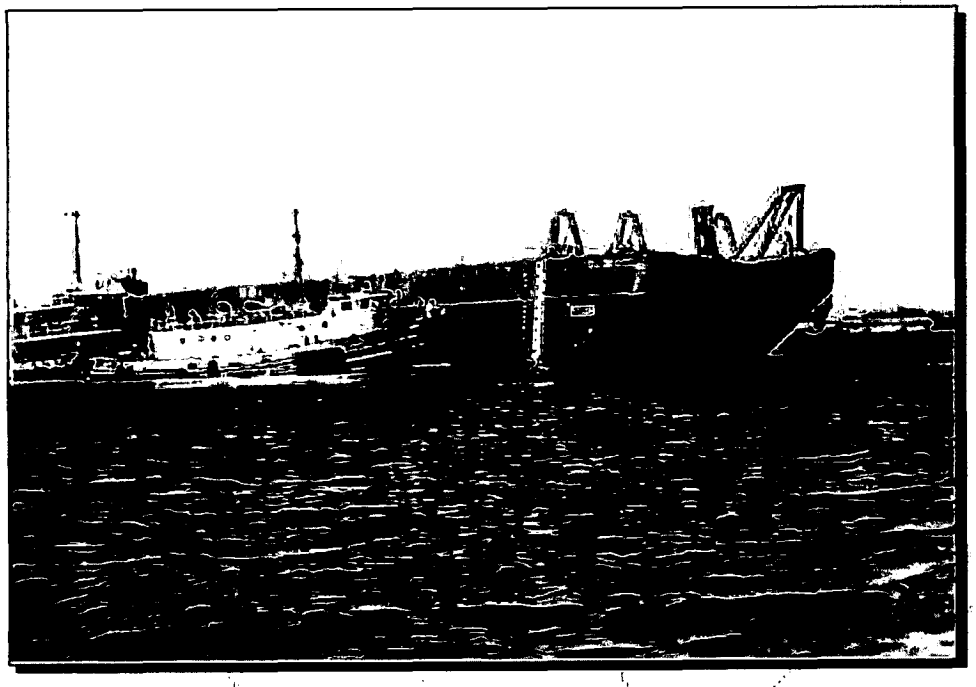
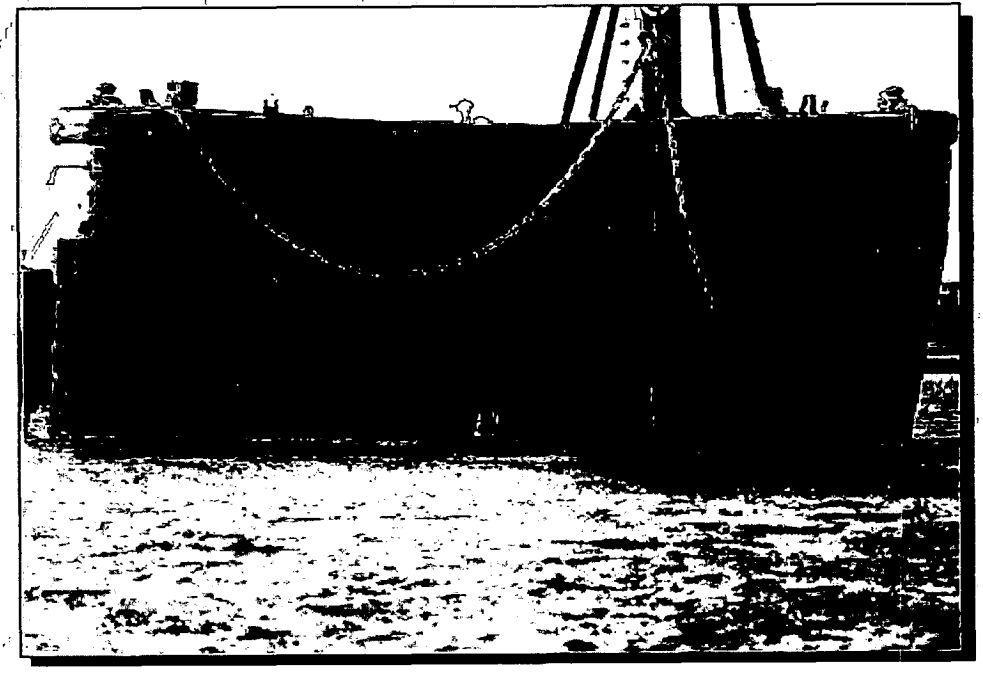
Disposal of Dredged Material at the Newark Bay Confined Disposal Facility
Liberty State Park Project





THE PORT AUTHORITY
OF NEW YORK & NEW JERSEY

MALCOLM PIRNIE
22252-036
January 1998

DISPOSAL OF DREDGE MATERIAL
AT THE
NEWARK BAY CONFINED DISPOSAL FACILITY

LIBERTY STATE PARK PROJECT

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DISPOSAL OF DREDGE MATERIAL
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1.0 EXECUTIVE SUMMARY

Malcolm Pirnie, Inc. has been contracted by the Port Authority of New York and New Jersey to perform Professional Services for Operation and Management of the Newark Bay Confined Disposal Facility (NBCDF). The contract includes development and implementation of the NBCDF Operations and Management Plan (O&M Plan), field observation of the disposal of dredged material in the NBCDF and water quality monitoring during specific disposal events. This report summarizes the outcome of those activities for the Liberty State Park project; the first disposal project at the facility.

During the period of November 15-20, 1997 the first disposal events for dredged material were completed at the NBCDF. Great Lakes Dredge and Dock Co. (Great Lakes) placed approximately 29,000 cubic yards (cy) of material from Liberty State Park into the NBCDF. There were fourteen separate disposal events using one of two 4,000 cy capacity disposal scows. Malcolm Pirnie and the Port Authority provided very close oversight to ensure successful disposal of dredged material in the NBCDF. Malcolm Pirnie staff provided oversight from their boat in Newark Bay and worked closely with the contractors and the Corps-certified inspectors to ensure close adherence to the requirements of the O&M Plan. Under subcontract to Malcolm Pirnie, EA Engineering Science and Technology, Inc. (EA) conducted water quality monitoring and total suspended solids (TSS) sampling at specified locations surrounding the NBCDF. For research purposes, the Port Authority requested additional monitoring, not required by the O&M Plan, be conducted to obtain data about turbidity that may result from disposal events. This monitoring and sampling was performed prior to and after each of the first ten disposal events. It was demonstrated that turbidity and TSS levels following each event were consistent with background levels prior to the event.

Based on the field data and observations, operational experiences, and lessons learned during the disposal events described in this report, the Port Authority is considering practical revisions to the current plan. If revisions are proposed, they will be submitted to the New Jersey Department of Environmental Protection for their review and approval.

2.0 PREDISPOSAL ACTIVITIES

The NBCDF Operations and Maintenance (O&M) Plan, dated November 4, 1997, was approved by the New Jersey Department of Environmental Protection (NJDEP) on October 31, 1997. Approval of the O&M Plan for the NBCDF was a permit condition prior to placement of material. The approved O&M Plan was the basis for the following meetings held prior to disposal activities for the Liberty State Park project. A summary of each meeting is presented below.

PreDisposal Activities
Liberty State Park

Meeting	Date/Location	Attendees	Purpose/Discussions
Predisposal Meeting	Nov. 5, 1997 1 World Trade Center, NY, NY	Port Authority NJDEP USACE Great Lakes Malcolm Pirnie EA AIS	Reviewed the O&M Plan and Predisposal requirements. Discussed logistics, anticipated time frames, inspection of vessels, and emergency contacts. NJDEP suggested an exact tugboat coordinate verification/scow placement protocol be developed. The importance of the NBCDF was stressed.
Dredge Inspector Training	Nov. 10, 1997 Port Newark	Port Authority Malcolm Pirnie Great Lakes AIS	Malcolm Pirnie provided training for use of the NBCDF to 3 Dredge Inspector from AIS and 2 tug boat captains.
Operation Meeting	Nov. 10, 1997 Port Newark	Port Authority USACE Great Lakes MPI EA AIS	Revisit requirements of the O&M Plan. Discussed protocol for the actual disposal event including dialogue between the tugboat captain and Malcolm Pirnie as a loaded barge approaches the NBCDF.
Dredge Inspector Training	Nov. 13, 1997 Port Newark/NBCDF	Malcolm Pirnie AIS	Malcolm Pirnie provided training for use of the NBCDF to 1 Dredge Inspector from AIS. Malcolm Pirnie and AIS visited NBCDF via boat.
Tugboat Captains/ Scowman Briefing	Nov. 15, 1997 Liberty State Park	Port Authority Great Lakes MPI AIS	Meeting was made necessary by a shift of schedule for dredging; different tug boat captains and scowman were to be used. Discussed and agreed upon radio frequencies, dialogue, time frames, and methods by which Malcolm Pirnie would verify tugboat coordinates within the NBCDF prior to giving affirmation for dumping.

2.1 Standard Operating Procedure

Following the November 10, 1997 operation meeting Malcolm Pirnie prepared a Standard Operating Procedure (SOP) for the Methodology for Disposal Events at the NBCDF. The SOP was faxed to Marc Helman, USACE, Bill Moore, Great Lakes and Ed Knoesel, Port Authority for review and comment on November 14, 1997. In addition, the SOP was reviewed, discussed, and slightly modified during the November 15, 1997 tugboat captain/scowman briefing.

Attached is the SOP in its current form. The SOP will be evaluated and may undergo revision if field conditions dictate.

3.0 DISPOSAL

Great Lakes placed materials dredged from Liberty State Park in the NBCDF November 15-20, 1997. Of a total of 14 scows of dredge material disposed, 11 were placed in the center of the NBCDF at the intersection of the yellow, blue, and green zones; the remaining 3 scow loads were placed in the yellow zone. The approximate location of the first 10 scows at the time of disposal are shown on Figures 1 through 10. Table 1 shows disposal data for each tug/scow that entered the NBCDF. Also attached are Dredging Inspectors' Reports for all 14 trips to the NBCDF, as completed by Dredge Inspector, Linda Craig. As shown on Table 1, some floating debris (logs/pilings) resulted from some of the disposal activities. Great Lakes collected the debris for disposal and stored it behind a boom next to Pier 74 for disposal later.

The first scowload was loaded at Liberty State Park between 13:00 and 14:00 on Saturday, November 15, 1997, but dredging had to be halted so that the scow could depart for the NBCDF so that disposal could occur during daylight hours. This scow contained less than 1000 cy, and was intended as a "dry run". Malcolm Pirnie and the Port Authority were present at the NBCDF in an observer boat. Once the tug boat/scow were in position near the center of the yellow zone, Malcolm Pirnie verified the coordinates provided by the tug captain over the radio. Following confirmation of the coordinates, Malcolm Pirnie gave the affirmative for dump, and the first disposal event proceeded at 16:27. It was noted that the tug had difficultly maintaining position due to the current and wind.

The second and third disposal events (scow #2 and #3) were placed on the morning of November 16, 1997. Great Lakes conducted dredging operations at Liberty State Park throughout the night and two scows were loaded up and transported to Berth 74 to await disposal during daylight at 07:00. Once in position near the center of the yellow zone,

Malcolm Pirnie confirmed the tugs position with the tug captain. Again, the tugs had difficulty remaining stationary during the coordinate verification process due to wind and current; a substantial amount of maneuvering was required to obtain exact tug positioning coordinates. The material from the scow #2 was placed successfully at 07:42. Scow #3 was also dumped successfully, at 09:29, but during the verification process the scow had swung clockwise, to an east-west direction, putting the bow of the scow over to the inclined southeastern side of the facility. While both dumps were placed within the boundaries of the NBCDF, it was evident that in place of, or in addition to, the coordinate verification process, a visual position verification system would be needed for subsequent dumps.

In consultation with the Port Authority, Malcolm Pirnie directed Scows 4 to 14 to place material toward the center of the NBCDF, at the intersection of the yellow, blue, and green areas. During these events the tugboat's longitude and latitude were recorded by the Dredge Inspector. Malcolm Pirnie's decision to affirm each dump was based upon visual confirmation using range markers along the centerline and midpoints of the sides of the CDF. Depending on the direction and strength of the tide, the scow was positioned slightly to north or south of the east-west range markers, but always near the center of the north-south range as shown on Figures 4 through 10.

Shifting operations from pinpoint disposal coordinates to disposal in the center portion of the CDF is an example of how operations of the NBCDF will be further improved based on field observations and experiences. Following this change in procedures, the Tug Captains confirmed that this change facilitated maneuvering into and out of the entrance channel.

4.0 WATER QUALITY MONITORING

In subcontract to Malcolm Pirnie, EA Engineering Science and Technology, Inc. conducted water quality monitoring for the first ten disposal events at the NBCDF as required by the O&M Plan. Monitoring consisted of the collection of the required total suspended solids (TSS) samples. In addition, for research purposes, the Port Authority requested monitoring be performed beyond the requirements of the permit to address concerns raised during the project's environmental review (NEPA EIS). For this first series of disposal events, field measurements of turbidity, temperature, salinity, and conductivity were obtained and recorded at sample stations located downcurrent of each disposal event and in the entrance channel. Monitoring was conducted prior to dumping (for control) and at intervals of 15, 45, 75 and 105 minutes following each disposal event. Also collected were water samples in the entrance channel immediately after the tug/scow passed through the entrance channel area, to determine the potential impact of resuspension. This was done to avoid misinterpretation of post-dump data at sample station TSS-1. Figures 1 through 10, attached, show levels of turbidity and TSS at each time interval/sample location for the first ten dump events.

Measurements of turbidity were consistent with control levels recorded prior to the disposal event. The 0.25 hr. post dump sample mean was 3.3 Nephelometric Turbidity Units (NTU), compared to the 2.5 NTU control sample mean. Turbidity at subsequent post dump intervals was similar or even lower than the control mean. Some elevated turbidity levels were recorded in the entrance channel at TSS-1 following passage of the tug but prior to the disposal event. These levels are most likely due to vessel traffic and may have affected post dump levels.

Review of TSS data show that the range of TSS level means at sample stations around the NBCDF for all dumps (40.1 to 42.1 mg/L) show no trend when compared to the TSS sample mean for all controls (43.4 mg/L). Figure 11 shows the mean turbidity and TSS levels for all

10 disposal events versus time. Attachment 3 includes data tables and summaries of all the water quality information.

A turbidity plume was observed by EA only once, during dump event #3. This plume appeared to be the result of the tug propeller in close proximity to the CDF side slope. The plume quickly dissipated and was not evident 45 minutes after the dump.

Because these were the first disposal events at the NBCDF turbidity measurements were made before and after each event to obtain additional data not required by O&M Plan. It is proposed that modifications be made to the O&M Plan to indicate that turbidity sampling will be done only if visual observations show a plume outside the NBCDF due to operations.

5.0 LESSONS LEARNED

The Liberty State Park dredge material disposal was successfully implemented at the CDF. While this project was successful, we offer the following recommendations to improve the O&M Plan based on lessons learned:

1. *We established that we need to be flexible in determining method of tug and scow position prior to disposal events. For the Liberty State Park job, it became evident that visual positioning using range markers was the optimal method. This method will be enhanced by placing additional ranges around the perimeter of the CDF to aid Tug Captains in exact positioning.* The DGPS method, via coordinate verification system originally planned is complicated by the geometry of the tugs DGPS antennae and the actual scow location; the far end of a scow can be as much as 175 feet from the location of a tug's DGPS antenna. While tug coordinates are of importance, they can be recorded by the dredge inspector along with the position (distance and direction) of the tugs positioning system relative to the scow. This information can be used to plot the actual dump position on maps back in the office. However, visual positioning is more effective and will allow less room for error and/or confusion than reading (constantly changing) coordinates over the radio. It is proposed that visual confirmation of disposal location be an acceptable alternative to verification of DGPS readouts at the time of disposal. During future predisposal meetings both approaches could be addressed. Regardless of how disposal location is determined, all tugs must have DGPS readouts for confirmation during the disposal event.

2. *Protocol should be developed to deal with floating debris.* During these events, floating debris was observed at the surface immediately following dumps. These debris were old pilings, encountered at Liberty State Park in numbers of 0-12 per scow. Great Lakes was instructed to collect this debris for disposal at a later date. It was observed that in calm

waters sufficient time was available for Great Lakes to retrieve floating debris, but in rougher weather more advanced methods or more boats will be needed. A standard protocol should be prepared and approved for inclusion into the next amendment to the O&M Plan.

3. *Provisions for 24 hour operations need to be addressed.* A significant lesson learned from the Liberty State Park project was that restricting disposal events to only daylight hours severely impacts efficiency of the dredging operation. Normally, maintenance dredging at a site is performed 24 hours a day, seven days a week. Limiting disposal to only daylight hours restricts how much dredging can be accomplished in a given day at the dredge site. Given the limited number of split hull scows available, limiting disposal to daylight hours also results in significant down time at the dredge site which significantly expands the schedule and increases costs. Therefore, it is recommended that the Port Authority meet with NJDEP and the USACE to discuss what needs to done to allow for 24 hour operation. In order to safely and effectively perform 24 hour operations, enhanced position verification procedures (using improved range markers that can be seen at night) can be developed and additional training of contractor's crews and Corps-certified inspectors should be provided.

The O&M Plan should be revised and resubmitted to NJDEP. Lessons learned from this successful project should be incorporated into the O&M Plan. Subsequent projects/lessons learned should also be incorporated.

Table 1: Newark Bay CDF - Summary of Dredged Materials Disposal

USER: Liberty State Park

Trip #	Date	Time of Dump	C.Y. (Est.)	Weather/ Wind (mph)	Tide	Target Area	Comments
1	11/15/97	1627	800	Overcast NW 15-20	In (High 2057)	Center of "Yellow"	Difficult for tug/scow to remain stationary during coordinates verification.
2	11/16/97	0742	3000	Cloudy W 5-10	In (High 0912)	Center of "Yellow"	Difficult for tug/scow to remain stationary during coordinates verification; at least 12 floating logs.
3	11/16/97	0929	3500	Cloudy W 5-10	High Tide (Slack)	Center of "Yellow"	Scow bow swung around to the East (clockwise) during coordinates verification. Possible placement of material on incline. 4 floating logs resulted from dump.
4	11/16/97	1628	3000	Clear WNW 15-25	Out (Low 1550)	Center of CDF	MPI gave visual verification to tug, lining up N-S and E-W range markers with scow. 3 to 4 floating logs
5	11/17/97	0730	2500	Clear W 15-20	In (High 1000)	Center of CDF	Scow in line with N-S and E-W range markers, slightly to the south. Minimal floating debris.
6	11/17/97	0838	2800	Clear W 15-20	In (High 1000)	Center of CDF	Scow in line with N-S and E-W range markers; 8 to10 floating logs resulted from this dump.
7	11/17/97	1543	2800	Clear W 10-15	Out (Low 1640)	Center of CDF	Scow in line w/N-S; E-W range markers. Slight delay in disposal after affirmative due to difficulty w/ scow lines. Minimal floating debris resulted from this dump.
8	11/18/97	0730	2510	Clear W 5-10	In (High 1100)	Center of CDF	East buoy at channel entrance out of position. Scow in line with range markers. Minimal floating debris.
9	11/18/97	0842	3120	Clear W 5-10	In (High 1100)	Center of CDF	East buoy at channel entrance out of position. Scow in line with range markers. Minimal floating debris.
10	11/18/97	1535	3200	Clear W 10-15	Out (low at 1730)	Center of CDF	Scow in line with range markers. East buoy at channel entrance back in location. 7 to 8 floating logs resulted from dump, collected by GLDD.
11	11/19/97	0734	2360	Clear S 0-5	In (High at 1152)	Center of CDF	Scow in line with range markers, Lots of logs (approximately 14) collected by GLDD and put in containment over by Pier 74
12	11/19/97	0944	3290	Clear S 0-5	In (High at 1152)	Center of CDF	Scow in line with range markers, Lots of logs (approximately 10) collected by GLDD and put in containment over by Pier 74
13	11/19/97	1545	3000	Clear W 5-10	Out (Low at 1820)	Center of CDF, slightly south	Bow of scow just touching E-W range marker; on N.S. Approximately 15 floating logs resulted from dump; picked-up by GLDD.
14	11/20/97	0730	2700	Clear SW 5-10	In (Low at 0640)	Center of CDF, slightly south	Bow of scow just touching E-W range Markers. Approximately 5 floating logs resulted from dump, picked-up by GLDD.

Inspector's Estimated Total **38,000**

END OF USER DISPOSAL

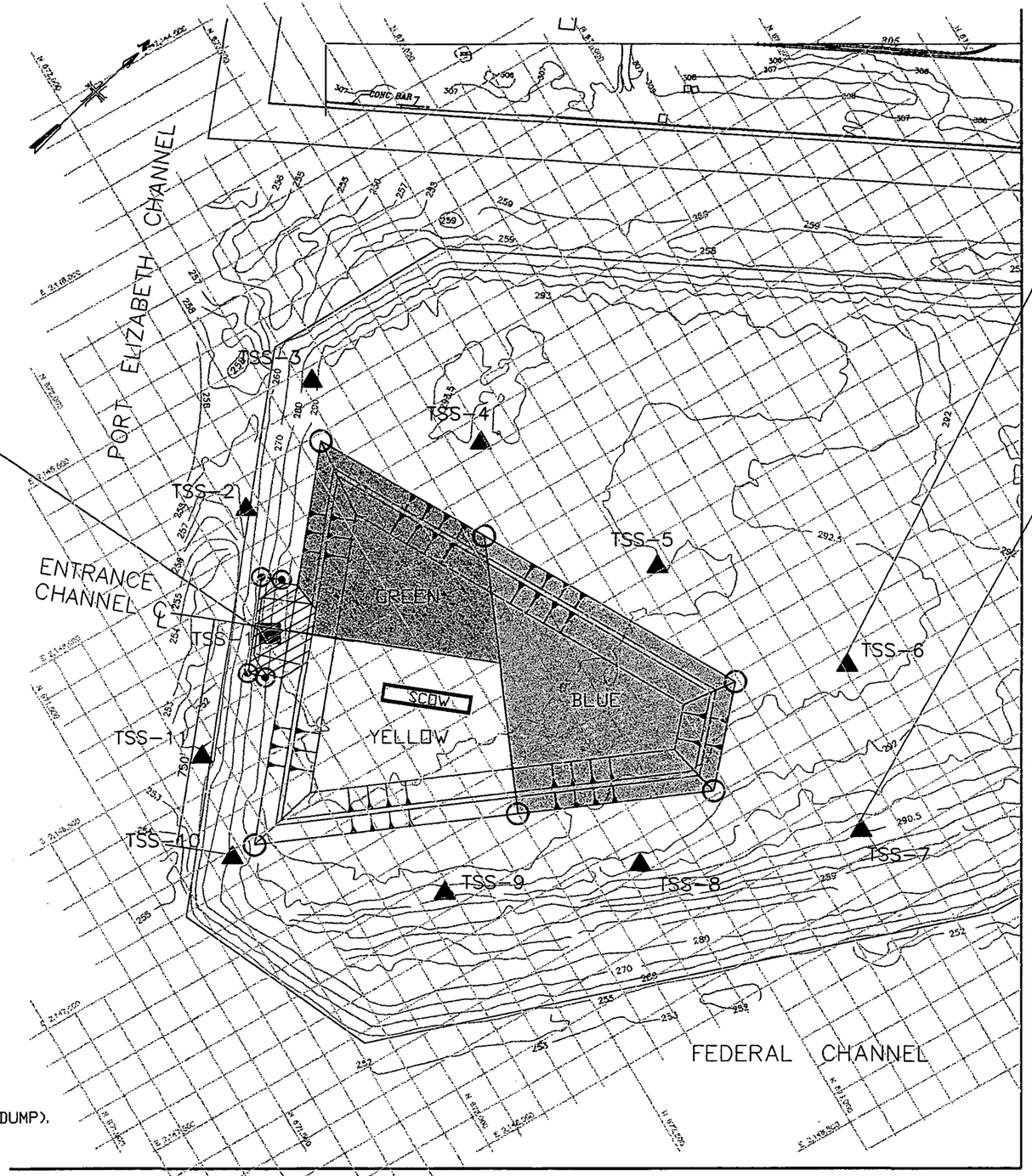
Note: Actual disposal amount of dredged material from Liberty State Park was 28,399 cy (based on pre/past bathymetric surveys). More dredging may be required by user to complete project.

WIND
NW
15-20 K

TIDE
HIGH @ 20:57

TSS-1		
TIME (HOURS)	TRANSMISSIVITY (NTU)	TSS mg/L
CONTROL	3.00/2.00	45.60/32.40
TRAFFIC	3.00/8.00	35.20/43.20
+0.25	5.00/7.00	41.60/38.80
+0.75	5.00/6.00	39.20/52.00
+1.25	3.00/5.00	38.40/45.60
+1.75	1.00/5.00	33.60/48.80

(SHALLOW/DEEP-NOTE 6)



TSS-6		
TIME (HOURS)	TRANSMISSIVITY (NTU)	TSS mg/L
CONTROL	2.00/3.00	43.60/34.40
+0.25	3.00/3.00	30.80/25.60
+0.75	4.00/6.00	28.00/26.80
+1.25	2.00/5.00	36.40/35.20
+1.75	2.00/4.00	30.80/29.60

(SHALLOW/DEEP-NOTE 6)

TSS-7		
TIME (HOURS)	TRANSMISSIVITY (NTU)	TSS mg/L
CONTROL	2.00/2.00	34.00/42.00
+0.25	4.00/4.00	25.60/32.00
+0.75	4.00/3.00	37.20/31.60
+1.25	2.00/3.00	31.20/36.00
+1.75	2.00/3.00	28.80/33.60

(SHALLOW/DEEP-NOTE 6)

LEGEND

DISPOSAL ZONES

- GREEN
- YELLOW
- BLUE
- ENTRANCE CHANNEL

- PERIMETER (CREST) BUOY LOCATIONS
- ENTRANCE CHANNEL MARKER BUOY LOCATIONS
- MID-CHANNEL TSS SAMPLING POINT, SAMPLED DURING ALL SAMPLING EVENTS
- TIDAL DEPENDENT SAMPLING POINTS

NOTES:

1. MEAN LOW WATER (MLW) ELEVATION 295=-2.35 NGVD 29.
2. THE COORDINATES SHOWN ARE BASED ON NEW JERSEY MERCATOR NAD27.
3. THE CONTOURS SHOWN ARE BASED ON BATHYMETRY OBTAINED BY ROGERS SURVEYING INC. DATED JUNE 8, 9, 14, 15, 1995.
4. TSS MONITORING WAS IN ACCORDANCE WITH THE NBCDF OPERATIONS AND MANAGEMENT PLAN.
5. THIS DRAWING IS ADAPTED FROM DRAWING ENTITLED "NEWARK BAY CONFINED DISPOSAL FACILITY, EXCAVATION PLAN," PORT AUTHORITY OF NEW YORK AND NEW JERSEY, JANUARY 27, 1997.
6. TSS AND TRANSMISSIVITY DATA ARE PRESENTED AS SHALLOW/DEEP. SHALLOW SAMPLES WERE COLLECTED 1.5 FEET FROM THE WATER SURFACE; DEEP SAMPLES WERE COLLECTED 1.5 FEET FROM THE BOTTOM (MAX. 20 FEET).
7. VESSEL 'TRAFFIC' SAMPLE WAS COLLECTED AT TSS-1 FOLLOWING THE TUG/SCOW ENTERING THE NBCDF BUT PRIOR TO THE DISPOSAL EVENT.
8. SCOW POSITION APPROXIMATE, BASED ON VISUAL OBSERVATION AT THE TIME OF DISPOSAL EVENT (I.E. DUMP).

MALCOLM PIRNIE

THE PORT AUTHORITY OF NY & NJ

TSS AND TRANSMISSIVITY DATA FOR DUMP EVENT # 1 OF FIRST 10 FOOT LIFT
NOVEMBER 15, 1997, 16:27
NEWARK BAY CONFINED DISPOSAL FACILITY

0 200 400
SCALE IN FEET

MALCOLM PIRNIE, INC.

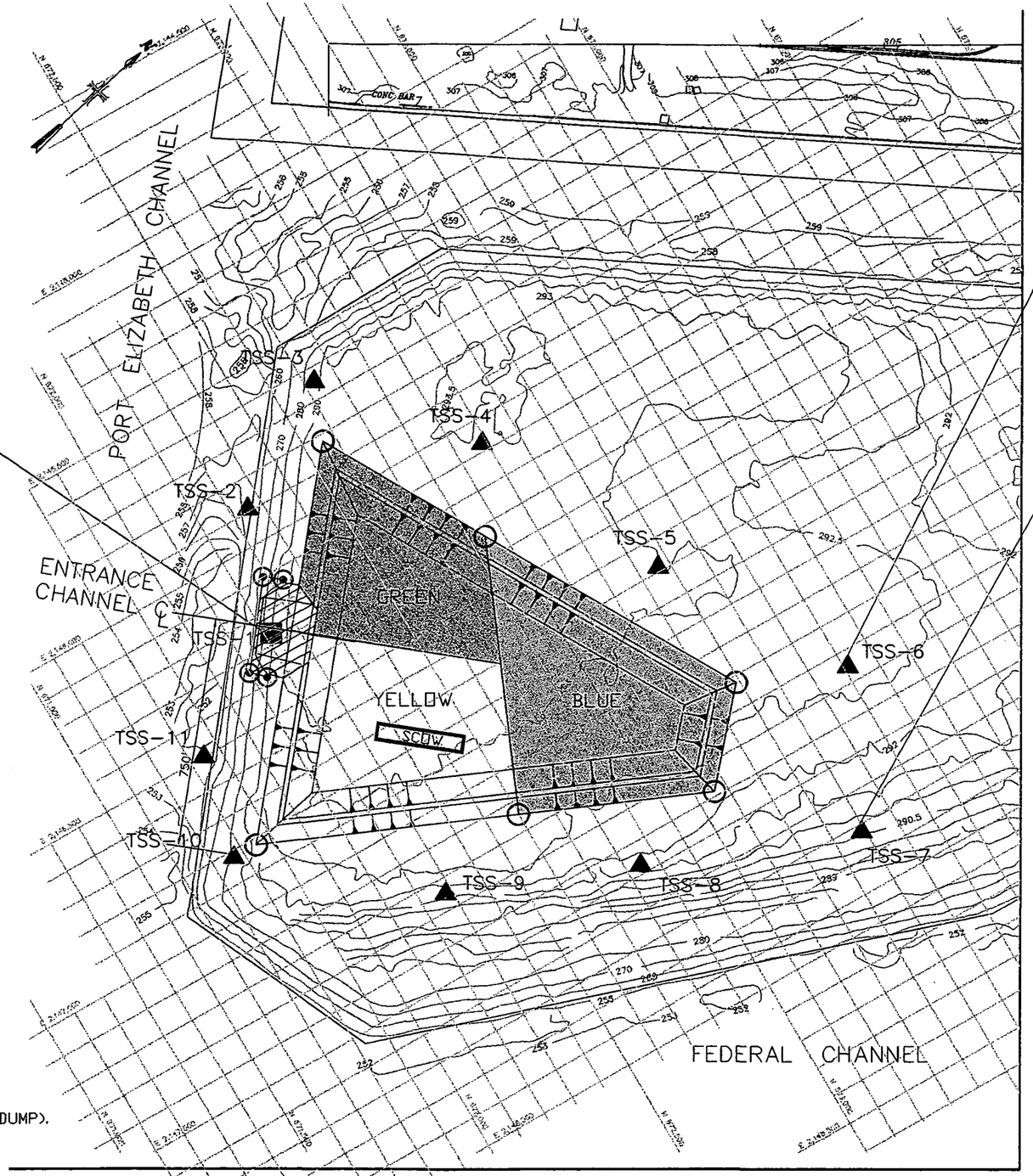
FIGURE 1

WIND
W 5 K

TIDE
HIGH @ 09:12

TSS-1		
TIME (HOURS)	TRANSMISSIVITY (NTU)	TSS mg/L
CONTROL	0.00/2.00	29.20/35.20
TRAFFIC	12.00/47.00	92.00/38.00
+0.25	1.00/1.00	37.20/69.60
+0.75	1.00/10.00	32.00/57.20
+1.25	-	-
+1.75	-	-

(SHALLOW/DEEP-NOTE 6)



TSS-6		
TIME (HOURS)	TRANSMISSIVITY (NTU)	TSS mg/L
CONTROL	1.00/1.00	35.60/43.20
+0.25	1.00/3.00	33.20/24.80
+0.75	0.00/0.00	25.60/24.00
+1.25	-	-
+1.75	-	-

(SHALLOW/DEEP-NOTE 6)

TSS-7		
TIME (HOURS)	TRANSMISSIVITY (NTU)	TSS mg/L
CONTROL	1.00/1.00	32.40/34.48
+0.25	1.00/2.00	32.00/36.40
+0.75	0.00/1.00	31.60/26.80
+1.25	-	-
+1.75	-	-

(SHALLOW/DEEP-NOTE 6)

LEGEND

DISPOSAL ZONES

- GREEN
- YELLOW
- BLUE
- ENTRANCE CHANNEL

- PERIMETER (CREST) BUOY LOCATIONS
- ENTRANCE CHANNEL MARKER BUOY LOCATIONS
- MID-CHANNEL TSS SAMPLING POINT, SAMPLED DURING ALL SAMPLING EVENTS
- TIDAL DEPENDENT SAMPLING POINTS

NOTES:

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7. VESSEL 'TRAFFIC' SAMPLE WAS COLLECTED AT TSS-1 FOLLOWING THE TUG/SCOW ENTERING THE NBCDF BUT PRIOR TO THE DISPOSAL EVENT.
8. SCOW POSITION APPROXIMATE, BASED ON VISUAL OBSERVATION AT THE TIME OF DISPOSAL EVENT (I.E. DUMP).

