

**R-51-12-4-4**

**FINAL ACTION MEMORANDUM  
FOR  
QUAY WALL SITE - RESPONSE TO DISCHARGE OF PETROLEUM  
PRODUCT**

**U.S. NAVAL SUBMARINE BASE  
NEW LONDON  
GROTON, CONNECTICUT**

**COMPREHENSIVE LONG-TERM  
ENVIRONMENTAL ACTION - NAVY (CLEAN) CONTRACT**

**Submitted to:**

**Northern Division  
Environmental Branch, Code 1823  
Naval Facilities Engineering Command  
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**Submitted by:**

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**Contract No. N62472-90-D-1298  
Contract Task Order 0129**

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January 12, 1994 <sup>5</sup>

Halliburton NUS Project Number 9594

Mr. Andy Stackpole  
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Groton, Connecticut 06349-5039

Reference: CLEAN Contract No. N62472-90-D-1298

Subject: Final Action Memorandum for Quay Wall Site  
Response to Discharge of Petroleum Product

Dear Mr. Stackpole:

On behalf of the United States Navy we are submitting with this letter three (3) copies of the Final Action Memorandum for Quay Wall Site - Response to Discharge of Petroleum Product.

If you have any questions concerning this document, please contact me at (412) 921-8418.

Very truly yours,

A handwritten signature in cursive script that reads "Pete Nimmer for". The signature is written in black ink and is positioned above the typed name of the signatory.

Matthew G. Cochran

MSG/pln

Enclosure

cc: Mark Evans (8) (Navy NORTHDIV)  
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File: CTO 129

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FIGURE A	-	Plan View of Area of Concern.
FIGURE B	-	Quay Wall/Storm Sewer Cross-Section.
FIGURE C	-	Potentiometric Surface Map - Near High Tide Groundwater Elevations
FIGURE D	-	Analytical Results for Petroleum Sample

## 1.0 PURPOSE

The purpose of this Action Memorandum is to document the response activities associated with remediation of petroleum product releases that occurred at the quay wall in the vicinity of Building 79, Lower Subbase, U.S Naval Submarine Base, New London, Groton, Connecticut. A proposed Quay Wall Investigation and Emergency Response letter was submitted to The State of Connecticut Department of Environmental Protection Agency on December 8, 1994 which detailed site removal and evaluation activities. This Action Memorandum is part of a Time Critical Removal Action and provides and narration of the activities conducted as part of these investigations. This action memorandum was prepared in accordance with the US Environmental Protection Agency (US EPA) Action Memorandum Guidance Document (EPA/540/P-90/004).

The remedial response action consisted of two phases. The first phase included the initial response to the detection of a release of petroleum product to the Thames River. The second phase includes the investigation and development of a long term remedial response to the current and future potential discharges. Activities conducted under the first phase included the deployment of spill containment booms, the collection and removal of product immediately accessible to vacuum truck hoses, the deployment of a skimmer to collect surficial product, and the application of oil absorbing pads to manage product in areas not immediately accessible. Activities anticipated to be conducted as part of the second phase of remedial response action includes inspection of pipes and manholes located in the vicinity of the discharge; installation of exploration/product recovery wells; review of historical information describing previous and on-going environmental investigations, plans and drawings of utilities, and other relevant information; and evaluation of technologies that could be useful in the remediation process.

## 2.0 SITE CONDITIONS AND BACKGROUND

### 2.1 SITE DESCRIPTION

#### 2.1.1 Removal Site Evaluation

On November 3, 1994 at 8:30 a.m., a release of petroleum product in the vicinity of Pier 4 of the lower subbase was reported by SUBASE Port Services Department to SUBASE Environmental Department. Containment booms and absorbent pads were deployed as an initial response to the release. Later that morning a vacuum truck was utilized to remove surficial oil and thicker high viscosity petroleum product associated with the release. During the afternoon, a skimmer was employed to remove product within the boom area. The Connecticut Department of Environmental Protection (CT DEP) was notified of the release at approximately 2:00 p.m. CT DEP arrived on-site at approximately 4:30 p.m. The SUBASE Environmental Department collected a sample of the released product for analysis and identification. Navy Port Services continued clean-up activities throughout the evening.

On November 4, 1994, following evaluation of the site CT DEP and SUBASE Environmental Department determined that a spill response contractor would be utilized to complete the clean-up and clean areas of the pier where product was adhering to pilings and pipe. The contractor arrived on-site at 5:00 p.m. and initiated clean-up activities. It was also determined that the most likely source of the release was a stormwater discharge pipe located north of Pier 4 and west of Building 79. The interior of a manhole from which the stormwater discharge pipe originates appeared to contain high concentrations of product. Other pipes that discharge into the manhole did not show contamination.

On November 5, 1994, clean-up activities by the spill response contractor continued. Additional samples of the product were obtained.

On November 6, 1994, the spill response contractor completed clean-up operations. Approximately 2100 gallons of oily water and twenty-one 55 gallon drums of petroleum contaminated absorbent pads were generated as a result of the effort. The containment boom was left in-place following completion of the spill response contractor's clean-up activities.

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On November 8, 1994, at 8:00 p.m., Port Services reported to the Environmental Department the appearance of additional product within the boom area and in the manhole. A plug was installed in the stormwater discharge pipe and the skimmer was utilized to manage the product. The investigation into possible sources of the product continued. One possible source of the product was determined to be oil product existing in void spaces behind the Quay wall. A watch was posted to monitor the area for possible additional releases.

On November 9, 1994, additional releases were not observed and consequently the watch was terminated. Product was observed in a second manhole located south of Pier 2. No release of product to the river was associated with the second manhole.

A remedial action contractor has been retained to further investigate the remediation of the oil existing in the manholes, stormwater pipes, and the soil surrounding these structures.

