

Annex 9.4

## Water Framework Assessment Directive

*(HR Wallingford)*



# **Able Marine Energy Park**

## **Water Framework Directive Assessment**

**Technical Note DER4712-01**



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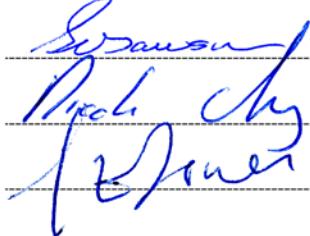
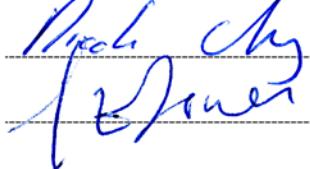
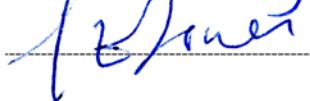
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## 1. *Introduction*

Able UK Ltd proposes to construct a Marine Energy Park (MEP) near Immingham on the southern bank of the Humber estuary. The MEP will provide a facility for the marine energy sector, initially for the construction of offshore wind turbines and other activities associated with renewable energy generation. An Environmental Impact Assessment (EIA) is being carried out and the Environmental Statement (ES) is being prepared. Separately, Able UK Ltd. has been asked by the Environment Agency (EA) to undertake a Water Framework Directive (WFD) Assessment to demonstrate compliance with the requirements of this Directive. The aim of the WFD is to achieve Good Ecological Status (or Good Ecological Potential for heavily modified water bodies) for river basins and their constituent water bodies. The MEP is located within the Humber Lower water body of the Humber River Basin.

The only other surface water body identified in the vicinity of the proposed development is the North Killingholme Haven Pits transitional water body (ID GB560402916700). There is occasional direct hydraulic connectivity between the Humber Lower and the North Killingholme Pits water bodies; however, this sluice is opened only at certain periods during the year. If the water in the lagoon is too high then the sluice is opened at low tide to allow water to flow from the lagoon to the Humber. If the water in the lagoon is too low then at high tide the sluice is opened to allow water to flow from the Humber to the lagoon. The location of the sluice gate itself is on the Humber side of the seawall in the north-west corner of the area, just outside the reserve. The water from the Humber already contains a high suspended sediment load and the increases in suspended solids associated with the dredging activity will be temporary and within the envelope of normal background levels. Further, there does not appear to be any mechanism by which on site construction activities (including drainage) or the subsequent operation of the site would affect this water body. HR Wallingford's report on dispersion modelling (EX6503) around the E.ON intake and outfall concludes that under existing conditions the plume from the outfall is rapidly dispersed so that water abstracted at the intake is less than 0.1°C above ambient temperature. The presence of a quay will force the plume from the outfall offshore parallel to the side of the quay in the direction of the intake. Therefore, while screening of this water body was carried out, it was not, subject to a detailed WFD assessment.

No groundwater bodies are likely to be impacted by the proposed development.

With respect to the WFD the key features of the development that may affect the Humber Lower water body are:

- Reclamation – The reclamation area is located within the footprint of the quay. It is anticipated that the total dredge quantities for the reclamation area will be 294,500 m<sup>3</sup>.
- Capital dredging – The total capital dredge will be approximately 1,609,200 m<sup>3</sup>.
- Disposal of dredged material – All material will be disposed of within the estuary in a number of disposal sites which will maintain the sediment supply. Sites are divided between erodible and non-erodible deposits.

## 2. WFD Assessment

The Environment Agency has provided guidance for assessing the compliance of dredging and disposal activities with the WFD in ‘Clearing the waters: marine dredging and the Water Framework Directive’. The guidance sets out a staged approach to ensuring WFD compliance i.e. screening, scoping, assessment and evaluation. As a capital (new) dredging and disposal project the MEP development is screened directly to the scoping stage. While the EA guidance was not designed for use for the reclamation aspects of the project, in the absence of any alternative guidance, HR Wallingford considers that the principles of the screening trigger tables can be applied as indicators as to whether a significant effect on WFD parameters is likely.

### 2.1 ASSESSMENT METHODOLOGY

Using the EA guidance and referring to the draft ES and its associated technical reports HR Wallingford has carried out a WFD assessment of the potential for the Marine Energy Park to have a *non-temporary* effect on WFD parameters that is *significant at water body level*. The outcome of the assessment is recorded in the Scoping Tables at Appendix A.

HR Wallingford has not undertaken a peer review or quality audit of the ES or the technical reports. While we have drawn our conclusions making reference to the ES, in cases where the ES conclusions may be unclear or the reasoning behind the impact assessment is not explained (e.g. sediment and water quality) we have used our experience to assess the likelihood of an effect on WFD parameters at water body level.

During the assessment it was necessary to make a number of assumptions, as follows:

- The scope of the EIA was agreed with the appropriate regulators and the Environment Agency (it is assumed that the EA response highlighted the issues of potential relevance to the WFD).
- The measures that are proposed to change zinc from ‘moderate’ in 2009 to ‘good’ in 2015 will not be affected by the proposed development.
- The Habitats Regulations Assessment (HRA) compensation proposal will ‘sign off’ the HRA (i.e. no outstanding issues regarding effects on the SPA-SAC).
- As the RBMP contains insufficient data for many parameters, we have assumed a parameter is at good status unless indicated otherwise in Annex B of the RBMP.
- Where data are not available for certain specific pollutants or hazardous priority substances due to their not forming part of routine sediment analysis for dredged material, we have based our assessment on our prediction of the likelihood of them being present at levels above CEFAS AL 1.
- Where a WFD parameter has been assessed in the EIA and, after reviewing the EIA, we are confident that there is unlikely to be an effect on the status of the water body we have indicated this in column 3 of the scoping table.
- Where WFD parameters are scoped in as requiring assessment but we have indicated that ‘no assessment is required’ in column 5a of the scoping table, this indicates that the assessment already included in the draft EIA is sufficient to support the conclusion that there will be no non-temporary effect on status at water body level.

