U.S. Army Corps of Engineers

Report

Results of a Submerged Oil Assessment of Sediments Located Within the Port of Oakland Federal Maintenance Channel

Prepared for

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List of Acronyms

Bay	San Francisco Bay
BCDC	Bay Conservation and Development Commission
COC	Chain-of-custody
DGPS	Differential global positioning system
DMMO	Dredged Material Management Office
LTMS	Long Term Management Strategy
MLLW	Mean lower low water
PER	Pacific EcoRisk
QA/QC	Quality assurance/quality control
RWQCB	Regional Water Quality Control Board
SOP	Standard operating procedures
SUAD	Suitable for undefined aquatic disposal
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency

1. INTRODUCTION

In support of maintenance dredging of the Federal Channel, located within the Port of Oakland's Outer Harbor (Figures 1-1 and 1-2), the Army Corps of Engineers (USACE) requires the removal of sediments from within the channel. Routine Dredged Materials Management Office (DMMO)-compliant sampling and testing of the proposed dredged materials has already been performed, and they have been determined to be suitable for unconfined aquatic disposal (SUAD) as well as suitable for placement at the Hamilton Wetlands restoration site. However, due to the recent Cosco Busan fuel oil spill in San Francisco Bay on November 7, there is concern that some of the fuel oil residues may have migrated to the Bay sediments.

In response to a DMMO request, the USACE has contracted Pacific EcoRisk (PER) to perform a study to determine whether any of the fuel oil (or residual fuel oil products) from the oil spill has migrated to sediments that are proposed to be dredged. Based on communications between the USACE and the DMMO, a study plan (PER 2007) was prepared and approved. The field sampling and characterization comprising this study was implemented on December 28. The results of this study are reported here.

1.1 Objectives of the Sediment Investigation

The purpose of this investigation was to determine the presence or absence of any residual fuel oil (or fuel oil products) from the oil spill within the proposed dredge limits; this was specifically a qualitative assessment performed to provide information only as to the presence or absence of residual fuel oil. The procedures for this sediment assessment are presented in Section 2.1.

At the time of the performance of the this assessment, promulgated protocols for this type of assessment were not available; however, a description of procedures used for the assessment of residual oil in support of other studies were available (NOAA 2004, Hydrographic Surveys 2005); these procedures were modified to meet the study objectives for this project. Guidance concerning sampling methodology, quality assurance/quality control (QA/QC) procedures, and data reporting were obtained from these sources:

- *Submerged Oil Assessment – Athos 1 Oil Spill* Submerged Oil Assessment Unit, Planning Section, Athos 1 Oil Spill Unified Command. Hazardous Material Response Division, Office of Response & Restoration. National Oceanic and Atmospheric Administration. Seattle Washington. December 11, 2004;
- Oil Mopping Project: Hydrographic Surveys Completes Submerged Oil Dragging Procedure. http://www.hydrosurveys.net/oilmopping.htm;
- Westway Terminal Company, Inc. Water Quality Certificate NJDEP File No: 0809-04-0010.1. New Jersey Department of Environmental Protection, Office of Dredging and Sediment Technology February 28, 2005.

1.2 Overview of Field Activities

The following activities were performed within the proposed dredge limits (Figure 1-3):

- A weighted beam with attached oil-sorbent materials ("pom-poms") was dragged along the sediment surface following previously established methods;
- Based on an informal agreement, between the Corps and the EPA, a single transect within the Oakland Outer Harbor and in the immediate vicinity of the Port of Oakland's Berth 37 (~8 feet wide and 1000 ft long and within the proposed dredge limits for the ASACE project) was run. Due to field time available, a second transect, in addition to the agreed upon transect, was run approximately parallel to the first transect on the northern outside of the federal channel. This transect provided even more indication that spill oil was not present in the dredging area.
- Upon completion of each transect run, the pom-poms were completely removed from the water and inspected for presence of mud to confirm that the beam reached the sediment surface;
- The pom-poms were assessed for the presence or absence of oil and the results of the trawl were recorded into a log book;
- Photographs of the pom-poms were taken to document the presence or absence of oil.

As no oil was found on the pom-poms after the representative transects within the Oakland Outer Harbor has been completed, no further sampling was performed.