### **2.1.2 Physical Location**

The site is located at NSB, New London, Groton, Connecticut. It is situated on the Thames River between Pier 4 and Pier 6, southwest of Building 79. The surrounding land is primarily industrial buildings and piers used for maintenance of Navy vessels. The area surrounding Pier 4 is underlain by numerous underground utilities and utility access passages. A power plant with underground storage tanks is located northwest of Pier 4. Fuel transfer mains used up until the early 1980's are located approximately 150 feet east of Pier 4. Branch lines from the main are located throughout the area northeast of Pier 4 and southeast of the power station. A former waste oil pit was also located in Building 79. Figure A (included in the Attachment Section) provides a plan view of the area of concern at the base.

### **2.1.3 Site Characteristics**

The site consists of three areas located within a Federal Department of Defense (DOD) operated facility. The first area is the tidal zone in which the release was first observed. The tidal zone is not exposed at low tide. The river is approximately thirty feet deep in the vicinity of the quay wall. The second area is near the pipe that appeared to be discharging product. The pipe is constructed such that it connects a manhole with the river. The outfall end extends beyond the quay wall into the river. The pipe is not exposed during diurnal low tides but does remain close to the surface. The pipe is approximately 12 inches in diameter

and constructed of steel and concrete. The pipe was installed in individual sections with each section measuring approximately four feet in length. The integrity of the joints of the pipe is unknown. The pipe connects upstream to a concrete and cement block manhole located approximately twenty five feet from the outfall at the quay wall.

The third area is the pier area. The pier (constructed in approximately 1950, after the installation of the quay wall, approximately 1935) that surrounds the site is constructed of column and sheet pilings. Figure B (included in the Attachment Section) provides a typical cross-section detail of the pier area where the release occurred. A wood plank system supported by timber pilings is located below the paved surface of a road. A quay wall is located below the road and adjacent to bulkhead pilings at the river edge. The fill soil below the wood planking and quay wall has a history of being unstable and washing out. The soil is replenished to the area below the planking by a series of manholes filled with sand along the length of the pier area. Access to the area below the planking is provided by a series of manholes located along the length of the pier area. A storm drain manhole was used to gain access to the stormwater discharge pipe suspected of being the source of the release. This stormwater discharge pipe has recently been filled with sand and no longer receives storm water runoff from any buildings or other sources. Other underground utility access passages also exist in the area of the quay wall including electric, communications, and storm drains. Additionally, fuel pipes previously used to refuel ships are also located in the area adjacent to the quay wall.

The direction of groundwater flow in the area of the quay wall is toward the river. Groundwater elevation is influenced by tidal fluctuations. This influence increases as groundwater approaches the pier area. Typical groundwater flow directions are provided in Figure C (included in the Attachment Section).

#### **2.1.4 Release or Threatened Release Into the Environment of a Hazardous Substance, Pollutant, or Contaminant**

Analysis of the sample obtained by the Navy of materials released at the quay wall indicates the presence of aged petroleum product consisting of organic chemical compounds and metals. The results of the analysis indicate that the product is a weathered petroleum product, probably a fuel or diesel oil. Analytical data from this representative sample of the petroleum material is provided as Attachment D.

### **2.1.5 National Priorities List Status**

The area in which the site is situated is registered on the National Priorities List (NPL). The CERCLIS reference number for the site is CTD980906515. The site has a hazard rating of 36.53. The ranking is based on the Hazard Ranking System for NPL sites. The site was first listed on the NPL in August, 1990. The site has been referred to the site assessment program for further investigation. Currently the area surrounding the site is being investigated as part of a remedial response action. A Remedial Investigation (RI) Work Plan has been prepared and is in the process of being implemented.

### **2.1.6 Maps, Pictures, or Other Graphic Representations**

Three figures are included in the Attachment Section. Figure A shows a plan view of the area. Figure B gives a cross-section of the quay wall and the Lower Base. Figure C presents a potentiometric surface map of the Lower Base area at near high tide conditions.

## **2.2 OTHER ACTIONS TO DATE**

### **2.2.1 Previous Actions**

Three previous actions have been conducted at the site. These actions are documented in the reports listed below:

- NESO (1979) - The NESO report identified oil contamination in the vicinity of Building 79. NESO recommended abandonment of a waste oil pit located within the building. Subsequently the pit was filled with concrete and a recovery well system was installed near Building 79 in 1985. The recovery system was operated for several months. It was found to be ineffective and later abandoned.
- Wehran (1987) - In 1987, Wehran Engineers and Scientists completed a subsurface investigation focused on the soil in the vicinity of Building 79. It was determined that manholes, soils, and groundwater within the study area were contaminated with No. 6 fuel oil that was greater than one year old. Additionally, trace levels of waste oil were also identified.

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- Phase I Remedial Investigation: Atlantic Environmental (1992) - A Phase I Remedial Investigation of the Lower Subbase was conducted in 1992. It included inspection of utility manholes and the waterfront bulkhead for evidence of contamination. Also included in the inspection was a soil gas survey, test borings, groundwater monitoring well installation, and soil and groundwater sampling with analysis. The investigation identified at least three areas of concern, Manhole 83, contaminated soil in the vicinity of Building 79, and the presence of petroleum product in wells located west of Building 79.

A brown milky oil was identified in Manhole 83, located west of Building 79. The source of contamination at this location was believed to have originated at Building 79, at the former waste oil pit.

Soil analysis indicated that a mixture of No. 6 fuel oil and waste oil was present in soil in the vicinity of Building 79. Samples obtained from soil borings installed during the course of this work showed the presence of petroleum product. One source of contamination was concluded to be an underground pipeline located in the vicinity of monitoring well 13MW12. The pipe line contained No. 6 fuel oil. The extent of contamination appeared to be limited to the immediate area of the pipe line and well. Currently all No.6 fuel oil pipelines are either abandoned or planned for abandonment in the near future.