An overview of the assessment and the conclusions is provided in Sections 2.2-2.5.

## 2.2 WFD WATER BODY CHARACTERISTICS

Reference to the 2009 Humber River Basin Management Plan (RBMP) confirms that the dredging, reclamation and disposal will all take place in the same water body – the Humber Lower transitional water body (ID GB530402609201). This is designated as a heavily modified water body (HMWB), with both flood protection and navigation cited as the reasons for this designation. The WFD ecological target for the water body is therefore good ecological potential (GEP) and, as with all surface water bodies, the default chemical status objective is good chemical status (GCS).

The water body-specific summary table in Annex B of the RBMP lists the following protected area designations as being relevant to the Humber Lower water body: Bathing Waters Directive; Freshwater Fish Directive; Habitats and/or Birds Directive; Nitrates Directive; Shellfish Waters Directive; and Urban Wastewater Treatment Directive.

The only other surface water body identified in the vicinity of the proposed development is the North Killingholme Haven Pits transitional water body (ID GB560402916700). The screening exercise concluded that while this water body is connected to the Humber Lower water body via a sluice mechanism this is not considered likely to result in a non-temporary effect on the status of the water body.

No groundwater bodies are likely to be impacted by the proposed development.

## 2.3 CURRENT STATUS OF HUMBER LOWER WATER BODY

Annex B of the Humber River Basin Management plan confirms that the Humber Lower water body is at moderate status overall. According to this Annex, the water body is currently failing to meet its WFD objectives in respect of benthic invertebrates, dissolved inorganic nitrogen, zinc and tributyl tin. It is also currently at moderate ecological potential because several technically viable mitigation measures are recorded as being ‘not in place’. These are all related to the flood protection aspect of the HMWB designation, and comprise measures to preserve and enhance marginal habitats, promote managed realignment, and replace hard defences with soft engineering solutions. Notwithstanding that these measures are related to flood risk management modifications, there may nonetheless be opportunities for other types of development to contribute to improving the ecological potential of the water body.

With the exception of zinc (for which a measure(s) is presumably envisaged although this is not clearly explained in the RBMP), the 2015 WFD target in respect of the other currently failing ecological and chemical parameters is unchanged from the present situation. The reasons cited for this continued failure include disproportionate cost and technical infeasibility – however, it is anticipated that the water body will meet its WFD objectives by 2027.

Insofar as protected areas are concerned, Annex D of the RBMP records the status of protected areas as shown in Table 1.

Annex D does not make clear why protected areas under the Freshwater Fish, Nitrates, and Urban Waste Water Treatment Directives are listed in Annex B for the Humber Lower transitional water body. However, from the initial application of the WFD assessment methodology and taking into account the outcomes of the EIA, it does not seem likely that the dredging, reclamation and disposal activities would have any effect on the ability of the water body to meet the objectives under these Directives. No further assessment of these protected area characteristics was therefore deemed necessary.

**Table 1 Protected Area Status**

Protected Area	Relevant Legislation	Status
Humber South East Shellfish Water	Shellfish Waters Directive (SWD)	Guideline fail, imperative pass
Cleethorpes recreational bathing water	Bathing Waters Directive (BWD)	Guideline pass; predicted compliance assessment under revised BWD, excellent
Humber Estuary SPA and SAC sites	Birds and Habitats Directives	Humber Estuary SPA not currently meeting water quality objectives; Humber Estuary SAC not meeting abstraction, by-catch, coastal squeeze, diffuse pollution or water quality objectives (however, both are due to meet their Article 4(1c) objectives by 2015)

## 2.4 NO DETERIORATION IN WFD STATUS

In all but one case where Step 1 in the scoping process identified a potential causal link for an effect on a WFD quality element, Step 5 subsequently concluded that no further assessment is required. These conclusions are based *inter alia* on the information provided in the ES which overall is considered sufficient to identify whether or not there is likely to be a non-temporary effect on status at water body level.

It is concluded that the proposed reclamation, dredging and disposal **will not cause a non-temporary deterioration in status at water body level** or otherwise affect the ability of the water body to achieve either its WFD objectives or relevant water-related protected area objectives.

The possible exception to the above conclusion relates to the presence of TBT in the sediments to be dredged. While the available chemical quality data indicate levels of TBT below CEFAS Action Level 1 it appears that only a portion of the sediment samples has been assessed for TBT. In particular the surface and shallow sub-tidal sediment does not appear to have been analysed for TBT. Given that there is the potential for TBT to be present in these sediments it is recommended that further analysis is carried out to confirm that TBT levels are acceptable across the material to be dredged. The WFD assessment should then be updated to reflect the outcome of that additional analysis.

The impact assessment and discussion in the ES are not repeated in this summary report however a full list of the documents referred to as part of the WFD assessment is included in Section 4.

## 2.5 CONTRIBUTING TO IMPROVEMENTS IN WFD STATUS

In addition to determining whether or not there will be an effect on status at water body level, it is also necessary to consider whether it is possible for a development (in this case the dredging, reclamation or disposal) to be carried out in such a way as to contribute to improving the status of failing WFD parameters in a cost effective and not disproportionately costly manner. Step 6 therefore highlights the failing parameters and identifies whether the development as planned (or with suggested modifications) might contribute to realising the wider WFD water body objectives.

