

EXECUTIVE SUMMARY

Baseline surveys of the newly designated Massachusetts Bay Disposal Site (MBDS) were conducted in September 1993 to delineate the topography and sediment composition of the site for DAMOS management. This information will enable management to optimize site usage and minimize adverse impact of future disposal projects. MBDS was characterized acoustically through collection of 1) precision bathymetric, 2) side-scan sonar, and 3) Sediment Acoustic Characterization System (SACS) data. In addition, sediments were sampled for grain size analyses to calibrate the acoustic data, and for chemical analyses to map the areal distribution of historically contaminated sediment documented in a prior survey.

MBDS was relocated approximately 1 nmi southwest from the interim MBDS; the interim site was used for the disposal of dredged material from 1977 to 1993. During the 1992/1993 disposal season, the majority of the material disposed at the interim MBDS originated from the Third Harbor Tunnel (THT) project in Boston Harbor. Previous monitoring results obtained through the Disposal Area Monitoring System (DAMOS) Program showed that THT material included fresh blasted rock and large consolidated clasts of Boston blue clay.

Results of the 1993 baseline survey indicated that the new MBDS was composed of two relatively distinct areas: 1) the newly incorporated southwestern area, and 2) the northeastern portion which overlaps the interim MBDS. The southwestern area, where no documented disposal of dredged material has occurred, was topographically featureless and sloped gradually towards the northeast. Sediments in this area were composed predominantly of fine-grained silts and clays. The northeastern region contained two major topographic features: the most recent dredged material disposal mound and a large, shallow basin where, historically, dredged material has been disposed. This shallow basin can be enhanced by management for a potential capping site. The highest topographic peak also was observed in this region, outside of the new site boundary, and interpreted as a remnant glacial outcrop.

Acoustic data suggested that the sediment composition in the northwest region was more heterogeneous than observed in the southwestern area, as would be expected for an area where disposal activity has occurred. The presence of older dredged material in the shallow basin was documented in the SACS data but was not evident in the side-scan mosaic. These results indicated that the high frequency side-scan sonar detected a thin layer of fine-grained sediment deposited on top of dredged material in the basin.

EXECUTIVE SUMMARY (continued)

Sediment samples were collected in a 600 m radial grid surrounding an area where polycyclic aromatic hydrocarbons (PAHs) were found to be elevated in a 1989 survey. Results confirmed that the center station of the grid contained higher levels of both metal and organic contaminants than the surrounding sediments. Contaminant concentrations decreased with radial distance away from this station and did not indicate further contamination towards the west as suggested by the previous data.

The integrated acoustic and chemical data proved to be useful in mapping not only the high-reflectance THT material at the most recent dredged material mound, but historical dredged material as well. Comparisons of the SACS and side-scan data indicated that the surface of dredged material disposed less than ten years ago was either covered by ambient sediments or sufficiently reworked to appear uniform to side-scan acoustics. Both the acoustic and chemical data will be used to manage future dredged material disposal and to plan potential *in situ* remediation of historically contaminated sediment.