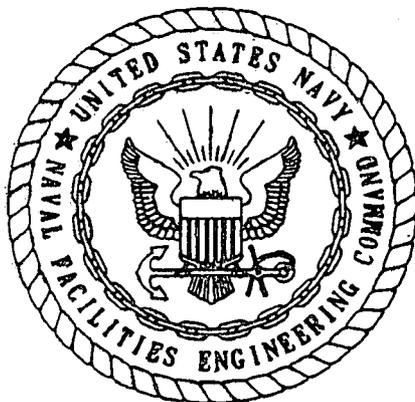


N61331.AR.001406
NSA PANAMA CITY
5090.3a

CONTAMINATION ASSESSMENT REPORT FACILITY 325 NSA PANAMA CITY FL
1/1/1996
ABB



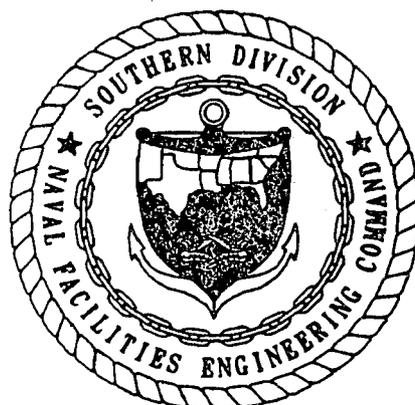
CONTAMINATION ASSESSMENT REPORT

FACILITY 325

**COASTAL SYSTEMS STATION PANAMA CITY
PANAMA CITY, FLORIDA**

**UNIT IDENTIFICATION CODE: N61331
CONTRACT NO. N62467-89-D-0317/011**

JANUARY 1996



**SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
NORTH CHARLESTON, SOUTH CAROLINA
29419-9010**



January 24, 1996

Document No. 7520.101

Mr. Eric Nuzie
Federal Facilities Coordinator
Bureau of Waste Cleanup
Florida Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, Florida 32399

**SUBJECT: Submittal of the Site 325, Contamination Assessment Report, Coastal Systems Station Panama City, Panama City, Florida.
Contract No. N62467-89-D-0317, CTO No. 011.**

Dear Mr. Nuzie:

Please find attached two copies of the Contamination Assessment Report for Site 325, Coastal Systems Station (CSS) Panama City, Panama City, Florida. Two copies have been sent to Nick Ugolini at Southern Division Naval Facilities Engineering Command in Charleston and two copies have been sent to Arturo McDonald at CSS Panama City.

If you have any questions, concerns, or comments please call either Jim Williams or myself at your earliest convenience at (904) 656-1293.

Sincerely,

ABB ENVIRONMENTAL SERVICES, INC.

Mark Diblin, P.G.
Senior Task Order Manager

Jim Williams, P.G.
Principal Geologist

cc: Jim Williams, ABB-ES
Nick Ugolini, EIC, SouthDiv
Arturo McDonald, NAS Pensacola
John Mitchell, RPM, FDEP
File



ABB Environmental Services Inc.

Berkeley Building
2590 Executive Center Circle East
Tallahassee, Florida 32301

Telephone (904) 656-1293
Fax (904) 877-0742

DISTRIBUTION

SOUTHNAVFACENGCOM	2
CSS Panama City	2
FDEP	2

CONTAMINATION ASSESSMENT REPORT

FACILITY 325

COASTAL SYSTEMS STATION PANAMA CITY
PANAMA CITY, FLORIDA

Unit Identification Code: N61331

Contract No. N62467-89-D-0317/011

Prepared by:

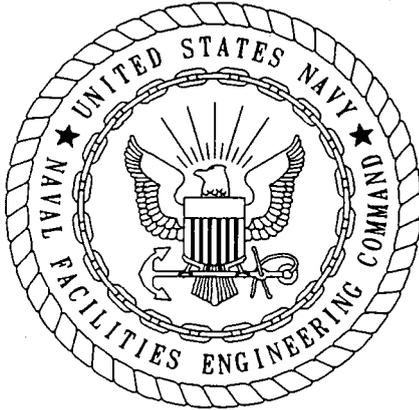
ABB Environmental Services, Inc.
2590 Executive Center Circle, East
Tallahassee, Florida 32301

Prepared for:

Department of the Navy, Southern Division
Naval Facilities Engineering Command
2155 Eagle Drive
North Charleston, South Carolina 29418

Nick Ugolini, Code 1843, Engineer-in-Charge

January 1996



CERTIFICATION OF TECHNICAL
DATA CONFORMITY (MAY 1987)

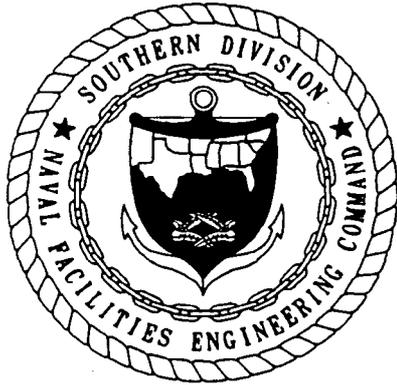
The Contractor, ABB Environmental Services, Inc., hereby certifies that, to the best of its knowledge and belief, the technical data delivered herewith under Contract No. N62467-89-D-0317/011 are complete and accurate and comply with all requirements of this contract.

