

**MONITORING REPORT No. 7
DREDGING AND RECLAMATION PROGRAMME IN
KINGSTON HARBOUR**

**Prepared for:
The Port Authority of Jamaica**

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BACKGROUND:

Water quality sampling fieldwork was carried out on March 11, 2002, and data from fixed stations at Middle, Angel, and Bustamante beacons was reviewed.

The sampling exercise carried out on March 11, was intended to provide measurement of TSS (total suspended solids)/turbidity in the channel (H1 and H2) where dredging was in progress.

A monitoring flight took place on 18th March and a selection of the photographs taken are attached.

An inspection of the berm at R1 was carried out on March 13th. The R1 bund preparation continued during the period covered by this report. The first sector was completed and work continued in the extension of the berm by PIHL. Significant plume from this activity was noted in our monitoring flight of March 19. The screen around the berm preparation activity was down at the time of our flight and was being repaired.

METHODOLOGY:

Monitoring on March 11 was carried out in the channel near Port Royal, where the dredge Cristoforo Colombo was operating. Other sites monitored included wake of a small container vessel (Heinrich – Plate 1), a site east of Delbert Sicard beacon, and Angel beacon (Figure 1). In order to assess the impact of dredging, sampling was carried out in an identified plume (Plate 2) as soon as the dredge departed, and the same site was re-sampled approximately ½hr later. The sampling sites were designated KTP 1 – 6 (Table 1).

**Table 1: Dredging And Reclamation In Kingston Harbour
Water Quality Sampling Sites March 22, 2002**

DESCRIPTION N COORD. W COORD	STATION NO.
Wake of Heinrich (Surface) 18° 00.218 76° 46.736	1
Dredge Plume North of Dredge 17° 57.417 76° 50.999	2
Area recently dredged 17° 57.147 76° 51.197	3
West of Delbert Sicard Beacon 17° 56.894 76° 51.525	4
Station 3 Resampled 17° 57.150 76° 51.201	5
Angel Beacon 17° 57.180 76° 49.607	6

Samples were generally collected at three depths (sub-stations) at each site sampled using the Van Dorn sampler. These sub-stations were denoted T (surface sample), M (middle depth), and B (bottom depth). The exception was station 6 - Angel beacon where sampling was confined to the surface.

Samples were analysed by Poly-Diagnostic Centre in accordance with Standard Methods for the Analysis of Water and Waste Water. TSS was determined by filtration of a known sample volume through a dried, pre weighed filter. After filtration, the filter was dried and re-weighed. TSS in mg/l is obtained through a determination of the weight difference of the filter before and after filtration. As a precaution against salt-water interference, filters were rinsed with warm distilled water after filtration of the sample. This precaution was employed in analysing samples collected subsequent to February 18.

Relying on the good correlation between turbidity and TSS determined from the February data (Figure 2) the WQ team was able to collect more samples. Most of these samples were analysed to determine turbidity. TSS was then determined from the plot of TSS vs. turbidity (Figure 2). Turbidity only was determined at Stations 1, 2, and 4, while as a control, turbidity and TSS were measured at stations 3, 5, and 6.

Table 2: Kingston Container Terminal Water Quality Data March 11, 2002

STATION NO	TIME	DEPTH (M)	LAB. RESULTS		FIELD DATA*
			TURBIDITY (NTU)	TSS (mg/l)	TSS (mg/l)
1T	1030	0.5		5.5	15
1M		6.5		3.6	5
1B		13.0		6.7	20
2T	1050	0.5		12.0	20
2M		6.0		32.3	10
2B		12.0		18.2	10
3T	1057	0.5	6.0	34.0	50
3M		6.0	7.0	43.1	100
3B		12.5	19.0	78.1	300
4T	1112	0.5		13.5	5
4M		5.0		7.8	5
4B		9.5		7.8	10
5T	1129	0.5	1.0	7.6	20
5M		6.0	3.0	14.6	10
5B		12.5	15.0	69.2	150
6T	1148	0.5	1.0	9.7	5
6M		2.0		-	10
6B		4.0		-	50