With regard to the currently failing WFD parameters, the assessment identified the following:

- Benthic invertebrates: both the disposal method (i.e. retaining sediment within the system) and the intertidal habitat creation will contribute to some improvements in this parameter.
- Dissolved inorganic nitrogen: there are no opportunities associated with the development to improve this parameter.
- Zinc: there are no opportunities associated with the development to improve this parameter, and the development will not impact upon other proposed measures aimed at such improvement.
- GEP/mitigation measures assessment: both the disposal method (i.e. retaining sediment within the system) and the intertidal habitat creation will contribute to some improvements by benefiting marginal aquatic habitats; the compensation site will also help to realise the opportunities associated with managed realignment albeit that the driver in this case is not flood defence.
- Tributyl-tin: there are no opportunities associated with the development to improve this parameter.

### 2.5.1 *Benthic Invertebrates*

The WFD assessment concludes that there will not be an effect on benthic invertebrates that is non-temporary and significant at water body level. However, benthic invertebrates are currently the lowest scoring biological element and the Environment Agency has advised that this element is likely to achieve good status this year (2011) but remain close to the good/moderate status class boundary. It is, therefore, important to consider any effects of the MEP on the ability of benthic invertebrates to remain at good status (and, in due course, to move further away from this boundary and more securely into the good status class).

The ES has concluded that the loss of habitat and benthic communities is assessed to be of a local scale restricted to the zone of influence (i.e. the dredged area, dredge disposal sites and the quay footprint). All species found in the intertidal and subtidal areas are typical of this habitat type in the middle region of the Humber Estuary, with moderate abundance and diversity of mostly common species. There are no species of particular conservation importance although those present are key prey species for birds.

The total subtidal project footprint is estimated at 18.4 ha, which is 0.11% of the overall subtidal estuarine habitat of 16,800 ha. This loss of benthic invertebrate habitats will be offset by the creation of 110 hectares of new intertidal estuarine habitat including mudflat. This habitat will be in place during the construction works. The net gain in habitat for benthic invertebrates is considerable and, as such, the MEP is not considered likely to affect the ability of benthic invertebrates to remain at good status; rather it is likely to assist in achieving that aim.

### 2.5.2 *Effect on Mitigation Measures ‘not in place’*

As explained in Section 2.3 the Humber River Basin Management Plan identifies the requirement for mitigation measures related to the flood protection aspect of the HMWB designation. These measures are to preserve and enhance marginal habitats, promote managed realignment, and replace hard defences with soft engineering solutions. It is considered that the proposed intertidal compensation site associated with the MEP (which at 110 hectares is significantly greater than the area of intertidal habitat

lost) will complement and support the achievement of the proposed mitigation measures. With respect to engineering solutions for hard defences, although the MEP extends riverwards beyond the present land boundary it does not alter significantly the length of frontage that will be subject to hard defences. The MEP will not, therefore, compromise the mitigation measures ‘not in place’ for the Humber Estuary. Further, the compensation site is likely to contribute to the achievement of those measures.

### 3. *Conclusions*

HR Wallingford has reviewed the relevant draft ES chapters and associated technical reports prepared for the Marine Energy Park project and concluded that (subject to confirmation of TBT sediment levels) the project is not likely to have a non-temporary effect on the status of WFD parameters that is significant at water body level. The project is not predicted to cause deterioration to the current status of the Humber Lower water body nor prevent it achieving its future status objectives. Further, the intertidal habitat creation is likely to contribute to future improvements in WFD status.

## 4. References

Clearing the waters: marine dredging and the Water Framework Directive

[www.environment-agency.gov.uk](http://www.environment-agency.gov.uk)

Environmental Impact Assessment chapters and technical reports:

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Able UK Ltd (May 2011), Environmental Assessment, Chapter 9: Water and Sediment Quality (draft). Provided by Able UK Ltd to HR Wallingford Ltd (May 2011)

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## *Appendices*



## *Appendix A WFD Assessment Scoping Tables*



## Scoping Process Tables

**Table 4 Part a: Scoping the assessment DREDGING AND RECLAMATION**

Step	1		2		3				4	
	Identify issues		Record current status & 2015 objective		Consider likelihood of effect				Indicate data availability	
	Tick <b>all</b> potentially affected quality elements or identify <b>all</b> potentially affected protected area characteristics		Record current status of quality element (include level of confidence in assessment).	Record 2015 objective	Using existing knowledge and information indicate likelihood of a non- temporary effect <b>on status at water body level</b>				Indicate whether potentially useful data already exist for that quality element	
	1a	1b	2a	2b	3a	3b	3c	3d	4a	4b
	Tick quality elements highlighted via Screening Steps 3 - 4	Referring to trigger tables, tick quality elements where potential causal link exists	High/Good/Moderate/Poor/Bad for Ecological Elements or High/Fail for Chemical Elements or Protected Area status or Not Assessed		None	Unlikely	Likely	Not known	Data exist	Data do not exist
<b>WFD Parameter (quality elements, specific pollutant priority substance, Protected Area)</b>										
<b>Biological elements</b>										
Phytoplankton		N/A								
Other aquatic flora (e.g. saltmarsh and seaweed)		Y	No information provided	No information provided		Y			Y	
Benthic invertebrate fauna		Y	Moderate uncertain	Moderate		Y			Y	
Fish fauna (transitional only)		Y	Good	Good		Y			Y	
<b>Hydromorphological elements supporting biological elements</b>										
<b>Morphological conditions</b>										
Depth variation		N								
Bed		N								
Intertidal zone structure		Y	Moderate (assumed because GEP failing)	Moderate (cited as technically infeasible)		Y			Y	
<b>Tidal regime</b>										
Dominant currents (coastal water bodies only)		N/A								
Freshwater flow (transitional water bodies only)		N								
Wave exposure		Y	No information provided	No information provided		Y			Y	

