

# SURVEY REPORT

## 1.0 GENERAL

*Project Title:* Canaveral ODMDS Erosion Rate Study

*Survey Title:* Canaveral ODMDS Dredged Material Sampling Survey

*Anderson Requested By:* Christopher McArthur      *Organization:* U.S. EPA Region 4

*Survey Chief Scientist:* Christopher J. McArthur, P.E.

*Organization:* U.S. EPA Region 4

*Organization Address:* 61 Forsyth, S.W., Atlanta, GA 30306

*Organization Telephone No.:* (404) 562-9391

*FAX No.:* (404) 562-9343

## 2.0 SCHEDULE OF OPERATIONS

*Mobilization Date:* 10/1/00 (evening)

*Location:* Port Canaveral, Florida

*Departure Date:* 10/2/00 (morning)

*Survey Duration (Days):* 1

*Demobilization Date:* 10/3/00 (morning)

*Location:* Port Canaveral, Florida

## 3.0 BACKGROUND INFORMATION

The Canaveral ODMDS was designated by EPA in 1990 for disposal of dredged material from the U.S. Navy Trident Basin and Entrance Channel, the Port of Canaveral facilities, and the Corps of Engineers Civil Works Projects at Canaveral. Concurrent with the site designation in 1990 a Site Management and Monitoring Plan (SMMP) was developed. This plan is currently in the process of revision. A main component of site monitoring is the determination of the short-term and long-term fate of materials disposed in the marine environment. Concern has been raised regarding the magnitude and extent of disposed dredged material dispersal outside of the ODMDS boundaries and the potential for disposed dredged material impacting potential future offshore sand sources for beach renourishment. Additionally, a quantitative analysis is needed to provide an estimate of the long term capacity of the disposal site. Close to 1 million cubic yards of material are disposed of at the ODMDS every year. A significant portion of this material comes from the entrance channel where the sediments have

been classified as stiff clays and silts, with horizons of very fine silty sand, shell fragments, and organics.

Numerous studies prior and subsequent to site designation have indicated that the ODMDS is a dispersive site for fine grained material and as a result dredged material may extend well beyond the designated site boundaries. However, adequate site specific information is not available to allow for a conclusive and quantitative statement regarding sediment transport from the ODMDS. In order to address this issue, the current study is intended to collect site specific information regarding the erodibility of dredged material disposed at the Canaveral ODMDS. Parameters calculated from the this study can be used in existing numerical models to provide quantitative estimates of the sediment transport occurring within and near the ODMDS. This in turn can be used to effectively manage the Canaveral ODMDS to minimize environmental impact.

#### **4.0 SUMMARY OF SCIENTIFIC ACTIVITIES/OBSERVATIONS** (Attach detail if needed)

Survey operations were initiated at 8 am on 10/1/2000 in the Canaveral Harbor Middle Turning Basin (MTB) at station CH-B-1. Three drops were attempted at this station utilizing the Gray O'Hara Box Core to obtain maximum depth penetration. The first drop resulted in approximately a 3 inch penetration of the box core. The second drop resulted in no sample and the third in 60% penetration. Samples retrieved from CH-B-1 consisted of dark grey cohesive fines with some shell. No samples from CH-B-1 were retained.

Following exploratory sampling in the MTB, the OSV Anderson proceeded to station CH-B-2 within the Canaveral Harbor West Turning Basin (WTB). Greater than 100% penetration was obtained at CH-B-2 and it was decided that samples from this station would be retained for analysis. The objective of the survey was to obtain one sample from either the WTB or MTB depending on which station provided the better sample. Three drops were needed at



Figure 1: Gray O'Hara Box Corer at station CH-B-2

CH-B-2 to obtain the 21 gallons of sediment needed. Each core sample provided approximately 7 gallons of sediment. Samples from CH-B-2 consisted of grey and black layers of very fine pudding like silts and clays.

The OSV Anderson then proceeded to the Canaveral ODMDS for sampling. Sampling was initiated at CDS-1 near the center of the most recent disposal events. Two drops were unsuccessfully attempted using the Gray O'Hara Box Core and therefore the Young Grab was used instead. Nine drops of the Young Grab were needed to obtain the 21 gallons of sediment needed for analysis. Samples generally consisted of gray fine silt and plastic clay. Some had considerable sand mixed in.

Three exploratory samples were then collected south of the disposal site for visual observation only. EXP1 approximately ½ mile south of the southern corner of the ODMDS consisted of about ¾ inch of very fine tan sand over dark grey clay (figure #3)

EXP2 collected 1 mile south of the southern corner of the ODMDS consisted of about ¾ to one inch of very fine tan sand over dark grey clay (figure #4).

