



Data Submittal for Water Quality Monitoring Event #5 on 10 July 2003 Providence River and Harbor Maintenance Dredging Project

Event Monitored: CAD Cell 3R – spring high tide disposal on 10 July

Applicable Water Quality Certification Conditions:

- 26c – dissolved metals and TSS for a spring high tide disposal within the first 100 disposal events

Associated Files:

- Prov_R_5_summary – Microsoft Word document containing this summary
- Prov_R_5_tables – Microsoft Word document containing station and sample ID information (Table 5-1), and analytical results (Table 5-2)
- Prov_R_5_figure – pdf document showing the sampling locations (Figure 5-1)

Criteria Exceedences: None

Summary:

The fifth monitored disposal event took place at 1814 on 10 July at approximately the time of predicted high tide for Providence (5.7 feet at 1801). Dredged material was released into cell 3R during a spring high water slack tide. Spring tide conditions represent the largest tidal fluctuations and strongest ambient currents experienced in the monthly lunar cycle. At the time of the disposal event, two dredges were working in the area (see Figure 5-1). Dredge 55 was anchored and working in cell 6R removing parent material (disposed offshore). Dredge 51 was spudded and working in cell 7R, removing unsuitable maintenance material that was being disposed into cell 3R.

Pre-disposal monitoring was performed during the last of the preceding flood tide. A reference sample was collected up current (south) of the dredging and disposal locations prior to disposal (UCR1 on Figure 5-1 and Table 5-1). Turbidity values were low, ranging from approximately 2-3 NTU through the water column. Salinity ranged from approximately 20 PSU at the surface to 28 PSU near the bottom. Water samples were collected from within the identified dredging turbidity plume approximately 150 feet down current from Dredge 55, during flood tide prior to the disposal event (DRG1 on Figure 5-1).

The disposal into cell 3R occurred at 1814, 13 minutes after the predicted high tide (1801), after which the scow was slowly maneuvered to the south of the disposal cell and back into position with Dredge 51 over cell 7R. At the time of disposal, a small northerly (flood) current was observed indicating that slack high water was occurring later than predicted. Similar to previous monitoring events, some discoloration and small patches of oil sheen were noted at the surface immediately following the disposal.



ADCP measurements performed over cell 3R immediately following the disposal event and relocation of the scow, identified an area of elevated backscatter within and above the cell and for a distance of approximately 600 feet south of the cell, likely influenced by the track of the tugboat and scow. Turbidity measurements directly over the cell ranged from 3 NTU to 28 NTU (near bottom). Ambient currents in the study area following the disposal event were mixed with no strong current magnitude or dominant direction. In these conditions, the disposal plume quickly dissipated and became difficult to discern from background conditions north or south of the disposal location. Turbidity measurements performed within the area where the plume had been originally identified were less than 5 NTU a short time after the disposal event. Turbidity levels continued to diminish over the cell, and at 90 minutes following the disposal event, turbidity ranged from 3 NTU to 12 NTU (near bottom) directly over the cell.

As the tide began to ebb, multiple transects were performed across and along the channel, and no elevated backscatter or turbidity plumes were detected beyond approximately 500 feet down current of the disposal cell. No measurements above background conditions (4 NTU) were observed along the 1500-foot down current compliance transect for metals. Since no discernable turbidity plume was observed along the down current compliance transect, the timing and location of compliance sample collection were based on measured current velocities and the calculated travel time and direction from the disposal cell (CM1 on Figure 5-1).

Dredges 51 and 55 continued to work throughout the monitoring period, with Dredge 51 removing unsuitable maintenance material overlying cell 7R and Dredge 55 removing parent material from cell 6R.

Results of the analysis of TSS and dissolved metals are presented in Table 5-2. TSS levels at the 1500 foot down current location were lower than at the reference location at all depths. The highest reported TSS (78 mg/L) was collected from the bottom water down current of the dredge. Dissolved silver concentrations were below the reporting limit of 0.5 ug/L for all samples, well below the acute water quality criterion of 1.9 ug/L. Dissolved copper concentrations were all below the acute water quality criterion (4.8 ug/L) with concentrations ranging from 0.65 to 1.6 ug/L. The highest copper concentration was reported for the surface sample at the background location.