

Feature		Issue	Water body classification and environmental objectives	Opportunity to deliver mitigation measures from the Programme of Measures and/or recommendations on preferred policy
Water body (and designation)	**Biological Quality Element**	**Potential for change in hydro-morphological or physical parameters**		
				with soft engineering solution
Ribble **(Heavily Modified Water Body – flood protection; shellfishery)**	Macrophytes	Macrophytes are potentially impacted by changes in slope, longitudinal position of the estuary, shoreline complexity (through the SMP2 Policies), episodicity of flows and inundation and substrate condition.	**Classification: Moderate Potential** • **WFD2** *No change that will cause failure to meet surface water Good Ecological Potential or result in a deterioration of surface water Ecological Potential* • **WFD 3** *No changes which will permanently prevent or compromise the Environmental Objectives being met in water bodies.* **Predicted Ecological Quality by 2015 Moderate**.	Specific hydromorphological measures for this water body in the North West RBMP that could be considered in SMP2 development or in scheme resulting from SMP2 policies: Preserve and where possible enhance ecological value of marginal aquatic habitat, banks and riparian zone; Managed realignment of flood defence; Retain marginal aquatic and riparian habitats (channel alteration); Bank rehabilitation / reprofiling; Removal of hard bank reinforcement / revetment, or replacement with soft engineering solution
	Macroalgae	Potential changes to macroalgae through changes in abrasion (associated with velocity) and episodicity as a result of SMP2 policies. The application of control structures may see a change in hydrodynamics leading to changes in abrasion and episodicity.		
	Angiosperms	There is the potential for change in the tidal inundations, sediment loading (through change in turbidity) and abrasion which may affect angiosperms.		
	Benthic/macro invertebrate	Increased erosion at the estuary mouth may lower the beach water table reducing opportunities for benthic/macro invertebrates.		
	Fish	Fish are potential impacted through SMP2 policies and natural processes impacting macrophytes and the vertical accretion of salt marshes reducing access to nursery areas.		
Wyre **(Heavily Modified Water Body – coastal protection)**	Macrophytes	Macrophytes may be impacted by erosion at the mouth of the estuary and changes its longitudinal position, through a process of stratigraphic rollover, changes in shoreline complexity or heterogeneity and substrate conditions through the SMP2 policies and increased inundations via sea level rise.	**Classification: Moderate Potential** • **WFD2** *No change that will cause failure to meet surface water Good Ecological Potential or result in a deterioration of surface water Ecological Potential* • **WFD 3** *No changes which will permanently prevent or compromise the Environmental Objectives being met in water bodies.* **Predicted Ecological Quality by 2015: Moderate**.	Specific hydromorphological measures for this water body in the North West RBMP that could be considered in SMP2 development or in scheme resulting from SMP2 policies: Preserve and where possible enhance ecological value of marginal aquatic habitat, banks and riparian zone; Managed realignment of flood defence; Removal of hard bank reinforcement / revetment, or replacement with soft engineering solution
	Macroalgae	Potential changes to macroalgae through change in abrasion (associated with velocity) and episodicity as a result of SMP2 policies. The application of control structures may see a change in hydrodynamics leading to changes in abrasion and episodicity.		
	Angiosperms	Potential changes to Angiosperms through increased inundations (tidal regime). If the defence were allowed to fail, there would be an increase in the estuary's tidal prism. This may increase flows and water levels thereby resulting in changes in abrasion (associated with velocity). As a result of SMP2 policies the application of control structures may also see a change in hydrodynamics leading to changes in abrasion. These mechanisms may reduce opportunities for angiosperm establishment.		

Feature		Issue	Water body classification and environmental objectives	Opportunity to deliver mitigation measures from the Programme of Measures and/or recommendations on preferred policy
Water body (and designation)	**Biological Quality Element**	**Potential for change in hydro-morphological or physical parameters**		
	Benthic/macro invertebrate	Increased erosion at the estuary mouth may lower the beach water table reducing opportunities for benthic/macro invertebrates.		
	Fish	Fish are potentially impacted through SMP2 policies and natural processes impacting macrophytes and the vertical accretion of salt marshes reducing access to nursery areas.		
Lune **(Not designated)**	Phytoplankton	Potential changes to phytoplankton through increases in water depth via sea level rise and vertical accretion of the salt marshes.	**Classification: Moderate Status** • **WFD2** *No change that will cause failure to meet surface water Good Ecological Status or result in a deterioration of surface water Ecological Status* • **WFD 3** *No changes which will permanently prevent or compromise the Environmental Objectives being met in water bodies.* **Predicted Ecological Quality by 2015: Moderate**.	No specific hydromorphological measures for this water body in the North West RBMP. General measures from the North West RBMP that could be considered in SMP2 development or in scheme resulting from SMP2 policies: Improve connection to the floodplain; research into the history and use of modified water bodies including cultural heritage; promote the use of soft engineering; reduce impact from hard bank reinforcement; develop local partnerships on a small scale to look at shoreline management issues and share best practice; provide a better habitat for wading birds such as waterfowl; progress work to create new saltmarsh habitat at candidate sites by managed realignment; and, develop guidance on whether obsolete defence structures are currently being used as a place of shelter by a protected species before removal is considered
	Macrophytes	Macrophytes are potentially impacted by changes in slope, longitudinal position of the estuary, shoreline complexity or heterogeneity (through the SMP2 Policies), episodicity of flows and inundation, base flows (in Chalk Streams) and changes in riparain shade and structure.		
	Macroalgae	Potential changes to macroalgae through change in abrasion (associated with velocity) and episodicity as a result of SMP2 policies. The application of control structures may see a change in hydrodynamics leading to changes in abrasion and episodicity.		
	Angiosperms	Potential changes to Angiosperms through increased inundations (tidal regime). If the defence were allowed to fail, there would be an increase in the estuary's tidal prism. This may increase flows and water levels thereby resulting in changes in abrasion (associated with velocity). As a result of SMP2 policies the application of control structures may also see a change in hydrodynamics leading to changes in abrasion. These mechanisms may reduce opportunities for angiosperm establishment.		
	Benthic/macro invertebrate	Increased erosion at the estuary mouth may lower the beach water table which reducing opportunities for benthic/macro invertebrates.		

Feature		Issue	Water body classification and environmental objectives	Opportunity to deliver mitigation measures from the Programme of Measures and/or recommendations on preferred policy
Water body (and designation)	**Biological Quality Element**	**Potential for change in hydro-morphological or physical parameters**		
	Fish	Fish are potentially impacted through SMP2 policies and natural processes impacting macrophytes, heterogeneity of habitat on the shoreline, changing substrate conditions and the vertical accretion of salt marshes reducing access to nursery areas.		
Kent **(Heavily Modified Water Body - shellfishery)**	Phytoplankton	Potential change to phytoplankton through increases in water depth via increases in sea levels and vertical accretion of the salt marshes	**Classification: Moderate Potential** • **WFD2** *No change that will cause failure to meet surface water Good Ecological Potential or result in a deterioration of surface water Ecological Potential* • **WFD 3** *No changes which will permanently prevent or compromise the Environmental Objectives being met in water bodies.* **Predicted Ecological Quality by 2015: Moderate .**	No specific hydromorphological measures for this water body in the North West RBMP. General measures from the North West RBMP that could be considered in SMP2 development or in scheme resulting from SMP2 policies: Improve connection to the floodplain; research into the history and use of modified water bodies including cultural heritage; promote the use of soft engineering; reduce impact from hard bank reinforcement; develop local partnerships on a small scale to look at shoreline management issues and share best practice; provide a better habitat for wading birds such as waterfowl; progress work to create new saltmarsh habitat at candidate sites by managed realignment; and, develop guidance on whether obsolete defence structures are currently being used as a place of shelter by a protected species before removal is considered
	Macrophytes	Macrophytes are potentially impacted by: changes in slope; longitudinal position of the estuary; shoreline complexity or heterogeneity (through the SMP2 Policies); turbidity which also affects light quality and quantity; episodicity of flows and inundation, base flows (in Chalk Streams); and, substrate conditions.		
	Macroalgae	Potential changes to macroalgae through change in abrasion (associated with velocity) and episodicity as a result of SMP2 policies. The application of control structures may see a change in hydrodynamics leading to changes in abrasion and episodicity.		
	Angiosperms	Potential changes to Angiosperms through increased inundations (tidal regime). If the defence were allowed to fail, there would be an increase in the estuary's tidal prism. This may increase flows and water levels thereby resulting in changes in abrasion (associated with velocity). As a result of SMP2 policies the application of control structures may also see a change in hydrodynamics leading to changes in abrasion. These mechanisms may reduce opportunities for angiosperm establishment.		
	Benthic/macro invertebrate	Increased erosion at the estuary mouth may lower the beach water table reducing opportunities for benthic/macro invertebrates.		
	Fish	Fish have the potential to be impacted by SMP2 polices through the altering the heterogeneity of habitats, substrate conditions, presence of macrophytes and the accessibility of nursery areas.		
Leven **(Not designated)**	Phytoplankton	Potential changes to phytoplankton through increases in water depth via increases in sea levels and vertical accretion of the salt marshes	**Classification: Poor Status** • **WFD2** *No change that will cause failure to meet surface water Good Ecological Potential or result in a deterioration of surface water Ecological Potential* • **WFD 3** *No changes which will permanently prevent or compromise the Environmental Objectives being met in water bodies.* **Predicted Ecological Quality by 2015: Poor.**	No specific hydromorphological measures for this water body in the North West RBMP. General measures that could be considered in SMP2 development or in scheme resulting from SMP2 policies: Improve connection to the floodplain; promote the use of soft engineering; reduce impact from hard bank reinforcement; develop local partnerships on a small scale to look at shoreline management issues and share best practice; provide a
	Macrophytes	Macrophytes are potentially impacted by changes in slope, longitudinal position of the estuary, shoreline complexity or heterogeneity (through the SMP2 Policies), turbidity which also affects light quality and quantity, episodicity of flows and inundation, base flows (in Chalk Streams) and substrate conditions.		

Feature		Issue	Water body classification and environmental objectives	Opportunity to deliver mitigation measures from the Programme of Measures and/or recommendations on preferred policy
Water body (and designation)	**Biological Quality Element**	**Potential for change in hydro-morphological or physical parameters**		
	Macroalgae	Potential changes to macroalgae through change in abrasion (associated with velocity) and episodicity as a result of SMP2 policies. The application of control structures may see a change in hydrodynamics leading to changes in abrasion and episodicity.		better habitat for wading birds such as waterfowl; progress work to create new saltmarsh habitat at candidate sites by managed realignment; and, develop guidance on whether obsolete defence structures are currently being used as a place of shelter by a protected species before removal is considered
	Angiosperms	Potential changes to Angiosperms through increased inundations (tidal regime). If the defence were allowed to fail, there would be an increase in the estuary's tidal prism. This may increase flows and water levels thereby resulting in changes in abrasion (associated with velocity). As a result of SMP2 policies the application of control structures may also see a change in hydrodynamics leading to changes in abrasion. These mechanisms may reduce opportunities for angiosperm establishment.		
	Benthic/macro invertebrate	Increased erosion at the estuary mouth may lower the beach water table reducing opportunities for benthic/macro invertebrates.		
	Fish	Fish have the potential to be impacted by SMP2 polices through the reduced presence of macrophytes.		
Duddon **(Not designated)**	Phytoplankton	Phytoplankton may be impacted through changes in turbidity. An increase in erosion of the sand flats will increase turbidity levels	**Classification: Modetate Status** • **WFD1** *No Change affecting high status sites.* • **WFD2** *No change that will cause failure to meet surface water Good Ecological Status or result in a deterioration of surface water Ecological Status* • **WFD 3** *No changes which will permanently prevent or compromise the Environmental Objectives being met in water bodies.* **Predicted Ecological Quality by 2015: Moderate**.	No specific hydromorphological measures for this water body in the North West RBMP. General measures from the North West RBMP that could be considered in SMP2 development or in scheme resulting from SMP2 policies: Improve connection to the floodplain; promote the use of soft engineering; reduce impact from hard bank reinforcement; develop local partnerships on a small scale to look at shoreline management issues and share best practice; provide a better habitat for wading birds such as waterfowl; progress work to create new saltmarsh habitat at candidate sites by managed realignment; and, develop guidance on whether obsolete defence structures are currently being used as a place of shelter by a protected species before removal is considered
	Macrophytes	Macrophytes are potentially impacted by changes in slope, longitudinal position of the estuary, shoreline complexity or heterogeneity and increases in episodicity of flows and inundation,		
	Macroalgae	Potential changes to macroalgae through changes in episodicity as a result of SMP2 policies. The application of control structures may see a change in hydrodynamics leading to changes in abrasion and episodicity.		
	Angiosperms	Increases in inundations (tidal regime) may impact on the colonisation potential of angiosperms		
	Benthic/macro invertebrate	Increased erosion at the estuary mouth may lower the beach water table reducing opportunities for benthic/macro invertebrates.		
	Fish	Fish have the potential to be impacted by SMP2 polices through the reduced presence of macrophytes.		
Esk (W) **(Not designated)**	Macrophytes	Macrophytes are potentially impacted by changes in longitudinal position of the estuary, episodicity of flows and inundation. Erosion may cause increased turbidity and a reduction in light quality and quantity through sediment being transport up the estuary.	**Classification: Moderate Status** • **WFD2** *No change that will cause failure to meet surface water Good Ecological Status or result in a deterioration of surface water Ecological Status*	No specific hydromorphological measures for this water body in the North West RBMP. General measures that could be considered in SMP2 development or in scheme resulting from SMP2

Feature		Issue	Water body classification and environmental objectives	Opportunity to deliver mitigation measures from the Programme of Measures and/or recommendations on preferred policy
Water body (and designation)	**Biological Quality Element**	**Potential for change in hydro-morphological or physical parameters**		
	Macroalgae	Potential changes to macroalgae through changes in episodicity as a result of SMP2 policies. The application of control structures may see a change in hydrodynamics leading to changes in episodicity.	• **WFD 3** *No changes which will permanently prevent or compromise the Environmental Objectives being met in water bodies.* **Predicted Ecological Quality by 2015: Moderate**.	policies: Improve connection to the floodplain; promote the use of soft engineering; reduce impact from hard bank reinforcement; develop local partnerships on a small scale to look at shoreline management issues and share best practice; provide a better habitat for wading birds such as waterfowl; progress work to create new saltmarsh habitat at candidate sites by managed realignment; and, develop guidance on whether obsolete defence structures are currently being used as a place of shelter by a protected species before removal is considered
	Benthic/macro invertebrate	Increased erosion at the estuary mouth may lower the beach water table reducing opportunities for benthic/macro invertebrates.		
	Fish	Fish have the potential to be impacted by SMP2 polices through the reduced presence of macrophytes.		
Pow/Rottington **(Heavily Modified Water Body – coastal protection)**	Macrophytes	Macrophytes are potentially impacted by changes episodicity of flows and inundation via sea level rise.	**Classification: Moderate Potential** • **WFD2** *No change that will cause failure to meet surface water Good Ecological Potential or result in a deterioration of surface water Ecological Potential* • **WFD 3** *No changes which will permanently prevent or compromise the Environmental Objectives being met in water bodies.* **Predicted Ecological Quality by 2015: Moderate.**	No specific hydromorphological measures for this water body in the North West RBMP. General measures from the North West RBMP that could be considered in SMP2 development or in scheme resulting from SMP2 policies: Improve connection to the floodplain; promote the use of soft engineering; reduce impact from hard bank reinforcement; develop local partnerships on a small scale to look at shoreline management issues and share best practice; provide a better habitat for wading birds such as waterfowl; progress work to create new saltmarsh habitat at candidate sites by managed realignment; and, develop guidance on whether obsolete defence structures are currently being used as a place of shelter by a protected species before removal is considered
	Fish	Fish have the potential to be impacted by SMP2 polices through the reduced presence of macrophytes.		
Derwent **(Heavily Modified Water Body – coastal protection; navigation)**	Macrophytes	Macrophytes are potentially impacted by changes in slope, longitudinal position of the estuary, shoreline complexity or heterogeneity (through the SMP2 Policies) and episodicity of flows and inundation.	**Classification: Good Potential** • **WFD2** *No change that will cause failure to meet surface water Good Ecological Potential or result in a deterioration of surface water Ecological Potential* • **WFD 3** *No changes which will permanently prevent or compromise the Environmental Objectives being met in water bodies.* **Predicted Ecological Quality by 2015: Good .**	No specific hydromorphological measures for this water body in the North West RBMP. Already meets Good potential so general measures from the North West RBMP do not apply.
	Angiosperms	Increases in inundations (tidal regime) may impact on the colonisation potential of angiosperms		
	Benthic/macro invertebrate	Increased erosion at the estuary mouth may lower the beach water table reducing opportunities for benthic/macro invertebrates.		
	Fish	Fish have the potential to be impacted by SMP2 polices through the reduced presence of macrophytes.		

