

Studies on Estuary Sedimentation Management

A summary of the draft report on “SUSTAINABLE SEDIMENTATION MANAGEMENT IN THE MEDINA ESTUARY: A FORWARD LOOK AT MAINTENANCE DREDGING NEEDS, PRACTICES AND MANAGEMENT – March 2018”.

Studies undertaken over the past few years have led to a greater understanding of the processes of fine sediment circulation in the Medina Estuary. The estuary is not in a natural state of balance in terms of its sediment circulation due to modifications to develop the port. Over past centuries these changes have resulted in artificially deeper and sheltered areas in which the fine sediment can accumulate. The main source of mud is from erosion around the coast of the Isle of Wight during winter storm periods and there is a very high variability in the amount that enters the estuary each year. A smaller source of mud is from shipping action and natural processes causing local erosion zones within the estuary itself.

Maintenance dredging records (post 1986) show that typically up to 8,000 dry tonnes of mud are dredged from the estuary each year, mainly using backhoe and barge methods, with spoil disposed of in offshore licenced areas. The need for a more sustainable approach has been an active topic of discussion between government agencies, managing authorities and stakeholders for many years. Developments in both knowledge and technology have recently combined to open new possibilities for a way forward. This report aims to illustrate how planning, managing and implementing maintenance dredging operations in the Medina Estuary could be conducted on a community basis rather than individually by local operators.

Clearly any new approach to dredging must not be more expensive than the methods currently used, and ideally would be cheaper. Other benefits would be minimal disruption of normal navigation and marina operation activities, less impact on the environment and a greater sense of partnership working between stakeholders.

The report was produced to promote discussion amongst stakeholders but does not make any strong recommendations about how stakeholders should work together or which dredging methods are the best. It identifies methods that do not appear particularly suitable for the estuary and suggests options for the remaining ways forward. However, in preparing the report it was clear that without a high degree of cooperation at all levels (licencing, monitoring, tendering, dredging operations) there is little scope for altering current practices.

Full collaboration between all the operators with dredging responsibilities could produce a management system that might include:

1. Joint MMO licence for all the Medina dredge sites, managed by Cowes Harbour Commission (CHC). There would be savings on MMO charges and on chemical analyses of samples required for licencing.
2. Agreement between all stakeholders (including the regulators) on the detail of the monitoring level that is necessary, and a fair sharing of monitoring costs between CHC and local operators, based on their level of dredging requirement.

3. Estuary-wide dredge campaigns at necessary time intervals, based on monitoring results. Joint campaigns would reduce plant mobilisation costs and enable negotiation of cheaper dredge rates.
4. Planning of the detail of dredge campaigns to: a) ensure minimal cross-impact between dredge zones (later dredging not refilling earlier dredged areas) and; b) minimising down time (moving between sites if for example pontoons have to be moved).
5. The potential use of Water Injection Dredging (WID) methods (or cutter-suction used in overflow mode) to: a) reduce dredge costs (no offshore disposal costs) and; b) ensure an optimum balance of sediment availability for the natural environment. These methods should also minimise impact on marina users, reduce the need to move pontoons, and minimise environmental impacts (water quality and marine life).
6. Real-time monitoring of plume dispersion during any trial or use of WID-type operations, to ensure optimum sediment re-accumulation/offshore loss patterns. Annual reports on patterns of sediment flux into, out of and around the estuary (combination of bathymetry and turbidity/flow monitoring).

A conclusion of this report is that the best dredging method may be very small WIDs operated frequently (several times per year). It is recognised however that such plant is in its early stages of development and may be somewhat experimental at this stage. It is foreseen that dredging may initially involve lorry-mounted WID/cutter-suction technology frequently in use today, with transition to a smaller, locally based system with time.

It is also recognised that the WID method cannot move compacted mud. There is a chance that until routine procedures are in place, with a frequency of dredging that inhibits 'over' compaction, cutter-suction methods, perhaps discharging into an overflowing barge, may be a good initial option.

The advancement of these ideas into a practical methodology will initially depend upon dialogue between CHC, the key marina operators and contractors who are able to offer dredging services. These conversations should be the next step, concreted through local workshops. Beyond this, the regulators will need to be consulted about the monitoring of environmental impacts. The final stage will be to seek approval and commitment to collaboration from all stakeholders.