SUMMARY

1. Three distinct channel types occur in Marshalls Creek estuary: an upper, straight, high-bank fluvially-dominant reach (900m); a tightly-meandering, low-gradient, low-energy, flanked by wetlands, reach, dominated by reworked marine-sand bedload (4000m); and a straighter, mangrove-flanked, sandbed channel, with steeper tidal gradients (more tidally dominant) (3200m). The latter is characterised by more mobile marine sand and reworked marine sand.

2. With the exception of fluvial materials and the lag gravels at site 13, both of which contain lithics derived from the catchment, all the bedload is potentially very mobile. Most of it is very fine to medium sand from marine sand and reworked marine sand.

3. Present stability is evident west of New Brighton from the wide plane bed, mud and bioturbation.

4. Present instability south of New Brighton is seen in micro and meso bedforms, due both to higher tidal energy and to more confined flood runout.

5. Dredging will modify both stable and unstable environments through the increased hydraulic efficiency of a deeper channel, a higher tidal range and a larger tidal prism, as well as more effective flood drainage.

6. In such potentially unstable bed sediments, there will be stability problems which will need to be carefully considered in the planning and design stages of any proposed works.

7. With more time and resources, more detailed work could be undertaken on sediment ages, the depth of scour and fill and problems associated with transient changes.