MALCOLM PIRNIE

THE PORT AUTHORITY OF NY & NJ

TSS AND TRANSMISSIVITY DATA FOR DUMP EVENT # 2 OF FIRST TEN FOOT LIFT
NOVEMBER 16, 1997, 07:42
NEWARK BAY CONFINED DISPOSAL FACILITY

0 200 400
SCALE IN FEET

MALCOLM PIRNIE, INC.

FIGURE 2

TSS-1		
TIME (HOURS)	TRANSMISSIVITY (NTU)	TSS mg/L
CONTROL	0.00/5.00	37.20/37.20
TRAFFIC	0.00/36.00	26.00/39.20
+0.25	0.00/3.00	22.80/26.40
+0.75	0.00/2.00	29.20/32.00
+1.25	0.00/0.00	27.20/21.20
+1.75	0.00/0.00	42.00/22.00

(SHALLOW/DEEP-NOTE 6)

LEGEND

DISPOSAL ZONES

GREEN

YELLOW

BLUE

ENTRANCE CHANNEL

PERIMETER (CREST) BUOY LOCATIONS

ENTRANCE CHANNEL MARKER BUOY LOCATIONS

MID-CHANNEL TSS SAMPLING POINT, SAMPLED DURING ALL SAMPLING EVENTS

TIDAL DEPENDENT SAMPLING POINTS

NOTES:

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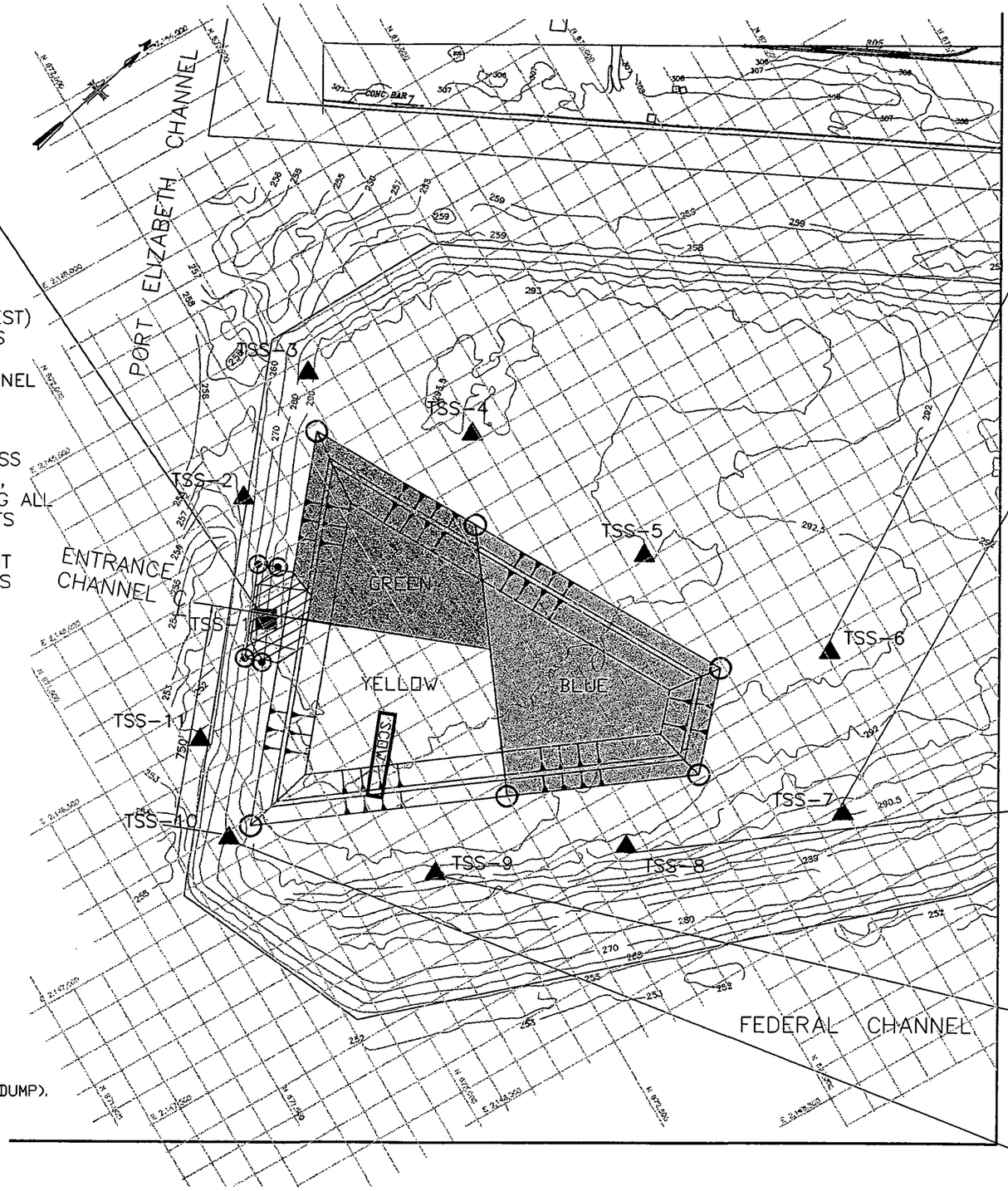
8. SCOW POSITION APPROXIMATE, BASED ON VISUAL OBSERVATION AT THE TIME OF DISPOSAL EVENT (I.E. DUMP).



TSS-6		
TIME (HOURS)	TRANSMISSIVITY (NTU)	TSS mg/L
CONTROL	0.00/0.00	72.40/24.80
+0.25	-	-
+0.75	-	-
+1.25	-	-
+1.75	-	-

(SHALLOW/DEEP-NOTE 6)

TSS-7		
TIME (HOURS)	TRANSMISSIVITY (NTU)	TSS mg/L
CONTROL	0.00/0.00	23.60/26.00
+0.25	0.00/0.00	26.80/16.00
+0.75	0.00/0.00	23.20/19.60
+1.25	-	-
+1.75	-	-

(SHALLOW/DEEP-NOTE 6)

WIND W 5 K

SLACK TIDE

HIGH @ 09:12

TSS-8		
TIME (HOURS)	TRANSMISSIVITY (NTU)	TSS mg/L
CONTROL	-	-
+0.25	0.00/0.00	47.60/23.60
+0.75	0.00/0.00	23.60/20.80
+1.25	-	-
+1.75	-	-

(SHALLOW/DEEP-NOTE 6)

TSS-9		
TIME (HOURS)	TRANSMISSIVITY (NTU)	TSS mg/L
CONTROL	-	-
+0.25	43.00/23.00	99.20/98.00
+0.75	0.00/0.00	29.20/18.80
+1.25	0.00/0.00	31.20/24.40
+1.75	0.00/0.00	32.00/29.20

(SHALLOW/DEEP-NOTE 6)

TSS-10		
TIME (HOURS)	TRANSMISSIVITY (NTU)	TSS mg/L
+1.25	0.00/0.00	24.80/19.60
+1.75	0.00/0.00	30.00/26.00

(SHALLOW/DEEP-NOTE 6)

MALCOLM PIRNIE

THE PORT AUTHORITY OF NY & NJ

TSS AND TRANSMISSIVITY DATA FOR DUMP EVENT # 3 OF FIRST TEN FOOT LIFT
NOVEMBER 16, 1997, 09:29
NEWARK BAY CONFINED DISPOSAL FACILITY

0 200 400
SCALE IN FEET

MALCOLM PIRNIE, INC.

FIGURE 3

WIND
WNW
15-25 K

SLACK TIDE

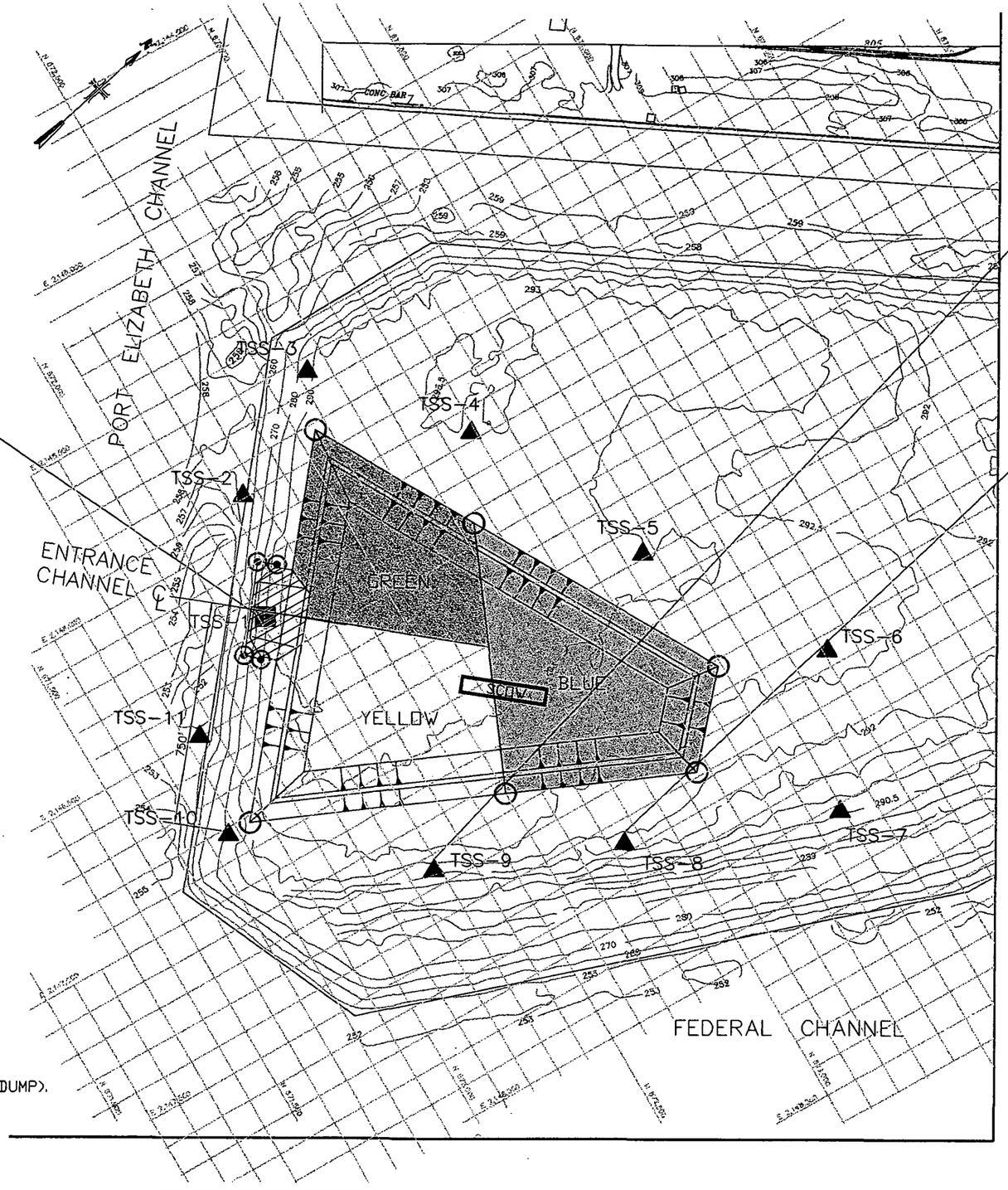
LOW (15:50)

TSS-1		
TIME (HOURS)	TRANSMISSIVITY (NTU)	TSS mg/L
CONTROL	5.00/5.00	35.60/30.50
TRAFFIC	5.00/4.00	50.00/87.20
+0.25	9.00/7.00	38.80/31.60
+0.75	5.00/3.00	33.60/39.20
+1.25	2.00/2.00	33.20/42.60
+1.75	3.00/-	36.00/41.20

(SHALLOW/DEEP-NOTE 6)

NOTES:

1. MEAN LOW WATER (MLW) ELEVATION 295=-2.35 NGVD 29.
2. THE COORDINATES SHOWN ARE BASED ON NEW JERSEY MERCATOR NAD27.
3. THE CONTOURS SHOWN ARE BASED ON BATHYMETRY OBTAINED BY ROGERS SURVEYING INC. DATED JUNE 8, 9, 14, 15, 1995.
4. TSS MONITORING WAS IN ACCORDANCE WITH THE NBCDF OPERATIONS AND MANAGEMENT PLAN.
5. THIS DRAWING IS ADAPTED FROM DRAWING ENTITLED "NEWARK BAY CONFINED DISPOSAL FACILITY, EXCAVATION PLAN," PORT AUTHORITY OF NEW YORK AND NEW JERSEY, JANUARY 27, 1997.
6. TSS AND TRANSMISSIVITY DATA ARE PRESENTED AS SHALLOW/DEEP. SHALLOW SAMPLES WERE COLLECTED 1.5 FEET FROM THE WATER SURFACE; DEEP SAMPLES WERE COLLECTED 1.5 FEET FROM THE BOTTOM (MAX. 20 FEET).
7. VESSEL 'TRAFFIC' SAMPLE WAS COLLECTED AT TSS-1 FOLLOWING THE TUG/SCOW ENTERING THE NBCDF BUT PRIOR TO THE DISPOSAL EVENT.
8. SCOW POSITION APPROXIMATE, BASED ON VISUAL OBSERVATION AT THE TIME OF DISPOSAL EVENT (I.E. DUMP).



TSS-9		
TIME (HOURS)	TRANSMISSIVITY (NTU)	TSS mg/L
CONTROL	8.00/9.00	34.80/39.60
+0.25	7.00/6.00	35.60/37.20
+0.75	4.00/-	38.40/32.80
+1.25	4.00/2.00	29.20/42.00
+1.75	8.00/3.00	51.60/37.20

(SHALLOW/DEEP-NOTE 6)

TSS-8		
TIME (HOURS)	TRANSMISSIVITY (NTU)	TSS mg/L
CONTROL	7.00/8.00	38.40/31.20
+0.25	8.00/6.00	47.60/38.00
+0.75	4.00/4.00	36.80/27.60
+1.25	6.00/-	42.80/37.20
+1.75	2.00/2.00	34.00/38.00

(SHALLOW/DEEP-NOTE 6)

LEGEND

DISPOSAL ZONES

- GREEN
- YELLOW
- BLUE
- ENTRANCE CHANNEL

- PERIMETER (CREST) BUOY LOCATIONS
- ENTRANCE CHANNEL MARKER BUOY LOCATIONS
- MID-CHANNEL TSS SAMPLING POINT, SAMPLED DURING ALL SAMPLING EVENTS
- TIDAL DEPENDENT SAMPLING POINTS

MALCOLM PIRNIE

THE PORT AUTHORITY OF NY & NJ

TSS AND TRANSMISSIVITY DATA FOR DUMP EVENT # 4 OF FIRST 10 FOOT LIFT
NOVEMBER 16, 1997, 16:28
NEWARK BAY CONFINED DISPOSAL FACILITY

0 200 400
SCALE IN FEET

MALCOLM PIRNIE, INC.

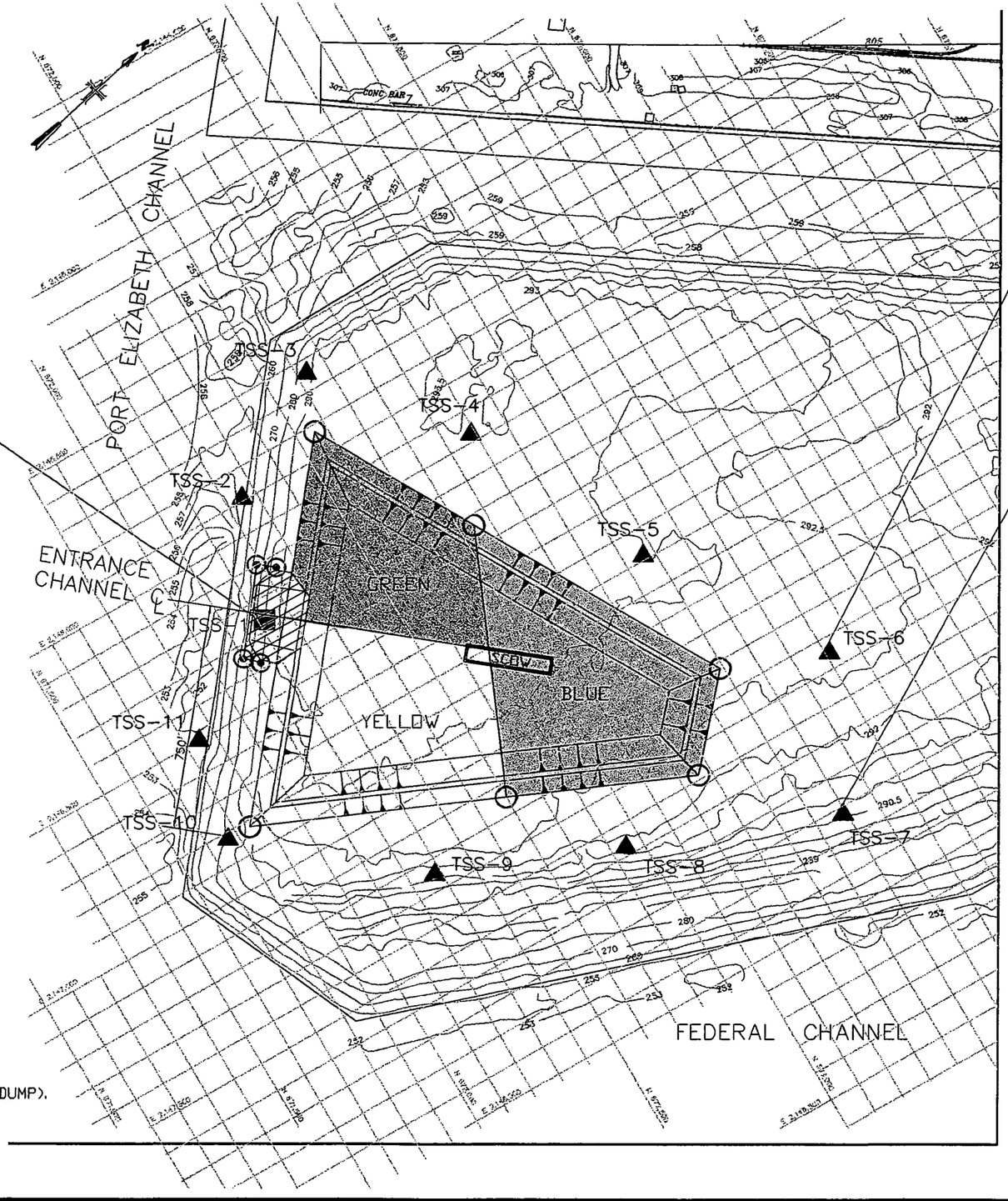
FIGURE 4

WIND
W
15-20 K

TIDE
HIGH (10:00)

TSS-1		
TIME (HOURS)	TRANSMISSIVITY (NTU)	TSS mg/L
CONTROL	-/2.00	51.20/33.60
TRAFFIC	1.00/2.00	42.00/57.60
+0.25	1.00/2.30	44.80/60.00
+0.75	1.00/2.00	52.00/35.20
+1.75	-	-

(SHALLOW/DEEP-NOTE 6)



TSS-6		
TIME (HOURS)	TRANSMISSIVITY (NTU)	TSS mg/L
CONTROL	7.00/3.00	32.00/29.60
+0.25	1.00/1.00	41.20/36.80
+0.75	9.00/9.00	40.40/43.60
+1.25	-	-
+1.75	-	-

(SHALLOW/DEEP-NOTE 6)

TSS-7		
TIME (HOURS)	TRANSMISSIVITY (NTU)	TSS mg/L
CONTROL	1.00/2.00	41.60/34.80
+0.25	1.00/1.00	38.80/34.40
+0.75	5.00/2.00	50.40/59.20
+1.25	-	-
+1.75	-	-

(SHALLOW/DEEP-NOTE 6)

NOTES:

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3. THE CONTOURS SHOWN ARE BASED ON BATHYMETRY OBTAINED BY ROGERS SURVEYING INC. DATED JUNE 8, 9, 14, 15, 1995.
4. TSS MONITORING WAS IN ACCORDANCE WITH THE NBCDF OPERATIONS AND MANAGEMENT PLAN.
5. THIS DRAWING IS ADAPTED FROM DRAWING ENTITLED "NEWARK BAY CONFINED DISPOSAL FACILITY, EXCAVATION PLAN," PORT AUTHORITY OF NEW YORK AND NEW JERSEY, JANUARY 27, 1997.
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8. SCOW POSITION APPROXIMATE, BASED ON VISUAL OBSERVATION AT THE TIME OF DISPOSAL EVENT (I.E. DUMP).

LEGEND

DISPOSAL ZONES

- GREEN
- YELLOW
- BLUE
- ENTRANCE CHANNEL

- PERIMETER (CREST) BUOY LOCATIONS
- ENTRANCE CHANNEL MARKER BUOY LOCATIONS
- MID-CHANNEL TSS SAMPLING POINT, SAMPLED DURING ALL SAMPLING EVENTS
- TIDAL DEPENDENT SAMPLING POINTS

MALCOLM PIRNIE

THE PORT AUTHORITY OF NY & NJ

TSS AND TRANSMISSIVITY DATA FOR DUMP EVENT # 5 OF FIRST TEN FOOT LIFT
NOVEMBER 17, 1997, 07:30
NEWARK BAY CONFINED DISPOSAL FACILITY

0 200 400
SCALE IN FEET

MALCOLM PIRNIE, INC.

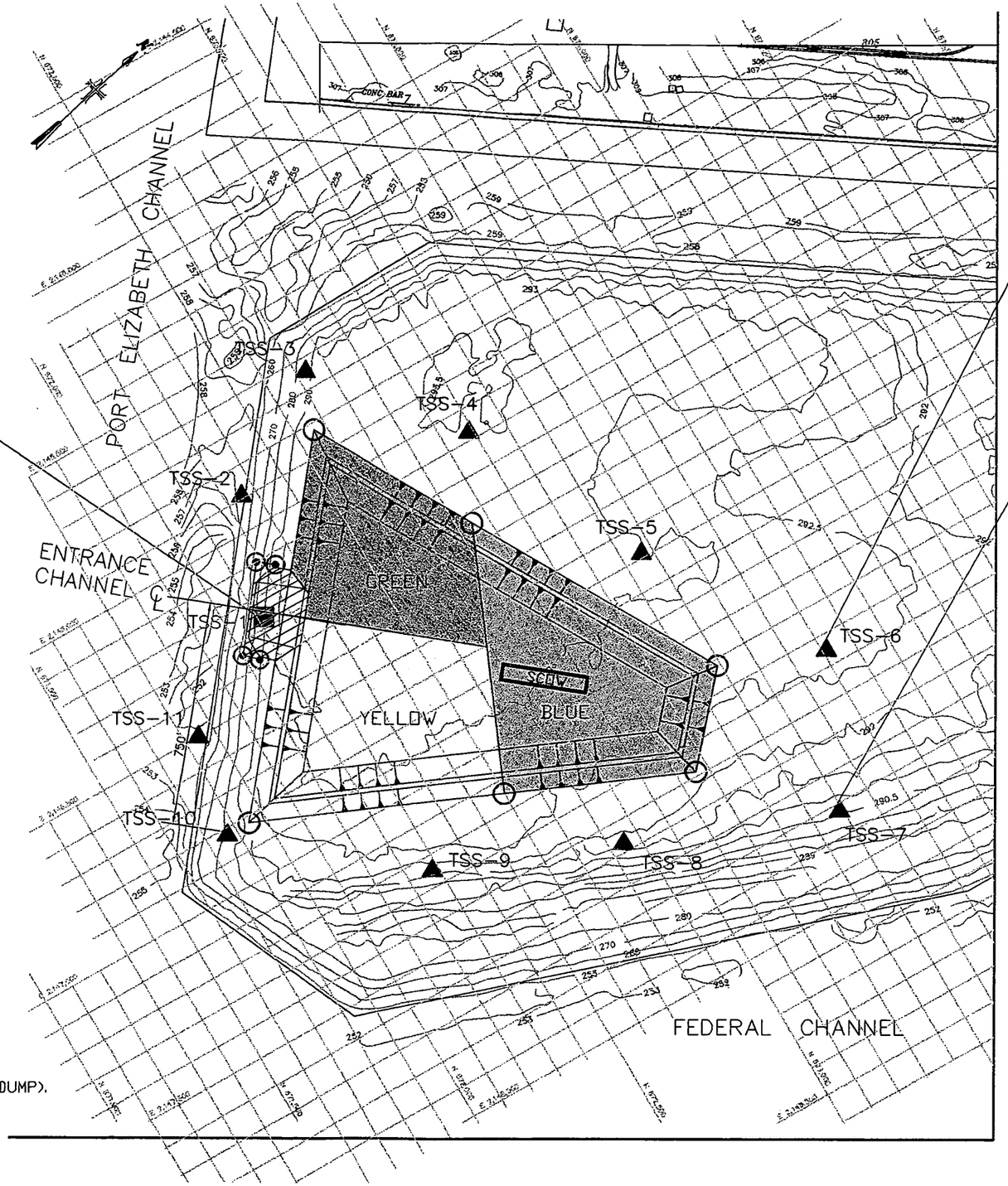
FIGURE 5

WIND
W
15-20 K

TIDE
HIGH (10:00)

TSS-1		
TIME (HOURS)	TRANSMISSIVITY (NTU)	TSS mg/L
CONTROL	0.00/2.00	52.80/48.40
TRAFFIC	1.00/2.00	53.60/53.60
+0.25	1.00/2.00	30.80/43.60
+0.75	1.00/2.00	49.60/60.80
+1.25	1.00/2.00	65.60/49.60
+1.75	1.00/2.00	51.60/50.40

(SHALLOW/DEEP-NOTE 6)



TSS-6		
TIME (HOURS)	TRANSMISSIVITY (NTU)	TSS mg/L
CONTROL	3.00/3.00	50.80/54.00
+0.25	1.00/1.00	55.20/30.40
+0.75	2.00/4.00	47.20/74.00
+1.25	1.00/1.00	56.00/60.00
+1.75	1.00/1.00	48.00/44.80

(SHALLOW/DEEP-NOTE 6)

TSS-7		
TIME (HOURS)	TRANSMISSIVITY (NTU)	TSS mg/L
CONTROL	2.00/4.00	59.60/52.40
+0.25	3.00/3.00	47.60/55.60
+0.75	2.00/2.00	58.00/54.00
+1.25	2.00/2.00	58.00/48.80
+1.75	1.00/1.00	48.40/49.20

(SHALLOW/DEEP-NOTE 6)

LEGEND

DISPOSAL ZONES

- GREEN
- YELLOW
- BLUE
- ENTRANCE CHANNEL

- PERIMETER (CREST) BUOY LOCATIONS
- ENTRANCE CHANNEL MARKER BUOY LOCATIONS
- MID-CHANNEL TSS SAMPLING POINT, SAMPLED DURING ALL SAMPLING EVENTS
- TIDAL DEPENDENT SAMPLING POINTS

NOTES:

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8. SCOW POSITION APPROXIMATE, BASED ON VISUAL OBSERVATION AT THE TIME OF DISPOSAL EVENT (I.E. DUMP).

MALCOLM PIRNIE

THE PORT AUTHORITY OF NY & NJ

TSS AND TRANSMISSIVITY DATA FOR DUMP EVENT # 6 OF FIRST 10 FOOT LIFT
NOVEMBER 17, 1997, 08:38
NEWARK BAY CONFINED DISPOSAL FACILITY

0 200 400
SCALE IN FEET

MALCOLM PIRNIE, INC.