Petroleum product (in the form of Total Petroleum Hydrocarbons (TPH)) in samples of groundwater obtained from wells located west of Building 79 were above detectable levels. However, a measurable level of visible free product was not observed in the area that was sampled. Historically, oil seeps and sheens have been reported at the waterfront near Building 79. During this investigation seeps and sheens were not observed anywhere along the waterfront at the Lower Subbase.

### **2.2.2 Current Actions**

The site is currently being investigated as part of the Comprehensive Long Term Action Navy (CLEAN) program. The current investigation includes the implementation of a Remedial Investigation (RI) work plan. The objective of the current investigation is to identify and quantify the sources of the contamination that periodically occur in the vicinity of the Lower Subbase and to identify methods and means that could be

implemented to correct the existing conditions.

## **2.3 STATE AND LOCAL AUTHORITIES' ROLE**

### **2.3.1 State and Local Actions To Date**

The state has responded to this release and considers it to be a spill response action. The role of the state during this response action has focused on response oversight and review.

### **2.3.2 Potential for Continued State / Local Response**

The site is located on land that falls under the jurisdiction of the federal government. It is anticipated that the state as well as the U.S. EPA will continue to monitor the actions of the Navy in response to the release and remediation action.

### 3.0 THREATS TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT AND STATUTORY AND REGULATORY AUTHORITIES

#### 3.1 THREATS TO PUBLIC HEALTH OR WELFARE

##### 3.1.1 Actual or Potential Exposure to Hazardous Substances or Pollutants by Nearby Populations or the Food Chain

It is not anticipated that local populations will be exposed to significant levels of hazardous substances or pollutants that result from this initial release. This determination is based on the relatively limited nature of the release, the rapid response provided by the Navy, installation of containment mechanisms, and the remediation of the release area following the initial response.

##### 3.1.2 Actual or Potential Contamination of Drinking Water Supplies

Groundwater is not utilized as a source of drinking water on-base or in the surrounding metropolitan area. Potable water is provided to the population in the vicinity of the base via water treatment plant and a municipal water pipe distribution system. Risks associated with actual or potential contamination of drinking water is considered minimal.

##### 3.1.3 Hazardous Materials Contained in Drums, Tanks, Etc. That May Pose a Threat of Release

Hazardous materials generated as a result of the response to this release were temporarily stored at the generation site. Following characterization, the materials were removed from the base and disposed of at a regulated facility permitted to manage the type of characterized waste. Potential exposure to materials of concern were limited by the use of closed containers, base security restrictions, and the physical segregation of waste containers by warning signs, warning tapes, or fence.

##### 3.1.4 Hazardous Materials in Soils at or near the Surface That Could Migrate

Contamination exists in the soil below the area where the release occurred. The contamination is influenced by groundwater flow and elevation. Subsurface migration of the contamination could occur

laterally and to a more limited extent vertically. Contamination is not likely to occur at land surface due to the presence of extensive area paving and a water table significantly below ground surface elevation.

### **3.1.5 Weather Conditions That Could Cause Materials of Concern To Be Released**

Increases in volume or velocity of groundwater flow resulting from heavy rain or snow melt will increase the likelihood of additional releases to the environment. The influence of tides on the elevation of groundwater will also contribute the possibility of additional releases to the environment. A boom is currently in place to prevent migration of any additional releases.

### **3.1.6 Threats of Fire or Explosion**

The threat of fire or explosion is not considered high due to the weathered nature of the product. Although the area below the quay wall is a confined space, and the accumulation of pockets of gases from natural or other sources is possible, no incidents have been reported during approximately 40 years of operations at the site.

## **3.2 THREATS TO THE ENVIRONMENT**

### **3.2.1 Actual or Potential Exposure to Hazardous Substances or Pollutants by Nearby Animals or the Food Chain**

It is not anticipated that local populations will be exposed to significant levels of hazardous substances or pollutants that result from this initial release. This determination is based on the relatively limited nature of the release, the rapid response provided by the Navy, installation of containment mechanisms, and the remediation of the release area following the initial response.

### **3.2.2 Actual or Potential Contamination of Sensitive Ecosystems**

Sensitive ecosystems do exist in the area surrounding the base. However, this release is not likely to significantly impact these ecosystems due to rapid containment and remediation of the release.

**3.2.3 Hazardous Materials Contained in Drums, Tanks, Etc. That May Pose a Threat of Release**

Hazardous materials generated as a result of the response to this release were temporarily stored at the generation site. Following characterization the materials were removed from the base and disposed of at a regulated facility permitted to manage hazardous waste. Potential exposure to materials of concern were limited by the use of closed containers, base security restrictions, and the physical segregation of waste containers by warning signs, warning tapes, or fence.

**3.2.4 Hazardous Materials in Soils at or Near the Surface That Could Migrate**

Contamination exists in the soil below the area where the release occurred. The contamination is influenced by groundwater flow and elevation. Subsurface migration of the contamination could occur laterally and to a more limited extent vertically. Contamination is not likely to occur at land surface, however, due to the presence of extensive area paving and a water table significantly below land surface elevation. The sheet piling along the water front acts as a barrier to contaminant migration.

**3.2.5 Weather Conditions That Could Cause Materials of Concern To Be Released**

Increases to the volume or velocity of groundwater flow such as heavy rain or snow melt will increase the likelihood of additional releases to the environment. The influence of tides on the elevation of groundwater will also contribute the possibility of additional releases to the environment. A boom is currently in place to prevent migration of any additional releases.