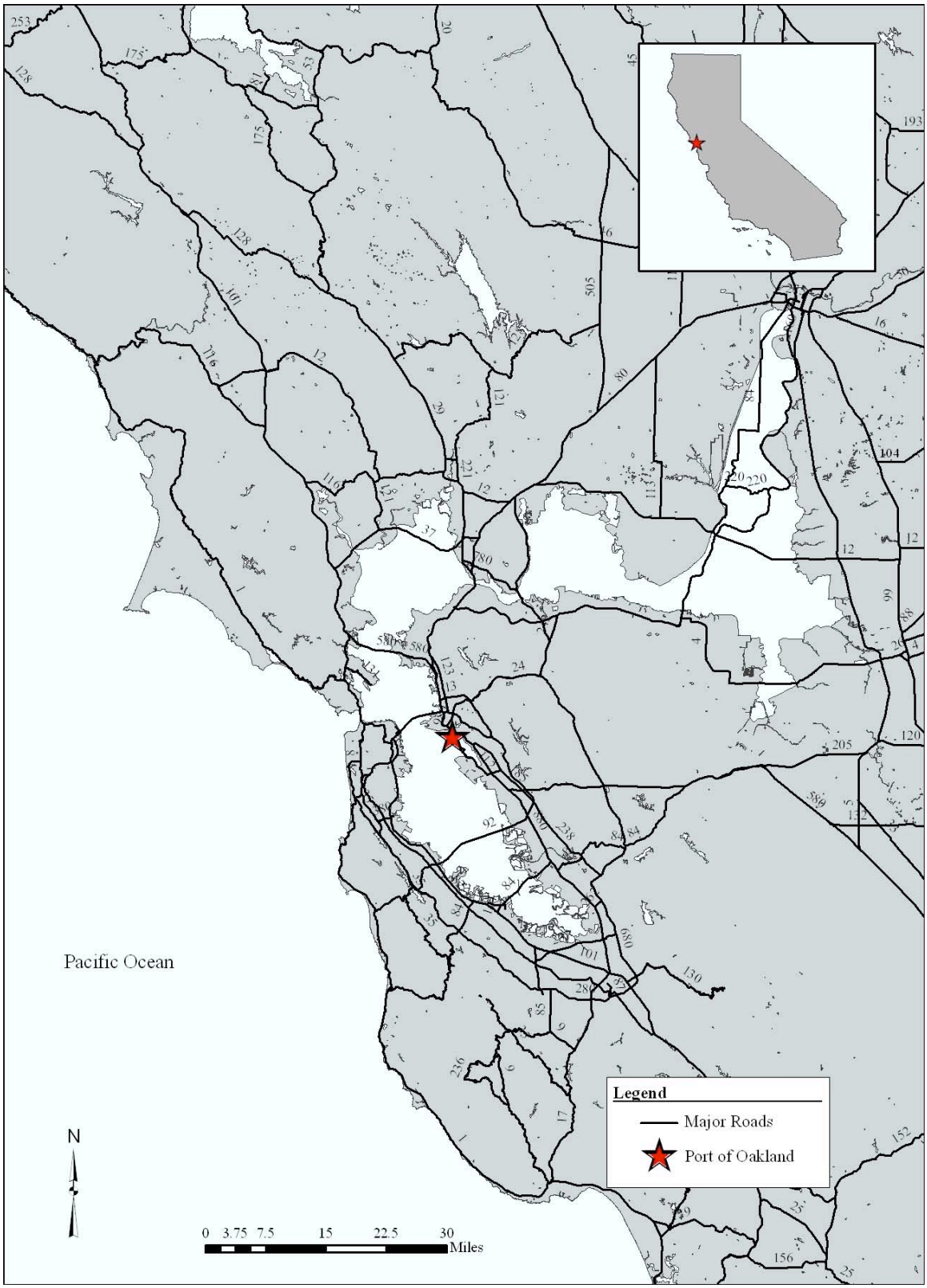

Figure 1-1. Location Map: Port of Oakland Outer Harbor

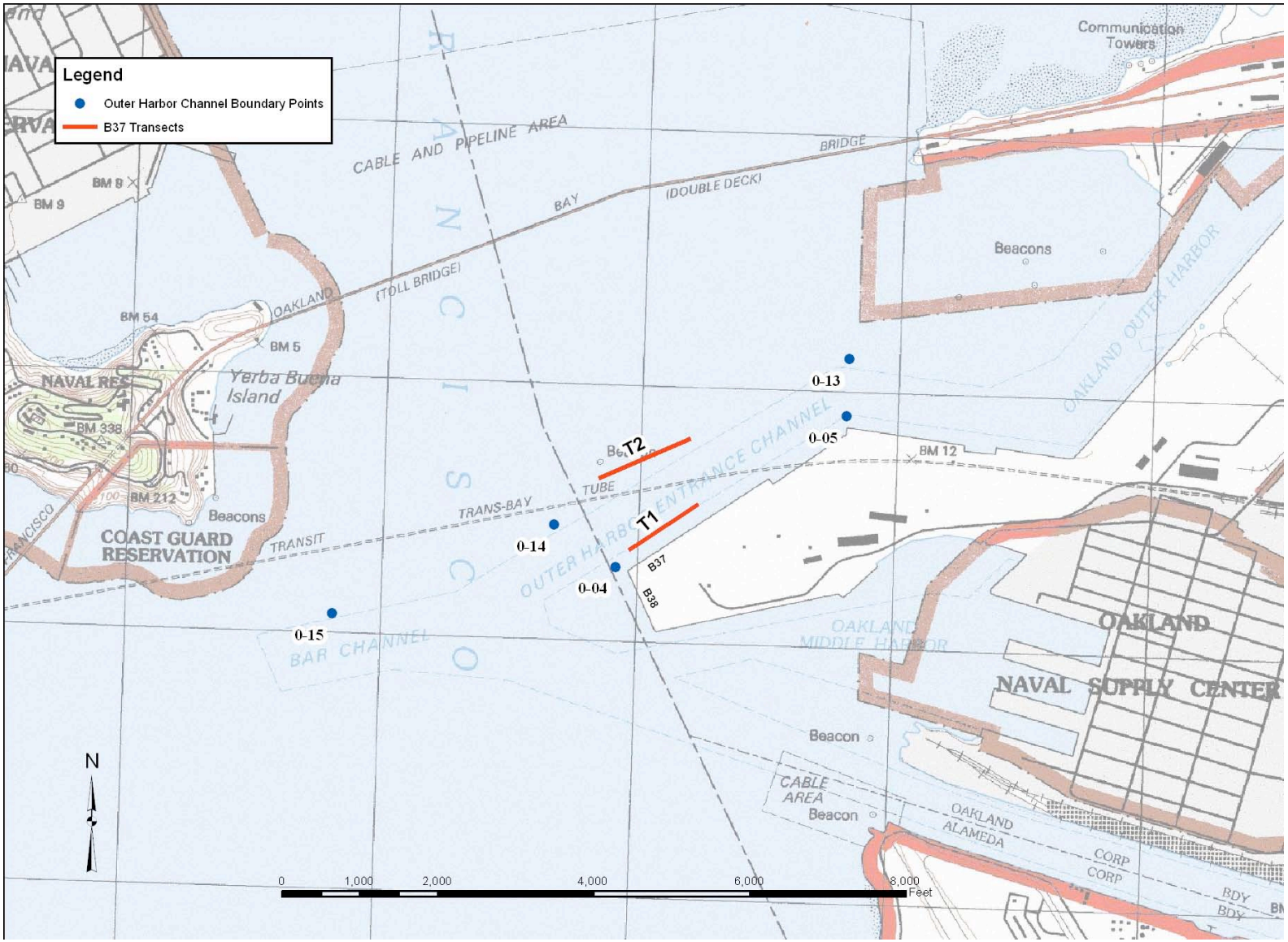

Figure 1-2. Vicinity Map: Oakland Outer Harbor

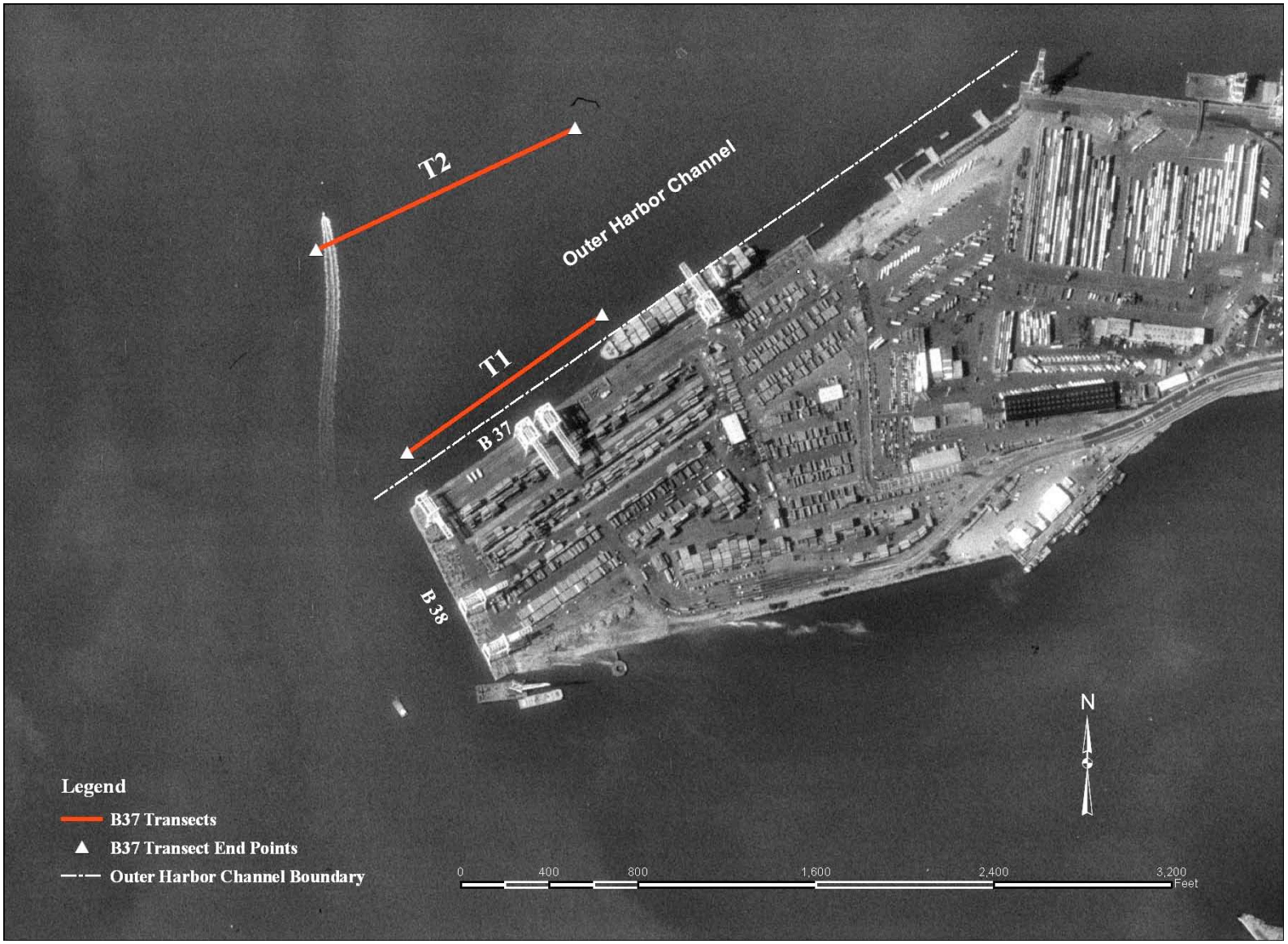

Figure 1-3. T1 and T2 Transects Oakland Outer Harbor

2. RESULTS

The results of the oil assessment performed on December 28, 2007, are presented in Sections 2.1 and 2.2. The procedures that were followed in this assessment are presented in Appendix A; field logs are presented in Appendix B.

2.1 Results of Transect T-1 Located Within the Oakland Outer Harbor Channel

Briefly, the results of the oil assessment of transect T-1 indicated that there was no oil or tar present. A summary of the transect run and results are presented in Table 1; documentation of the results are presented in Figures 1-1 through 1-10.

