Planning Act 2008
Infrastructure Planning (Changes to, and Revocation of, Development Consent Orders) Regulations 2011
Document reference: TR030006/D4/16

Able Marine Energy Park

Material Change 2

Applicant's Response to the MMO's D3 submission (REP3-019)

Responses to MMO comments of 18 January 2022:

1. MMO Comments on Relevant Representations (RR)

Natural England (NE) [Examination Library Reference REP1-036]

1.1 No comment from HR Wallingford.

Environment Agency (EA) [Examination Library Reference REP1-032]

1.2 Noted . No action from HR Wallingford.

Able Humber Ports Limited [Examination Library Reference REP1-026]

1.3 Noted. No action from HR Wallingford.

1.4 Noted. No action from HR Wallingford.

Historic England (HE) [Examination Library Reference REP1-039]

1.5 Noted. No action from HR Wallingford.

2. Comments on any amendments made to the Draft Amendment Order (DAO) by the Applicant at Deadline 1

2.1. No comment from HR Wallingford.

3. Comments on Applicant's proposed change to construction sequence that were not available at Deadline 2.

MMO comments on "Modelling of sediment plume dispersion from AMEP construction activities" by HR Wallingford [Examination Library Reference AS-005]. The MMO have requested an update to the report to address the comments they raise.

MMO Comment

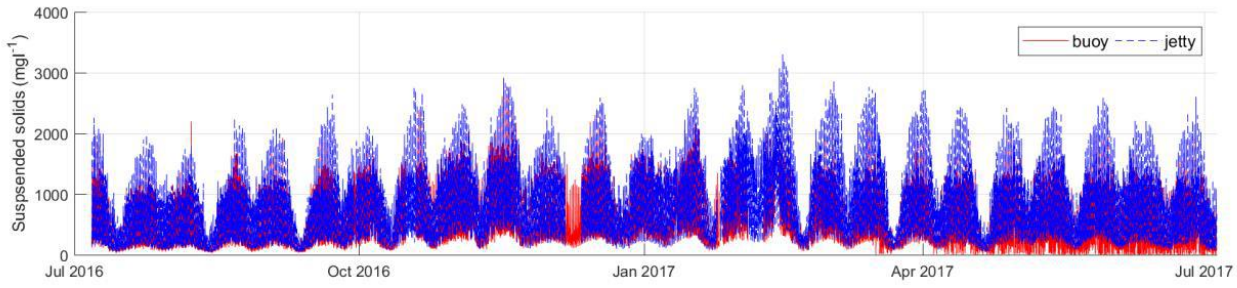
3.1 The MMO note that Sections 6.2.1 (early phase) and 6.3.1 (late phase) present data on depth-averaged suspended sediment concentration (SSC) increases, which indicate (absolute) increases over background of up to 50mg/l. The general conclusion is that the absolute increases are low in an estuary context. However, Section 4 (background SSC) lists peak SSC (at various estuary locations around the site) which the MMO consider would be more valuable presented as background values (while minimum values would be indicative of the potential worst case instantaneous change). It can be assumed that the works will occur at 'off-peak' times (i.e., dredging is not likely to occur in excessive weather/flow states associated with peak SSC) so the relative increase over background is not well represented. While the MMO appreciate that the peak value shows that very high SSC is not unusual in the location, comparison with the mean would make a stronger point with respect to the significance of the chronic effect.

HR Wallingford response

The approach adopted in the HR Wallingford sediment plume report to the presentation of predicted increases in sediment concentrations arising from dredging activities is the same as in previous reports. Results are presented in the form of instantaneous plots of suspended sediment concentration levels above background levels at specific stages of the tide and as a plot of the envelope of peak suspended sediment concentration predicted over the course of the simulation period (a spring-neap cycle) regardless of the state of the tide.

Available information on measured concentrations in the vicinity of the AMEP site were described in HR Wallingford Report DER6453-RT002-R04-00, June 2021 and then summarised in this and previous reports to provide a context for comparison. The general conclusion for the dredging activities simulated is that the absolute increases are comparable to those previously assessed for the amended scheme with BHD loading barges and that the impacts are considered low in an estuary context. This is the important point arising from these further studies.

The MMO are suggesting that the peak SSC described may occur at times of excessive weather or river flow states and that dredging may not occur at these times. This is not necessarily the case for an estuarine environment. The factors most influencing SSC in the vicinity of the AMEP site will likely be tidal range, tidal surge; river discharge/rainfall and local wind wave action. It is not certain that any of these conditions, except perhaps exceedingly high winds, would affect the dredging activity (and as acknowledged, dredging vessels would be very unlikely to operate in such conditions in any case). The figure below (Figure 12 from UES Appendix UES9.3) shows the time measurements of suspended sediment concentration at two locations in proximity to the AMEP site measured over a year. The strong correlation with the spring-neap tidal cycle can clearly be seen, with elevated concentrations (typically peaking at 2,000 to 3,000 mg/l) at the time of spring tides and reduced concentrations at the time of neap tides (typically peaking at 200 to 500 mg/l).



