Kyleakin Pier – Request for clarification of issues relating to Chapter 18 of EIS.

Response to comments made by SNH email 28th December 2016 as applied to the Addendum (March 6th) to the report

Comment 2

The modelling of the sediment plumes and sediment deposition was undertaken for the proposed tendered dredging scenario over the full dredging period which ranged from 84 days to 105 days depending upon the Tenderer. In order to be conservative a Force 3 wind from the south was applied over the entire dredging period. Given the length of the dredging period it is likely that winds will actually come from a range of directions with variable strengths during the period thus we consider that the use of a F3 southerly wind over the entire period is appropriate and conservative.

Wind driven currents are primarily surface currents and thus only affect surface plumes. In stronger winds wave action tends to mix the surface layer with the overall water column and thus the sediment plume is more affected by the tidal currents than a surface current. Added to this is the fact that there is generally no overspill during the dredging operations planned for the development so surface plumes will not dominate the losses to the water column from the dredging operations. Thus the application of a Force 3 southerly wind over the entire dredging period is appropriate and conservative.

Comment 3

The inner and outer dredging areas are illustrated in Figures 8.2, 8.3 and 8.4 of RPS' Hydraulic Modelling Report. For convenience, these areas have been illustrated again in Figure C3.1A below. The inner and outer dredge areas were chosen to reflect the heterogeneous nature of the sediments comprising the seabed in these areas and the possible dredging methods that could be used to dredge each respective area.

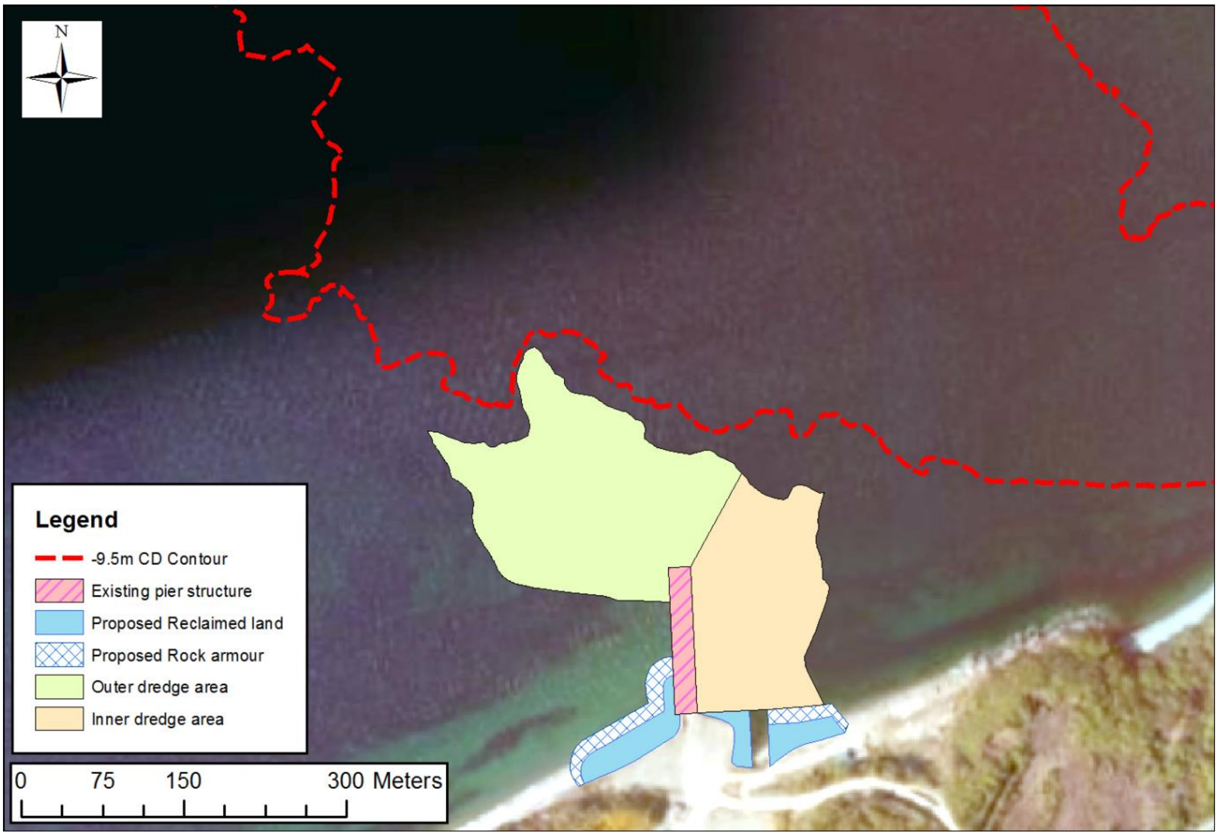

Figure C3.1A: Location and extent of the proposed dredge area in relation to -9.5m CD contour.