Feature		Issue	Water body classification and environmental objectives	Opportunity to deliver mitigation measures from the Programme of Measures and/or recommendations on preferred policy
Water body (and designation)	**Biological Quality Element**	**Potential for change in hydro-morphological or physical parameters**		
Maryport **(Heavily Modified Water Body – coastal protection)**	Macrophytes	Macrophytes are potentially impacted by changes in slope, longitudinal position of the estuary, shoreline complexity or heterogeneity (through the SMP2 Policies) and episodicity of flows and inundation.	**Classification: Moderate Potential** • **WFD2** *No change that will cause failure to meet surface water Good Ecological Potential or result in a deterioration of surface water Ecological Potential* • **WFD 3** *No changes which will permanently prevent or compromise the Environmental Objectives being met in water bodies.* **Predicted Ecological Quality by 2015: Moderate.**	Specific hydromorphological measures for this water body in the North West RBMP that could be considered in SMP2 development or in scheme resulting from SMP2 policies: Indirect / offsite mitigation (offsetting measures); Increase in-channel morphological diversity
	Benthic/macro invertebrate	Increased erosion at the estuary mouth may lower the beach water table reducing opportunities for benthic/macro invertebrates.		
	Fish	Fish have the potential to be impacted by SMP2 polices through the reduced presence of macrophytes by the use of control structures or increased natural processes.		
Solway **(Not designated)**	Macrophytes	Macrophytes are potentially impacted by changes in longitudinal position of the estuary, shoreline complexity or heterogeneity (through the SMP2 Policies) and episodicity of flows and inundation.	**Classification: Moderate Status** • **WFD2** *No change that will cause failure to meet surface water Good Ecological Status or result in a deterioration of surface water Ecological*	

Feature		Issue	Water body classification and environmental objectives	Opportunity to deliver mitigation measures from the Programme of Measures and/or recommendations on preferred policy
Water body (and designation)	**Biological Quality Element**	**Potential for change in hydro-morphological or physical parameters**		
	Angiosperms	Increases in inundations (tidal regime) may impact on the colonisation potential of angiosperms.	*Status/potential* • **WFD 3** *No changes which will permanently prevent or compromise the Environmental Objectives being met in water bodies.* **Predicted Ecological Quality by 2015: Moderate**.	No specific hydromorphological measures for this water body in the Solway Tweed RBMP. No general hydromorphological measures relevant to flood and coastal erosion in the Solway Tweed RBMP.
	Benthic/macro invertebrate	Increased erosion at the estuary mouth may lower the beach water table reducing opportunities for benthic/macro invertebrates.		
	Fish	Fish have the potential to be impacted by SMP2 polices through the reduced presence of macrophytes by the use of control structures or increased natural processes. In addition, natural process of infilling may reduce access to nursery area by salt marsh accretion.		

K.3.3 Step 3: Assess preferred SMP2 Policies against WFD environmental objectives

The potential impact of SMP2 policies on WFD environmental objectives is addressed in **Table 8**. In this table the potential to meet or fail the environmental objective is assessed in terms of the impact of SMP2 policy on the relevant physical and hydromorphological parameter. The relationship between these parameters and the BQEs has already been determined in Tables 6 and 7. The impact of climate change on baseline processes has been taken into account at this stage.

Table 7 Assessment of SMP policy against the environmental objectives (Denoted in the Water Framework Directive: step by step process for assessing Shoreline Management Plan as Assessment Table 3)

Scenario Area		Policy Unit		SMP2 Policy			Assessment of impact (including list of water bodies affected)	Environmental objectives met?			
				2025	2055	2105		WFD 1	WFD 2	WFD 3	WFD 4
11a1	Great Orme to Little Orme	1.1	Great Ormes Head	NAI	NAI	NAI	The SMP2 policy is to maintain the defences at Llandudno whilst allowing the rocky cliff line either side to naturally evolve. The defences may be supported by a programme of cliff stabilisation and beach recharge. Where defences are maintained there is potential for coastal squeeze. This will not be mitigated by the NAI in adjacent policy units, as the rocky cliffs supply limited amounts of sediment to the system. Coastal squeeze may increase water depth affecting phytoplankton communities and reduce the area of intertidal habitat. Cliff stabilisation will prevent new beach material from being eroded however the beach recharge will mitigate the lack of sediment input. Beach recharge may impact benthic communities by changing the beach water table.	N/A	✓	✓	✓
		1.2	Llandudno	HTL	HTL	HTL		N/A	✓	✓	✓
		1.3	Little Ormes Head	NAI	NAI	NAI	This management option reflects the current management policy which result in the water body being impacted is described as Good Potential (North Wales Coastal Water) and Good Status (Anglesey North Coastal Water). Predicted future Ecological Status and Potential remains the same therefore, by ensuring an accurate match of beach material for recharge, it is unlikely that there will be deterioration in Ecological Status and Potential as a result of the SMP2 policy.	N/A	✓	✓	✓
11a2	Little Orme to Clwyd Estuary	2.1	Little Orme to Rhos on sea (Penrhyn Bay)	HTL	HTL	HTL	SMP2 policy is to maintain the defences along this section of coast by raising them to provide an adequate standard of defence to protect urban areas from the impacts of sea level rise. Where appropriate, secondary defences are also being proposed to provide additional protection to the large flood risk area to the west of the policy unit. At Penrhyn Bay and sections from Llanddulas to Clwyd Estuary, where groyne fields are not present, there is the potential for coastal squeeze. This will result in a loss of the sandy foreshore and non-designated intertidal habitat by changes to water depth, beach water table and altering abrasion impacting macroalgae, phytoplankton and benthic communities. There may be a deterioration of Ecological Potential. **Water body affected: North Wales coastal**	N/A	✓	✓	✓
		2.2	Rhos on Sea to Llanddulas (Colwyn Bay)	HTL	HTL	HTL		N/A	✓	✓	✓
		2.3	Llanddulas to Clwyd Estuary	HTL	HTL	HTL		N/A	x	✓	✓

Scenario Area		Policy Unit		SMP2 Policy			Assessment of impact (including list of water bodies affected)	Environmental objectives met?			
				2025	2055	2105		WFD 1	WFD 2	WFD 3	WFD 4
11a3	Clywd Estuary	3.1	Hortons Nose to Foryd Railway Bridge	HLT	HTL	HTL	SMP2 policy is to maintain the existing defences at the estuary mouth. The preferred policy for the east and west bank of the estuary is to maintain the defences over the first epoch and explore opportunities for MR for subsequent epochs. Maintenance of the control structures at the estuary mouth may result in coastal squeeze and the loss of the sandy foreshore. This may result in changes in water depth and beach water table impacting phytoplankton and benthic communities. MR in the middle of the estuary will look to address the issues of sea level rise and will attempt to mitigate the impact of coastal squeeze of intertidal habitats at the estuary mouth. However, a change in tidal prism resulting from MR could also change hydrodynamics and sediment movements and therefore turbidity and sediment loading. These changes may potentially impact macrophytes, macroalgae, angiosperms and benthic invertebrates. There is unlikely to be a reduction in access to the estuary and notwithstanding the cumulative impacts to macrophytes this means little or no potential changes for migratory fish. A MR policy will allow the estuary to function more naturally and therefore deterioration in Ecological Potential is considered unlikely.	N/A	✓	✓	✓
		3.2	Foryd Railway Bridge to Rhuddlan Road Bridge Clwyd Estuary West (left) bank	HTL	MR	MR		N/A	✓	✓	✓
		3.3	Rhuddlan Road Bridge to Forydd Railway Bridge Clwyd Estuary East (right) bank	HTL	MR	MR		N/A	✓	✓	✓
		3.4	Forydd Railway Bridge to Foryd Road Bridge	HTL	HTL	HTL		N/A	✓	✓	✓

Scenario Area		Policy Unit		SMP2 Policy			Assessment of impact (including list of water bodies affected)	Environmental objectives met?			
				2025	2055	2105		WFD 1	WFD 2	WFD 3	WFD 4
11a4	Clwyd Estuary to Point of Ayr	4.1	Clwyd Estuary to Rhyl Golf Links	HTL	HTL	HTL	The SMP2 policy for this section of coast is to maintain the existing defences from the mouth of the Clwyd Estuary to Prestatyn. Where appropriate, the primary defences can be reduced in height and supported by secondary set-back defences. In addition, there is the potential for undertaking dune management in areas of existing defences i.e. between Rhyl Golf Links to Barkby Beach. Between Barkby Beach and Point of Ayr, the preferred policy looks to maintain the dune system through MR. Although the maintenance of existing structures has the potential to reduce the sandy foreshore, impacting phytoplankton and benthic communities, tThe use of secondary defences will limit the need to increase the height of these structures. This will lessen the impacts of coastal squeeze and will be further mitigated by MR, which will allow the dune system to roll back naturally whilst the use of set back defences will widen the beach.	N/A	✓	✓	✓
		4.2	Rhyl Golf Links	HTL	HTL	HTL	There is a proposal for beach recharge and strategic beach management to further mitigate the impact of coastal squeeze. This may impact the benthic community by changing the beach water table but is unlikely to result in deterioration in Ecological Potential as a result of the SMP2 policy. There are two groundwater source protection zones at Prestatyn and Pen-y-cefn. The SPZ at Pen-y-cefn is too far inland to be considered at risk from saline intrusion. However, MR at Barkby Beach to Point Ayr may see a natural roll back of the defence line, which may impact on the total catchment of the SPZ at Prestatyn within the Clwyd Silurain GWB. However, beach recharge activities combined with the construction of secondary defence will control flood risk. It is recommended that this SPZ is closely monitored at this location as Clwyd Silurain GWB is currently quoted as 'probably not at risk from Saline Intrusion'. With the implementation of the proposed management practises deterioration in groundwater status is considered unlikely.	N/A	✓	✓	✓
		4.3	Rhyl Golf Links to Barkby Beach (Prestatyn)	HTL	HTL	HTL		N/A	✓	✓	✓
		4.4	Barkby Beach to Point Ayr	MR	MR	MR		N/A	✓	✓	✓

Scenario Area		Policy Unit		SMP2 Policy			Assessment of impact (including list of water bodies affected)	Environmental objectives met?			
				2025	2055	2105		WFD 1	WFD 2	WFD 3	WFD 4
11a5	Dee Estuary	5.1	Point of Ayr to Mostyn	HTL	HTL	HTL	The preferred plan is for only certain areas of the estuary to be defended whilst allowing the rest of the estuary to progress naturally through MR or NAI. The protection of industrial assets through HTL limits the exposure of contaminated sediments however it increases coastal squeeze, which would impact on phytoplankton and benthic communities. The potential loss of sediment is mitigated by areas of MR at Mostyn to Flint Marsh and NAI at Sealand Rifle Range to Burton Point (east bank), Dee Burton Point to Thurstaston Cliff and at Royal Liverpool Golf Club to Hilbre Point. This would create opportunities to retain sediment through salt marsh accretion. MR may change baseflow in the tributaries, which may affect macrophytes, increasing tidal inundations and sediment loading, impacting angiosperms. However, MR in some areas is mitigating losses of intertidal habitat due to coastal squeeze. At Point of Ayr to Mostyn where HTL is proposed to manage flood and erosion risk to a mainline railway, there is potential for coastal squeeze of intertidal habitat if sea level rise outpaces ongoing accretion in the long-term. Any loss of intertidal habitat due to coastal squeeze in the long-term is likely to impact on phytoplankton, macrophytes, macroalgae, angiosperms and benthic communities through changes to inshore water depths, hydrodynamics and the beach water table, and fish, as a result of accessibility to nursery areas. Holding the line along up to 8.4km in policy unit 5.1 alone could affect 12% of the frontage of the Dee Estuary waterbody (the frontage of which covers 65.6km). However, any coastal squeeze would occur with or without the strategy due to the presence of the coastal railway line and therefore the proposed policy will not in itself result in any deterioration in Ecological Potential of the waterbody. Holding the line in other policy units (namely Thurstaton slipway to Royal Liverpool Golf Club, and Hilbre Island in the long term), may result in coastal sqeeze if sea level rise outpaces ongoing accretion. Any loss of intertidal habitat due to coastal squeeze in the long-term is likely to impact on phytoplankton, macrophytes, macroalgae, angiosperms and benthic communities through changes to inshore water depths, hydrodynamics and the beach water table, and fish, as a result of accessibility to nursery areas. Holding the line in these policy units would affect a significant proportion of the frontage of the Dee Estuary waterbody. There is therefore potential for deterioration in Ecological Potential. **Water Bodies affected: Dee (North Wales) transitional and Mersey Mouth coastal** At Thurstaton Slipway, there is the potential of reactivating contaminated sediments and in the long term there is a potential for coastal squeeze if sea level rise outpaces ongoing accretion, which may result in deterioration in the Ecological Potential in the medium term. This would require careful study prior to implementation. There are five groundwater source protection zones at West	N/A	✓	✓	✓
		5.2	Monstyn to Flint Marsh	HTL	MR	MR		N/A	✓	✓	✓
		5.3	Flint Marsh to Chester Weir to Sealand Rifle Range (Inner Dee Estuary both banks)	HTL	HTL/MR	HTL/MR		N/A	✓	✓	✓
		5.4	Sealand Rifle Range to Burton Point	HTL	MR	MR		N/A	✓	✓	✓
		5.5	Burton Point to Thurstaston Cliffs	NAI	NAI	NAI		N/A	✓	✓	✓
		5.6	Thurstaston Cliffs	NAI	NAI	NAI		N/A	✓	✓	✓
		5.7	Thurstaton Slipway to Croft Drive, Caldy	HTL	HTL	HTL		N/A	x	✓	✓

Scenario Area		Policy Unit		SMP2 Policy 2025	SMP2 Policy 2055	SMP2 Policy 2105	Assessment of impact (including list of water bodies affected)	Environmental objectives met? WFD 1	WFD 2	WFD 3	WFD 4
		5.8	Croft Drive Caldy to West Kirby Marine Lake	HTL	HTL	NAI	Kirby, Frankby, Prenton, Neston and Hooton. However, none of these sites are at risk from saline inundation. Therefore, it is considered unlikely that the policy will result in a deterioration of groundwater status.	N/A	x	✓	✓
		5.9	West Kirby Marine Lake to Royal Liverpool Golf Club	HTL	HTL	HTL		N/A	x	✓	✓
		5.10'	Royal Liverpool Golf Club to Hilbre Point	NAI	NAI	NAI		N/A	✓	✓	✓
		5.11	Hilbre Island	HTL	HTL	HTL		N/A	x	✓	✓
11a6	Wirral	6.1	Hibre Point to Wallasey Embankment	HTL	HTL	HTL	The continued defence of most sections of coastline within the Wirral should prevent erosion and flooding of the hinterland. These defences may potentially result in the narrowing of the foreshore and the loss of intertidal habitat. Due to the positive sediment budget, coastal squeeze is not considered to be an issue in the short to medium term. However, in the long term there is a potential for coastal squeeze if sea level rise outpaces ongoing accretion. The potential loss of intertidal habitat due to coastal squeeze is likely to impact on phytoplankton, macroalgae, angiosperms and benthic communities through changes to inshore water depths, hydrodynamics, beach water table. MR is unlikely to mitigate this impact as the proposed areas are small in comparison. Therefore, there is a potential deterioration in Ecological Potential. **Water body affected: Mersey Mouth coastal** .	N/A	x	✓	✓
		6.2	Wallasey Embankment	HTL	HTL	HTL		N/A	x	✓	✓
		6.3	Wallasey Embankment to Harrison Groyne	HTL	HTL	MR		N/A	✓	✓	✓
		6.4	Harrison Groyne to Perch Rock	HLT	HTL	HTL		N/A	x	✓	✓
11a7	Mersey Estuary	7.1	Perch Rock to Riverwood Road / Eastham Park (South / left bank)	HTL	HTL	HTL	The preferred SMP2 policy for the majority of the estuary is HTL. There are small pockets of MR and NAI however these are complicated by contaminated land issues. Potential for coastal squeeze of intertidal habitat in the long-term in sections of the estuary where the height of defences is to be increased to provide an appropriate standard of protection against sea level rise, if sediment supply does not allow accretion to match sea level rise. This could impact on phytoplankton, macrophytes, macroalgae, angiosperms, benthic/macro invertebrate and fish BQEs through potential changes in water depth, turbidity, abrasion, sediment loading and changes in beach water table. The potential loss of intertidal habitat due to coastal squeeze may be partially mitigated by the eroding till cliffs at West Bank Dock Estate to Garston Industrial estate, which will provide some sediment to help reduce coastal squeeze. However, significant proportion of the frontage of the waterbody (up to 84%) may be subject to coastal squeeze of intertidal habitat in the long-term.	N/A	x	✓	✓
		7.2	Riverwood Road / Eastham Park to Eastham Ferry	NAI	NAI	NAI		N/A	✓	✓	✓
		7.3	Eastham Ferry to Runcorn Bridge (south bank)	HTL	HTL	HTL		N/A	x	✓	✓
		7.4	Runcorn Bridge to Arpley landfill Site (Upper Mersey Estuary south bank)	HTL	MR	MR		N/A	✓	✓	✓