**3.2.6 Threats of Fire or Explosion**

The threat of fire or explosion is not considered high due to the weathered nature of the product. Although the area below the quay wall is a confined space, and the accumulation of pockets of gases from natural or other sources is possible, no incidents have been reported during approximately 40 years of operations at the site.

#### 4.0 ENDANGERMENT DETERMINATION

Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the response action provided in this Action Memorandum, may have presented an immanent and substantial endangerment to public health or welfare, or the environment. However, effective controls of the release were implemented immediately after the release was discovered. These controls minimized the endangerment to public health and the environment.

## 5.0 REMEDIAL ACTIONS AND ESTIMATED COSTS

### 5.1 REMEDIAL ACTIONS

#### 5.1.1 Action Description

During the period November 3 through November 9, 1994 , unusually low tide (diurnal tides) occurred at U.S. Naval Submarine Base, New London. On November 3, 1994, during the period of low tide, a release of what appeared to be petroleum product was first reported by SUBASE Port Services to NSB New London Environmental Department. SUBASE Port Services personnel observed what appeared to be petroleum product and sludge draining into the Thames River from the area of a storm drain outfall. The storm drain is situated between Pier 4 and Pier 6 at a quay wall on the tidal flat.

The quantity of the initial discharge was not determined. However, an oil spill containment boom was deployed to minimize dispersion of the discharge into the river. Following deployment of the oil spill boom, SUBASE Port Services deployed absorbent pads to absorb product. The application of absorbent pads was followed by deployment of a vacuum truck to remove readily accessible product. A preliminary investigation was initiated to determine the source of the product.

At approximately low tide (1350 hours) on November 3, 1994 additional product was observed at the same location as the earlier discharge. The additional product was a thick black oily substance. A skimmer was deployed to collect the additional product inside the boom area. The vacuum truck also continued to collect product. The truck collected approximately 1100 gallons of oily water and 200 gallons of product. The Connecticut Department of Environmental Protection was notified of the incident at approximately 1400 hours.

Representatives of the Connecticut Department of Environmental Protection arrived on-site the evening of Nov. 3 to review spill response. Samples of the product were obtained for laboratory analysis (results are included as Attachment D). An investigation to determine the source of the discharge continued into the evening. An obvious source was not found. Port Services continued to use absorbent pads to collect product throughout the night.

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A spill response and clean-up contractor was brought on-site to complete the cleanup starting on November 4, 1994. The investigation of the source of the discharge continued into the following day. It was determined that a stormwater discharge pipe manhole located on Albacore Road opposite Building 79 was the most probable source of the discharge. Product was found inside of the stormwater discharge pipe access manhole immediately upgradient of the pipe outfall at the quay wall. Inspection of the pipe leading into the manhole from farther upgradient (away from the river) showed no presence of the product. The findings of the inspection were confirmed through the use of dye testing in pipes that discharge into the manhole.

On the evening of November 4, the clean-up contractor initiated steam cleaning activities to remove product that was adhering to the walls of the manhole and the piles of the Quay wall. The clean-up operation was considered completed by the morning of November 6. Port Services reported that no product was visible within the area of the boom. The clean-up effort of the contractor generated approximately 2300 gallons of oily waste water and twenty-one 55 gallon drums of absorbent pads containing product.

On the morning of November 8, additional product was reported in the boom area by Port Services. Following further investigation, additional product was also found in the storm drain manhole. Navy divers placed a wood plug in the outfall in order to further contain the discharge of product. Further investigation indicates that there have been previous reports of oil floating on the groundwater behind the quay wall. A wooden planking system supports the road in this area, below which is a void space which contains groundwater and some floating oil. It is hypothesized that the unusually low tides may have allowed the groundwater level to drop below the level of the planking thus allowing the oil to flow into the outfall pipe.

The seal of the wood plug was tested with tracer dye. Because of leaks in the wood plug, arrangements were made to install an expandable plug into the outfall pipe. The wood plug was left in place until the afternoon of November 6. At this time it was replaced with an expandable rubber plug. Following installation of the plug, an around the clock watch was established for the subject area. No observable releases have occurred at the subject area since the installation of the plug. However, it was observed that the manhole immediately south of the subject area showed signs of petroleum product. The seepage was contained in the manhole and was not released to the river. The oil spill boom remain in place in the area of the original release. A remedial action contractor (Halliburton NUS) is retained to further investigate the release area and to determine remedial options.

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From the inspection of the area it was determined that the bulk of the product was present below the planking of the historical platform. A cross-section of the area is included in Figure B (attached). The wooden planking system was encountered at 6 to 8 feet below grade. Product was observed to be present in the void space below the wooden planking and in electrical manholes throughout the Lower Subbase. Additional activities were conducted at the site in December 1994 to prevent an additional release of petroleum to the river. These activities included installing 5 recovery wells along the water front near Building 79. These investigations confirmed that a void space is present under wooden pilings behind the bulk head sheet pilings and that oil is present in this area (see Figure B). Samples were collected of the sediment in this void space and were analyzed for numerous parameters to determine the compounds present in the petroleum material. Results of these samples are discussed in detail in the 'Proposed Quay Wall Investigation and Emergency Response' letter that was submitted to The State of Connecticut Department of Environmental Protection Agency on December 8, 1994.

Based on these investigations, the void space underlying the wooden planking is suspected to be source of oil which was released to the Thames River. Discussions with base personnel indicated that the oil present in the void space may enter the sewer pipe through joints or cracks. The portion of the storm sewer pipe in the manhole has been filled with sand to prevent the infiltration of oil into the top of the pipe. Low tides are suspected to cause a drop in the water level behind the quay wall, thereby allowing the oil to flow into the river through the storm sewer pipe via joints or cracks in the sewer pipe.

