We stress that these figures are at best 'guestimates' because there is insufficient knowledge of the effects of specific rates of sedimentation on the health and survivorship of corals on Australian fringing reefs to provide definitive statements about critical thresholds. Suggestions from elsewhere of maximum rates of sedimentation that can be tolerated by corals range from 10mg/cm^2/day (Pastorok & Bilyard, 1985) to well over 500mg/cm^2/day (Cortes & Risk, 1985). These disparate figures highlight the likely dependence of tolerances of corals to sedimentation on local conditions, species, and acclimation of the corals to local conditions.

Instantaneous Measurements of Sedimentation

Except in rough weather, when sedimentation will be great, sediment traps will not adequately measure sediment deposition over short periods (1-2 days). Inferring average rates of sedimentation from instantaneous measures of other variables, however, is also unlikely to provide adequate estimates of sedimentation. We have shown that there are several difficulties with attempting to relate data from sediment traps to those from secchi depth and suspended solids. Sediment traps sample sediment deposition over 7-10 days, whereas turbidity measures are instantaneous. The sediment trap measurements are affected by varying weather conditions on days preceding and following those on which turbidity was measured. Clearly, more experimental work is necessary to establish whether there are short-term relations between turbidity and sedimentation. We therefore suggest that extreme caution is necessary if management decisions are to be based on inferences of rates of sedimentation from rapid, on site measurements of variables such as water clarity and turbidity.

SUMMARY

We have described the characteristics of the benthic biota on the fringing reefs along the south-east coast of Magnetic Island. The reefs are variable in structure at a variety of scales. Of particular interest with respect to the proposed development of Magnetic Quay, is the relatively clear distinction, on biological grounds, between Nelly Bay and the reefs Geoffrey, Arthur, Florence, and Picnic Bays, particular for reef slope biota. Although several taxa differ in abundance among the bays, reefs in Nelly Bay in general, and the northern end of Nelly Bay in particular, generally support a similar taxonomic assemblage of corals and algae as reefs in the other bays. It is unlikely, therefore, that ecologically significant features will be lost through excavation at the north end of Nelly Bay.

Several difficulties are likely to be encountered in the assessing of environmental impacts of the development of Magnetic Quay. These difficulties are not unique to this development, but their solution has not often been addressed. We devote considerable text to the discussion of possible

solutions and recommend several strategies to ensure that environmental impacts are assessed realistically. We provide an outline of an environmental impact assessment study that would achieve this aim (Appendix C).

On a procedural note, we would emphasise the necessity for the developers to minimise the output of sediment into Nelly Bay at all times. In particular, we emphasise that the consequences of any release of sediment are likely to be greatest when the weather is calm. It is under these circumstances, that sediment is most likely to accumulate on the corals and result in damage from smothering.

Finally, it is important to have established *a priori* a logical set of procedures which are to be used in determining whether an impact has occurred. Basing of such procedures on the singular relation of variation in environmental variables (such as sedimentation) to hypothesised 'critical thresholds' is logically and empirically flawed. In its place, we describe a set of five steps that will result in any conclusion of an impact being both justifiable and reasonably unlikely to be erroneous.