Scenario Area		Policy Unit		SMP2 Policy 2025	SMP2 Policy 2055	SMP2 Policy 2105	Assessment of impact (including list of water bodies affected)	Environmental objectives met? WFD 1	WFD 2	WFD 3	WFD 4
		7.5	Arpley Landfill site (south bank) to SMP2 boundary to west of Sewage works (north bank)	HTL	HTL	HTL	Therefore, there is a potential for deterioration in Ecological Potential. **Water body affected: Mersey transitional**	N/A	✓	✓	✓
		7.6	Sewage works to Terrace Road Widnes (Upper Mersey Estuary north bank)	HTL	MR	MR	There are two groundwater source protection zones at Halewood and Birkenhead. Neither of these catchments are at risk from saline inundation. Therefore, it is considered unlikely that the policy will result in a deterioration of groundwater status.	N/A	x	✓	✓
		7.7	Terrace Road Widnes to Pickerings Pasture	HTL	HTL	HTL		N/A	x	✓	✓
		7.8	West Bank Dock Estate to Garston Industrial Estate	NAI	NAI	NAI		N/A	✓	✓	✓
		7.9	Garston Industrial Estate to Seaforth	HTL	HTL	HTL		N/A	x	✓	✓
11a8	Seaforth to the River Alt	8.1	Seaforth to MEPAS pumping Station	HTL	HTL	HTL	SMP2 policy calls for HTL along the east and west banks with the exception of MEPAS pumping station where MR will allow the dune system to develop. There is the potential for coastal squeeze to occur in front of the maintained existing defences, however as these are only to be maintained where assets are at risk and will be localised the potential for coastal squeeze is limited. Further, MR will mitigate the loss of sediment. Therefore, deterioration in Ecological Potential (Not yet Assessed) due to SMP2 policy is considered unlikely.	N/A	✓	✓	✓
		8.2	MEPAS pumping Station to Hightown	MR	MR	MR		N/A	✓	✓	✓
		8.3	Hightown to mouth of the River Alt (east bank)	HTL	HTL	HTL		N/A	✓	✓	✓
		8.4	River Alt mouth (east and west banks) to the Alt pumping station	HTL	HTL	HTL		N/A	✓	✓	✓
11.9	Formby Dunes	9.1	Mouth of the River Alt (west bank) to Weld Road, Southport (Formby dune system)	MR	MR	MR	SMP2 policy is for MR to maintain the dune system. Deterioration in Ecological status due to SMP2 policy is considered unlikely	N/A	✓	✓	✓

Scenario Area		Policy Unit		SMP2 Policy			Assessment of impact (including list of water bodies affected)	Environmental objectives met?			
				2025	2055	2105		WFD 1	WFD 2	WFD 3	WFD 4
11b1	Ribble Estuary	1.1	Weld Road to Fairways (Southport)	HTL	HTL	HTL	The majority of policy units in the Ribble Estuary have the preferred scenario of maintaining the existing defences by HTL. On the south bank of the estuary, HTL is unlikely to result in issues of coastal squeeze as the areas are experiencing salt marsh accretion. This accretion however could potentially impact on fish and macrophytes through changes in slope and accessibility to nursery areas. The proposed area of MR will increase the area of intertidal habitat and thus may increase spawning/nursery areas. The Estuary's north bank policy consists of large areas of HTL. NAI at Nase Point to Warton Point will provide an area for flood elevation and sediment storage There are three groundwater source protection zones at Barton, Broughton and Preston. However, due to distances between the estuary and these SPZs it is considered unlikely that the policy will result in a deterioration of groundwater status.	N/A	✓	✓	✓
		1.2	Fairways to Crossens Pumping Station (defence & shoreline position taken to be embankment landward of Marshside reserve at edge of SSSI / Ramsar / SAC and not Marine Drive)	HTL	HTL	HTL		N/A	✓	✓	✓
		1.3	Crossens Pumping Station to Hesketh Out Marsh West (Hundred End Gutter)	HTL	HTL	MR		N/A	✓	✓	✓
		1.4	Hesketh Outmarsh West	HTL	HTL	MR		N/A	✓	✓	✓
		1.5	Hesketh Outmarsh East	MR	HTL	HTL		N/A	✓	✓	✓
		1.6	Hesketh Outmarsh East to White Bridge, Rufford (River Douglas left bank)	HTL	HTL	MR		N/A	✓	✓	✓
		1.7	White Bridge, Rufford, to Old Railway Embankment, Much Hoole Marsh House (River Douglas right bank)	HTL	HTL	MR		N/A	✓	✓	✓

Scenario Area	Policy Unit		SMP2 Policy 2025	SMP2 Policy 2055	SMP2 Policy 2105	Assessment of impact (including list of water bodies affected)	Environmental objectives met? WFD 1	WFD 2	WFD 3	WFD 4
	1.8	Old Railway Embankment, Much Hoole Marsh House to Hutton Marsh (Pilots Cottage)	HTL	HTL	MR		N/A	✓	✓	✓
	1.9	Hutton Marsh	MR	HTL	MR		N/A	✓	✓	✓
	1.10'	Hutton Marsh to Penwortham Golf Course	HTL	MR	HTL		N/A	✓	✓	✓
	1.11	Penwortham Golf Course to Penwortham Bridge	HTL	HTL	HTL		N/A	✓	✓	✓
	1.12	Penwortham Bridge to Freckleton Marsh (W end of sewage works)	HTL	HTL	HTL		N/A	✓	✓	✓
	1.13	Freckleton Marsh (W end of sewage works) to Naze Point	HTL	HTL	MR		N/A	✓	✓	✓
	1.14	Naze Point to Warton Bank	NAI	NAI	NAI		N/A	✓	✓	✓
	1.15	Warton Bank to Lytham Dock	HTL	HTL	HTL		N/A	✓	✓	✓
	1.16	Lytham Dock to Land Registry	HTL	HTL	HTL		N/A	✓	✓	✓
	1.17	Lytham Land Registry to Fairhaven Lake	HTL	HTL	HTL		N/A	✓	✓	✓
	1.18	Fairhaven Lake	HTL	HTL	HTL		N/A	✓	✓	✓
	1.19	Fairhaven Lake to Miniature Golf Course	HTL	HTL	HTL		N/A	✓	✓	✓
	1.20'	Miniature Golf Course to St Anne's Pier	HTL	HTL	HTL		N/A	✓	✓	✓
	1.21	St Annes's Pier to St Annes' Northern Boundary	HTL	HTL	HTL		N/A	✓	✓	✓

Scenario Area		Policy Unit		SMP2 Policy 2025	SMP2 Policy 2055	SMP2 Policy 2105	Assessment of impact (including list of water bodies affected)	Environmental objectives met? WFD 1	WFD 2	WFD 3	WFD 4
11b2	St Annes to Rossall Point	2.1	St Annes (northern boundary) to Squires Gate	MR	HTL	HTL	Along this section of coast the preferred scenario is for HTL. This is a continuation of current management policy with provisions for sea level rise. However, as the groyne field encourages coastal accretion there is unlikely to be coastal squeeze. There is the potential for the groyne field to disrupt sediment transport into the neighbouring coastal areas. Therefore, there is a potential deterioration in Ecological Potential. **Water bodies affected: Cumbria coastal**.	N/A	✓	✓	✓
		2.2	Squires Gate to Blackpool Tower	HTL	HTL	HTL		N/A	✓	✓	✓
		2.3	Blackpool Tower to Anchorsholme Park	HTL	HTL	HTL		N/A	✓	✓	✓
		2.4	Anchorsholme Park	HTL	HTL	HTL		N/A	✓	✓	✓
		2.5	Anchorsholme Park to Jubilee Gardens	HTL	HTL	HTL		N/A	✓	✓	✓
		2.6	Jubilee Gardens to Five Bar Gate	HTL	HTL	HTL		N/A	✓	✓	✓
		2.7	Five Bar Gate to Rossall Hospital (Rossall School)	HTL	HTL	HTL		N/A	✓	✓	✓
		2.8	Rossall Hospital to Chatsworth Avenue	HTL	HTL	HTL		N/A	✓	✓	✓
		2.9	Chatsworth Avenue to Rossall Point	HTL	HTL	HTL		N/A	✓	x	✓
11c1	Fleetwood and the Wyre Estuary	1.1	Rossall Point to Marine Lake (east)	HTL	HTL	HTL	SMP2 policy is for HTL along the open section of coast between Rossall Point and Fleetwood Ferry. This coastline is currently accreting. This is an area where control structures are currently used and therefore it is unlikely that there will be an alteration in hydrodynamics. Although increasing the height of the control structures to allow for sea level rise may result in some changes to hydrodynamics and sediment movement, the policy allows for the construction of secondary defences inland and for beach management to maintain the dunes as a natural line of defence. In some policy units in the long term there is a potential for coastal squeeze of intertidal habitat within Morecambe Bay SPA, Ramsar site and SAC, if sea level rise outpaces ongoing accretion. The potential loss of intertidal habitat due to coastal squeeze is likely to impact on phytoplankton, macroalgae, angiosperms and benthic communities through changes to inshore water depths, hydrodynamics, beach water table, and would potentially affect a significant proportion of frontage of the overall Wyre Estuary waterbody. There is therefore potential for preventing the water body reaching Good potential in the future (and, speculatively, some potential for deterioration in existing Moderate potential).	N/A	✓	✓	✓
		1.2	Marine Lake to Fleetwood Pier	HTL	HTL	HTL		N/A	✓	✓	✓
		1.3	Fleetwood Pier to Fleetwood Ferry	HTL	HTL	HTL		N/A	✓	✓	✓
		1.4	Fleetwood to Stanah	HTL	HTL	HTL		N/A	X	✓	✓

Scenario Area		Policy Unit		SMP2 Policy 2025	SMP2 Policy 2055	SMP2 Policy 2105	Assessment of impact (including list of water bodies affected)	Environmental objectives met? WFD 1	WFD 2	WFD 3	WFD 4
		1.5	Stanah to Cartford Bridge (south bank) and Cartford Bridge to Shard Bridge (north bank)	HTL	MR	MR	Preferred SMP2 policy is for HTL at the mouth of the estuary and limited embankments. Policy in the inner estuary will see the defences withdrawn in favour of NAI in the second epoch. The control structures at the mouth of the estuary will prevent the process of stratigraphic rollover and protect the estuary from re-activation of contaminated sediments from the landfill sites. Coastal squeeze resulting from areas of HTL is mitigated by the areas of NAI. However this, together with sea level rise, will change the estuary's tidal prism resulting in the loss of estuary mudflats and saltmarshes. This change in the tidal prism could also change hydrodynamics and sediment movement impacting benthic and macro invertebrate communities. There are a number groundwater source protection zones surrounding Wyre Estuary. The total catchment area is at risk from saline inundation on the east side of the estuary where the SMP2 policy will see the shoreline retreating in section 11c1.4. This may result in saline inundation into the total catchment. Therefore, it is considered likely that the policy may result in a deterioration of groundwater status. **Water bodyaffected: Wyre transitional** **Groundwater body affected: West Lancashire Quaternary Sand and Gravel**	N/A	✓	✓	✓
		1.6	Shard Road (A588) to Golf Course	HTL	HTL	HTL		N/A	X	✓	✓
		1.7	Knott End Golf course	NAI	NAI	NAI		N/A	✓	✓	x
		1.8	Golf course to Knott End on Sea	HTL	HTL	HTL		N/A	X	✓	✓
11c2	Knott End to Plover Scar	2.1	Knott End on Sea	HTL	HTL	HTL	SMP2 polices preferred scenario recommends HTL along this frontage with MR between Fluke Hall and Glasson Dock. The control structures may result in coastal squeeze; however the MR policy will offset this squeeze in the second epoch as the coast rolls back, potentially creating new intertidal habitat. Increased inundation and changes to the hydrodynamics through MR will impact on phytoplankton, macrophytes, macroalgae, angiosperms, benthic communities and fish BQEs. However, this is likely to be a temporary impact and the offset is likely to be a benefit. There is potential for coastal squeeze of intertidal habitat along a significant proportion of the Cumbria Coastal Water Body, if sea level rise outpaces ongoing accretion in the long-term. The potential loss of intertidal habitat due to coastal squeeze is likely to impact on phytoplankton, macroalgae, angiosperms and benthic communities through changes to inshore water depths, hydrodynamics, beach water table. Therefore, there is a potential for preventing the water body reaching Good potential in the future (and, speculatively, some potential for deterioration in existing Moderate potential). There are a number groundwater source protection zones surrounding this section of coast. The total catchments area is at risk from saline inundation where the SMP2 policy will see the shoreline retreating in sections 11c2.3 and 11c2.4 which may result in saline inundation into the total catchment. Therefore, it is considered likely that the policy may result in a deterioration	N/A	X	✓	✓
		2.2	Knott End to Fluke Hall	HTL	HTL	HTL		N/A	X	✓	✓
		2.3	Fluke Hall to Cocker Bridge	HTL	HTL or MR	HTL		N/A	X	✓	X
		2.4	Cocker Bridge to Glasson Dock	HTL	HTL or MR	HTL or MR		N/A	X	✓	X

Scenario Area		Policy Unit		SMP2 Policy			Assessment of impact (including list of water bodies affected)	Environmental objectives met?			
				2025	2055	2105		WFD 1	WFD 2	WFD 3	WFD 4
							of groundwater status. **Water body affected: Cumbria coastal** **Groundwater body affected: West Lancashire Quaternary Sand and Gravel**				
11c3	Lune Estuary	3.1	Glasson Dock to Condor Green Farm	HTL	HTL	HTL	The SMP2 preferred scenarios for the Lune Estuary is HTL on the southern estuary mouth and MR in the second epoch on the northern estuary mouth. HTL is the preferred scenario in the inner estuary and in-between there is a combination of NAI and MR. Any potential losses of intertidal habitat due to coastal squeeze are offset by the areas of NAI and MR and the potential recontamination of the sediment in the landfill is prevented by HTL. Phytoplankton, macrophytes, angiosperms and fish BQEs are impacted by changes in tidal prism, increased water depth, alteration in longitudinal position, shoreline complexity and saltmarsh elevation through NAI and MR. These policies are returning the estuary to its natural state and therefore unlikely to cause a deterioration in Ecological Potential.	N/A	✓	✓	✓
		3.2	Conder Green Farm to Aldcliffe	NAI	NAI	NAI		N/A	✓	✓	✓
		3.3	Aldcliffe to Freemans Wood (Aldcliffe Marsh)	NAI	NAI	NAI		N/A	✓	✓	✓
		3.4	Freemans Wood to Skerton Weir (east bank) and Skerton Weir to Lythe Bridge (west bank)	HTL	HTL	HTL		N/A	✓	✓	✓
		3.5	Lythe Bridge to Riverside Farm	HTL	MR	MR		N/A	✓	✓	✓
		3.6	Riverside Farm to Overton cattle grid	NAI	NAI	NAI		N/A	✓	✓	✓
		3.7	Overton Cattle Grid to Sunderland Village	HTL	HTL	MR		N/A	✓	✓	✓
11c4	Sunderland Village to Potts Corner	4.1	Sunderland Village to Sunderland Brows Farm	NAI	NAI	NAI	The preferred scenario for this stretch of coast is NAI and MR (with the exception of Secondary Embankment to Potts Corner) allowing the coast to function naturally. As overall accretion is expected to match sea level rise in the long-term, it is unlikely that there will be deterioration in Ecological Status.	N/A	✓	✓	✓
		4.2	Sunderland Point	MR	MR	MR		N/A	✓	✓	✓