FIGURE 6

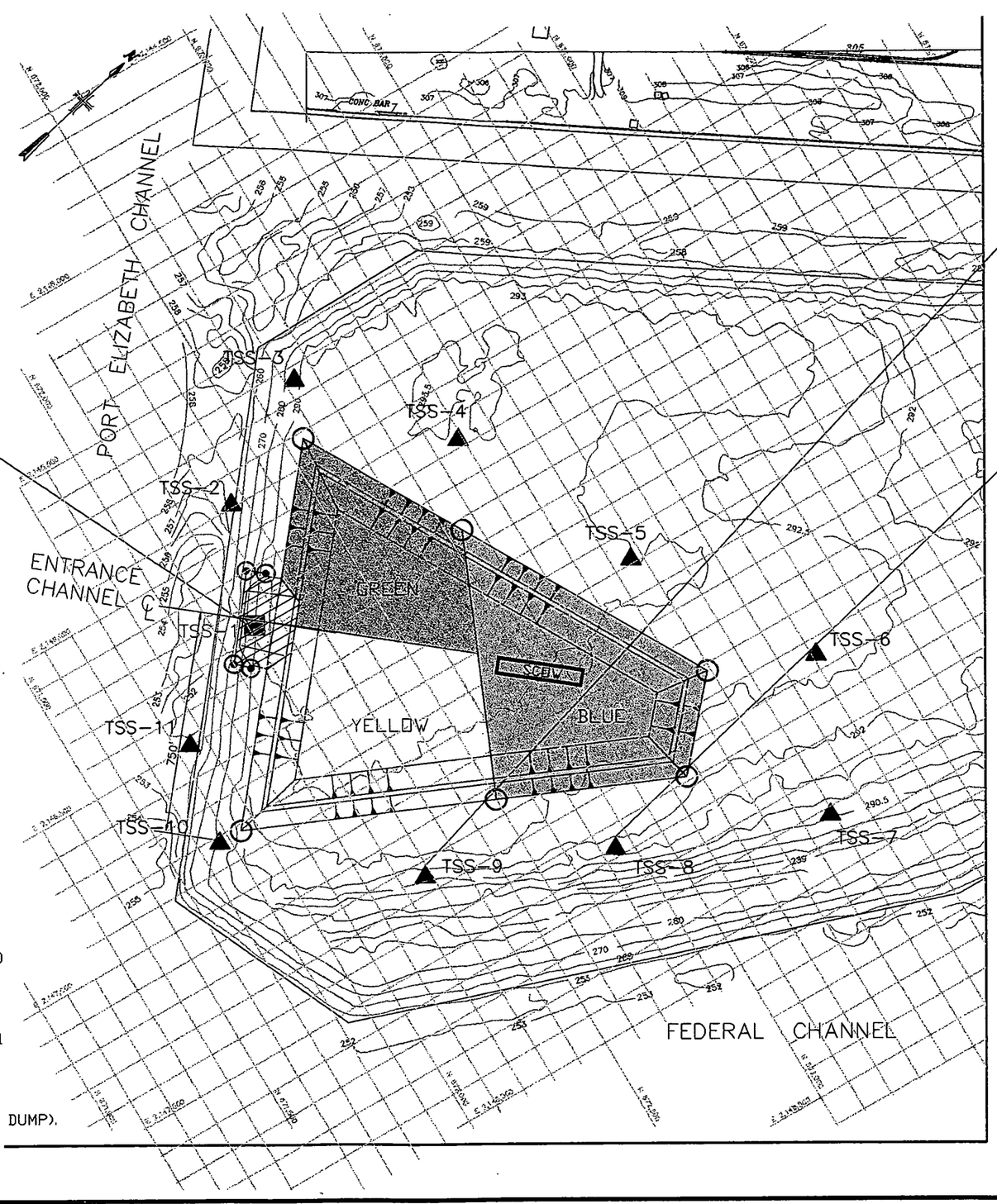
WIND
W
10-15 K

TIDE

LOW (16:40)

TSS-1		
TIME (HOURS)	TRANSMISSIVITY (NTU)	TSS mg/L
CONTROL	2.60/2.90	48.80/58.40
TRAFFIC	1.40/1.40	56.80/57.20
+0.25	2.60/2.80	53.60/64.80
+0.75	1.90/2.00	46.40/48.30
+1.25	1.70/1.80	59.20/42.80
+1.75	1.30/1.30	56.40/51.60

(SHALLOW/DEEP-NOTE 6)



TSS-9		
TIME (HOURS)	TRANSMISSIVITY (NTU)	TSS mg/L
CONTROL	3.10/3.30	58.40/55.60
+0.25	2.00/2.40	56.00/62.00
+0.75	2.40/2.30	52.80/55.60
+1.25	1.60/1.60	41.60/52.00
+1.75	1.30/1.50	51.60/56.40

(SHALLOW/DEEP-NOTE 6)

TSS-8		
TIME (HOURS)	TRANSMISSIVITY (NTU)	TSS mg/L
CONTROL	4.40/3.60	55.60/54.00
+0.25	2.20/2.30	54.80/50.00
+0.75	2.20/2.20	54.80/48.20
+1.25	2.20/2.20	56.00/52.40
+1.75	1.40/1.40	48.40/60.40

(SHALLOW/DEEP-NOTE 6)

LEGEND

DISPOSAL ZONES

- GREEN
- YELLOW
- BLUE
- ENTRANCE CHANNEL

- PERIMETER (CREST) BUOY LOCATIONS
- ENTRANCE CHANNEL MARKER BUOY LOCATIONS
- MID-CHANNEL TSS SAMPLING POINT, SAMPLED DURING ALL SAMPLING EVENTS
- TIDAL DEPENDENT SAMPLING POINTS

NOTES:

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8. SCOW POSITION APPROXIMATE, BASED ON VISUAL OBSERVATION AT THE TIME OF DISPOSAL EVENT (I.E. DUMP).

MALCOLM PIRNIE

THE PORT AUTHORITY OF NY & NJ

TSS AND TRANSMISSIVITY DATA FOR DUMP EVENT # 7 OF FIRST 10 FOOT LIFT
NOVEMBER 17, 1997, 15:43
NEWARK BAY CONFINED DISPOSAL FACILITY

0 200 400
SCALE IN FEET

MALCOLM PIRNIE, INC.

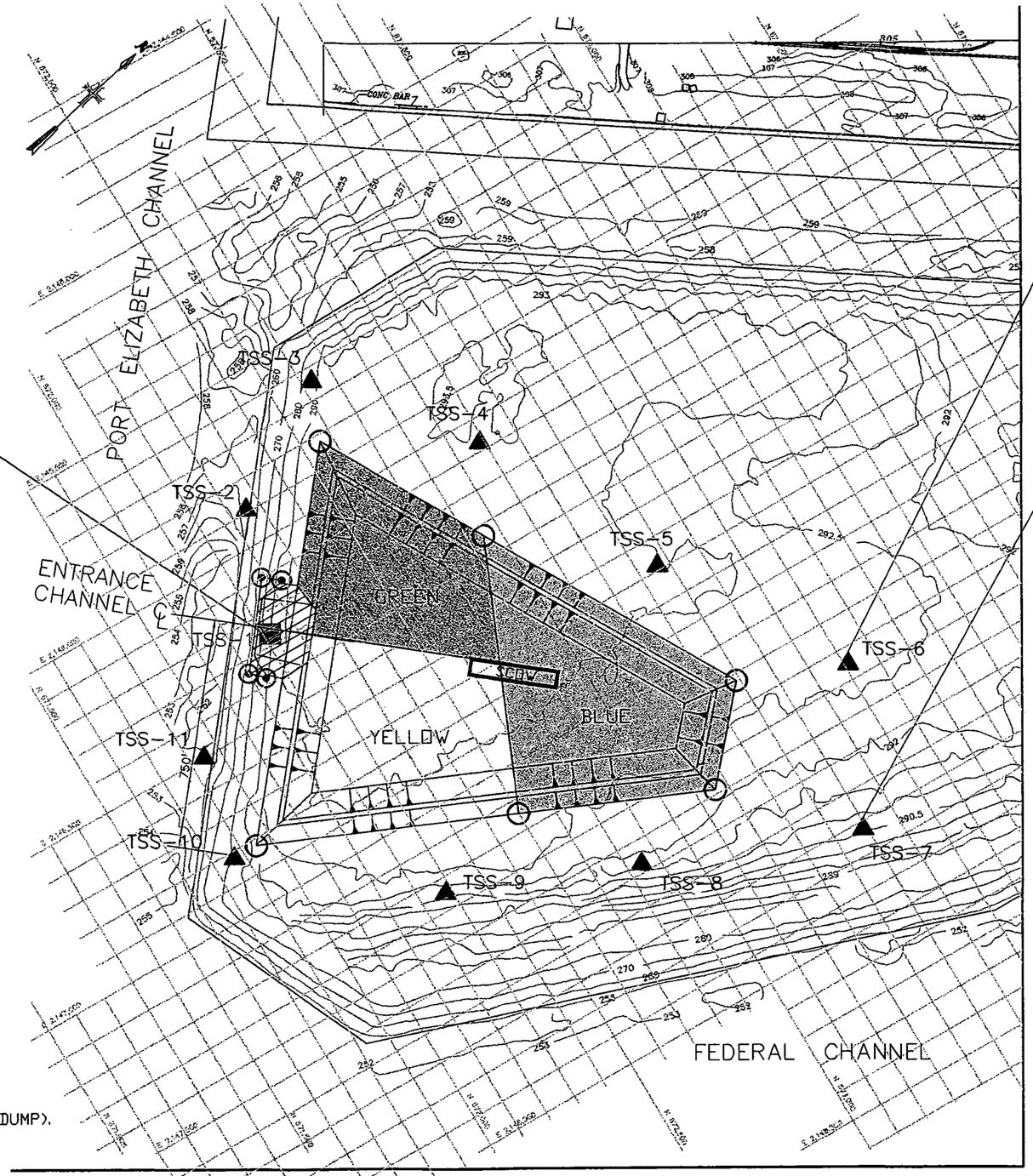
FIGURE 7

WIND
W
5-10 K

TIDE
HIGH (11:00)

TSS-1		
TIME (HOURS)	TRANSMISSIVITY (NTU)	TSS mg/L
CONTROL	1.30/2.00	50.80/48.80
TRAFFIC	3.30/3.00	34.40/37.20
+0.25	1.30/2.60	31.60/36.40
+0.75	-	-
+1.25	-	-
+1.75	-	-

(SHALLOW/DEEP-NOTE 6)



TSS-6		
TIME (HOURS)	TRANSMISSIVITY (NTU)	TSS mg/L
CONTROL	1.30/1.40	166.00/42.00
+0.25	1.20/1.70	40.40/38.40
+0.75	-	-
+1.25	-	-
+1.75	-	-

(SHALLOW/DEEP-NOTE 6)

TSS-7		
TIME (HOURS)	TRANSMISSIVITY (NTU)	TSS mg/L
CONTROL	0.70/1.30	38.00/31.20
+0.25	1.20/1.30	43.20/33.60
+0.75	-	-
+1.25	-	-
+1.75	-	-

(SHALLOW/DEEP-NOTE 6)

LEGEND

DISPOSAL ZONES

- GREEN
- YELLOW
- BLUE
- ENTRANCE CHANNEL

- PERIMETER (CREST) BUOY LOCATIONS
- ENTRANCE CHANNEL MARKER BUOY LOCATIONS
- MID-CHANNEL TSS SAMPLING POINT, SAMPLED DURING ALL SAMPLING EVENTS
- TIDAL DEPENDENT SAMPLING POINTS

NOTES:

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8. SCOW POSITION APPROXIMATE, BASED ON VISUAL OBSERVATION AT THE TIME OF DISPOSAL EVENT (I.E. DUMP).

MALCOLM PIRNIE

THE PORT AUTHORITY OF NY & NJ

TSS AND TRANSMISSIVITY DATA FOR DUMP EVENT # 8 OF FIRST 10 FOOT LIFT
NOVEMBER 18, 1997, 07:30
NEWARK BAY CONFINED DISPOSAL FACILITY

0 200 400
SCALE IN FEET

MALCOLM PIRNIE, INC.

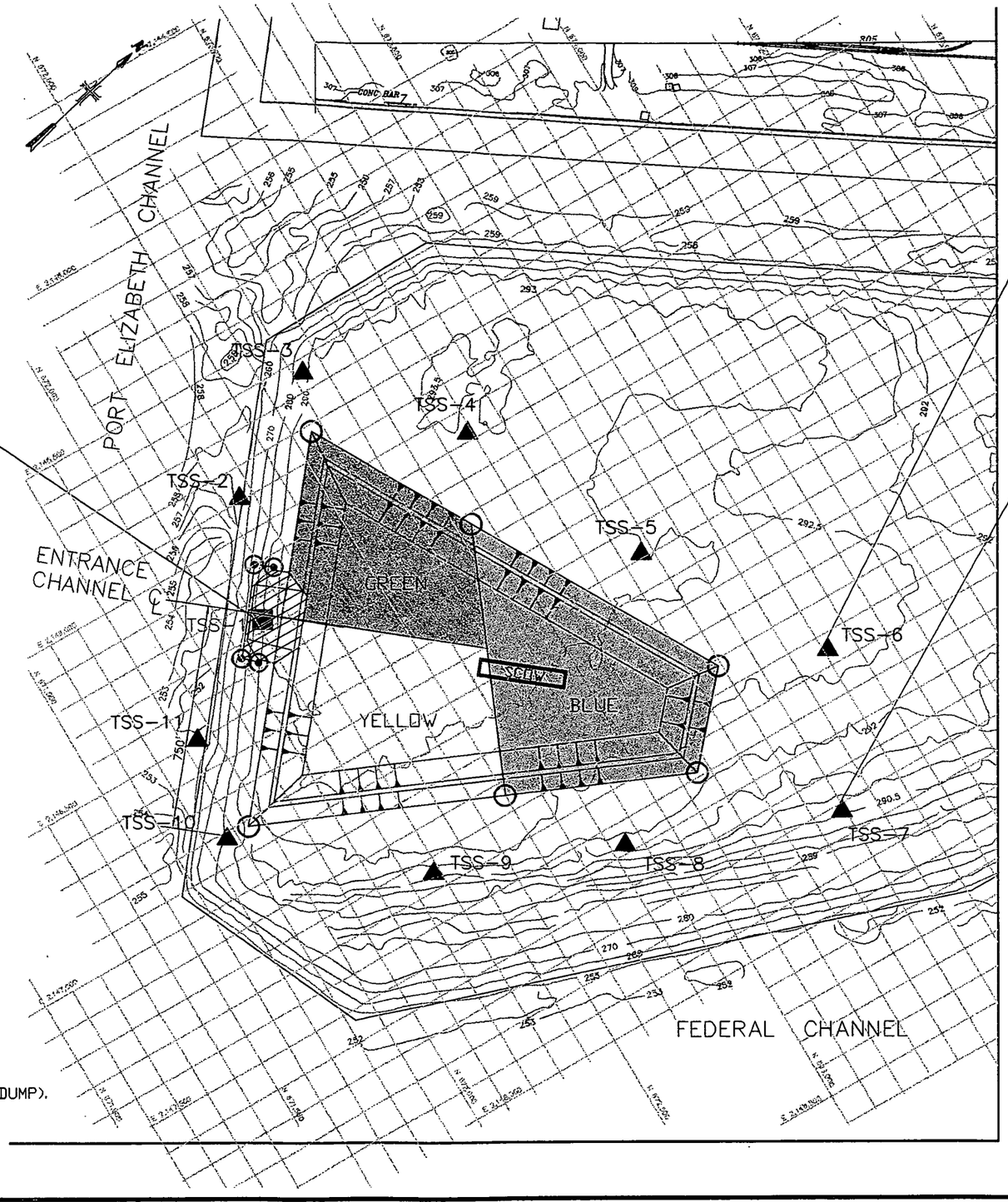
FIGURE 8

WIND
W
5-10 K

TIDE
HIGH (11:00)

TSS-1		
TIME (HOURS)	TRANSMISSIVITY (NTU)	TSS mg/L
CONTROL	0.80/3.30	31.60/52.40
TRAFFIC	1.50/4.90	38.80/76.80
+0.25	1.00/2.50	32.80/44.80
+0.75	0.80/1.10	28.40/31.20
+1.25	0.90/2.00	50.80/46.40
+1.75	0.80/1.70	24.40/53.20

(SHALLOW/DEEP-NOTE 6)



TSS-6		
TIME (HOURS)	TRANSMISSIVITY (NTU)	TSS mg/L
CONTROL	1.00/2.30	45.60/64.80
+0.25	2.20/3.00	30.00/36.80
+0.75	0.50/1.60	55.60/48.00
+1.25	1.00/1.70	46.40/52.80
+1.75	0.60/1.80	42.40/37.60

(SHALLOW/DEEP-NOTE 6)

TSS-7		
TIME (HOURS)	TRANSMISSIVITY (NTU)	TSS mg/L
CONTROL	1.50/2.30	48.00/41.60
+0.25	0.80/1.50	60.00/39.60
+0.75	0.50/1.20	43.60/45.60
+1.25	1.00/1.20	43.20/36.80
+1.75	0.80/1.70	32.80/38.40

(SHALLOW/DEEP-NOTE 6)

LEGEND

DISPOSAL ZONES

- GREEN
- YELLOW
- BLUE
- ENTRANCE CHANNEL

- PERIMETER (CREST) BUOY LOCATIONS
- ENTRANCE CHANNEL MARKER BUOY LOCATIONS
- MID-CHANNEL TSS SAMPLING POINT, SAMPLED DURING ALL SAMPLING EVENTS
- TIDAL DEPENDENT SAMPLING POINTS

NOTES:

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8. SCOW POSITION APPROXIMATE, BASED ON VISUAL OBSERVATION AT THE TIME OF DISPOSAL EVENT (I.E. DUMP).

MALCOLM PIRNIE

THE PORT AUTHORITY OF NY & NJ

TSS AND TRANSMISSIVITY DATA FOR DUMP EVENT # 9 OF FIRST 10 FOOT LIFT
NOVEMBER 18, 1997, 08:42
NEWARK BAY CONFINED DISPOSAL FACILITY

0 200 400
SCALE IN FEET

MALCOLM PIRNIE, INC.

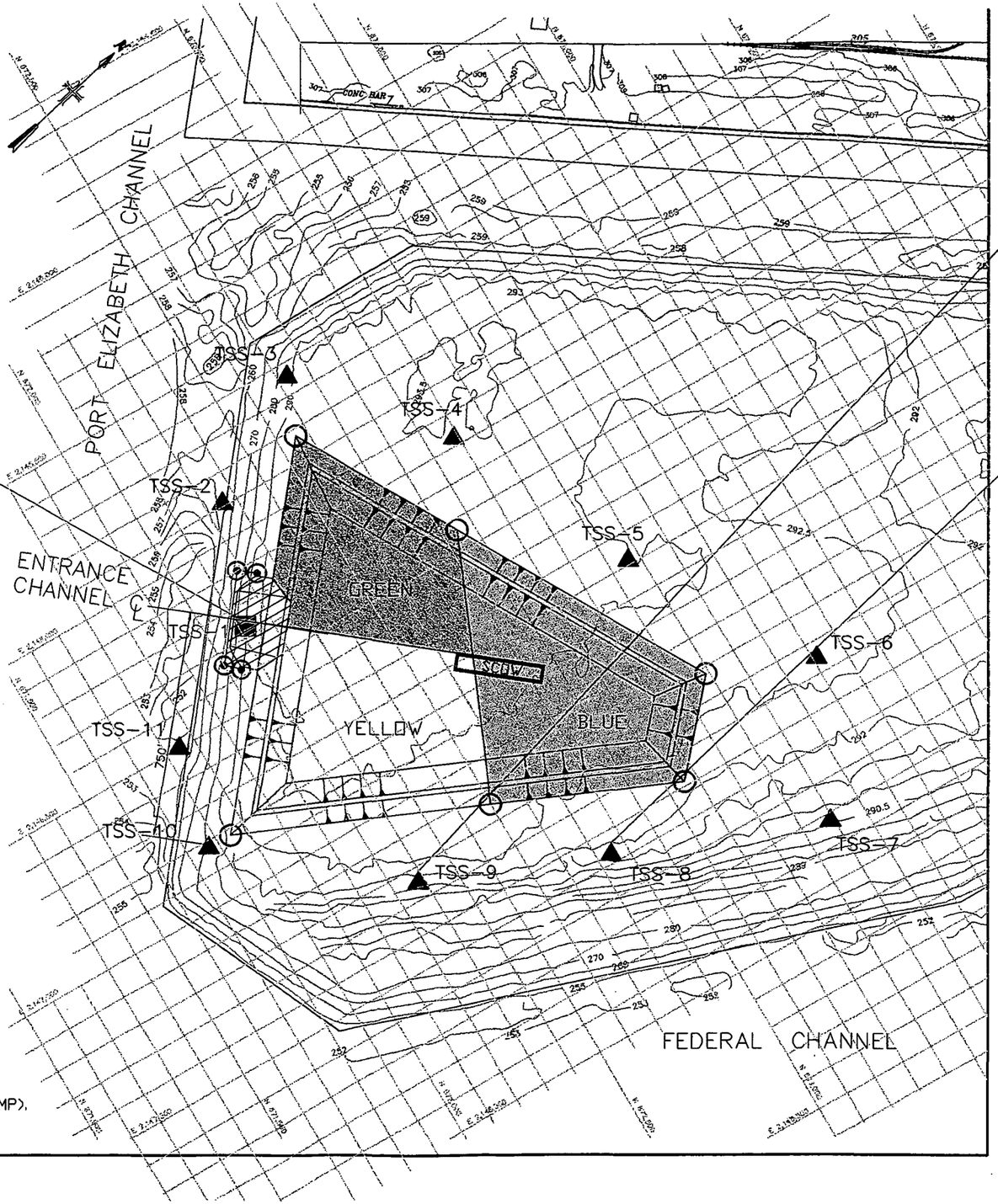
FIGURE 9

WIND
W
10-15 K

TIDE
LOW (17:30)

TSS-1		
TIME (HOURS)	TRANSMISSIVITY (NTU)	TSS mg/L
CONTROL	2.20/1.70	39.60/32.80
TRAFFIC	2.00/1.90	32.80/34.00
+0.25	0.90/2.00	44.40/33.40
+0.75	1.20/1.70	50.40/36.00
+1.25	1.40/1.20	26.40/36.80
+1.75	1.10/0.70	32.40/36.00

(SHALLOW/DEEP- NOTE 6)



TSS-9		
TIME (HOURS)	TRANSMISSIVITY (NTU)	TSS mg/L
CONTROL	2.10/2.20	25.20/35.20
+0.25	1.90/1.90	42.80/48.80
+0.75	1.40/1.50	42.00/46.00
+1.25	2.00/2.10	54.80/41.60
+1.75	1.30/1.40	49.60/42.40

(SHALLOW/DEEP- NOTE 6)

TSS-8		
TIME (HOURS)	TRANSMISSIVITY (NTU)	TSS mg/L
CONTROL	2.10/2.30	30.80/32.80
+0.25	1.30/1.60	46.80/27.60
+0.75	1.30/1.20	38.80/42.00
+1.25	2.00/2.10	38.40/43.60
+1.75	1.10/1.10	43.60/42.00

(SHALLOW/DEEP- NOTE 6)

LEGEND

DISPOSAL ZONES

- GREEN
- YELLOW
- BLUE
- ENTRANCE CHANNEL

- PERIMETER (CREST) BUOY LOCATIONS
- ENTRANCE CHANNEL MARKER BUOY LOCATIONS
- MID-CHANNEL TSS SAMPLING POINT, SAMPLED DURING ALL SAMPLING EVENTS
- TIDAL DEPENDENT SAMPLING POINTS

NOTES:

1. MEAN LOW WATER (MLW) ELEVATION 295=-2.35 NGVD 29.
2. THE COORDINATES SHOWN ARE BASED ON NEW JERSEY MERCATOR NAD27.
3. THE CONTOURS SHOWN ARE BASED ON BATHYMETRY OBTAINED BY ROGERS SURVEYING INC. DATED JUNE 8, 9, 14, 15, 1995.
4. TSS MONITORING WAS IN ACCORDANCE WITH THE NBCDF OPERATIONS AND MANAGEMENT PLAN.
5. THIS DRAWING IS ADAPTED FROM DRAWING ENTITLED "NEWARK BAY CONFINED DISPOSAL FACILITY, EXCAVATION PLAN," PORT AUTHORITY OF NEW YORK AND NEW JERSEY, JANUARY 27, 1997.
6. TSS AND TRANSMISSIVITY DATA ARE PRESENTED AS SHALLOW/DEEP. SHALLOW SAMPLES WERE COLLECTED 1.5 FEET FROM THE WATER SURFACE; DEEP SAMPLES WERE COLLECTED 1.5 FEET FROM THE BOTTOM (MAX. 20 FEET).
7. VESSEL 'TRAFFIC' SAMPLE WAS COLLECTED AT TSS-1 FOLLOWING THE TUG/SCOW ENTERING THE NBCDF BUT PRIOR TO THE DISPOSAL EVENT.
8. SCOW POSITION APPROXIMATE, BASED ON VISUAL OBSERVATION AT THE TIME OF DISPOSAL EVENT (I.E. DUMP).

MALCOLM PIRNIE

THE PORT AUTHORITY OF NY & NJ

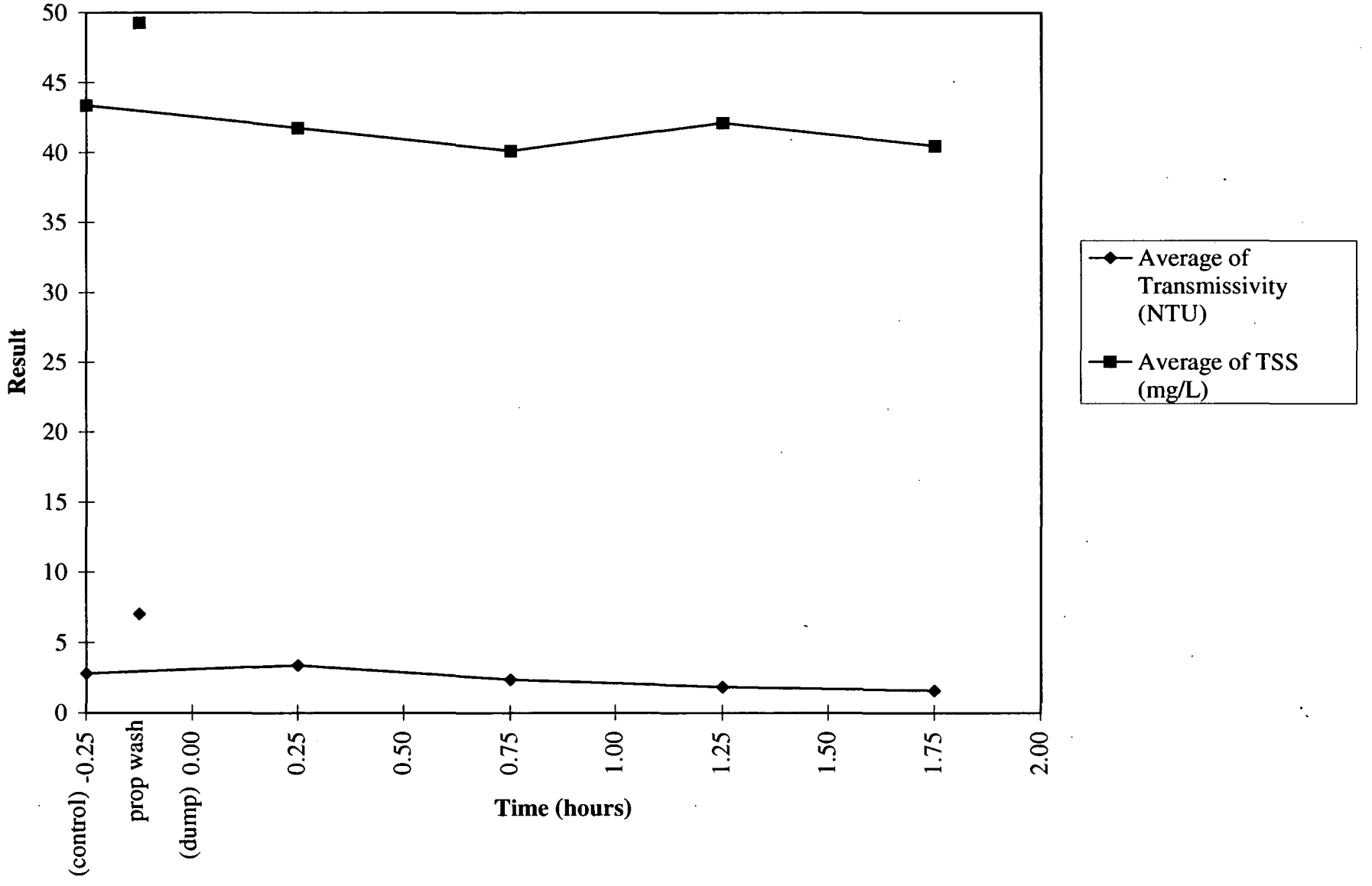
TSS AND TRANSMISSIVITY DATA FOR DUMP EVENT # 10 OF FIRST 10 FOOT LIFT
NOVEMBER 18, 1997, 15:35
NEWARK BAY CONFINED DISPOSAL FACILITY

0 200 400
SCALE IN FEET

MALCOLM PIRNIE, INC.

FIGURE10

FIGURE 11
NEWARK BAY CONFINED DISPOSAL FACILITY
Averages of Results - Water Quality Monitoring
Liberty State Park Dump Events 1-10



NOTES
(1) Data presented are averages for first ten dump events, all samples collected (sample station TSS-1 and two downcurrent stations).