Step	1		2		3				4	
	Identify issues		Record current status & 2015 objective		Indicate likelihood of effect				Indicate data availability	
	Tick <b>all</b> potentially affected quality elements or identify <b>all</b> potentially affected protected area characteristics		Record current status of quality element (include level of confidence in assessment).	Record 2015 objective	Using existing knowledge and information indicate likelihood of a non- temporary effect <b>on status at water body level</b>				Indicate whether potentially useful data already exist for that quality element	
	1a	1b	2a	2b	3a	3b	3c	3d	4a	4b
	Tick quality elements highlighted via Screening Steps 3 - 4	Referring to trigger tables, tick quality elements where potential causal link exists	High/Good/Moderate/Poor/Bad for Ecological Elements or High/Fail for Chemical Elements or Protected Area status or Not Assessed	None	Unlikely	Likely	Not known	Data exist	Data do not exist	
<b>WFD Parameter (quality elements, specific pollutant priority substance, Protected Area)</b>										
<b>Chemical and physico-chemical elements supporting biological elements</b>										
Transparency		Y	No information provided	No information provided		Y			Y	
Thermal conditions		N/A								
Oxygenation conditions		Y	High	High		Y			Y	
Salinity		N/A								
Nutrient conditions (e.g. nitrogen)		Y	Moderate uncertain	Moderate		Y			Y	
<b>Specific Pollutants</b>										
Arsenic		Y	High	High		Y			Y	
Chromium		Y				Y			Y	
Copper		Y	High	High		Y			Y	
Zinc		Y	Moderate uncertain	High		Y			Y	
PCBs (congeners to be confirmed by EA & CEFAS)		N								

Step	1		2		3				4	
	Identify issues		Record current status & 2015 objective		Indicate likelihood of effect				Indicate data availability	
	Tick <b>all</b> potentially affected quality elements or identify <b>all</b> potentially affected protected area characteristics		Record current status of quality element (include level of confidence in assessment).	Record 2015 objective	Using existing knowledge and information indicate likelihood of a non-temporary effect <b>on status at water body level</b>				Indicate whether potentially useful data already exist for that quality element	
	1a	1b	2a	2b	3a	3b	3c	3d	4a	4b
	Tick quality elements highlighted via Screening Steps 3 - 4	Referring to trigger tables, tick quality elements where potential causal link exists	High/Good/Moderate/Poor/Bad for Ecological Elements or High/Fail for Chemical Elements or Protected Area status or Not Assessed	None	Unlikely	Likely	Not known	Data exist	Data do not exist	
<b>WFD Parameter (quality elements, specific pollutant priority substance, Protected Area)</b>										
<b>Selected Priority Substances</b>										
Anthracene		Y	High	High		Y			Y	
Hexachlorobenzene, Hexachlorobutadiene and Hexachlorocyclohexane		Y Not routinely analysed for but assumed to be presented at similar levels to other PAHSSs	All high	All high		Y			Y	
Penta Bromodiphenyl ethers		Y Not routinely analysed for but assumed to be presented at similar levels to other PAHSSs				Y			Y	
Cadmium and its compounds		Y	High	High		Y			Y	
Fluoranthene		Y				Y			Y	
Lead and its compounds		Y	High	High		Y			Y	
Mercury and its compounds (PHS)		N	High	High					Y	
Naphthalene		Y	High	High		Y			Y	
Nickel and its compounds		Y	High	High		Y			Y	
Polyaromatic hydrocarbons (Benzo(a)pyrene) (Benzo(b)fluoranthene) (Benzo(g,h,i)perylene) (Benzo(k)fluoranthene) (Indeno(1,2,3-cd)pyrene) and benzo(g,h,i)perylene)		Y				Y			Y	
Tributyltin compounds		Y	Fail	Fail		Y (Further sampling and analysis required)			Y (Further sampling and analysis required)	

Step	1		2		3				4	
	Identify issues		Record Current status & 2015 Objective		Indicate likelihood of effect				Indicate data availability	
	Tick <b>all</b> potentially affected quality elements or identify <b>all</b> potentially affected protected area characteristics			Record current status of quality element (include level of confidence in assessment)	Record 2015 Objective	Using existing knowledge and information indicate likelihood of a non- temporary effect <b>on status at water body level</b>				Indicate whether potentially useful data already exist for that quality element
	1a	1b	2a	2b	3a	3b	3c	3d	4a	4b
	Tick quality elements highlighted via Screening Steps 3 - 4	Referring to trigger tables, tick quality elements where potential causal link exists	High/Good/Moderate/Poor/Bad for Ecological Elements or High/Fail for Chemical Elements or Protected Area status or Not Assessed	None	Unlikely	Likely	Not known	Data exist	Data do not exist	
<b>WFD Parameter (quality elements, specific pollutant priority substance, Protected Area)</b>										
<b>Protected Areas</b>										
Areas designated for the protection of economically significant aquatic species ( <b>shellfish waters</b> )		N	Guideline fail, imperative pass	Not known		Y			Y	
Bodies of water designated as recreational waters ( <b>bathing water</b> )		N	Guideline pass; predicted compliance assessment under revised BWD, excellent	Not known		Y			Y	
Nutrient-sensitive areas including Nitrate Vulnerable Zones, polluted Waters and Sensitive Areas		Y		Not known		Y			Y	
Areas designated for the protection of habitats or species where maintenance or improvement of the status of water is an important factor in their protection, including Natura 2000 sites ( <b>Special Areas of Conservation and Special protection Areas</b> )	Water dependent Interest Feature	Water dependent interest feature	Humber Estuary SPA not meeting water quality objectives  Humber Estuary SAC not meeting abstraction, by-catch, coastal squeeze, diffuse pollution or water quality objectives	Humber Estuary SPA and SAC both due to meet Art 4(c) objectives by 2015		Based on the HRA outcome			Y	

