APPENDIX A
EVALUATION OF SSFATE MODELING FOR NEWARK BAY

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The results of the study "SSFATE Modeling of Arthur Kill Dredging, Final Report", by New York/New Jersey Harbor Partnership (NYNJ Harbor Partnership 2003) do not provide reliable estimates of the extent of dispersal and subsequent deposition of suspended material due to dredging. This is because the model does not appear to function properly.

Model results show local accumulations of solids in the water column at locations at some distance from the dredge. For example, in Figure 7-2 of NYNJ Harbor Partnership (2003), segments colored yellow and orange are present in Upper New York Bay just south of Kill van Kull on the western side of the channel (90 kg/m3 release rate). Such high concentrations are not observed at any depth in nearby areas of the bay or towards the eastern end of Kill van Kull. This means that this local high concentration does not appear to represent a plume of high-concentration water emanating from the dredge. Instead, solids appear to have increased in concentration in this local area. Such a local increase in TSS could occur only due to locally elevated settling rates. However, the elevated TSS levels occur in the 2 to 4m depth, that is, not near the bottom. This result suggests the possibility that the model is not conserving water mass, and thus that model results are an artifact of the how the model was developed.

This apparently counter-intuitive result may be related to the way in which the three-dimensional hydrodynamic model was coupled to SSFATE. Surface flows from the hydrodynamic model (USACE 1999) were apparently used in SSFATE for all depths within the water column. In an estuary with complex three-dimensional circulation and complex bathymetry, this method of model coupling would be likely to cause water mass not to be conserved.

ERDC plans to revisit the application of SSFATE to the Newark Bay area. The planned effort will rely upon (1) a revised version of the model SSFATE; (2) the incorporation of additional resuspension data; and (3) corrected application of hydrodynamic model results.

References

NYNJ Harbor Partnership, 2003. *SSFATE Modeling of Arthur Kill Dredging.* Final Report, June 2003.

U.S. Army Corps of Engineers, 1999. *New York/New Jersey Harbor Navigation Study Hydrodynamic and Water Quality Modeling:* Preliminary Draft Final Report.

APPENDIX B
INTERIM REPORT FOR THE 2005 RESUSPENSION STUDY

NY & NJ Harbor Deepening Project - Total Suspended Solids (TSS) Monitoring

Interim Report

September 2005

For:

U.S. Army Corps of Engineers

Submitted by:

One Blue Hill Plaza
Pearl River, NY 10965

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I. INTRODUCTION

Water column total suspended solids (TSS) concentrations and turbidity were monitored during dredging operations in the Kill Van Kull. Monitoring was conducted in the portions of the S-KVK Dredging Project Area dominated by fine-grained sediments. Monitoring efforts focused on operations of the clamshell dredge Bean 2, which was equipped with an eight cubic yard cable arm environmental bucket.

The objectives of the monitoring effort were:

1) Define the extent of the suspended solids plume resulting from dredging operations through TSS and turbidity sampling; and

2) Correlate turbidity readings with TSS concentrations to facilitate future dredge operations monitoring.

II. SAMPLING METHODOLOGY

Sampling was conducted on four occasions, July 1, July 19, August 1, and August 15, 2005. Each sampling event included one ebb and one flood tidal stage, with the exception of August 15, which only included the flood tidal stage. On July 19, sampling was also conducted during slack low tide. For each sampling event, TSS concentrations and turbidity were measured at different locations relative to the dredge. TSS concentrations were measured directly at three discrete depths and turbidity was measured through the water column (profile) by taking readings at regular intervals from the surface to the bottom.

During each tidal stage, current speed and direction were established with a General Oceanics Electronic Flowmeter. One station up-current of dredging operations (background) was sampled first, followed by up to nine down-current stations. Station distance from the dredge was established using a range finder and a Trimble global positioning system (GPS). The up-current station was located approximately 250 ft from the dredge. The down-current stations were located approximately 250 ft, 500 ft, and 1000 ft from the dredge (station locations were labeled A, B and C, respectively for data summary and graphing purposes).

Three locations were sampled at each distance, one in the anticipated center of the plume, in line with the dredge and the current (center station), and two on anticipated edges of the plume (north and south, relative to the center stations). Some locations were not sampled during each survey due to tidal conditions, vessel traffic in the channel or in-water obstructions (e.g., bulkheads, piers).

At each sampling station the position coordinates were recorded after the boat was anchored. Depth was measured using a Hummingbird Wide Paramount depth finder. Turbidity, temperature and salinity (as conductivity) profiles were collected using a conductivity-temperature-depth recorder (CTD) equipped with an optical backscatter meter (OBS). The CTD/OBS was lowered through the water column until it made contact with the bottom. Measurements were recorded approximately once per second during each CTD/OBS cast, where downcast refers to the instrument descending through the water column and upcast

refers to the instrument ascending through the water column. One downcast and upcast was performed at each station.

At each station, discreet water samples were collected for TSS analysis using a Niskin bottle. Grab samples were collected 18 in below the surface (near-surface), at mid-depth, and approximately 3 ft above the bottom (near-bottom). For shallow stations (< 15 ft. deep), only near-bottom samples were collected. Grab samples were collected in duplicate on July 1 and in triplicate on July 19, August 1, and August 15. One water sample from each depth was analyzed for temperature, conductivity and turbidity. Temperature and conductivity were measured using a YSI Model 85 multiple parameter meter and turbidity was measured using an HF Scientific Portable Turbidimeter. Water samples were poured from the Niskin sampler into Nalgene sample bottles and placed on ice until delivery to the analytical laboratory.

Samples were analyzed for TSS using EPA Method 160.2 and concentrations were reported as mg/L. Turbidity readings were correlated to TSS concentrations using both field measurements and a laboratory calibration of the OBS sensor, described in Section VI.

III. STATION LOCATIONS

1. JULY 1, 2005

The Bean 2 dredge was located at the east end of Shooters Island in the Kill Van Kull. Sampling began on the ebb tide. The direction of the tidal current was generally southeast. Sampling was conducted at ten locations; one location 250 ft up-current of the dredge and three locations at each distance of 250 ft (A), 500 ft (B) and 1000 ft (C) down-current of the dredge.

Sampling was not conducted during slack low water due to maintenance of the dredge at this time. Dredging and sampling resumed during the flood tide. The direction of the tidal current during the flood tide was generally northwest. Although current speed was not measured on this date, visual observation indicated that the flood tidal current speed was faster than the ebb tidal current speed. Sampling was conducted at nine locations; one location 250 ft up-current of the dredge, two locations 250 ft down-current of the dredge and three locations at each distance of 500 ft and 1000 ft down-current of the dredge.

A summary of station information is provided in Table 1. Locations of the sampling stations in the Kill van Kull relative to the dredge are shown in Figure 1.

2. JULY 19, 2005

The Bean 2 dredge was located east of Shooters Island in the Kill Van Kull. The dredge Tauracavor was positioned approximately 1500 ft away from the Bean 2, dredging material comprised of approximately 65% rock and 35% glacial till and clay. However, the dredge Tauracavor was out of service for the entire sampling period and thus did not influence TSS concentrations or turbidity at this location.

Sampling began on the ebb tide. The direction of the tidal current was generally southeast. Sampling was conducted at eight locations; one location 250 ft up-current of the dredge, three locations approximately 250 ft down-current of the dredge, and two locations at each distance of 500 ft and 1000 ft down-current of the dredge. The dredge stopped working before the second and third locations at each approximate distance of 500 ft and 1000 ft could be sampled. When dredging resumed, the tidal stage was slack low water. Two locations were sampled during slack low tide, both were approximately 250 ft from the dredge.

The direction of the flood tidal current was generally northwest and as previously noted, the current was faster than the ebb tidal current. Sampling was conducted at one location 250 ft up-current of the dredge, three locations approximately 250 ft down current of the dredge, two locations approximately 500 ft down-current of the dredge, one location 750 ft down-current of the dredge and one location 1000 ft down-current of the dredge. In-water obstructions and the position of the dredge Tauracavor prevented sampling at all 1000 ft locations. The 750 ft location was sampled instead of a 500 ft location in order to obtain samples on the shoal.

A summary of station information is provided in Table 2. Locations of the sampling stations in the Kill van Kull relative to the dredge are shown in Figure 2. The dredge spuds were retracted a couple of times during the sampling event and the dredge moved approximately 100 ft each time. The sampling transect was shifted to follow the potential suspended sediment plume.

3. AUGUST 1, 2005

The Bean 2 dredge was located east of Shooters Island in the Kill Van Kull. The dredge Tauracavor was positioned approximately 1500 ft away from the Bean 2. The Tauracavor was operating during the sampling event, dredging material comprised of approximately 30% rock and 70% glacial till and clay. Operations of the Tauracavor may have influenced TSS concentrations and turbidity readings at the background station on the ebb tide.

Sampling began on the ebb tide. As previously observed, the direction of the tidal current was generally southeast. Sampling was conducted at seven locations; one location 250 ft up-current of the dredge and three locations at each approximate distance of 250 ft and 500 ft down-current of the dredge. Instrumentation maintenance of the CTD/OBS delayed initiation of sampling, and the end of the ebb tidal phase occurred before sampling at the 1000 ft stations could be completed. Sampling was not conducted at slack low tide.

Flood tide sampling began at the background sampling location approximately 250 ft up-current of the dredge. After sampling was completed at this station, the dredge went out of service for two hours for repairs to the clamshell bucket. Dredging and sampling resumed during the flood tidal stage. As previously noted, the direction of the flood tidal current was generally northwest and the speed of the current was greater than that of the ebb tide. Maintenance of the CTD/OBS prevented turbidity profiles from being sampled at down-current stations during the flood tide. Only four locations could be sampled for TSS due to time constraints. Sampling for TSS was conducted at three locations 250 ft down current of the dredge and one location 700 ft down-current of the dredge. A location 700 ft down-current of the dredge was chosen because two locations at distances of 500 ft could not be

sampled due to in-water obstructions and the position of the dredge Tauracavor, and stations at distances of 1000 ft could not be sampled due to heavy vessel traffic in the channel.

A summary of station information is provided in Table 3. Locations of the sampling stations in the Kill van Kull, relative to the dredge are shown in Figure 3

4. AUGUST 15, 2005

The Bean 2 dredge was located between the Bayonne Bridge and Shooters Island in the Kill Van Kull. The dredge Tauracavor was positioned approximately 3000 ft away from the Bean 2. The Tauracavor was operating during the sampling event, dredging material comprised of approximately 50% rock and 50% glacial till and clay. However, due to the relative locations of the dredges and the tidal conditions, this additional dredging activity did not appear to influence TSS concentrations or turbidity in the vicinity of the Bean 2.

Sampling was conducted on the flood tide. As previously observed, the direction of the tidal current in the channel was generally northwest. However, at this sampling location, the flood tidal current was not very strong and surface currents appeared to be moving in the opposite direction even though a flood tidal current was evident in the main channel.

Flood tide sampling began at the background sampling location 250 ft up-current of the dredge. Sampling was conducted at three locations 250 ft down current of the dredge and two locations 500 ft down-current of the dredge. The dredge stopped working for approximately one hour for maintenance. When dredging resumed, two additional locations were sampled up-current of the dredge, due to the apparent tidal eddies at this location. Due to the generally weak strength of the tidal current, sampling was not conducted at 1000 ft intervals.

A summary of station information is provided in Table 4. Locations of the sampling stations in the Kill van Kull relative to the dredge are shown in Figure 4.

IV. DATA ANALYSIS

The presence or absence of suspended sediment plumes was determined through statistical comparison of background and down-current TSS concentrations and turbidity. A plume was considered present when down-current values were significantly higher than background levels.

Mean TSS concentrations were calculated for each depth (near-surface, mid-depth and bottom) for each station. For each sample date and each tide (flood or ebb) a two-way analysis of variance (ANOVA) was performed with depth and station as independent variables and TSS concentration as the dependent variable. Tests were conducted at the α=0.05 significance level.

Due to significant interaction terms between the two variables in many cases, it was not possible to make conclusions as to the significance of the main effects (depth and station). Therefore, a one-way ANOVA was conducted for depth and station separately as the independent variables. When the one-way ANOVA indicated a significant effect, Tukey's

Studentized Range (HSD) Test was performed in order to determine which depths and/or stations were significantly different using pairwise comparisons.

For each sampling station, mean turbidity values were calculated for the following depth ranges: 0 to 10 ft, 10 to 20 ft, 20 to 30 ft, 30 to 40 ft and 40 to 50 ft. ANOVAs were then performed as previously described for TSS data, with depth range and Station ID as independent variables and turbidity as the dependent variable. For both TSS and turbidity data, when a significant difference was indicated in the near-bottom depths, a separate one-way ANOVA was performed to compare near-bottom TSS and turbidity values between stations.

V. RESULTS

Turbidity and TSS concentration results from the four sampling events are presented below. For CTD/OBS data, only the results of downcasts (instrument descending through the water column) are presented due to the potential effect of instrument contact with the bottom on upcast turbidity readings.

1. JULY 1, 2005

Salinity ranged from 18.98 to 20.64 ppt on the ebb tide and from 19.12 to 21.70 ppt on the flood tide and was relatively uniform throughout the water column. Temperature ranged from 22.98 to 24.53 ^{o}C on the ebb tide and from 22.19 to 26.38 ^{o}C on the flood tide and was also similar throughout the water column.

During the ebb tide, background (up-current) turbidity ranged from 3 to 4 NTU and mean background TSS concentrations ranged between 5.5 and 6.8 mg/L (Figure 5). Mean turbidity was similar to background for all stations except Station A-Down-C, the center station located in the channel, 250 ft down-current of the dredge. At this station, turbidity ranged from 3 to 35 NTU and was significantly higher ($p<0.0001$) than at the up-current station (Figure 5). During the ebb tide, turbidity in the depth range of 40 to 50 ft was significantly higher ($p<0.0001$) than turbidity at all other locations in the water column, and turbidity in the depth ranges of 30 to 40 ft and 20 to 30 ft was significantly higher ($p<0.0001$) than turbidity in the surface water (0 to 10 ft). This was likely caused by the increase in turbidity with depth at Station A-Down-C, as there was an interaction between depth range and station. Comparison of near-bottom turbidities between stations did not produce a different result from comparison of turbidity over all depths (Figure 5).

Mean TSS concentrations at Station A-Down-C (in the channel, 250 ft down-current of the dredge) were also significantly higher ($p<0.0003$) than mean TSS concentrations at the up-current station, and ranged between 4.7 mg/L in the near-surface water samples and 51.8 in the near-bottom water samples (Figure 5). Mean TSS concentrations at all other stations were similar to the up-current station. During the ebb tide, TSS concentrations were not significantly different between near-surface, mid-water, and near-bottom samples.

During the flood tide, background (up-current) turbidity ranged from 3 to 14 NTU and mean background TSS concentrations were between 6.3 and 13.8 mg/L (Figure 6). Mean turbidity was significantly higher than background ($p<0.0001$) at Stations A-Down-C, B-Down-C, B-Down-S, and C-Down-C. At Stations A-Down-C and C-Down-C, center stations located in

the channel, 250 ft and 1000 ft down-current of the dredge, turbidity readings ranged from 6 to 40 NTU, and increased in the near-bottom water (Figure 6). At Stations B-Down-C and B-Down-S, the center and south stations located in the channel, 500 ft down-current of the dredge, turbidity readings ranged from 6 to 15 NTU and increased slightly with depth. During the flood tide, turbidity readings in the depth range of 30 to 40 ft and 40 to 50 ft were significantly higher ($p<0.0001$) than turbidity readings at the shallower locations in the water column. There was an interaction between depth range and station, likely caused by the increase in turbidity with depth at all downstream stations except for those on the north track (Figure 6). Comparison of near-bottom turbidities between stations did not produce a different result from comparison of turbidity over all depths.

Mean TSS concentrations at Station B-Down-S (in the channel, 500 ft down-current of the dredge) were significantly higher ($p<0.0003$) than mean TSS concentrations at the up-current station, and ranged between 15 mg/L in the near-surface water and 32.5 mg/L in the near-bottom water (Figure 6). Mean TSS concentrations at all other stations were similar to the up-current station, when all depths were compared together. During the flood tide, TSS concentrations were significantly higher in the near-bottom water ($p<0.008$) than in mid-depth and near-surface water. When only near-bottom TSS concentrations were compared between stations, mean concentrations at Stations B-Down-S, C-Down-C and C-Down-S, located in the channel, 500 ft (B) and 1000 ft (C) down-current of the dredge, were significantly higher than mean concentrations at the up-current station (Figure 6).

Summary: During the ebb tide, significantly higher turbidity and TSS concentrations were measured at the station in the channel, 250 ft down-current from the dredge, in line with the dredge and current. Turbidity and TSS concentrations at all other ebb tide stations were similar to the up-current station. During the flood tide, significantly higher turbidity was measured at all center stations in the channel (250 ft, 500 ft and 1000 ft down-current of the dredge) and at one south station located in the channel, 500 ft down-current of the dredge. Mean TSS concentrations at this south station were significantly higher than background concentrations. When only near-bottom depths were compared, two stations 1000 ft down-current of the dredge (center and south tracks) had mean TSS concentrations significantly higher than background concentrations. Two stations had elevated TSS concentrations that corresponded with elevated turbidity readings.

2. JULY 19, 2005

Salinity ranged from 19.2 to 20.7 ppt during the ebb tide, from 18.8 to 19.9 ppt during slack low tide, and from 18.9 to 21.1 ppt during flood tide and was relatively uniform throughout the water column. Temperature ranged from 24.8 to 25.9 ^{o}C during ebb tide, from 24.9 to 26.4 ^{o}C during slack low tide, and from 24.8 to 25.1^{o}C during flood tide and was also similar throughout the water column.

During the ebb tide, background (up-current) turbidity ranged from 5 to 10 NTU and mean background TSS concentrations ranged between 9.0 and 14.5 mg/L (Figure 7). Mean turbidity readings were similar to background readings for all stations down-current of the dredge when turbidity was compared across all depth ranges. During the ebb tide, turbidity readings in the depth range of 40 to 50 ft were significantly higher ($p<0.0001$) than turbidity readings at all other locations in the water column. When turbidity in the bottom depth range

was compared between stations, turbidity at Station A-Down-C (in the channel, 250 ft down-current of the dredge) was significantly higher than turbidity at the up-current station (Figure 7).

Mean TSS concentrations at Station A-Down-S (in the channel, 250 ft down-current of the dredge) were significantly higher ($p<0.0001$) than mean TSS concentrations at the up-current station, and ranged between 12.9 mg/L in the near-surface water samples and 18.9 mg/L in the near-bottom water samples (Figure 7). Mean TSS concentrations at all other stations were similar to the up-current station. During the ebb tide, TSS concentrations were significantly higher in the near-bottom water ($p<0.001$) than in the near-surface water, but when near-bottom TSS concentrations were compared between stations, mean concentrations at the down-current stations were not significantly different from mean TSS concentrations at the up-current station.

During the flood tide, background (up-current) turbidity readings ranged from 5.4 to 18 NTU and mean background TSS concentrations were between 11 and 16.5 mg/L (Figure 8). Mean turbidity was significantly higher than background ($p<0.0001$) at Stations A-Down-C, A-Down-S, B-Down-C, B-Down-N, and C-Down-N. Turbidity was greatest at Stations A-Down-C and A-Down-S (both in the channel, 300 ft and 250 ft down-current of the dredge), ranging between 8.8 and 29.5 NTU and increasing in the near-bottom water. Turbidity also increased in the near-bottom water at Station C-Down-N (in the channel, 1100 ft down-current of the dredge), up to 25.9 NTU. Field notes indicated that a large container ship passed just prior to sampling at Station C-Down-N. Turbidity at Stations B-Down-C and B-Down-N (in the channel, 500 ft and 450 ft down-current of the dredge) ranged from 10 to 20 NTU and was relatively constant throughout the water column. During the flood tide, turbidity in the depth range of 30 to 40 ft and 40 to 50 ft was significantly higher ($p<0.0001$) than turbidity at the shallower locations in the water column. There was an interaction between depth range and station, likely caused by the increase in turbidity with depth at Stations A-Down-C, A-Down-S, and C-Down-N (Figure 8). Comparison of near-bottom turbidities between stations did not produce a different result from comparison of turbidity over all depths.

Mean TSS concentrations at Station A-Down-S (in the channel, 250 ft down-current of the dredge) were significantly higher ($p<0.0001$) than mean TSS concentrations at the up-current station, and ranged between 25.3 mg/L in the near-surface water samples and 75.6 mg/L in the near-bottom water samples (Figure 8). Mean TSS concentrations at all other stations were similar to the up-current station, when all depths were compared together. During the flood tide, TSS concentrations were significantly higher in the near-bottom water ($p<0.008$) than in near-surface water. There was an interaction between depth and station, which was likely caused by the high TSS concentrations in the bottom water of Station A-Down-S, as comparison of mean near-bottom TSS concentrations between stations did not produce a different result from comparison of TSS concentrations over all depths.