Attachment No. 1
NBCDF Photographs

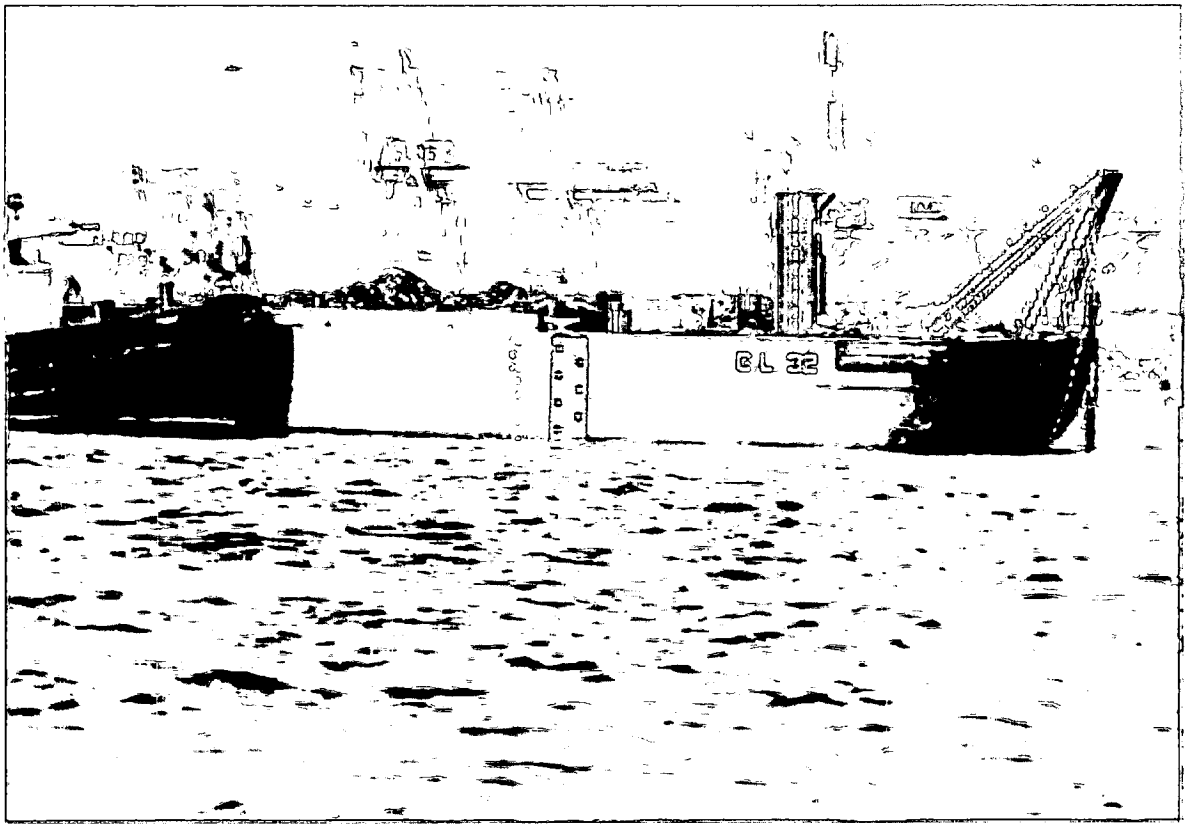


Photo 1: Loaded Scow Being Moved Into Position for Dump
November 15, 1997

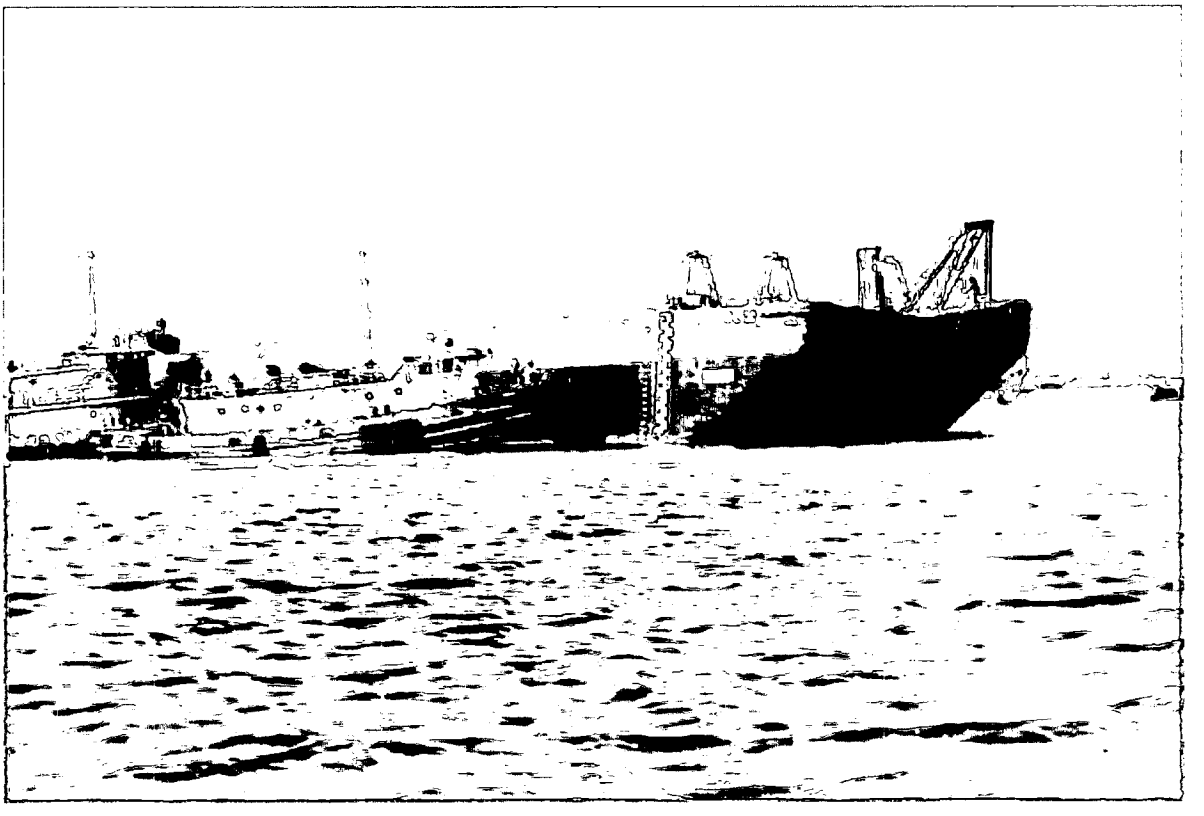


Photo 2: Split-Hull Scow During Disposal Event (Doors Open)
November 15, 1997

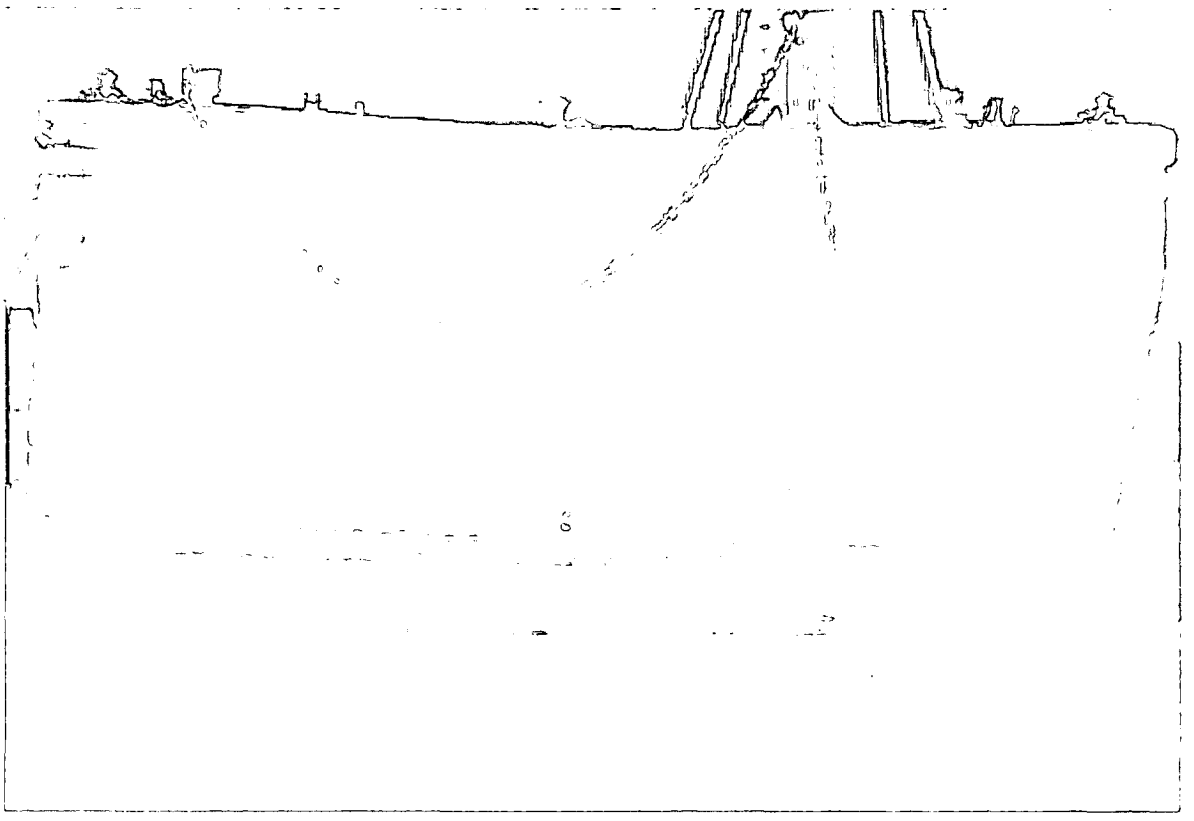


Photo 3: Split-Hull Scow During Disposal Event (Doors Open)
November 15, 1997

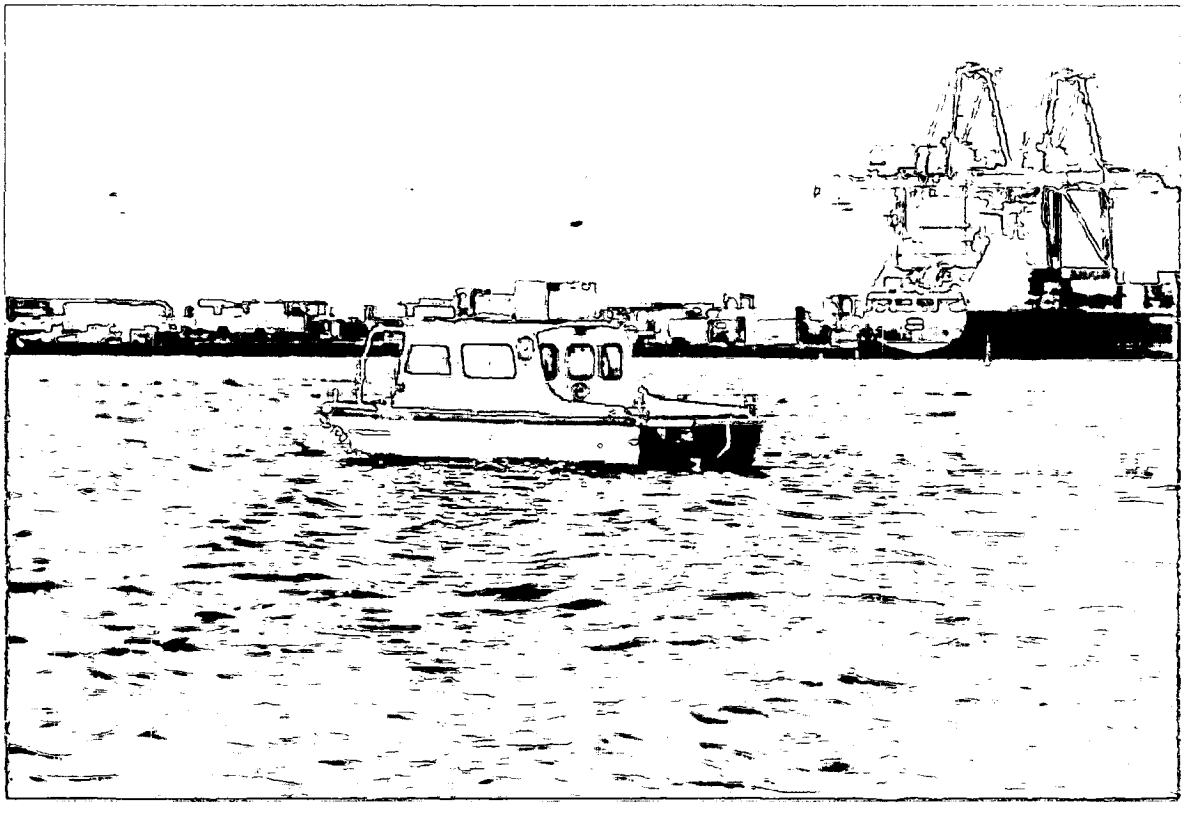


Photo 4: Great Lakes Boat Collecting Floating Debris
November 15, 1997

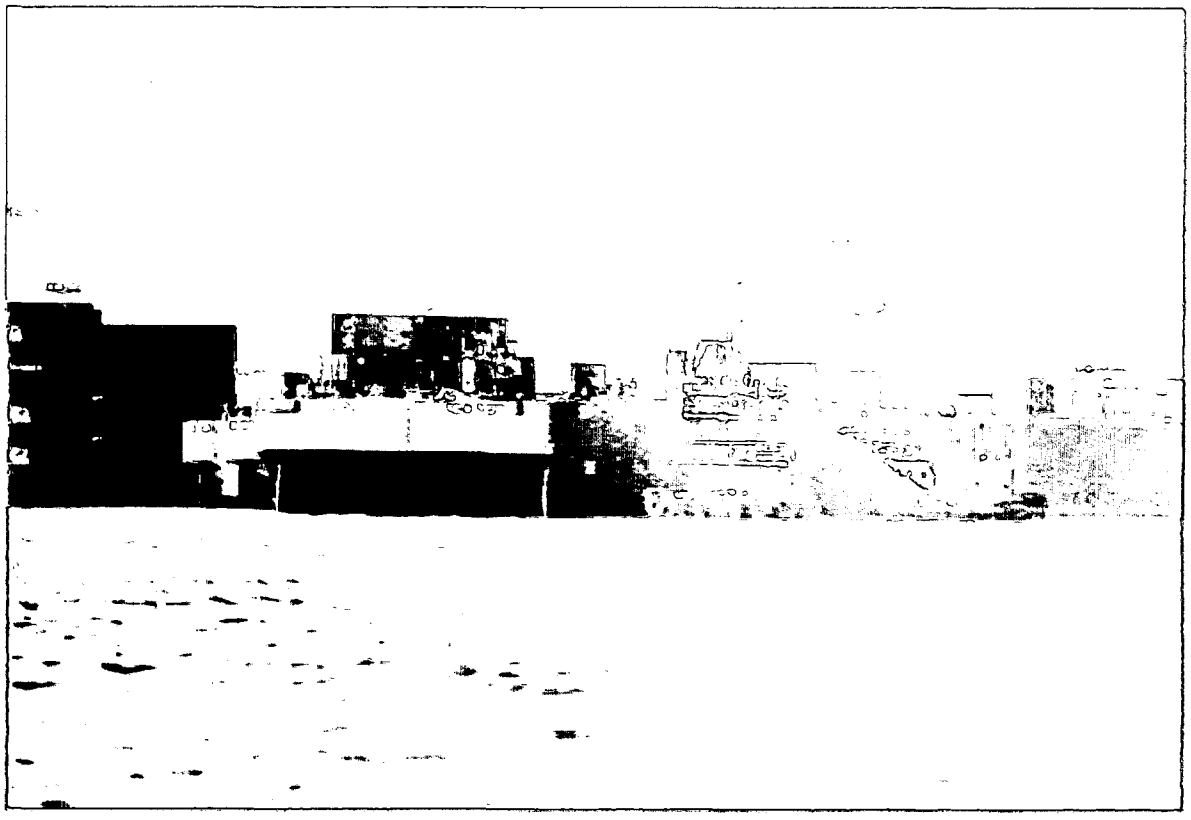


Photo 5: Spilt-Hull Scow With Doors Closed Preparing to Exit the Facility
November 15, 1997

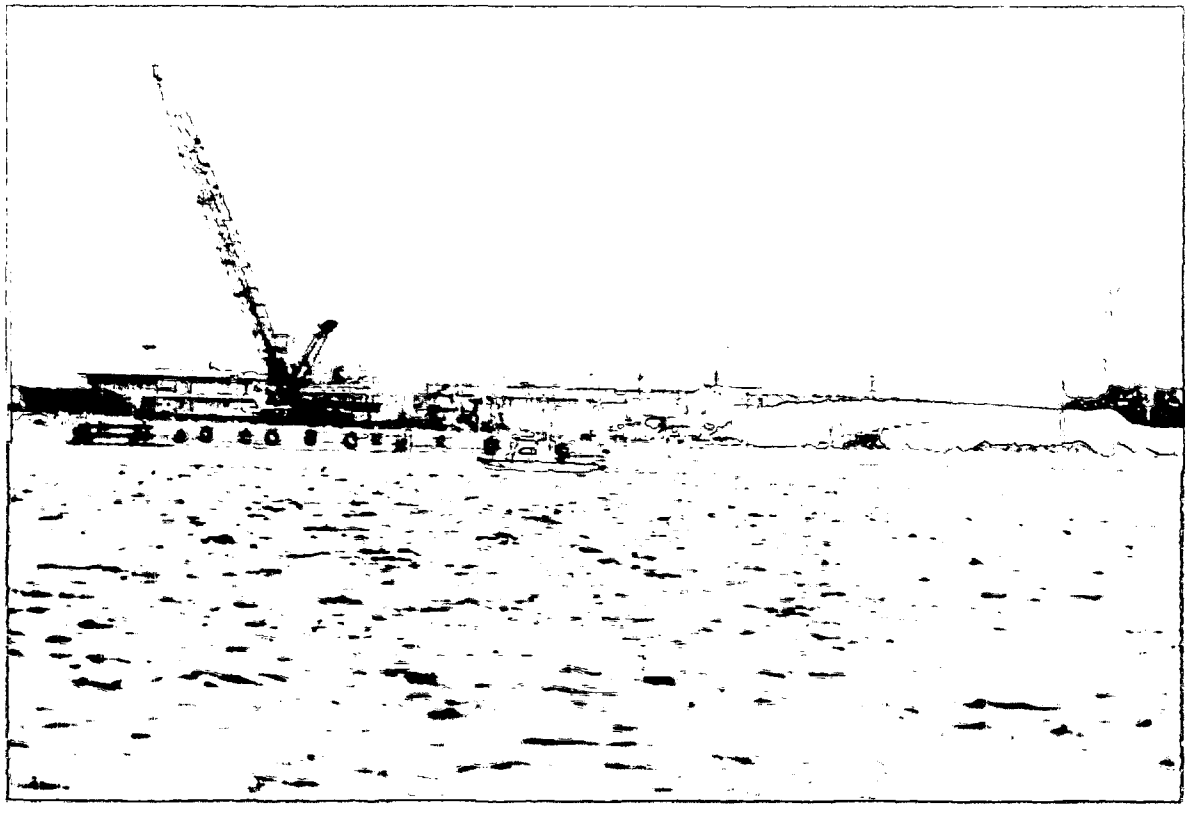


Photo 6: EA Boat Collecting Water Quality Data and TSS Samples
November 15, 1997

Photo 7: Split Hull Scow During Disposal Event (Doors Open)
November 16, 1997

Photo 8: Malcolm Pirnie Boat (Left) Observing Dump
November 16, 1997

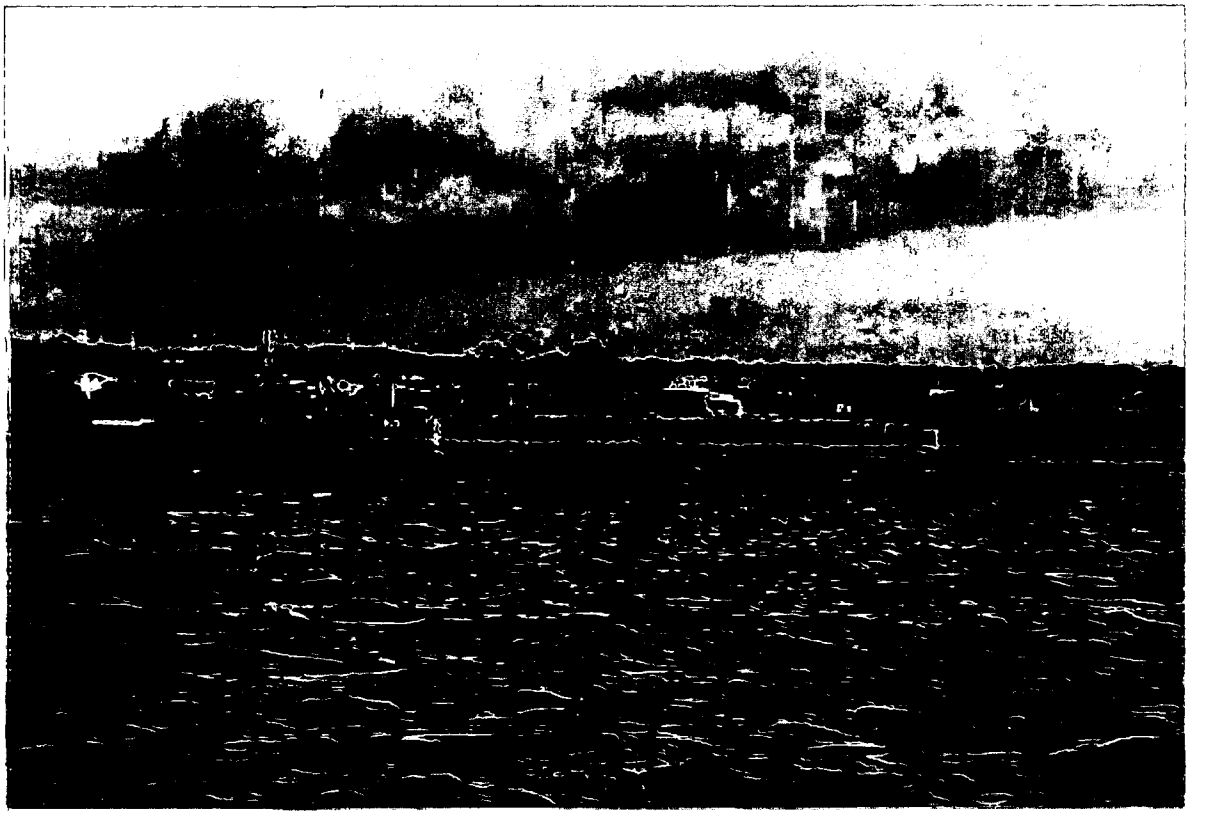


Photo 9: Loaded Scow in Newark Bay in Route to NBCDF
November 17, 1997

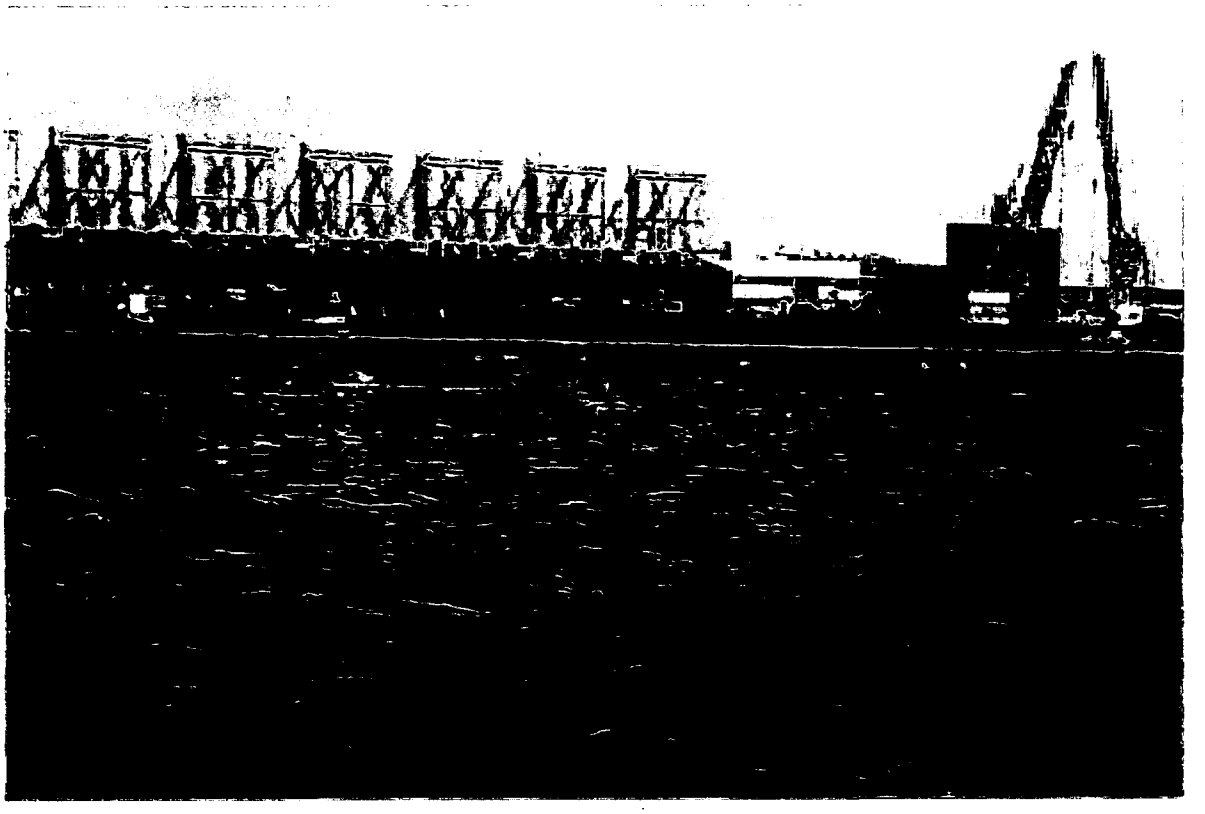


Photo 10: NBCDF Entrance Channel (Red Buoy)
November 17, 1997

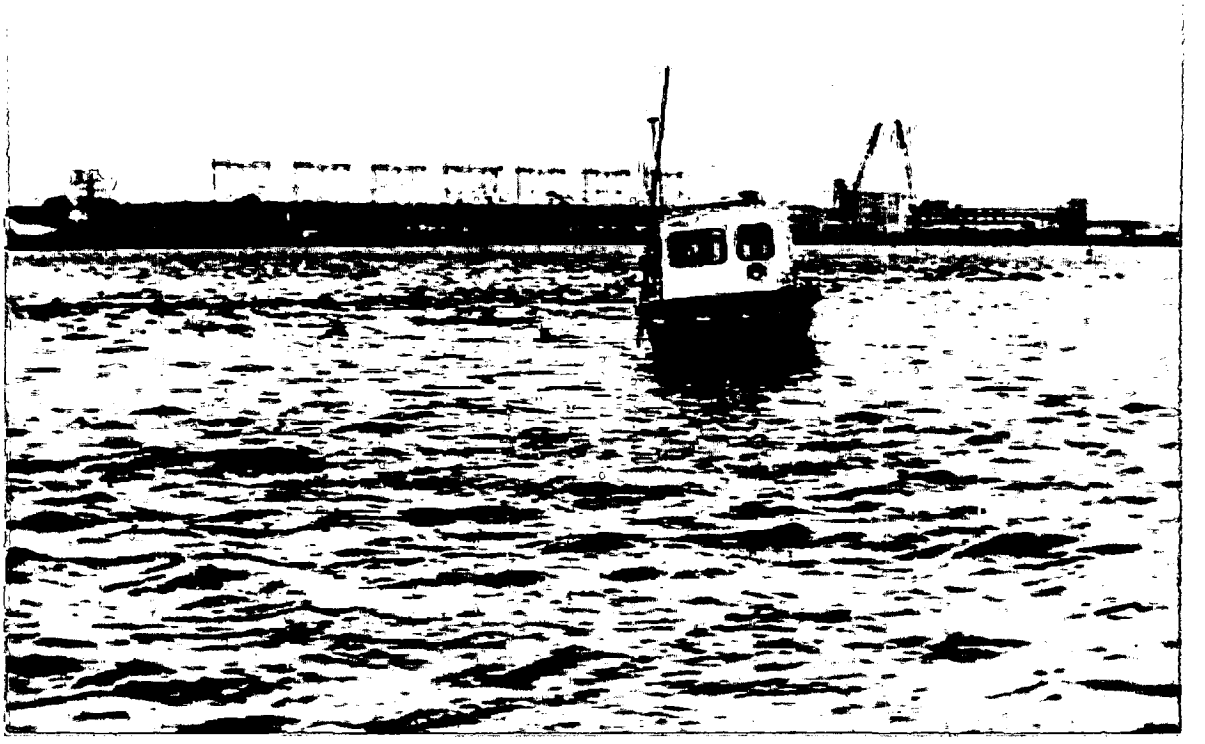


Photo 11: Great Lakes Boat Collecting Floating Debris
November 18, 1997

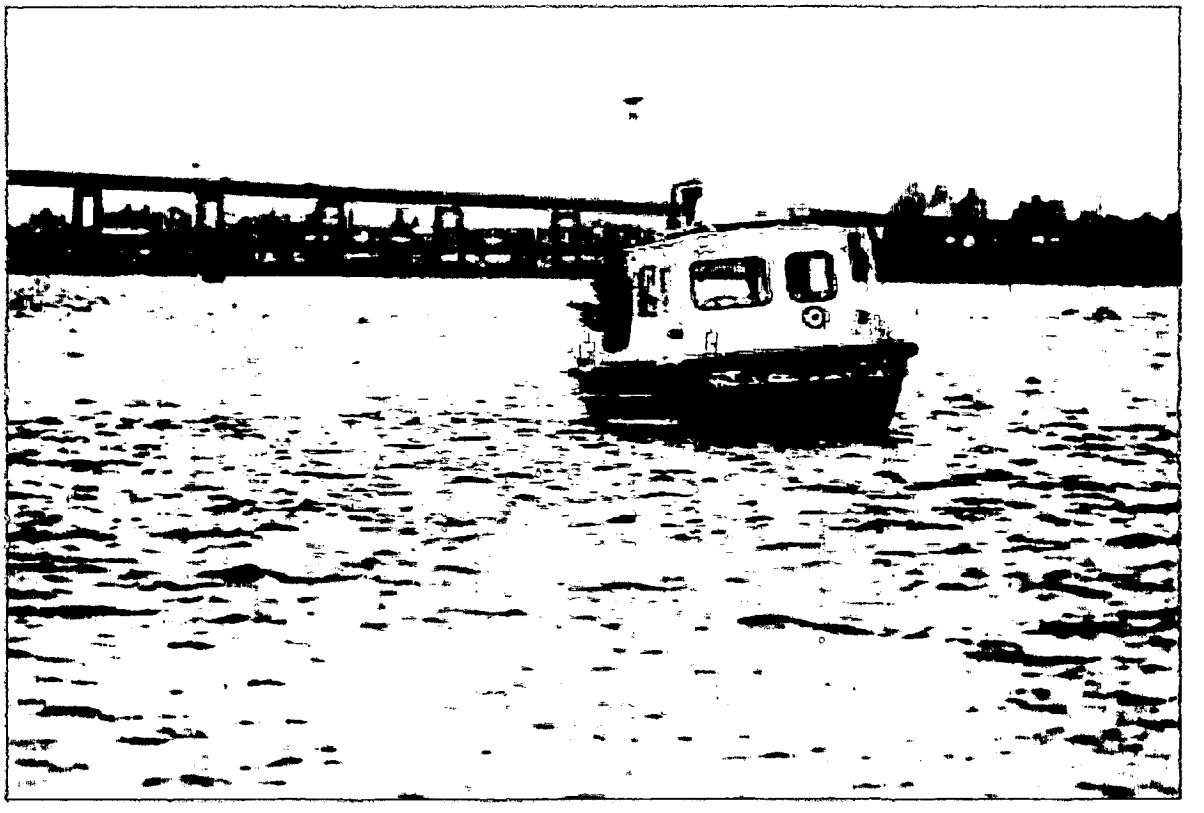


Photo 12: Great Lakes Boat Collecting Floating Debris
November 17, 1997

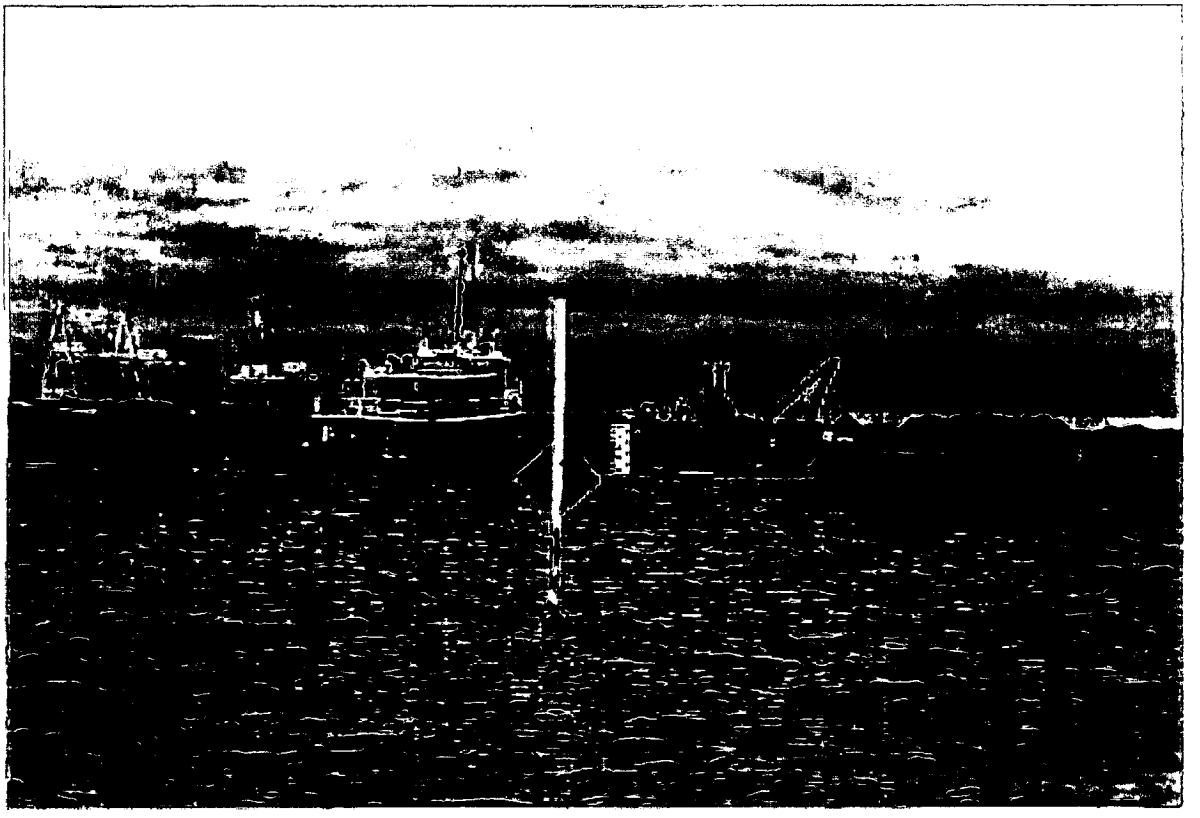


Photo 13: Loaded Scow Being Visually Positioned For Dump With Range Markers
November 17, 1997