**Table 4 Part b: Confirming the scope of the assessment**

Step	5			6	7				8	
	Decide on level of assessment			Aim to Improve	Consider options for delivery of assessment				Confirm and agree scope	
	5a	5b	5c	6	7a	7b	7c	7d	8a	8b
	Indicate appropriate scope of assessment based on likelihood of effect on status at water body level				Proposed delivery mechanism(s) More than one option may be ticked if appropriate.				Tick when scope of assessment is agreed with regulator (e.g. MFA) or EA (if no other assessment mechanism applies)	
	No assessment required <i>(i.e. no further assessment to that carried out in the Environment Assessment)</i>	Overview/high level assessment	Detailed assessment	Aim to Improve (only applicable if water body is not already at Good Status)	Scope-in to project EIA	Scope-in to Maintenance Dredging Protocol or Appropriate assessment	Scope-in to project environmental appraisal	WFD-specific investigation required	Scope agreed with regulator	Scope agreed with EA
<b>WFD Parameter (quality elements, specific pollutant priority substance, Protected Area)</b>										
<b>Biological elements</b>										
Phytoplankton	N/A									
Other aquatic flora (e.g. saltmarsh and seaweed)	Y			Y	Y				Y	Y
Benthic invertebrate fauna	Y			Y	Y				Y	Y
Fish fauna (transitional only)	Y			Y	Y				Y	Y
<b>Hydromorphological elements supporting biological elements</b>										
<b>Morphological conditions</b>										
Depth variation	N/A									
Bed	N/A									
Intertidal zone structure	Y			Y	Y				Y	Y
<b>Tidal regime</b>										
Dominant currents (coastal)	N/A									
Wave exposure	Y				Y				Y	Y
<b>Chemical and physico-chemical elements supporting biological elements</b>										
Transparency	Y				Y				Y	Y
Thermal conditions	N/A									
Oxygenation conditions	Y				Y				Y	Y
Salinity	N/A									
Nutrient conditions (nitrogen)	Y				Y				Y	Y

Step	5			6	7				8	
	Decide on level of assessment			Aim to Improve	Consider options for delivery of assessment				Confirm and agree scope	
	Indicate appropriate scope of assessment based on likelihood of effect on status at water body level			All assessments must consider whether any measures can be taken to contribute towards improving water body status in respect of failing quality elements.	Proposed delivery mechanism(s) More than one option may be ticked if appropriate.				Tick when scope of assessment is agreed with regulator (e.g. MFA) or EA (if no other assessment mechanism applies)	
	5a	5b	5c	6	7a	7b	7c	7d	8a	8b
	No assessment required (i.e. no further assessment to that carried out in the Environment Assessment)	Overview/high level assessment	Detailed assessment	Aim to Improve	Scope-in to project EIA	Scope-in to Maintenance Dredging Protocol or Appropriate assessment	Scope-in to project environmental appraisal	WFD-specific investigation required	Scope agreed with regulator	Scope agreed with EA
<b>WFD Parameter (quality elements, specific pollutant priority substance, Protected Area)</b>										
<b>Specific Pollutants</b>										
Arsenic	Y				Y				Y	Y
Chromium	Y				Y				Y	Y
Copper	Y				Y				Y	Y
Zinc	Y				Y				Y	Y
PCBs (congeners to be confirmed by EA & CEFAS)										
<b>Selected Priority Substances</b>										
Anthracene (PHS)	Y				Y				Y	Y
Hexachlorobenzene, Hexachlorobutadiene and Hexachlorocyclohexane	Y				Y				Y	Y

Step	5			6	7				8	
	Decide on level of assessment			Aim to Improve	Consider options for delivery of assessment				Confirm and agree scope	
	Indicate appropriate scope of assessment based on likelihood of effect on status at water body level			All assessments must consider whether any measures can be taken to contribute towards improving water body status in respect of failing quality elements.	Proposed delivery mechanism(s) More than one option may be ticked if appropriate.				Tick when scope of assessment is agreed with regulator (e.g. MFA) or EA (if no other assessment mechanism applies)	
	5a	5b	5c	6	7a	7b	7c	7d	8a	8b
	No assessment required (i.e. no further assessment to that carried out in the Environment Assessment)	Overview/high level assessment	Detailed assessment	Aim to Improve	Scope-in to project EIA	Scope-in to Maintenance Dredging Protocol or Appropriate assessment	Scope-in to project environmental appraisal	WFD-specific investigation required	Scope agreed with regulator	Scope agreed with EA
WFD Parameter (quality elements, specific pollutant priority substance, Protected Area)										
Selected Priority Substances										
Penta Bromodiphenyl ethers	Y				Y				Y	Y
Cadmium and its compounds (PHS)	Y				Y				Y	Y
Fluoranthene	Y				Y				Y	Y
Lead and its compounds	Y				Y				Y	Y
Mercury and its compounds (PHS)	N									
Naphthalene	Y				Y				Y	Y
Nickel and its compounds	Y				Y				Y	Y
Polyaromatic hydrocarbons (PHS)	Y				Y				Y	Y
• (Benzo(a)pyrene) (PHS)										
• (Benzo(b)fluoranthene) (PHS)										
• (Benzo(g,h,i)perylene) (PHS)										
• (Benzo(k)fluoranthene)										
• (Indeno(1,2,3-cd)pyrene) and benzo(g,h,i)perylene) (PHS)										
Tributyltin compounds (PHS)	Y				Y (Further sampling and analysis recommended)				Y	Y