Turbidity at slack low tide ranged between 3.4 and 7.5 NTU and mean TSS concentrations ranged between 9 and 11 mg/L. Both turbidity and TSS concentrations were similar to both the flood tide and ebb tide up-current stations (Figure 9).

Summary: During the ebb tide, significantly higher mean TSS concentrations relative to background were measured at the south station located in the channel, 250 ft down-current from the dredge. However, these concentrations were less than 20 mg/L. Significantly higher turbidity was measured in the near-bottom water at the center station located 250 ft down-current of the dredge, but this difference was not reflected in the measured TSS concentrations. During the flood tide, turbidity was higher than background at five down-current stations, which were all located in the channel. Two stations were located approximately 250 feet from the dredge (250 ft and 300 ft, center and south tracks), two were located approximately 500 ft from the dredge (450 ft and 500 ft, center and north tracks) and one was located 1100 ft from the dredge (north track). At the station 1000 ft down-current of the dredge turbidity may have been influenced by the passage of a large container ship. Mean TSS concentrations were higher than background concentrations at only one station, 250 ft down-current of the dredge (in the channel, south track).

3. AUGUST 1, 2005

Water column salinity, temperature and turbidity were only measured on the ebb tide due to maintenance of the CTD/OBS during the flood tide. Salinity ranged from 21.4 to 22.5 ppt on the ebb tide and temperature ranged from 24.9 to 26.2 ^{o}C and both were generally uniform throughout the water column.

Background (up-current) turbidity ranged from 5 to 10 NTU on the ebb tide to a depth of approximately 39.8 ft (Figure 10). From 39.8 ft to 46 ft, turbidity ranged from 27 to 59.5 NTU. Turbidity measurements at this location may have been influenced by the dredge Tauracavor. Mean TSS concentrations at the up-current station were 12 to 13 mg/L in the near-surface and mid-water, and 36.5 in the near-bottom water. The flood tide up-current station was included in statistical analysis of turbidity due to the potential influence of the second dredge on the ebb tide up-current station. Turbidity at the flood tide up-current station ranged from 3.5 to 8.0 NTU. When turbidity was compared between all ebb tide stations and the up-current flood tide station, turbidity at the ebb tide up-current station was significantly higher ($p<0.0001$) than all other stations. Turbidity at the ebb tide down-current stations was not significantly different from the flood tide up-current station when compared across all depths. Turbidity readings in the depth range of 40 to 50 ft were significantly higher ($p<0.0001$) than turbidity readings at all other locations in the water column. There was an interaction between depth range and station, and when turbidity in the bottom depth range was compared between stations, near-bottom turbidities at the ebb tide up-current station and at Station A-Down-N (in the channel, 285 ft down-current of the dredge) were significantly higher than turbidity at the flood tide up-current station. Mean TSS concentrations were not significantly different between any of the ebb tide stations.

During the flood tide, mean TSS concentrations at the up-current station were between 11 and 17.5 mg/L (Figure 11). Mean TSS concentrations were not significantly different between the down-current stations and the up-current station. Mean TSS concentrations were not significantly different between near-surface, mid-depth and near-bottom water samples.

Summary: During the ebb tide, turbidity at the up-current station was significantly higher than at all of the down-current stations, likely due to the influence of the dredge Tauracavor.

Significantly higher near-bottom turbidity, relative to the flood tide up-current station, was measured at Station A-Down-N, the north station located 285 ft down-current from the dredge. This difference was not reflected in the mean TSS concentrations, which were less than 20 mg/L at all depths at this sampling station.

4. AUGUST 15, 2005

During the flood tide, salinity ranged from 20.0 to 24.2 ppt and temperature ranged from 24.8 to 26.5 ^{o}C. Both were relatively uniform throughout the water column. Background (up-current) turbidity readings ranged from 5 to 14 NTU and background TSS concentrations ranged between 25 and 27 mg/L (Figure 12). However, turbidity was significantly lower than the "background" station, ranging between 5 and 11.5 NTU, at Stations A-Down-C, B-Down-C, located in the channel, 250 ft and 525 ft down-current of the dredge, and Up-Current 300', located in the shallows. Turbidity at Station A-Down-S (on the side-slope, 300 ft down-current of the dredge) was significantly higher than all other stations, ranging from 8.3 NTU to 26.7 NTU. Turbidity in the depth range of 0 to 10 ft was significantly lower ($p<0.0001$) than turbidity at all other locations in the water column. There was an interaction between depth and station, which is probably due to turbidity changing with depth at some stations (increasing or decreasing) and not at others (Figure 12).

Mean TSS concentrations at Station A-Down-S (side-slope, 300 ft down-current of the dredge) were significantly higher ($p<0.0025$) than mean TSS concentrations at the up-current station, and ranged between 25.5 mg/L in the near-surface water samples and 45.1 mg/L in the near-bottom water samples (Figure 12). During the flood tide there was no significant difference between mean TSS concentrations in near-surface, mid-depth and near-bottom waters.

Summary: During the flood tide, both turbidity and mean TSS concentrations were significantly higher than background at one south station (A-Down-S), located on the side-slope, 300 ft down-current of the dredge.

VI. CORRELATION OF TSS CONCENTRATIONS AND TURBIDITY

Correlation between TSS concentrations and turbidity data was established using both field data and laboratory calibration of the OBS sensor. For field data, the mean TSS concentrations at a particular depth were compared to the mean turbidity reading at that depth. The mean turbidity value was calculated over the range of depths equal to the TSS sample collection depth $\pm$ 3 ft. Turbidity was then plotted as a function of TSS concentration and linear regression was used to derive a relationship (Figure 13). The regression was significant ($p<0.0001$) and both the regression coefficient (0.393) and intercept (2.24) were significantly different from zero with p-values of 0.0001 and 0.004, respectively. The R^2 value was 0.43.

Laboratory calibration of the OBS sensor with sediment was performed following the methods in the D&A Instrument Company operations manual for OBS 1 and OBS 3 sensors. Sediment was collected from within dredging area during each sampling event using a Ponar Grab. As the sediment properties were similar on all collection dates, only sediment collected on August 15, 2005 was used for the calibration. Calibration was first performed using dried sediment. The sediment was homogenized and a subsample was placed in a

drying oven at 106°C. Large debris were removed by hand prior to drying. Calibration was performed with a constant volume of deionized water in a black bucket using a hand-drill equipped with a stainless steel stirrer. Dry sediment was weighed into individual weigh boats and disaggregated in a small amount of water (1 ml). The sediment was added to the bucket incrementally and the OBS recorded turbidity (through the CTD) for a period of 2 minutes after each addition. The mean turbidity value was calculated over the time period, plotted against the concentration of suspended solids (TSS), and linear regression was used to derive a relationship (Figure 14). The regression was significant ($p<0.0001$) and both the regression coefficient (0.144) and intercept (0.834) were significantly different from zero with p-values < 0.0001. The R^2 value was 0.998.

Due to the properties of the sediment ("sticky" black mud) complete disaggregation was difficult after drying. Since incomplete disaggregation can affect the correlation between turbidity and TSS concentrations, calibration was also performed using wet sediment. The sediment was homogenized and three subsamples were weighed into crucibles and placed in a drying oven for percent moisture analysis. Percent moisture was determined to be 50%. Wet sediment was then weighed into individual weigh boats and disaggregated in a small amount of water (1 ml). As described for the dried sediment, wet sediment was added to the deionized water incrementally and the OBS recorded turbidity (through the CTD) for a period of 2 minutes after each addition. The mean turbidity value was calculated over the time period, plotted against the dry weight-based concentration of suspended solids (TSS), and linear regression was used to derive a relationship (Figure 15). The regression was significant ($p<0.0001$) and both the regression coefficient (0.253) and intercept (0.899) were significantly different from zero with p-values of 0.0001 and 0.0002, respectively. The R^2 value was 0.999.

VII. CONCLUSIONS

Generally, significantly higher turbidity and TSS concentrations relative to background were limited to within 250 ft of dredging operations. For the ebb tide sampling events on July 1, July 19 and August 1, 2005 significantly higher turbidity and TSS concentrations relative to background were only present at stations located in the channel, approximately 250 ft from the dredge (Track A). For the flood tide sampling events on July 1 and July 19, significantly higher turbidity and TSS concentrations relative to background were measured at stations in the channel, up to 1000 ft down-current of the dredge (Tracks A, B and C). However, on July 19 the elevated turbidity at one station 1000 ft down-current of the dredge may have been caused by a passing container ship. On August 15 during the flood tide, significantly higher turbidity and TSS concentrations relative to background were only measured at one station located on the side-slope, 300 ft down-current of the dredge. On July 1 (observed) and July 19 (measured), the flood tidal current was much faster than the ebb tidal current, which indicates the effect of tidal current on spatial distribution of the suspended solids plume. This is further supported by the limited distribution of the plume on August 15, when dredging and sampling occurred at a location with a weak flood tidal current.

Background turbidity generally ranged from 5 to 18 NTU and background TSS concentrations generally ranged between 5 and 18 mg/L. The highest turbidity values measured were between 35 and 40 NTU, with the exception of the up-current measurement

that was likely influenced by the dredge Tauracavor (up to 60 NTU). The two greatest mean TSS concentrations measured were 45 and 77 mg/L. Generally, higher turbidity and TSS concentrations occurred in near-bottom water in channel areas. This suggests that the suspended solids plume is primarily concentrated in the bottom water of the navigation channel, with generally decreasing concentrations with decreasing depth in the water column (shallower). These results correspond to other studies of turbidity and TSS in the NY/NJ Harbor. Ambient TSS concentrations have been reported to range from 4 to 44 mg/L with generally higher TSS concentrations in the near-bottom water (LMS 1997, USACE 2002). Concentrations over an order of magnitude higher than background concentrations (up to 952 mg/L) have been observed following passage of container ships (LMS 1997, USACE 2002).

Generally, significantly higher TSS concentrations were reflected in the turbidity measurements. However, significantly higher turbidity was not necessarily reflected in the measured TSS concentrations, especially during the flood tidal stage. This suggests that the suspended solids plume may be highly variable over short time periods and may dissipate relatively quickly depending on the current speed. Also, elevated turbidity/TSS concentrations were not necessarily consistent along one track (e.g. higher measurements were not concentrated to one track or transect). This suggests that the suspended solids plume may also show high spatial variation.

The correlation between TSS and turbidity measurements with the OBS was very strong in the laboratory calibration. This demonstrates that the OBS does effectively measure increasing concentrations of suspended solids, and that relative comparisons of turbidity will provide an indirect measure of relative concentrations of suspended solids. The field correlation between turbidity and TSS concentrations was significant, but was likely affected by temporal variability of the plume. The laboratory-derived coefficient was approximately one half of the field-derived coefficient. Therefore, field turbidity measurements converted to TSS concentrations using the coefficient derived from the laboratory calibration will be approximately two times the TSS concentrations measured in the field. Although the laboratory calibration will always represent “ideal” conditions, both the field and laboratory correlations can be optimized in an attempt to produce a stronger relationship between them.

VIII. RECOMMENDATIONS FOR FUTURE MONITORING EFFORTS

- Characterize the backscatter from suspended solids and current velocity throughout the water column using an Acoustic Doppler Current Profiler (ADCP) to assist in assessing movement of the suspended solids plume and temporal variability.
- Use the ADCP to take continuous measurements while the vessel is underway in order to capture potential spatial variability of the suspended solids plume
- Continue to take TSS grab samples at fixed stations in triplicate in order to provide statistically comparable concentrations and to aid in correlation of relative measures (OBS, ADCP) with actual concentrations
- Continue to use the CTD/OBS to measure conductivity (salinity), temperature, depth and turbidity to characterize the water column

- Optimize the field correlation of turbidity and TSS concentrations by taking concurrent OBS measurements with grab samples
- Optimize the laboratory correlation of turbidity and TSS concentrations by using filtered site water or artificial seawater and performing grain size analysis on grab samples to characterize the suspended material and mimic the composition in the calibration.

IX. REFERENCES

LMS. 1997. Water quality monitoring of Howland Hook dredge operation. Lawler, Matusky and Skelly Engineers, Pearl River, NY.

USACE. 2002. 2001 Total suspended sediment and turbidity monitoring for Newark Bay, Kill van Kull, and Port Jersey. U.S. Army Corps of Engineers, New York District, New York, NY.

Table 1. Station information for sampling conducted on July 1, 2005.

Date	ID	Tide	Distance ft	Location	Track	Depth ft
7/1/2005	Up-Current	Ebb	250	Upstream	Center	33
7/1/2005	A-Down-C	Ebb	250	Downstream	Center	45
7/1/2005	A-Down-S	Ebb	250	Downstream	South	13
7/1/2005	A-Down-N	Ebb	250	Downstream	North	43
7/1/2005	B-Down-C	Ebb	500	Downstream	Center	25
7/1/2005	B-Down-S	Ebb	500	Downstream	South	20
7/1/2005	B-Down-N	Ebb	500	Downstream	North	44
7/1/2005	C-Down-C	Ebb	1000	Downstream	Center	30
7/1/2005	C-Down-S	Ebb	1000	Downstream	South	15
7/1/2005	C-Down-N	Ebb	1000	Downstream	North	44
7/1/2005	Up-Current	Flood	250	Upstream	Center	44
7/1/2005	A-Down-C	Flood	250	Downstream	Center	37
7/1/2005	A-Down-N	Flood	250	Downstream	North	46
7/1/2005	B-Down-C	Flood	500	Downstream	Center	42
7/1/2005	B-Down-S	Flood	500	Downstream	South	36
7/1/2005	B-Down-N	Flood	500	Downstream	North	47
7/1/2005	C-Down-C	Flood	1000	Downstream	Center	42
7/1/2005	C-Down-S	Flood	1000	Downstream	South	44
7/1/2005	C-Down-N	Flood	1000	Downstream	North	48

* Current speed and wind conditions were not recorded on this date

Table 2. Station information for sampling conducted on July 19, 2005.

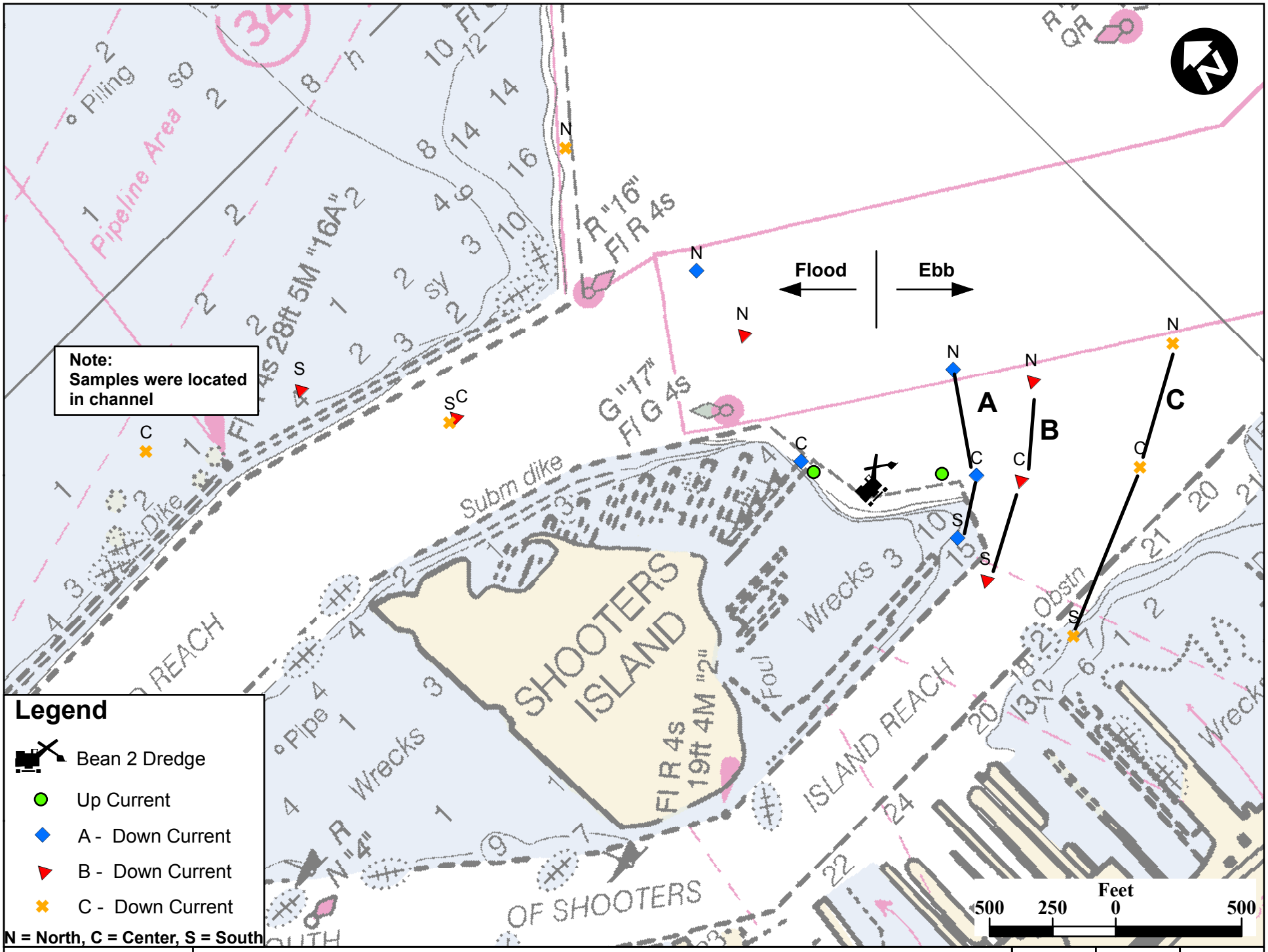
Date	ID	Tide	Distance ft	Location	Track	Depth ft	Current cm/s	Wind speed mph	Wind Dir	Precip
7/19/2005	Up-Current	Ebb	250	Upstream	Center	45	9	0 - 5	SW	NO
7/19/2005	A-Down-C	Ebb	250	Downstream	Center	46	20	0 - 5	SW	NO
7/19/2005	A-Down-S	Ebb	250	Downstream	South	41	10	0 - 5	SW	NO
7/19/2005	A-Down-N	Ebb	250	Downstream	North	45	15	0 - 5	SW	NO
7/19/2005	B-Down-C	Ebb	500	Downstream	Center	45	22	0 - 5	SW	NO
7/19/2005	B-Down-S	Ebb	500	Downstream	South	44	13	0 - 5	SW	NO
7/19/2005	C-Down-C	Ebb	1000	Downstream	Center	45	20	0 - 5	SW	NO
7/19/2005	C-Down-N	Ebb	900	Downstream	North	45	25	0 - 5	SW	NO
7/19/2005	Slack 300'	Slack Low	300	Slack	North	43	5	5 - 10	SW	NO
7/19/2005	Slack 250'	Slack Low	250	Slack	North	43	0	10 - 15	SW	NO
7/19/2005	Up-Current	Flood	300	Upstream	Center	45	5	15 - 20	SW	NO
7/19/2005	A-Down-C	Flood	300	Downstream	Center	41	40	15 - 20	SW	NO
7/19/2005	A-Down-S	Flood	250	Downstream	South	47	15	15 - 20	SW	NO
7/19/2005	A-Down-N	Flood	250	Downstream	North	46	35	15 - 20	SW	NO
7/19/2005	B-Down-C	Flood	500	Downstream	Center	46	30	15 - 20	SW	NO
7/19/2005	B-Down-N	Flood	450	Downstream	North	45	45	15 - 20	SW	NO
7/19/2005	C-Down-S	Flood	750	Downstream	South	6	15	15 - 20	SW	NO
7/19/2005	C-Down-N	Flood	1100	Downstream	North	47	25	15 - 20	SW	NO

Table 3. Station information for sampling conducted on August 1, 2005.

Date	ID	Tide	Distance ft	Location	Track	Depth ft	Current cm/s	Wind speed mph	Wind Dir	Precip
8/1/2005	Up-Current	Ebb	300	Upstream	Center	44	0	0 - 5	SE	NO
8/1/2005	A-Down-C	Ebb	300	Downstream	Center	43	5	0 - 5	SE	NO
8/1/2005	A-Down-S	Ebb	300	Downstream	South	12	5	0 - 5	SE	NO
8/1/2005	A-Down-N	Ebb	285	Downstream	North	46	10	0 - 5	SE	NO
8/1/2005	B-Down-C	Ebb	600	Downstream	Center	43	10	0 - 5	SE	NO
8/1/2005	B-Down-S	Ebb	500	Downstream	South	13	10	0 - 5	SE	NO
8/1/2005	B-Down-N	Ebb	550	Downstream	North	45	5	0 - 5	SE	NO
8/1/2005	Up-Current	Flood	275	Upstream	Center	42	5	0 - 5	SE	NO
8/1/2005	A-Down-C	Flood	320	Downstream	Center	48	25	0 - 5	SE	NO
8/1/2005	A-Down-S	Flood	270	Downstream	South	11	20	5 - 10	E	NO
8/1/2005	A-Down-N	Flood	285	Downstream	North	53	50	5 - 10	SE	NO
8/1/2005	B-Down-C	Flood	700	Downstream	Center	49	40	5 - 10	SE	NO

Table 4. Station information for sampling conducted on August 15, 2005.