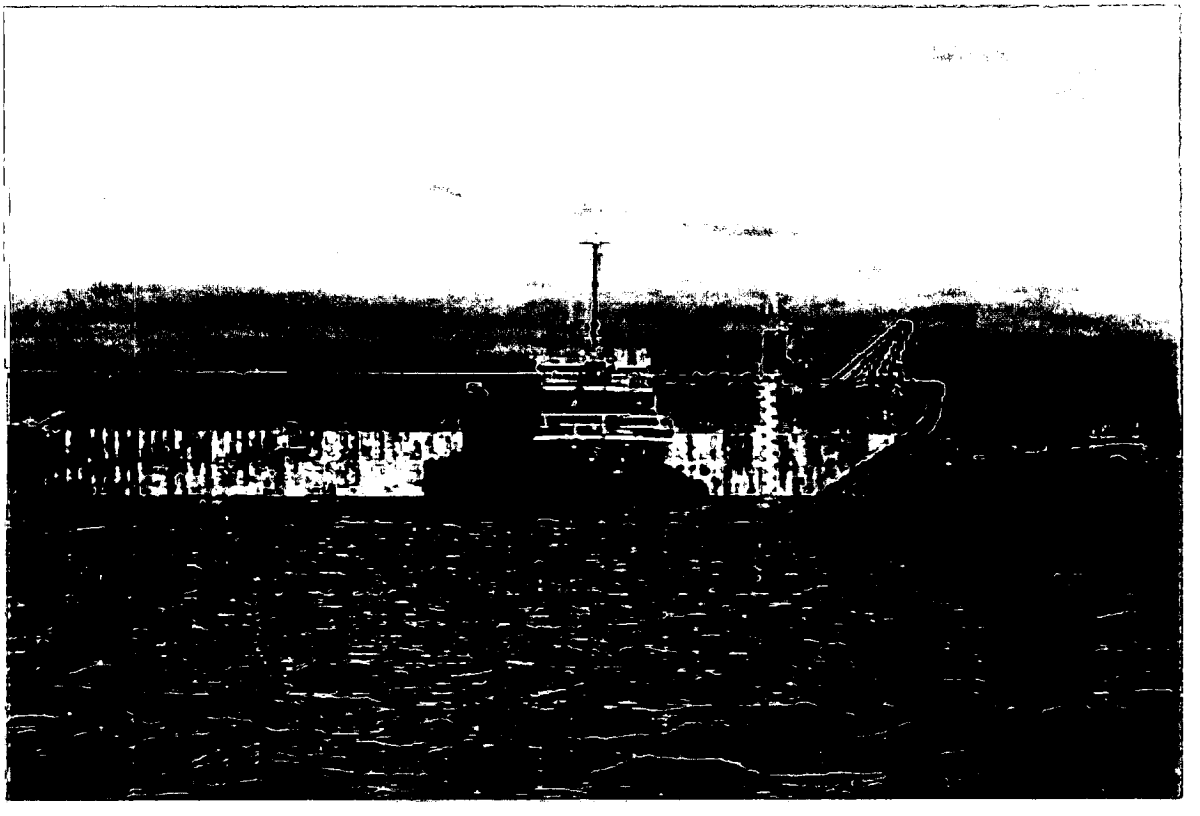


Photo 14: Empty Scow Immediately Following Dump
November 17, 1997

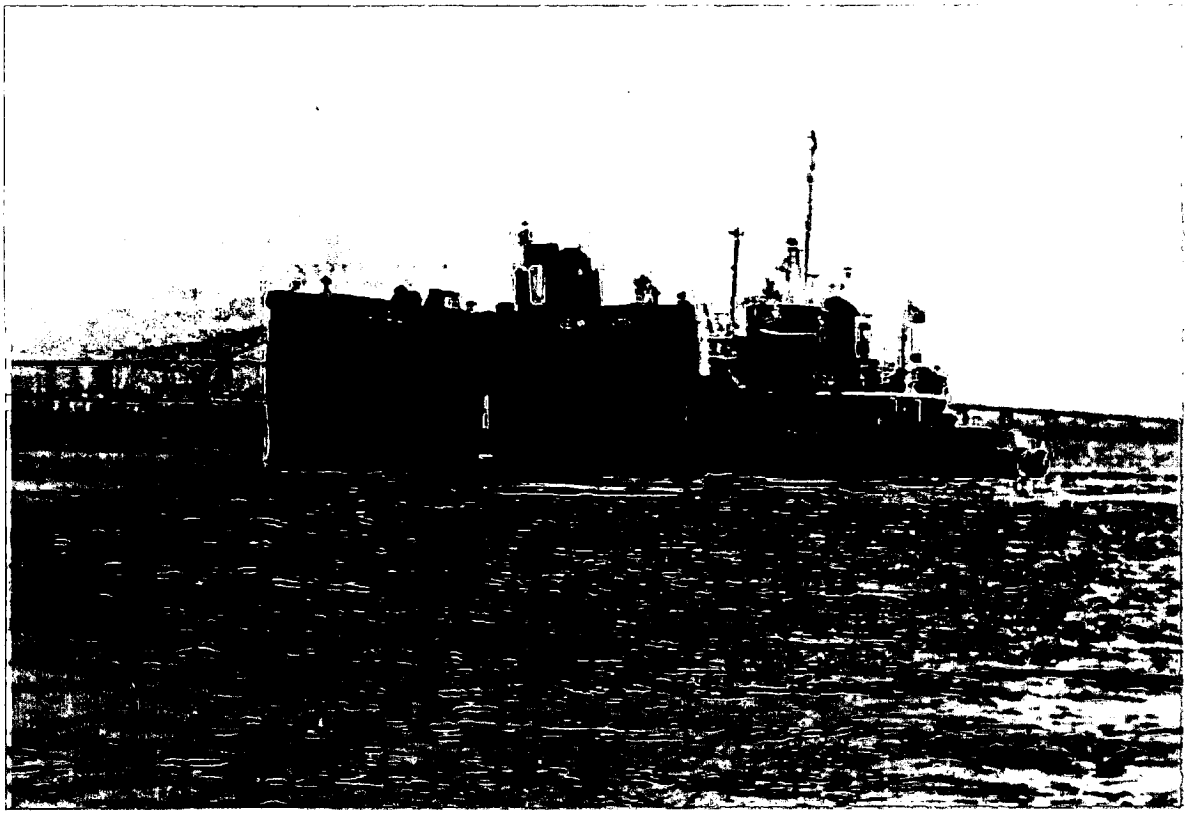


Photo 15: Empty Scow (Doors Open) Following Dump
November 17, 1997

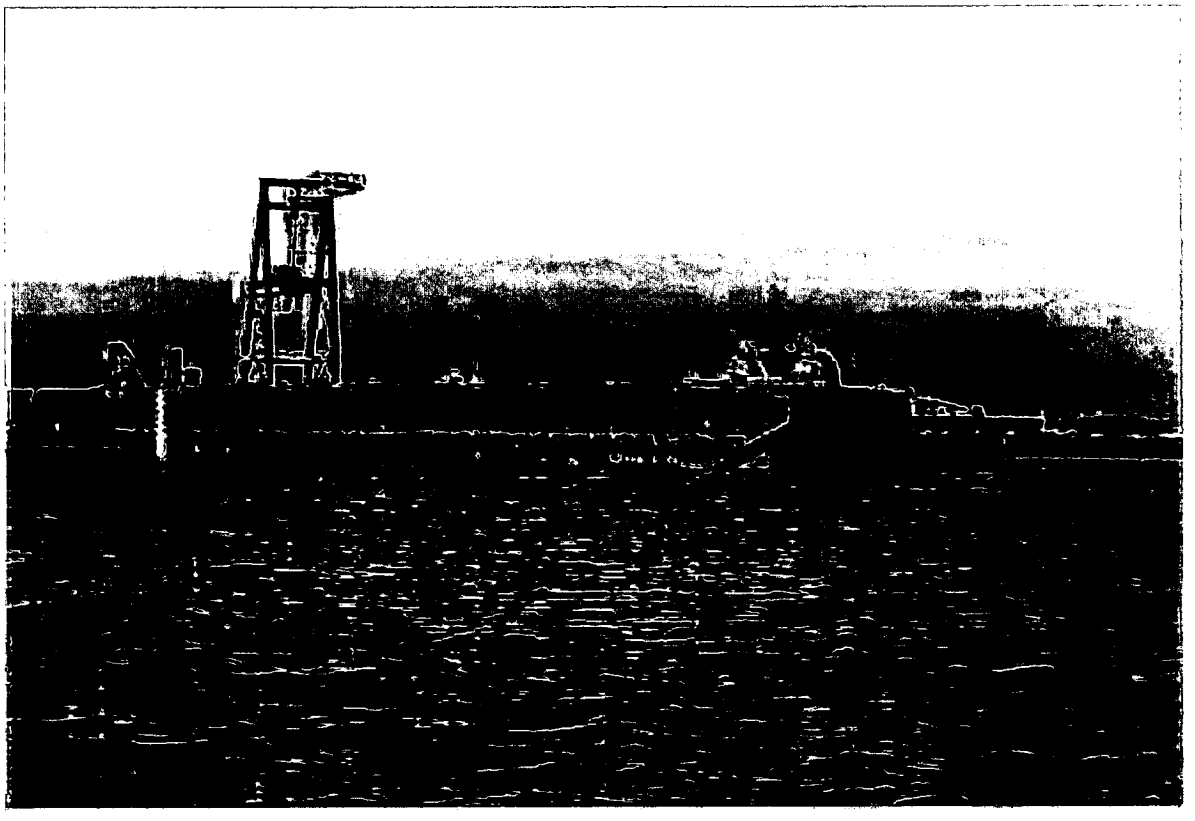


Photo 16: Empty Scow Exiting NBCDF

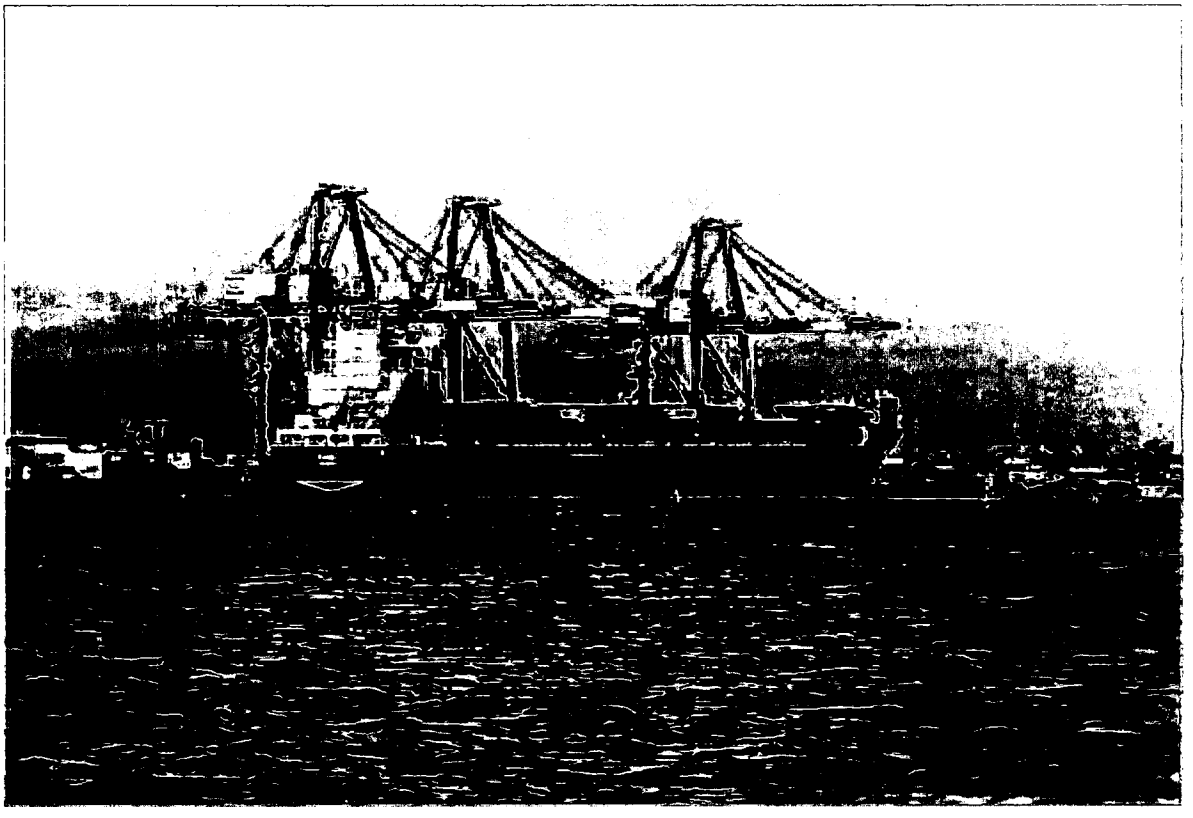


Photo 17: NBCDF Entrance Channel With Port Elizabeth in Background
November 17, 1997

Attachment No. 2
Standard Operating Procedure
Newark Bay Confined Disposal Facility Methodology for Disposal Events

Newark Bay Confined Disposal Facility
Methodology for Disposal Events

Standard Operating Procedure

I. EMPTY SCOW ARRIVES ALONGSIDE DREDGE

A. Scowman insures scow is pressured-up to hold load

B. Scowman performs visual inspection of hydraulic system

C. Scowman informs mate on dredge that scow is ready to be loaded

D. Scowman boards dredge and places portable VHF radio in charger

II. SCOW BEING LOADED ALONGSIDE DREDGE

A. Scowman monitors pressure of hydraulic system

B. Scowman completes checklist of scow for status of fluids, lights, hatch covers, and safety items

III. LOADED SCOW ALONGSIDE DREDGE

A. Scowman retrieves portable VHF Radio from charger

B. Scowman submits scow checklist to dredge captain or dredge operator

* SCOW DOES NOT LEAVE DREDGE UNTIL RADIO ONBOARD AND CHECKLIST SUBMITTED

IV. TOWING TUG MAKES UP TO LOADED SCOW

A. After tug is made up to scow, a radio check will be performed as follows:

i. Tug captain calls scow "This is tug (tug name) calling scow (scow number) for a radio check"

ii. Scowman replies "This is scow (scow number) back to the tug (tug name) for a radio check"

iii. Tug captain replies "scow (scow number) radio check complete"

* IF RADIO CHECK IS UNSUCCESSFUL, TOWING TUG DOES NOT LEAVE SITE UNTIL SITUATION IS REMEDIED AND A SUCCESSFUL RADIO CHECK IS COMPLETED

V. TOWING TUG APPROACHES NBCDF

A. When towing tug is within 15 minutes o Newark Bay CDF communication with the scow will be established as follows:

i. Tug captain call scow "This is tug (tug name) calling scow (scow number)"
ii. Scowman replies "This is scow (scow number) back to the tug (tug name)"
iii. Tug captain replies "This is tug (tug name) back to scow (scow number), be advised we are within 15 minutes of disposal site, please acknowledge"
iv. Scowman replies "This is scow (scow number) back to tug (tug name) confirming 15 minutes to disposal site"

* IF RADIO COMMUNICATION IS NOT ESTABLISHED, TOWING TUG RETURNS TO DREDGE SITE WITH LOADED SCOW AND REPEATS PROCEDURE FROM STEP IV.

V. RADIO PROCEDURE (TUG/MALCOLM PIRNIE)

B. When towing tug is within 15 minutes of disposal site, radio communication on Channel 76 with Malcolm Pirnie will be established as follows:

i. Tug captain calls Malcolm Pirnie "This is (tug name) calling Malcolm Pirnie"

ii. Malcolm Pirnie replies "This is Malcolm Pirnie back to (tug name)"

iii. Tug captain replies, "this is (tug name) back to Malcolm Pirnie, be advised we are within 15 minutes of disposal site, please acknowledge"

iv. Malcolm Pirnie replies, "this is Malcolm Pirnie confirming 15 minutes to disposal site"

v. Malcolm Pirnie calls (tug name), "The dump will occur in the (zone color) zone. The DGPS coordinates in NAD 1927 for the dump are Northing (Coordinate) and Easting (Coordinate)"

vi. Tug Captain replies, "Confirming dump coordinates Northing (Coordinate) and Easting (Coordinate)."

vii. Malcolm Pirnie replies, "Coordinates are confirmed." If coordinates are not confirmed Malcolm Pirnie replies, "Negative, repeating coordinates."

and repeats v and vi until correct.

* IF RADIO COMMUNICATION.....

* ALL COORDINATES ARE FOR THE TUGS DGPS RECEIVER AND ARE IN NJ STATE

PLANE COORDINATES NAD 27.

VI. TOWING TUG AND LOADED SCOW WITHIN NBCDF

A. Radio procedure for tug Malcolm Pirnie on Channel 76 as follows:

i. Tug Captain calls Malcolm Pirnie "this is tug (tug name) calling Malcolm Pirnie"

ii. Malcolm Pirnie replies, this is Malcolm Pirnie back to (tug name)."

iii. Tug Captain replies, "this is (tug name) back to Malcolm Pirnie, tug position is Northing (Coordinate) and Easting (Coordinate).

iv. Malcolm Pinrie replies, this is Malcolm Pirnie confirming tug position, Northing (Coordinate) and Easting (Coordinate)

v. Tug Captain replies, "tug position is correct." If position is not correct, Tug Captain replies, negative" and repeats iii, iv and v until correct.

vi. Malcolm Pirnie Replies, "Affirmative for Dump."

* TUG CAPTAIN WILL NOT DIRECT SCOW TO DUMP UNTIL MALCOLM PIRNIE GIVES AFFIRMATIVE FOR TUG COORDINATES.

B. Radio procedure (Tug/Scow) for disposal event as follows:

i. Tug captain calls scow "This is tug (tug name) calling scow (scow number)"

ii. Scowman replies "This is scow (scow number) back to the tug (tug name)"

iii. Tug captain replies "This is tug (tug name) back to scow (scow number), stand by to release scow, please acknowledge"

iv. Scowman replies "This is scow (scow number) back to tug (tug name),

standing by".

v. Tug captain replies "This is tug (tug name) back to scow (scow number), dump the scow, please acknowledge"

vi. Scowman replies " This is scow (scow number) back to tug (tug name), dumping the scow"

* IF RADIO COMMUNICATION IS NOT ESTABLISHED, TOWING TUG. REMAINS IN NBCDF UNTIL COMMUNICATION IS ESTABLISHED.

CONFINED DISPOSAL FACILITY
SCOW CHECKLIST

PREPARED BY SCOWMAN:_____

DATE:_____ SCOW:_____

DREDGE:_____

1. Hydraulic System Pressure Checked:_____

2. **FLUIDS**

   Hydro:_____ Fuel: _____ Battery Water: _____

   Anti-Freeze:_____

3. **LIGHTS**

   Running Lights: _____

   Switch Board Indicator Lights:_____

4. **HATCH COVERS:**

   Bow:_____ Stern:_____

   Port: _____ Strbd: _____

5. **SAFETY CHECK:**

   Hand Rails: _____ Life Raft:_____

   Fire Exit: _____ Fire Axe: _____

6. **RADIO:**

   VHF Radio Aboard: _____

7. **REVIEWED BY:** _____ (CAPTAIN OR OPERATOR)

COMMENTS:

_____

_____

Attachment No. 3
NBCDF Transportation & Disposal Logs

FORM NB65

TRANSPORTATION AND DISPOSAL LOG
INSPECTOR'S LOG FOR DISPOSAL FROM SPLIT-HULL SCOWS

Basic Disposal Information & Status

Date: 11/15/97

Project: LIBERTY ISLAND
Permit Number:
Tow Owner: GREAT LAKES DREDGE DOCK
Trip Number: 1
Inspector's Name: L. CRAIG
Inspector's Signature:
Description of Material: SAT & MUD, CLAY
Tug's Navigational Unit (Manufacturer/Model): TRIMBLE 4005 DS

TUG AND SCOW INFORMATION

Tug Name: McCORMACK BOYS
Tug Captain: B. TILLOTSON
Scow Name or Number: 6482
Scowman's Name: M. SEALL

LOADING INFORMATION

Volume of material (cu yds): 800
Time scow loading is complete (hh:mm): 1400
Scow draft forward (ft): 9.5
Scow draft aft (ft): 10.0
Scow draft port (ft): 10.0
Scow draft starboard (ft): 11.0

TRANSIT INFORMATION

Depart dredge site (date [mm-dd-yy] and time [hh:mm]): 11/15/97 1410
Length of tow line (if applicable) (ft): NA

Time scow arrives at entrance channel to Newark Bay Confined Disposal Area
(date [mm-dd-yy] and time [hh:mm]): 11/15/97

DISPOSAL SITE WEATHER CONDITIONS

Wind Direction (from): NW
Wind Speed (mph): 15-20
Weather Conditions: very cloudy
Visibility (no. miles): 1/2 mile
Wave/Swell Height (ft): choppy ripples off
Temperature: 32°

DISPOSAL INSTRUCTIONS (from Disposal Site Manager)

Disposal cell(s) where material is to be discharged: yellow
Marker buoys where material is to be discharged:
Scow speed (kts): 0.5

Post-it Fax Note 7671 | Date 11/15 | pages ▶ 6
To DAVID FOSTER | From L. CRAIG
Co. | Co. AIS
Phone # | Phone #
Fax # (914) 641-2155 | Fax # 201-437-2997

TRIP 1

DISPOSAL OPERATIONS (Bottom Dumping)

START DISPOSAL TIME - *Doors Opened* (date [mm-dd-yy] and time [hh:mm]): 11/15/97 1627

Cell Designation Yellow Observed water depth (ft): No Sounder Direction of tide: Flooding

Tidal Conditions: Circular EDDIES IN PIT

True Position - determined by Differential Global Positioning System (DGPS) based on New Jersey Mercator NAD 27 coordinates:

- ~~North~~: 40° 40' 41.5519" 7
- ~~East~~: 74° 08' 15.25"

Location of Scow relative to Tug: PORTSIDE 10° Angle

END DISPOSAL TIME - (date [mm-dd-yy] and time [hh:mm]): 11/15/97

Cell Designation Yellow

True Position - determined by Differential Global Positioning System (DGPS) based on New Jersey Mercator NAD 27 coordinates:

- ~~North~~: 40°40' 41.85"
- ~~East~~: 74°08' 15.1165"

Location of Scow relative to Tug: PORT SIDE on 5° angle

POST-DISPOSAL OPERATIONS

Time scow **leaves entrance channel to Newark Bay Confined Disposal Area** (date [mm-dd-yy] and time [hh:mm]): 11/15/97 1639

Time scow **returned to dredge site** (date [mm-dd-yy] and time [hh:mm]): _____

COMMENTS**: Need to do something about RADIO calls. by the time we call Malcolm Pirnie, confirm + repeat position then call + instruct the seaman to dump we're off position by more than a half second

Tied up to Berth 74 1645

****Record any comments or observations including any delays, variances from anticipated plans, difficulties, etc. For any spills, accidents, or emergencies at a minimum, record immediate actions taken, notifications made, initial assessment of damage and proposed future actions.

FORM NBDS

TRANSPORTATION AND DISPOSAL LOG
INSPECTOR'S LOG FOR DISPOSAL FROM SPLIT-HULL SCOWS

Basic Disposal Information & Status

Date: 11/16/97

Project: LIBERTY ISLAND
Permit Number: 95-05571
Tow Owner: GREAT LAKES D+D
Trip Number: 2
Inspector's Name: A CRAIG
Inspector's Signature: A Craig
Description of Material: CAT F MUD BELT PILINGS
Tug's Navigational Unit (Manufacturer/Model): TRIMBLE 4000SDS

TUG AND SCOW INFORMATION

Tug Name: Mc Cormack Boys
Tug Captain: B. PELOTSON
Scow Name or Number: 6432
Scowman's Name: M. SLAZI

LOADING INFORMATION

Volume of material (cu yds): 3000
Time scow loading is complete (hh:mm): 0240
Scow draft forward (ft): 11.0
Scow draft aft (ft): 11.3
Scow draft port (ft): —
Scow draft starboard (ft): —

TRANSIT INFORMATION

Depart dredge site (date [mm-dd-yy] and time [hh:mm]): 11/16/97 0345
Length of tow line (if applicable) (ft): —

Time scow arrives at entrance channel to Newark Bay Confined Disposal Area
(date [mm-dd-yy] and time [hh:mm]): 11/16/97 0731

DISPOSAL SITE WEATHER CONDITIONS

Wind Direction (from): W
Wind Speed (mph): 5-10
Weather Conditions: PT Cloudy
Visibility (no. miles): 5 miles
Wave/Swell Height (ft): Ripples 0.2 ft
Temperature: 28°

DISPOSAL INSTRUCTIONS (from Disposal Site Manager)

Disposal cell(s) where material is to be discharged: Yellow
Marker buoys where material is to be discharged: —
Scow speed (kts): 0.3

Trip 2

DISPOSAL OPERATIONS (Bottom Dumping)

START DISPOSAL TIME - *Doors Opened* (date [mm-dd-yy] and time [hh:mm]): 11/16/97 0742
Call Designation Yellow Observed water depth (ft): No Sounder Direction of tide: Flood
Tidal Conditions:
Tug Position - determined by Differential Global Positioning System (DGPS) based on New Jersey Mercator NAD 27 coordinates:
- North: 40° 40' 41.3510" HDG 353° spinning
- East: 74° 08' 14.1991

Location of Scow relative to Tug: Portside of Tug (stern of scow)
Heading 353°

END DISPOSAL TIME - (date [mm-dd-yy] and time [hh:mm]): 11/16/97 0745
Call Designation Yellow
Tug Position - determined by Differential Global Positioning System (DGPS) based on New Jersey Mercator NAD 27 coordinates:
- North: 40° 40' 41.5361"
- East: 74° 08' 13.9219

Location of Scow relative to Tug: Port side (stern of scow)

POST-DISPOSAL OPERATIONS

Time scow leaves entrance channel to Newark Bay Confined Disposal Area (date [mm-dd-yy] and time [hh:mm]): 11/16/97 0758

Time scow returned to dredging site (date [mm-dd-yy] and time [hh:mm]): 11/16/97 0850

COMMENTS:** Still having problem of scow & tug being off point by time the radio messages are finished.
Did manage a dead stop for part of disposal. Vessels were stationary at 40°40'41.6516 / 74°08'14.1005" for approximately 3 minutes of dump.

last 2 lines while scow was closing
After disposal some pilings were seen floating in the disposal area.

**Record any comments or observations including any delays, variances from anticipated plans, difficulties, etc. For any spills, accidents, or emergencies at a minimum, record immediate actions taken, notifications made, initial assessment of damage and proposed future actions.

FORM NB05

TRANSPORTATION AND DISPOSAL LOG
INSPECTOR'S LOG FOR DISPOSAL FROM SPLIT-HULL SCOWS

Basic Disposal Information & Status

Date: 11/16/97

Project: Liberty Island
Permit Number: 95-055-71
Tow Owner: Great Lakes D&D
Trip Number: 7
Inspector's Name: L Pirie
Inspector's Signature:
Description of Material: Cat IE Mud Silt Pilings
Tug's Navigational Unit (Manufacturer/Model): Trimble Navigation NT 900 D GPS

TUG AND SCOW INFORMATION

Tug Name: Delmar C. Lynn
Tug Captain: R. Collinesi
Scow Name or Number: 6233
Scowman's Name: W. Konecny

LOADING INFORMATION

Volume of material (cu yds): 3500
Time scow loading is complete (hh:mm): 2045 11/15/97
Scow draft forward (ft): 1
Scow draft aft (ft): 15.0
Scow draft port (ft): 14.5
Scow draft starboard (ft): 15.2

TRANSIT INFORMATION

Depart dredge site (date [mm-dd-yy] and time [hh:mm]): 11/15/97 2100
Length of tow line (if applicable) (ft): —

Time scow arrives at entrance channel to Newark Bay Confined Disposal Area
(date [mm-dd-yy] and time [hh:mm]): 11/16/97

DISPOSAL SITE WEATHER CONDITIONS

Wind Direction (from): W
Wind Speed (mph): 5-10
Weather Conditions: PT Cloudy
Visibility (no. miles): +15 miles
Wave/Swell Height (ft): Rippled
Temperature: 40°

DISPOSAL INSTRUCTIONS (from Disposal Site Manager)

Disposal cell(s) where material is to be discharged: Yellow
Marker buoys where material is to be discharged: —
Scow speed (kts): 0.4

Trip 2 Trip 3 OF

DISPOSAL OPERATIONS (Bottom Dumping)

START DISPOSAL TIME - *Doors Opened* (date [mm-dd-yy] and time [hh:mm]): 11/16/97 0929
Cell Designation yellow Observed water depth (ft): ______ Direction of tide: ?
Tidal Conditions: ______

Tug Position - determined by Differential Global Positioning System (DGPS) based on New Jersey Mercator NAD 27 coordinates:

- North: 40°40.6994 HDG 193°
- East: 74°08.2391

Location of Scow relative to Tug: Tug portside to on stern of scow

END DISPOSAL TIME - (date [mm-dd-yy] and time [hh:mm]): 11/16/97 0932
Cell Designation yellow

Tug Position - determined by Differential Global Positioning System (DGPS) based on New Jersey Mercator NAD 27 coordinates:

- North: 40°40.6749' 136°
- East: 74°08.2083'

Location of Scow relative to Tug: Tug portside to on stern of scow slightly tilted (5°)

POST-DISPOSAL OPERATIONS

Time scow leaves entrance channel to Newark Bay Confined Disposal Area (date [mm-dd-yy] and time [hh:mm]): 11/16/97 0944

Time scow returned to dredge site (date [mm-dd-yy] and time [hh:mm]): 11/16/97 0958 to Berth 74

COMMENTS:**

I saw only one piling floating after disposal

**Record any comments or observations including any delays, variances from anticipated plans, difficulties, etc. For any spills, accidents, or emergencies at a minimum, record immediate actions taken, notifications made, initial assessment of damage and proposed future actions.