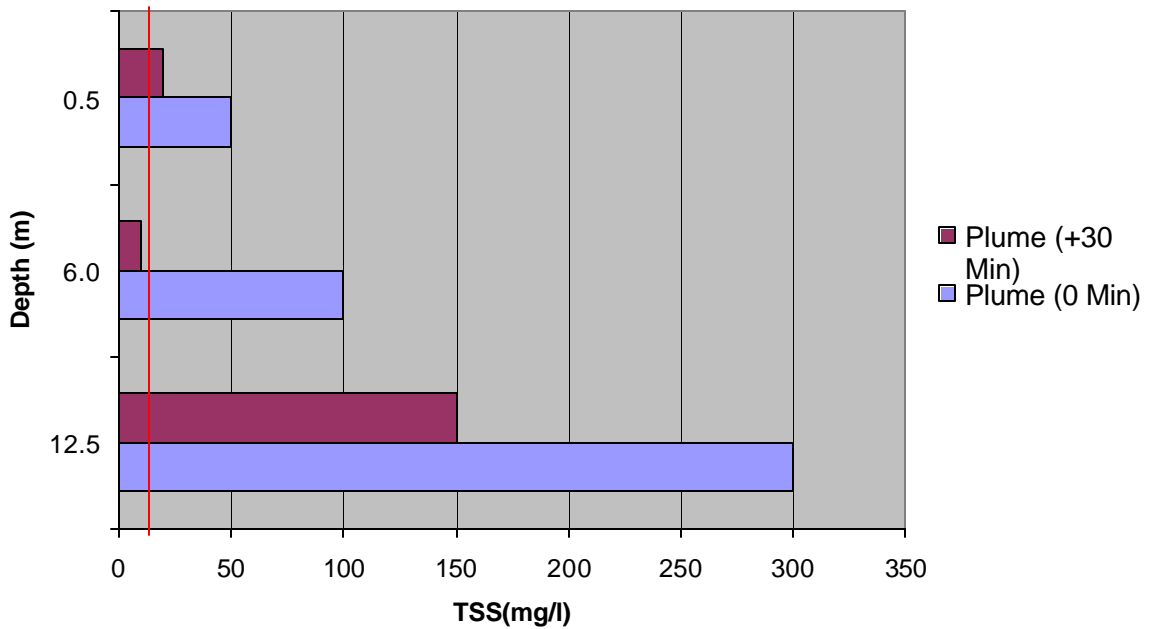
Field Data

Field data collected by Jan De Nul on March 11 indicated a range of 5 – 300mg/l for TSS at the sites monitored. The highest values were determined for Station 3, the dredge site.

At the dredge site TSS was 50mg/l at the surface, 100mg/l at middle depth (6.0M), and 300mg/l at the bottom (12.5M). At this same site approximately thirty minutes later, the values were significantly reduced to 20mg/l at the surface, 10mg/l at middle depth, and 150mg/l at the bottom (Figure 3).

In the wake of the Heinrich, Station 2 TSS was determined to be 15mg/l at the surface, 5mg/l at middle depth (6.5M), and 20mg/l at the bottom (13M).

Figure 3 : TSS Profile at Dredge Site March 11



— NRCA Standard

At Station 3 - the plume north of the dredge site, TSS was determined to be 20mg/l at the surface, and 10mg/l below the surface.

At Station 4 (west of Delbert Sicard beacon), TSS was determined to be 5mg/l at surface and middle, and 10mg/l at the bottom.

At Angel beacon (Station 6) TSS was 5mg/l at the surface, 10mg/l at middle depth (2.0M) and 50mg/l at the bottom (4.0M).

Data from the **fixed stations** indicated a range of 20 – 200mg/l TSS at Middle ground. For March 4, TSS was around 50mg/l increasing to 200mg/l prior to cleaning on March 5. Subsequent to cleaning TSS reading dropped to around 20mg/l increasing to 160mg/l at around 1100 on March 7. TSS remains high even after cleaning on March 8. After cleaning on March 9 however, TSS drops to 20mg/l through March 10.

At Bustamante beacon the range for TSS -was 5 – 40mg/l throughout March 4 to March 10.

CONCLUSION/ENVIRONMENTAL IMPACT

Results indicate that effects of the dredging were confined to the channel. The effect was not noticeable at the sampling location to the west of the dredge site or at Angel beacon.

The significant fall off in TSS at the dredge site over a 30 minute period indicates that the impact from dredging on water quality is significant for a relatively short period. The fact that the bottom values are also significantly higher than at the surface suggests that much of the disturbed material settled rapidly.

Data from the fixed stations suggest that impact from TSS is greater at Middle Ground.