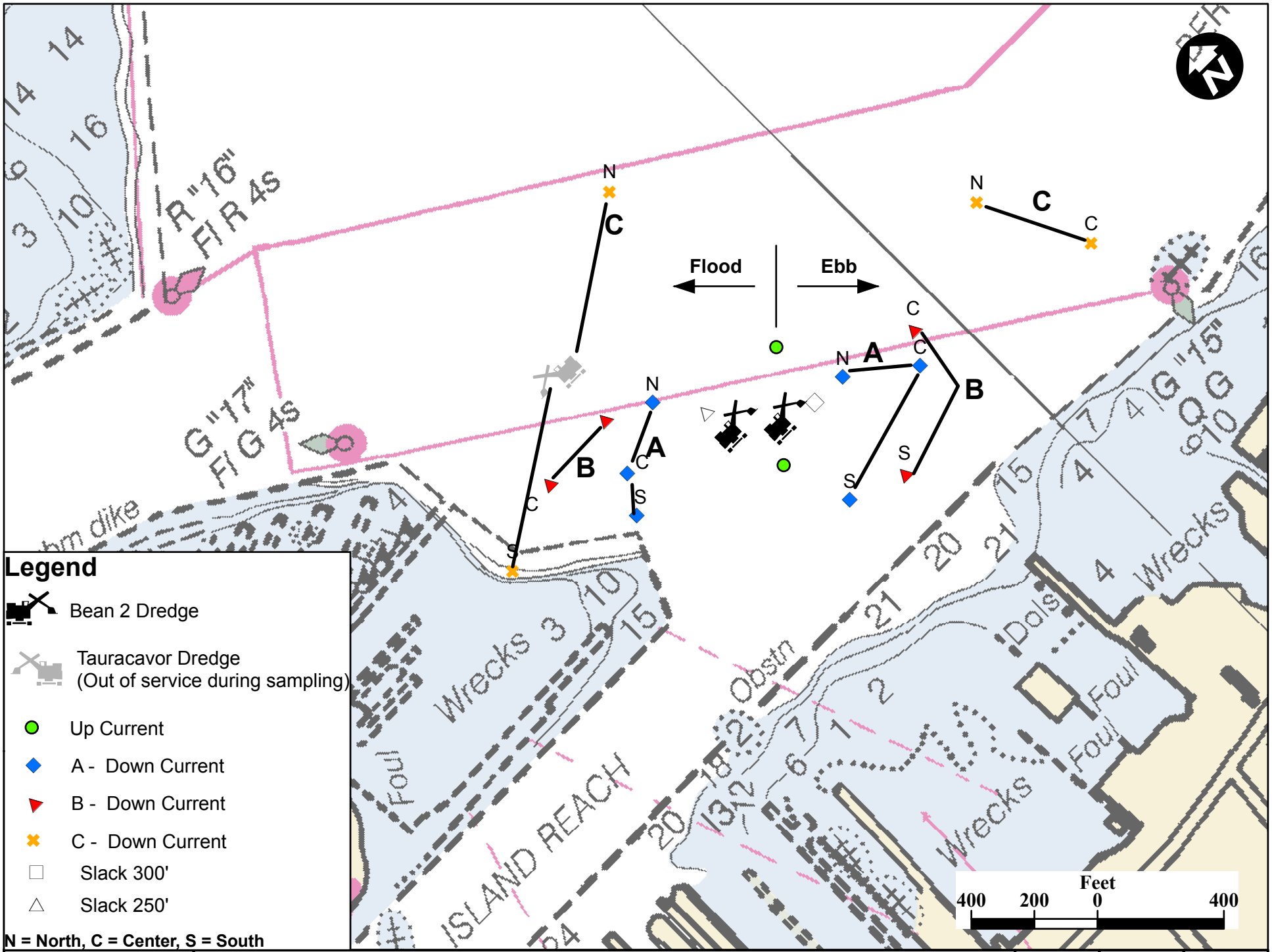
Date	ID	Tide	Distance ft	Location	Track	Depth ft	Current cm/s	Wind Speed mph	Wind Dir	Precip
8/15/2005	Up-Current	Flood	350	Upstream	Center	51	10	5 - 10	N	NO
8/15/2005	Up-Current 300'	Flood	300	Upstream	South	14	0	5 - 10	N	NO
8/15/2005	Up-Current 550'	Flood	550	Upstream	Center	26	5	10 - 15	N	NO
8/15/2005	A-Down-C	Flood	250	Downstream	Center	50	10	10 - 15	N	NO
8/15/2005	A-Down-S	Flood	300	Downstream	South	28	10	5 - 10	N	Lt. Rain
8/15/2005	A-Down-N	Flood	250	Downstream	North	49	15	5 - 10	N	Lt. Rain
8/15/2005	B-Down-C	Flood	525	Downstream	Center	50	10	5 - 10	NE	NO
8/15/2005	B-Down-S	Flood	500	Downstream	South	13	10	5 - 10	NE	NO



HDR | LMS

July 1 2005 TSS Sample Locations

Job No.	Date	Figure No.
1033-005		1



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July 19 2005 TSS Sample Locations

Job No.	Date	Figure No.
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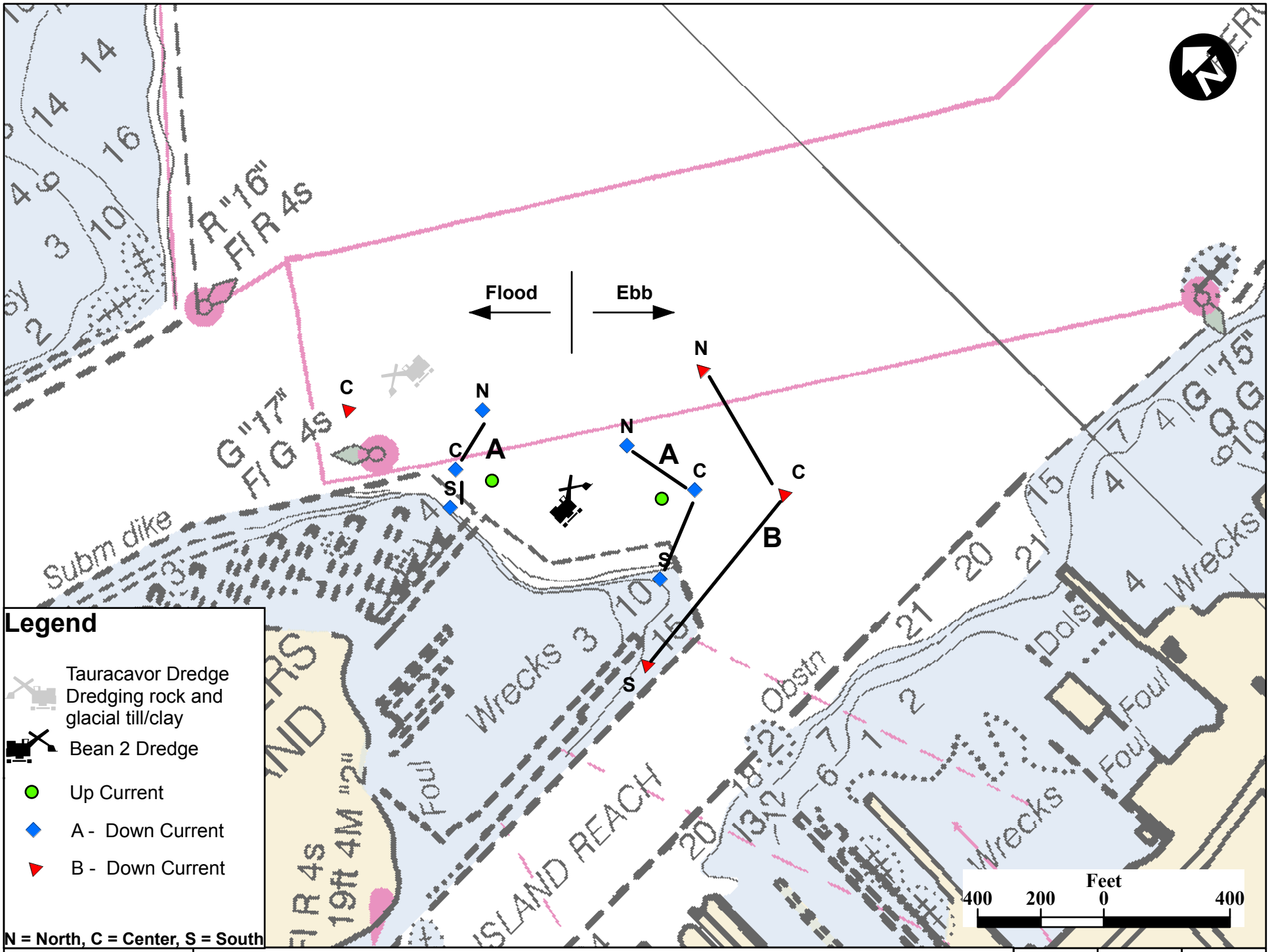

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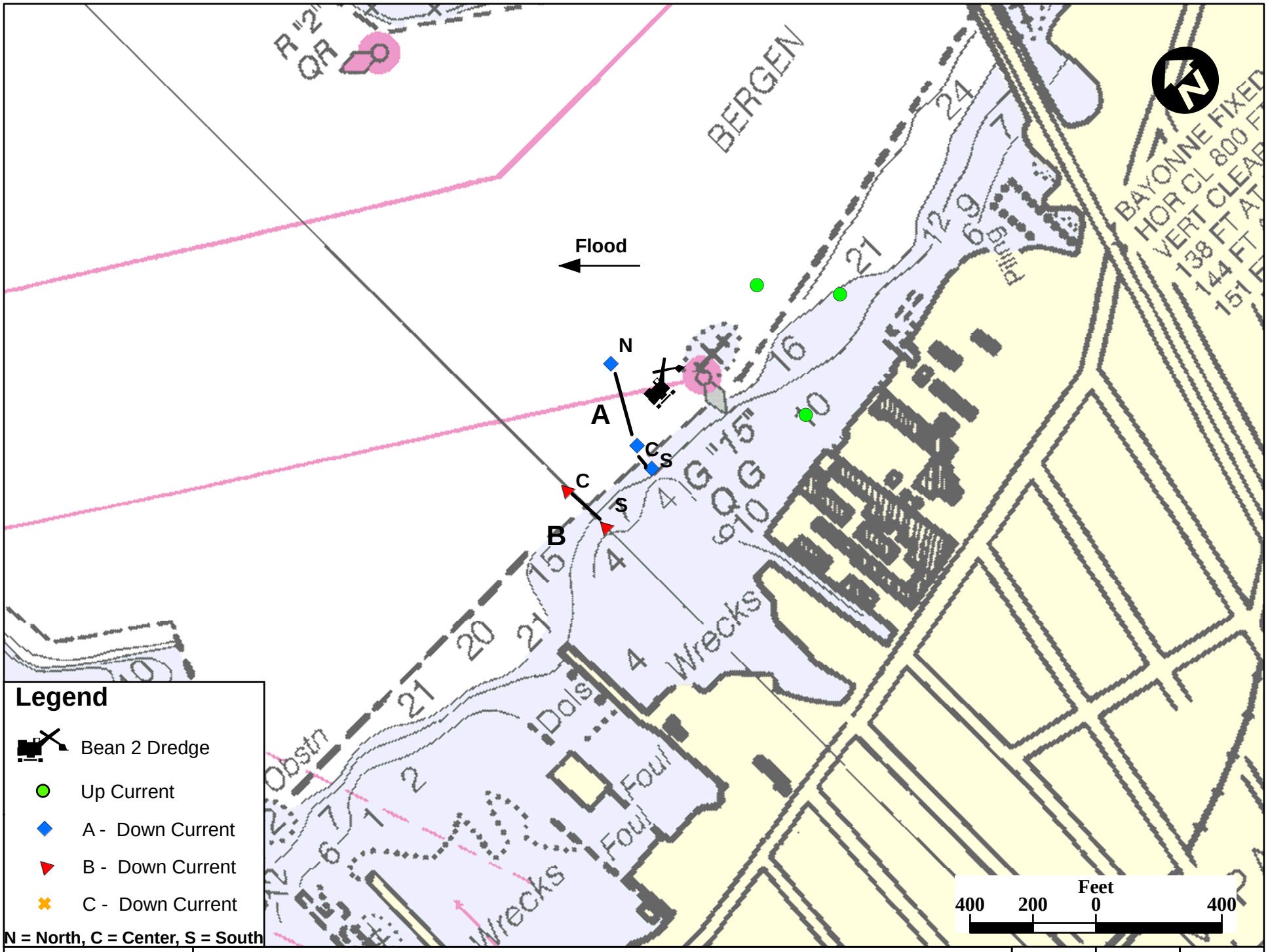
August 1 2005 TSS Sample Locations

Job No.	Date	Figure No.
1033-005		3



August 15 2005 TSS Sample Locations

Job No.	Date	Figure No.
1033-005		4

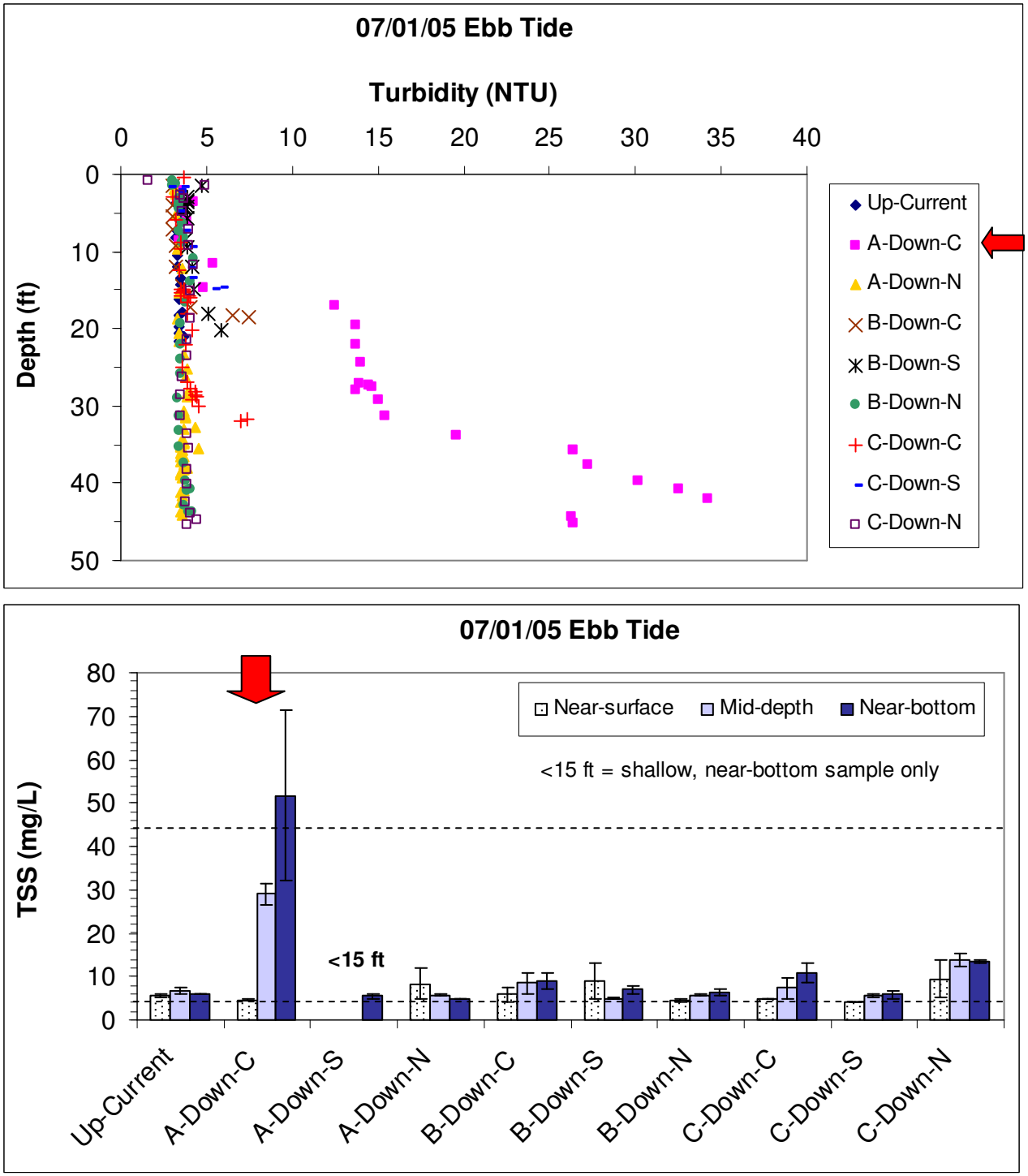


Figure 5. **Turbidity (top) and TSS concentrations (bottom) at all stations sampled during ebb tide on July 01, 2005.** Track A represents stations approximately 250' from the dredge, Track B represents stations approximately 500' from the dredge and Track C represents stations approximately 1000' from the dredge. Turbidity was measured throughout the water column and TSS samples were collected at discrete depths. TSS concentrations represent the mean of two replicates and error bars represent standard error of the mean. The dashed lines on the graph of TSS concentrations represent the low (4 mg/L) and high (44 mg/L) limits for measured ambient conditions in the NY/NJ Harbor (LMS 1997, USACE 2002). On both graphs, a red arrow indicates a significant difference (α=0.05) from the station up-current of the dredge (background conditions) over all depths.

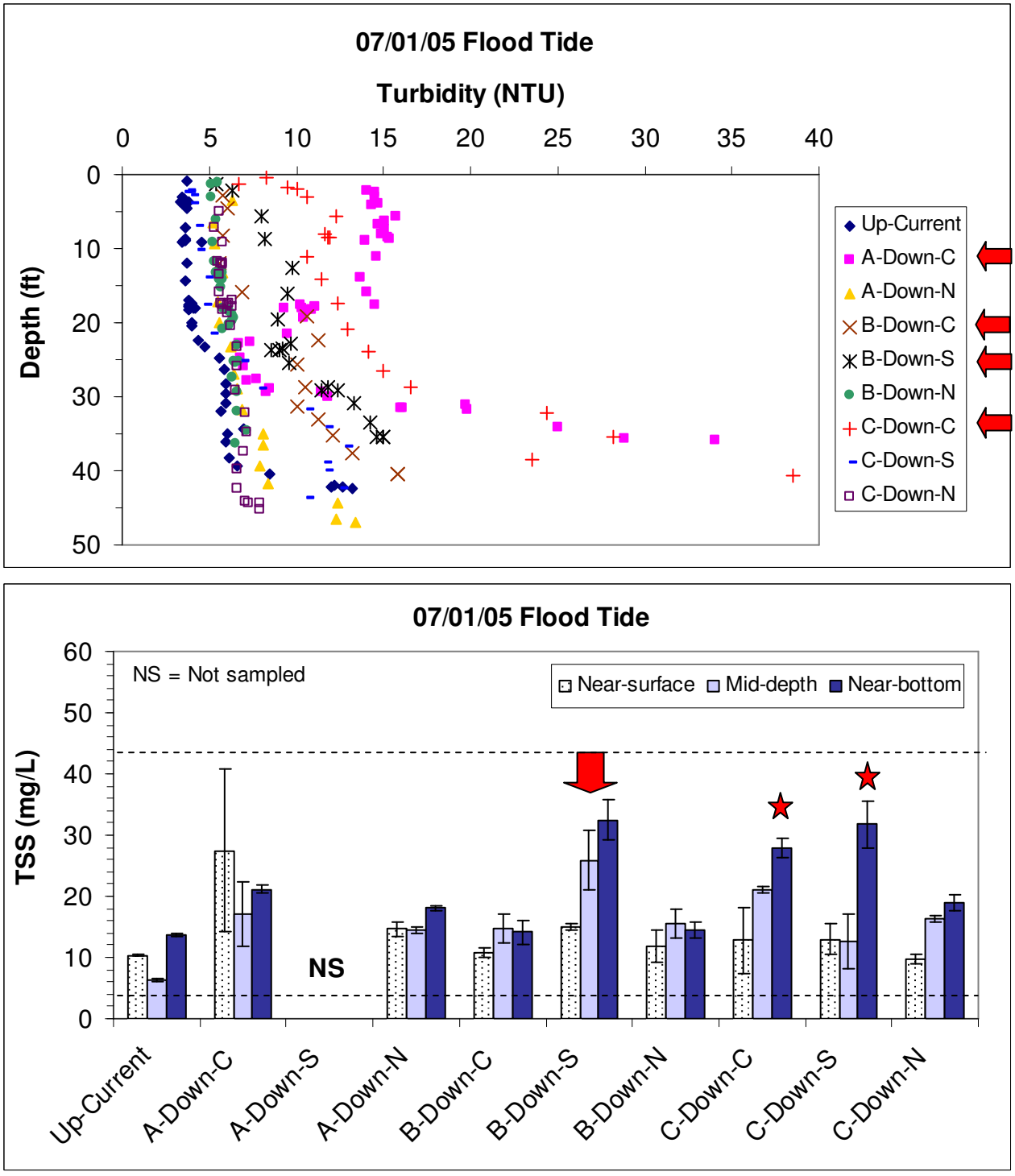


Figure 6. Turbidity (top) and TSS concentrations (bottom) at all stations sampled during flood tide on July 01, 2005. Track A represents stations approximately 250' from the dredge, Track B represents stations approximately 500' from the dredge and Track C represents stations approximately 1000' from the dredge. Turbidity was measured throughout the water column and TSS samples were collected at discrete depths. TSS concentrations represent the mean of two replicates and error bars represent standard error of the mean. The dashed lines on the graph of TSS concentrations represent the low (4 mg/L) and high (44 mg/L) limits for measured ambient conditions in the NY/NJ Harbor (LMS 1997, USACE 2002). On both graphs, a red arrow indicates a significant difference (α=0.05) from the station up-current of the dredge (background conditions) over all depths. On the graph of TSS concentrations, a red star indicates a significant difference (α=0.05) in the near-bottom concentrations from the station up-current of the dredge.