Table 2-1. Results for Transect T-1 Located Within the Oakland Outer Harbor Channel

Data	Start of Transect Run	End of Transect Run
Latitude/Northing	37º 48.389	37º 48.490
Longitude/Easting	122º 20.561	122º 20.378
Measured Water Depth MLLW (ft)	49.6	19.7
Mud Present on Beam	NA	YES
Visual Oil/Tar Present	NA	NO
Petroleum Odor Present	NA	NO

2.2 Results of Transect T-2 Located Within the Oakland Outer Harbor Channel

Briefly, the results of the oil assessment of transect T-2 indicated that there was no oil or residual tar present. A summary of the transect run and result are presented in Table 2-1; documentation of the results are presented in Figures 1-11 through 1-19.

Table 2-2. Results for Transect T-2 Located Within the Oakland Outer Harbor Channel

Data	Start of Transect Run	End of Transect Run
Latitude/Northing	37º 48.540	37º 48.629
Longitude/Easting	122º 20.645	122º 20.402
Measured Water Depth MLLW (ft)	18.5	10.5
Mud Present on Beam	NA	YES
Visual Oil/Tar Present	NA	NO
Petroleum Odor Present	NA	NO

Figure 2-1. Oil Snare Apparatus

Figure 2-2. Performance of Transect 1 Run

Figure 2-3. Transect 1: Evidence of Beam Reaching Surficial Sediment

Figure 2-4. Transect 1: Evidence of Weighted Tails Reaching Surficial Sediment

Figure 2-5. Transect 1: Inspection of Oil Snares

Figure 2-6. Transect 1: Presence of Material Retained on Oil Snare

Figure 2-7. Transect 1: Assessment of Material Retained on Oil Snare

Figure 2-8. Transect 1: Material Easily Washed Off of Nitrile Gloves – No Petroleum Retained

Figure 2-9. Transect 1: Rinsing of Oil Snare Apparatus with Site Water

Figure 2-10. Transect 1: Verification that Oil Snare Did Not Retain Any Petroleum Product

Figure 2-11. Transect 2: Green Buoy Identifying Location of the Oakland Outer Harbor Channel

Figure 2-12. Performance of Transect 2 Run

Figure 2-13. Transect 2: Evidence of Beam Reaching Surficial Sediment

Figure 2-14. Transect 2: Inspection of Oil Snares

Figure 2-15. Transect 2: Presence of Mud on the Oil Snare (pom-pom)

Figure 2-16. Transect 2: Assessment of Material Retained on Oil Snare

Figure 2-17. Transect 2: Material Easily Washed Off of Nitrile Gloves – No Petroleum Retained

Figure 2-18. Transect 2: Site Water Rinse of Oil Snare Apparatus

Figure 2-19. Transect 2: Verification that Oil Snare Did Not Retain Any Petroleum Product

3. REFERENCES

Submerged Oil Assessment – Athos 1 Oil Spill Submerged Oil Assessment Unit, Planning Section, Athos 1 Oil Spill Unified Command. Hazardous Material Response Division, Office of Response & Restoration. National Oceanic and Atmospheric Administration. Seattle Washington. December 11, 2004.

Oil Mopping Project: Hydrographic Surveys Completes Submerged Oil Dragging Procedure. http://www.hydrosurveys.net/oilmopping.htm.

Westway Terminal Company, Inc. Water Quality Certificate NJDEP File No: 0809-04-0010.1. New Jersey Department of Environmental Protection, Office of Dredging and Sediment Technology February 28, 2005.

Appendix A

Boom and Oil Snare (Pom-poms) Procedures

Boom and Oil Snare (Pom-poms) Procedures

Sorbent material (oil snare or pom-poms or other appropriate material) will be dragged atop sediments to detect the presence of residual oil deposits. The following procedures will be followed and are based on procedures performed in support of oil-spill clean-up efforts on the Delaware River (NOAA 2004; NJDEP 2005, Hydrosurvey 2005).

General Requirements:

- A towing vessel will drag a weighted mopping beam aligned perpendicular to the direction of travel;
- The towing vessel will travel along a pre-defined transect within the area to be dredged using a DGPS navigation system with data logger accurate to +/- 1 meter;
- Sorbent pom-poms will be attached to the mopping beam to ensure continuous coverage along the mopping beam;
- Towing cables or chains of adequate strength and length to ensure the mopping beam will remain in contact with the bottom during dragging will be used; and
- Control measures should be in place in the event that mobile fuel oil is present and resuspended into the water column; Mr. Michael Donnelly (USACE) will be responsible for management and implementation of such Control measures. It is not anticipated that any residual fuel oil from the Cosco Busan Spill will be present at the site; however, in the event that fuel oil is observed during the testing Mr. Michael Donnelly will contact the appropriate personnel.