Source Figure 12 of Appendix UES9.3

Given the low levels of suspended sediment increase above background levels predicted to occur for the simulated dredging activity and the time varying nature of natural suspended sediment concentrations over the course of a spring-neap cycle it is not appropriate, in the view of HR Wallingford, to consider the plume concentrations, for this particular dredging activity, against the

mean measured concentrations. This approach was not requested by the MMO for other simulation results presented.

MMO Comment

3.2 The MMO also consider that the report does not discuss in significant depth the change in SSC relative to the previous phasing of construction works - the nominal subject of this report being the relative consequence of changing the construction sequence. However, the report also presents (i) deposition in Sections 6.2.2 and 6.3.2 (being little more than a few mm per tidal cycle, and therefore effectively undetectable by depth monitoring methods), and (ii) the increase in infill at nearby berths (Table 6.1 and 6.2). The increase in infill relative to previous modelling is largely negligible, except for the nearby South Killingholme Oil Jetty – here, the infill increases 12-fold (to 38m3 per tidal cycle) for the first phase and 70-fold (to 219m3) in the late-stage results. The MMO consider that it would be of value to know how these volumes compare with typical maintenance dredge requirements i.e., an explicit demonstration that maintenance dredge requirements are unaffected by this volume. In addition, for further confidence, the MMO would like to see a simple numerical (or graphical/mapping) indication of the relative magnitudes of SSC increase relative to the mean, and infill at the oil jetty berth.

HR Wallingford response

In the previous studies supporting the application plume modelling was not undertaken to illustrate the reclamation stages of the construction. The dredging strategy described the works that would be undertaken including the reclamation. The reclamation activity itself was envisaged to be discharge of dredged material into confined areas (i.e. cells created by cross dams and bunds) where the source of plumes arising from the reclamation would be run-off of transport water and accompanying fines.

Given the proposed change to the construction, to undertake open reclamation (i.e. without the confinement provided by closed cells) it was considered helpful to illustrate the proposed open reclamation activity. The reclamation activity is proposed to take place over about 10 months. At times (on two occasions for up to a month each) there will also be BHD dredging loading into barges occurring whilst the reclamation takes place. It was decided to simulate these occasions, when there will be reclamation run-off in combination with BHD dredging activity, and to compare these results with those presented previously for the BHD operations. The comparison that is made is with the previously presented BHD loading barges. There is no previously presented plume simulation work on the reclamation activity itself because the losses from this activity were expected to be minimal.

The report presents the results in the same format as for previous plume modelling studies and hence presents patterns and rates of deposition and volumes of infill at nearby berths. Importantly the report uses the flow patterns arising from the part constructed works. The previously published results used either the baseline flow conditions, representative of the very start of the construction

programme, or the final scheme flow conditions, representative of the end of the construction programme.

The results of the new plume simulations show that compared to the previous simulations the predicted increases in infill at nearby berths are negligible except at South Killingholme Oil Jetty (SKOJ) where additional infill is predicted as a result of the combined effects of the changes to the hydrodynamics associated with the stage of construction, the location of the BHD operation and the effects of reclamation run-off compared to the previous simulations of BHD seawards of the AMEP quay.

The Applicant understands from the Operator that no maintenance dredging is currently carried out at SKOJ so any siltation that occurred would likely be due to AMEP if there were no other wider changes in the estuary or at other berths. For the downstream Immingham Riverside berths including SKOJ the average annual quantity dredged and disposed over the period 2016 to 2019 was 3,447,000 wet tonnes. Based on the proposed construction sequence (10 months of reclamation and up to 2 months of BHD operations) the additional monthly infill predicted at SKOJ is between a maximum of 70 m^3 and 430 m^3. The SKOJ berth will be regularly surveyed during the construction period and protective provisions are in place should there be sedimentation in the berths above the typical background rates.

MMO Comment

3.3 The application does not address what impact the third cross dam listed amongst the material changes would have and how this relates to the modelling presented - the phrase ‘cross dam’ does not appear in the document. The MMO consider it is unlikely to have a significant impact on the overall conclusions and is unlikely to require additional modelling, however, for clarification purposes, the MMO request comments (quantitively) on the physical impact of this feature relative to the modelling presented i.e., whether the cross dam has any new pathway to impact as a result of the new construction phasing.

HR Wallingford response

The cross dams referred to in the list of material changes are to be constructed from landward by land based plant placing suitable material along the alignment of the cross dam. Release of fines from this activity has not been assessed specifically but is expected to be low compared to other construction activities. This early stage construction activity would be similar between the original scheme and the modified scheme. The land based construction of the cross bunds does not introduce a new pathway for impact compared to the previous design.

The main effects of the construction of the cross dams will be on the hydrodynamics rather than the release of fines. The first cross dam (northern) will create zones of recirculation over the adjacent intertidal and shallow subtidal. The second (southern) will create an embayment between the two cross bunds and modify the flow patterns there as well as extending the overall area along the foreshore where flows are modified. As the construction of the front berm and quay wall progresses

along with the reclamation and dredging the flow patterns are further modified in the footprint of the reclamation. To seaward where the berm/quay wall is completed the flow will becomes more trained along the quay wall alignment, with flows approaching that of the final layout. The third, internal, cross dam will have only minor influence on the flow regime against the context of these changes during the construction sequence.

HR Wallingford, 1st February 2022