Step	5			6	7				8	
	Decide on level of assessment			Aim to Improve	Consider options for delivery of assessment				Confirm and agree scope	
	Indicate appropriate scope of assessment based on likelihood of effect on status at water body level			All assessments must consider whether any measures can be taken to contribute towards improving water body status in respect of failing quality elements.	Proposed delivery mechanism(s) More than one option may be ticked if appropriate.				Tick when scope of assessment is agreed with regulator (e.g. MFA) or EA (if no other assessment mechanism applies)	
	5a	5b	5c	6	7a	7b	7c	7d	8a	8b
	No assessment required (i.e. no further assessment to that carried out in the Environment Assessment)	Overview/high level assessment	Detailed assessment	Aim to Improve	Scope-in to project EIA	Scope-in to Maintenance Dredging Protocol Or Appropriate Assessment	Scope-in to project environmental appraisal	WFD-specific investigation required	Scope agreed with regulator	Scope agreed with EA
WFD Parameter (quality elements, specific pollutant priority substance, Protected Area)										
Relevant Protected areas										
Areas designated for the protection of economically significant aquatic species ( <b>shellfish waters</b> )				N/A						
Bodies of water designated as recreational waters ( <b>bathing waters</b> )				N/A						
Nutrient-sensitive areas including Nitrate Vulnerable Zones, polluted Waters and Sensitive Areas	Y			N/A	Y				Y	Y
Areas designated for the protection of habitats or species where maintenance or improvement of the status of water is an important factor in their protection, including Natura 2000 sites ( <b>Special Areas of Conservation and Special protection Areas</b> )	Y			Contribution delivered via HRA process	Y				Y	Y

## Scoping Process Tables

**Table 4 Part a: Scoping the assessment DISPOSAL**

Step	1		2		3				4	
	Identify issues		Record current status & 2015 objective		Consider likelihood of effect				Indicate data availability	
	Tick <b>all</b> potentially affected quality elements or identify <b>all</b> potentially affected protected area characteristics		Record current status of quality element (include level of confidence in assessment).	Record 2015 objective	Using existing knowledge and information indicate likelihood of a non- temporary effect <b>on status at water body level</b>				Indicate whether potentially useful data already exist for that quality element	
	1a	1b	2a	2b	3a	3b	3c	3d	4a	4b
	Tick quality elements highlighted via Screening Steps 3 - 4	Referring to trigger tables, tick quality elements where potential causal link exists	High/Good/Moderate/Poor/Bad for Ecological Elements or High/Fail for Chemical Elements or Protected Area status or Not Assessed		None	Unlikely	Likely	Not known	Data exist	Data do not exist
<b>WFD Parameter (quality elements, specific pollutant priority substance, Protected Area)</b>										
<b>Biological elements</b>										
Phytoplankton		N/A	No information provided	No information provided						
Other aquatic flora (e.g. saltmarsh and seaweed)		Y	Moderate uncertain	Moderate		Y			Y	
Benthic invertebrate fauna		Y	Good	Good		Y			Y	
Fish fauna (transitional only)		Y	No information provided	No information provided		Y			Y	
<b>Hydromorphological elements supporting biological elements</b>										
<b>Morphological conditions</b>										
Depth variation		N								
Bed		N								
Intertidal zone structure		N								
<b>Tidal regime</b>										
Dominant currents (coastal water bodies only)		N/A								
Freshwater flow (transitional water bodies only)		N								
Wave exposure		N								

Step	1		2		3				4	
	Identify issues		Record current status & 2015 objective		Indicate likelihood of effect				Indicate data availability	
	Tick <b>all</b> potentially affected quality elements or identify <b>all</b> potentially affected protected area characteristics		Record current status of quality element (include level of confidence in assessment).	Record 2015 objective	Using existing knowledge and information indicate likelihood of a non- temporary effect <b>on status at water body level</b>				Indicate whether potentially useful data already exist for that quality element	
	1a	1b	2a	2b	3a	3b	3c	3d	4a	4b
	Tick quality elements highlighted via Screening Steps 3 - 4	Referring to trigger tables, tick quality elements where potential causal link exists	High/Good/Moderate/Poor/Bad for Ecological Elements or High/Fail for Chemical Elements or Protected Area status or Not Assessed	None	Unlikely	Likely	Not known	Data exist	Data do not exist	
<b>WFD Parameter (quality elements, specific pollutant priority substance, Protected Area)</b>										
<b>Chemical and physico-chemical elements supporting biological elements</b>										
Transparency		Y	No information provided	No information provided		Y			Y	
Thermal conditions		N/A								
Oxygenation conditions		Y	High	High		Y			Y	
Salinity		N/A								
Nutrient conditions (e.g. nitrogen)		N/A								
<b>Specific Pollutants</b>										
Arsenic		Y				Y			Y	
Chromium		Y				Y			Y	
Copper		Y				Y			Y	
Zinc		Y				Y			Y	
PCBs (congeners to be confirmed by EA & CEFAS)		N								