EXP3 collected 1 mile east of EXP2 consisted of 1 to 1½ inches of very fine tan sand over dark grey plastic mud.

Ten drops were then made at CDS-2 near recent dumps the previous week (dump on 9/25/00). The second drop retrieved a piece of fabric and was discarded. Following the eighth dump, the winch began to leak hydraulic fluid. Operations were suspended and a bucket of mud near the leak was discarded due to contamination. The remaining two drops were conducted following



Figure 2: Sediments from CDS-1



Figure 3: Sediments from EXP1



Figure 4: Sediments from EXP2



Figure 5: Sediments from CDS-2

repair and cleanup of the hydraulic fluid. Sediments at CDS-2 varied from drop to drop. Most samples consisted of grey very fine sand mixed with non-cohesive silts and clays. The profile of the last grab was characterized as a surface layer of tan fine sand  $\frac{1}{2}$  to  $\frac{3}{4}$  inch thick followed by a 3.5 inches of dark grey to black pudding-like silt/clay and a bottom layer similar to the surface layer.

Sampling was completed at 1425 on 10/1/2000. Sample custody procedures were followed and the samples were picked up for shipping by FedEx at 5pm at the Morton Salt Dock (Airbill #810525692410).

## **5.0 SUMMARY OF RESULTS COMPLETED DURING SURVEY** (Attach detail if needed)

All five samples were successfully sampled. Sample station locations are shown in figures 6, 7, 8 and 9. Figure 8 also shows locations of recent disposal activity.