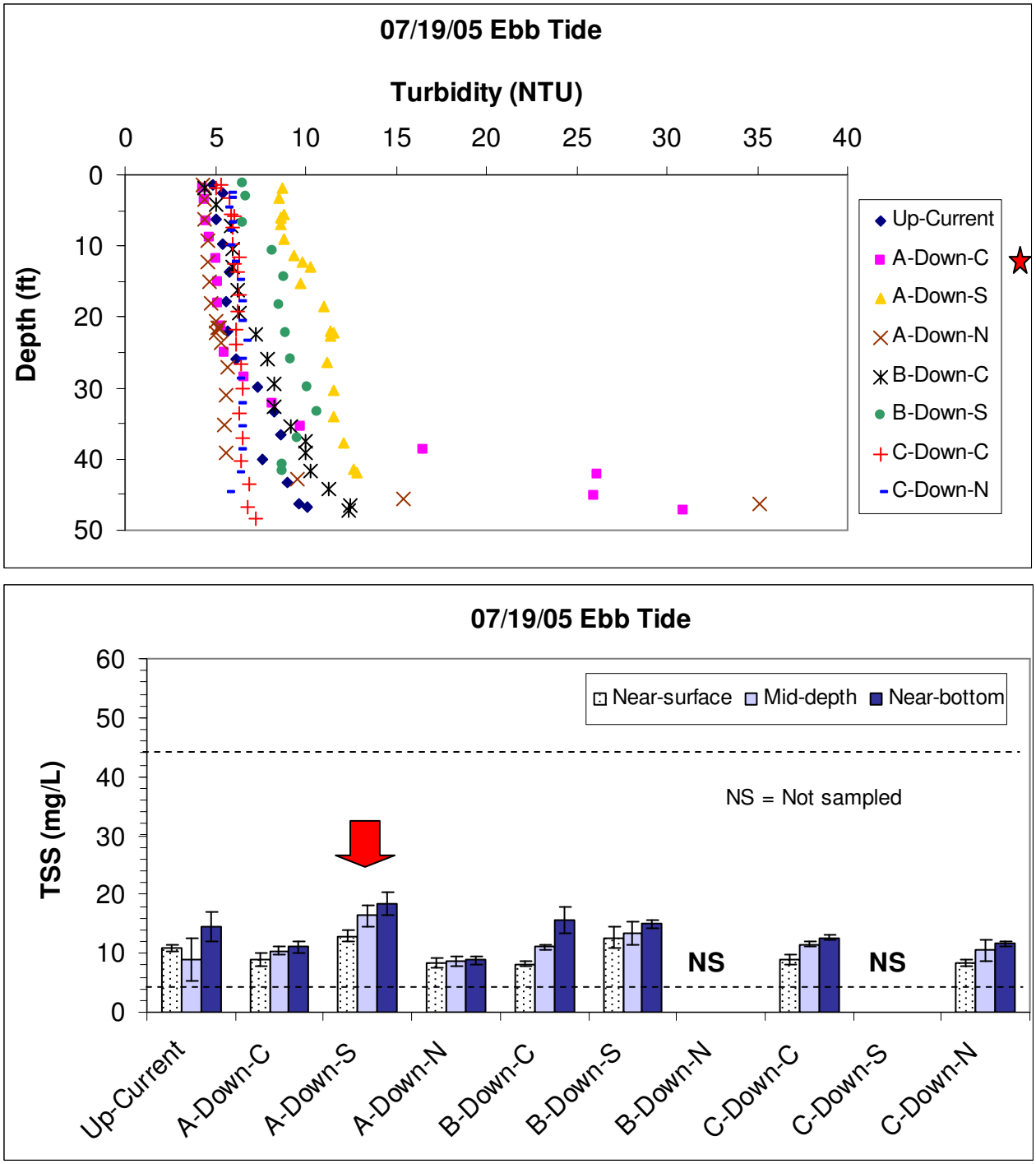


Figure 7. Turbidity (top) and TSS concentrations (bottom) at all stations sampled during ebb tide on July 19, 2005. Track A represents stations approximately 250' from the dredge, Track B represents stations approximately 500' from the dredge and Track C represents stations approximately 1000' from the dredge. Turbidity was measured throughout the water column and TSS samples were collected at discrete depths. TSS concentrations represent the mean of three replicates and error bars represent standard error of the mean. The dashed lines on the graph of TSS concentrations represent the low (4 mg/L) and high (44 mg/L) limits for measured ambient conditions in the NY/NJ Harbor (LMS 1997, USACE 2002). A red arrow indicates a significant difference (α=0.05) from the station up-current of the dredge (background) over all depths. A red star indicates a significant difference (α=0.05) in near-bottom concentrations from the station up-current of the dredge.

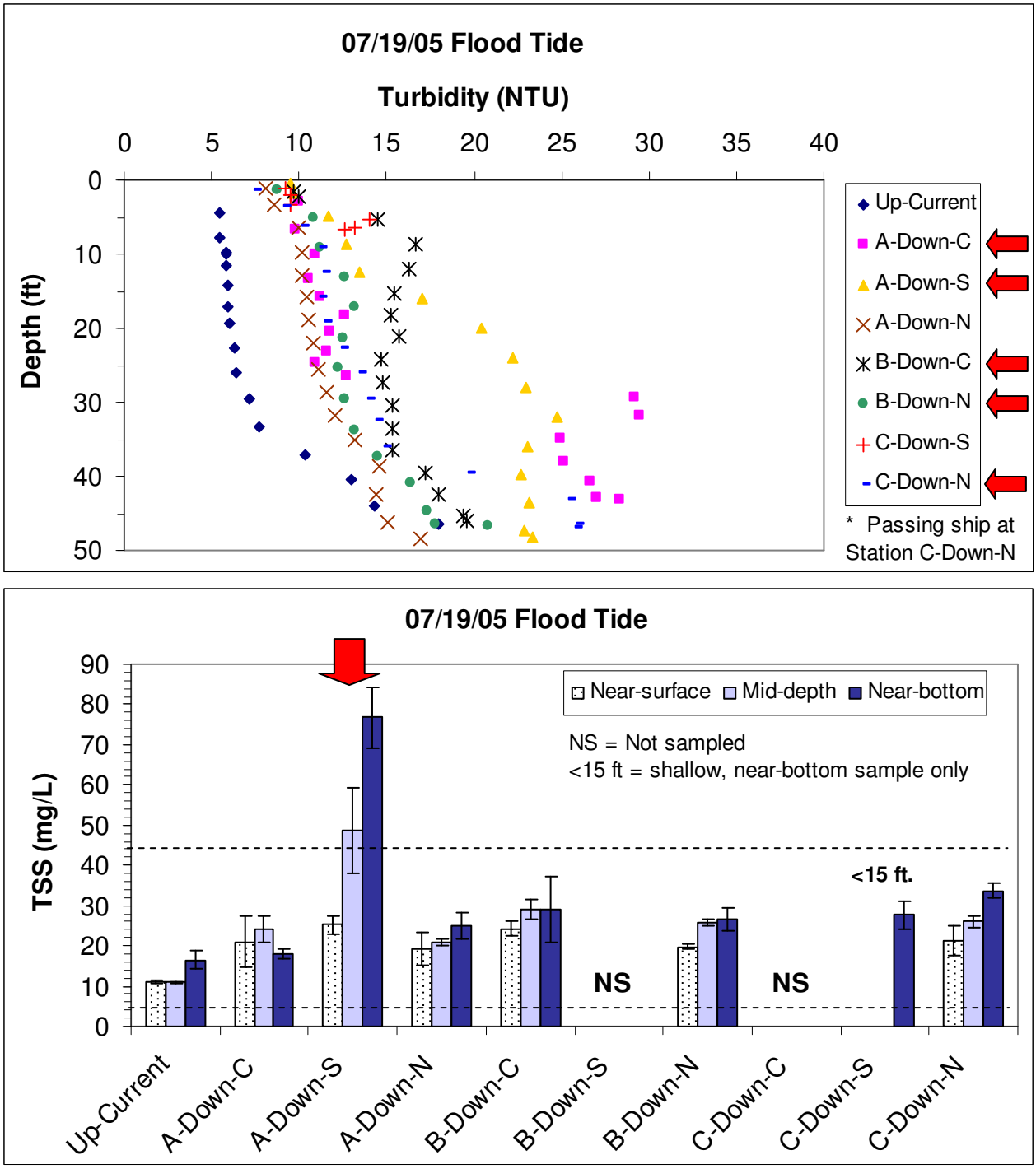


Figure 8. Turbidity (top) and TSS concentrations (bottom) at all stations sampled during flood tide on July 19, 2005. Track A represents stations approximately 250' from the dredge, Track B represents stations approximately 500' from the dredge and Track C represents stations approximately 1000' from the dredge, except for Station C-Down-S, which was 750' from the dredge. Turbidity was measured throughout the water column and TSS samples were collected at discrete depths. TSS concentrations represent the mean of three replicates and error bars represent standard error of the mean. The dashed lines on the graph of TSS concentrations represent the low (4 mg/L) and high (44 mg/L) limits for measured ambient conditions in the NY/NJ Harbor (LMS 1997, USACE 2002). On both graphs, a red arrow indicates a significant difference (α=0.05) from the station up-current of the dredge (background conditions). Turbidity at Station C-Down-N may have been affected by a passing container ship.

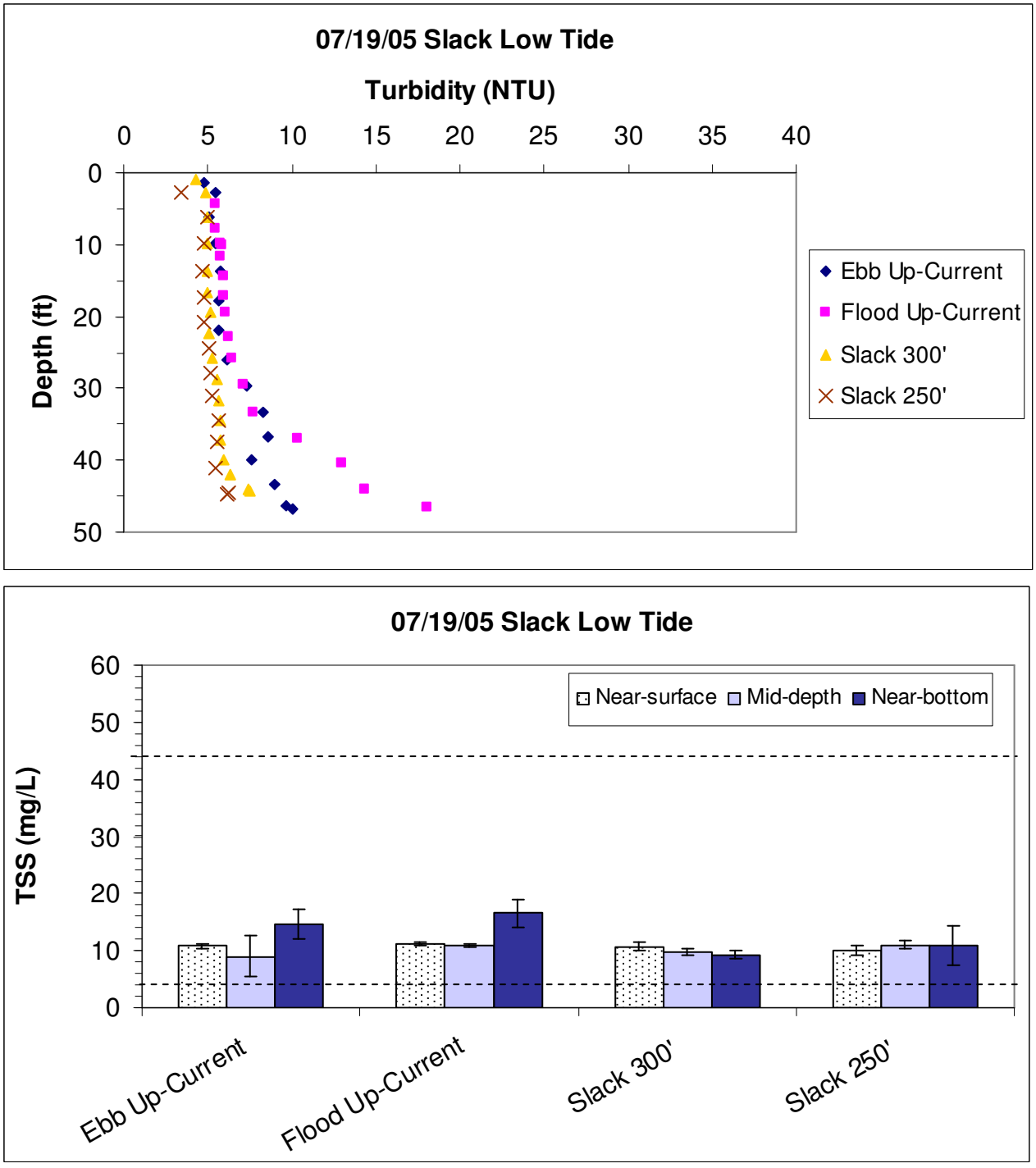


Figure 9. **Turbidity (top) and TSS concentrations (bottom) at all stations sampled during slack low tide on July 19, 2005.** Turbidity was measured throughout the water column and TSS samples were collected at discrete depths. TSS concentrations represent the mean of three replicates and error bars represent standard error of the mean. The dashed lines on the graph of TSS concentrations represent the low (4 mg/L) and high (44 mg/L) limits for measured ambient conditions in the NY/NJ Harbor (LMS 1997, USACE 2002).

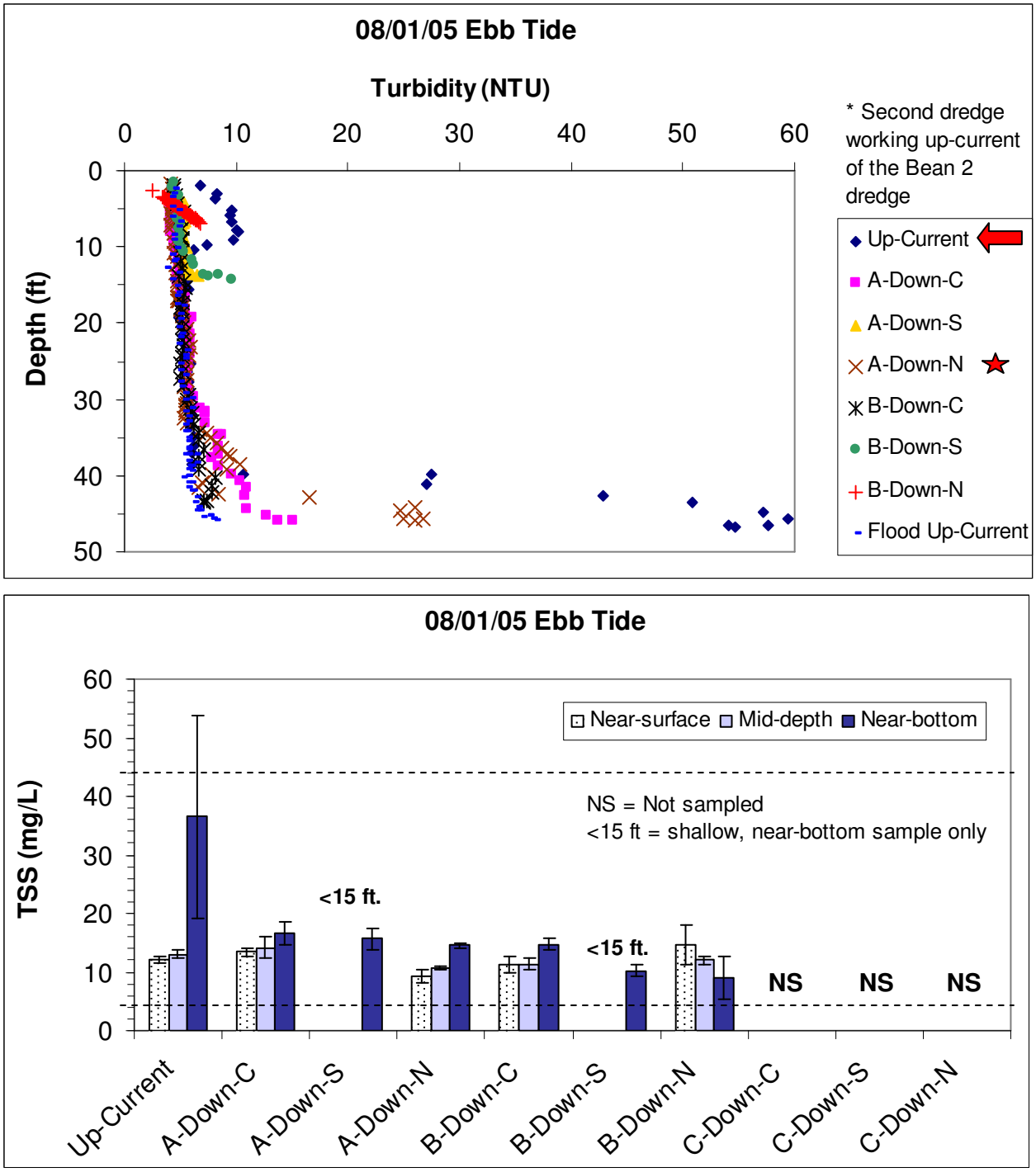


Figure 10. **Turbidity (top) and TSS concentrations (bottom) at all stations sampled during ebb tide on August 01, 2005.** Track A represents stations approximately 250' from the dredge, Track B represents stations approximately 500' from the dredge and Track C represents stations approximately 1000' from the dredge. Turbidity was measured throughout the water column and TSS samples were collected at discrete depths. TSS concentrations represent the mean of three replicates and error bars represent standard error of the mean. The dashed lines on the graph of TSS concentrations represent the low (4 mg/L) and high (44 mg/L) limits for measured ambient conditions in the NY/NJ Harbor (LMS 1997, USACE 2002). The red arrow indicates a significant difference (α=0.05) between the ebb tide up-current station and the stations down-current of the dredge. A second dredge (dredging rock and glacial till/clay) in the area appeared to affect the turbidity at the station up-current of the Bean 2 dredge on the ebb tide. Thus, the flood-tide up-current station turbidity values were included for reference. A red star indicates a significant difference (α=0.05) in near-bottom concentrations from the flood tide up-current station.