Other activities conducted in the area include pumping activities conducted to prevent petroleum from migrating to the Thames River during low tide. On four occasions in December (during diurnal low tides) oil and water was pumped from the void space during low tides when the maximum amount of petroleum could be recovered. In all four cases, oil and water were pumped from the void to a tanker truck where oil and water were allowed to separate. Water was then returned to the void space from the tanker with and oil water mixture remaining in the tanker. The remaining oil and water mixture was then disposed of by a disposal contractor. A total of approximately 16,000 gallons of water/oil mixture was removed during the four occasions in December, 1994. A small percentage of the liquid pumped (less than 5%) was petroleum product. During each pumping event a thin layer of oil approximately 1/8 inch thick was observed on the surface of the water in the tanker truck.

### **5.1.2 Contribution to Remedial Performance**

The actions undertaken at the site to date include containment and remediation of the initial release, identification of the source of the release, plugging the release location and installing several wells to identify the magnitude of petroleum behind the quay wall. In addition, oil and water have been pumped from the quay wall area at low tide to prevent any additional release of petroleum. These pumping activities will contribute to remedial performance by testing the viability of pumping directly from the quay wall area. The effectiveness of these measures is being determined and will be compared to other potential remediation options for the site.

### **5.1.3 Description of Alternative Technologies**

Alternative technologies were not considered at the time of the initial response. However, the spill response and management program previously developed for use by the base was employed successfully as part of the initial response. An alternative technologies evaluation is anticipated to be conducted following further investigation of the possible source(s) of the petroleum product, as part of a long term remedial response action.

### **5.1.4 Engineering Evaluation / Cost Analysis**

An Engineering Evaluation / Cost Analysis was not conducted as part of the response to the release since alternative technologies were not considered or evaluated and because this activity is a Time Critical Removal Action.

### **5.1.5 ARARs**

As part of a federal facility the site is currently being managed under the provisions of the National Contingency Plan and CERCLA. Additional regulatory requirements will be determined during the course of the current on-going remedial investigation.

### **5.1.6 Project Schedule**

The initial response to the release was completed during the period November 3 through November 8,

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1994. Additional pumping activities were conducted in December, 1994. Additional investigation/response activities are anticipated to be conducted or have been conducted as part of a long term remedial response action.

## **5.2 ESTIMATED COSTS**

Cost estimates are not required at this time because these activities are part of a Time Critical Removal Action.

FINAL

## **6.0 EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN**

A significant change in the situation is not expected if additional actions are delayed or not taken. Although additional petroleum product is present behind the quay wall area, efforts are being undertaken to contain the potential future release of petroleum materials to the environment. These efforts had included the placement of a oil boom to prevent the movement of any additional product into the river, plugging the storm sewer discharge which was the original source of the release, establishment of a watch along the water front to detect any further release, and the removal of oil and water from the void space along the quay wall.

FINAL

## 7.0 OUTSTANDING POLICY ISSUES

There are no outstanding policy issues at this time.

FINAL

## 8.0 ENFORCEMENT

There are no enforcement actions being implemented at this time.

**9.0 RECOMMENDATION**

This Action Memorandum documents the response activities associated with remediation of petroleum product releases that occurred at the quay wall in the vicinity of Building 79, Lower Subbase, U.S Naval Submarine Base, New London, Groton, Connecticut. This Action Memorandum is part of a Time Critical Removal Action and provides and narration of the activities conducted as part of these investigations. This action memorandum was prepared in accordance with the US Environmental Protection Agency (US EPA) Action Memorandum Guidance Document (EPA/540/P-90/004).

Response to the initial release has been completed and a letter report was submitted to the CT DEP. A continued review of existing data will be conducted to identify a potential source of contamination. Further investigation will continue and a determination will be made regarding the most feasible long term remedial option. Examples of options which will be evaluated may include, but will not be limited to, groundwater pump and treat, surfactant injection, bioremediation, and/or soil excavation and removal. A removal site evaluation will be prepared to document all activities which were conducted.

\_\_\_\_\_  
L. G. Dominique

\_\_\_\_\_  
Date

FINAL

**ATTACHMENTS**

- FIGURE A PLAN VIEW OF AREA OF CONCERN
- FIGURE B QUAY WALL/STORM SEWER DIAGRAM
- FIGURE C POTENTIOMETRIC SURFACE MAP - NEAR HIGH TIDE GROUNDWATER  
ELEVATION
- FIGURE D ANALYTICAL RESULTS FOR PETROLEUM SAMPLE

DRAFT

**ATTACHMENTS**

FIGURE D - Analytical Results for Petroleum Sample



# Crystal Springs Laboratory, Inc.

Environmental & Chemical Testing

CT Dept. of Health #PH-06-02

178 Bridge Street R  
Groton, Connecticut 06340  
(800) 445-1751

Sample ID#: CSLNV-1105

Date: 8 November 1994

Date Received: 11-05-94

Sampled by: E.A. Cioffi

Time Received: 10:00 A.M.

Test: Oil

Report to:

Location: Vacuum Truck 84-0605  
Naval Submarine Base New London  
Groton, CT

Name: Mike Brown  
Street: Environmental Division Code 1600  
Naval Submarine Base New London  
Town, State: Groton, CT

TCLP Extraction: EPA 1311

<u>TCLP METALS</u>	<u>RESULTS</u>	<u>METHOD</u>	<u>REGULATORY LEVELS</u>
Arsenic	<0.05 mg/L	6010	5.0 mg/L
Barium	<0.05 mg/L	6010	100.0 mg/L
Cadmium	<0.05 mg/L	6010	1.0 mg/L
Chromium	<0.05 mg/L	6010	5.0 mg/L
Lead	3.1 mg/L	6010	5.0 mg/L
Mercury	<0.005 mg/L	7470	0.2 mg/L
Selenium	<0.1 mg/L	6010	1.0 mg/L
Silver	<0.05 mg/L	6010	5.0 mg/L