Scenario Area		Policy Unit		SMP2 Policy			Assessment of impact (including list of water bodies affected)	Environmental objectives met?			
				2025	2055	2105		WFD 1	WFD 2	WFD 3	WFD 4
		4.3	Sunderland Point to Secondary Embankment	NAI	NAI	NAI		N/A	✓	✓	✓
		4.4	Secondary Embankment to Potts Corner	HTL	HTL	HTL		N/A	✓	✓	✓
11c5	Potts Corner to Heysham Dock	5.1	Potts Corner to Heysham Power Station	NAI	NAI	NAI	The potential losses of intertidal habitat due to coastal squeeze resulting from a HTL policy between Heysham Power Station and Heysham Dock will be offset by the NAI in the preceding policy unit. However, NAI will allow erosion of the soft cliff faces, which will impact on macrophytes. This is a minor impact on the wider Morecambe Bay and Duddon Sands coastal water which is unlikely to result in deterioration of Ecological Potential as a result of this policy.	N/A	✓	✓	✓
		5.2	Heysham Power Station and Heysham Dock	HTL	HTL	HTL		N/A	✓	✓	✓
11c6	Heysham to Hest Bank	6.1	South End of Halfmoon Bay to Chapel Hill (Lower Heysham)	NAI	NAI	NAI	The SMP2 preferred scenarios result in a continued HTL policy surrounding Morecambe and NAI to the south at Lower Heysham. The HTL policy is unlikely to result in a significant loss of intertidal habitat due to coastal squeeze as the fish tail groynes encourage accretion. However, there is potential for coastal squeeze of intertidal habitat along a significant proportion of thewaterbody's coastline, if sea level rise outpaces ongoing accretion in the long-term. The potential loss of intertidal habitat due to coastal squeeze is likely to impact on macrophytes, macroalgae and angiosperms through changes in abrasion and episodicity. Therefore, there is a potential deterioration in Ecological Potential. **Water body affected:Morecambe Bay and Duddon Sands coastal**	N/A	✓	✓	✓
		6.2	Chapel Hill to Hest Bank (Morecambe)	HTL	HTL	HTL		N/A	x	✓	✓
11c7	Hest Bank to Heald Brow	7.1	Hest Bank to north of West Cain House	HTL	MR	HTL	The SMP2 preferred scenarios for all sections of coast includes either HTL with MR in the second epoch follow by HTL or NAI. This will affect macrophytes, macroalgae, angiosperms and fish through changes in slope, shoreline complexity, inundation and vertical accretion of saltmarshes limiting access to nursery areas. However, these processes are returning the estuary to a natural state. Through re-aligning the coast there is potential for re-activation of contamination sediment of a landfill site. Should the realignment cause flooding of the landfill site, either directly or through backdoor flooding of neighbouring policy units (11c7.3 and 11c7.4), there would be a deterioration in Ecological Potential.	N/A	x	✓	✓
		7.2	West Cain House to Red Bank Farm	NAI	NAI	NAI		N/A	✓	✓	✓
		7.3	Red Bank Farm to Bolton-le-Sands Caravan Park	HTL	MR	HTL		N/A	x	✓	✓
		7.4	Bolton-le-Sands Caravan Park to River Keer	NAI	NAI	NAI		N/A	✓	✓	✓

Scenario Area		Policy Unit		SMP2 Policy			Assessment of impact (including list of water bodies affected)	Environmental objectives met?			
				2025	2055	2105		WFD 1	WFD 2	WFD 3	WFD 4
		7.5	River Keer to Heald Brow	NAI	NAI	NAI	**Water body affected: Kent transitional**	N/A	✓	✓	✓
11c8	Heald Brow to Humphrey Head	8.1	Heald Brow to Frith Wood	NAI	NAI	NAI	SMP2 preferred scenario is to maintain defences on the north side of the estuary mouth and NAI on the southern side. The defences are currently unlikely to result in coastal squeeze issues as the system is currently accreting. This accretion may affect macrophytes, macroalgae, angiosperms and fish through changes in slope, longitudinal position, shoreline complexity, inundation and vertical accretion of saltmarshes limiting access to nursery areas. However, these processes are returning the estuary to a natural state. Therefore, it is unlikely that there will be deterioration in Ecological Potential (not yet assessed).	N/A	✓	✓	✓
		8.2	New Barns	NAI	NAI	NAI		N/A	✓	✓	✓
		8.3	Grubbins Wood (New Barns to Ash Meadow)	NAI	NAI	NAI		N/A	✓	✓	✓
		8.4	Ash Meadow to the Kent Viaduct (Arnside)	HTL	HTL	HTL		N/A	✓	✓	✓
		8.5	Kent Viaduct to Holme Island	HTL	HTL	HTL		N/A	✓	✓	✓
		8.6	Holme Island to Humphrey Head	HTL	HTL	HTL		N/A	✓	✓	✓
11c9	Kent Estuary	9.1	Kent Viaduct to Duck Fell Road (Sandside)	HTL	MR	MR	The preferred scenario for the Inner Kent Estuary is HTL and MR. The intertidal habitat losses that the estuary may experience as a result of coastal squeeze is mitigated by the area of intertidal habitat that may be created through MR in the medium and long term. Therefore, there is unlikely to be deterioration in Ecological Potential.	N/A	✓	✓	✓
		9.2	Sandside (Duck Fell Road to Hollins Well Road)	HTL	HTL	HTL		N/A	✓	✓	✓
		9.3	Hollins Well Road north to Levens Bridge (east bank) & Levens Bridge to Kent Viaduct (west bank)	HTL	MR	MR		N/A	✓	✓	✓
11c10	Humphrey Head to Cark	10.1	Humphrey Head	NAI	NAI	NAI	For this section of coast preferred SMP2 scenarios are NAI and MR and although this will see increased inundations and saltmarsh vertical accretion these policies support the natural development of this stretch of coastline. Therefore, deterioration in Ecological Potential is considered unlikely.	N/A	✓	✓	✓
		10.2	Humphrey Head to Cowpren Point	HTL	MR and HTL	MR		N/A	✓	✓	✓
		10.3	Cowpren Point to Cark	NAI	NAI	NAI		N/A	✓	✓	✓
11c11	Outer Leven Estuary	11.1	Cark to Leven Viaduct	NAI	NAI	NAI	SMP2 preferred scenarios is for either NAI or MR in the Outer Leven Estuary with the exception of Canal Foot and the realigned defences at Sandhall to Conishead Priory. The defence at these locations are limited and in the case of Canal Foot are assumed not to have implications on the wider system. Sandhall to Conishead Priory potentially may result in loss of intertidal habitat due to coastal squeeze in the long term and will require further study. Coastal squeeze experienced at Canal Foot (and probably Sandhall to Conishead Priory) is mitigated by the NAI and MR along the Outer Estuary mouth. These policies could potential impact macrophytes, macroalgae, angiosperms and fish through changes in slope, longitudinal position, shoreline	N/A	✓	✓	✓
		11.2	Leven Viaduct to Canal Foot cottages	NAI	NAI	NAI		N/A	✓	✓	✓
		11.3	Canal Foot	HTL	HTL	HTL		N/A	✓	✓	✓
		11.4	Glaxo Factory Site (south)	NAI	NAI	NAI		N/A	✓	✓	✓
		11.5	Sandhall to Conishead Priory	HTL	MR	MR		N/A	✓	✓	✓

Scenario Area		Policy Unit		SMP2 Policy			Assessment of impact (including list of water bodies affected)	Environmental objectives met?			
				2025	2055	2105		WFD 1	WFD 2	WFD 3	WFD 4
		11.6	Conishead Priory to Bardsea	NAI	NAI	NAI	complexity, inundation and vertical accretion of saltmarshes limiting access to nursery areas. However, as these are natural processes it is unlikely that there will be a deterioration in Ecological Potential (not yet assessed)	N/A	✓	✓	✓
11c12	Levan Estuary	12.1	Leven Viaduct to Haverthwaite (left bank) and Haverthwaite to Greenodd (right bank)	HTL	MR	NAI	The preferred scenario for the Leven Estuary is for a continuation of HTL policy followed in the second epoch by MR and then NAI. HTL policy is maintained through all three epochs at Greenood to Barrow End Rocks. There is potential for losses of intertidal habitat due to coastal squeeze in the long-term as a result of HTL policy. There is potential for deterioration in Ecological Potential in the long-term. **Water body affected: Leven transitional**	N/A	✓	✓	✓
		12.2	Greenodd to Barrow End Rocks (A590)	HTL	HTL	HTL		N/A	x	✓	✓
		12.3	Barrow End Rocks (A590) to Leven Viaduct	HTL	MR	NAI		N/A	✓	✓	✓
11c13	Bardsea to Piel Island	13.1	Bardsea to Newbiggin	NAI	NAI	NAI	SMP2 preferred scenarios along this stretch of coast are NAI along the low cliff and HTL to maintain the coastal road. Towards Piel Harbour the policy is for HTL. Ongoing accretion in the short and medium-term will ensure that HTL will not erode the existing sandflats and saltmarshes. Newbiggin to Piel Island may experience loss of intertidal habitat due to coastal squeeze along a significant proportion of the frontage of the Cumbria Coastal Water Body in the long-term if sediment supply does not allow accretion of intertidal habitat to keep pace with sea level rise. Although some of the losses may be mitigated by NAI between Barsea to Newbiggin with the release of sediments through erosion of the soft cliff face, it is considered that there may be a reduction in Ecological Potential in the long-term. **Water body affected: Cumbria coastal**	N/A	✓	✓	✓
		13.2	Newbiggin to Rampside	HTL	MR	HTL		N/A	x	✓	✓
		13.3	Rampside	NAI	HTL	HTL		N/A	x	✓	✓
		13.4	Roa Island	HTL	HTL	HTL		N/A	x	✓	✓
		13.5	Piel Island	NAI	NAI	NAI		N/A	✓	✓	✓
11c14	Walney Island	14.1	South End Hawes to Biggar (east side)	NAI	NAI	NAI	SMP2 preferred scenarios along this stretch of coast supports the natural development of the island through NAI and MR. Exception to this are at Biggar to Lenny Hill where defences are proposed to be maintained to manage flood and erosion risk to Vickertown and at Hare Hill to Hillock Whins. At these locations the defences would protect a landfill site from releasing contaminants as a result of erosion. These defences would also maintain the integrity of the island. At policy units where NAI or MR is the proposed scenario the impacts on BQEs are likely to be minor in the wider context of the water bodies they potentially could impact: Cumbria coastal water; and, Morecambe Bay and Duddon Sands. In policy units where HTL is the preferred scenario there may be loss of intertidal habitat due to coastal squeeze impacting on phytoplankton, macroalgae, angiosperms and benthic communities through changes to inshore water depths, wave patterns and current dynamics, beach	N/A	✓	✓	✓
		14.2	Biggar to Lenny Hill (east side)	HTL	HTL	HTL		N/A	✓	✓	✓
		14.3	South End Hawes to Hare Hill (open coast)	NAI	NAI	NAI		N/A	✓	✓	✓
		14.4	Hare Hill to Hillock Whins	HTL	HTL	HTL		N/A	✓	✓	✓
		14.5	Hillock Whins to Nanny point Scar	NAI	MR	MR		N/A	✓	✓	✓
		14.6	Nanny Point Scar to Mill Scar	NAI	NAI	NAI		N/A	✓	✓	✓

Scenario Area		Policy Unit		SMP2 Policy			Assessment of impact (including list of water bodies affected)	Environmental objectives met?			
				2025	2055	2105		WFD 1	WFD 2	WFD 3	WFD 4
		14.7	Mill Scar to north of West Shore Park	MR	MR	MR	water table. These impacts are however, mitigated for by NAI in other areas which increase sediment availability and reduce changes to hydrodynamics. Therefore, there is unlikely to be deterioration in Ecological Status (of Cumbria coastal water) or Potential (Morecambe Bay and Duddon Sands). Haws Bank lagoons at the southern end of Walney Island (units 14.1 and 14.3) are classified as a separate coastal water body, recognising their value as saline lagoon habitat. NAI in these units will potentially result in a risk of increasing salinity of the lagon if future breaches or overtopping occur, but this would be part of a natural evolution of the coast. And no change is proposed by the SMP2. Thus this risk is scoped out of the WFD assessment.	N/A	✓	✓	✓
		14.8	North Walney - from north of West Shore Park to Lenny Hill (both coasts)	NAI	NAI	NAI		N/A	✓	✓	✓
11c15	Walney Island (Mainland)	15.1	Rampside to Westfield Point	NAI	NAI	NAI	SMP2 preferred scenarios along this stretch of coast allow the shoreline to continue to evolve under natural processes by NAI. Exception to this is at Westfield Point to Hindpool where defences are proposed to be maintained to manage flood and erosion risk to the gasworks and power station. At policy units where NAI or MR is the proposed scenario the impacts on BQEs are likely to be minor in the wider context of the water bodies they potentially could impact: Cumbria coastal water; and, Morecambe Bay and Duddon Sands. At Westfield Point to Hindpool, where HTL is the preferred scenario, loss of intertidal habitat due to coastal squeeze may impact on phytoplankton, macroalgae, angiosperms and benthic communities through changes to inshore water depths, hydrodynamics, beach water table. These impacts are however, mitigated for by NAI in other areas which increase sediment availability and reduce changes to hydrodynamics. Therefore, there is unlikely to be deterioration in Ecological Status (of Cumbria coastal water) or Potential (Morecambe Bay and Duddon Sands). Cavendish Dock is classified as a separate coastal water body, recognising its value as saline lagoon habitat. HTL in unit 15.2 will maintain the current conditions and preserve the saline lagoon biological quality elements in this small water body. There is a groundwater source protection zones surrounding Barrow-in-Furness. The total catchments and outer zone is at risk from saline inundation as the preferred scenario of Hindpool to Lowsy Point will, potentially, see the shoreline retreating which may result in saline intrusion into the catchment. Therefore, it is considered likely that the policy may result in a deterioration of groundwater status. **Groundwater body affected: Furness Permo-Triassic Sandstone Aquifers**	N/A	✓	✓	✓
		15.2	Westfield Point to Hindpool (Barrow in Furness)	HTL	HTL	HTL		N/A	✓	✓	✓
		15.3	Hindpool to Lowsy Point	NAI	NAI	NAI		N/A	✓	✓	x