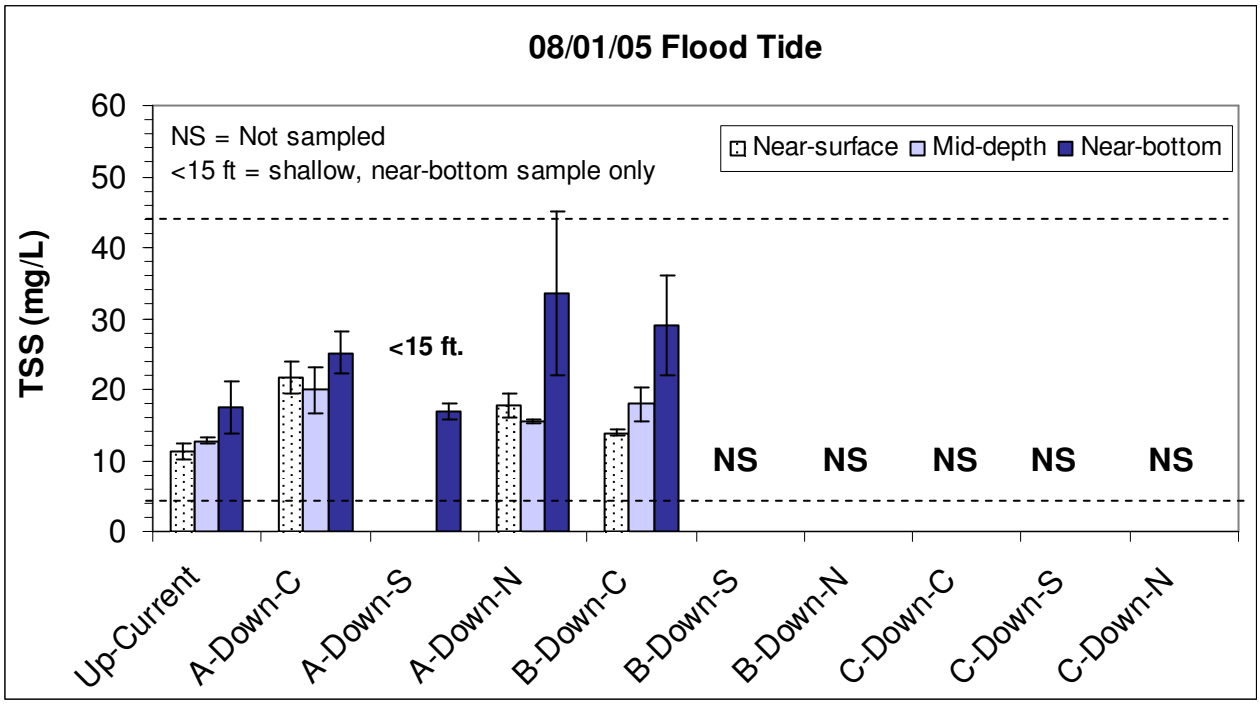


Figure 11. **TSS concentrations at all stations sampled during flood tide on August 01, 2005.** Track A represents stations approximately 250' from the dredge and Station B-Down-C was located approximately 700' from the dredge. Other stations at distances of 500' (Track B) and 1000' (Track C) from the dredge were not sampled due to logistical considerations. TSS concentrations represent the mean of three replicates and error bars represent standard error of the mean. The dashed lines on the graph represent the low (4 mg/L) and high (44 mg/L) limits for measured ambient conditions in the NY/NJ Harbor (LMS 1997, USACE 2002). Turbidity measurements (other than at the up-current station) were not collected on the flood tide due to loss of communication with the instrument.

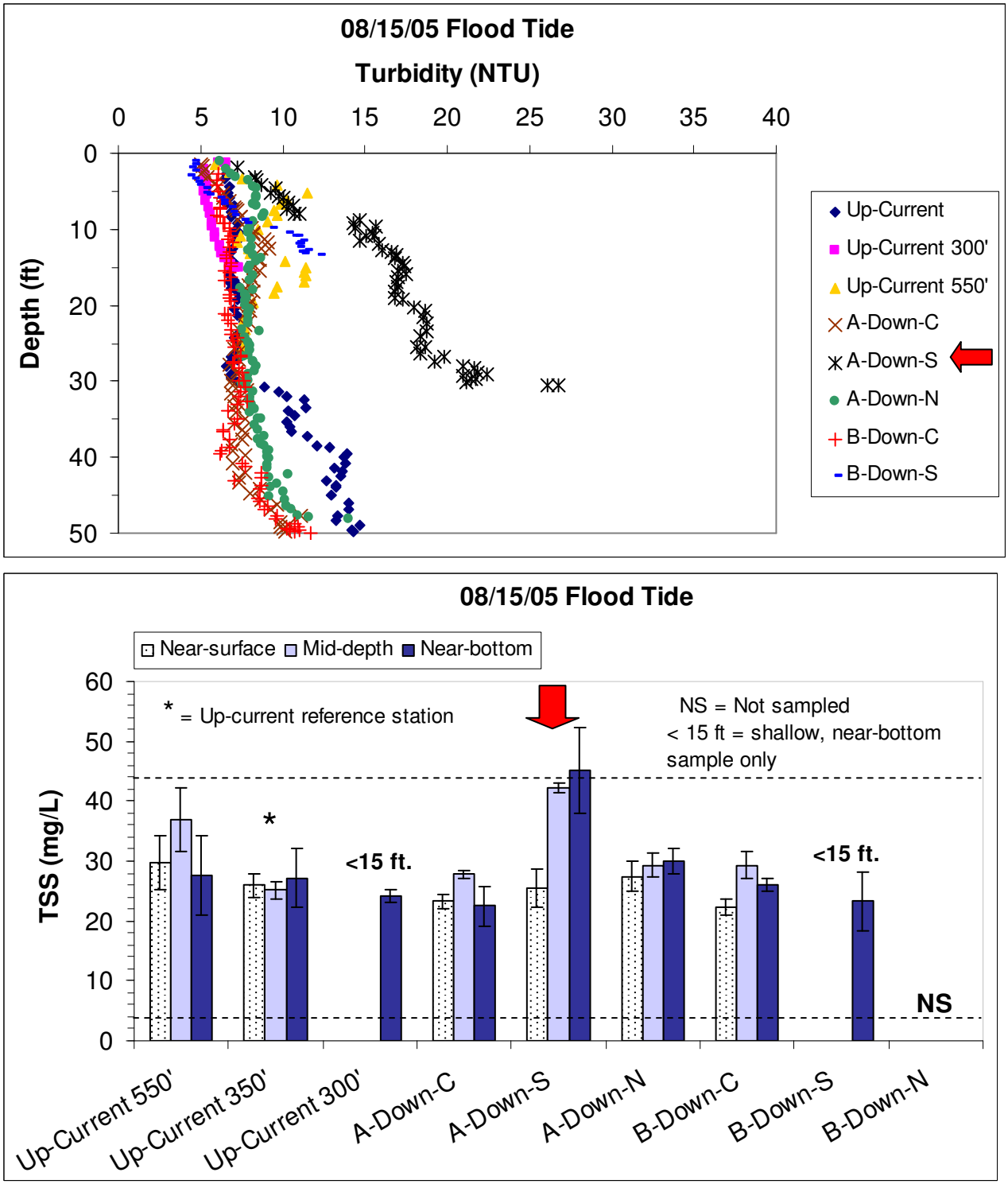


Figure 12. Turbidity (top) and TSS concentrations (bottom) at all stations sampled during flood tide on August 15, 2005. Track A represents stations approximately 250' from the dredge, Track B represents stations approximately 500' from the dredge. Samples were not collected at distances greater than 500' from the dredge (Track C) due to very weak tidal currents. Turbidity was measured throughout the water column and TSS samples were collected at discrete depths. TSS concentrations represent the mean of three replicates and error bars represent standard error of the mean. The dashed lines on the graph of TSS concentrations represent the low (4 mg/L) and high (44 mg/L) limits for measured ambient conditions in the NY/NJ Harbor (LMS 1997, USACE 2002). On both graphs, a red arrow indicates a significant difference (α=0.05) from the station up-current of the dredge (background conditions).

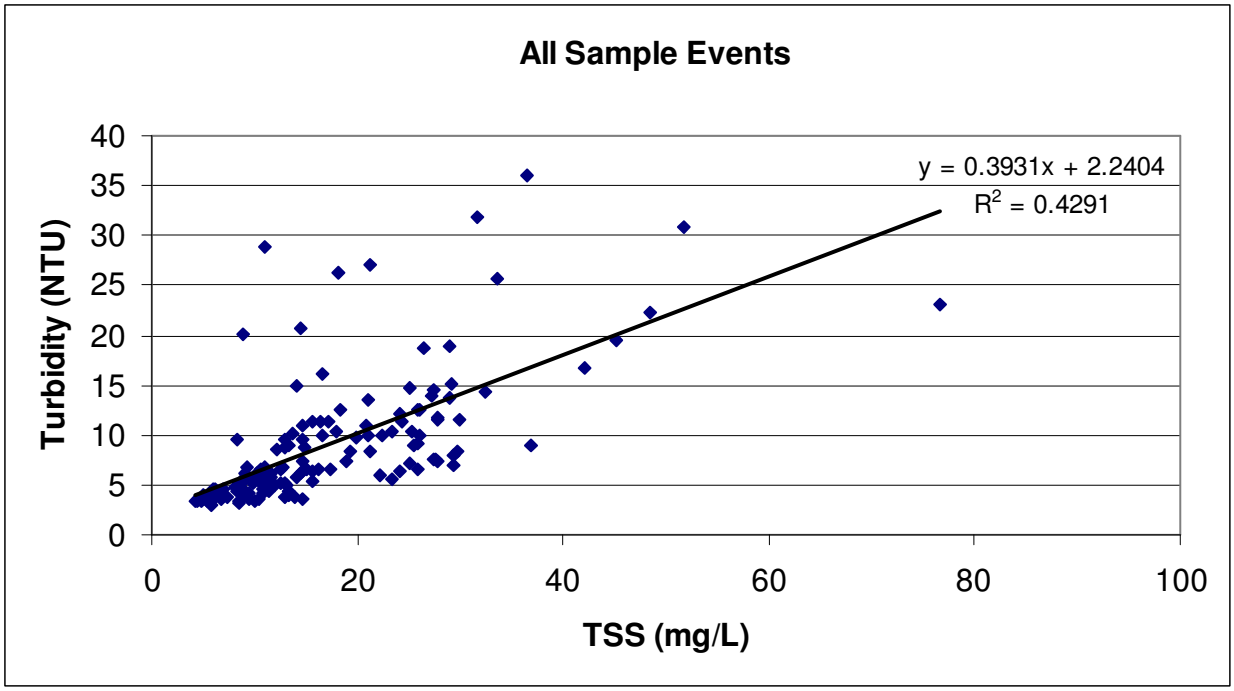


Figure 13. **Correlation of TSS concentrations and turbidity measurements collected during all field sampling events.** The TSS concentrations represent the mean of all replicates collected at a particular depth. A turbidity value for the TSS sample collection depth was derived by calculating the mean turbidity over the range of depths equal to TSS sample collection depth $\pm$ 3 ft. Turbidity was then plotted as a function of TSS concentration and linear regression was used to derive a relationship. The regression coefficient and intercept were significantly different from zero at the α=0.05 level, with p-values of 0.0001 and 0.004, respectively.

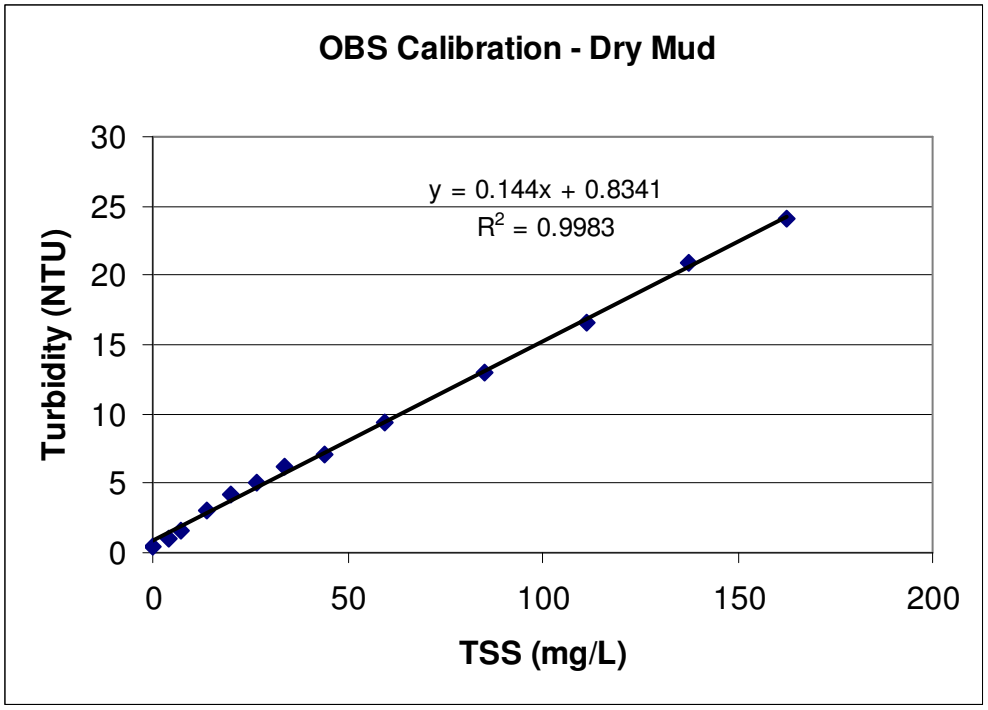


Figure 14. **Results of the laboratory calibration of the OBS in order to correlate TSS concentrations and turbidity measurements**. Aliquots of dry mud were added to a fixed volume of water in order to produce known TSS concentrations and turbidity measurements were collected. Turbidity was then plotted as a function of TSS concentration and linear regression was used to derive a relationship. The regression coefficient and intercept were significantly different from zero at the $\alpha=0.05$ level, with p-values<0.0001.

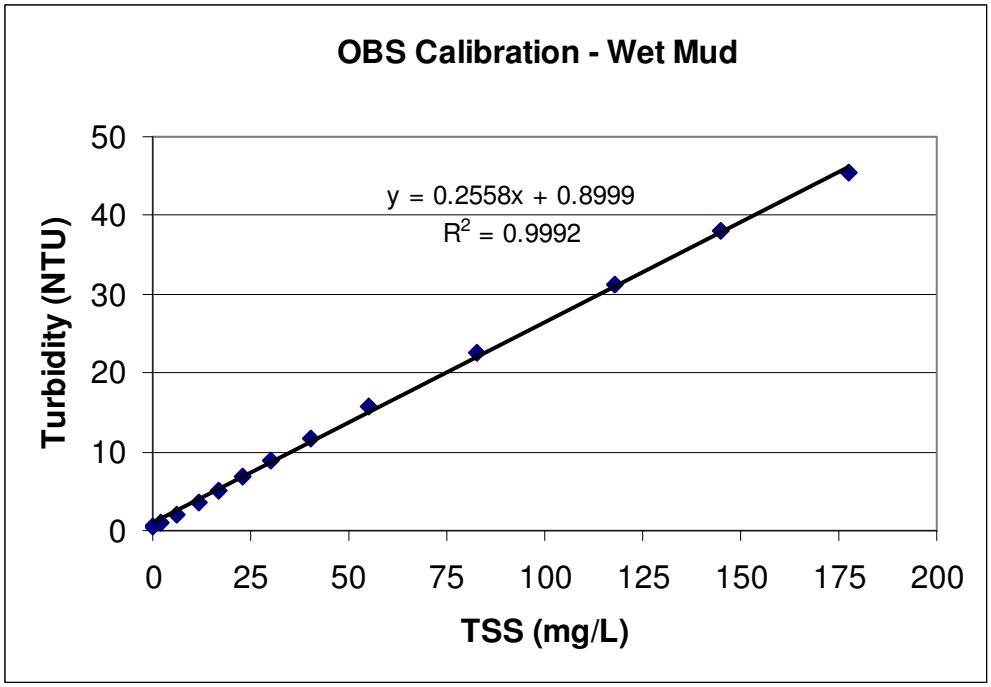


Figure 15. **Results of the laboratory calibration of the OBS in order to correlate TSS concentrations and turbidity measurements.** Aliquots of wet mud were added to a fixed volume of water in order to produce known TSS concentrations and turbidity measurements were collected. Turbidity was then plotted as a function of TSS concentration and linear regression was used to derive a relationship. The regression coefficient and intercept were significantly different from zero at the α=0.05 level, with p-values of 0.0001 and 0.0002, respectively.

APPENDIX C
USACE-EPA COORDINATION PLAN AND RELATED CORRESPONDENCE

APPENDIX C
USACE-EPA COORDINATION PLAN AND RELATED CORRESPONDENCE

This appendix contains the following documents:

- Minutes from a coordination meeting held December 6, 2004
- Minutes from a coordination meeting held April 7, 2005
- Minutes from a coordination meeting held April 28, 2005
- USACE Comments to EPA RI/FS Sediment Sampling Plan provided August 24,
- 2005
- Minutes from a coordination meeting held August 26, 2005
- Minutes from a coordination meeting help September 8, 2005
- Minutes from a coordination meeting help September 13, 2005

- Coordination Plan dated September 21, 2005

The following documents have been added since September 30, 2005:

- Minutes from a coordination meeting held October 11, 2005
- Minutes from a coordination meeting held October 20, 2005
- Minutes from a coordination meeting held November 8, 2005

(Note, there was no coordination meeting in December 2005 at the request of USEPA due to scheduling conflicts.)

- Coordination Plan dated December 21, 2005

CENAN-PP-H 6 Dec 04

MEMORANDUM FOR RECORD

SUBJECT: Meeting with USEPA Region 2 Concerning the NRDC letter dated 24 Nov 04.

1. On 6 December 2004 members of the USACE New York District met with the USEPA Region 2 to discuss the NRDC letter of 24 November 2004 and to seek their recommendations on proceeding. The agenda is attached. The following persons attended:

USACE	USEPA
Tom Shea	Elizabeth Butler
Scott Nicholson	Doug Pabst
Angelo Trotto	Patricia Hick
Richard Tomer	Amelia Wagner
Beth Nash	
Harold Hawkins	PANYNJ
Adam Perlson	Atef Ahmed
Jenine Gallo	
Mike Millard	
Ellen Simon	

2. After reviewing the letter, we discussed various points. The following is a summary of the key points/conclusions of the meeting:

a. The area in question is a CERCLA study area, not a CERCLA site. The EPA is in the early stages of determining what studies are needed to determine the criteria and aerial extent for defining which sediments are characteristic of hazardous material and what remediation methods should be performed, if warranted. This is the purpose of their Feasibility Study/Remedial Investigation.

b. The EPA saw no reason for the USACE to stop any of its navigation projects.

c. The EPA would not comment on our need for additional NEPA documentation. They stated that this was a USACE decision to make. However, they stated that they would discuss the matter with their NEPA experts and have them contact us.

3. POC is the undersigned, tel. (212) 254-5570.

THOMAS J. SHEA, III
Project Manager

Corps/EPA Meeting to Discuss:
EPA CERCLA Study of Newark Bay and the NRDC Letter to COL Polo
6 Dec 05 @ EPA, 19th Floor

A. The EPA Study
   1. What is a CERCLA Study Area?
   2. What is the study area and what type of studies are being conducted?
   3. How long is the study and what type of recommendations could be made?
   4. What does this mean to the Corps with new and O&M work being performed in the Study area?

B. NRDC Letter
   1. Review letter
   - Status Solicitation of S-KVK-2 issued, but four months or more before dredging starts
   - Status AK-2 District working bid protest but award by end of the month barring addition protest. It will most likely be Mar. before dredging started

   2 Issues
   - Claim that Dredging projects likely to exacerbate the imminent and substantial endangerment to human health.
   - Claim that dredging activities will undermine the viability of the superfund remedial investigation.
   - Claim that the dredging will delay or prevent an effective cleanup.
   - Claim that dredging will create significant public liability

   3. What do they want?

   4. What are the impacts based on the discussion above.

C. Summary and Recommendations
   1. What are our courses of action?
   2. How should we proceed?
   3. When do we schedule the meeting and who attends?

CENAN-PP-H 8 April 2005

MEMORANDUM FOR RECORD

SUBJECT: Meeting with EPA and Tierra Solutions Concerning Sampling in Newark Bay

1. On 7 April 2005, I attended a meeting with the EPA and Tierra Solution (TSI) to discuss sampling and modeling in the Newark Bay Study Area (NBSA). Corps and EPA persons in attendance included:

Tom Shea	USACE Project Manager
Scott Nicholson	USACE Project Manager
Bryce Wisemiller	USACE Project Manager
Beth Nash	USACE Sediment Management
Elizabeth Butler	EPA Project Manager

2. Some key points discussed from a Corps perspective included:

a. The purpose of the meeting was to further discuss coordination with the HDP and the Newark Bay Superfund Study Area. The Corps' was present to identify additional resources, technical products and coordination that could support EPA's Newark Bay superfund study and to coordinate activities between the two efforts to insure that the navigation program did not impact or interfere with the sampling.

b. EPA said they were expecting to proceed with the sampling in the Fall with no dates set. It was clarified that earlier coordination had included the Corps providing dredging schedules to EPA for coordinating with the sampling schedule drafted by Tierra Solutions. At this meeting it was unclear if dredging operations would occurr during the sampling.

c. Progress on EPA's review of the Draft Newark Bay Sampling Plan prepared by Tierra Solutions was discussed. They informed us that they were trying to complete the review in time for Tierra to do the sampling during the Fall. There was a general discussion about who was providing EPA technical support and comments on the plan. They said they had hired representatives from Malcolm Pirnie who are also working on the Lower Passaic River Project for the Corps and EPA and they were aware of our navigation program in Newark Bay. The Corps would continue to provide comments as the plan was refined.

d. The Corps offered to provide any information from the navigation program to EPA and Malcolm Pirnie that may include sampling results from earlier investigations that could further the superfund study of Newark Bay.