END
40° 40.49"
08° 10.418"

S
40° 41.982"
08' 14.316"

FORM NBDS

TRANSPORTATION AND DISPOSAL LOG
INSPECTOR'S LOG FOR DISPOSAL FROM SPLIT-HULL SCOWS

Basic Disposal Information & Status

Date: 11/16/97

Project: LIBERTY ISLAND
Permit Number: 95-05571
Tow Owner: GREAT LAKES DRD
Trip Number: 4
Inspector's Name: L CRAIG
Inspector's Signature:
Description of Material: CAT E MUD SILT
Tug's Navigational Unit (Manufacturer/Model): TRIMBLE 400SIDS

TUG AND SCOW INFORMATION

Tug Name: Mc Cormack Boys
Tug Captain: D. THOMPSON
Scow Name or Number: GL 32
Scowman's Name: M. SLOAN

LOADING INFORMATION

Volume of material (cu yds): 3000
Time scow loading is complete (hh:mm): 1350
Scow draft forward (ft): 14.0 AFT
Scow draft aft (ft): 14.0
Scow draft port (ft): 13.0 Forward
Scow draft starboard (ft): — Aft

TRANSIT INFORMATION

Depart dredge site (date [mm-dd-yy] and time [hh:mm]): 11/16/97 @ 1350
Length of tow line (if applicable) (ft): —

Time scow arrives at entrance channel to Newark Bay Confined Disposal Area
(date [mm-dd-yy] and time [hh:mm]): 11/16/97 1623

DISPOSAL SITE WEATHER CONDITIONS

Wind Direction (from): WNW
Wind Speed (mph): 15-25
Weather Conditions: PT. SUNNY
Visibility (no. miles): 7-10
Wave/Swell Height (ft): 1/2-1ft Choppy
Temperature: ± 35°

DISPOSAL INSTRUCTIONS (from Disposal Site Manager)

Disposal cell(s) where material is to be discharged: NW corner of yellow
Marker buoys where material is to be discharged: —
Scow speed (kts): 0.40

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To DAVID FOSTER | From L. Craig
Co. | Co. AIS
Phone # | Phone #
Fax # (914) 641-1455 | Fax # 201-574-2997

TRIP 4

DISPOSAL OPERATIONS (Bottom Dumping)

START DISPOSAL TIME - *Doors Opened* (date [mm-dd-yy] and time [hh:mm]): 16 28 11/16/97

Cell Designation yellow Observed water depth (ft): 70 * Direction of tide: FLOODING

Tidal Conditions:

Tug Position - determined by Differential Global Positioning System (DGPS) based on New Jersey Mercator NAD 27 coordinates:

- North: 40° 40' 44, 2637 HDG 037° magnetic
- East: 74° 08' 12.7155

Location of Scow relative to Tug: Scow on tug's Port side - tug beyond the stern of the scow

END DISPOSAL TIME - (date [mm-dd-yy] and time [hh:mm]): 11/16/97 1629

Cell Designation yellow

Tug Position - determined by Differential Global Positioning System (DGPS) based on New Jersey Mercator NAD 27 coordinates: Closed 40° 40' 44, 4544" 74° 08' 11, 3885"

- North: 40° 40' 44, 4544"
- East: 74° 08' 11, 4532 HDG 050° magnet

Location of Scow relative to Tug: Tug stern end of starboard st. of scow
ie Scow on tug's Portside on slight angle 10° ( ) off true parallel to tug.

POST-DISPOSAL OPERATIONS

Time scow leaves entrance channel to Newark Bay Confined Disposal Area (date [mm-dd-yy] and time [hh:mm]): 11/16/97 1636

Time scow returned to dredge site (date [mm-dd-yy] and time [hh:mm]): 11/16/97

COMMENTS**:

* Depth received from the GL Survey boat

Navigation antennae on starboard side of tug approx 80-90 ft from the center of the HOPPER

[illegible] antennae

This time Malcolm Pirnie picked an area free as range line to align with so it appeared the disposal went easier. Eight (Tender tug) parallel lines.

**Record any comments or observations including any delays, variances from anticipated plans, difficulties, etc. For any spills, accidents, or emergencies at a minimum, record immediate actions taken, notifications made, initial assessment of damage and proposed future actions.

FORM NB05

TRANSPORTATION AND DISPOSAL LOG
INSPECTOR'S LOG FOR DISPOSAL FROM SPLIT-HULL SCOWS

Basic Disposal Information & Status

Date: 11/17/97

Project: LIBERTY ISLAND
Permit Number: 95-05571
Tow Owner: GREAT LAKES D+D
Trip Number: 5
Inspector's Name: L. FRAIA
Inspector's Signature:
Description of Material: CAT II MUD + SILT
Tug's Navigational Unit (Manufacturer/Model): TRIMBLE NAVIGATION NT200D GPS

TUG AND SCOW INFORMATION

Tug Name: D.C. LYNN
Tug Captain: R. CELLINESI
Scow Name or Number: GL33
Scowman's Name: W. HONECNY

LOADING INFORMATION

Volume of material (cu yds): 2500
Time scow loading is complete (hh:mm): 1805
Scow draft forward (ft): 13.5
Scow draft aft (ft): 14.0
Scow draft port (ft):
Scow draft starboard (ft): X

TRANSIT INFORMATION

Depart dredge site (date [mm-dd-yy] and time [hh:mm]): 11/17/97 1835
Length of tow line (if applicable) (ft): —

Time scow arrives at entrance channel to Newark Bay Confined Disposal Area
(date [mm-dd-yy] and time [hh:mm]): 11/17/97 0724

DISPOSAL SITE WEATHER CONDITIONS

Wind Direction (from): N
Wind Speed (mph): 15-20
Weather Conditions: Clear + Sunny
Visibility (no. miles): > 15 miles
Wave/Swell Height (ft): calm 0.0
Temperature: 21°

DISPOSAL INSTRUCTIONS (from Disposal Site Manager)

Disposal cell(s) where material is to be discharged: —
Marker buoys where material is to be discharged: Triangulate on all 3 range markers
Scow speed (kts): 0.0

Trip 0

DISPOSAL OPERATIONS (Bottom Dumping)

START DISPOSAL TIME - *Doors Opened* (date [mm-dd-yy] and time [hh:mm]): 11/1/97 073

Cell Designation Central pit Observed water depth (ft): No Sounding Direction of tide: Flood

Tidal Conditions: _____

Tug Position - determined by Differential Global Positioning System (DGPS) based on New Jersey Mercator NAD 27 coordinates:

- North: 40°40.7472'
- East: 74°08.2373

Location of Scow relative to Tug: Tug on stern end of scow - Scow on the tugs port side

END DISPOSAL TIME - (date [mm-dd-yy] and time [hh:mm]): 11/7/97 073.1

Cell Designation Cross beam of 3 range markers slightly into the Channel

Tug Position - determined by Differential Global Positioning System (DGPS) based on New Jersey Mercator NAD 27 coordinates:

- North: 40°40.7489'
- East: 74°08.2385'

Location of Scow relative to Tug: on port hip with a slight tilt approx 10°

POST-DISPOSAL OPERATIONS

Time scow **leaves entrance channel to Newark Bay Confined Disposal Area** (date [mm-dd-yy] and time [hh:mm]): 11/7/97 0738

Time scow **returned to dredge site** (date [mm-dd-yy] and time [hh:mm]): 11/7/97

COMMENTS**: Tried to take scow at 0852 then unbeknownst to head for dredge at same time. GPS antenna on PORT side of Bridge about 100 ft to center of scow the vessel lined up with the North Range markers then slightly south of the East/west markers.

****Record any comments or observations including any delays, variances from anticipated plans, difficulties, etc. For any spills, accidents, or emergencies at a minimum, record immediate actions taken, notifications made, initial assessment of damage and proposed future actions.

TRANSPORTATION AND DISPOSAL LOG
INSPECTOR'S LOG FOR DISPOSAL FROM SPLIT-HULL SCOWS

Basic Disposal Information & Status

Date: 11/17/97

Project: LIBERTY ISLAND
Permit Number: 95-05571
Tow Owner: GREAT LAKES P I D
Trip Number: 5
Inspector's Name: LINDA CRAIG
Inspector's Signature: Linda Craig
Description of Material: CAT II MUD SILT CLUMPS
Tug's Navigational Unit (Manufacturer/Model): TRIMBLE 400 SDS

TUG AND SCOW INFORMATION

Tug Name: McCORMACK BOYS
Tug Captain: D. TILLOTSON
Scow Name or Number: GL 33
Scowman's Name: M. SCALI

LOADING INFORMATION

Volume of material (cu yds): 9800
Time scow loading is complete (hh:mm): 0001
Scow draft forward (ft): 14.5
Scow draft aft (ft): 15
Scow draft port (ft): _____
Scow draft starboard (ft): X

TRANSIT INFORMATION

Depart dredge site (date [mm-dd-yy] and time [hh:mm]): 11/17/97 0020
Length of tow line (if applicable) (ft): —
Left dock 0807
Time scow **arrives at entrance channel to Newark Bay Confined Disposal Area**
(date [mm-dd-yy] and time [hh:mm]): 11/17/97 0829

DISPOSAL SITE WEATHER CONDITIONS

Wind Direction (from): W
Wind Speed (mph): 15-20
Weather Conditions: Clear & Sunny
Visibility (no. miles): + 15 miles
Wave/Swell Height (ft): Lapko
Temperature: 95°

DISPOSAL INSTRUCTIONS (from Disposal Site Manager)

Disposal cell(s) where material is to be discharged: —
Marker buoys where material is to be discharged: Triangulated off the range markers
Scow speed (kts): 0.0

Trip 6

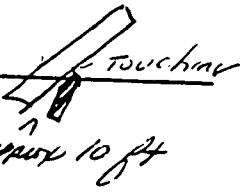
DISPOSAL OPERATIONS (Bottom Dumping)

START DISPOSAL TIME - *Doors Opened* (date [mm-dd-yy] and time [hh:mm]): 11/17/97 0838
Cell Designation entrance point Observed water depth (ft): _____ Direction of tide: FLOOD
Tidal Conditions: _____
Tug Position - determined by Differential Global Positioning System (DGPS) based on New Jersey Mercator NAD 27 coordinates:
- North: ~40°40' 45.5264"
- East: 74° 08' 13.6182

Location of Scow relative to Tug: on portside bow of tug less than 5% of

END DISPOSAL TIME - (date [mm-dd-yy] and time [hh:mm]): 11/17/97 0838
Cell Designation _____
Tug Position - determined by Differential Global Positioning System (DGPS) based on New Jersey Mercator NAD 27 coordinates:
- North: 40°40' 45.1829
- East: 74° 08' 13.6122

Location of Scow relative to Tug: approx 10% off port



POST-DISPOSAL OPERATIONS

Time scow **leaves entrance channel to Newark Bay Confined Disposal Area** (date [mm-dd-yy] and time [hh:mm]): 11/17/97 0845

Time scow **returned to dredge site** (date [mm-dd-yy] and time [hh:mm]): 11/17/97 docked at berth 74 0910

COMMENTS**: G.P.S Antenna on starboard side of Mr Bomack Bags 10-12 floating pilings seen after disposal, collected by the G.L. survey vessel and placed behind a containment boom at berth 74

**Record any comments or observations including any delays, variances from anticipated plans, difficulties, etc. For any spills, accidents, or emergencies at a minimum, record immediate actions taken, notifications made, initial assessment of damage and proposed future actions.

FORM NB05

TRANSPORTATION AND DISPOSAL LOG
INSPECTOR'S LOG FOR DISPOSAL FROM SPLIT-HULL SCOWS

Basic Disposal Information & Status

Date: 11/17/97

roject: LIBERTY ISLAND Permit Number: 95-05574
ow Owner: GREAT LAKES D&D Trip Number: 7
spector's Name: L CRAIG Inspector's Signature:
escription of Material: CAT II MUDDY SILT
g's Navigational Unit (Manufacturer/Model): TRIMBLE NAVIGATION NT200D GPS

UG AND SCOW INFORMATION

g Name: DOZMUR C LYNN Tug Captain: R COLLINGS I
ow Name or Number: GL33 Scowman's Name: W HONECNY

ADING INFORMATION

lume of material (cu yds): 2 SVO
ne scow loading is complete (hh:mm): ~~0925~~ 1300
ow draft forward (ft): 13.5 Scow draft aft (ft): 14.0
ow draft port (ft): 14.0 Scow draft starboard (ft): 14.5

ANSIT INFORMATION

part dredge site (date [mm-dd-yy] and time [hh:mm]): 11/17/97 1310
gth of tow line (if applicable) (ft): —

e scow **arrives at entrance channel to Newark Bay Confined Disposal Area**
e [mm-dd-yy] and time [hh:mm]): 11/17/97 1534

POSAL SITE WEATHER CONDITIONS

d Direction (from): W Wind Speed (mph): 10-15
ther Conditions: CLR + SUNNY Visibility (no. miles): 15 MILES
e/Swell Height (ft): RIPPLES Temperature: 40°

POSAL INSTRUCTIONS (from Disposal Site Manager)

osal cell(s) where material is to be discharged: —
ter buoys where material is to be discharged: TRIANGULATE ON 211 3 REAR MARKERS
speed (kts): 0.0

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To DAVID FOSTER | From L CRAIG
Co. | Co. MALCOLM PIRNIE | Co. AIS
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Trip 7

DISPOSAL OPERATIONS (Bottom Dumping)

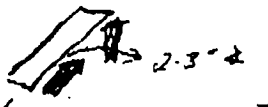
START DISPOSAL TIME - *Doors Opened* (date [mm-dd-yy] and time [hh:mm]): 11/17/97 1543

Call Designation ~~anchor~~ Buoy **Observed water depth (ft):** ——— **Direction of tide:** EBB

Tidal Conditions: Beginning of tide change

Tug Position - determined by Differential Global Positioning System (DGPS) based on New Jersey Mercator NAD 27 coordinates:

- **North:** 40°40.7633'
- **East:** 74°05.2090'



Location of Scow relative to Tug: Starboard stern end of scow on portside bow of Tug

END DISPOSAL TIME - (date [mm-dd-yy] and time [hh:mm]): 11/17/97 1543

Call Designation entire last slot forward into Blue cell

Tug Position - determined by Differential Global Positioning System (DGPS) based on New Jersey Mercator NAD 27 coordinates:

- **North:** 40°40.7615'
- **East:** 74°08.2044'

Location of Scow relative to Tug: portside of scow 15 ft off sterns bow Tug alganist scow

POST-DISPOSAL OPERATIONS

Time scow leaves entrance channel to Newark Bay Confined Disposal Area (date [mm-dd-yy] and time [hh:mm]): 11/17/97 1530

Time scow returned to dredge site (date [mm-dd-yy] and time [hh:mm]): 11/16/97 1930

COMMENTS:** 1600 tied up to Berth 74

There was a delay on disposal after ALTERNATIVE to dump call due to loosing of lines to avoid line breakage being slow

**Record any comments or observations including any delays, variances from anticipated plans, difficulties, etc. For any spills, accidents, or emergencies at a minimum, record immediate actions taken, notifications made, initial assessment of damage and proposed future actions.

FORM NB05

TRANSPORTATION AND DISPOSAL LOG
INSPECTOR'S LOG FOR DISPOSAL FROM SPLIT-HULL SCOWS

Basic Disposal Information & Status

Date: 11/18/97

Project: LIBERTY ISLAND
Permit Number: 95-055-74
Tow Owner: GREAT LAKES D/D
Trip Number: 8
Inspector's Name: L CRAIG
Inspector's Signature: L Craig
Description of Material: CAT II MUD + SILT + CLAY
Tug's Navigational Unit (Manufacturer/Model): TRIMBLE 4400 SIDS

TUG AND SCOW INFORMATION

Tug Name: McCormack Boys
Tug Captain: B TIMOTSON
Scow Name or Number: 6632
Scowman's Name: M. SLAHI

LOADING INFORMATION

Volume of material (cu yds): 2510
Time scow loading is complete (hh:mm): 1920
Scow draft forward (ft): 12.0
Scow draft aft (ft): 13.00
Scow draft port (ft):
Scow draft starboard (ft): X

TRANSIT INFORMATION

Depart dredge site (date [mm-dd-yy] and time [hh:mm]): 11/17/97 1920
Length of tow line (if applicable) (ft): —

Time scow arrives at entrance channel to Newark Bay Confined Disposal Area
(date [mm-dd-yy] and time [hh:mm]): 11/18/97 0714

DISPOSAL SITE WEATHER CONDITIONS

Wind Direction (from): W
Wind Speed (mph): 5-10
Weather Conditions: clear + sunny
Visibility (no. miles): ± 20
Wave/Swell Height (ft): DAPPLED
Temperature: 40°

DISPOSAL INSTRUCTIONS (from Disposal Site Manager)

Disposal cell(s) where material is to be discharged: —
Marker buoys where material is to be discharged: TRIANGULATED FROM 3 RANGE MARKERS
Scow speed (kts): 0.0

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To DAVID FOSTER | From L CRAIG
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Date

TRIP 8

DISPOSAL OPERATIONS (Bottom Dumping)

START DISPOSAL TIME - *Doors Opened* (date [mm-dd-yy] and time [hh:mm]): 11/15/97 0720
Cell Designation Centre Pit Observed water depth (ft): —— Direction of tide: Flood
Tidal Conditions: _____
Tug Position - determined by Differential Global Positioning System (DGPS) based on New Jersey Mercator NAD 27 coordinates:
- North: 40° 40' 30. 2461
- East: [redacted] 08' 24. 1140

Location of Scow relative to Tug: STARBOARD Stern end of scow on PORTSIDE HIP of Tug

END DISPOSAL TIME - (date [mm-dd-yy] and time [hh:mm]): 11/15/97 0730
Cell Designation Central triangle of Range markers
Tug Position - determined by Differential Global Positioning System (DGPS) based on New Jersey Mercator NAD 27 coordinates:
- North: 40° 40' 30. 2461"
- East: [redacted] 08' 24. 1136"

Location of Scow relative to Tug: PORTSIDE slightly angled 
Stern upwind

POST-DISPOSAL OPERATIONS

Time scow **leaves entrance channel to Newark Bay Confined Disposal Area** (date [mm-dd-yy] and time [hh:mm]): 11/15/97 0736

Time scow **returned to dredge site** (date [mm-dd-yy] and time [hh:mm]): 11/15/97 0830

COMMENTS**: Assisted by the D. C. LYNN

East (WHITE buoy) ENTRANCE CHANNEL MARKER MISSING.

Ran aground at entrance to pit on way into pit.

**Record any comments or observations including any delays, variances from anticipated plans, difficulties, etc. For any spills, accidents, or emergencies at a minimum, record immediate actions taken, notifications made, initial assessment of damage and proposed future actions.

FORM NB05

TRANSPORTATION AND DISPOSAL LOG
INSPECTOR'S LOG FOR DISPOSAL FROM SPLIT-HULL SCOWS

Basic Disposal Information & Status

Date: 11/18/97

oject: LIBERTY ISLAND Permit Number: 95-05574

w Owner: GREAT LAKES D&D Trip Number: 9

spector's Name: LINDEN CRAIG Inspector's Signature: [signature]

scription of Material: MUD, SILT FINES

g's Navigational Unit (Manufacturer/Model): TRIMBLE NAVIGATION NT200D GPS

G AND SCOW INFORMATION

g Name: D. C. LYNN Tug Captain: RON COLLINES!

ow Name or Number: GL33 Scowman's Name: W. KONARSKY

ADING INFORMATION

lume of material (cu yds): 3120

ne scow loading is complete (hh:mm): ≅ 2330

ow draft forward (ft): 15.0 Scow draft aft (ft): 15.0

ow draft port (ft): _____ Scow draft starboard (ft): X

ANSIT INFORMATION

art dredge site (date [mm-dd-yy] and time [hh:mm]): 11/17/97 2235

igth of tow line (if applicable) (ft): ____

ne scow **arrives at entrance channel to Newark Bay Confined Disposal Area**

e [mm-dd-yy] and time [hh:mm]): 11/18/97 0230

POSAL SITE WEATHER CONDITIONS

id Direction (from): W Wind Speed (mph): 5-10

ather Conditions: CLEAR & SUNNY Visibility (no. miles): ±20

ve/Swell Height (ft): GLASSY CALM 0 Temperature: 40°

POSAL INSTRUCTIONS (from Disposal Site Manager)

osal cell(s) where material is to be discharged: ____

ker buoys where material is to be discharged: CROSSLINGS of RANGE MARKERS

v speed (kts): 0.0

TRIP 9

DISPOSAL OPERATIONS (Bottom Dumping)

START DISPOSAL TIME - *Doors Opened* (date [mm-dd-yy] and time [hh:mm]): 11/18/97 0842
Cell Designation Center of Pit Observed water depth (ft): _____ Direction of tide: Flood
Tidal Conditions: _____
Tug Position - determined by Differential Global Positioning System (DGPS) based on New Jersey Mercator NAD 27 coordinates: TUG HDG 030°
- North: 40°40.7543'
- East: 74°08.2192'

Location of Scow relative to Tug: starboard stern end of scow on PORTSIDE BOW of TUG

END DISPOSAL TIME - (date [mm-dd-yy] and time [hh:mm]): 11/18/97 0842
Cell Designation PIT CENTER SLIGHTLY NORTH of EAST/WEST RANGE MARKERS
Tug Position - determined by Differential Global Positioning System (DGPS) based on New Jersey Mercator NAD 27 coordinates: TUG HDG 025°
- North: 40°40.7568
- East: 74°08.2164

Location of Scow relative to Tug: PORT SIDE 10°± wider as cleared up

POST-DISPOSAL OPERATIONS

Time scow **leaves entrance channel to Newark Bay Confined Disposal Area** (date [mm-dd-yy] and time [hh:mm]): 11/18/97 0852

Time scow **returned to dredge site** (date [mm-dd-yy] and time [hh:mm]): 11/18/97 to dock at Berth 74 0859

COMMENTS**: I saw 5-6 floaters after disposal occurred. Great Lakes survey vessel was clearing them down as D.C. LYNN left the pit

2 w/in entrance channel buoy missing

**Record any comments or observations including any delays, variances from anticipated plans, difficulties, etc. For any spills, accidents, or emergencies at a minimum, record immediate actions taken, notifications made, initial assessment of damage and proposed future actions.

FORM NB05

TRANSPORTATION AND DISPOSAL LOG
INSPECTOR'S LOG FOR DISPOSAL FROM SPLIT-HULL SCOWS

Basic Disposal Information & Status

Date: 11/18/97

oject: LIBERTY ISLAND Permit Number: 95-055-74/
ow Owner: GREAT LAKES D+D Trip Number: 10
spector's Name: L CRAIG Inspector's Signature: [signature]
scription of Material: MUD SILT PLUMES
g's Navigational Unit (Manufacturer/Model): TRIMBLE NAVIGATION NT2000 GPS

G AND SCOW INFORMATION

g Name: D. C. LYNN Tug Captain: R. CELLINOSI
ow Name or Number: GL 32 Scowman's Name: M. SLATI

ADING INFORMATION

lume of material (cu yds): 3200
ne scow loading is complete (hh:mm): 11 40
ow draft forward (ft): 16.5 Scow draft aft (ft): 15.0
ow draft port (ft): 16.5 Scow draft starboard (ft): 15.0

ANSIT INFORMATION

art dredge site (date [mm-dd-yy] and time [hh:mm]): 11/18/97 1300
gth of tow line (if applicable) (ft): —

e scow **arrives at entrance channel to Newark Bay Confined Disposal Area**
e [mm-dd-yy] and time [hh:mm]): 11/18/97 1526

POSAL SITE WEATHER CONDITIONS

d Direction (from): W Wind Speed (mph): 10-15
ther Conditions: clear & sunny Visibility (no. miles): +20 miles
e/Swell Height (ft): Ripple 0 ft Temperature: 40

POSAL INSTRUCTIONS (from Disposal Site Manager)

osal cell(s) where material is to be discharged: —
er buoys where material is to be discharged: just north of the ~~[illegible]~~ of the Range Markers
speed (kts): 6.0

Trip 10

DISPOSAL OPERATIONS (Bottom Dumping)

START DISPOSAL TIME - *Doors Opened* (date [mm-dd-yy] and time [hh:mm]): 11/18/97 / 1532

Cell Designation AT CENTER Observed water depth (ft): — Direction of tide: EBB

Tidal Conditions: SLACK

Tug Position - determined by Differential Global Positioning System (DGPS) based on New Jersey Mercator NAD 27 coordinates:

- North: 40°40.7573'
- East: 74°08.2323

035° TUG HDG

Location of Scow relative to Tug: Stern starboard scow on portside tug

END DISPOSAL TIME - (date [mm-dd-yy] and time [hh:mm]): 11/18/97 1536

Cell Designation center NORTHERN end of pit

Tug Position - determined by Differential Global Positioning System (DGPS) based on New Jersey Mercator NAD 27 coordinates:

- North: 40°40.7524'
- East: 74°08.2315'

Location of Scow relative to Tug: Stern starboard on tug portside

POST-DISPOSAL OPERATIONS

Time scow **leaves entrance channel to Newark Bay Confined Disposal Area** (date [mm-dd-yy] and time [hh:mm]): 11/18/97 1545

Time scow **returned to dredge site** (date [mm-dd-yy] and time [hh:mm]): 11/18/97 To Berth 74 at 1555

COMMENTS:**

11 floating pilings after disposal - chased down by the GREAT LAKES Survey vessel + deposited behind the boom at Berth 74.

White entrance buoy back on location.

Due to loose line after disposal scow swung out about 20ft off one stern Tug Boat past the scow.

**Record any comments or observations including any delays, variances from anticipated plans, difficulties, etc. For any spills, accidents, or emergencies at a minimum, record immediate actions taken, notifications made, initial assessment of damage and proposed future actions.

FORM NB05

TRANSPORTATION AND DISPOSAL LOG
INSPECTOR'S LOG FOR DISPOSAL FROM SPLIT-HULL SCOWS

Basic Disposal Information & Status

Date: 11/19/97

oject: LIBERTY STATE PARK — Permit Number: 95-0535-NJ
ow Owner: GREAT LAKES D.D. — Trip Number: 11
spector's Name: L CRAIN — Inspector's Signature:
scription of Material: MUD & SILT (CAT I PILING)
g's Navigational Unit (Manufacturer/Model): TRIMBLE 2600 SIDS

UG AND SCOW INFORMATION

g Name: McCormack Boys — Tug Captain: B. THOMPSON
ow Name or Number: GL 32 — Scowman's Name: MICHAEL

OADING INFORMATION

olume of material (cu yds): 2360
me scow loading is complete (hh:mm): 0400
ow draft forward (ft): 12 — Scow draft aft (ft): 12
ow draft port (ft): X — Scow draft starboard (ft):

RANSIT INFORMATION

part dredge site (date [mm-dd-yy] and time [hh:mm]): 11/19/97 0515
ngth of tow line (if applicable) (ft): —

ne scow **arrives at entrance channel to Newark Bay Confined Disposal Area**
ite [mm-dd-yy] and time [hh:mm]): 11/19/97 0726

SPOSAL SITE WEATHER CONDITIONS

nd Direction (from): — Wind Speed (mph):
eather Conditions: Clear & Sunny — Visibility (no. miles): 2miles
ve/Swell Height (ft): Rippled 1 — Temperature: 36°

SPOSAL INSTRUCTIONS (from Disposal Site Manager)

posal cell(s) where material is to be discharged: —
rker buoys where material is to be discharged: Triangulation on Jersey side of Buoy numbers
ow speed (kts): 0.0

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To DAVID FOSTER | From L CRAIN
Co./Dept. MCCORMACK BROS | Co. AIS
Phone # | Phone #
Fax # 973-522-0440 | Fax # 201-578-4960

Tug 11

DISPOSAL OPERATIONS (Bottom Dumping)

START DISPOSAL TIME - *Doors Opened* (date [mm-dd-yy] and time [hh:mm]): 11/19/97 0734
Cell Designation ff Center Observed water depth (ft): ___ Direction of tide: Flood
Tidal Conditions: ___
Tug Position - determined by Differential Global Positioning System (DGPS) based on New Jersey Mercator NAD 27 coordinates: Tug HDG -040°
- North: 40°40' 45.3188"
- East: 74° 08' 13.8923"

Location of Scow relative to Tug: Stern port side of scow on Starboard side of tug

END DISPOSAL TIME - (date [mm-dd-yy] and time [hh:mm]): 11/19/97 0734
Cell Designation center of cell slightly north of the east/west markers
Tug Position - determined by Differential Global Positioning System (DGPS) based on New Jersey Mercator NAD 27 coordinates:
- North: 40° 40' 48.8188"
- East: 74° 08' 13.4884"

Location of Scow relative to Tug: Starboard side of tug 8 5' wide

POST-DISPOSAL OPERATIONS

Time scow **leaves entrance channel to Newark Bay Confined Disposal Area** (date [mm-dd-yy] and time [hh:mm]): 11/19/97 0747

Time scow **returned to dredge site** (date [mm-dd-yy] and time [hh:mm]): 11/19/97 1020

COMMENTS**: Lots of floating logs + pilings after disposal.
Great Lakes Survey vessel collected item as

**Record any comments or observations including any delays, variances from anticipated plans, difficulties, etc. For any spills, accidents, or emergencies at a minimum, record immediate actions taken, notifications made, initial assessment of damage and proposed future actions.

FORM NB05

TRANSPORTATION AND DISPOSAL LOG
INSPECTOR'S LOG FOR DISPOSAL FROM SPLIT-HULL SCOWS

Basic Disposal Information & Status

Date: 11/19/97

oject: LIBERTY STATE PARK — Permit Number: 95-053-74

ow Owner: GREAT LAKES D.D. — Trip Number: 12

spector's Name: L CRAIG — Inspector's Signature:

escription of Material: CAT 2 MUD, SILT, PLUNGS, LOGS

ug's Navigational Unit (Manufacturer/Model): TRIMBLE NAVIGATION NT200D GPS

TUG AND SCOW INFORMATION

ug Name: DENMOR C LYNN — Tug Captain: B COLLINESI

cow Name or Number: GL 33 — Scowman's Name: W. MONEONY

LOADING INFORMATION

olume of material (cu yds): 3290

ime scow loading is complete (hh:mm): 2300

cow draft forward (ft): 15 — Scow draft aft (ft): 15

cow draft port (ft): — Scow draft starboard (ft): X

TRANSIT INFORMATION

Depart dredge site (date [mm-dd-yy] and time [hh:mm]): 11/19/97 2320 to berth 74-026

Length of tow line (if applicable) (ft): —

Time scow **arrives at entrance channel to Newark Bay Confined Disposal Area** date [mm-dd-yy] and time [hh:mm]): 11/19/97 0837

DISPOSAL SITE WEATHER CONDITIONS

Wind Direction (from): — Wind Speed (mph): —

Weather Conditions: Clear & sunny — Visibility (no. miles): 20 miles

Wave/Swell Height (ft): glassy calm 0 ft — Temperature: 39°

DISPOSAL INSTRUCTIONS (from Disposal Site Manager)

Disposal cell(s) where material is to be discharged: —

Marker buoys where material is to be discharged: Center pit at Junction of 2 Range markers

Scow speed (kts): 0.0

Trip 12

DISPOSAL OPERATIONS (Bottom Dumping)

START DISPOSAL TIME - *Doors Opened* (date [mm-dd-yy] and time [hh:mm]): 11/19/97 0944

Cell Designation Cell pit Observed water depth (ft): _____ Direction of tide: Flood

Tidal Conditions: _____

Tug Position - determined by Differential Global Positioning System (DGPS) based on New Jersey Mercator NAD 27 coordinates:

Tug Heading 047°

- North: 40° 40.7529'
- East: 74° 08.2185'

Location of Scow relative to Tug: Outside tug to stern and to Starboard side of scow

END DISPOSAL TIME - (date [mm-dd-yy] and time [hh:mm]): 11/19/97 0944

Cell Designation North Central section of pit

Tug Position - determined by Differential Global Positioning System (DGPS) based on New Jersey Mercator NAD 27 coordinates:

Tug Heading 048°

- North: 40° 40.7528'
- East: 74° 08.2494'

Location of Scow relative to Tug: Outside of Tug 3FT wide

POST-DISPOSAL OPERATIONS

Time scow **leaves entrance channel to Newark Bay Confined Disposal Area** (date [mm-dd-yy] and time [hh:mm]): 11/19/97 0853

Time scow **returned to dredge site** (date [mm-dd-yy] and time [hh:mm]): 11/19/97 0900

to berth 74

COMMENTS:**

Lots of small floating logs being chased down by Great Lakes Dredge Vessel

**Record any comments or observations including any delays, variances from anticipated plans, difficulties, etc. For any spills, accidents, or emergencies at a minimum, record immediate actions taken, notifications made, initial assessment of damage and proposed future actions.