Scenario Area		Policy Unit		SMP2 Policy			Assessment of impact (including list of water bodies affected)	Environmental objectives met?			
				2025	2055	2105		WFD 1	WFD 2	WFD 3	WFD 4
11c16	Duddon Estuary	16.1	Lowsy Point to Askam Pier	NAI	NAI	NAI	SMP2 preferred scenarios supports the natural development of the Duddon Estuary whilst managing flood- risk to the railway line through maintenance of existing defences. Where defences are in place that is not protecting the railway, SMP2 preferred scenarios recommends the placement of set-back defences at a MR line. NAI and MR at the estuary mouth will impact macrophytes and angiosperm through changes in longitudinal position of the estuary and increased inundation. However, this policy is supporting the natural development of the estuary. Where HTL is preferred scenario, there may be loss of intertidal habitat due to coastal squeeze. This may impact on phytoplankton, macroalgae, angiosperms and benthic communities, through changes to inshore water depths and hydrodynamics. These impacts are however, mitigated for by NAI and MR in other areas which increase sediment availability and reduce changes hydrodynamic. Therefore, deterioration in Ecological Potential is considered unlikely.	N/A	✓	✓	✓
		16.2	Askam-in-Furness (including Askam Pier)	HTL	HTL	HTL		N/A	✓	✓	✓
		16.3	Askam to Dunnerholme	NAI	NAI	NAI		N/A	✓	✓	✓
		16.4	Dunnerholme to Sand Side	HTL	HTL	HTL		N/A	✓	✓	✓
		16.5	Kirkby-in-Furness	HTL	HTL	HTL		N/A	✓	✓	✓
		16.6	Herdhouse Moss	NAI	NAI	NAI		N/A	✓	✓	✓
		16.7	Galloper Pool to Viaduct	HTL	HTL	HTL		N/A	✓	✓	✓
		16.8	Duddon Estuary (Both banks upstream of Viaduct and right bank south to Green Rd Station)	HTL	MR	MR		N/A	✓	✓	✓
		16.9	Millom Marshes	HTL	MR	MR		N/A	✓	✓	✓
		16.10'	Red Hills (Industrial area)	NAI	NAI	NAI		N/A	✓	✓	✓
		16.11	Hodbarrow Mains to Hodbarrow Point	NAI	MR	HTL		N/A	✓	✓	✓
11d1	Hodbarrow Point to Selker	1.1	Hodbarrow Point to Haverigg	HTL	MR	HTL	The preferred scenario for this stretch of coast is a combination of HTL to manage flood risk to key settlements and NAI. Loss of intertidal habitat due to coastal squeeze issues will generally be mitigated by NAI allowing the coast to function naturally. Therefore, it is unlikely that there will deterioration in Ecological Status. Hodbarrow lagoon in units 1.1 is classified as a separate coastal water body, recognising its value as saline lagoon habitat. Short-term HTL will protect the lagoon against the risk of increasing salinity (following breaches or overtopping), but MR in the medium term may result in the lagoon becoming fully saline, with impacts on the saline lagoon biological quality elements. This issue, however, is more significant to the lagoon's SPA and SAC status as it is these designations which have resulted in it being identified as a water body separate from the main coastal water body. Thus this impact is addressed in the Habitats Regulations Assessment.	N/A	✓	✓	✓
		1.2	Haverigg	HTL	HTL	HTL		N/A	✓	✓	✓
		1.3	Haverigg to Hartrees Hill	NAI	NAI	NAI		N/A	✓	✓	✓
		1.4	Silecroft (Hartrees Hill)	HTL	HTL	HTL		N/A	✓	✓	✓
		1.5	Hartrees Hill to Selker	NAI	NAI	NAI		N/A	✓	✓	✓

Scenario Area		Policy Unit		SMP2 Policy			Assessment of impact (including list of water bodies affected)	Environmental objectives met?			
				2025	2055	2105		WFD 1	WFD 2	WFD 3	WFD 4
11d2	Selker to Eskmeals	2.1	Selker to Stubb Place	NAI	NAI	NAI	The preferred scenario for this stretch of coast is NAI and MR allowing the coast to function naturally. This will impact on macrophytes, microalgae and fish BQEs by the potential changes to longitudinal position of the Ravenglass Estuary mouth resulting in changes in hydrodynamics, and an increasing the risk of inundation. However, these preferred scenarios support natural functioning of the estuary therefore It is unlikely, therefore that there will be deterioration in Ecological Status or Potential.	N/A	✓	✓	✓
		2.2	Stubb Place and Eskmeals Dunes	MR	MR	MR		N/A	✓	✓	✓
11d3	Ravenglass Estuary Complex	3.1	Eskmeals Dunes to Ravenglass including River Esk to Muncaster Bridge SMP2 boundary	NAI	NAI	NAI	The preferred scenario for this stretch of coast is NAI with the exception of Ravenglass where HTL will maintain the integrity of the town. Intertidal habitat loss due to coastal squeeze issues will be mitigated by NAI allowing the coast to function naturally. NAI will promote the vertical accretion of saltmarshes thereby limiting the access for fish to nursery areas. However, this is likely to be in localised areas only and will not result in deterioration in Ecological status or Potential.	N/A	✓	✓	✓
		3.2	Ravenglass	HTL	HTL	HTL		N/A	✓	✓	✓
		3.3	Ravenglass to Drigg Point including River Mite to Muncaster Mill and River Irt to Drigg Holme	NAI	NAI	NAI		N/A	✓	✓	✓
11d4	Drigg Point to Seascale	4.1	Drigg Point to Seascale	NAI	NAI	NAI	The preferred scenario for this stretch of coast is NAI allowing the coast to function naturally. It is unlikely that there will be deterioration in Ecological Status.	N/A	✓	✓	✓
11d5	Seascale to St Bees	5.1	Seascale	HTL	HTL	HTL	SMP2 preferred scenarios recommends maintaining defences protecting infrastructure at Seascale, Sellafield and Coulderton to Pow Beck. Along the stretches of coast in-between the defences NAI will allow the coast to function naturally and will mitigate for loss of intertidal area due to coastal squeeze from the defences in other locations. Therefore, it is unlikely that there may be deterioration in Ecological Status.	N/A	✓	✓	✓
		5.2	Seascale to Sellafield	NAI	NAI	NAI		N/A	✓	✓	✓
		5.3	Sellafield	HTL	HTL	HTL		N/A	✓	✓	✓
		5.4	Sellafield to Braystones	NAI	NAI	NAI		N/A	✓	✓	✓
		5.5	Braystones, Nethertown and Coulderton	MR	NAI	NAI		N/A	✓	✓	✓
		5.6	Coulderton to Sea Mill	NAI	NAI	NAI		N/A	✓ ✓	✓ ✓	✓ ✓
		5.7	Sea Mill to Pow	HTL	HTL	HTL					

Scenario Area		Policy Unit		SMP2 Policy			Assessment of impact (including list of water bodies affected)	Environmental objectives met?			
				2025	2055	2105		WFD 1	WFD 2	WFD 3	WFD 4
			Beck					N/A	✓	✓	✓
11d6	St Bees	6.1	Pow Beck to St Bees Promenade	NAI	NAI	NAI	Along this short section of coast NAI will see the continued erosion of the cliff and HTL at the promenade in the short and medium term. Intertidal habitat loss due to coastal squeeze issues and potential loss of beach width will be mitigated by the release of sediments from cliff face erosion at Pow Beck to St Bees. As such it is unlikely that there will be deterioration in Ecological Status as a result of SMP2 policy in the long term.	N/A	✓	✓	✓
		6.2	St Bees Promenade	HTL	HTL	MR		N/A	✓	✓	✓
11d7	St Bees Head	7.1	St Bees Head	NAI	NAI	NAI	The plan is to allow the natural development of the coast and, hence, there is unlikely to be deterioration in Ecological Status as a result of SMP2 policy.	N/A	✓	✓	✓
11e1'	St Bees to Whitehaven	1.1	St Bees Head to Saltom Pit	NAI	NAI	NAI	The plan is to allow the natural development of the coast in all policy units except at Saltom Pit. This is a small section of coast and there is therefore unlikely to be any ramification surrounding policy units, hence, there is unlikely to be deterioration in Ecological Status as a result of SMP2 policy.	N/A	✓	✓	✓
		1.2	Saltom Pit	HTL	HTL	NAI		N/A	✓	✓	✓
		1.3	Saltom Pit to Whitehaven	NAI	NAI	NAI		N/A	✓	✓	✓
		1.4	Whitehaven South Beach	NAI	NAI	NAI		N/A	✓	✓	✓
11e2'	Whitehaven to Workington	2.1	Whitehaven Harbour and north beach	HTL	HTL	HTL	The preferred scenario for large stretch of this coast is HTL. This is due to the presence of Whitehaven harbour and the railway infrastructure. NAI in the second epoch between Harrington Parks and Harrington Harbour requires further study as the contaminated land may need defending. To the north of this stretch of coast there are sections where NAI and MR are the preferred scenario. However, due to the HTL in multiple adjoining policy units loss of intertidal habitat due to coastal squeeze is likely to impact on phytoplankton, macroalgae, angiosperms and benthic communities through changes to inshore water depths, hydrodynamics, beach water table. NAI and MR are unlikely to mitigate this impact as the proposed areas are small in comparison. Further, the MR at The Howe to Workington Harbour south breakwater, depending on the location of any proposed set back defences, has the potential to impact on the Derwent estuary mouth affecting its longitudinal position and impact macrophytes and fish, although this is unlikely to limit access for migrating species of fish. On balance, there is likely to be deterioration in Ecological Status. **Water Body affected: Solway Outer South coastal.**	N/A	x	✓	✓
		2.2	Bransty to Parton	HTL	HTL	HTL		N/A	x	✓	✓

Scenario Area		Policy Unit		SMP2 Policy			Assessment of impact (including list of water bodies affected)	Environmental objectives met?			
				2025	2055	2105		WFD 1	WFD 2	WFD 3	WFD 4
		2.3	Parton	HTL	HTL	HTL		N/A	x	✓	✓
		2.4	Parton to Harrington Parks	HTL	HTL	HTL		N/A	x	✓	✓
		2.5	Harrington Parks to Harrington Harbour	HTL	NAI	NAI		N/A	x	✓	✓
		2.6	Harrington Harbour	HTL	HTL	HTL		N/A	x	✓	✓
		2.7	Harrington to Steel Works Site	HTL	HTL	HTL		N/A	x	✓	✓
		2.8	Steel Works Site	HTL	HTL	HTL		N/A	x	✓	✓
		2.9	Steel Works to The Howe	NAI	NAI	NAI		N/A	✓	✓	✓
		2.10'	The Howe to Workington Harbour south breakwater	MR	MR	MR		N/A	✓	✓	✓
		2.11	Workington Harbour	HTL	HTL	HTL		N/A	✓	✓	✓
11e3'	Workington to Maryport	3.1	Workington Harbour to Siddick	HTL	MR	MR	SMP2 preferred scenario is to maintain the defences at Risehow to Maryport Marina and at the Marina/Harbour, with a MR at Workington Harbour to Siddick in the medium term and NAI between Risehow and Maryport Marina. This will allow for a more naturally functioning coastline and will mitigate for the coastal squeeze in areas of the HTL. The MR at Workington Harbour to Siddick, depending on the location of secondary defences, may contribute to backdoor flooding of Siddick Ponds. This may result in a potential for deterioration in Ecological Status (not yet assessed) of the landward freshwater body as a result of potential changes in salinity and inundations, which would impact on freshwater biology. **Water body affected: Siddick Ponds freshwater**	N/A	x	✓	✓
		3.2	Siddick to Risehow	HTL	HTL	HTL		N/A	✓	✓	✓
		3.3	Risehow to Maryport Marina	NAI	NAI	NAI		N/A	✓	✓	✓
		3.4	Maryport Harbour / Marina	HTL	HTL	HTL		N/A	✓	✓	✓
11e4'	Maryport to Dubmill Point	4.1	Maryport Harbour to Roman Fort	HTL	HTL	HTL	The preferred scenarios defend sections of coast at Maryport Harbour by maintaining the seawall. HTL at other locations consist of localised defences and beach/dune management activities. Therefore, coastal squeeze is likely to be localised and mitigated by the large areas of NAI and MR. SMP2 NAI policy supports the natural functioning of the coast and deterioration in Ecological Potential is considered unlikely.	N/A	✓	✓	✓
		4.2	Roman Fort to bank End (Maryport Promenade)	HTL	NAI	NAI		N/A	✓	✓	✓

Scenario Area		Policy Unit		SMP2 Policy			Assessment of impact (including list of water bodies affected)	Environmental objectives met?			
				2025	2055	2105		WFD 1	WFD 2	WFD 3	WFD 4
		4.3	Maryport Golf Course to Allonby	MR	MR	MR	The small Allonby Bay coastal water body overlaps the frontage from 4.3 (part of) to 4.5 inclusive. HTL policy in this reach can be considered to be offset by MR so that overall there is unlikely to be a significant change affecting the water body's Ecological Potential.	N/A	✓	✓	✓
		4.4	Allonby	HTL	HTL	HTL		N/A	✓	✓	✓
		4.5	Allonby to Seacroft Farm	NAI	NAI	NAI		N/A	✓	✓	✓
		4.6	Seacroft Farm to Dubmill Point	HTL	NAI	NAI		N/A	✓	✓	✓
11e5'	Dubmill Point to Silloth	5.1	Dubmill Point to Silloth	MR	MR	MR	The plan is to allow the natural development of the coast through MR and, hence, there is unlikely to be deterioration in Ecological Status as a result of SMP2 policy.	N/A	✓	✓	✓
11e6'	Silloth to The Grune	6.1	Silloth Harbour	HTL	HTL	HTL	The plan manages the flood and erosion risk to Silloth Harbour and to the open coast to Skinburness through HTL. North of Skinburness to The Grune SMP2 preferred scenarios supports the natural development of the coast. The coast will experience minimal loss of intertidal habitat in the short and medium-term through HTL due to a combination of groyne fields holding sediment and beach recharge. This recharge will however impact on benthic/macro invertebrate BQEs through changes to beach water table. By ensuring an accurate match of beach material for recharge, any impact is likely to be temporary.	N/A	✓	✓	✓
		6.2	Silloth to Skinburness (open coast)	HTL	HTL	HTL		N/A	✓	✓	✓
		6.3	The Grune	NAI	NAI	NAI		N/A	✓	✓	✓
11e7'	Moricambe Bay	7.1	Skinburness (east)	HTL	HTL	HTL	SMP2 preferred scenarios recommends HTL in small areas of the estuary. Surrounding these are areas of MR, which would support the natural development of the estuary and help to mitigate for loss of intertidal habitat due to coastal squeeze. Therefore, deterioration in Ecological Status is considered unlikely. There is a groundwater source protection zone surrounding Low Row. This total catchment is outside of the flood risk zone so therefore it is not considered to be at risk from saline intrusion unless there is a significant shoreline retreat. This is unlikely in the epochs studied as part of the SMP2; therefore a deterioration of groundwater status is not predicted.	N/A	✓	✓	✓
		7.2	Skinburness to Wath Farm	HTL	MR	HTL		N/A	✓	✓	✓
		7.3	Wath Farm to Saltcoates including Waver to Brownrigg	MR	MR	MR		N/A	✓	✓	✓
		7.4	Newton Marsh	MR	MR	MR		N/A	✓	✓	✓
		7.5	Newton Marsh to Anthorn including Wampool to NTL	MR	MR	MR		N/A	✓	✓	✓
		7.6	Anthorn	HTL	HTL	HTL		N/A	✓	✓	✓
		7.7	Anthorn to Cardurnock	MR	MR	MR		N/A	✓	✓	✓

Scenario Area		Policy Unit		SMP2 Policy			Assessment of impact (including list of water bodies affected)	Environmental objectives met?			
				2025	2055	2105		WFD 1	WFD 2	WFD 3	WFD 4
11e8'	Cardurnock to Scottish Border	8.1	Cardurnock to Bowness-on-Solway	MR	MR	MR	The plan is to allow the natural development of the coast along the majority of policy units on the English side of the Solway Firth with the exception of: 1. a small section at Rockliffe where HTL will maintain the town of Rockliffe's integrity. This being the case there are large areas of the estuary where MR would help to mitigate the loss of intertidal area due to coastal squeeze. MR will impact macrophytes, angiosperms and fish through change in longitudinal position of the estuary mouth and inundation. This is considered to be the natural development of the estuary and therefore it is considered unlikely that there will be deterioration in Ecological Status.	N/A	✓	✓	✓
		8.2	Bowness-on-Solway	MR	MR	MR		N/A	✓	✓	✓
		8.3	Bowness-on-Solway to Drumburgh	MR	MR	MR		N/A	✓	✓	✓
		8.4	Drumburgh to Dykesfield	MR	MR	MR		N/A	✓	✓	✓
		8.5	Dykesfield to NTL Kingsmoor (Eden)	MR	MR	MR		N/A	✓	✓	✓
		8.6	NTL Kingsmoor (Eden) to Rockliffe	MR	MR	MR		N/A	✓	✓	✓
		8.7	Rockliffe	HTL	HTL	HTL		N/A	✓	✓	✓
		8.8	Rockliffe to Demesne Farm	MR	MR	MR		N/A	✓	✓	✓
		8.9	Demesne Farm to Metal Bridge (Esk)	MR	MR	MR		N/A	✓	✓	✓
		8.10'	Metal Bridge (Esk) to the River Sark	MR	MR	HTL		N/A	✓	✓	✓