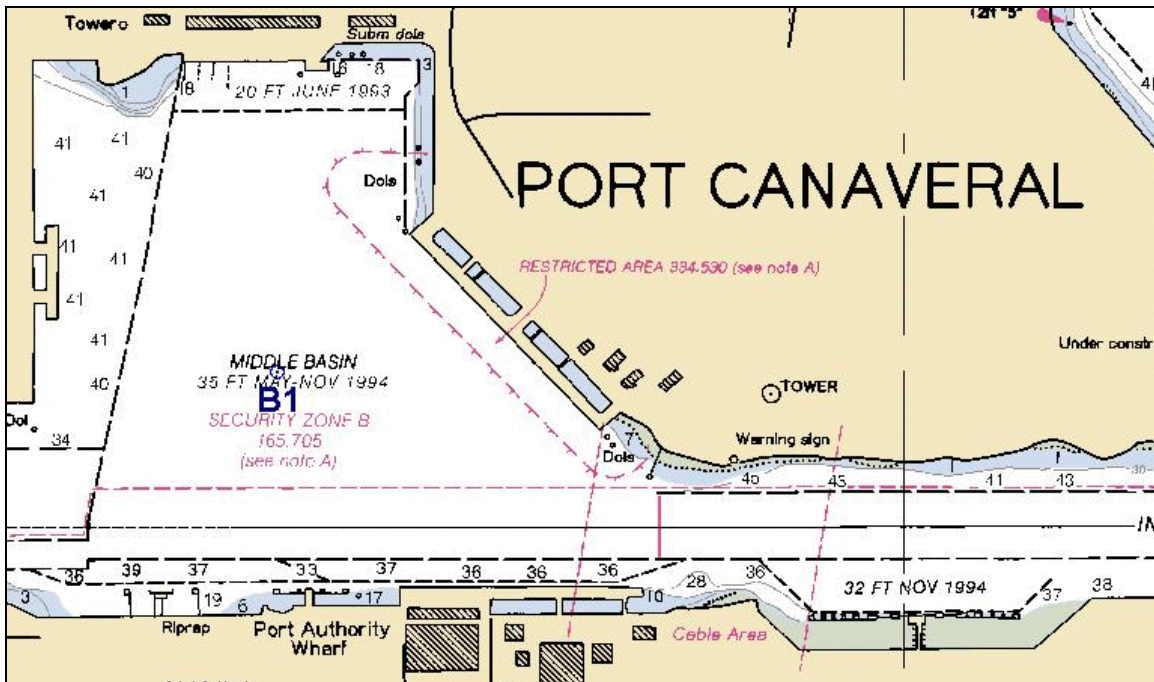


Figure 6: Middle Turning Basin Sample Station

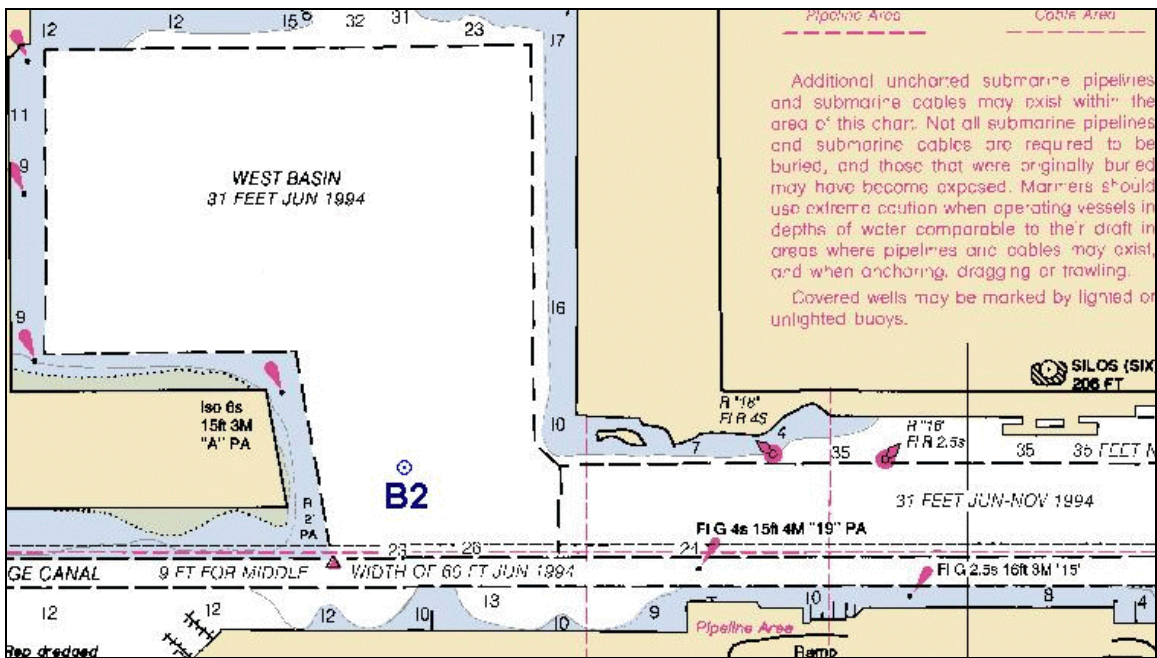


Figure 7: Western Turning Basin Sample Station

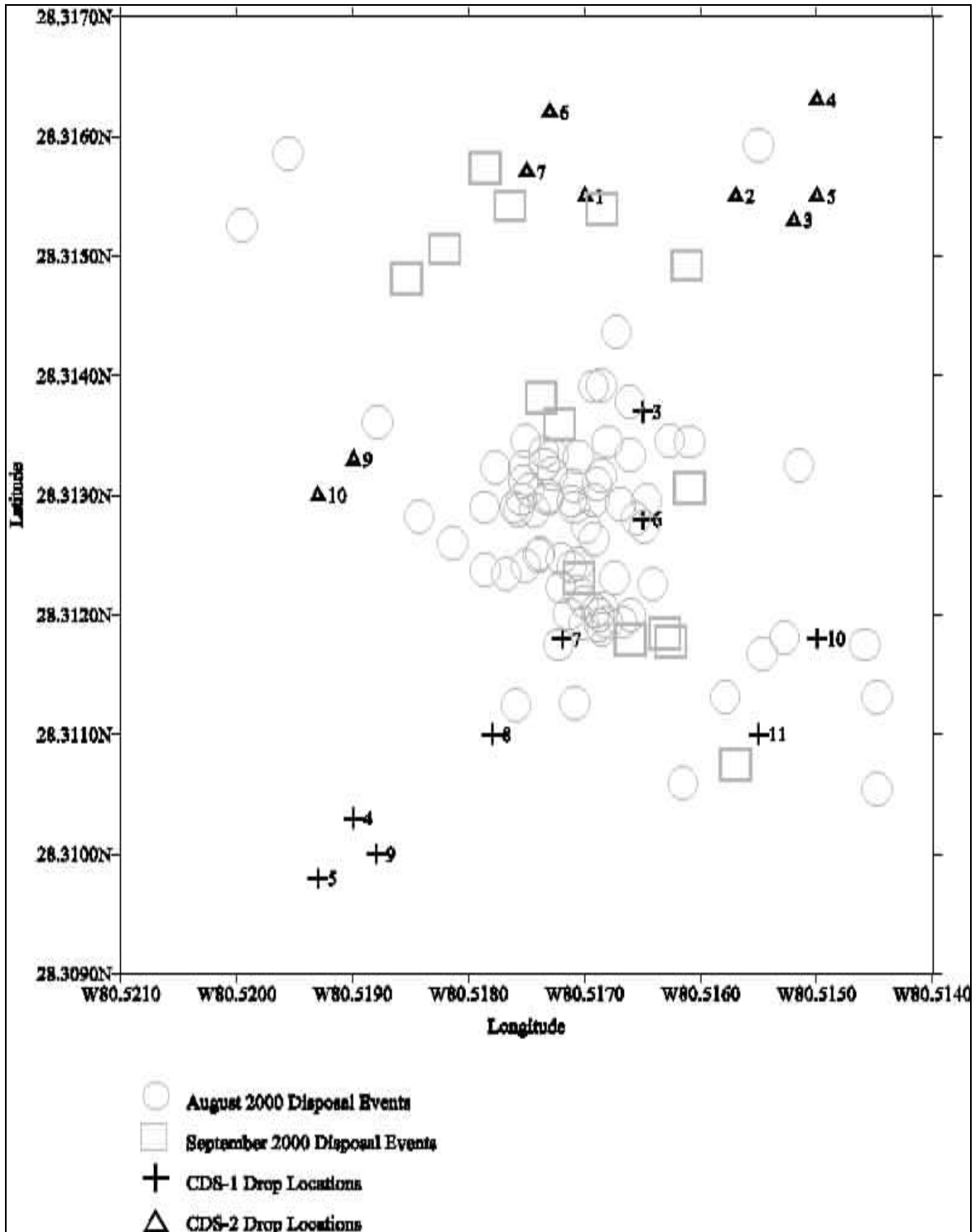