3. Discussion followed on the Newark Bay study area and comments on the sampling plan.

a. The study area was generally located between the Goethals and Bayonne Bridge's and Kearney Point. For the modeling, this would be extended up the Passaic River, the Hackensack River (to Oradel Dam) and include the Kill Van Kull and Arthur Kill.

b. The Corps questioned the need to sample in the Channels based on the ideal that it was removing the bottom and side slopes in its new work construction. We also mentioned that if sampling was to take place near Bergen Point, coordination would have to be conducted with the Pilots and USCG, in addition to the Corps.

c. TSI may model the channels to 50 ft. However, the depths used for their modeling may vary based on that they are modeling for.

d. The Corps' suggested that EPA's technical team review historic maps available on a NOAA web site that would identify former dredged areas that had been abandoned and now filled in with sediments.

e. It was recognized that an additional meeting was required that would include our Operations (Monte Greges and Randy Hintz) and Engineering (Ben Baker and Steve Weinberg) to discuss additional comments on the sediment profiles and other data that the Corps may have.

3. POC is the undersigned at (917) 790-8304.

THOMAS J. SHEA, III
Project Manager

CENAN-PP-H 29 April 2005

MEMORANDUM FOR RECORD

SUBJECT: Meeting with EPA and Tierra Solutions Concerning Sampling in Newark Bay

1. On 28 April 2005, I attended a meeting with the EPA and Tierra Solution (TSI) to discuss sampling and modeling in the Newark Bay Study Area (NBSA). Persons in attendance included:

Tom Shea	USACE Project Manager
Scott Nicholson	USACE Project Manager
Bryce Wisemiller	USACE Project Manager
Beth Nash	USACE Sediment Management
Elizabeth Butler	EPA Project Manager
Steve Weinberg	USACE Engineering
Ben Baker	USACE Engineering
Rick McNultt	Tierra Solutions
Paul Blumstern	Tierra Solutions
Ed Garvey	Malcolm Pirnie
Bob Romagnoli	BBI

2. The purpose of the meeting was to further discuss coordination after the April 8, 2005 meeting with the HDP and the Newark Bay Superfund Study Area. The Corps' was present to identify additional resources, technical products and coordination that could support EPA's Newark Bay superfund study and to coordinate activities between the two efforts to insure that the navigation program did not impact or interfere with the sampling.

3. EPA said they were still expecting to proceed with the sampling in the Fall with no dates set. It was clarified that earlier coordination had included the Corps providing dredging schedules to EPA for coordinating with the sampling schedule drafted by Tierra Solutions, Inc. (TSI). It was also classified that the sampling was being conducted by a TSI contractor.

4. Some key points discussed from a Corps perspective included:

a. It was recognized that additional data from the Newark Bay Confined Disposal Facility EIS (NBCDF EIS) was needed. A point of contract at the PANYNJ was provided. Ben Baker agreed to check for any geotechical data he may have on or around the NBCDF

b. The Corps discussed its historic sampling techniques, and made a comparison between stratified and composite samples.

c. Bryce Wisemiller explained about Corps sampling and testing procedures for navigation projects. In general, the geological strata are identified and sampling points are identified based on coordination with state and federal agencies (just states for non-HARS

material). Samples are taken town to the proposed limit of dredging and then tested. Tests include raw sediment chemistry, bulk chemistry for processed dredged material and multi-batch leachate. The samples are also composited with about two to three cores to a composite, generally.

d. The Corps advised that there may be some maintenance dredging in the fall in the Port Elizabeth and Pierhead Channels. The sampling may or may not be completed when this occurs. The coordination during HDP construction was discussed including the development of a phone chain between the dredging operations and the sampling efforts in Newark Bay by EPA.

e. We commented on the historic development of Newark Bay using NOAA charts. NOAA has charts going back to 1866 and an analysis will show presently unused channels, piers, etc. Three specific sites were identified looking at the NOAA charts that were former channels that were abandoned and now shoaled in. These were identified as prime areas for sampling since the sedimentation occurred during the periods when contaminants were released into the system.

f. The Corps will be awarding a contract for the removal of some utilities in the Arthur Kill. This may provide some recently deposited sediment for NBSA testing

3. POC is the undersigned at (917) 790-8304.

THOMAS J. SHEA, III
Project Manager

DEPARTMENT OF THE ARMY
NEW YORK DISTRICT, CORPS OF ENGINEERS
JACOB K. JAVITS FEDERAL BUILDING
NEW YORK, N.Y. 10278-0090

REPLY TO
ATTENTION OF
Harbor Programs Branch

August 24, 2005

Ms. Elizabeth Butler
Remedial Project Manager, Newark Bay
U.S. Environmental Protection Agency, Region 2
290 Broadway
New York, NY 10010

Dear Ms. Butler:

As discussed with you previously (see attached Memorandums for Record) and as recently requested, this letter provides our summary comments to the draft Work Plan related to the EPA CERCLA Newark Bay Study Area (specifically Volume 2a of 3 of the RIWP and the June 2004 TSI Response to Comments, dated May, June and August 2005). These comments reflect several members of the New York District, US Army Corps of Engineers (USACE) review of the current draft Work Plan, especially the sampling plan. Please see the attachment to this letter for the comments.

We also wish to note that the coordination meetings held with you, your consultants and TSI in April, provided substantial amounts of information to you related to the nature of the sediments to be dredged from the deepening of selected navigation channels in the southern half of Newark Bay, bathymetric data on these and other maintained navigation channels in the Bay, and on biological data collections and analysis performed on the sediments in various areas of Newark Bay has been useful to you in your RI/FS. We remain committed to continue to provide your office all information related to our various programs that may be of use in your RI/FS of Newark Bay.

In addition to the comments in the attachment and based on our general understanding of the plans for the Phase 1 sampling in Newark Bay (as described in the draft Work Plan and as relayed by email from you on August 16, 2005 to Mr. Thomas Shea of the New York USACE), we also wish to confirm our initial understanding that potential impacts of our ongoing maintenance and deepening program can be avoided though our understanding of your program and continued coordination. If your office has a different view or concern on any of the statements below, please contact our office as soon as possible so that we may develop plans so to avoid any significant adverse impact upon your sampling effort.

a. The EPA is expected to receive from TSI on or about September 6th the revised Work Plan for the Newark Bay RI/FS, which includes the Phase 1 sampling effort. The EPA is scheduled to approve this plan on or about September 16th. The intent of Phase 1 sampling is to gather preliminary baseline data related to the four goals established in the AOC for the RI/FS. Phase 1 will consist of three data collection efforts: 1) current bathymetry of the study area (planned to occur in October 2005); 2) Biological Activity Zone (BAZ) sampling (also planned to occur in October 2005); and 3) sediment contaminant coring and analysis (planned to occur in November-December 2005). EPA will use this data and analysis to determine its next steps.

1) Regarding the bathymetry data collection, in areas in which we are or plan to be dredging, we can or have made available to you or your consultants, pre and/or post multi-beam surveys of the areas dredged. Given the relatively dense data generated by multi-beam surveys, this should provide better bathymetry

data for the dredged areas of the Bay than what your data collection effort would otherwise. Further, since this and past survey data can help to quantify and localize sedimentation patterns in the Bay, the bathymetry data from our dredging program should have a substantial positive effect on establishing the baseline conditions for the RI/FS and the accomplishment of its goals.

2) Regarding the BAZ sampling, we have provided to your office recently documented biological data from samples from approximately a dozen years ago. This information, combined with the information that will be collected this fall should help to establish not only a baseline but also a trend in the biological benthic conditions that exist in the Bay. Given the relatively low levels of sediment resuspension from the USACE' environmentally protective dredging operations in the Bay and based on our extensive experience and studies, we believe that our continued dredging operations will not adversely interfere with this sampling effort. Of course, given the nature of dredging, samples planned for inside the affected federal channel boundaries may be affected by the obvious disturbance of dredging which has been recently performed or is underway. Should EPA wish to take BAZ samples within the "active" navigation channels, we will coordinate our dredging program to avoid any adverse interference with the BAZ sampling effort.

3) Regarding the sediment coring and analysis effort of the Phase 1 RI/FS, we understand that these cores will be taken to two different depths, 3.5 feet and 6.5 feet, with contaminant analysis performed on the first 6 inches, then every foot thereafter. As noted earlier, we believe that this arbitrarily predetermined depth may be wholly insufficient in selected locations of the bay (see para b. on page 1 above). Further, the locations (particularly as noted in para b. on page 1 above), may be better refined once the bathymetry data collection is completed so thought may be given towards slightly adjusting these locations just after the bathymetry data is collected but prior to the corings being taken. Because the deepening dredging that has been done and is now underway will obviously affect the cores in the channels, we continue to question its utility (as commented in para a. on page 1 above). However, for cores taken outside the dredged areas, our analysis and past experience indicates that the sediment deposited off-channel from the dredging operations will be negligible compared to the vertical resolution of the analysis being performed. Moreover, past comparisons of contamination levels of the silty, recently deposited surficial material in our deepening contracts indicates that it is remarkably similar to the surficial sediment contamination that exists in the sediments outside the HDP boundaries.[1] Nevertheless, we understand that just prior to the Phase 1 sediment sampling, that EPA and the USACE will coordinate on the precise locations of samples to be taken so that we can coordinate with our dredging contractors to ensure that our effort does not interfere with the sampling effort. The USACE and EPA will set up a meeting that will include their contractors to discuss communications protocols during the sampling in order to minimize impacts to the sampling. It should be noted that Phase 1 cores samples taken in the "active" federal channels, where dredging is currently occurring or where dredging is expected to occur in the near future, that the recently deposited, silty surficial sediments may not physically be there (in terms of stratum) for the Phase 2 sampling. We view the safe and protective dredging, treatment and use of these sediments to remediate impacted upland sites in the Port region as providing considerable environmental benefits to the region beyond the economic benefits related to the improvement of the navigation channels.

b. Phase 2 sampling will be based on the data analysis conducted from the Phase 1 sampling and is not expected to begin until 2006. As you know, we would appreciate receiving as soon as is practicable a more detailed schedule of any and all sampling in the RI/FS effort so that the USACE can analyze any potential (or theoretical) adverse impact or interference that our planned dredging may have on this sampling.

[1] CENAN-PP-H MFR dated 22 March 2005.

c. EPAs future biological sampling is expected to occur in the spring and again in the late fall of 2006. The USACE will continue to provide EPA with all of its biological sampling data collected for the deepening projects. As noted above, our preliminary analysis indicates that our continued deepening effort should not interfere with the planned RI/FS biological sampling, except for samples within the recently dredged/disturbed channel areas.

d. EPA was not sure when it will begin its water quality sampling planned as part of the Phase 2 sampling effort. Again, the USACE will provide its data to the EPA and is committed to work with the EPA to ensure that our continued deepening program does not adversely interfere with your RI/FS sampling effort.

e. EPA will also conduct sampling in and near Combined Sewer Outfalls (CSOs). We understand that you expect this some time in the future and do not foresee any impacts to occur because of our dredging since we are dredging so far away from the CSOs.

In closing, we wish to once again pledge our commitment to work with the EPA so that our respective efforts in the Newark Bay can proceed concurrently and in a complimentary manner. If we, both EPA and USACE, believe that no other alternative is possible and that some USACE activity is likely to interfere with your study sampling effort, we will direct our contractors away from the sampling to avoid the interference. Given the obvious magnitude of these two efforts and their potential future positive impact to this region (environmentally and economically), it is incumbent upon both our agencies to make every effort so that each can proceed as quickly and efficiently as is possible.

Should you wish to discuss this matter further or should you wish to arrange a meeting between our offices (possibly to establish a periodic, regular meeting to coordinate the two efforts), please contact Mr. Thomas Shea, the Project Manager for the USACE 50 foot Harbor Deepening Project, at (917) 790-8304.

for

WILLIAM J. SLEZAK, P.E.
Chief, Harbor Programs Branch

CF:
Ray Basso, EPA
Alice Yeh, EPA
Ellen Simon, USACE
Bryce Wisemiller, USACE
Scott Nicholson, USACE

USACE Comments to EPA RI/FS Sediment Sampling Plan

a. Tierra Solutions, Inc (TSI) has proposed a large number (20 out of 60) of sampling points that are located in the navigation channels in the southern half of Newark Bay that have been recently or are currently being deepened. We note that these areas have been recently dredged to a depth where the exposed sedimentary deposits are of pre-industrial age and consequently have not been exposed to long term sources of contamination. USACE considers these channels to be well characterized and suggests that many of the sampling locations be relocated outside these dredged channels to other areas, ones that have not been analyzed as frequently. USACE understands the need to get a historic view of the contamination. However, including areas which are known not to have contamination not only wastes limited resources but also implies a potential contamination problem exists in areas that we know, through our thorough and well reviewed sediment testing data, do not have extensive sediment contamination (beyond that which deposits in the channel bottom from off-channel sources).

b. Related to the primary goal of the RI/FS as we understand it is the need to identify and determine the horizontal and vertical distribution and concentration of various contaminants in the Bay. As relayed to you and to TSI in April and related to this goal, we continue to advise that three general locations are primary importance for performing deep sediment sampling (well beyond 6.5 feet potentially). They are locations that, based on historical and, to some extent, recently collected information, appear to be areas of high amounts of sediment deposition through the period in which the pollution occurred in the north, middle and southern portions of Newark Bay. The USACE suggests sampling in these areas, at least to a depth of the Pleistocene-Holocene layer (about 24 ft in one location) instead of the suggested 6.5 feet to determine the historic extent of contamination. During our meetings in April 2005 and most recently in August 17, 2005, the USACE identified to you on a navigation chart the three suggested sampling locations. The attached slides show prime specific locations for consideration in placement of these deep cores.

c. Related to comment b., above, the Newark Bay CDF EIS sought to identify areas of minimal sediment contamination thickness. Rather than sample near the CDF or the 2S/2N sites, samples should be taken in the areas outside of these sites where the thickest contamination was thought or considered to exist, based on the analysis performed during the EIS effort.

d. To our knowledge, the highest level of dioxin contamination measured in Newark Bay occurred along the northern bulkhead in Port Newark. We understand from anecdotal communications that this was the ~~area that was used to load Agent Orange during the Vietnam War period. Further, we understand from~~ the Port Authority of New York and New Jersey (PANY/NJ), that this area has not been maintenance dredged recently. As such and given the previous, relatively high levels of dioxin contamination found along this berthing area, we suggest that further samples be taken in this area and that EPA coordinate this sampling effort with the PANY/NJ to determine the areas of greatest likelihood of having sediments deposited in the past several decades.

e. Related to comment a. above, TSI proposed "grouping" of sediment samples as shown on Figure 6.1 should be revised to better reflect the actual distinctions in the channels, that being to distinguish the northern, unmaintained/deepened channels from those in the southern half that have and are undergoing regular maintenance and deepening. Currently, the figure distinguishes by color the "Port Channels" from the "Navigation Channels" but does not distinguish, except by a line, the northern "inactive" channels from the southern, "active" channels. We consider the east/west distinction (*i.e.* Port vs. navigation) to be far less relevant to the RI/FS effort than distinguishing the southern, "active" federal channels from those in the northern half of the Bay that have not and are not likely to be maintenance dredged (much less deepened) in the foreseeable future.

f. For the hydrodynamic modeling that is currently planned by EPA's consultants (under contract with the USACE's Kansas City District), we note that the selected modeling period for the Bay is the same time period that the USACE has performed substantial channel deepening, both in the Bay and in the Kill Van Kull leading into the Bay. This could very well lead to modeling results that are at least very difficult and at worst impossible to prove conclusively whether if and when the remedial action phase of the study is reached. Rather, modeling runs used for baseline analysis should assume either that the deepening has not yet begun or, better still, that the deepening dredging has been completed, because that is the expected end state of the Bay. That being said, we understand, though that to characterize the dynamic nature of sediment transport in the Bay that modeling runs made during channel deepening may provide useful information.

CENAN-PP-H 26 August 2005

MEMORANDUM FOR RECORD

SUBJECT: Coordination of Continued Harbor Deepening Activities in Newark Bay with EPA's Sediment Sampling and Source Selection Identification Program under the Newark Bay CERCLA Study

1. A conference call was held this morning on the subject topic. The purpose of the meeting was to further discuss coordination with the HDP and the Newark Bay Superfund Study Area. The Corps' was present to identify additional resources, technical products and coordination that could support EPA's Newark Bay Superfund study and to further coordinate activities between the two efforts to insure that the navigation program did not impact or interfere with the any proposed sampling efforts. Progress on EPA's review of the Draft Newark Bay Sampling Plan prepared by Tierra Solutions was discussed. The following individuals were involved:

- Elizabeth Butler, USEPA Region 2, Project Manager of the Newark Bay RI/FS
- Len Warner, Malcolm Pirnie, Technical PM to EPA on the CERCLA Passaic River and Newark Bay Studies
- Ed Garvey PhD, Malcolm Pirnie, Geo- Chemical Scientist and Technical Consultant to EPA on the CERCLA Passaic River and Newark Bay Studies' sampling workplans
- Bryce Wisemiller, New York District, USACE, Project Manager
- Scott Nicholson, New York District, USACE, Project Manager

2. The Malcom Pirnie ("MP") consultants explained that three methods of sampling were planned for the Phase 1 sampling to be performed later this fall and possibly winter: bathymetry, biological activity zone (surficial sediment profile photographs and surficial sediment grab samples), and sediment cores. Based on the extensive previous technical information provided by the Corps to EPA and MP, the MP technical consultants concluded (for the reasons listed below) with EPA's concurrence that after reviewing dredging activities in the Newark Bay study area, that none of these Phase 1 sampling actions would, in any significant manner, be interfered with or affected by the ongoing dredging activities of the Corps in Newark Bay. This again confirmed the Corps' initial understanding from previous meetings and documented in a recent letter to EPA (dated August 24, 2005). Specifically, related to each of these methods of sampling, the following was discussed.

a. Sampling Method 1 – Bathymetry: MP confirmed that the bathymetry data collection equipment (sonar) and subsequent results are not affected by dredging operations, and bathymetry data easily can be collected around the operating dredging equipment. In addition, as noted in a separate recent letter to EPA dated August 24, 2005, the Corps had offered to augment the bathymetry data collection by providing the bathymetry surveys taken in the Corps' contract areas before and after dredging operations were performed.

b. Sampling Method II – Biological Activity Zone: This sampling involves the collection of either a profile photograph of the sediment water interface and/or the collection of surficial sediments to identify the type and depth of organisms living within the sediments at that location. Since this community of organisms and this zone are established over time, and therefore tolerant of existing background conditions within the bay, they are not affected by resuspension caused by dredging (which we know is less than existing background conditions), except in the specific area being dredged. For their sampling, MP and EPA know of no area actively being dredged during the Phase 1 sampling this fall and winter where these samples would be taken. Nor, indeed, would there be any value in taking such samples. Consequently, EPA and MP stated that they did not see any interference or impact of the Corps' ongoing dredging operations on EPA's sampling in these areas.

c. Sampling Method III – Sediment Coring: MP explained that since the natural processes (storms, river flow, etc.) and human-related processes (e.g., passing ships, dredging operations, etc.) were relatively continuous over long time periods in which the sediments they plan to collect were deposited, that the continued dredging operations would not affect this sampling due to the relatively low deposition rates measured within the bay (i.e., dredging would be a negligible affect) and the very localized affect of dredging operations. In other words, there is no additional sediment resuspension from dredging activities which would affect the results of the sampling.

3. The MP consultants also discussed whether the dredging would interfere with the chemistry of Newark Bay and consequently the Superfund study remedial investigation. Based on their extensive review of technical data provided by the Corps and other technical information gathered on the investigation, they have concluded that the effects of the dredging operations are an inconsequential component of the overall baseline chemistry in the Bay and would not affect sampling results carried out under the Newark Bay Study plan. In other words, according to MP, dredging will not result in any adverse affects on the exiting background conditions of the bay to the extent it would have an adverse affect upon the RI/FS. Moreover, MP and EPA view the dredging in the bay as a benefit in that it will remove existing contaminated sediments from further exposure.

4. Since part of the planned sampling effort did involve areas within channels, the parties agreed that a coordination plan for how vessels (e.g., dredges, sampling vessels) may be moved, if and as necessary, could easily address any issues related to having separate dredging and sampling vessels in the same geographic area at the same time. Further, this plan will also incorporate coordination actions to best select the specific locations of the sediment corings (based on the status of the dredging operations and the extensive information the Corps has on the sediments in the dredging contract areas).