FORM NB05

TRANSPORTATION AND DISPOSAL LOG
INSPECTOR'S LOG FOR DISPOSAL FROM SPLIT-HULL SCOWS

Basic Disposal Information & Status

Date: 11/19/97

Project: LIBERTY STATE PARK
Permit Number: 95-05574
Scow Owner: GREAT LAKES D&D
Trip Number: 13
Inspector's Name: L. CRAIG
Inspector's Signature:
Description of Material: SAND & MUD SILT BLEND LOAM
Tug's Navigational Unit (Manufacturer/Model): FURUNO 1000SDS

TUG AND SCOW INFORMATION

Tug Name: McCormack Boys
Tug Captain: TUTOTSAN
Scow Name or Number: GL32
Scowman's Name: M. SLAHL

LOADING INFORMATION

Volume of material (cu yds): 3000
Time scow loading is complete (hh:mm): 1235
Scow draft forward (ft): 14.0
Scow draft aft (ft): 14.0
Scow draft port (ft): X
Scow draft starboard (ft): X

TRANSIT INFORMATION

Depart dredge site (date [mm-dd-yy] and time [hh:mm]): 11/19/97 1240
Length of tow line (if applicable) (ft): —

Time scow **arrives at entrance channel to Newark Bay Confined Disposal Area** (date [mm-dd-yy] and time [hh:mm]): 11/19/97 1536

DISPOSAL SITE WEATHER CONDITIONS

Wind Direction (from): W
Wind Speed (mph): 5-10
Weather Conditions: Clear + Sunny
Visibility (no. miles): 20 MILES
Wave/Swell Height (ft): Ripple 0ft
Temperature: 42°

DISPOSAL INSTRUCTIONS (from Disposal Site Manager)

Disposal cell(s) where material is to be discharged: —
Marker buoys where material is to be discharged: Junction of 3 markers
Scow speed (kts): 0.0

Tr. P 13

DISPOSAL OPERATIONS (Bottom Dumping)

START DISPOSAL TIME - *Doors Opened* (date [mm-dd-yy] and time [hh:mm]): 11/19/07 15:45

Cell Designation Pt Center Observed water depth (ft): _____ Direction of tide: EBB

Tidal Conditions: _____

Tug Position - determined by Differential Global Positioning System (DGPS) based on New Jersey Mercator NAD 27 coordinates:

Tug HEADING - 049°

- North: 40° 40' 44.1219"
- East: 74° 08' 17.3414"

Location of Scow relative to Tug: stern of scow ported on tugs starboard side

END DISPOSAL TIME - (date [mm-dd-yy] and time [hh:mm]): 11/19/07 15:45

Cell Designation Center of Pt

Tug Position - determined by Differential Global Positioning System (DGPS) based on New Jersey Mercator NAD 27 coordinates:

HDG 051°

- North: 40° 40' 44.3376
- East: 74° 08' 17.3799

Location of Scow relative to Tug: Starboard midship slightly

POST-DISPOSAL OPERATIONS

Time scow **leaves entrance channel to Newark Bay Confined Disposal Area** (date [mm-dd-yy] and time [hh:mm]): 11/19/07 1655

Time scow **returned to dredge site** (date [mm-dd-yy] and time [hh:mm]): 11/19/07

COMMENTS**: To Berth 74 at 1667

Lots of floating logs being observed down by the Great Lakes Survey Vessel

**Record any comments or observations including any delays, variances from anticipated plans, difficulties, etc. For any spills, accidents, or emergencies at a minimum, record immediate actions taken, notifications made, initial assessment of damage and proposed future actions.

FORM NB05

TRANSPORTATION AND DISPOSAL LOG
INSPECTOR'S LOG FOR DISPOSAL FROM SPLIT-HULL SCOWS

Basic Disposal Information & Status

Date: 11/20/97

roject: LIBERTY STATE PARK FERRY TERMINAL Permit Number: 95-055 74

ow Owner: GREAT LAKES D&R Trip Number: 12

ıspector's Name: LINDA CREAIA Inspector's Signature:

escription of Material: CAT F MUD SILT PLUMOSO LOAM

ug's Navigational Unit (Manufacturer/Model): TRIMBLE NAVIGATION NT 200 D GPS

Post-it® Fax Note 7671 | Date | # of pages ▲
To DAVID FOSTER | From L CREAIA
Co./Dept. MALCOLM PIRNIE | Co. AIS
Phone # | Phone #
Fax # 973-5922340 | Fax # 201-[illegible]

UG AND SCOW INFORMATION

ıg Name: DORMAR / LYNN Tug Captain: R. CELLINOSI

ow Name or Number: GL 25 Scowman's Name: W KONECNY

)ADING INFORMATION

)lume of material (cu yds): 2700

ne scow loading is complete (hh:mm): est approx 1700

)w draft forward (ft): 13.5 Scow draft aft (ft): 13.0

)w draft port (ft): Scow draft starboard (ft): X

ANSIT INFORMATION

)art dredge site (date [mm-dd-yy] and time [hh:mm]): 11/19/97 1830 for Berth 32 St Brooklyn

gth of tow line (if applicable) (ft): —

left Brooklyn at 2340

Left Berth 72 Port Elizabeth 0715

e scow arrives at entrance channel to Newark Bay Confined Disposal Area

e [mm-dd-yy] and time [hh:mm]): 11/20/97 0723

POSAL SITE WEATHER CONDITIONS

d Direction (from): SW Wind Speed (mph): 5-10

ther Conditions: Clear + Sunny early Visibility (no. miles): 20 mile

e/Swell Height (ft): Glassy smooth 0 Temperature: 44°

'OSAL INSTRUCTIONS (from Disposal Site Manager)

)sal cell(s) where material is to be discharged: —

er buoys where material is to be discharged: Junction of 3 range markers

speed (kts): 0.0

Trip 20

DISPOSAL OPERATIONS (Bottom Dumping)

START DISPOSAL TIME - *Doors Opened* (date [mm-dd-yy] and time [hh:mm]): 11/20/97 0732
Cell Designation Pot Center Observed water depth (ft): _____ Direction of tide: Flood
Tidal Conditions: _____
Tug Position - determined by Differential Global Positioning System (DGPS) based on New Jersey Mercator NAD 27 coordinates:
- North: 40°40. 7409'
- East: 74°04. 0400'

Tug Heading 044°
Location of Scow relative to Tug: portside of tug to stern end of starboard side of scow

END DISPOSAL TIME - (date [mm-dd-yy] and time [hh:mm]): 11/20/97 0731
Cell Designation Sight North Extension
Tug Position - determined by Differential Global Positioning System (DGPS) based on New Jersey Mercator NAD 27 coordinates:
- North: 40°40. 7437'
- East: 74°08. 2567'

HDG 024°
Location of Scow relative to Tug: portside

POST-DISPOSAL OPERATIONS

Time scow **leaves entrance channel to Newark Bay Confined Disposal Area** (date [mm-dd-yy] and time [hh:mm]): 11/20/97 0736

Time scow **returned to dredge site** (date [mm-dd-yy] and time [hh:mm]): to berth 74 11/20/97 0827

COMMENTS**: 3-5' kts steering and being towed by the GREAT LAKES Survey vessel

Last load - job finished

**Record any comments or observations including any delays, variances from anticipated plans, difficulties, etc. For any spills, accidents, or emergencies at a minimum, record immediate actions taken, notifications made, initial assessment of damage and proposed future actions.

Attachment No. 4
NBCDF Water Quality Monitoring Data

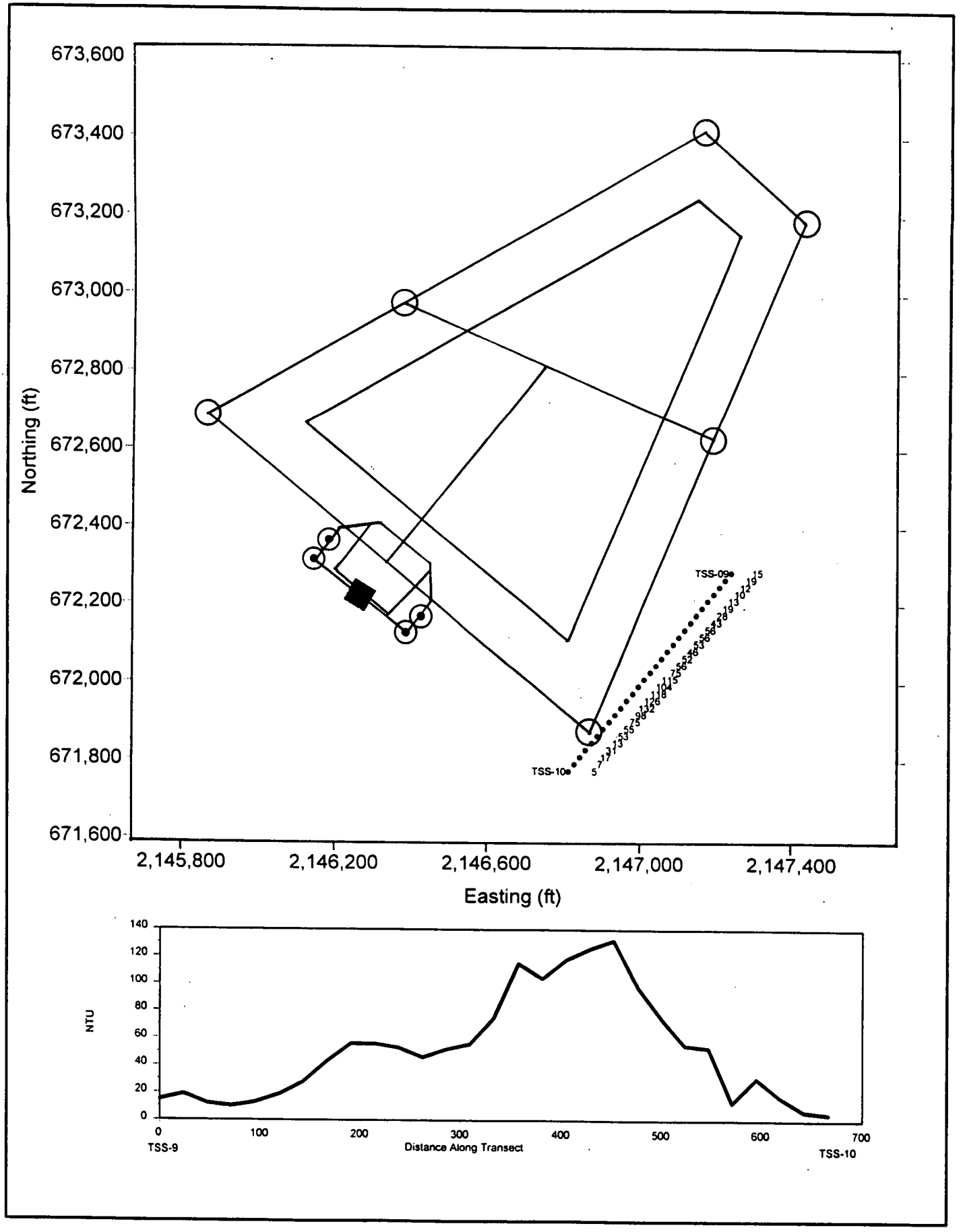

Figure 1. Location of transect and turbidity (NTU) measurements collected in conjunction with plume tracking at 0.25-hour interval during Dump Event No. 3 on 16 November 1997 at the Newark Bay CDF.

TABLE 1 LIST OF SAMPLING STATION LOCATIONS USED FOR WATER QUALITY MONITORING AT THE NEWARK BAY CDF

Station Number	Northings	Eastings
TSS-1	672,220	2,146,266
TSS-2	672,358	2,145,883
TSS-3	672,735	2,145,636
TSS-4	673,090	2,146,067
TSS-5	673,367	2,146,678
TSS-6	673,717	2,147,242
TSS-7	673,493	2,147,715
TSS-8	672,850	2,147,465
TSS-9	672,282	2,147,241
TSS-10	671,771	2,146,813
TSS-11	671,850	2,146,492

NOTE: The coordinates shown are based on New Jersey Mercator NAD 27.

TABLE 2 SUMMARY OF TIDE, WIND, AND WAVE CONDITIONS DURING EACH DUMP EVENT MONITORING INTERVAL FOR LIFT 1 AT THE NEWARK BAY CDF

Dump Event No.	Date	Enter Time	Dump Time	Exit Time	CDF Cell	Interval	Wind Direction	Wind Speed (mph)	Wave Height (ft)	Tide Stage	Shipping Traffic
1	11/15/97	4:12 PM	4:30 PM	4:40 PM	Yellow	Control	W	7	0.5	SBF	Minimal
						0.25	W	7	0.5	FLOOD	Minimal
						0.75	W	10	0.5	FLOOD	
						1.25	W	10	0.5	FLOOD	
						1.75	W	5	0.5	FLOOD	
2	11/16/97	7:30 AM	7:40 AM	7:55 AM	Yellow	Control	W	10	0.5	FLOOD	
						0.25	W	1.5	0.5	FLOOD	
						0.75	W	10	0.5	FLOOD	
3	11/16/97	9:15 AM	9:30 AM	9:45 AM	Yellow	Control	W	10	0.5	FLOOD	Minimal
						0.25	W	15	0.5	SBE	Minimal
						0.75	NW	15	0.5	SBE	Minimal
						1.25	NW	15	0.5	EBB	Minimal
						1.75	NW	15	0.5	EBB	Minimal
4	11/16/97	4:20 PM	4:30 PM	4:35 PM	Yellow	Control	W	20	1.5	SBF	
						0.25	W	10	0.5	SBF	
						0.75	W	5	0.5	SBF	
						1.25	W	5	0.5	SBF	
						1.75	W	5	0.5	FLOOD	
5	11/17/97	7:20 AM	7:30 AM		Yellow	Control	W	5	0	FLOOD	
						0.25	W	5	0	FLOOD	
						0.75	W	5	0	FLOOD	

TABLE 2 (Continued)

Dump Event No.	Date	Enter Time	Dump Time	Exit Time	CDF Cell	Interval	Wind Direction	Wind Speed (mph)	Wave Height (ft)	Tide Stage	Shipping Traffic
6	11/17/97	8:30 AM	8:40 AM	8:56 AM	Yellow	Control	W	5	0	FLOOD	
						0.25	W	5	0	FLOOD	
						0.75	W	5	0	SBE	
						1.25	W	10	0.5	SBE	
						1.75	W	10	0.5	SBE	
7	11/17/97	3:35 PM	3:45 PM	3:48 PM	Yellow	Control	W	10	0.5	EBB	
						0.25	SW	5	0.5	EBB	
						0.75	SW	10	0.5	EBB	
						1.25	SW	10	0.5	EBB	
						1.75	SW	15	0.5	SBF	
8	11/18/97	7:20 AM	7:30 AM	7:38 AM	Yellow	Control	SW	2	0	FLOOD	
						0.25	SW	1	0	FLOOD	
9	11/18/97	8:37 AM	8:45 AM	8:55 AM	Yellow	Control		0	0	FLOOD	
						0.25		0	0	FLOOD	
						0.75		0	0	FLOOD	
						1.25	SW	1	0	SBE	
						1.75	SW	1	0	SBE	
10	11/18/97	3:30 PM	3:35 PM	3:47 PM	Yellow	Control	SW	4	0.5	EBB	
						0.25	SW	4	0	EBB	
						0.75	SW	2	0	EBB	
						1.25	SW	5	0.5	EBB	
						1.75	SW	5	0	EBB	

TABLE 3 SUMMARY OF PHYSICAL/CHEMICAL DATA COLLECTED DURING LIFT 1 MONITORING AT THE NEWARK BAY CDF

Event No.	Sample Date	Sample Time	Sample Type	Sample Interval	Station Number	Sample Number	Station Depth	Sample Depth	Speed (cm/s)	Heading (deg)	Temperature °C)	Salinity (ppt)	Conductivity (mmhos/cm)	Transmissivity (NTU)	TSS (mg/L)
1	11/15/9	3:35 pm	Control	Control	1	1	18.0	1.5	0.0	341	9.22	19.2	31.8	3.0	45.6
	11/15/9	3:35 pm	Control	Control	1	2	18.0	16.5	0.0	341	9.28	18.8	28.7	2.0	32.4
	11/15/9	3:42 pm	Control	Control	6	4	4.0	2.0	0.0	269	9.11	18.7	30.8	3.0	34.4
	11/15/9	3:42 pm	Control	Control	6	3	4.0	1.5	0.0	269	9.22	18.7	30.9	2.0	43.6
	11/15/9	3:45 pm	Control	Control	7	5	4.0	1.5	0.0	350	9.11	18.3	29.9	2.0	34.0
	11/15/9	3:45 pm	Control	Control	7	6	4.0	2.5	0.0	350	9.22	18.2	30.0	2.0	42.0
	11/15/9	4:15 pm	Tug prop-wash	Control	1	8	19.0	17.5	9.77	330	9.33	18.7	30.1	8.0	43.2
	11/15/9	4:15 pm	Tug prop-wash	Control	1	7	19.0	1.5	9.77	330	9.28	19.1	30.5	3.0	35.2
	11/15/9	4:45 pm	Post-dump	0.25	6	10	4.0	2.5	20.58	338	9.28	16.7	28.2	3.0	25.6
	11/15/9	4:45 pm	Post-dump	0.25	6	9	4.0	1.5	20.58	338	9.28	16.7	28.2	3.0	30.8
	11/15/9	4:50 pm	Post-dump	0.25	7	11	6.0	1.5	24.69	343	9.28	18.2	30.5	4.0	25.6
	11/15/9	4:50 pm	Post-dump	0.25	7	12	6.0	4.5	24.69	343	9.28	18.2	30.5	4.0	32.0
	11/15/9	4:55 pm	Post-dump	0.25	1	14	22.0	18.5	24.18	340	9.39	18.6	28.7	7.0	38.8
	11/15/9	4:55 pm	Post-dump	0.25	1	13	22.0	1.5	24.18	340	9.39	18.7	28.7	5.0	41.6
	11/15/9	5:15 pm	Post-dump	0.75	1	16	22.0	18.0	24.69	350	9.33	18.7	28.7	6.0	52.0
	11/15/9	5:15 pm	Post-dump	0.75	1	15	22.0	1.5	24.69	350	9.39	18.7	28.7	5.0	39.2
	11/15/9	5:25 pm	Post-dump	0.75	7	18	4.0	2.0	27.78	348	9.39	18.6	31.3	3.0	31.6
	11/15/9	5:25 pm	Post-dump	0.75	7	17	4.0	1.5	27.78	348	9.28	19.0	30.1	4.0	37.2
	11/15/9	5:27 pm	Post-dump	0.75	6	19	6.0	1.5	27.78	348	9.33	17.9	29.9	4.0	28.0
	11/15/9	5:27 pm	Post-dump	0.75	6	20	6.0	4.5	27.78	348	9.39	18.8	30.5	6.0	26.8
	11/15/9	5:42 pm	Post-dump	1.25	6	21	6.0	1.5	28.81	347	9.22	19.2	29.8	2.0	36.4
	11/15/9	5:42 pm	Post-dump	1.25	6	22	6.0	4.5	28.81	347	9.33	18.1	30.3	5.0	35.2
	11/15/9	5:48 pm	Post-dump	1.25	7	24	4.0	2.5	29.32	347	9.33	19.0	31.2	3.0	36.0
	11/15/9	5:48 pm	Post-dump	1.25	7	23	4.0	1.5	29.32	347	9.28	19.3	29.8	2.0	31.2
	11/15/9	5:55 pm	Post-dump	1.25	1	26	20.0	18.5	28.29	345	9.39	18.9	29.9	5.0	45.6
	11/15/9	5:55 pm	Post-dump	1.25	1	25	20.0	1.5	28.29	345	9.28	18.7	30.7	3.0	38.4
	11/15/9	6:12 pm	Post-dump	1.75	1	28	22.0	18.5	31.38	348	9.22	18.5	31.4	5.0	48.8
	11/15/9	6:12 pm	Post-dump	1.75	1	27	22.0	1.5	31.38	348	9.11	18.7	32.1	1.0	33.6
	11/15/9	6:20 pm	Post-dump	1.75	6	30	6.50	5.0	29.32	352	9.11	18.6	30.3	4.0	29.6
	11/15/9	6:20 pm	Post-dump	1.75	6	29	6.50	1.5	29.32	352	9.06	19.0	29.5	2.0	30.8
	11/15/9	6:24 pm	Post-dump	1.75	7	32	8.50	7.0	29.84	352	9.22	19.0	31.3	2.0	28.8
	11/15/9	6:24 pm	Post-dump	1.75	7	31	8.50	1.5	29.84	352	9.06	19.1	29.8	3.0	33.6

TABLE 3 (Continued)

Event No.	Sample Date	Sample Time	Sample Type	Sample Interval	Station Number	Sample Number	Station Depth	Sample Depth	Speed (cm/s)	Heading (deg)	Temperature °C)	Salinity (ppt)	Conductivity (mmhos/cm)	Transmissivity (NTU)	TSS (mg/L)
2	11/16/9	7:05 am	Control	Control	1	33	23.0	1.5	31.38	352	9.11	18.8	31.0	0.0	29.2
	11/16/9	7:05 am	Control	Control	1	34	23.0	18.0	31.38	352	9.28	19.9	31.7	2.0	35.2
	11/16/9	7:15 am	Control	Control	7	35	10.0	1.5	28.81	340	9.22	18.6	30.1	1.0	32.4
	11/16/9	7:15 am	Control	Control	7	36	10.0	8.5	28.81	340	9.28	19.4	30.4	1.0	34.4
	11/16/9	7:20 am	Control	Control	6	37	8.0	1.5	25.21	343	9.22	19.6	31.0	1.0	35.6
	11/16/9	7:20 am	Control	Control	6	38	8.0	6.5	25.21	343	9.22	18.8	30.4	1.0	43.2
	11/16/9	7:35 am	Tug prop-wash	Control	1	39	18.0	1.5	21.60	348	9.22	14.2	30.5	12.0	92.0
	11/16/9	7:35 am	Tug prop-wash	Control	1	40	18.0	16.5	21.60	348	9.28	20.5	31.3	47.0	38.0
	11/16/9	7:55 am	Post-dump	0.25	7	41	10.0	1.5	16.46	331	9.22	14.6	31.8	1.0	32.0
	11/16/9	7:55 am	Post-dump	0.25	7	42	10.0	8.5	16.46	331	9.22	19.6	32.5	2.0	36.4
	11/16/9	8:00 am	Post-dump	0.25	6	44	8.0	6.5	18.0	314	9.22	19.6	30.7	3.0	24.8
	11/16/9	8:00 am	Post-dump	0.25	6	43	8.0	1.5	18.0	314	8.89	19.0	31.5	1.0	33.2
	11/16/9	8:05 am	Post-dump	0.25	1	45	23.0	1.5	16.98	316	9.06	19.3	31.9	1.0	37.2
	11/16/9	8:05 am	Post-dump	0.25	1	46	23.0	20.0	16.98	316	9.0	19.2	32.1	1.0	69.6
	11/16/9	8:20 am	Post-dump	0.75	1	47	23.0	1.5	16.46	316	9.11	18.5	31.4	1.0	32.0
	11/16/9	8:20 am	Post-dump	0.75	1	48	23.0	20.0	16.46	316	9.28	19.9	32.9	10.0	57.2
	11/16/9	8:25 am	Post-dump	0.75	7	49	9.0	1.5	18.0	310	9.11	19.9	32.0	0.0	31.6
	11/16/9	8:25 am	Post-dump	0.75	7	50	9.0	7.5	18.0	310	9.22	19.8	30.4	1.0	26.8
	11/16/9	8:30 am	Post-dump	0.75	6	51	7.0	1.5	22.12	306	9.0	18.9	31.6	0.0	24.0
	11/16/9	8:30 am	Post-dump	0.75	6	52	7.0	5.5	22.12	306	9.11	18.7	31.0	0.0	25.6

TABLE 3 (Continued)

Event No.	Sample Date	Sample Time	Sample Type	Sample Interval	Station Number	Sample Number	Station Depth	Sample Depth	Speed (cm/s)	Heading (deg)	Temperature °C)	Salinity (ppt)	Conductivity (mmhos/cm)	Transmissivity (NTU)	TSS (mg/L)
3	11/16/9	8:50 am	Control	Control	6	53	7.0	1.5	18.0	302	9.0	19.2	31.8	0.0	72.4
	11/16/9	8:50 am	Control	Control	6	54	7.0	5.5	18.0	302	9.11	18.5	31.3	0.0	24.8
	11/16/9	8:55 am	Control	Control	7	56	10.0	8.5	7.20	302	9.11	18.7	31.5	0.0	26.0
	11/16/9	8:55 am	Control	Control	7	55	10.0	1.5	7.20	302	9.0	18.7	30.9	0.0	23.6
	11/16/9	9:00 am	Control	Control	1	58	22.0	20.0	0.51	241	9.28	19.3	32.1	5.0	37.2
	11/16/9	9:00 am	Control	Control	1	57	22.0	1.5	0.51	241	8.89	18.2	30.2	0.0	37.2
	11/16/9	9:15 am	Tug prop-wash	Control	1	60	17.0	15.5	7.20	154	9.28	19.6	32.4	36.0	39.2
	11/16/9	9:15 am	Tug prop-wash	Control	1	59	17.0	1.5	7.20	154	8.89	19.0	30.3	0.0	26.0
	11/16/9	9:45 am	Post-dump	0.25	9	62	8.0	6.5	10.29	123	9.28	19.7	31.7	23.0	98.0
	11/16/9	9:45 am	Post-dump	0.25	9	61	8.0	1.5	10.29	123	9.28	19.5	31.7	43.0	99.2
	11/16/9	9:50 am	Post-dump	0.25	8	64	9.0	7.5	7.20	136	9.11	19.0	30.6	0.0	23.6
	11/16/9	9:50 am	Post-dump	0.25	8	63	9.0	1.5	7.20	136	9.11	18.7	30.3	0.0	47.6
	11/16/9	9:55 am	Post-dump	0.25	7	66	10.0	8.5	9.26	140	9.28	19.4	30.9	0.0	16.0
	11/16/9	9:55 am	Post-dump	0.25	7	65	10.0	1.5	9.26	140	9.11	18.6	30.2	0.0	26.8
	11/16/9	10:00	Post-dump	0.25	1	67	25.0	1.5	10.29	164	9.11	18.7	30.5	0.0	22.8
	11/16/9	10:00	Post-dump	0.25	1	68	25.0	20.0	10.29	164	9.28	19.7	30.9	3.0	26.4
	11/16/9	10:12	Post-dump	0.75	1	70	17.0	15.5	9.26	130	9.28	20.1	31.4	2.0	32.0
	11/16/9	10:12	Post-dump	0.75	1	69	16.0	1.5	9.26	130	9.11	19.0	30.5	0.0	29.2
	11/16/9	10:17	Post-dump	0.75	9	71	8.50	1.5	6.17	126	9.11	18.7	30.4	0.0	29.2
	11/16/9	10:17	Post-dump	0.75	9	72	8.50	7.0	6.17	126	9.11	19.1	31.0	0.0	18.8
	11/16/9	10:22	Post-dump	0.75	8	74	8.0	6.5	5.66	151	9.28	19.2	31.0	0.0	20.8
	11/16/9	10:22	Post-dump	0.75	8	73	8.0	1.5	5.66	151	9.0	18.8	31.2	0.0	23.6
	11/16/9	10:27	Post-dump	0.75	7	76	9.0	7.5	11.32	194	9.22	19.6	32.0	0.0	19.6
	11/16/9	10:27	Post-dump	0.75	7	75	9.0	1.5	11.32	194	9.11	18.8	30.5	0.0	23.2
	11/16/9	10:40	Post-dump	1.25	9	78	9.50	8.0	2.57	337	9.22	19.1	29.9	0.0	24.4
	11/16/9	10:40	Post-dump	1.25	9	77	9.50	1.5	2.57	337	9.11	19.7	30.8	0.0	31.2
	11/16/9	10:45	Post-dump	1.25	10	80	16.0	14.5	2.57	355	9.22	19.0	31.9	0.0	19.6
	11/16/9	10:45	Post-dump	1.25	10	79	16.0	1.5	2.57	355	9.11	19.2	31.0	0.0	24.8
	11/16/9	10:50	Post-dump	1.25	1	81	22.0	1.5	1.03	9	9.11	18.9	31.3	0.0	27.2
	11/16/9	10:50	Post-dump	1.25	1	82	22.0	20.0	1.03	9	9.23	19.0	30.9	0.0	21.2
	11/16/9	11:10	Post-dump	1.75	1	84	20.0	18.0	0.51	251	9.28	19.6	30.5	0.0	22.0
	11/16/9	11:10	Post-dump	1.75	1	83	20.0	1.5	0.51	251	9.22	19.8	30.5	0.0	42.0
	11/16/9	11:14	Post-dump	1.75	10	85	17.0	1.5	5.14	167	9.22	19.9	31.2	0.0	30.0
	11/16/9	11:14	Post-dump	1.75	10	86	17.0	15.5	5.14	167	9.22	20.0	30.4	0.0	26.0
	11/16/9	11:18	Post-dump	1.75	9	87	8.0	1.5	6.17	161	9.11	19.6	30.8	0.0	32.0
	11/16/9	11:18	Post-dump	1.75	9	88	8.0	6.5	6.17	161	9.11	19.4	31.7	0.0	29.2

TABLE 3 (Continued)

Event No.	Sample Date	Sample Time	Sample Type	Sample Interval	Station Number	Sample Number	Station Depth	Sample Depth	Speed (cm/s)	Heading (deg)	Temperature °C)	Salinity (ppt)	Conductivity (mmhos/cm)	Transmissivity (NTU)	TSS (mg/L)
4	11/16/9	3:35 pm	Control	Control	1	90	19.0	17.5	1.03	320	9.22	19.5	30.4	5.0	30.8
	11/16/9	3:35 pm	Control	Control	1	89	19.0	1.5	1.03	320	8.89	17.5	29.8	5.0	35.6
	11/16/9	3:43 pm	Control	Control	9	92	3.50	2.0	2.57	340	8.89	16.2	27.6	9.0	39.6
	11/16/9	3:43 pm	Control	Control	9	91	3.50	1.5	2.57	340	8.89	16.8	27.4	8.0	34.8
	11/16/9	3:47 pm	Control	Control	8	93	4.0	1.5	2.57	340	9.22	16.3	26.9	7.0	38.4
	11/16/9	3:47 pm	Control	Control	8	94	4.0	2.5	2.57	340	8.89	17.0	27.4	8.0	31.2
	11/16/9	4:25 pm	Tug prop-wash	Control	1	95	15.0	1.5	1.03	74	8.78	17.6	29.0	5.0	50.0
	11/16/9	4:25 pm	Tug prop-wash	Control	1	96	15.0	13.5	1.03	74	8.89	18.2	24.0	4.0	87.2
	11/16/9	4:40 pm	Post-dump	0.25	8	97	3.0	1.5	3.60	129	8.78	15.6	25.8	8.0	47.6
	11/16/9	4:40 pm	Post-dump	0.25	8	98	3.0	1.5	3.60	129	8.78	15.6	25.8	6.0	38.0
	11/16/9	4:46 pm	Post-dump	0.25	9	100	3.0	1.5	2.57	130	8.78	15.9	25.9	6.0	37.2
	11/16/9	4:46 pm	Post-dump	0.25	9	99	3.0	1.5	2.57	130	8.78	15.9	26.9	7.0	35.6
	11/16/9	4:50 pm	Post-dump	0.25	1	101	19.0	1.5	5.14	144	8.89	18.1	27.3	9.0	38.8
	11/16/9	4:50 pm	Post-dump	0.25	1	102	19.50	18.0	5.14	144	9.0	18.7	30.0	7.0	31.6
	11/16/9	5:10 pm	Post-dump	0.75	1	104	20.0	18.5	5.66	9	8.61	18.9	29.8	3.0	39.2
	11/16/9	5:10 pm	Post-dump	0.75	1	103	20.0	1.5	5.66	9	NR	NR	NR	5.0	33.6
	11/16/9	5:15 pm	Post-dump	0.75	9	105	4.0	1.5	9.77	347	8.72	16.2	26.4	4.0	28.4
	11/16/9	5:15 pm	Post-dump	0.75	9	106	4.0	2.5	9.77	347	NR	NR	NR	NR	32.8
	11/16/9	5:22 pm	Post-dump	0.75	8	107	4.0	1.5	9.77	331	8.61	16.2	26.3	4.0	36.8
	11/16/9	5:22 pm	Post-dump	0.75	8	108	4.0	1.5	9.77	331	8.61	16.2	26.3	4.0	27.6
	11/16/9	5:40 pm	Post-dump	1.25	8	110	4.0	2.5	26.23	329	NR	NR	NR	NR	37.2
	11/16/9	5:40 pm	Post-dump	1.25	8	109	4.0	1.5	26.23	329	NR	NR	NR	6.0	42.8
	11/16/9	5:45 pm	Post-dump	1.25	9	112	4.50	2.0	29.84	334	NR	NR	NR	2.0	42.0
	11/16/9	5:45 pm	Post-dump	1.25	9	111	4.50	1.5	29.84	334	NR	NR	NR	4.0	29.2
	11/16/9	5:50 pm	Post-dump	1.25	1	113	19.0	1.5	29.32	340	NR	NR	NR	2.0	33.2
	11/16/9	5:50 pm	Post-dump	1.25	1	114	19.0	17.5	29.32	340	NR	NR	NR	2.0	42.8
	11/16/9	6:05 pm	Post-dump	1.75	1	115	19.0	1.5	29.84	338	NR	NR	NR	3.0	36.0
	11/16/9	6:05 pm	Post-dump	1.75	1	116	19.0	17.5	29.84	338	NR	NR	NR	NR	41.2
	11/16/9	6:10 pm	Post-dump	1.75	9	117	4.50	1.5	32.41	338	NR	NR	NR	8.0	51.6
	11/16/9	6:10 pm	Post-dump	1.75	9	118	4.50	3.0	32.41	338	7.22	NR	NR	3.0	37.2
	11/16/9	6:15 pm	Post-dump	1.75	8	119	4.50	1.5	32.41	337	6.94	NR	NR	2.0	34.0
	11/16/9	6:15 pm	Post-dump	1.75	8	120	4.50	3.0	32.41	337	6.94	NR	NR	2.0	38.0

NOTE: NR = Water quality parameters not recorded due to field instrument problems.