The dredging simulations have been undertaken for the dredging of both areas using a Backhoe Dredger as per the tenderers proposals. Thus no part of the dredging has been omitted from the simulations. Figure AD5 in the Addendum Document presents examples of the typical dredging plumes at various stages of the tidal cycle to give the reader an idea of how the plumes move about under the influence of the tide. The plume for the "inner" area was selected as the bed sediment in the "inner" area include finer material than in the "outer" area making the plumes from the inner area more visible than those during the dredging of the outer area.

As noted in the text, the plume concentrations in the area adjacent to the flame shell beds were less than 25 mg/L (equivalent to 0.025kg/m^3) and only approached this concentration for a very short period during the dredging. Thus it is not surprising that Figure AD7, which illustrates the deposition levels at the end of the 84 day BHD dredging campaign, shows deposition of sediments in the region of the flame shell bed to be less than 0.50mm.

An early draft of the coastal process chapter included maximum SSC envelope plots for each of the dredging scenarios. However, as these plots represent the maximum value that occurs at each point in space at any time throughout the dredging operation even if it only occurs for one numerical time step, RPS have found that these plots can often be misleading and can cause undue concern if misunderstood. In order to avoid potential confusion, it was decided to omit these maximum plots from the final version of RPS' Hydraulic Modelling Report.

In the interest of completeness, the maximum SSC envelop and the maximum bed thickness envelop from the BHD dredging campaign simulations have been presented overleaf.

The maximum SSC envelop illustrates the area that is covered by the dredging plume as the dredger moves back and forth across the dredge area. The simulation included the effect of tidal and wind driven currents over the full period of the dredging operations. As noted previously, the value of the SSC illustrated in the figure is the maximum value that occurs at each point in space at any time throughout the dredging operation even if it only occurs for one numerical time step.

In a similar manner, the maximum bed level change envelop plot illustrates the maximum deposition depth of sediment over the area at any time during the dredging operation. This figure can include material that to settle on the seabed at slack water before being subsequently re-suspended by the increasing tidal flow. A comparison can be made between the maximum deposition depths plot and the deposition depth plot at the end of the simulation to see the areas where temporally deposited sediment has been re-suspended.

The maximum envelop plots for the tenderers dredging proposals are presented overleaf. These diagrams can be compared with the mean SSC and the deposition depth at the end of the dredging simulations shown in Figures AD6 and AD7 in the Addendum to the report.