CENAN-PP-H
SUBJECT: Coordination of Continued Harbor Deepening Activities in Newark Bay with Sampling Planned under EPA CERCLA Study

EPA mentioned that this plan was under development and would be completed after the Phase 1 sampling plan was approved in September but prior to the sampling occurring thereafter. Because of this, MP and EPA agreed that the sediment core sampling would not be interfered with by the continued Corps dredging operations in the Bay. A subsequent coordination meeting between the Corps Construction offices and the EPA, MP and possibly Tierra Solutions Inc. was tentatively scheduled for the morning of 8 Sep 05 at the Corps' Construction field office in Caven Point, New Jersey.

5. EPA and MP also mentioned that no water column sampling was planned for this year. There was discussion that the methods had not been established yet for the Newark Bay system and were being developed on a trial basis under the Lower Passaic Study with the technical advisory committee. After the Lower Passaic Study trial is complete, then the Newark Bay, Water Quality sampling plan would be drafted. They expected it would not be developed until spring of 2006 and the Water Quality sampling in Newark Bay would not be performed until later in 2006 and possibly not until Spring 2007. The Corps requested that EPA and MP provide as soon as possible any plans and general methods and approaches for this type of sampling so to ensure that the Corps could evaluate them when they are completed with ongoing dredging operations in the Bay so that it does not have any interference with or impact upon the sampling.

BRYCE WISEMILLER
Project Manager, CENAN-PP-H

SCOTT NICHOLSON
Project Manager, CENAN-PP-H

CENAN-PP-H 12 September 2005

MEMORANDUM FOR RECORD

SUBJECT: Coordination Team Meeting for USACE and EPA Activities in the Newark Bay Study Area.

1. The Newark Bay Study Area Coordination Team met on 8 September 2005 at the New York District. The attendance list and agenda are attached.

2. The goals of the meeting were:

a. Ensure all parties understand each others' activities within the NBSA.
b. Determine if the Corps' dredging has any impacts on the EPA Sampling Plan and to identify mitigation or avoidance strategies to minimize the impacts.
c. Identify points of contract for sampling, dredging, and monitoring activities.
d. Review and understand key points in the Coordination Plan.

3. The following is a summary of the items that were discussed:

a. The USACE construction contract procedures were explained in order to identify key points where additional coordination may be required or better conducted. These included the publishing of the Plans and Specifications for bidding, the bid opening, the bid evaluation period prior to award, contract award, review and approval of required plans (safety, environmental, etc.) and the Notice to Proceed. A pre-construction workshop is held roughly 3 weeks after a bid is accepted and USACE suggested that EPA, TSI and MP may want to attend this. USACE also suggested that the group may want to be included in the monthly/weekly Harbor Ops Committee meetings with the USCG and Pilots.

b. Malcolm Pirnie (MP) explained the rationale behind the need to collect samples in the navigation channels. The purpose of this sampling is to characterize the sediment load in Newark Bay and identify where it comes from. By obtaining a recent record of deposition, EPA hopes to explore sediments that were recently transported as suspended material and are currently contributing to deposition in the Newark Bay Study Area.

c. USACE then explained where they have dredged in the past and where they will in the future. These specific, contract drawings, which show the contract acceptance areas and limits, were reviewed with EPA, MP and TSI during the meeting:

Kill Van Kill: The northern portion of the channel was dredged approximately one year ago. The Contract Area 4B was completed approximately 3 weeks ago. Contract Area 4B contains the NBSA RI/FS sample point 004 (as labeled in the NBSA RIWP – Rev 0). Sample point 004 appears to be near Shooters Island. If the sample point is within the limits of the channel, then the silt has been removed as part of Contract Area 4B. If outside of the channel,

there should be no problem with the sample. The southern half of the channel has not been dredged yet and the USACE recommends that this area be a high priority in the sampling sequence. The area where sample point 005 is located was also dredged during Contract Area 5 dredging, which was completed about one year ago. USACE believes that sample point 050 will not be impacted since it believes that it is located on the flats near Shooters Island.

Arthur Kill: The area near sample point 001 was dredged in the last three months. USACE recommended that the sample be taken in acceptance Area F, which is east of the sample point. USACE expects dredging to begin in acceptance Area F in the next few weeks. It was noted that Area F contained higher levels of contaminants relative to nearby areas, such that this area exceeded NJ's upland criteria and will be disposed instead at Fresh Kills. Other acceptance areas that have not been dredged in the AK include Areas G and C (which has a no dredging allowed period for six months beginning 1 Feb). The USACE also expects to begin removing utilities in Utility Option Area 1 in mid-October. The removal of the utilities may disturb the sediment such that TSI may want to sample there prior to utility work. USACE also suggested that TSI may want to consider taking a few samples south of the Geothals Bridge. There are several areas there that have not been dredged and could provide useful information. The USACE currently has a Maintenance contract out for bid that will remove shoals in the Arthur Kill south of the Geothals Bridge. Contract award is expected in mid-September. The USACE does not expect to remove the shoals in the contract that are near the Geothals Bridge area due to funding. The option of moving an AK sampling point to a location south of the Goethals Bridge was discussed.

d. The group agreed to have a smaller group meet at USACE at 0900 hrs, 13 September 2005 to discuss the contract areas and sampling points in more detail.

e. EPA briefed that their sampling was still scheduled for October and November 2005. Phase 2 sampling is not yet known since it is based on the Phase 1 sampling. Biological Sampling will focus primarily on the flats area.

f. EPA stated that they had received the Sampling RIWP, Rev 1 from TSI and that it was posted to PREMIS. TSI stated that there were no major changes to the plan relative to sampling of the navigation channels. A copy was provided to the USACE and is posted at:

P:\N___ Letter of I_____\EA Amendment Documents\RI - FS from EPA 8 Sept 2005\Volume 2 - Investigation Work Plan

P:\N___ Letter of I_____\EA Amendment Documents\RI - FS from EPA 8 Sept 2005\Volume 3 - Health and Safety Contingency Plan

g. Dredging in Newark Bay is scheduled to go out for bid in November with contract award anticipated in mid-February and dredging anticipated in Spring '06. Joe Olha noted that the USACE has conducted maintenance dredging in the Port Newark, Pierhead, Elizabeth and Newark Bay channels in the past, and that future O&M dredging is scheduled for March '06,

which could last from 1-4 months. Mr. Olha will provide additional information at the meeting scheduled for next week. USACE reiterated that it does not see a difference between the channels mentioned above, while TSI has grouped the first three as separate channels than the main channel since USACE has performed new work and maintenance dredging in all of the channels.

h. A brief discussion was held on the sampling and data collection to be done by the NRDA Trustees. At this time, they have not made any decisions on how to proceed with their data collection to build their case.

i. TSI agreed to provide USACE in electronic format with coordinates of the sampling locations so that they could be overlaid with dredging maps to better define the exact locations relative to dredging areas.

3. POC is the undersigned at (917) 790-8304.

THOMAS J. SHEA, III
Project Manager

Newark Bay Study Area
Corps-EPA Coordination Team Meeting

8 September 2005

26 Federal Plaza, USACE Executive Conference Room, Room 2115
Or via telephone: 1-877-931-3686, Participant Code: 554508#

Goals and Agenda

Goals:

a. Ensure all parties understand each others activities within the NBSA.

b. Determine if there are any impacts to the EPA Sampling Plan by Corps dredging and identify mitigation or avoidance strategies to minimize the impacts.

c. Identify points of contract for sampling, dredging, and monitoring activities.

d. Review and understand key points in the Coordination Plan.

Agenda:

Opening Remarks	Shea/Butler
Introductions	Shea
Construction Update and Coordination with Sampling	
Overview of Corps process from Award to physical construction	Hawkins/Shea
Current and future work in the AK	Conetta/DiDato/Leach
Current and future work in the KVK	Conetta/DiDato/Leach
Future work in the NB	Hawkins
RI/FS schedule update	Butler
Discuss receipt of the final sampling plan	Shea
Highlight critical changes	TSI
TSS/Turbidity Monitoring Program (outline goals and schedule)	Pinzon/LMS/ERDC
Communications Strategy	
On-water contractor to contractor	Shea
Scheduling of sampling near dredging contractors	
Coordination with USCG	Morton
Status update of O&M work in the NB	Olha
Status of Permitted work in the NB	Tomer

Agency Only:

Review and agreement to the Coordination Plan (attached)	Shea
Discuss the analysis (and schedule) that will be performed for the amendment to the DEA to identify potential impacts from dredging to the EPA study	Pinzon/Glaser

Thomas Shea	Project Manager	USACE Harbor Programs Branch	917-790-8304	Thomas.shea@usace.army.mil
Scott Nicholson	Project Manager	USACE Harbor Programs Branch	917-790-8216	Scott.r.nicholson @usace.army.mil
Harold Hawkins	Project Manager	USACE Harbor Programs Branch	917-790-8204	harold.j.hawkins @ usace.army.mil
Mike Millard	Project Manager	USACE Harbor Programs Branch	917-790-8206	michael.j.millard @usace.army.mil
Patricia Donohue	Project Manager	USACE Operations Division		
Joe Olha	Project Manager	USACE Operations Division	917 790 8404	joseph.olha@usace.army.mil
Richard Tomer George Nieves	Chief	USACE Regulatory Branch USACE REGULATORY Branch	917-790-8510 917-790-8410	george.nieves@usace.army.mil
Jenine Gallo	Team Leader	USACE Environmental Analysis Branch	917 790 8617	Jenine.Gallo@USACEARMY.mil
Ronald Pinzon	Biologist	USACE Environmental Analysis Branch	917 790 8627	RONALD.R.PINZON@USACE.ARMY.MIL
Adam Perelson	Physical Scientist	USACE Environmental Analysis Branch	917-790-8602	adam.d.perelson@usace.army.mil
Steven Weinberg	Project Engineer	USACE Engineering Division	917 790 8391	STEVEN.R.WEINBERG @USACE.ARMY.MIL
~~Ben Baker~~ Beth Nash	~~Geologist~~ Envir. Engineer	USACE ~~Engineering~~ Division Operations	917 790 8537	Beth.K.Nash@usace.army.mil
~~Beth Nash~~ Ben Baker	~~Envir. Engineer~~ Geologist	USACE ~~Operations~~ Division Engineering	917 790 8379	Ben A Baker@usace.army.mil
Ellen Simon	Attorney	USACE Office of Counsel	917-790-8158	ellen.b.simon@usace.army.mil
Elizabeth Butler	Project Manager	EPA Emergency and Remedial Response Division	212-637-4396	butler.elizabeth@epa.gov
Alice Yeh	Project Manager	EPA Emergency and Remedial Response Division		

Delmar Karlen, Jr. Attorney USEPA, Office of Regional Counsel (212)637-3118 Karlen.Delmar@epa.gov

RON CONETTA. Resident Engr USACE Const. Division 201 433-9228 ronald.d.conetta@USACE.ARMY.mil

SERENA CIPARIS PROJECT MANAGER HDR/LMS 845-735-8300 serena.ciparis@hdrinc.com

JOHN DUSCHANG SR. MANAGING SCIENTIST HDR/LMS 845-735-8300 JOHN.DUSCHANG@HDRINC.COM

DAVID GLASER QEA

Amelia Wagner	Attorney	EPA Office of the Regional Counsel	212-637-3141	wagner.amelia@epa.gov
Elizabeth Buckrucker	Project Manager	USACE Kansas City District		
Rick McNultt	Remediation manager	Tierra Solutions	732-246-5849	RMCNUTT354@AOL.COM
Paul [redacted] Bluestein	Project Manager	Tierra Solutions	[redacted]	RJbluestein@tierra-inc.com
Ed Garvey	Geochemist	Malcolm Pirnie	201 398 4326	egarvey@pirnie.com
Bob Romagnoli	Project Manager	BBL	315 446-9120	r@BBL-INC.com
LCDR Ernie Morton	Chief	USCG Activities NY, Vessel Traffic Service		
Tom Costanza		Port Authority of NY & NJ		
Matt Masters		Port Authority of NY & NJ		
Steve Dorrler	Mgr. Waterways Dev.	PANYNJ	212-435-4273	sdorrler@panynj.gov
Suzanne Dietrick		NJ Department of Environmental Protection		
Janine MacGregor		NJ Department of Environmental Protection		
KD McGuckin	Regional DHM Coordinator	NY Department of Environmental Conservation	718-482-4078	Kdmcguck@gw.dec.state.ny.us
Tom Kubiak		US Fish and Wildlife Service		
Tom Bronson		NOAA		
Reyhan Mehran		NOAA		

Ray Basso — EPA — (212) 637-4417 — basso.ray@epa.gov

LEN WARNER — OVERSIGHT PROJECT MGR. — MALCOLM PIRNIE — (914) 641-2972 — lwarner@pirnie.com

Bill Seyk — NY Harbor Projects Manager — COE — 917-790-8305 — william.f.seyk@usace.army.mil

CENAN-PP-H 14 September 2005

MEMORANDUM FOR RECORD

SUBJECT: Additional NBSA Coordination – Sediment Sampling Points

1. An additional coordination meeting was held on 13 September 2005 at the USACE office to discuss the RIWP sediment sampling points and their relationship to the dredging construction contracts in more detail. The following persons attended:

Mike Millard	USACE	Project Manager
Patricia Donohue	USACE	Project Manager
Joe Ohla	USACE	Project Manager
Jenine Gallo	USACE	Environmental Team Leader
Steve Weinberg	USACE	Engineering Team Leader
Ron Conetta	USACE	Construction Resident Engineer
Adam Perelson	USACE	Physical Scientist
Beth Nash	USACE	Environmental Engineer
Elizabeth Butler	USEPA	Remediation Project Manager
Len Warner	Malcolm-Pirnie	Project Manager
Bob Romagnoli	BBL	Project Manager
Rick McNutt	Tierra Solutions	Remediation Manager
Paul Bluestein	Tierra Solutions	Project Manager

2. The sampling plan for the EPA project was evaluated in relation to past and future dredging work. The plan may need adjusting dependent on when the Arthur Kill and Newark Bay areas were last dredged and when they will be dredged in the next six months. The following is a list of Corps deliverables to be sent to Elizabeth Butler of EPA and Bob Romagnoli of BBL to aid them in re-evaluating whether a few minor adjustments to five points (newly labeled # 001, 006, 008, 010, and 011) are necessary.

- Newark Bay Dredging History:
  - New work (deepening) – provided by Steve during the meeting
  - Maintenance- The last dredge area in Newark Bay was provided by Patricia Donohue during the meeting, additional historic information will follow. It was determined based on the dredging history that the sampling locations identified in the channel should be OK due to amount of time that has lapsed since last dredged and high sedimentation rates in particular areas.

- Future dredging in the next 6 months:
  - New Work, Deepening – north of Shooters Island by Sept. 30th and Area F as early as Mid – October. The upland material is currently scheduled to be completed by December.

- Maintenance- Newark Bay: the selected contractor could sample Mid December to February with dredging of Port Newark and Port Newark Pierhead channels in mid-March to June. This is dependant on resolution of legal issues.
- Maintenance Arthur Kill: Joe Olha to provide sampling and dredging time frame.

3. Follow-up actions include:

- FAA circular and guidance when doing work near the adjacent airport- to be provided by Patricia Donohue.
- Arthur Kill most recent conditions survey located south of the Goethals Bridge to show shoaling – to be provided by Joe Ohla.
- A map of the utility removal area that is currently contracted. A CD of maps was provided by Steve Weinberg during the meeting. Steve also agreed to provide TSI with a point of contact at PSE&G to assist in locating utilities. (NOTE: CD is rather dated, as it predates the removal and replacement of utilities in lower NB and the AK.)
- Pre-dredge survey of the Arthur Kill deepening – provided by Mike Millard
- Overlay map of the sampling points and dredging areas, this was requested by Tom Shea; Steve Weinberg stated that he had someone working on it. NOTE: TSI also asked that the location of utility crossings be included on the overlay.
- Jenine stated that Ron Pinzon would provide biological data mentioned at the 9/8 meeting to TSI.

It was agreed to have these items sent to Bob and Elizabeth by the end of the week, so that the sampling plan can be finalized.

4. At the 9/8 meeting the sampling points were referred to as listed in RIWP Revision 0. However, since TSI submitted RIWP Revision 1 on 9/6 with re-numbered sampling points, the new numbers are included here with explanations of changes where re-numbering occurred. Based on the additional information and clarifications provided by USACE on areas recently dredged and to be dredged before early November, some of the sampling points were proposed to be relocated as indicated below:

- #001. Current location in AK 2 was dredged in last 3 months; proposed to be relocated to just South of Goethals Bridge. Joe Olha of OPs Division stated that the area from the Goethals Bridge south to the Outerbridge was probably last maintenance dredged in the late 1990s, specifically the shoal areas were done in the 1997-1998 timeframe. The precise sample location will be dependent on the shoal locations in this area. Area F was considered for this point, however with a mid-October start date for dredging that area was dropped from consideration. Joe will provide information on historical maintenance dredging in this area.

- #002 and 051 (renumbered to 010 and 011). Current location of these points in AK 2 has not been dredged yet: proposed to be relocated into the AK 2 utility area 1 (east of Port Ivory and Bridge Creek), as the option for the dredging in this area is not expected to occur before

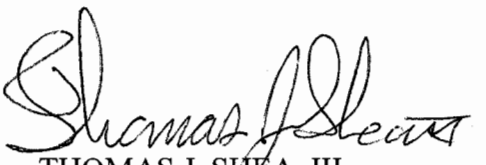
- 2006. Final locations to depend upon shoaling (to be provided by EN). The utilities are inactive; USACE is going out for bid soon but does not anticipate dredging until December.

- #004 (renumbered to 008). Current location in AK 2 , represented as the Shooters Island Option Area 1, has not been dredged yet; developed a contingency plan to relocate this point to south of Shooters Island if this point cannot be coordinated with dredging work by DonJon (dredger). This area has not been dredged since '97 but dredging will begin by 9/30. USACE will determine if enough material for Fresh Kills can be obtained from this general area without removal of this sample, thereby avoiding this location until the end of the AK2 dredging.

- #005 (renumbered to 006). Current location of this point in the KVK may have been dredged; proposed to be relocated slightly north into contract area 5, if necessary, since the southern portion of the Kill van Kull was recently dredged and contract area 5 has not been dredged in 2-3 years.

5. EPA confirmed that they will begin their sediment coring on or about 7 November. They prefer not to sample past mid-December due to health and safety concerns for the field crews. The USACE noted that they have conducted various types of sampling during the winter with no problems.

6. POC is the undersigned at (917) 790-8304.



THOMAS J. SHEA, III
Project Manager

Newark Bay Study Area Coordination Plan

pertaining to

US Army Corps of Engineers Dredging Activities in the Newark Bay, Kill Van Kull and Arthur Kill

and the

US Environmental Protection Agency's Remedial Investigation and Feasibility Study of the Newark Bay Study Area

Prepared by

Harbor Programs Branch
New York District, US Army Corps of Engineers

and

Emergency and Remedial Response Division
Region 2, US Environmental Protection Agency

21 September 2005

Newark Bay Study Area Coordination Plan
pertaining to
US Army Corps of Engineers Dredging Activities in the
Newark Bay, Kill Van Kull and Arthur Kill
and the
US Environmental Protection Agency's Remedial Investigation and Feasibility Study
of the Newark Bay Study Area

Purpose: To describe the coordination activities to take place between the US Army Corps of Engineers (USACE) and the US Environmental Protection Agency (EPA) to ensure that impacts on the EPA's remedial investigation and feasibility study, and possible future environmental remediation, of the Newark Bay Study Area from dredging activities are identified, avoided, and minimized to the fullest extent possible.

Objectives:

a. In accordance with the stated purpose, share all available information about the agencies' respective projects consistently and in a timely fashion.

b. Avoid to the fullest extent possible negative schedule impacts to EPA sampling and USACE dredging.

c. Identify opportunities to support goals and objectives of each agency's projects.

Goals:

a. Ensure that USACE dredging activities are not delayed by EPA study activities.

b. Ensure that EPA's remedial investigation and feasibility study, and possible future environmental remediation, of the Newark Bay Study Area activities are not delayed or negatively impacted by the USACE's dredging activities in that Area.

c. Coordinate sampling and modeling efforts prior to, during, and after dredging, when feasible, to insure integrity and efficiency of both dredging and sampling.

d. Evaluate results from EPA studies during dredging activities that may inform the Corps on how to improve dredging activities and better understand how to manage future dredging operations more efficiently and effectively to achieve USACE Environmental Operating Principles on environmental protection and sustainability.