TCLP Volatile Organics (EPA 1311/8240)

<u>PARAMETER</u>	<u>RESULTS</u>	<u>COMPONENT MDL</u>	<u>REGULATORY LEVELS</u>
Acetone	Not Detected	<5.0 ug/L	-----
Acrolein	Not Detected	<5.0 ug/L	-----
Acrylonitrile	Not Detected	<5.0 ug/L	-----
Benzene	Not Detected	<5.0 ug/L	500 ug/L
Bromodichloromethane	Not Detected	<5.0 ug/L	-----
Bromoform	Not Detected	<5.0 ug/L	-----
Bromomethane	Not Detected	<5.0 ug/L	-----
2-Butanone (MEK)	Not Detected	<5.0 ug/L	200,000 ug/L
Carbon Disulfide	Not Detected	<5.0 ug/L	-----
Carbon Tetrachloride	Not Detected	<5.0 ug/L	500 ug/L
Chlorobenzene	Not Detected	<5.0 ug/L	100,000 ug/L
Chlorodibromomethane	Not Detected	<5.0 ug/L	-----
Chloroethane	Not Detected	<5.0 ug/L	-----
2-Chloroethyl vinyl ether	Not Detected	<5.0 ug/L	-----
Chloroform	12 ug/L	<5.0 ug/L	5,000 ug/L
Chloromethane	Not Detected	<5.0 ug/L	-----
1,2-Dichlorobenzene	Not Detected	<5.0 ug/L	-----
1,3-Dichlorobenzene	Not Detected	<5.0 ug/L	-----
1,4-Dichlorobenzene	Not Detected	<5.0 ug/L	7,500 ug/L
1,1-Dichloroethane	Not Detected	<5.0 ug/L	-----
1,2-Dichloroethane	Not Detected	<5.0 ug/L	500 ug/L
1,1-Dichloroethylene	Not Detected	<5.0 ug/L	700 ug/L
cis-1,2-Dichloroethylene	Not Detected	<5.0 ug/L	-----
trans-1,2-Dichloroethylene	Not Detected	<5.0 ug/L	-----
1,2-Dichloropropane	Not Detected	<5.0 ug/L	-----
cis-1,3-Dichloropropene	Not Detected	<5.0 ug/L	-----
trans-1,3-Dichloropropene	Not Detected	<5.0 ug/L	-----
Ethyl benzene	Not Detected	<5.0 ug/L	-----
2-Hexanone	Not Detected	<5.0 ug/L	-----
Methylene chloride	Not Detected	<5.0 ug/L	-----
4-Methyl-2-pentanone	Not Detected	<5.0 ug/L	-----
Styrene	Not Detected	<5.0 ug/L	-----
1,1,2,2-Tetrachloroethane	Not Detected	<5.0 ug/L	-----
Tetrachloroethylene	Not Detected	<5.0 ug/L	700 ug/L
Toluene	Not Detected	<5.0 ug/L	-----
1,1,1-Trichloroethane	Not Detected	<5.0 ug/L	-----
1,1,2-Trichloroethane	Not Detected	<5.0 ug/L	-----
Trichloroethylene	Not Detected	<5.0 ug/L	500 ug/L
Trichlorofluoromethane	Not Detected	<5.0 ug/L	-----
1,2,3-Trichloropropane	Not Detected	<5.0 ug/L	-----
Vinyl Acetate	Not Detected	<5.0 ug/L	-----
Vinyl Chloride	Not Detected	<5.0 ug/L	200 ug/L
Xylene	Not Detected	<5.0 ug/L	-----

Sample ID#: CSLN-1105  
Page 4

Date: 8 November 1994

TOTAL METALS

<u>METALS</u>	<u>RESULTS</u>	<u>METHOD</u>
Arsenic, Total	<1.0 mg/Kg	6010
Barium, Total	5.0 mg/Kg	6010
Boron, Total	<2 mg/Kg	6010
Cadmium, Total	1.0 mg/Kg	6010
Chromium, Total	11.0 mg/Kg	6010
Copper, Total	27.0 mg/Kg	6010
Iron, Total	960 mg/Kg	6010
Lead, Total	225 mg/Kg	6010
Magnesium, Total	236 mg/Kg	6010
Manganese, Total	9.0 mg/Kg	6010
Mercury, Total	0.026 mg/Kg	7470
Selenium, Total	<1.0 mg/Kg	6010
Silver, Total	<1.0 mg/Kg	6010
Tin, Total	25 mg/Kg	6010
Zinc, Total	30.0 mg/Kg	6010

Sample ID#: CSLNV-1107  
Page 5

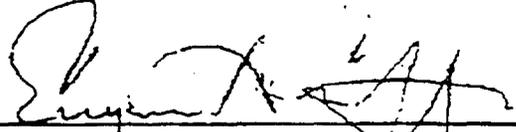
Date: 8 November 1984

OTHER ANALYTES

<u>PARAMETER</u>	<u>RESULTS</u>	<u>METHOD</u>
pH	6.84	1010
Cyanide, Total		
Flash Point	>200° F	9040
Polychlorinated Biphenyls (Total PCB's)	<10.0 mg/Kg	8080