Tenderers proposed BHD methodology with dredging period of 84 days

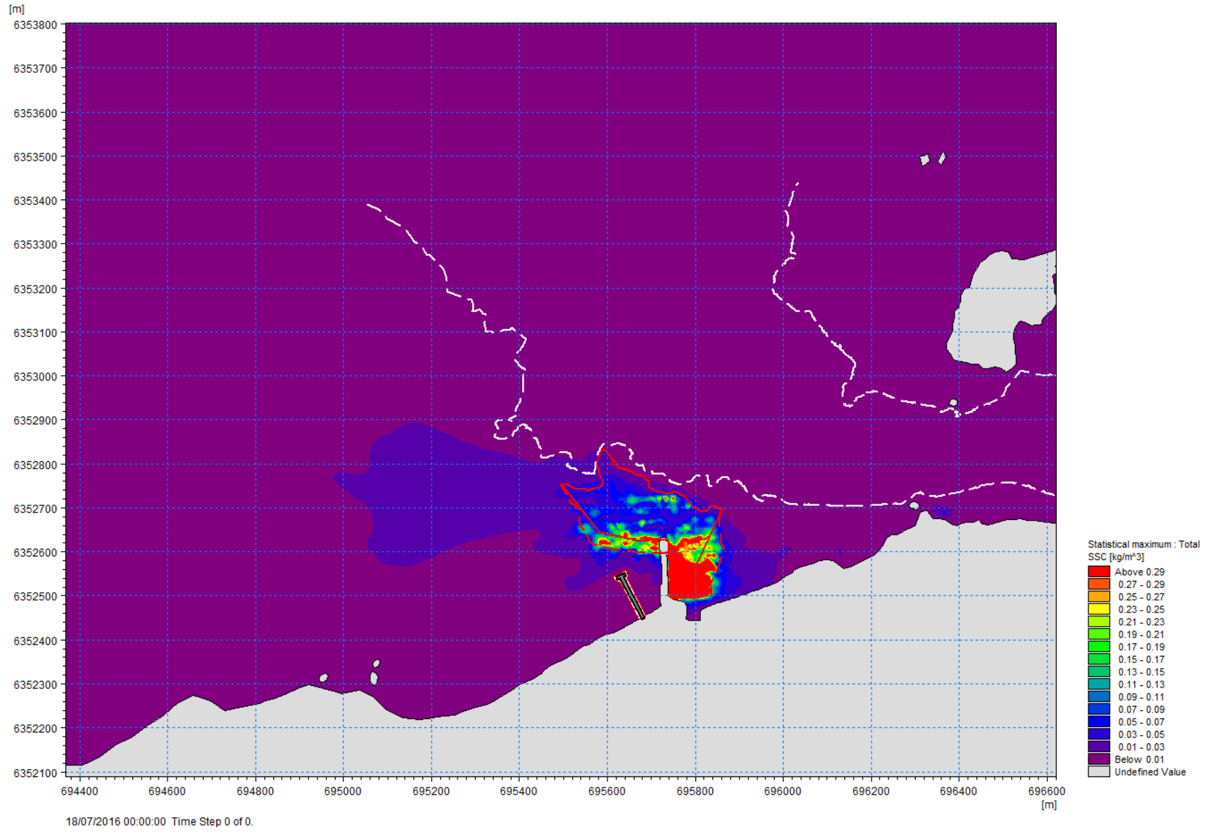

Figure C3.2A: The maximum total SSC envelop created by the BHD during the entire capital dredging programme.

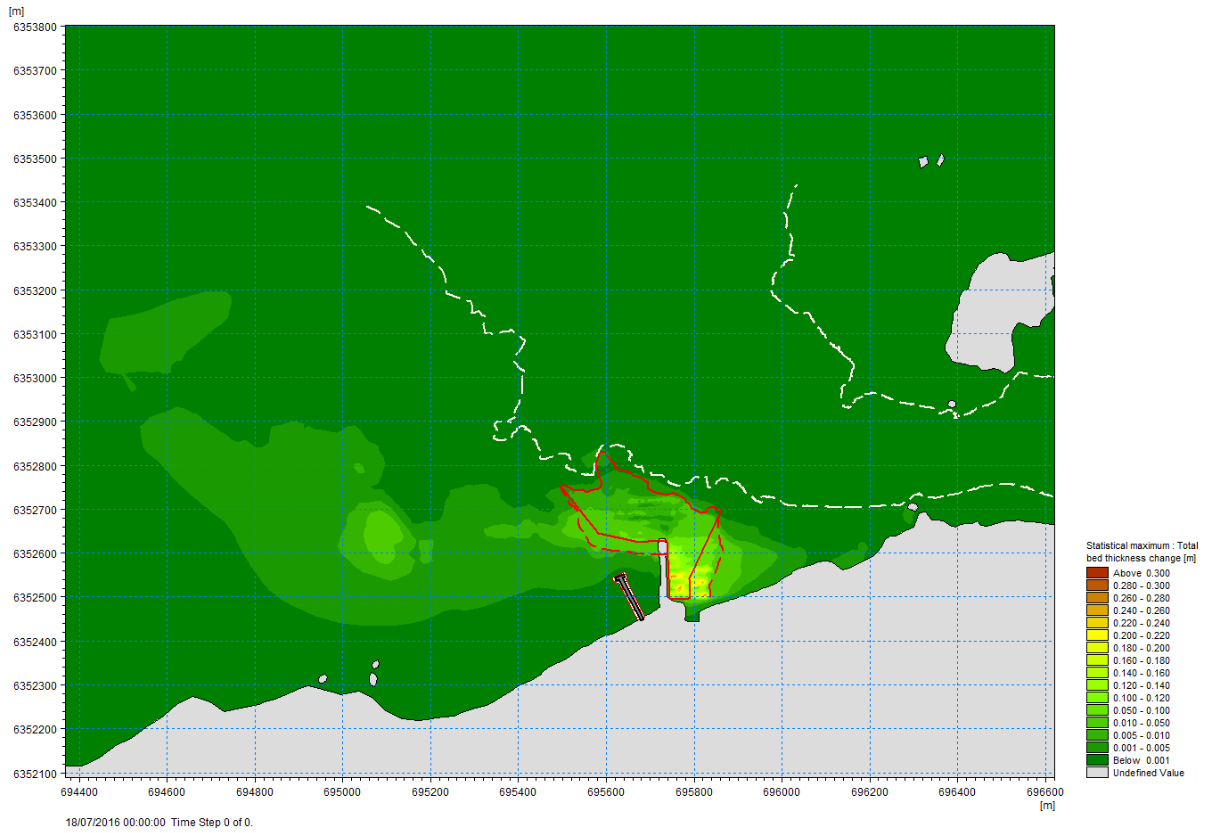

Figure C3.3A: Maximum deposition depth envelop during the 84day BHD dredging campaign.

It will be seen from the figures above and the appropriate figures in the Addendum Document to the Hydraulic Modelling Report that the maximum SSCs which occur over the flame shell beds are low (15 mg/L) and are restricted to a very localised part of the flame shell bed area over a short duration of time. Similarly the maximum deposition of sediments in this localised region at the edge of the flame shell beds is less than 2mm and again only occurs for a short time during the turn of the tide. Effectively the flame shell bed area is totally dispersive for the dredged plume material.

It should also be noted that subsequent to the completion of the dredging scenario modelling the decision was taken to reduce the extent of the dredging at the North West corner of the dredged area. This reduction in the area which projects close to the flame shell beds will further reduce the level of the SSC and the temporary deposition of material at the south western edge of the flame shell beds.