

Physical factors at the Rame Head disposal site – anthropogenic aspects

1. Issues

There is public concern that silt introduced into the Rame Head marine environment by disposal may remain in the Whitsand Bay, and that turbidity within Whitsand Bay may increase because of the disposal of dredge material.

2. Approach

The approach taken by CEFAS was to use available data to:

- Assess the natural environmental setting; and
- Examine, document and assess the known anthropogenic inputs.

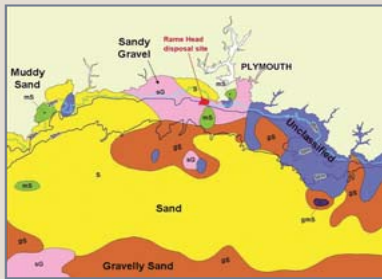


Figure 1. Distribution of seabed sediments on the continental shelf immediately south of Plymouth (redrawn from British Geological Survey, 1987).

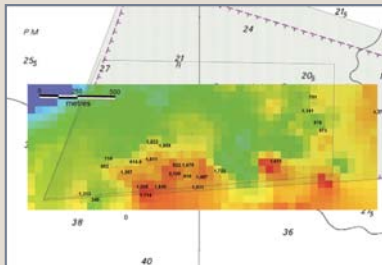


Figure 2. A simple model of potential sea-floor deposition for the 108 hopper loads of material disposed of in Jan-Feb 2005. Scale, m³.

- Disposal events in Jan-Feb 2005 were mostly located (red colour) in the SW & S region of the licence area. From the known locations of each disposal event, the theoretical accumulation can be calculated.
(Assumptions: material spreads exactly beneath the disposal vessel; no losses in the water column; deposition in a square with sides 50 m long. Volumes in each square are added together).
- The potential for transport of dredged material into Whitsand Bay is minimised by such emplacement because material is unlikely to be transported upslope and across the rocky western portion of the licence area.

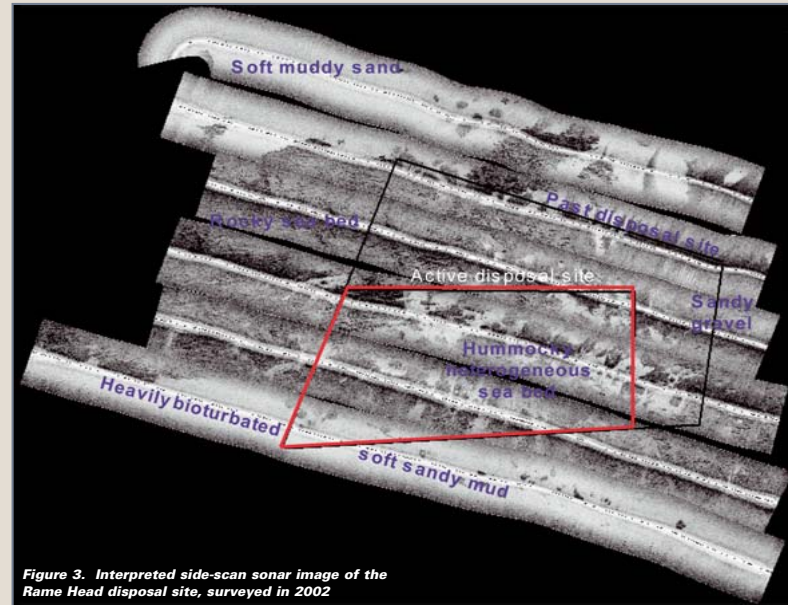


Figure 3. Interpreted side-scan sonar image of the Rame Head disposal site, surveyed in 2002

3. Key messages

- The disposal site is clearly dispersive in the long term.
- The thickness of disposal events can be inferred from swath mapping and side-scan images. Elevated areas between rock outcrops on the seabed are a few 10's of cm in thickness, and generally thinner than a metre.

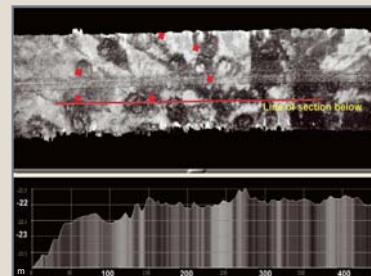


Figure 4. Detailed swath-bathymetric image of the disposal site, showing individual mounds resulting from disposal in early 2005.

4. Litter in Whitsand Bay

The issue of litter in the bay has been documented, using towing a video-camera along a series of lines.

Coarse items of litter were found within the disposal site, with an average of 1.7 litter items per 100 m of camera tow. Disposal near the active Rame Head disposal site has been occurring for many decades.



Figure 5. Locations of camera tows (green dots) and locations where litter was recorded (red dots). Tows were performed on 10/6/01, 12/6/02 and 12/6/03.

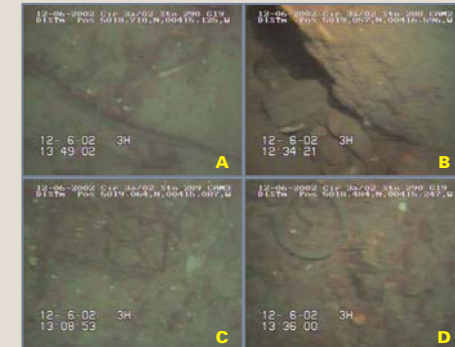


Figure 6. Video images taken on 12/6/02:
a) an accumulation of cable and wire at site G19
b) a brick next to a rock outcrop along camera tow line CAM2
c) a crate of unidentified objects at CAM 3
d) a circular object at site G19

5. Litter on the beaches

Litter surveys of Portwrinkle Beach by the Marine Conservation Society show large amounts of litter, 30% of which was derived from fishing activity and 50% from unknown sources.

Figure 7. Litter washed up on beach, Whitsand Bay. Photographer: Keith Hiscock (www.marlin.ac.uk).



Figure 8. Images of Polhawn Cove, taken 25/3/2005.

6. Conclusions

- There is no major accumulation of dredged material at the disposal site, consistent with the hydrodynamics, sediment dynamics, sediment distribution and general geomorphology of the bay.
- The volume of recently deposited individual hopper loads of dredge material is consistent with the tonnages licenced for disposal.
- From the evidence considered for this report, it is not possible to confirm whether the litter found at the Rame Head disposal site is a direct consequence of disposal operations, although it is likely to be a source for some.
- At the disposal site, the main issue regarding litter is an aesthetic one.
- On the Whitsand Bay beaches, litter is likely to derive from regional tourism and fishing activity as well as from dredge disposal operations.

References

British Geological Survey (1987). Sea bed sediments around the UK. South Sheet, scale 1:1,000,000.

Acknowledgements

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