Figure 8: CDS-1 and CDS-2 Sample Station Locations and Year 2000 Disposal Locations

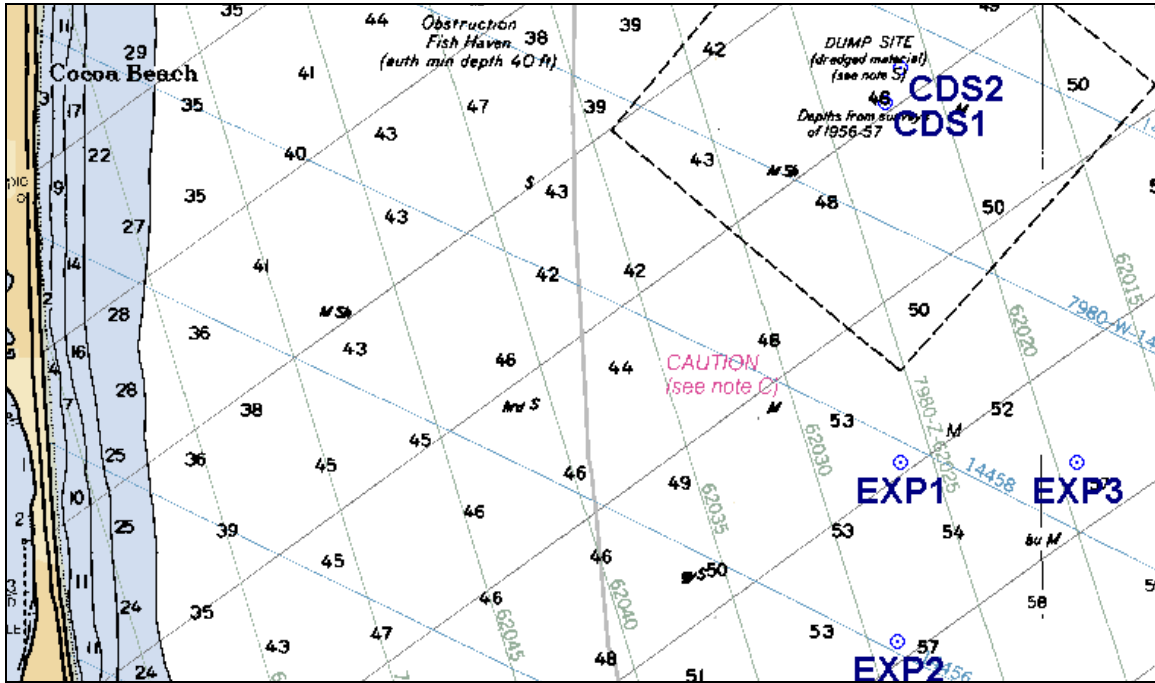


Figure 9: Ocean Sample Locations

Sample location, time of sampling and depth are given in Table 1.