Step	1 Identify issues		2 Record current status & 2015 objective		3 Indicate likelihood of effect				4 Indicate data availability	
	1a	1b	2a	2b	3a	3b	3c	3d	4a	4b
	Tick <b>all</b> potentially affected quality elements or identify <b>all</b> potentially affected protected area characteristics	Referring to trigger tables, tick quality elements where potential causal link exists	Record current status of quality element (include level of confidence in assessment).	Record 2015 objective	Using existing knowledge and information indicate likelihood of a non-temporary effect <b>on status at water body level</b>				Indicate whether potentially useful data already exist for that quality element	
	1a	1b	2a	2b	3a	3b	3c	3d	4a	4b
	Tick quality elements highlighted via Screening Steps 3 - 4	Referring to trigger tables, tick quality elements where potential causal link exists	High/Good/Moderate/Poor/Bad for Ecological Elements or High/Fail for Chemical Elements or Protected Area status or Not Assessed	None	Unlikely	Likely	Not known	Data exist	Data do not exist	
<b>WFD Parameter (quality elements, specific pollutant priority substance, Protected Area)</b>										
<b>Selected Priority Substances</b>										
Anthracene		Y	High	High		Y			Y	
Hexachlorobenzene, Hexachlorobutadiene and Hexachlorocyclohexane		Y Not routinely analysed for but assumed to be presented at similar levels to other PAHSS	All high	All high		Y			Y	
Penta Bromodiphenyl ethers		No information				Y			Y	
Cadmium and its compounds		Y	High	High		Y			Y	
Fluoranthene		Y				Y			Y	
Lead and its compounds		Y	High	High		Y			Y	
Mercury and its compounds (PHS)		N	High	High		Y			Y	
Naphthalene		Y	High	High		Y			Y	
Nickel and its compounds		Y	High	High		Y			Y	
Polyaromatic hydrocarbons (Benzo(a)pyrene) (Benzo(b)fluoranthene) (Benzo(g,h,i)perylene) (Benzo(k)fluoranthene) (Indeno(1,2,3-cd)pyrene) and benzo(g,h,i)perylene)		Y				Y			Y	
Tributyltin compounds		Y	Fail	Fail		Y (Further sampling and analysis required)			Y (Further sampling and analysis required)	

Step	1		2		3				4	
	Identify issues		Record Current status & 2015 Objective		Indicate likelihood of effect				Indicate data availability	
	Tick <i>all</i> potentially affected quality elements or identify <i>all</i> potentially affected protected area characteristics		Record current status of quality element (include level of confidence in assessment)	Record 2015 Objective	Using existing knowledge and information indicate likelihood of a non- temporary effect <i>on status at water body level</i>				Indicate whether potentially useful data already exist for that quality element	
	1a	1b	2a	2b	3a	3b	3c	3d	4a	4b
	Tick quality elements highlighted via Screening Steps 3 - 4	Referring to trigger tables, tick quality elements where potential causal link exists	High/Good/Moderate/Poor/Bad for Ecological Elements or High/Fail for Chemical Elements or Protected Area status or Not Assessed		None	Unlikely	Likely	Not known	Data exist	Data do not exist
WFD Parameter (quality elements, specific pollutant priority substance, Protected Area)										
Protected Areas										
Areas designated for the protection of economically significant aquatic species ( <b>shellfish waters</b> )		Y	Guideline fail, imperative pass			Y			Y	
Bodies of water designated as recreational waters ( <b>bathing water</b> )		N	Guideline pass; predicted compliance assessment under revised BWD, excellent							
Nutrient-sensitive areas including Nitrate Vulnerable Zones, polluted Waters and Sensitive Areas		N								
Areas designated for the protection of habitats or species where maintenance or improvement of the status of water is an important factor in their protection, including Natura 2000 sites ( <b>Special Areas of Conservation and Special protection Areas</b> )	Water dependent Interest Feature	Humber Estuary SPA not meeting water quality objectives	Water dependent interest feature	Humber Estuary SPA not meeting water quality objectives  Humber Estuary SAC not meeting abstraction, by-catch, coastal squeeze, diffuse pollution or water quality objectives		Y			Y	
		Y								
		Humber Estuary SAC not meeting abstraction, by-catch, coastal squeeze, diffuse pollution or water quality objectives								

**Table 4 Part b: Confirming the scope of the assessment**

Step	5			6	7				8	
	Decide on level of assessment			Aim to Improve	Consider options for delivery of assessment				Confirm and agree scope	
	Indicate appropriate scope of assessment based on likelihood of effect on status at water body level			All assessments must consider whether any measures can be taken to contribute towards improving water body status in respect of failing quality elements.	Proposed delivery mechanism(s) More than one option may be ticked if appropriate.				Tick when scope of assessment is agreed with regulator (e.g. MFA) or EA (if no other assessment mechanism applies)	
	5a	5b	5c	6	7a	7b	7c	7d	8a	8b
	No assessment required (i.e. no further assessment to that carried out in the Environment Assessment)	Overview/high level assessment	Detailed assessment	Aim to Improve (only applicable if water body is not already at Good Status)	Scope-in to project EIA	Scope-in to Maintenance Dredging Protocol or Appropriate assessment	Scope-in to project environmental appraisal	WFD-specific investigation required	Scope agreed with regulator	Scope agreed with EA
<b>WFD Parameter (quality elements, specific pollutant priority substance, Protected Area)</b>										
<b>Biological elements</b>										
Phytoplankton										
Other aquatic flora (e.g. saltmarsh and seaweed)	Y				Y				Y	Y
Benthic invertebrate fauna	Y			Retaining sediment in estuary will contribute	Y				Y	Y
Fish fauna (transitional only)	Y				Y				Y	Y
<b>Hydromorphological elements supporting biological elements</b>										
<b>Morphological conditions</b>										
Depth variation										
Bed										
Intertidal zone structure				Retaining sediment in estuary will contribute						
<b>Tidal regime</b>										
Dominant currents (coastal)										
Wave exposure										
<b>Chemical and physico-chemical elements supporting biological elements</b>										
Transparency	Y				Y				Y	Y
Thermal conditions										
Oxygenation conditions	Y				Y				Y	Y
Salinity										
Nutrient conditions (nitrogen)										