TABLE 3 (Continued)

Event No.	Sample Date	Sample Time	Sample Type	Sample Interval	Station Number	Sample Number	Station Depth	Sample Depth	Speed (cm/s)	Heading (deg)	Temperature °C)	Salinity (ppt)	Conductivity (mmhos/cm)	Transmissivity (NTU)	TSS (mg/L)
5	11/17/9	6:50 am	Control	Control	1	121	18.0	1.5	30.86	350	8.78	19.4	31.3	NR	51.2
	11/17/9	6:50 am	Control	Control	1	122	18.0	16.5	30.86	350	8.94	19.7	31.6	2.0	33.6
	11/17/9	7:04 am	Control	Control	6	124	6.0	4.5	31.89	351	8.61	19.0	30.7	3.0	29.6
	11/17/9	7:04 am	Control	Control	6	123	6.0	1.5	31.89	351	8.39	18.9	30.5	7.0	32.0
	11/17/9	7:08 am	Control	Control	7	125	9.0	1.5	27.26	347	8.61	18.9	30.2	1.0	41.6
	11/17/9	7:08 am	Control	Control	7	126	9.0	6.5	27.26	347	8.56	19.0	30.7	2.0	34.8
	11/17/9	7:28 am	Tug prop-wash	Control	1	127	18.0	1.5	30.86	350	8.50	19.1	30.7	1.0	42.0
	11/17/9	7:28 am	Tug prop-wash	Control	1	128	18.0	16.5	30.86	350	8.67	19.0	30.7	2.0	57.6
	11/17/9	7:40 am	Post-dump	0.25	7	129	9.0	1.5	31.89	351	3.70	19.5	31.0	1.0	38.8
	11/17/9	7:40 am	Post-dump	0.25	7	130	9.0	7.5	31.89	351	3.90	19.4	29.9	1.0	34.4
	11/17/9	7:46 am	Post-dump	0.25	6	132	6.0	4.5	29.84	351	4.0	18.4	29.9	1.0	36.8
	11/17/9	7:46 am	Post-dump	0.25	6	131	6.0	1.5	29.84	351	4.10	18.0	29.7	1.0	41.2
	11/17/9	7:52 am	Post-dump	0.25	1	133	20.0	1.5	25.21	348	4.40	19.3	30.7	1.0	44.8
	11/17/9	7:52 am	Post-dump	0.25	1	134	20.0	18.5	25.21	348	4.40	19.2	29.8	2.30	60.0
	11/17/9	8:10 am	Post-dump	0.75	1	135	20.0	1.5	22.63	341	8.33	19.4	31.3	1.0	52.0
	11/17/9	8:10 am	Post-dump	0.75	1	136	20.0	18.5	22.63	341	4.70	19.6	31.7	2.0	35.2
	11/17/9	8:12 am	Post-dump	0.75	6	137	6.0	1.5	22.63	341	4.90	18.8	30.5	9.0	40.4
	11/17/9	8:12 am	Post-dump	0.75	6	138	6.0	4.5	22.63	341	4.90	19.0	30.8	9.0	43.6
	11/17/9	8:16 am	Post-dump	0.75	7	139	9.0	1.5	21.09	331	5.0	18.9	31.3	5.0	50.4
	11/17/9	8:16 am	Post-dump	0.75	7	140	9.0	7.5	21.09	331	5.0	19.2	31.6	2.0	59.2

TABLE 3 (Continued)

Event No.	Sample Date	Sample Time	Sample Type	Sample Interval	Station Number	Sample Number	Station Depth	Sample Depth	Speed (cm/s)	Heading (deg)	Temperature °C)	Salinity (ppt)	Conductivity (mmhos/cm)	Transmissivity (NTU)	TSS (mg/L)
6	11/17/9	8:18 am	Control	Control	7	142	8.0	6.5	23.15	338	5.40	19.8	30.0	4.0	52.4
	11/17/9	8:18 am	Control	Control	7	141	8.0	1.5	23.15	338	5.50	19.9	30.5	2.0	59.6
	11/17/9	8:21 am	Control	Control	6	143	6.0	1.5	23.15	338	5.60	20.2	31.8	3.0	50.8
	11/17/9	8:21 am	Control	Control	6	144	6.0	4.5	23.15	338	5.60	19.7	29.7	2.0	54.0
	11/17/9	8:25 am	Control	Control	1	145	18.0	1.5	25.72	350	5.40	19.6	29.4	0.0	52.8
	11/17/9	8:25 am	Control	Control	1	146	18.0	16.5	25.72	350	5.30	20.1	29.3	2.0	48.4
	11/17/9	8:30 am	Tug prop-wash	Control	1	147	18.0	1.5	25.21	355	5.30	20.2	31.1	1.0	53.6
	11/17/9	8:30 am	Tug prop-wash	Control	1	148	18.0	16.5	25.21	355	5.30	20.2	31.0	2.0	53.6
	11/17/9	8:50 am	Post-dump	0.25	7	149	9.0	1.5	23.15	347	5.50	19.2	30.9	3.0	47.6
	11/17/9	8:50 am	Post-dump	0.25	7	150	9.0	7.5	23.15	347	5.40	19.6	30.7	3.0	55.6
	11/17/9	8:53 am	Post-dump	0.25	6	152	6.0	4.5	20.06	341	5.60	19.0	29.3	1.0	30.4
	11/17/9	8:53 am	Post-dump	0.25	6	151	6.0	1.5	20.06	341	5.60	18.9	29.7	1.0	55.2
	11/17/9	8:58 am	Post-dump	0.25	1	153	20.0	1.5	17.49	338	5.90	18.9	30.7	1.0	30.8
	11/17/9	8:58 am	Post-dump	0.25	1	154	20.0	18.5	17.49	338	5.90	19.1	30.7	2.0	43.6
	11/17/9	9:20 am	Post-dump	0.75	1	155	22.0	21.5	15.95	309	6.0	19.1	31.0	1.0	49.6
	11/17/9	9:20 am	Post-dump	0.75	1	156	22.0	20.0	15.95	309	6.0	19.4	29.7	2.0	60.8
	11/17/9	9:28 am	Post-dump	0.75	6	158	8.0	6.5	15.95	317	6.10	18.4	30.6	4.0	74.0
	11/17/9	9:28 am	Post-dump	0.75	6	157	8.0	1.5	15.95	317	6.10	18.6	29.4	2.0	47.2
	11/17/9	9:32 am	Post-dump	0.75	7	160	10.0	8.5	15.95	317	6.30	19.1	30.8	2.0	54.0
	11/17/9	9:32 am	Post-dump	0.75	7	159	10.0	1.5	15.95	317	6.30	19.1	30.9	2.0	58.0
	11/17/9	9:50 am	Post-dump	1.25	7	161	10.0	1.5	19.03	310	6.20	19.4	31.0	2.0	58.0
	11/17/9	9:50 am	Post-dump	1.25	7	162	10.0	6.5	19.03	310	6.20	19.5	29.9	2.0	48.8
	11/17/9	9:57 am	Post-dump	1.25	6	163	8.0	1.5	20.58	307	6.30	18.0	29.8	1.0	56.0
	11/17/9	9:57 am	Post-dump	1.25	6	164	8.0	6.5	20.58	307	6.20	19.4	30.9	1.0	60.0
	11/17/9	10:04	Post-dump	1.25	1	165	22.0	1.5	13.37	312	6.40	19.6	30.7	1.0	65.6
	11/17/9	10:04	Post-dump	1.25	1	166	22.0	20.0	13.37	312	6.40	19.4	30.7	2.0	49.6
	11/17/9	10:25	Post-dump	1.75	1	167	22.0	1.5	3.09	192	6.40	19.2	31.8	1.0	51.6
	11/17/9	10:25	Post-dump	1.75	1	168	22.0	20.0	3.09	192	6.40	18.5	31.3	2.0	50.4
	11/17/9	10:30	Post-dump	1.75	6	170	8.0	6.5	7.20	174	6.50	19.3	31.6	1.0	44.8
	11/17/9	10:30	Post-dump	1.75	6	169	8.0	1.5	7.20	174	6.50	18.2	30.9	1.0	48.0
	11/17/9	10:35	Post-dump	1.75	7	171	10.0	1.5	10.29	175	6.60	19.0	30.2	1.0	48.4
	11/17/9	10:35	Post-dump	1.75	7	172	10.0	8.5	10.29	175	6.60	19.6	32.8	1.0	49.2

TABLE 3 (Continued)

Event No.	Sample Date	Sample Time	Sample Type	Sample Interval	Station Number	Sample Number	Station Depth	Sample Depth	Speed (cm/s)	Heading (deg)	Temperature °C)	Salinity (ppt)	Conductivity (mmhos/cm)	Transmissivity (NTU)	TSS (mg/L)
7	11/17/9	3:15 pm	Control	Control	1	173	18.0	1.5	2.57	261	6.80	22.6	36.0	2.60	48.8
	11/17/9	3:15 pm	Control	Control	1	174	18.0	16.0	2.57	261	6.80	23.1	35.3	2.90	58.4
	11/17/9	3:25 pm	Control	Control	8	176	4.0	2.5	4.63	320	6.90	21.8	33.6	3.60	54.0
	11/17/9	3:25 pm	Control	Control	8	175	4.0	1.5	4.63	320	6.90	22.2	34.1	4.40	55.6
	11/17/9	3:30 pm	Control	Control	9	178	5.0	3.5	2.57	343	7.0	19.9	29.9	3.30	55.6
	11/17/9	3:30 pm	Control	Control	9	177	4.0	1.5	2.57	343	7.0	20.9	34.1	3.10	58.4
	11/17/9	3:40 pm	Tug prop-wash	Control	1	179	24.0	1.5	1.03	29	7.0	21.3	32.3	1.40	56.8
	11/17/9	3:40 pm	Tug prop-wash	Control	1	180	24.0	20.0	1.03	29	7.10	22.1	32.1	1.40	57.2
	11/17/9	3:50 pm	Post-dump	0.25	8	181	4.0	1.5	1.54	181	7.0	19.4	30.5	2.20	54.8
	11/17/9	3:50 pm	Post-dump	0.25	8	182	4.0	2.5	1.54	181	7.0	18.3	29.3	2.30	50.0
	11/17/9	3:58 pm	Post-dump	0.25	9	184	5.0	3.5	2.06	194	7.20	19.3	29.7	2.40	62.0
	11/17/9	3:58 pm	Post-dump	0.25	9	183	5.0	1.5	2.06	194	7.20	18.1	29.4	2.0	56.0
	11/17/9	4:03 pm	Post-dump	0.25	1	185	18.0	1.5	1.54	291	7.20	19.2	30.8	2.60	53.6
	11/17/9	4:03 pm	Post-dump	0.25	1	186	18.0	16.5	1.54	291	7.20	19.3	30.8	2.80	64.8
	11/17/9	4:25 pm	Post-dump	0.75	1	187	24.0	1.5	2.57	177	6.80	21.1	32.3	1.90	46.4
	11/17/9	4:25 pm	Post-dump	0.75	1	188	24.0	20.0	2.57	177	6.90	19.4	31.0	2.0	48.8
	11/17/9	4:30 pm	Post-dump	0.75	9	189	6.0	1.5	2.57	140	6.80	19.1	30.1	2.40	52.8
	11/17/9	4:30 pm	Post-dump	0.75	9	190	6.0	4.5	2.57	140	6.80	18.4	29.9	2.30	55.6
	11/17/9	4:34 pm	Post-dump	0.75	8	191	3.0	1.5	2.57	156	6.90	19.9	31.0	2.20	54.8
	11/17/9	4:34 pm	Post-dump	0.75	8	192	3.0	1.5	2.57	156	6.90	19.0	30.8	2.20	48.2
	11/17/9	4:55 pm	Post-dump	1.25	8	193	3.0	1.5	0.0	300	6.50	19.2	30.0	2.20	56.0
	11/17/9	4:55 pm	Post-dump	1.25	8	194	3.0	1.5	0.0	300	6.50	18.8	29.9	2.20	52.4
	11/17/9	4:58 pm	Post-dump	1.25	9	195	5.0	1.5	0.51	314	6.50	18.9	29.6	1.60	51.6
	11/17/9	4:58 pm	Post-dump	1.25	9	196	5.0	3.5	0.51	314	6.50	19.1	31.0	1.60	52.0
	11/17/9	5:03 pm	Post-dump	1.25	1	198	20.0	18.0	1.03	163	6.60	18.2	30.0	1.80	42.8
	11/17/9	5:05 pm	Post-dump	1.25	1	197	20.0	1.5	1.03	163	6.60	19.4	31.3	1.70	59.2
	11/17/9	5:19 pm	Post-dump	1.75	1	199	23.0	1.5	0.51	158	6.50	19.2	31.6	1.30	45.6
	11/17/9	5:19 pm	Post-dump	1.75	1	200	28.0	18.0	0.51	158	6.50	19.7	30.3	1.30	45.6
	11/17/9	5:27 pm	Post-dump	1.75	9	202	5.0	3.5	0.51	237	6.50	19.0	30.7	1.50	56.4
	11/17/9	5:27 pm	Post-dump	1.75	9	201	5.0	1.5	0.51	237	6.50	18.7	30.6	1.30	51.6
	11/17/9	5:32 pm	Post-dump	1.75	8	203	3.0	1.5	4.63	314	6.50	18.6	30.9	1.40	48.4
	11/17/9	5:32 pm	Post-dump	1.75	8	204	3.60	1.5	4.63	314	6.50	18.7	30.5	1.40	60.4

TABLE 3 (Continued)

Event No.	Sample Date	Sample Time	Sample Type	Sample Interval	Station Number	Sample Number	Station Depth	Sample Depth	Speed (cm/s)	Heading (deg)	Temperature °C)	Salinity (ppt)	Conductivity (mmhos/cm)	Transmissivity (NTU)	TSS (mg/L)
8	11/18/9	6:48 am	Control	Control	1	205	22.0	1.5	31.38	345	7.80	19.5	31.0	1.30	50.8
	11/18/9	6:48 am	Control	Control	1	206	22.0	18.5	31.38	345	8.40	19.4	29.3	2.0	48.8
	11/18/9	6:58 am	Control	Control	6	207	8.0	1.5	32.92	347	7.70	18.0	29.4	1.30	166.0
	11/18/9	6:58 am	Control	Control	6	208	8.0	6.5	32.92	347	8.0	18.4	29.7	1.40	42.0
	11/18/9	7:06 am	Control	Control	7	209	11.0	1.5	31.38	345	7.80	19.9	30.7	0.70	38.0
	11/18/9	7:06 am	Control	Control	7	210	11.0	9.5	31.38	345	8.30	19.1	30.9	1.30	31.2
	11/18/9	7:27 am	Tug prop-wash	Control	1	211	22.0	1.5	32.92	341	7.90	18.9	30.0	3.30	34.4
	11/18/9	7:27 am	Tug prop-wash	Control	1	212	22.0	18.5	32.92	341	8.40	19.2	31.1	3.0	37.2
	11/18/9	7:43 am	Post-dump	0.25	6	213	6.0	1.5	29.84	351	8.20	19.2	31.0	1.20	40.4
	11/18/9	7:43 am	Post-dump	0.25	6	214	6.0	4.5	29.84	351	8.40	18.6	29.3	1.70	38.4
	11/18/9	7:48 am	Post-dump	0.25	7	215	9.0	1.5	28.81	348	8.10	18.8	29.4	1.20	43.2
	11/18/9	7:48 am	Post-dump	0.25	7	216	9.0	7.5	28.81	348	8.40	19.1	29.6	1.30	33.6
	11/18/9	7:53 am	Post-dump	0.25	1	217	18.0	1.5	28.29	345	8.20	19.6	30.7	1.30	31.6
	11/18/9	7:53 am	Post-dump	0.25	1	218	18.0	15.5	28.29	345	8.50	19.2	30.9	2.60	36.4

TABLE 3 (Continued)

Event No.	Sample Date	Sample Time	Sample Type	Sample Interval	Station Number	Sample Number	Station Depth	Sample Depth	Speed (cm/s)	Heading (deg)	Temperature °C)	Salinity (ppt)	Conductivity (mmhos/cm)	Transmissivity (NTU)	TSS (mg/L)
9	11/18/9	8:15 am	Control	Control	1	219	20.0	1.5	28.29	350	8.0	19.0	31.4	0.80	31.6
	11/18/9	8:15 am	Control	Control	1	220	20.0	18.0	28.29	350	7.70	18.7	30.0	3.30	52.4
	11/18/9	8:23 am	Control	Control	6	222	8.0	6.5	27.78	348	7.80	19.2	31.6	2.30	64.8
	11/18/9	8:23 am	Control	Control	6	221	8.0	1.5	27.78	348	7.90	18.9	29.9	1.0	45.6
	11/18/9	8:28 am	Control	Control	7	223	10.0	1.5	27.78	350	8.0	18.8	30.0	1.50	48.0
	11/18/9	8:28 am	Control	Control	7	224	10.0	8.5	27.78	350	8.10	18.7	30.7	2.30	41.6
	11/18/9	8:40 am	Tug prop-wash	Control	1	225	20.0	1.5	24.18	344	8.0	19.1	31.1	1.50	38.8
	11/18/9	8:40 am	Tug prop-wash	Control	1	226	20.0	18.0	24.18	344	8.20	19.2	29.9	4.90	76.8
	11/18/9	8:56 am	Post-dump	0.25	7	228	10.0	8.0	22.63	344	8.10	19.4	29.8	1.50	39.6
	11/18/9	8:56 am	Post-dump	0.25	7	227	10.0	1.5	22.63	344	7.80	19.2	31.0	0.80	60.0
	11/18/9	9:00 am	Post-dump	0.25	6	230	8.0	6.5	22.63	343	7.80	18.9	30.0	3.0	36.8
	11/18/9	9:00 am	Post-dump	0.25	6	229	8.0	1.5	22.63	343	7.70	20.1	31.2	2.20	30.0
	11/18/9	9:05 am	Post-dump	0.25	1	231	25.0	1.5	20.58	340	8.20	19.2	31.1	1.0	32.8
	11/18/9	9:05 am	Post-dump	0.25	1	232	25.0	20.0	20.58	340	7.90	19.1	30.9	2.50	44.8
	11/18/9	9:25 am	Post-dump	0.75	1	233	25.0	1.5	15.43	334	8.10	18.4	29.7	0.80	28.4
	11/18/9	9:25 am	Post-dump	0.75	1	234	25.0	20.0	15.43	334	8.30	19.2	31.6	1.10	31.2
	11/18/9	9:30 am	Post-dump	0.75	6	235	8.0	1.5	14.92	330	7.90	19.1	31.1	0.50	55.6
	11/18/9	9:30 am	Post-dump	0.75	6	236	8.0	6.5	14.92	330	8.0	19.2	30.7	1.60	48.0
	11/18/9	9:34 am	Post-dump	0.75	7	237	10.0	1.5	12.35	323	7.80	18.3	29.9	0.50	43.6
	11/18/9	9:34 am	Post-dump	0.75	7	238	10.0	8.5	12.35	323	8.20	18.4	31.1	1.20	45.6
	11/18/9	9:54 am	Post-dump	1.25	7	240	10.0	8.5	15.43	320	7.90	19.4	31.4	1.20	36.8
	11/18/9	9:54 am	Post-dump	1.25	7	239	10.0	1.5	15.43	320	7.80	19.5	31.7	1.0	43.2
	11/18/9	9:59 am	Post-dump	1.25	6	241	8.0	1.5	15.43	313	8.20	18.6	29.8	1.0	46.4
	11/18/9	9:59 am	Post-dump	1.25	6	242	8.0	6.5	15.43	313	8.20	18.9	29.6	1.70	52.8
	11/18/9	10:06	Post-dump	1.25	1	243	28.0	1.5	15.43	317	8.31	19.4	31.4	0.90	50.8
	11/18/9	10:06	Post-dump	1.25	1	244	28.0	20.0	15.43	317	8.30	19.1	30.1	2.0	46.4
	11/18/9	10:27	Post-dump	1.75	1	246	28.0	20.0	7.72	316	8.0	19.0	30.1	1.70	53.2
	11/18/9	10:27	Post-dump	1.75	1	245	28.0	1.5	7.72	316	7.70	19.3	31.1	0.80	24.4
	11/18/9	10:33	Post-dump	1.75	6	248	10.0	9.0	7.72	309	7.80	18.8	29.8	1.80	37.6
	11/18/9	10:33	Post-dump	1.75	6	247	10.0	1.5	7.72	309	8.10	18.4	30.0	0.60	42.4
	11/18/9	10:36	Post-dump	1.75	7	249	12.0	1.5	7.72	309	8.20	19.2	30.1	0.80	32.8
	11/18/9	10:36	Post-dump	1.75	7	250	12.0	10.5	7.72	309	8.20	19.4	31.0	1.70	38.4

TABLE 3 (Continued)

Event No.	Sample Date	Sample Time	Sample Type	Sample Interval	Station Number	Sample Number	Station Depth	Sample Depth	Speed (cm/s)	Heading (deg)	Temperature °C)	Salinity (ppt)	Conductivity (mmhos/cm)	Transmissivity (NTU)	TSS (mg/L)
10	11/18/9	3:10 pm	Control	Control	1	251	28.0	1.5	1.03	111	8.30	19.2	31.4	2.20	39.6
	11/18/9	3:10 pm	Control	Control	1	252	28.0	20.0	1.03	111	8.0	18.8	29.9	1.70	32.8
	11/18/9	3:16 pm	Control	Control	9	253	5.0	1.5	0.51	106	8.20	18.6	30.3	2.10	25.2
	11/18/9	3:16 pm	Control	Control	9	254	5.0	3.5	0.51	106	8.10	18.9	30.0	2.20	35.2
	11/18/9	3:26 pm	Control	Control	8	255	5.0	1.5	2.57	127	8.20	19.4	31.3	2.10	30.8
	11/18/9	3:26 pm	Control	Control	8	256	5.0	3.5	2.57	127	8.0	18.7	29.9	2.30	32.8
	11/18/9	3:30 pm	Tug prop-wash	Control	1	258	20.0	18.5	1.54	112	7.90	18.9	30.5	1.90	34.0
	11/18/9	3:30 pm	Tug prop-wash	Control	1	257	20.0	1.5	1.54	112	8.10	18.8	29.0	2.0	32.8
	11/18/9	3:47 pm	Post-dump	0.25	8	259	4.0	1.5	1.03	130	8.40	19.9	31.5	1.30	46.8
	11/18/9	3:47 pm	Post-dump	0.25	8	260	4.0	2.5	1.03	130	8.40	20.1	31.3	1.60	27.6
	11/18/9	3:52 pm	Post-dump	0.25	9	261	5.0	1.5	0.51	133	8.30	19.6	31.1	1.90	42.8
	11/18/9	3:52 pm	Post-dump	0.25	9	262	5.0	3.5	0.51	133	8.40	18.9	30.0	1.90	48.8
	11/18/9	3:57 pm	Post-dump	0.25	1	264	25.0	20.0	1.03	120	8.0	19.2	31.0	2.0	33.6
	11/18/9	3:57 pm	Post-dump	0.25	1	263	25.0	1.5	1.03	120	8.20	19.2	30.1	0.90	44.4
	11/18/9	4:16 pm	Post-dump	0.75	1	266	22.0	20.0	1.03	135	7.90	19.7	31.7	1.70	36.0
	11/18/9	4:16 pm	Post-dump	0.75	1	265	22.0	1.5	1.03	135	8.20	19.5	31.6	1.20	50.4
	11/18/9	4:22 pm	Post-dump	0.75	9	267	4.0	1.5	1.03	106	8.10	19.0	30.6	1.40	42.0
	11/18/9	4:22 pm	Post-dump	0.75	9	268	4.0	2.5	1.03	106	8.10	18.6	30.1	1.50	46.0
	11/18/9	4:26 pm	Post-dump	0.75	8	269	4.0	1.5	0.51	116	8.10	18.7	29.5	1.30	38.8
	11/18/9	4:26 pm	Post-dump	0.75	8	270	4.0	2.5	0.51	116	8.20	19.2	31.2	1.20	42.0
	11/18/9	4:42 pm	Post-dump	1.25	8	271	4.0	1.5	5.66	189	8.0	19.0	30.5	2.0	38.4
	11/18/9	4:42 pm	Post-dump	1.25	8	272	4.0	2.5	5.66	189	8.10	18.6	30.0	2.10	43.6
	11/18/9	4:48 pm	Post-dump	1.25	9	273	4.0	1.5	5.66	202	7.70	20.0	31.4	2.0	54.8
	11/18/9	4:48 pm	Post-dump	1.25	9	274	4.0	2.5	5.66	202	7.80	18.7	30.1	2.10	41.6
	11/18/9	4:53 pm	Post-dump	1.25	1	276	25.0	20.0	2.57	316	7.90	18.6	30.5	1.20	36.8
	11/18/9	4:53 pm	Post-dump	1.25	1	275	25.0	1.5	2.57	316	8.0	19.1	31.0	1.40	26.4
	11/18/9	5:15 pm	Post-dump	1.75	1	277	25.0	1.5	1.03	140	8.10	19.5	31.8	1.10	32.4
	11/18/9	5:15 pm	Post-dump	1.75	1	278	25.0	20.0	1.03	140	8.0	19.1	29.9	0.70	36.0
	11/18/9	5:18 pm	Post-dump	1.75	9	279	4.0	1.5	1.54	139	7.90	19.2	31.0	1.30	49.6
	11/18/9	5:18 pm	Post-dump	1.75	9	280	4.0	2.5	1.54	139	8.0	19.0	31.1	1.40	42.4
	11/18/9	5:23 pm	Post-dump	1.75	8	282	4.0	2.5	0.51	126	7.90	19.2	30.9	1.10	42.0
	11/18/9	5:23 pm	Post-dump	1.75	8	281	4.0	1.5	0.51	126	7.80	18.9	31.3	1.10	43.6

TABLE 4 STATISTICAL SUMMARY OF PHYSICAL/CHEMICAL DATA BY DUMP EVENT AND SAMPLE TYPE FOR LIFT 1 MONITORING AT THE NEWARK BAY CDF

Measure	Sample Type	Sample Interval	Minimum	Maximum	Mean	Number of Samples
Conductivity (mmhos/cm)	Control	Control	26.9	36.0	30.7	60
	Post-dump	0.25	25.8	32.5	30.1	62
	Post-dump	0.75	26.3	32.8	30.5	54
	Post-dump	1.25	29.5	31.9	30.5	36
	Post-dump	1.75	29.5	32.8	30.8	36
	Tug prop-wash	Control	24.0	32.4	30.4	20
Salinity (ppt)	Control	Control	16.2	23.1	19.1	60
	Post-dump	0.25	14.6	20.1	18.7	62
	Post-dump	0.75	16.2	21.1	18.9	54
	Post-dump	1.25	18.0	20.0	19.1	36
	Post-dump	1.75	18.2	20.0	19.1	36
	Tug prop-wash	Control	14.2	22.1	19.1	20
Temperature (°C)	Control	Control	5.3	9.3	8.2	60
	Post-dump	0.25	3.7	9.4	7.8	62
	Post-dump	0.75	4.7	9.4	7.9	54
	Post-dump	1.25	6.2	9.4	7.9	36
	Post-dump	1.75	6.4	9.3	7.8	39
	Tug prop-wash	Control	5.3	9.3	8.2	20
Transmissivity (NTU)	Control	Control	0.0	9.0	2.5	59
	Post-dump	0.25	0.0	43.0	3.4	62
	Post-dump	0.75	0.0	10.0	2.4	55
	Post-dump	1.25	0.0	6.0	1.8	41
	Post-dump	1.75	0.0	8.0	1.6	41
	Tug prop-wash	Control	0.0	47.0	7.0	20
TSS (mg/L)	Control	Control	23.6	166.0	43.4	60
	Post-dump	0.25	16.0	99.2	41.8	62
	Post-dump	0.75	18.8	74.0	40.1	56
	Post-dump	1.25	19.6	65.6	42.1	42
	Post-dump	1.75	22.0	60.4	40.5	42
	Tug prop-wash	Control	26.0	92.0	49.3	20