Table 1: Sample Station Location

Station ID	Time (Hr)	Latitude (°N)	Longitude (°W)	Depth (feet)
CH-B-2 d1	838	28°24.63'	80°37.43'	30.9
CH-B-2 d2	850	28°24.64'	80°37.46'	31.6
CH-B-2 d3	854	28°24.63'	80°37.46'	31.6
CDS-1 d3	1011	28°18.82'	80°30.99'	34.2
CDS-1 d4	1022	28°18.62'	80°31.14'	38.9
CDS-1 d5	1023	28°18.59'	80°31.16'	40.4
CDS-1 d6	1032	28°18.77'	80°30.99'	36.6
CDS-1 d7	1034	28°18.71'	80°31.03'	36.1
CDS-1 d8	1037	28°18.66'	80°31.07'	37.2
CDS-1 d9	1040	28°18.60'	80°31.13'	40.8

Station ID	Time (Hr)	Latitude (°N)	Longitude (°W)	Depth (feet)
CDS-1 d10	1049	28°18.71'	80°30.90'	40.3
CDS-1 d11	1052	28°18.66'	80°30.93'	37.0
CDS-2 d1	1326	28°18.93'	80°31.02'	36.5
CDS-2 d2	1332	28°18.94'	80°30.94'	38.6
CDS-2 d3	1336	28°18.92'	80°30.91'	39.9
CDS-2 d4	1340	28°18.98'	80°30.90'	39.6
CDS-2 d5	1345	28°18.93'	80°30.90'	38.7
CDS-2 d6	1351	28°18.97'	80°31.04'	36.2
CDS-2 d7	1354	28°18.94'	80°31.05'	34.8
CDS-2 d8	1415	28°18.90'	80°31.05'	33.0

## 6.0 LIST, COMPLETION DATES, AND DISCUSSION OF PENDING ANALYSES

The collected samples were shipped to Department of Energy Sandia National Labs (SNL) for analysis. The samples will be homogenized for each site and poured into 30 cm coring tubes. These cores will be allowed to consolidate for 1 to 120 days. SNL will then determine 1) erosion rate as a function of bulk density and shear stress and 2) bulk density and critical shear stress as a function of depth. The tests will be performed at intervals of approximately 2, 10, 60 and 120 days of consolidation. Additionally, SNL will determine bulk density, particle size, mineralogy and organic carbon for each sample. The pending analysis and completion dates for this survey are listed in Table 2.



**Table 2: Completion Dates**

<b>Task</b>	<b>Date</b>	<b>Organization</b>
Erosion Rate Analysis	February, 2001	DOE Sandia National Labs
Intermediate Report on Erosion Rate Analysis	March, 2001	DOE Sandia National Labs
Final Report on Erosion Rate Analysis	April, 2001	DOE Sandia National Labs
Canaveral ODMDS SMMP Monitoring Report	June, 2001	EPA Region 4

## **7.0 PROBLEMS ENCOUNTERED**

No problems were encountered.

## **8.0 ACHIEVEMENT OF SURVEY OBJECTIVES**

All 3 samples and 3 exploratory stations were completed.

## **9.0 PRELIMINARY ENVIRONMENTAL MANAGEMENT DECISIONS FROM SURVEY**

No preliminary environmental management decisions can be made from the survey. Visual observations during survey indicated recent dredged material disposal at CDS-1 and CDS-2. Exploratory stations appear to be satisfactory for future current meter deployment.

## **10.0 RECOMMENDATIONS FOR ANDERSON IMPROVEMENTS**

It is recommended that the piston corer be reconditioned and repaired so that it is useable during future surveys.

## 11.0 CONTRACTOR SUPPORT EVALUATION

No supplementary contractor support was used on this survey.

## 12.0 SCIENTIFIC PARTY (If different from survey plan)

	<u>NAME</u>	<u>SURVEY RESPONSIBILITY</u>	<u>ORGANIZATION</u>
1)	Chris McArthur	Chief Scientist & QA/QC	EPA/Atlanta
2)	Drew Kendall	Sample Collection	EPA/Atlanta

## 13.0 FINAL REPORTING PLANS

Canaveral ODMDS SMMP Monitoring Report

Completion Date: See Table 2

Report Filing Location: EPA Region 4, Atlanta, GA