Table 8 Summary of achievement (or otherwise) of environmental objectives for each water body in the SMP area (Denoted in the Water Framework Directive: step by step process for assessing Shoreline Management Plan as Assessment Table 4)

Water Body (and related SMP2 policy units)	Environmental objectives met?				WFD Summary Statement required?
	WFD 1	WFD2	WFD3	WFD4	
North Wales (11a1.1 -11a4.4)	N/A	x 11a2.3	✓	✓	**Yes-** Environmental Objective WFD2 may not be met in one management area in this water body under SMP2 policies.
Mersey Mouth (11a5.11-11b2.9)	N/A	x 11a5.7, 5.8, 5.9, 5.116.1,6.2 , 6.4,	✓	✓	**Yes-** Environmental Objective WFD2 may not be met in some management areas in these water bodies under SMP2 policies.
Morecambe Bay & Duddon Sands (11b2.9-11c14.3)	N/A	x 11c6.2,	✓	x 11c2.3,2. 4 & 15.3	**Yes-** Environmental Objective WFD2 and 4 may not be met in some management areas in these water bodies under SMP2 policies.
Cumbria (11b2.9-11d7.1)	N/A	x 11b2.9, 11c2.1, 2.2, 2.3 & 2.4. 11c 13..2, 13.3 & 13.4	x 11b2.9	x 11c1.7 11c2.3 & 2.4	**Yes-** Environmental Objectives WFD2, WFD3 and WFD4 may not be met in some management areas in these water bodies under SMP2 policies.
Solway Outer South (11d7.1-11e4.6)	N/A	x 11e2.1,2.2, 2.3,2.4,2.5, 2.6,2.7,2.8, 3.1	✓	✓	**Yes-** Environmental Objective WFD2 may not be met in some management areas in these water bodies under SMP2 policies.
Cavendish Dock	N/A	✓	✓	✓	**No-** not necessary as delivery of Environmental Objectives is likely to be supported by the proposed SMP2 policy.

Water Body (and related SMP2 policy units)	Environmental objectives met?				WFD Summary Statement required?
	WFD 1	WFD2	WFD3	WFD4	
Allonby Bay	N/A	✓	✓	✓	**No**- not necessary as delivery of Environmental Objectives is likely to be supported by the proposed SMP2 policy.
Hodbarrow Lagoon	N/A	✓	✓	✓	**No**- not necessary as delivery of Environmental Objectives is likely to be supported by the proposed SMP2 policy.
Haws Bank Lagoons	N/A	✓	✓	✓	**No**- not necessary as delivery of Environmental Objectives is likely to be supported by the proposed SMP2 policy.
Clywd (11a3.1-11a3.4)	N/A	✓	✓	✓	**No**- not necessary as delivery of Environmental Objectives is likely to be supported by the proposed SMP2 policy.
Dee (N Wales) 11a5.1-11a5.11)	N/A	**x** 11a5.X7, 5.8, 5.9, 5.11	✓	✓	**Yes-** Environmental Objective WFD2 may not be met in some management areas in these water bodies under SMP2 policies..
Mersey (11a7.1-11a7.9)	N/A	**x** 11a7.1, 7.3, 7.6, 7.7 & 7.9	✓	✓	**Yes-** Environmental Objective WFD2 may not be met in some management areas in these water bodies under SMP2 policies.
Alt (11a8.1-11a8.4)	N/A	✓	✓	✓	**No**- not necessary as delivery of Environmental Objectives is likely to be supported by the proposed SMP2 policy.
Ribble (11b1.1-11b1.21)	N/A	✓	✓	✓	**No**- not necessary as delivery of Environmental Objectives is likely to be supported by the proposed SMP2 policy.
Wyre (11c1-11c2)	N/A	X 11c1.4, 1.6, 1.8	✓	**x** 11c1.7, 2.3, 2.4	**Yes –** Environmental Objective WFD2 may not be met in some management areas in this transitional water body under proposed SMP2 policies **Yes-** Environmental Objective WFD4 may not be met in some management areas in this transitional water bodyi under proposed SMP2 policies.
Lune (11c3.1-11c.7)	N/A	✓	✓	✓	**No**- not necessary as delivery of Environmental Objectives is likely to be supported by the proposed SMP2 policy.
Kent (11c9.1-11c9.3)	N/A	**x** 11c7.1 & 7.3,	✓	✓	**No**- not necessary as delivery of Environmental Objectives is likely to be supported by the proposed SMP2 policy.

Water Body (and related SMP2 policy units)	Environmental objectives met?				WFD Summary Statement required?
	WFD 1	WFD2	WFD3	WFD4	
Leven (11c11.1-11c12.3)	N/A	Xx 11c12.2	✓	✓	**Yes –** Environmental Objective WFD2 may not be met in some management areas in this transitional water body under proposed SMP2 policies
Duddon (11c16.1-11c16.12)	N/A	✓	✓	✓	**No**- not necessary as delivery of Environmental Objectives is likely to be supported by the proposed SMP2 policy.
Esk (W) (11d3.1-11d3.3)	N/A	✓	✓	✓	**No**- not necessary as delivery of Environmental Objectives is likely to be supported by the proposed SMP2 policy.
Pow/Rottington (11d6.1-11d6.2)	N/A	✓	✓	✓	**No**- not necessary as delivery of Environmental Objectives is likely to be supported by the proposed SMP2 policy.
Derwent (11e2.11-11e3.1)	N/A	✓	✓	✓	**No**- not necessary as delivery of Environmental Objectives is likely to be supported by the proposed SMP2 policy.
Maryport (11e3.4-11e4.1)	N/A	✓	✓	✓	**No**- not necessary as delivery of Environmental Objectives is likely to be supported by the proposed SMP2 policy.
Solway (11e6.3-11e8.10)	N/A	✓	✓	✓	**No**- not necessary as delivery of Environmental Objectives is likely to be supported by the proposed SMP2 policy.

D.3.3.1 Environmental Objective (WFD1)

There are no High Status water bodies in The North West England and North Wales SMP2 area, therefore there are no Scenario Areas where SMP2 policy could result in a failure of this objective. This may be a consideration in future SMP2s and should continue to be scoped into further assessments.

D.3.3.2 Environmental Objective (WFD2)

Twelve Scenario Areas in The North West England and North Wales SMP2 area have the potential to contribute to a failure to meet environmental objective WFD2 (no change that will cause a failure to meet surface water Good Ecological Status or Potential or result in a deterioration of surface water status or potential). Several of these Scenario Areas are situated on open coast and as a result of SMP2 polices, HTL, there is the potential for coastal squeeze resulting in the loss of sandy foreshore and intertidal habitats. This could potentially impact macroalgae, phytoplankton and benthic and macro invertebrate. The use of MR in Scenario Area 11e3 may result in backdoor flooding of a freshwater pond resulting in impacts to the freshwater biology.

In Scenario Areas 11a7 and 11c7, HTL is the preferred policy in the short term followed by MR. There is the potential for reactivation of contaminated land and therefore impact on BQEs.

D.3.3.3 Environmental Objective (WFD3)

There is one Scenario Area (11b2), policy unit 11b2.9, where there is the potential to contribute to a failure in WFD3 (no changes which permanently prevent the Environmental Objectives of other water bodies being met). The proposed HTL policy (management of the groyne field) has the potential to disrupt sediment transport in the adjoining policy unit.

D.3.3.4 Environmental Objective (WFD4)

The preferred policy of three of the Scenario Areas in The North West England and North Wales SMP2 area has the potential to result in deterioration in groundwater status. Each of the Scenario Areas where deterioration is quoted as likely, has a preferred SMP2 policy of NAI or MR (in the case of 11c2) and will see a retreat in shoreline. Scenario Area 11c1 is located in the Dee Carboniferous Limestone and common with the other three Scenario Areas the policy may result in saline intrusion. Scenario Area 11c2 potentially impacts on Rufford Permo-Triassic Sandstone Aquifers and 11c15 on Fylde Permo-Triassic Sandstone Aquifers.

K.3.4 Step 4: Complete WFD summary statement

A summary of water bodies achievement (or otherwise) of the WFD environmental objective is listed in **Table 8**. Where the WFD environmental objective is not met a WFD summary statement is complete in **Table 9**.

Table 9 Water Framework Directive summary statement (Denoted in the Water Framework Directive: step by step process for assessing Shoreline Management Plan as Assessment Table 5)

Water body (including policy units that affect it)	Water Framework Directive Summary Statement Checklist	Provide a brief description of decision making and reference to further documentation within the SMP2
North Wales (11a2.3)	**Mitigation measures:** have all practicable mitigation measures been incorporated into the preferred SMP2 policies that affect this water body in order to mitigate the adverse impacts on the status of the water body? If not, then list mitigation measures that could be required.	Mitigation measures that could be required for the preferred SMP2 policies: Sediment transport study along the North Wales frontage, to monitor sediment supply from west and develop a strategic approach to future beach management; Examine ways to integrate defence schemes so as to improve the coastal landscapes; Develop protection methods that avoids linear defences; Ensure local management options to maintain a sand foreshore are incorporated into engineering measures to defend the frontage; Consider methods for HTL which may allow maintanence of substrate and lower abrasion; Discussion with landowners about the potential for habitiat creation; Develop methods of retaining sediments; Implement beach feeding strategies to maintain the health of the recreational beach resource Undertake studies to investigate MR opportunities to provide secondary set back defences in the medium term for habitat creation and/or flood storage; Investigate opportunities to create set back defence line to manage risks from breaches of the natural dune defence system; Consider options for natural development/retreat in medium to longer term; Develop coastal flood risk management strategy taking into account coastal process and flood risk linkages between open coast and Clywd estuary; Beach and coastal defence asset monitoring in conjunction with CERMS; Environmental monitoring of designated sites; Detailed monitoring of shingle to inform beach feeding strategy; Consider the use of development controls and buffer zones to limit exposed development; and Undertake consultation with key stakeholders and general public during strategy development Reference the SMP2 Action Plan.
	Overriding public interest: Can it be shown that the reasons for selecting the preferred SMP2 policies are reasons of overriding public interest (ROPI) and/or the benefits to the environment and to society of achieving the environmental objectives are outweighed by the benefits of the preferred SMP2 policies to human health, to the maintenance of health and safety or to sustainable development?	The policy of HTL will maintain the integrity of Penrhyn Bay and Rhos on Sea as coastal communities and provide flood risk management to communities of Towyn, Kinmel Bay, Pensarn and Belgrano. HTL is required to protect property and infrastructure assets- i.e. ROPI. Due the number of settlements dependant on these defences the benefits to human health, and the maintainance of health and safety requirements, outweigh the benefits of achieving the environmental objectives. - i.e. - ROPI HTL is likely to be the most cost effective option in the long term. Where there is undeveloped flood plain a lower standard of protection could be considered as there is overtopping storage capacity. No real environmental benefit to realign defences as very little space available due to railway constraints and any habitat creation is unlikely to be sustainable over 100 years. Defences restrict shingle movement, which may have an adverse effect on the SSSI in the future. Therefore future implementation of policies should take this into consideration. Holding the line will protect the cycleway and coastal path, recreational and tourist assets Large flood plain with high value of assets so HTL to manage flood risk has good economic justification. For further details of the economic justification and assets considered for protection see Appendix H- Economic Appraisal and sensitivity testing. Reference the Appendix 20 Statement of Case.
	Better environmental options: Have other significantly better options for the SMP2 policies been consider? Can it be demonstrated that those better environmental policy options which were discounted were done so on the grounds of being either technically unfeasible or disproportionately costly.	Neither NAI nor MR are considered practical options as the defences are required to protect the frontage from erosion. Impact on coastal assets would impact on the socio-economic development of the towns Penrhyn Bay, Rhos on Sea, Towyn, Kinmel Bay, Pensarn and Belgrano. Further, the removal of the groynes in a MR scenario would result in the probable reduction in beach width and fluvial flooding issues. The SMP2 has explored all options for this section of coast and has concluded that HTL is the most appropriate option. Reference the Appendix 20 Statement of Case.

Water body (including policy units that affect it)	Water Framework Directive Summary Statement Checklist	Provide a brief description of decision making and reference to further documentation within the SMP2
	Affect on other water bodies: Can it be demonstrated that the preferred SMP2 policies do not permanently exclude or compromise the achievement of the objectives of the Directive in water bodies within the same River Basin District that are outside of the SMP2 area?	The Environment Agency's Flood Map has been consulted to check that there are no landward fresh water bodies that could be impacted by SMP2 policies. SMP2 policies for policy units in nearby TraC water bodies (Anglesey North, North Wales, Clwyd and Dee Estuaries) have also been assessed within this report for potential to cause deterioration in Status/Potential.
	Other issues: Can it be shown that there are no other overriding issues that should be considered (such as designated site, recommendations of the Habitats Regulations Assessment)?	The Liverpool Bay pSPA is located offshore of this section of the SMP2. The Habitats Regulations Assessment concluded for this section that No Adverse Effects are anticipated on the Integrity of this European site. The groyne field restricts shingle movement therefore there may be an adverse affect on the SSSI in the future.
Mersey Mouth (11a5.11, 6.1,6.2,6.4)	**Mitigation measures:** have all practicable mitigation measures been incorporated into the preferred SMP2 policies that affect this water body in order to mitigate the adverse impacts on the status of the water body? If not, then list mitigation measures that could be required.	Mitigation measures that could be required for the preferred SMP2 policies: Sediment transport study along the Warrel frontage, to monitor sediment supply and develop a strategic approach to future beach management; Examine ways to integrate defence schemes so as to improve the coastal landscapes; Develop protection methods that avoids linear defences; Ensure local management options to maintain a sand foreshore are incorporated into engineering measures to defend the frontage; Consider methods for HTL which may allow maintanence of substrate and lower abrasion; Discussion with landowners about the potential for habitiat creation; Develop methods of retaining sediments; Implement beach feeding strategies to maintain the health of the recreational beach resource Undertake studies to investigate MR opportunities to provide secondary set back defences in the long term for habitat creation and/or flood storage; Investigate opportunities to create set back defence line to manage risks from breaches of the natural dune defence system; Consider options for natural development/retreat in the longer term; Develop coastal flood risk management strategy taking into account coastal process and flood risk linkages between open coast and Dee and Mersey estuaries; Beach and coastal defence asset monitoring in conjunction with CERMS; Environmental monitoring of designated sites; Consider the use of development controls and buffer zones to limit exposed development; and Undertake consultation with key stakeholders and general public during strategy development Reference the SMP2 Action Plan.
	Overriding public interest: Can it be shown that the reasons for selecting the preferred SMP2 policies are reasons of overriding public interest (ROPI) and/or the benefits to the environment and to society of achieving the environmental objectives are outweighed by the benefits of the preferred SMP2 policies to human health, to the maintenance of health and safety or to sustainable development?	At 11a5.11, HTL is required to protect Hilbre Island. At 11b2.9 HTL is required in combination with HTL on adjacent frontages to protect the large flood risk cell between Hilbre Point (Stanley Road) and Perch Rock (New Brighton) where there are a high concentration of properties at flood risk, and is justified on economic grounds due to the high value of the assets at risk. HTL is required to protect property and infrastructure assets- i.e. ROPI. This will provide benefits to human health and will maintain health and safety requirements outweighing the benefits of achieving the environmental objectives. For further details of the economic justification and assets considered for protection see Appendix H- Economic Appraisal and sensitivity testing. Reference the Appendix 20 Statement of Case.
	Better environmental options: Have other significantly better options for the SMP2 policies been consider? Can it be demonstrated that those better environmental policy options which were discounted were done so on the grounds of being either technically unfeasible or disproportionately costly.	MR and NAI would not offer the required level of protection to the assets at risk and would result in an increase in erosion and flood risk. The SMP2 has explored all options for this section of coast and has concluded that HTL is the most appropriate option although there are, as indicated in the SMP2, opportunity of limited MR in long term in unit 11a6.3. Reference the Appendix 20 Statement of Case.

