

MONITORING REPORT
Technological and Environmental Management Network Ltd
January 24th 2002

DREDGING AND RECLAMATION PROGRAMME IN KINGSTON HARBOUR

The R1 bund preparation continues. First sector completed, material dredged from PB dredge site being pumped into the completed section of R1 from the Leonardo Da Vinci. Significant plume noted from the outlet weir in R1. Screen around outlet stolen, to be replaced.

Hopper dredge Christoforo Colombo dredging in H1 and H2, material being disposed of at 1000m contour outside of the harbour. No problems at the dump site here, but dredge site has significant plume, but no impact noted at the Bustamante Beacon, near to the Port Royal mangroves. At the disposal site, residual plumes were noted from previous spoil dumps, but the plumes were far away from any reef or cay.

Monitoring trips were carried out on the following dates:

Thursday January 3rd: Site inspection at R1

Wednesday 16th January: Site inspection at R1, Water quality monitoring of dredge activities

Saturday 19th: Flight over dredge and disposal sites

Photographs attached.

Comments:

No screens visible. At R1

Water Quality Monitoring Results

METHODOLOGY:

Samples were collected on January 16, and measurements of TSS were made at the following sites

- At Middle Ground - Propeller wake of ship using channel

- At H1 in wake of dredge
- Bustamante beacon
- H1 approximately 40m after dredge had passed

Data from the fixed stations for January 7 to 20 are available.

RESULTS:

Results of sample analysis are being prepared by the laboratory. Field measurements made on January 16 [1] indicated the following:

- TSS in propeller plume of vessel was determined to be in the range 0-180mg/l. The highest reading was recorded at the bottom of the water column, while the lowest reading was recorded at 6m below the surface.
- At H1 in the plume of the dredge TSS generally varied between 100 and 300mg/l.
- At Bustamante beacon the range was determined to be around 5mg/l throughout the water column. Near the bottom an off scale reading was obtained. This was considered to be due to disturbance of the seafloor by the probe/and or the sampler.
- A resampling in sector H1 about 40minutes after the dredge had passed indicated significantly reduced TSS (5-50mg/l).

Data from the fixed stations indicate the following:

- Very high TSS values at Middle Ground Jan 7 to 8 (range 100->500mg/l).
- Elevated TSS values at Angel and Bustamante between January 7, and 9 but significantly less than Middle Ground. At Angel beacon TSS was determined to be in the range 30->500mg/l while at Bustamante beacon a range of 50-100mg/l was determined.
- Subsequent to cleaning on January 11, all fixed stations showed greatly reduced levels (range 0-20mg/l).
- From January 12 to 13, TSS at Angel and Bustamante remain in the range 0-5mg/l. Middle ground however trended upwards going off scale (>350mg/l) by January 13.

CONCLUSIONS/ENVIRONMENTAL IMPACT

- Dredging in H1 created a plume which had TSS levels up to 30 times the criteria value.
- The majority of material forming the plume in the wake of the dredge is removed within forty minutes of dredging.
- Disappearance of the plume is quite likely a combination of settling and local currents.
- WQ in the vicinity of Bustamante and Angel beacons continues to be relatively unaffected.

- Middle ground continues to be relatively heavily impacted by TSS. Propeller wake appears to be a significant contributor to episodes of TSS.
- Fouling of the sensors is a contributor to the high TSS values observed particularly just before cleaning of the sensors.

Table 1

Indicator Parameter	Phase 1 Background Levels	Standard/Criteria value
Total suspended solids (TSS) mg/l	0 -7	<10mg/l (1)
Biological oxygen demand (BOD) mg/l	18mg/l to 27mg/l	<1.7 (1)
Dissolved oxygen (DO) mg/l	4.6mg/l to 8.8mg/l	4.8mg/l (2)
Hydrogen Sulphide (H ₂ S) µg/l	88ppm - 99ppm. (Total Sulphide In sediment pore water)	2µg/l (2)
Lead	<1.3µg/l	8.1µg/l (2)
Chromium	<.5 – 1.1µg/l	50 µg/l (2)
Copper	<1.0µg/l	3.1µg/l (2)
Cadmium	<1.0µg/l	9.3 µg/l (2)

1) NRCA Proposed Coral Reef Standard

2) USEPA Criterion Continuous Concentration(CCC)