Performance Criteria:

- The dragging vessel shall proceed at no more than five (5) knots;
- After the transcet pass, the mopping beam shall be completely removed from the water and inspected;
- The condition of the pom-poms (no oil, lightly oiled, heavily oiled) shall be noted for inclusion in the Field Report; any sediments remaining on the pom-poms will be evaluated for petroleum odor and noted in the field log;
- Any pom-poms containing oil will be placed into a plastic bin and sealed for possible further characterization; any oiled pom-poms not retained will be placed in the appropriate waste bin and disposed of at the appropriate waste facility;
- Photos will be taken when oil is present and/or before the pom-poms are discarded;
- If oil is encountered, clean pom-poms shall be attached and the same transect path shall be dragged again; however, the transect will be divided into appropriate lengths so as to isolate the location of the residual fuel oil; and
- If significant operational hindrances are encountered (i.e., due to trash, debris, or other unforeseen physical obstacles, environmental or time constraints), the operation may be modified in the field to adapt to these hindrances, including modifications to transect spacing and coverage area as long as a diligent and reasonable effort is made to “mop” the greatest area possible under the given conditions.

Data Logging and Field Report (should include):

- Area name and date(s) of dragging operations;
- Time of transect run;
- Description of the condition of the pom-poms after transect run;
- Photos of pom-poms will be included in the Report;
- An AutoCAD drawing (or equivalent) of the area including major features (piers, bulkheads); and
- Signature of the person with responsibility for the dragging operation to include a statement as to the integrity of the Report.

Appendix B

Field Logs

Pacific EcoRisk
Environmental Consulting and Testing

Pacific EcoRisk
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Oil Assessment Log Form

Station ID: T1 **Date:** 12/28/07

Project Name: USACG "OIL" ASSESSMENT **Project No.:** 12789

Vertical Datum: (MLLW) MLW Other:

Depth Measurement: (~~Sounder~~) Leadline

Data	Start	Stop
Time:	10:15	10:20
Latitude/Northing	37° 48.389	37° 48.490
Longitude/Easting	122° 20.561	122° 20.372
(A) Measured Water Depth (ft)	52.6 ft	52.8 ft
(B) Tide Height (ft)	3.0 ft	3.1 ft
(C) Mudline Elevation (A–B=C)	49.6 ft	49.7 ft
Mud Present on Beam	NA	(Y) N
Visual Oil Present	NA	Y (N)
Petroleum Odor Present	NA	Y (N)

Pom-pom Condition

Pom-pom Condition	(no oil) lightly oiled heavily oiled
Comments:	~71 yrd off Berth 37 pom-poms clean mud on pom poms - washed off macro algae present no oil sheen observed 1.9 kt Berth 37 inside chn 53.2-54 ft

Recorded by: J. M. Cotsifas

Pacific EcoRisk
Environmental Consulting and Testing

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Oil Assessment Log Form

Station ID: T2 **Date:** 12/28/07

Project Name: USACE "OIL" Assessment **Project No.:** 12789

Vertical Datum: (MLLW) MLW Other:

Depth Measurement: (Sounder) Leadline

Data	Start	Stop
Time:	1320	1328
Latitude/Northing	37° 48.540	37° 48.629
Longitude/Easting	122° 20.645	122° 20.402
(A) Measured Water Depth (ft)	23.6 ft	~~14.3~~ 15.7 ft
(B) Tide Height (ft)	+5.1 ft	+ 5.2 ft
(C) Mudline Elevation (A–B=C)	18.5 ft	10.5 ft
Mud Present on Beam	NA	(Y) N
Visual Oil Present	NA	Y (N)
Petroleum Odor Present	NA	Y (N)

Pom-pom Condition

Pom-pom Condition	no oil	lightly oiled	heavily oiled
Comments:	1.9 kt pom pom w/mud - washed off macro algae present no oil sheen observed		

Recorded by: JZ