Water body (including policy units that affect it)	Water Framework Directive Summary Statement Checklist	Provide a brief description of decision making and reference to further documentation within the SMP2
Morecambe Bay & Duddon Sands (11c1.4, 1.6, 1.8, 2.1, 2.2, 2.3, 2.4, 6.2, 12.2, 13.2, 13.3 & 13.4 & 11c15.3)	**Affect on other water bodies:** Can it be demonstrated that the preferred SMP2 policies do not permanently exclude or compromise the achievement of the objectives of the Directive in water bodies within the same River Basin District that are outside of the SMP2 area?	The Environment Agency's Flood Map has been consulted to check that there are no landward additional fresh water bodies that could be impacted by SMP2 policies. SMP2 policies for policy units in nearby TraC water bodies have also been assessed within this report for potential to cause deterioration in Status/Potential.
	Other issues: Can it be shown that there are no other overriding issues that should be considered (such as designated site, recommendations of the Habitats Regulations Assessment)?	No. The Habitats Regulations Assessment concluded that there are limited opportunities for managed realignment of NAI. Navigational training walls more important to management of intertidal areas than coastal defences, however potential for **Adverse Effect** on Dee Estuary SAC, SPA and Ramsar site, and on Mersey Narrows and North Wirral Foreshore potential SPA in long term if accretion does not keep pace with sea level rise.
	Mitigation measures: have all practicable mitigation measures been incorporated into the preferred SMP2 policies that affect this water body in order to mitigate the adverse impacts on the status of the water body? If not, then list mitigation measures that could be required.	Mitigation measures that could be required for the preferred SMP2 policies: Investigations into potential MR locations; Discussion with landowners regarding the potential for increased flood risk; Develop coastal flood risk management strategy taking into account coastal process and flood risk linkages between open coast and Wyre estuary; Undertake studies and consultation to investigate opportunities to set back the defence alignment.; Undertake a detailed examination of the benefits; Further investigate and monitor flood and erosion risk in realigned locations and the potential risk to the groundwater source protection zone; Investigate drainage options in the foreshore; Beach and coastal defence asset monitoring in conjunction with CERMS; Implementation of appropriate further mitigation measures based on the results of the monitoring and investigation; Environmental monitoring of designated sites; Long term monitoring of intertidal habitat required to assess the impacts of coastal squeeze into the long term epoch; Discussion with landowners about potential habitat enhancements; Undertake consultation with key stakeholders and general public during strategy development; Ensure SMP2 policies and flood and erosion risks are accounted for in the next revisions of land use plans; Potential coastal squeeze losses of intertidal habitat within internationally designated sites in long term; and Potential requirement for Habitats Regulations Assessment and continued consultation with Natural England needed. Reference the SMP2 Action Plan.
	Overriding public interest: Can it be shown that the reasons for selecting the preferred SMP2 policies are reasons of overriding public interest (ROPI) and/or the benefits to the environment and to society of achieving the environmental objectives are outweighed by the benefits of the preferred SMP2 policies to human health, to the maintenance of health and safety or to sustainable development?	Yes, HTL in some or all of the epochs in the various policy units is necessary to protect a significant of residential and commercial properties from flooding. MR in sections 11c, 2.3, 2.4 and NAI at 11c15.3 may see saline inundation into the total catchment (outer zone 3) of a groundwater source protection zone. This policy is dependent on further investigation. Establishing a wider saltmarsh area will deliver a more sustainable flood defence, protecting people and property in the wider flood cell, providing sustainable development and benefits to human health for a reduction in flood risk. NAI will result in naturally functioning sustainable coastline Setting back the defence line (e.g. to the A588) may result in an increase in extent of intertidal habitat allowing saltmarsh to roll back as sea levels rise. Potential for new intertidal habitat to help offset coastal squeeze losses elsewhere. isolated properties and land owners and visitors to Cockers ands Abbey could be affected by MR. Set back defence could be a smaller structure requiring less maintenance which will therefore be more cost effective than current defences. Reference the Appendix 20 Statement of Case.

Water body (including policy units that affect it)	Water Framework Directive Summary Statement Checklist	Provide a brief description of decision making and reference to further documentation within the SMP2
Cumbria (11b2.9, 11c2.1, 2.2, 2.3, 2.4, 13.2, 13.3 & 13.4)	**Better environmental options:** Have other significantly better options for the SMP2 policies been consider? Can it be demonstrated that those better environmental policy options which were discounted were done so on the grounds of being either technically unfeasible or disproportionately costly.	NAI and MR may result in the flooding of the sewage work and the contamination of the water body. HTL through all epochs may result in the loss of intertidal habitat in the long-term. Reference the Appendix 20 Statement of Case.
	Affect on other water bodies: Can it be demonstrated that the preferred SMP2 policies do not permanently exclude or compromise the achievement of the objectives of the Directive in water bodies within the same River Basin District that are outside of the SMP2 area?	The Environment Agency's Flood Map has been consulted to check that there are no landward additional fresh water bodies that could be impacted by SMP2 policies. SMP2 policies for policy units in nearby TraC water bodies have also been assessed within this report for potential to cause deterioration in Status/Potential.
	Other issues: Can it be shown that there are no other overriding issues that should be considered (such as designated site, recommendations of the Habitats Regulations Assessment)?	The Habitats Regulations Assessment concluded that there is potential for adverse effects on Morecambe Bay SAC, SPA and Ramsar site in some of these affected policy units in the long-term due to loss of intertidal habitat from coastal squeeze (if ongoing accretion does not continue in line with sea level rise).
	Mitigation measures: have all practicable mitigation measures been incorporated into the preferred SMP2 policies that affect this water body in order to mitigate the adverse impacts on the status of the water body? If not, then list mitigation measures that could be required.	Mitigation measures that could be required for the preferred SMP2 policies: Complete Beach management plan; Undertake a sediment transport study of the area; Develop coastal flood risk management strategy taking into account coastal process and flood risk linkages between open coast and Wyre estuary; Beach and coastal defence asset monitoring in conjunction with CERMS; Environmental monitoring of designated sites; Investigate local erosion and alternative methods for retaining sediments; Monitor beach levels and sediment transport to enable an effective beach management plan to be developed; Consider options for natural development/retreat in the long term; Undertake consultation with key stakeholders and general public during strategy development; and, Ensure SMP2 policies and flood and erosion risks are accounted for in the next revisions of land use plans. Reference the SMP2 Action Plan.
	Overriding public interest: Can it be shown that the reasons for selecting the preferred SMP2 policies are reasons of overriding public interest (ROPI) and/or the benefits to the environment and to society of achieving the environmental objectives are outweighed by the benefits of the preferred SMP2 policies to human health, to the maintenance of health and safety or to sustainable development?	HTL in some or all of the epochs will protect a significant number of properties from flooding. At 11b2.9 HTL is required in combination with HTL on adjacent frontages to protect the large flood risk cell between Cleveleys and Fleetwood where there are over 25,000 properties at flood risk, and is justified on economic grounds due to the high value of the assets at risk. HTL is required to protect property and infrastructure assets- i.e. ROPI. This will provide benefits to human health and will maintain health and safety requirements outweighing the benefits of achieving the environmental objectives. For further details of the economic justification and assets considered for protection see Appendix H- Economic Appraisal and sensitivity testing. Local amenity of golf course will be protected Into the long term Reference the Appendix 20 Statement of Case.
	Better environmental options: Have other significantly better options for the SMP2 policies been consider? Can it be demonstrated that those better environmental policy options which were discounted were done so on the grounds of being either technically unfeasible or disproportionately costly.	MR and NAI would not offer the required level of protection to the assets at risk and would result in an increase in erosion and flood risk. The SMP2 has explored all options for this section of coast and has concluded that HTL is the most appropriate option. Reference the Appendix 20 Statement of Case.

Water body (including policy units that affect it)	Water Framework Directive Summary Statement Checklist	Provide a brief description of decision making and reference to further documentation within the SMP2
	Affect on other water bodies: Can it be demonstrated that the preferred SMP2 policies do not permanently exclude or compromise the achievement of the objectives of the Directive in water bodies within the same River Basin District that are outside of the SMP2 area?	The Environment Agency's Flood Map has been consulted to check that there are no landward fresh water bodies that could be impacted by SMP2 policies. SMP2 policies for policy units in nearby TraC water bodies (Morecambe Bay and Duddon Sands coastal water body, Ribble, Kent and Leven transitional water bodies) have also been assessed within this report for potential to cause deterioration in Status/Potential.
	Other issues: Can it be shown that there are no other overriding issues that should be considered (such as designated site, recommendations of the Habitats Regulations Assessment)?	The Habitats Regulations Assessment concluded that there is potential for adverse effects on Morecambe Bay SAC, SPA and Ramsar site in the long-term due to coastal squeeze losses of intertidal habitat if accretion does not continue in line with sea level rise. This adverse effect may occur due to holding the line in policy units 11c2.1, 2.2, 2.3, 2.4, 13.2, 13.3 and 13.4.
Solway Outer South (11e2.1,2.2,2.3,2.4,2.5,2.6,2.7,2.8,3.1)	**Mitigation measures:** have all practicable mitigation measures been incorporated into the preferred SMP2 policies that affect this water body in order to mitigate the adverse impacts on the status of the water body? If not, then list mitigation measures that could be required.	Mitigation measures that could be required for the preferred SMP2 policies: Investigate potential contaminated land between Harrington Parks and Harrington Harbour to confirm long term policy (EA), implementation of appropriate further mitigation measures based on results of the monitoring and investigations; Develop protection methods that avoids linear defences; Consider methods for HTL which may allow maintanence of substrate and lower abrasion; Develop methods of retaining sediments; Investigate drainage option on the foreshore; Beach and coastal defence asset monitoring in conjunction with CERMS; Environmental monitoring of designated sites; Monitor risk to railway line between Harrington and the steel works site in order to facilitate timely construction of defences when the risk justifies. Ensure local management options to maintain a sand foreshore are incorporated into engineering measures to defend the frontage; Monitor erosion risk to assets and contaminated land between The Howe to Workington Harbour in order to construct new defences when justified; Consider method of MR that does not result in backdoor flooding of the Siddick Ponds; Ensure SMP2 policies and flood and erosion risks are accounted for in the next revisions of land use plans; and, Ensure flood and erosion risks are accounted for in planning decisions. Reference the SMP2 Action Plan.
	Overriding public interest: Can it be shown that the reasons for selecting the preferred SMP2 policies are reasons of overriding public interest (ROPI) and/or the benefits to the environment and to society of achieving the environmental objectives are outweighed by the benefits of the preferred SMP2 policies to human health, to the maintenance of health and safety or to sustainable development?	The policy of HTL will maintain railway line and associated infrastructure as a transport linkage between Whitehaven and Workington. In addition, this line services the national strategic power assets in the North West, Sellafield nuclear power station and associated facilities. These facilities are considered to be of national importance and their continued operation, in the medium term offer benefit to human health that outweigh the benefits of achieving the environmental objectives- i.e. - ROPI. In the long term, it is likely that alternative power sources will be developed and these assets will not longer hold their importance. For further details of the economic justification see Appendix H- Economic Appraisal and sensitivity testing. Maintains amenity and social value associated with harbour. Justification depends on commercial / amenity harbour use. Maintains integrity of Workington. Justification reliant on redevelopment - may require developer contributions. HTL (in 11e3.1) in short-term provides time to investigate the nature of potential contamination and landfill & to protect residual life of windfarms. MR policy will promote more sustainable shoreline with release of some sediment to local beaches to the north. Assets at risk of erosion & flooding unlikely to justify continuous defences for whole frontage Reference the Appendix 20 Statement of Case.

Water body (including policy units that affect it)	Water Framework Directive Summary Statement Checklist	Provide a brief description of decision making and reference to further documentation within the SMP2
		No adverse impacts on designated sites through holding the line. Protection of Parton Roman Fort Scheduled Monument. No adverse impacts on designated sites through holding the line. Potential loss of war memorial if defences are not maintained for the railway Additional risk of fluvial flooding along this frontage.
	Better environmental options: Have other significantly better options for the SMP2 policies been consider? Can it be demonstrated that those better environmental policy options which were discounted were done so on the grounds of being either technically unfeasible or disproportionately costly.	NAI and MR may result in damage to the railway line through flooding or erosion. The SMP2 has explored all options for this section of coast and has concluded that HTL is the most appropriate option. Reference the Appendix 20 Statement of Case.
	Affect on other water bodies: Can it be demonstrated that the preferred SMP2 policies do not permanently exclude or compromise the achievement of the objectives of the Directive in water bodies within the same River Basin District that are outside of the SMP2 area?	The Environment Agency's Flood Map has been consulted to check that there are no landward fresh water bodies that could be impacted by SMP2 policies. There is the potential for the saline inundation of Siddick Ponds (11e3.1), depending on the location of the set back defences. This potential would require assessment prior to the implementation of the SMP2 policy. SMP2 policies for policy units in nearby TraC water bodies (Inner Solway Firth and Cumbria Coastal Water) have also been assessed within this report for potential to cause deterioration in Status/Potential.
	Other issues: Can it be shown that there are no other overriding issues that should be considered (such as designated site, recommendations of the Habitats Regulations Assessment)?	There are no Natura 2000 sites within this section of the SMP2.
Dee (North Wales) (11a5.7, 5.8, 5.9 and 5.11)	**Mitigation measures:** have all practicable mitigation measures been incorporated into the preferred SMP2 policies that affect this water body in order to mitigate the adverse impacts on the status of the water body? If not, then list mitigation measures that could be required.	Mitigation measures that could be required for the preferred SMP2 policies: Develop a strategic approach to beach management and beach recharge for the whole north Wales frontage from Little Orme through to the Dee estuary. Strategy development should include a sediment transport study to assess monitoring data, review potential sediment sources, use numerical modelling and environmental for assessment of options and appraisal of costs and benefits. Complete the ongoing strategy studies for the Dee estuary and adjoining coastal flood cells to develop a consistent approach to management of flood risk in the large flood cells and inform Dee estuary wide strategy .(see item 3.1).The strategy will include a range of actions to manage the likelihood and consequences of flooding. Undertake Dee estuary wide study to investigate links between land contamination and flood risk management options in order to inform long term strategy on the requirements for implementation of measures to address any problems arising from this study including consideration of removal of contamination so as not to constrain future management. This work will focus on areas outside of the Wirral Undertake Dee Estuary wide managed realignment, habitat creation and flood storage study to inform the estuary wide strategy and develop any necessary mitigation Development of strategic approach to implementation of the SMP2 policies for Dee Estuary, considering flood risks from fluvial, coastal and land drainage issues. Undertake a qualitative risk assessment to identify particularly vulnerable communities along the frontage. Develop a more detailed economic case for the proposed policy, taking account of risks from contaminated land and to golf club land in order to inform future approaches at strategy level and confirm the viability of the policies at the next SMP review. Investigate erosion risks and justification and affordability of rebuilding defences at end of residual life. Confirm a funding source and or a viable adaptation strategy to inform SMP3 review. Also investigate legal issues around maintenance at Cubbins Green. Confirm arrangements for future maintenance. Reference the SMP2 Action Plan.