MDL - Method Detection Limit

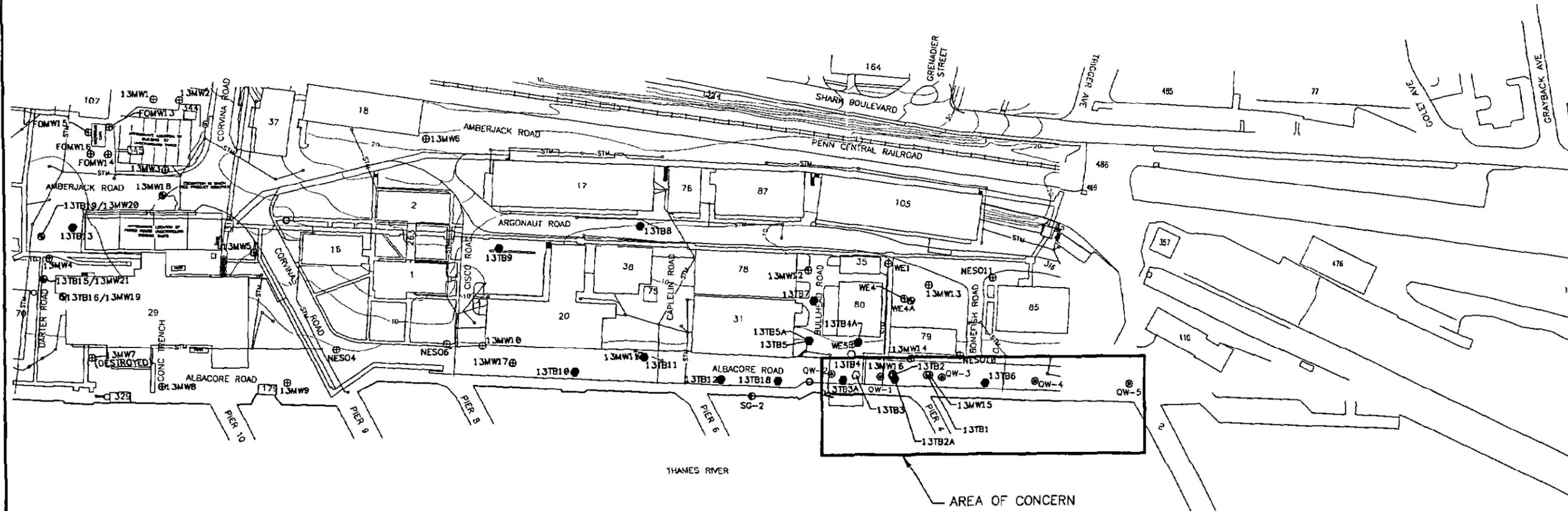
All procedures are in strict compliance with U.S.E.P.A., CT Dept. of Health, and CT D.E.P. guidelines.

  
Dr. Eugene A. Gioff, Director



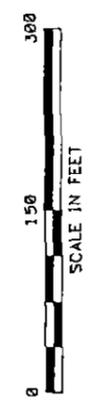
VIEW=PLOT PLAN LAY  
ACAD 0 \DATA\CADD\9594\LRASEA DMC 12/29/94 .MB