Step	5			6	7				8	
	Decide on level of assessment			Aim to Improve	Consider options for delivery of assessment				Confirm and agree scope	
	Indicate appropriate scope of assessment based on likelihood of effect on status at water body level			All assessments must consider whether any measures can be taken to contribute towards improving water body status in respect of failing quality elements.	Proposed delivery mechanism(s) More than one option may be ticked if appropriate.				Tick when scope of assessment is agreed with regulator (e.g. MFA) or EA (if no other assessment mechanism applies)	
	5a	5b	5c	6	7a	7b	7c	7d	8a	8b
	No assessment required (i.e. no further assessment to that carried out in the Environment Assessment)	Overview/high level assessment	Detailed assessment	Aim to Improve	Scope-in to project EIA	Scope-in to Maintenance Dredging Protocol or Appropriate assessment	Scope-in to project environmental appraisal	WFD-specific investigation required	Scope agreed with regulator	Scope agreed with EA
WFD Parameter (quality elements, specific pollutant priority substance, Protected Area)										
Specific Pollutants										
Arsenic	Y				Y				Y	Y
Chromium	Y				Y				Y	Y
Copper	Y				Y				Y	Y
Zinc	Y			No	Y				Y	Y
PCBs (congeners to be confirmed by EA & CEFAS)										
Selected Priority Substances										
Anthracene (PHS)	Y				Y				Y	Y
Hexachlorobenzene, Hexachlorobutadiene and Hexachlorocyclohexane	Y				Y				Y	Y

Step	5			6	7				8	
	Decide on level of assessment			Aim to Improve	Consider options for delivery of assessment				Confirm and agree scope	
	Indicate appropriate scope of assessment based on likelihood of effect on status at water body level			All assessments must consider whether any measures can be taken to contribute towards improving water body status in respect of failing quality elements.	Proposed delivery mechanism(s) More than one option may be ticked if appropriate.				Tick when scope of assessment is agreed with regulator (e.g. MFA) or EA (if no other assessment mechanism applies)	
	5a	5b	5c	6	7a	7b	7c	7d	8a	8b
	No assessment required (i.e. no further assessment to that carried out in the Environment Assessment)	Overview/high level assessment	Detailed assessment	Aim to Improve	Scope-in to project EIA	Scope-in to Maintenance Dredging Protocol or Appropriate assessment	Scope-in to project environmental appraisal	WFD-specific investigation required	Scope agreed with regulator	Scope agreed with EA
WFD Parameter (quality elements, specific pollutant priority substance, Protected Area)										
Selected Priority Substances										
Penta Bromodiphenyl ethers	Y				Y				Y	Y
Cadmium and its compounds (PHS)	Y				Y				Y	Y
Fluoranthene	Y				Y				Y	Y
Lead and its compounds	Y				Y				Y	Y
Mercury and its compounds (PHS)	N									
Naphthalene	Y				Y				Y	Y
Nickel and its compounds	Y				Y				Y	Y
Polyaromatic hydrocarbons (PHS)	Y				Y				Y	Y
• (Benzo(a)pyrene) (PHS)										
• (Benzo(b)fluoranthene) (PHS)										
• (Benzo(g,h,i)perylene) (PHS)										
• (Benzo(k)fluoranthene)										
• (Indeno(1,2,3-cd)pyrene) and benzo(g,h,i)perylene) (PHS)										
Tributyltin compounds (PHS)	Y			No	Y (Further sampling and analysis required)				Y	Y

Step	5			6	7				8	
	Decide on level of assessment			Aim to Improve	Consider options for delivery of assessment				Confirm and agree scope	
	Indicate appropriate scope of assessment based on likelihood of effect on status at water body level			All assessments must consider whether any measures can be taken to contribute towards improving water body status in respect of failing quality elements.	Proposed delivery mechanism(s) More than one option may be ticked if appropriate.				Tick when scope of assessment is agreed with regulator (e.g. MFA) or EA (if no other assessment mechanism applies)	
	5a	5b	5c	6	7a	7b	7c	7d	8a	8b
	No assessment required (i.e. no further assessment to that carried out in the Environment Assessment)	Overview/high level assessment	Detailed assessment	Aim to Improve	Scope-in to project EIA	Scope-in to Maintenance Dredging Protocol Or Appropriate Assessment	Scope-in to project environmental appraisal	WFD-specific investigation required	Scope agreed with regulator	Scope agreed with EA
WFD Parameter (quality elements, specific pollutant priority substance, Protected Area)										
Relevant Protected areas										
Areas designated for the protection of economically significant aquatic species ( <b>shellfish waters</b> )	Y			No	Y				Y	Y
Bodies of water designated as recreational waters ( <b>bathing waters</b> )	Y			No	Y				Y	Y
Nutrient-sensitive areas including Nitrate Vulnerable Zones, polluted Waters and Sensitive Areas	Y			No	Y				Y	Y
Areas designated for the protection of habitats or species where maintenance or improvement of the status of water is an important factor in their protection, including Natura 2000 sites ( <b>Special Areas of Conservation and Special protection Areas</b> )	Y			Compensation Selected disposal method and compensation identified in HRA could both contribute	Y				Y	Y