1. Agency Representation: Team will be co-chaired by the US Army Corps of Engineers – NY District and the US Environmental Protection Agency – Region 2 The team will also include representatives from the following agencies: the Port Authority of NY and New Jersey, the NRDA trustees (US Fish and Wildlife Service, and National Marine Fisheries, The New York State Department of Environmental Conservation (NYSDEC) and, the New Jersey Department of Environmental Protection (NJDEP)), the States of New York and New Jersey regulatory agencies (NJDEP and NYSDEC), and the US Coast Guard. A listing of the initial team members is attached. Agency contractors or other technical experts may be brought on as needed to address specific issues,

2. Duration of the Team: The team will remain active for the duration of the NBSA RI/FS.

3. Meetings

a. The team shall meet monthly to:
- update each other on current activities,
- update each other on future activities,
- identify upcoming document review requirements,
- update the status and identify issues for on-going document reviews,
- conduct on-board reviews of documents,
- resolve any outstanding issues.

b. The monthly meeting will be held at 10:00 am on the second Tuesday of the month.

c. The team may meet in between the monthly meetings based on the needs of either agency. Team members may also be invited to attend other relevant meeting, as appropriate, such as USACE meetings with dredging contractors.

d. A monthly meeting may be cancelled if there is no need to share information. This will be coordinated between the two co-chairpersons.

e. The team will meet at the offices of USACE or EPA on an alternating month basis. A draft agenda will be circulated to team members for review and input approximately 1 week prior to the scheduled meeting date.

f. Minutes of the meetings will be prepared and distributed to the team for review, comment and concurrence prior to finalization.

4. Team Members:

Thomas Shea	Project Manager	USACE Harbor Programs Branch
Scott Nicholson	Project Manager	USACE Harbor Programs Branch
Harold Hawkins	Project Manager	USACE Harbor Programs Branch
Mike Millard	Project Manager	USACE Harbor Programs Branch
Patricia Donohue	Project Manager	USACE Operations Division
Joe Olha	Project Manager	USACE Operations Division
Ron Conetta	Resident Engineer	USACE Construction Division
Sam DiDato	Project Engineer	USACE Construction Division
David Gentile	Project Engineer	USACE Construction Division
Richard Tomer	Chief	USACE Regulatory Branch
Jenine Gallo	Team Leader	USACE Environmental Analysis Branch
Ronald Pinzon	Biologist	USACE Environmental Analysis Branch
Adam Perelson	Physical Scientist	USACE Environmental Analysis Branch
Steven Weinberg	Project Engineer	USACE Engineering Division
Ben Baker	Geologist	USACE Engineering Division
Beth Nash	Envir. Engineer	USACE Operations Division
Ellen Simon	Attorney	USACE Office of Counsel
Elizabeth Butler	Project Manager	EPA Emergency and Remedial Response Division
Alice Yeh	Project Manager	EPA Emergency and Remedial Response Division
Amelia Wagner	Attorney	EPA Office of the Regional Counsel
LCDR Ernie Morton	Chief	USCG Activities NY, Vessel Traffic Service
Steve Dorrler		Port Authority of NY & NJ
Matt Masters		Port Authority of NY & NJ

Suzanne Dietrick	NJ Department of Environmental Protection
Janine MacGregor	NJ Department of Environmental Protection
KD McGuckin	NY Department of Environmental Conservation
Tim Kubiak	US Fish and Wildlife Service
Tom Brosnan	NOAA
Reyhan Mehran	NOAA

CENAN-PP-H 24 October 2005

MEMORANDUM FOR RECORD

SUBJECT: Newark Bay Study Area Coordination Team Meeting

1. The regularly scheduled monthly coordination meeting was held on 11 Oct 05 at the USACE office to discuss the USACE and EPA activities in the NBSA. The following persons attended:

Hal Hawkins	USACE	Project Manager
Scott Nicholson	USACE	Project Manager
Joe Olha	USACE	Project Manager
Adam Perelson	USACE	Physical Scientist
Steve Weinberg	USACE	Project Engineer
Elizabeth Butler	USEPA	Remediation Project Manager
Amelia Wagner	USEPA	Office of the Regional Counsel
Steve Dorrler	PANYNJ	Program Manager

2. The following is a summary of the discussions held during the monthly coordination meeting:

a. USACE Draft Amendment (DA) to the Draft Environmental Assessment (DEA). The DA was mailed out to interested parties on 3 October. Since the notice in the local newspapers was not published until 10 Oct 05, the comment period ends on 11 Nov 05. An advance copy of the amendment was sent to NRDC on 30 Sep 05. The final EA was originally scheduled for 20 November and will not be completed until 30 Nov.

b. S-KVK-2: Bean continues to work near Shooters Island and Bergen Point. They expect to finish the western area by the end of October and will be working east towards the Bayonne Bridge after that. They are still working towards meeting the work plan that was described at the 13 Sep 05 coordination meeting. It was noted that within 800'-1000' off of Shooter's Island should be depositional.

c. AK-1: DonJon has not returned to the non-HARS area (Area F) as of this meeting, but should begin shortly. They are awaiting agreement with Fresh Kills for the placement of dredged material. Area F work has also not yet begun.

d. Utility Area: The pre-con meeting was held on 6 Oct 05 and the contractor stated the he expects to start work in two weeks. Trenching work is expected to begin near the first of November.

e. S-NB-1: The USACE still intends to advertise this contract area once the Final EA is completed, a FOSI/FONSI is signed and the water quality certificate is received. Advertisement is expected in Dec 05.

f. O&M Work: The O&M work in the NB is scheduled to start in March. For the AK, the pre-con meeting is scheduled for 17 Oct and work will begin in early November. The AK work is all south of the Goethals Bridge and is outside of the NBSA.

g. EPA Sampling: The contractors completed the BAZ sampling during the first week of October and is expected to finish the bathymetric surveys by 13 Oct. Sediment sampling could now being as early as 24 Oct (two weeks earlier then originally scheduled). Sediment sampling will not begin until there is agreement between contractors for the chemical testing, *i.e.,* all the testing contracts need to be awarded prior to start of the sediment sampling.

h. Tierra Solutions has produced a new sampling map, RIWP Figure 6a. Elizabeth Butler states that once she is able to extract the figure out of the document that it is in, she will post it to PREmis. (Post note, the file was distributed to the USACE team on 13 Oct.) Actual sampling locations will be finalized when the samples are being taken to account for on-water conditions and the recent bathymetric surveys. Figure 6a shows the general locations that will provide guidance to the contractor.

i. A meeting with the USCG, pilots, USACE contractors and EPA sampling contractors will be set up to discuss the details of the sampling and share where everyone expected to be located on the water during the sampling. (Post note: This meeting is set up for 1430 hrs, 20 Oct in the Construction Conference Room, USACE and via teleconference.)

j. Documents under review: USACE will send EPA the final set of P&S for the S-NB-1 contract area for information. USACE will also invite EPA to the pre-con meeting for the contract area, (to be scheduled once the contract is awarded and the NTP is issued. The EPA Pathways Analysis Report is still open for review until the third week in October (USACE notified EPA that it has no comments during the original review period.)

k. EPA Phase 2 sampling: This will begin once the Phase 1 data is obtained and analyzed. As such, EPA does not have any firm plans for what this phase will entail, such as where, when or what additional sampling will take place.

l. The members present discussed an issue raised by Janine MacGregor of NJDEP concerning the Coordination Plan and its scope. The members present felt that the draft amendment to the draft EA tried to bring a broader view point to the entire study, however, it is difficult since the trustees are not at the same point in their studies as the EPA is. As such, the members present agreed that we need continued coordination with NRDA and that we would like to use the coordination team as the forum to do so.

m. The Honeywell site has data taken from the NBSA. Scott Nicholson will coordinate with that study to obtain the data for EPA and USACE use.

n. Funding of sediment sampling for EPA by USACE: If the USACE were to take additional sediment samples for EPA that were beyond the needs of USACE, EPA would need to provide that funding.

o. The question of USACE becoming a NRDA Trustee was raised. The USACE needs to conduct its own evaluation of this and coordinate this action with its own HQs.

3. The next meeting will be on 8 Nov 95 at 1000 hrs at the EPA offices.

4. POC is the undersigned at (917) 790-8304.

THOMAS J. SHEA, III
Project Manager

CENAN-PP-H 24 October 2005

MEMORANDUM FOR RECORD

SUBJECT: Newark Bay Study Area Coordination Team Conference Call – Special Topic of Contractor On-Water Coordination during Sampling

1. A special meeting of the NBSA Coordination team was held via conference call on 20 Oct 05 to discuss the on-water coordination of the carious contractors and other interested parties. The following persons took part attended in person or by phone:

Hal Hawkins	USACE	Project Manager
Mike Millard	USACE	Project Manager
Steve Weinberg	USACE	Project Engineer
Sam DiDato	USACE	Construction Project Engineer
Gerald Giacchetti	USACE	Construction Project Engineer
Ron Conetta	USACE	Resident Engineer
LtCdr Ernie Morton	USCG	Vessel Traffic Services, Sector NY
Elizabeth Butler	USEPA	Remediation Project Manager
Hank Mahlman	Sandy Hook Pilots	
Robert Flannery	Metro Pilots	
Simon Zorovich	McAllister Pilots	
Lenny Warner	Malcolm-Pirnie	
Rick McNutt	Tierra Solutions	
Paul Bluestein	Tierra Solutions	
Bob Romagnoli	BBL	

2. The following is a summary of the discussions held during the coordination meeting:

a. Elizabeth Butler described the general program that EPA is undertaking. She stated that Tierra Solution is the primary lead with BBL supporting them. They have hired Ocean Surveys, Inc as the sampling contractor, who has a lot of experience in the New York and New Jersey Harbor. She also stated that bathymetric surveys are to be completed by 21 October and that the sampling work will begin on 24 Oct with the actual coring operations to begin on 25 Oct. Each sample should take about one hour and they will be taking samples in the channels, side slopes and flats. OSI will be using a vibracore to take the samples and will also be taking grab samples of the surface sediments. The maximum length of each core will be about six feet. Work is scheduled to begin in the Arthur Kill and proceed east and then north. Work will be conducted during daylight hours.

b. USCG and pilots stated that their main concern is not to impact traffic. As such, when sampling in the channels and particularly in the area near Bergen Point, it is best to sample during low tide or between tides when there is less traffic, and to shadow the dredgers by staying on the same side of the channel. The sampling vessel will also need to maintain contact with

Vessel Traffic Services and may be directed to move from the sampling point if a larger ship needs the space to transit. The pilots also indicated that in the AK, if the vessel doing sampling could stay to the same side as the dredges it would help them to stay out of the way of ship traffic. The pilots also asked if Tierra Solutions could leave off a copy of the sampling map showing the sample locations with the USCG at Fort Wadsworth so the pilots could stop by and look at it.

c. Ron Conetta provided the following updates:

- AK 1: Contractor is performing clean up work in Areas A, B, C and D, this will have no effect on the sampling since no sample points are in these acceptance areas.
- AK 2/3: Contractor is working in Area X, near Port Ivory. There is no sampling scheduled for that area.
- AK Utility Area: There is one sampling point in this area; however, the contractor has not begun work in the area. He recommended that this sample point be a high priority for OSI so that the sample can be obtained before the contractor enters the area.
- There is a sample point located north of Shooters Island in the AK. The USACE contractor is not in that area yet and is not scheduled to be there until November.
- The USACE has no work scheduled south of the Goethals Bridge in the AK or near the Bayonne Bridge in the KVK, so there is no impact to those sample points.

d. A copy of the sample points overlaid on the contraction contract areas will be provided to the pilots.

e. It was agreed that Ernie Morton would be the contact for questions regarding vessel traffic-mail by Steve Weinberg.

3. POC is the undersigned at (917) 790-8304.

THOMAS J. SHEA, III
Project Manager

CENAN-PP-H 9 November 2005

MEMORANDUM FOR RECORD

SUBJECT: Newark Bay Study Area Coordination Team Meeting

1. The regularly scheduled monthly coordination meeting was held on 8 Nov 05 at the USEPA office to discuss the USACE and EPA activities in the NBSA. The following persons attended:

Hal Hawkins	USACE	Project Manager
Scott Nicholson	USACE	Project Manager
Patricia Donohue	USACE	Project Manager
Joe Olha	USACE	Project Manager
Adam Perelson	USACE	Physical Scientist
Steve Weinberg	USACE	Project Engineer
Ben Baker	USACE	Project Geologist
Elizabeth Butler	USEPA	Remediation Project Manager
Amelia Wagner	USEPA	Office of the Regional Counsel
Steve Dorrler	PANYNJ	Program Manager
Sharon Heller	PANYNJ	Environmental Program Specialist
Tim Kubiak	USFWS	
Tom Bronson	NOAA	

2. The following is a summary of the discussions held during the monthly coordination meeting:

a. The Utility removal contractor has begun work in the Arthur Kill. They are beginning in Zone 1.

b. The AK 2/3 contact is at about 37% complete and is proceeding as planned. The AK 1 Contract is 99% complete.

c. EPA was invited to the monthly progress meetings held on the third Thursday of each month at Caven Point.

d. EPA Sampling:

1) Ocean Surveys, Inc. (OSI) had difficulties finding sediment to sample near sample location 001. Steve Weinberg and Ben Baker provided outcrop maps to assist in moving that sample to an area that should have sediment for sampling.

2) OSI was successful in obtaining samples from the utilities removal areas, area F and near Old Place Creek, due to USACE input.

3) Sample location 006 hit rock. The area near Bergen Point is a high energy/scour area and it is not likely that there is sediment there for sampling. In addition, the USACE previously dredged that area and was required to drill, blast and then remove hard rock

to obtain its required depths. USACE recommended moving the sample point north in the channel towards the flats.

4) Samples in the flats south of Shooters Island have been taken. However, there were difficulties in obtaining a sample from sample location 008 due to lack of sediment. USACE recommended moving the sample point southeast, closer to Shooters Island.

5) In general, sampling has been taking longer than expected due to poor weather conditions. To date, 14 cores have been taken, predominately in the southern area (AK and KVK).

e. USACE O&M: The maintenance dredging contract for the Newark Bay Federal Channel is expected to be advertised in December and physical work scheduled to begin in April. The maintenance work in the Arthur Kill, south of the Goethals Bridge is schedule to begin this week.

f. EPA was requested to provide a map of the final sampling coordinates at the next coordination meeting.

g. The USACE draft EA Amendment public comment period ends on 12 November. EPA stated that they mailed USACE their comments. Final EA is expected near 1 Dec 05.

h. Patricia Donohue produced a map, which was provided to EPA, showing the location and dates of O&M dredging in the Newark Bay Federal Channel since 1997.

i. EPA will give a status update of the NBSA RI/FS at the next publicly attended Lower Passaic River Study meeting.

j. The Lower Passaic River Pilot dredging will take place on 8 & 9 Dec 05 with a media day on 9 Dec.

3. The next meeting will be on 13 Dec 05 at 1000 hrs at the USACE offices.

4. POC is the undersigned at (917) 790-8304.

THOMAS J. SHEA, III
Project Manager

Newark Bay Study Area Coordination Plan

pertaining to

US Army Corps of Engineers Dredging Activities in the
Newark Bay, Kill Van Kull and Arthur Kill

and the

US Environmental Protection Agency's Remedial Investigation and
Feasibility Study of the Newark Bay Study Area

Prepared by

Harbor Programs Branch
New York District, US Army Corps of Engineers

and

Emergency and Remedial Response Division
Region 2, US Environmental Protection Agency

21 December 2005

Newark Bay Study Area Coordination Plan
pertaining to
US Army Corps of Engineers Dredging Activities in the
Newark Bay, Kill Van Kull and Arthur Kill
and the
US Environmental Protection Agency's Remedial Investigation and Feasibility Study
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Purpose: To describe the coordination activities to take place between the US Army Corps of Engineers (USACE) and the US Environmental Protection Agency (EPA) to ensure that impacts on the EPA's remedial investigation and feasibility study, and possible future environmental remediation, of the Newark Bay Study Area from dredging activities are identified, avoided, and minimized to the fullest extent possible.

Objectives:

a. In accordance with the stated purpose, share all available information about the agencies' respective projects consistently and in a timely fashion.

b. Avoid to the fullest extent possible negative schedule impacts to EPA sampling and USACE dredging.

c. Identify opportunities to support goals and objectives of each agency's projects.

Goals:

a. Ensure that USACE dredging activities are not delayed by EPA study activities.

b. Ensure that EPA's remedial investigation and feasibility study, and possible future environmental remediation, of the Newark Bay Study Area activities are not delayed or negatively impacted by the USACE's dredging activities in that Area.

c. Coordinate sampling and modeling efforts prior to, during, and after dredging, when feasible, to insure integrity and efficiency of both dredging and sampling.

d. Evaluate results from EPA studies during dredging activities that may inform the Corps on how to improve dredging activities and better understand how to manage future dredging operations more efficiently and effectively to achieve USACE Environmental Operating Principles on environmental protection and sustainability.

1. Agency Representation: Team will be co-chaired by the US Army Corps of Engineers – NY District and the US Environmental Protection Agency – Region 2 The team will also include representatives from the following agencies: the Port Authority of NY and New Jersey, the NRDA trustees (US Fish and Wildlife Service, and National Marine Fisheries, The New York State Department of Environmental Conservation (NYSDEC) and, the New Jersey Department of Environmental Protection (NJDEP)), the States of New York and New Jersey regulatory agencies (NJDEP and NYSDEC), and the US Coast Guard. A listing of the initial team members is attached. Agency contractors or other technical experts may be brought on as needed to address specific issues,

2. Duration of the Team: The team will remain active for the duration of the NBSA RI/FS.

3. Meetings

a. The team shall meet monthly to:

- update each other on current activities,
- update each other on future activities,
- identify upcoming document review requirements,
- update the status and identify issues for on-going document reviews,
- conduct on-board reviews of documents,
- resolve any outstanding issues.

b. The monthly meeting will be held at 10:00 am on the second Tuesday of the month.

c. The team may meet in between the monthly meetings based on the needs of either agency. Team members may also be invited to attend other relevant meeting, as appropriate, such as USACE meetings with dredging contractors.

d. A monthly meeting may be cancelled if there is no need to share information. This will be coordinated between the two co-chairpersons.

e. The team will meet at the offices of USACE or EPA on an alternating month basis. A draft agenda will be circulated to team members for review and input approximately 1 week prior to the scheduled meeting date.

f. Minutes of the meetings will be prepared and distributed to the team for review, comment and concurrence prior to finalization.

4. Dispute Resolution: All agencies recognize that they are acting in a cooperative fashion to assist each other in furthering the goals of the coordination plan. As such, it is further recognized that each agency has specific regulatory authorities. In view of this, the team will implement the following as a dispute resolution plan:

a. First, the team will attempt to resolve the dispute at the team level. The team will normally defer issues to the agency that has the legal or regulatory authority pertaining to the issue. The team shall be given seven days to resolve the dispute.

b. If the team cannot resolve the issue, then the issue will be raised to the agency supervisors of the team members who have the dispute. The supervisors will be given seven days to resolve the dispute.

c. If the immediate supervisors cannot resolve the issue, they will raise it the NY & NJ Harbor Senior Partners. This group is composed of the senior representatives of each agency, which may not be the local agency head. The Senior Partners will endeavor to resolve the dispute within 30 days, convening a special meeting amongst its members if necessary in order to resolve the dispute.

5. Team Members:

Thomas Shea	Project Manager	USACE Harbor Programs Branch
Scott Nicholson	Project Manager	USACE Harbor Programs Branch
Harold Hawkins	Project Manager	USACE Harbor Programs Branch
Mike Millard	Project Manager	USACE Harbor Programs Branch

Patricia Donohue	Project Manager	USACE Operations Division
Joe Olha	Project Manager	USACE Operations Division
Ron Conetta	Resident Engineer	USACE Construction Division
Sam DiDato	Project Engineer	USACE Construction Division
David Gentile	Project Engineer	USACE Construction Division
Richard Tomer	Chief	USACE Regulatory Branch
Jenine Gallo	Team Leader	USACE Environmental Analysis Branch
Ronald Pinzon	Biologist	USACE Environmental Analysis Branch
Adam Perelson	Physical Scientist	USACE Environmental Analysis Branch
Steven Weinberg	Project Engineer	USACE Engineering Division
Ben Baker	Geologist	USACE Engineering Division
Beth Nash	Envir. Engineer	USACE Operations Division
Ellen Simon	Attorney	USACE Office of Counsel
Elizabeth Butler	Project Manager	EPA Emergency and Remedial Response Division
Alice Yeh	Project Manager	EPA Emergency and Remedial Response Division
Amelia Wagner	Attorney	EPA Office of the Regional Counsel
LCDR Ernie Morton	Chief	USCG Activities NY, Vessel Traffic Service
Steve Dorrler		Port Authority of NY & NJ
Matt Masters		Port Authority of NY & NJ
Suzanne Dietrick		NJ Department of Environmental Protection
Janine MacGregor		NJ Department of Environmental Protection
KD McGuckin		NY Department of Environmental Conservation
Tim Kubiak		US Fish and Wildlife Service
Tom Brosnan		NOAA
Reyhan Mehran		NOAA