FIGURE A  
PLAN VIEW OF AREA OF CONCERN



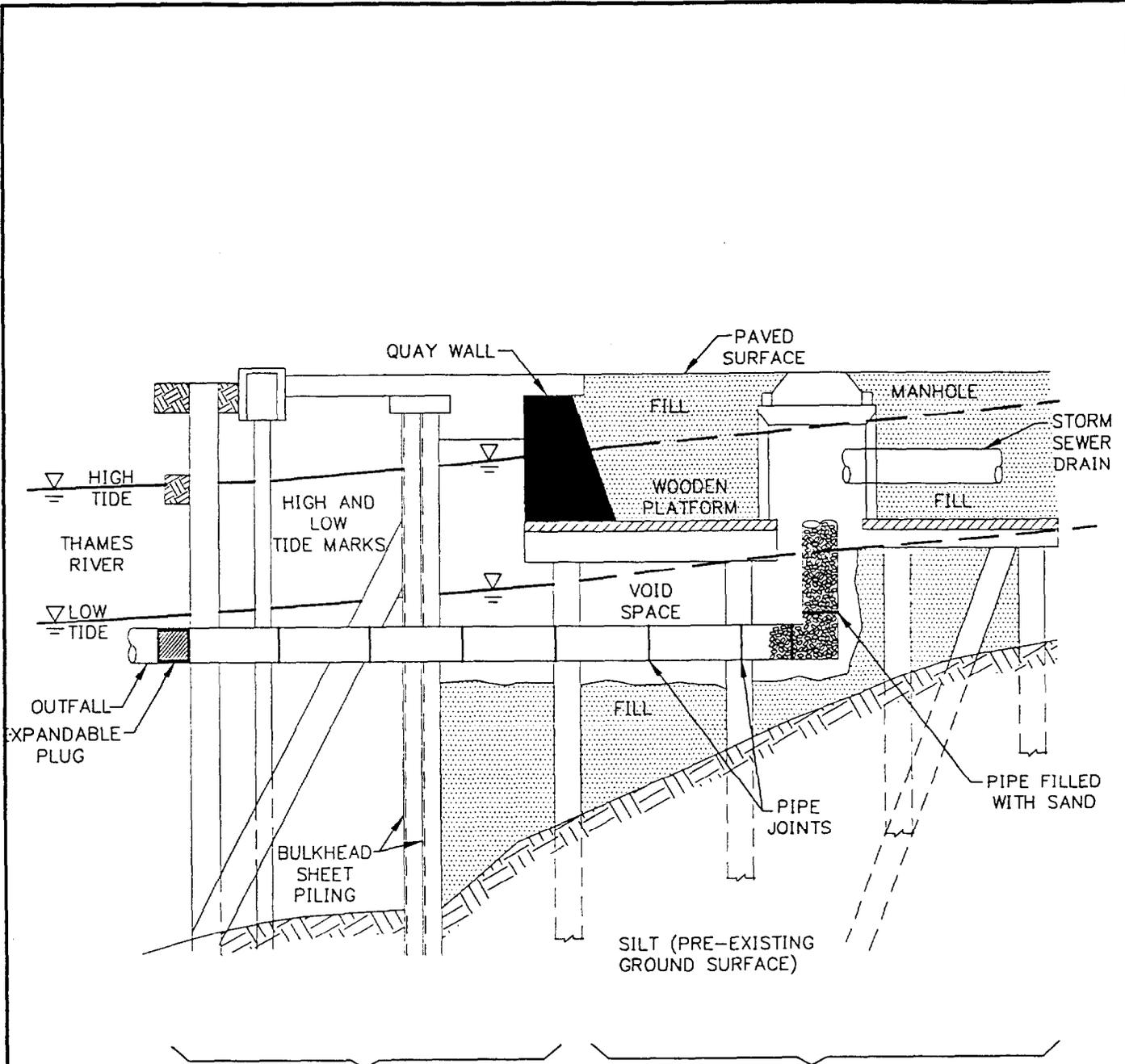
LEGEND

- |                 |                      |                 |
|-----------------|----------------------|-----------------|
| EXIST. PHASE II | MONITORING WELL      | EXIST. CONTOUR  |
| 61MW1           | 7MW5                 | 10              |
| 61TB1           | 7TB5                 | 123             |
| 65S1            | 14SS3                | WATERCOURSE     |
| 20SD1           | SEDIMENT SAMPLE      | STW             |
| 20SW1           | SURFACE WATER SAMPLE | STORM SEWER AND |
|                 | 85W/SD4              | CATCH BASIN     |
|                 | SC-1                 | EXPOSED BEDROCK |
|                 | QW-1                 |                 |
|                 | PROPOSED WELL        |                 |
|                 | GRAY WALL            |                 |



SCALE IN FEET

00613012



BUILT DURING JUNE, 1952

BUILT DURING AUGUST, 1940

ACAD: O:\DATA\CADD\9594\QUAY.DWG 12/29/94 VR VIEW=PLOT BUNK LAY

NOT TO SCALE

SOURCE: WEHREN, 1987

FIGURE B  
QUAY WALL/STORM SEWER DIAGRAM

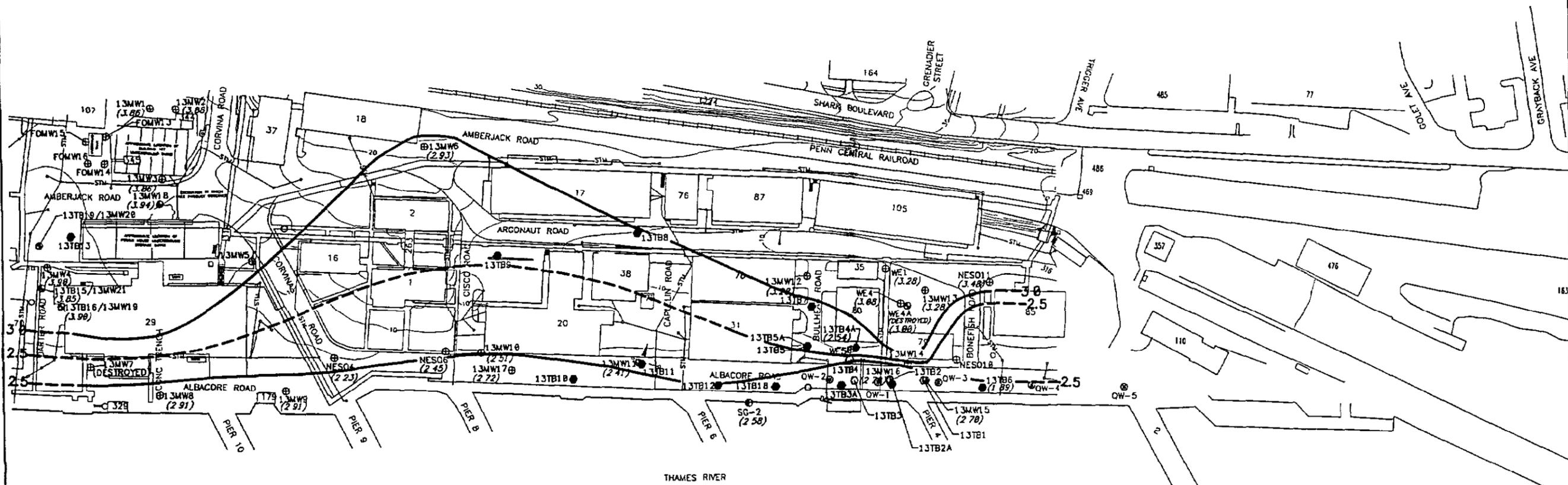




VIEW=PLOT DLBASE LAY  
ACAD 0 \DATA\CADD\9594\LBASEA.DWG 12/02/94 MB

FIGURE C

Potentiometric Surface Map  
Near High Tide Groundwater Elevations  
**HALLIBURTON NUS**  
Environmental Corporation



- NOTE
- 1 UNDERGROUND UTILITY LOCATIONS AREA APPROXIMATE
  - 2 BASE MAP AND UTILITY INFORMATION FROM MAPS OF NSB-NLON AND PHASE II RI WORK PLAN
  - 3 GROUNDWATER DATA COLLECTED MARCH, 1994

LEGEND

⑩	EXIST CONTOUR
123	BUILDING NO
—	WATERCOURSE
—	STORM SEWER AND CATCH BASIN
—	EXPOSED BEDROCK
○	MONITORING WELL
⊙	TEST BORING
△	SURFACE SOIL SAMPLE
◇	SEDIMENT SAMPLE
◇	SURFACE WATER SAMPLE
◇	SEDIMENT WATER AND/OR SAMPLE
◇	STAFF GAUGE SAMPLE
⊙	PROPOSED WELL
⊙	QUAY WALL



00613022