Water body (including policy units that affect it)	Water Framework Directive Summary Statement Checklist	Provide a brief description of decision making and reference to further documentation within the SMP2
Mersey (11a7.1, 7.3, 7.6 & 7.9)	**Overriding public interest:** Can it be shown that the reasons for selecting the preferred SMP2 policies are reasons of overriding public interest (ROPI) and/or the benefits to the environment and to society of achieving the environmental objectives are outweighed by the benefits of the preferred SMP2 policies to human health, to the maintenance of health and safety or to sustainable development?	The policy of HTL in these policy units manages the erosion risk to cliff-top properties, West Kirby, contaminated land and maintains some amenity assets including a golf course and West Kirby.
	Better environmental options: Have other significantly better options for the SMP2 policies been consider? Can it be demonstrated that those better environmental policy options which were discounted were done so on the grounds of being either technically unfeasible or disproportionately costly.	NAI and MR would result in the loss of some residential properties and the release of potentially contaminated material into the Dee Estuary.
	Affect on other water bodies: Can it be demonstrated that the preferred SMP2 policies do not permanently exclude or compromise the achievement of the objectives of the Directive in water bodies within the same River Basin District that are outside of the SMP2 area?	No other waterbodies will be affected.
	Other issues: Can it be shown that there are no other overriding issues that should be considered (such as designated site, recommendations of the Habitats Regulations Assessment)?	The Habitat Regulations Assessment concludes that there is a potential for an adverse effect on the Dee Estuary SAC, SPA and Ramsar site in the long-term epoch as a result of coastal squeeze of intertidal habitat, if accretion does not keep pace with sea level rise.
	Mitigation measures: have all practicable mitigation measures been incorporated into the preferred SMP2 policies that affect this water body in order to mitigate the adverse impacts on the status of the water body? If not, then list mitigation measures that could be required.	Mitigation measures that could be required for the preferred SMP2 policies: Mitigation measures are currently being developed as part of the SMP2. Investigate potential contaminated land to confirm long term policy (EA), implementation of appropriate further mitigation measures based on results of the monitoring and investigations; Develop protection methods that avoids linear defences; Consider methods for HTL which may allow maintanence of substrate and lower abrasion; Develop methods of retaining sediments; Ensure local management options to maintain a sand foreshore are incorporated into engineering measures to defend the frontage; Discussion with landowners about potential habitat enhancement and increased flood risk; Detailed examination of benfits; Investigate drainage options on the foreshore. Beach and coastal defence asset monitoring in conjunction with CERMS; Reference the SMP2 Action Plan.
	Overriding public interest: Can it be shown that the reasons for selecting the preferred SMP2 policies are reasons of overriding public interest (ROPI) and/or the benefits to the environment and to society of achieving the environmental objectives are outweighed by the benefits of the preferred SMP2 policies to human health, to the maintenance of health and safety or to sustainable development?	HTL will maintain the integrity of Wallasey, Bebington, Ellesmere Port, Runcorn, and conurbations, docks, ports and the Manchester Ship Canal, the Great Sankey Canal, Industry, docks and infrastructure i.e. - ROPI. Coastal squeeze issue created by HTL are mitigated by MR in other areas of the estuary. However, this is complicated by contaminated land issues and potential contamination of the water body. Opportunities for habitat creation in the medium / long term though further study. Justification is reliant on overall justification for defending canals and maintaining the integrity of infrastructure and industry at Warrington and Runcorn. This area is a large urban conurbation and HTL offer benefit to human health which, on balance, outweighes the benefits of achieving the environmental objectives. For further details of the economic justification and assets considered for protection see Appendix H- Economic Appraisal and sensitivity testing. Reference the Appendix 20 Statement of Case.
	Better environmental options: Have other significantly better options for the SMP2 policies been consider? Can it be demonstrated that those better environmental policy options which were discounted were done so on the grounds of being either technically unfeasible or disproportionately costly.	A continuation of HTL policy will see coastal squeeze of estuarine habitat. NAI may result in the release of contaminated sediment and advance the line will magnify any coastal squeeze issues. Reference the Appendix 20 Statement of Case.

Water body (including policy units that affect it)	Water Framework Directive Summary Statement Checklist	Provide a brief description of decision making and reference to further documentation within the SMP2
	Affect on other water bodies: Can it be demonstrated that the preferred SMP2 policies do not permanently exclude or compromise the achievement of the objectives of the Directive in water bodies within the same River Basin District that are outside of the SMP2 area?	The Environment Agency's Flood Map has been consulted to check that there are no landward fresh water bodies that could be impacted by SMP2 policies. SMP2 policies for policy units in nearby TraC water bodies have also been assessed within this report for potential to cause deterioration in Status/Potential.
	Other issues: Can it be shown that there are no other overriding issues that should be considered (such as designated site, recommendations of the Habitats Regulations Assessment)?	The Habitats Regulations Assessment concluded that Adverse Effects on the Integrity of the IMersey Estuary Ramsar Site, Mersey Estuary SPA and Mersey Narrows & North Wirral Foreshore pSPA and pRamsar Site) could occur in the long-term as a result of coastal squeeze of intertidal habitats, if accretion does not keep pace with sea level rise.
Wyre (11cl.4, 1.6,1.7, 1.8, 2.1, 2.2, 2.3 & 2.4)	**Mitigation measures:** have all practicable mitigation measures been incorporated into the preferred SMP2 policies that affect this water body in order to mitigate the adverse impacts on the status of the water body? If not, then list mitigation measures that could be required.	Mitigation measures that could be required for the preferred SMP2 policies: Discussion with landowners regarding the potential for increased flood risk; Develop coastal flood risk management strategy taking into account coastal process and flood risk linkages between open coast and Wyre estuary; Further investigate and monitor flood and erosion risk in realigned locations and the potential risk to the groundwater source protection zone; Implementation of appropriate further mitigation measures based on the results of the monitoring and investigation; Environmental monitoring of designated sites; Discussion with landowners about potential habitat enhancements; Undertake consultation with key stakeholders and general public during strategy development; Ensure SMP2 policies and flood and erosion risks are accounted for in the next revisions of land use plans; Beach and coastal defence asset monitoring in conjunction with CERMS; Environmental monitoring of designated sites. Reference the SMP2 Action Plan.
	Overriding public interest: Can it be shown that the reasons for selecting the preferred SMP2 policies are reasons of overriding public interest (ROPI) and/or the benefits to the environment and to society of achieving the environmental objectives are outweighed by the benefits of the preferred SMP2 policies to human health, to the maintenance of health and safety or to sustainable development?	Defences cannot be justified on a national economic basis. NAI supports the natural functioning of the estuary and mitigates potential loss of intertidal habitat due to coastal squeeze in areas of HTL along other stretches of the estuary. Reference the Appendix 20 Statement of Case.
	Better environmental options: Have other significantly better options for the SMP2 policies been consider? Can it be demonstrated that those better environmental policy options which were discounted were done so on the grounds of being either technically unfeasible or disproportionately costly.	HTL would require significant capital investment and cannot be justified at this location. MR although less capital investment, would require more than can be justified. For further details of the economic justification see Appendix H-Economic Appraisal and sensitivity testing. Reference the Appendix 20 Statement of Case.
	Affect on other water bodies: Can it be demonstrated that the preferred SMP2 policies do not permanently exclude or compromise the achievement of the objectives of the Directive in water bodies within the same River Basin District that are outside of the SMP2 area?	The Environment Agency's Flood Map has been consulted to check that there are no additional landward fresh water bodies that could be impacted by SMP2 policies. SMP2 policies for policy units in nearby TraC water bodies have also been assessed within this report for potential to cause deterioration in Status/Potential.

Water body (including policy units that affect it)	Water Framework Directive Summary Statement Checklist	Provide a brief description of decision making and reference to further documentation within the SMP2
	Other issues: Can it be shown that there are no other overriding issues that should be considered (such as designated site, recommendations of the Habitats Regulations Assessment)?	A separate Habitat Regulations Assessment has been undertaken to assess the predicted impact on the integrity of adjacent Ribble SPA and Ramsar site.
Kent (11c7.1 &7.3)	**Mitigation measures:** have all practicable mitigation measures been incorporated into the preferred SMP2 policies that affect this water body in order to mitigate the adverse impacts on the status of the water body? If not, then list mitigation measures that could be required.	Mitigation measures that could be required for the preferred SMP2 policies: Investigations into potential MR locations and and extents should be carried out including impacts on the Lune Estuary Channel and Agricultural Land loss; Investigate potential contaminated land to confirm long term policy (EA), implementation of appropriate further mitigation measures based on results of the monitoring and investigations; Develop coastal flood risk management strategy taking into account coastal processes and flood risk linkages between open coast and Lune estuary; Undertake studies and consultation to investigate opportunities to set back the defence alignment. Beach and coastal defence asset monitoring in conjunction with CERMS; Environmental monitoring of designated sites; Undertake consultation with key stakeholders and general public during strategy development; Ensure SMP2 policies and flood and erosion risks are accounted for in the next revisions of land use plans;and, Discussion with landowners regarding the potential for increased flood risk; Implementation of appropriate further mitigation measures based on the results of the monitoring and investigation; Discussion with landowners about potential habitat enhancements; Reference the SMP2 Action Plan.
	Overriding public interest: Can it be shown that the reasons for selecting the preferred SMP2 policies are reasons of overriding public interest (ROPI) and/or the benefits to the environment and to society of achieving the environmental objectives are outweighed by the benefits of the preferred SMP2 policies to human health, to the maintenance of health and safety or to sustainable development?	In policy unit 7.1 HTL is currently protecting infrastructure including the sewage works and railway line, HTL at 7.3 is protecting Pasture Lane landfill site. MR in the second epoch may cause flooding to the sewage works. That policy is dependent on the outcome of further studies, in which it is recommended that an assessment of the potential for inundation of these locations and the optimum position of the set back defences is addressed. Likely to be insufficient national economic case for long term HTL. For further details of the economic justification see Appendix H- Economic Appraisal and sensitivity testing. Reference the Appendix 20 Statement of Case.
	Better environmental options: Have other significantly better options for the SMP2 policies been consider? Can it be demonstrated that those better environmental policy options which were discounted were done so on the grounds of being either technically unfeasible or disproportionately costly.	NAI and MR may result in the flooding of the sewage work and the contamination of the water body. HTL through all epochs would result in a loss of intertidal habitat and these policy units would not mitigate the impact of HTL in other locations. Reference the Appendix 20 Statement of Case.

Water body (including policy units that affect it)	Water Framework Directive Summary Statement Checklist	Provide a brief description of decision making and reference to further documentation within the SMP2
	Affect on other water bodies: Can it be demonstrated that the preferred SMP2 policies do not permanently exclude or compromise the achievement of the objectives of the Directive in water bodies within the same River Basin District that are outside of the SMP2 area?	The Environment Agency's Flood Map has been consulted to check that there are no landward additional fresh water bodies that could be impacted by SMP2 policies. SMP2 policies for policy units in nearby TraC water bodies have also been assessed within this report for potential to cause deterioration in Status/Potential.
	Other issues: Can it be shown that there are no other overriding issues that should be considered (such as designated site, recommendations of the Appropriate Assessment)?	The Habitats Regulations Assessment commented; It is recommended that a more robust assessment of the HTL and MR Policies need to be undertaken through a Coastal or Flood Defence Strategy, which will include this Policy Unit, along with a more site specific Habitats Regulations Assessment to accompany the Strategy, in order to further explore the practicality and feasibility of this Policy option. In addition, it is recommended that studies are undertaken to investigate potential opportunities to set back the line of defences in the medium term. Provided that the preventative measures of additional studies and assessment can explore the practicality and feasibility of this Policy option, then it can be concluded that No Adverse Effects are anticipated on the Integrity of the International Sites at this stage.
Leven (11c12.2)	**Mitigation measures:** have all practicable mitigation measures been incorporated into the preferred SMP2 policies that affect this water body in order to mitigate the adverse impacts on the status of the water body? If not, then list mitigation measures that could be required.	Mitigation measures that could be required for the preferred SMP2 policies: Undertake studies & consultation to investigate managed realignment viability and associated affects on the Leven Estuary and adjacent bay and infrastructure such as the Leven Viaduct, to inform policy delivery and develop a long term strategy, including a more detailed Habitats Regulations Assessment. Confirm preferred technical approach, extents of managed realignments, potential for habitat gains and losses and inform RHCP. Develop and promote a Leven estuary flood risk management and adaptation strategy taking into account estuary process and effects of managed realignment elsewhere in the bay Undertake estuary and coastal defence asset monitoring in conjunction with Cell 11 Regional Monitoring Strategy to inform strategy and future SMP reviews Continued monitoring of the condition of designated sites to provide baseline data for future Habitat Regulations Assessments. Investigate need for adaptation programme to assist with delivering changes to policy. Reference the SMP2 Action Plan.
	Overriding public interest: Can it be shown that the reasons for selecting the preferred SMP2 policies are reasons of overriding public interest (ROPI) and/or the benefits to the environment and to society of achieving the environmental objectives are outweighed by the benefits of the preferred SMP2 policies to human health, to the maintenance of health and safety or to sustainable development?	Holding the line in policy unit 11c12.1 would manage the flood and erosion risk to the main A590 road, which is a key transport link for the region.
	Better environmental options: Have other significantly better options for the SMP2 policies been consider? Can it be demonstrated that those better environmental policy options which were discounted were done so on the grounds of being either technically unfeasible or disproportionately costly.	MR and/or NAI would not provide the necessary flood protection to the main A-road in this policy unit.
	Affect on other water bodies: Can it be demonstrated that the preferred SMP2 policies do not permanently exclude or compromise the achievement of the objectives of the Directive in water bodies within the same River Basin District that are outside of the SMP2 area?	There would be no known effect on other waterbodies.
	Other issues: Can it be shown that there are no other overriding issues that should be considered (such as designated site, recommendations of the Appropriate Assessment)?	The Habitats Regulations Assessment concluded that there may be an adverse effect in the long-term on Morecambe Bay SAC, SPA and Ramsar site as a result of coastal squeeze of intertidal habitat, if accretion does not continue in line with sea level rise.

K.4 Discussion and Conclusions

Some waterbodies within the Management Areas in North West England and North Wales SMP2 area bodies may experience deterioration in Ecological Status or Potential of the water bodies (particularly in the long-term, if sediment accretion does not keep pace with sea level rise) and therefore may fail WFD2, WFD3 or WFD4 environmental objectives. Where this is the case, summary statements have been completed, (Table 9), which assess the preferred SMP2 policies against Article 4.7 of the WFD. In Table 9, future mitigation measures are proposed and the reasons for policy selection are outlined.

The most significant potential failure is of environmental objective WFD4 through saline inundation of a groundwater body and where there is the potential for re-activation of contaminated sediments. There is potential for failure of WFD4 at;

(i) Wyre Estuary, Knott End Golf course (11c1.7), where monitoring is recommended by both the SMP2 and this WFD assessment;

(ii) Morecambe Bay and Duddon Sands coastal water, Fluke hall to Cocker Bridge (11c2.3) and Cocker Bridge to Glasson Dock (11c2.4), where a flood risk strategy and monitoring is recommended in the SMP2 mitigation measures; and,

(iii) Morecambe Bay and Duddon Sands coastal water, Hindpool to Lowsy Point (11c15.3), where a flood risk strategy and monitoring is recommended in the SMP2 mitigation measures.

There is a potential for re-activation of contaminated sediments at:

(i) Kent Estuary, Hest Bank to West Cain House and Red Bank Farm to Bolton-le-Sands Caravan Park (11c7.1&7.3), where investigations into potential MR locations and a development of a coastal flood risk management strategy taking into account coastal processes and flood risk linkages is proposed as mitigation in the SMP2.

(ii) Mersey Estuary, Runcorn Bridge to Arpley landfill site and the Sewage works to Runcorn Bridge (11a7.4 &7.6), where mitigation measures are to be confirmed as part of the SMP2 however would be likely to be similar as to those outline above.

As this WFD assessment was undertaken on a semi-retrospective basis it was able to recommend that the SMP2 boundary of the first policy unit (11a1.1) is moved to exclude Anglesey North from the assessment. This was done as part of the iterative development of the SMP2. Further, there is a case to move the boundaries of 11b2.9, 11d3.3 and 11d7.1 to align them with the associated water bodies. For all suggested boundary movement it is recommended that analysis of the coastal processes is undertaken prior to any reconsideration.

K.5 References

Environment Agency, 2009a, Water Framework Directive: step by step process for assessing Shoreline Management Plans, 82_09.

Environmental Agency, 2009b, [online], What's in your backyard?, Available: http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&lang=_e [Accessed 040909]

Environmental Agency, 2009c, [online], Water Framework Directive, Available: http://www.environment-agency.gov.uk/research/planning/33106.aspx [Accessed 040909]

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