DATE: January 24, 1996

NAME AND TITLE OF CERTIFYING OFFICIAL: Mark Diblin, P.G.
Task Order Manager

NAME AND TITLE OF CERTIFYING OFFICIAL: Michael J. Williams, P.G.
Project Technical Lead

(DFAR 252.227-7036)



FOREWORD

To meet its mission objectives, the U.S. Navy performs a variety of operations, some requiring the use, handling, storage, or disposal of hazardous materials. Through accidental spills and leaks and conventional methods of past disposal, hazardous materials may have entered the environment in ways unacceptable by today's standards. With growing knowledge of the long-term effects of hazardous materials on the environment, the Department of Defense (DOD) initiated various programs to investigate and remediate conditions related to suspected past releases of hazardous materials at their facilities.

One of these programs is the Comprehensive Long-Term Environmental Action, Navy Underground Storage Tank (UST) program. This program complies with Subtitle I of the Resource Conservation and Recovery Act and the Hazardous and Solid Waste Amendments of 1984. In addition, the UST program complies with all appropriate State and local storage tank regulations as they pertain to each naval facility.

The UST program includes the following activities:

- registration and management of Navy and Marine Corps storage tank systems,
- contamination assessment planning,
- site field investigations,
- preparation of contamination assessment reports,
- remedial (corrective) action planning,
- implementation of the remedial action plans, and
- tank and pipeline closures.

The Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOM) manages the UST program and the U.S. Environmental Protection Agency and the Florida Department of Environmental Protection (FDEP; formerly Florida Department of Environmental Regulation) oversee the Navy UST program at Coastal Systems Station (CSS) Panama City.

Questions regarding this report should be addressed to the Commanding Officer, CSS, Panama City, Florida, or to SOUTHNAVFACENGCOM, Nick Ugolini, Code 1843, at (803) 820-5596.

EXECUTIVE SUMMARY

Facility 325 was the location of three 20,000-gallon fiberglass underground storage tanks (USTs) containing JP-5 jet fuel and one 300-gallon UST containing waste JP-5. The 20,000-gallon USTs were installed in 1976 and became operational in 1983. Tank contents were reportedly restricted to JP-5 jet fuel. As part of the Navy Release Detection program, four monitoring wells were installed around the 20,000-gallon USTs in 1989. During the installation of the monitoring wells, petroleum-contaminated soil was detected.

ABB Environmental Services, Inc. (ABB-ES) initiated a contamination assessment (CA) at the site in September 1992. As part of the CA, 10 soil borings and three monitoring wells were installed. ABB-ES sampled all site monitoring wells in October 1992. Several groundwater samples slightly exceeded the State target levels for benzene and total naphthalenes. After reviewing the analytical data with the Florida Department of Environmental Protection (FDEP), a decision was made to resample all wells at the site. The wells were resampled in March 1993. Groundwater contaminant concentrations had slightly increased since October 1992. Of particular note, however, was the sample collected from monitoring well MW-4, in which relatively high concentrations of total naphthalenes were detected. The concentrations of total naphthalenes in MW-4, when compared to the earlier laboratory results in which no contaminants were detected, suggested that a recent release or leak had occurred. ABB-ES recommended that the Activity conduct tightness testing on the 20,000-gallon USTs and associated pipelines. Shortly thereafter, Activity personnel discovered free product in MW-4. As much as 1.25 feet of free product was measured in MW-4 in July 1993. Several tightness tests were conducted from May through July 1993, and a leak was discovered in the underground pipelines associated with UST No. 2, the middle UST. In August 1993, approximately 9 inches of free product were discovered in a second monitoring well, MW-6.

ABB-ES mobilized to the site in July 1994 to install free product recovery wells. Fourteen soil borings were advanced at the site to locate the area of greatest free product thickness. One recovery well was installed on the north side of the tank pad, and two recovery wells were installed along the east side of the tank pad. After the installation of the recovery well, only one well contained measurable free product (0.01 foot).

After conducting a cost/benefit analysis, the Activity made a decision to abandon the leaking system and replace it with a similar system. SOUTHNAVFACENCOM decided to use the remedial action contract (RAC) contractor, Bechtel Environmental, Inc. (BEI), to remove the USTs and free product from the site and requested that ABB-ES provide oversight of BEI for free product removal. The plan was later revised to include UST, pipelines, and soil removal oversight.

ABB-ES, BEI, and BEI's subcontractor, Florida Petroleum Services, mobilized to the site to perform the initial remedial action (IRA). The USTs and associated pipelines were removed in July and August 1995. Excessively contaminated soil (>50 ppm) in the area of the USTs and along the pipelines was removed and replaced with clean fill material. In total, approximately 490 cubic yards of excessively contaminated soil were removed from the site. Not all excessively contaminated soil was removed from the site, only the amount required to pull the tanks and pipelines. The IRA scope of work also called for the removal of free

product; however, only a slight sheen of free product was observed in the excavation. An attempt was made to remove the free product by vacuuming the groundwater surface for approximately 3 hours. The amount of free product removed was not measurable.

Following removal of the USTs, ABB-ES returned to the site to complete the contamination assessment. Twenty-three soil borings were advanced and 18 monitoring wells were installed to assess the horizontal and vertical extent of soil and groundwater contamination. The following is a summary of the findings:

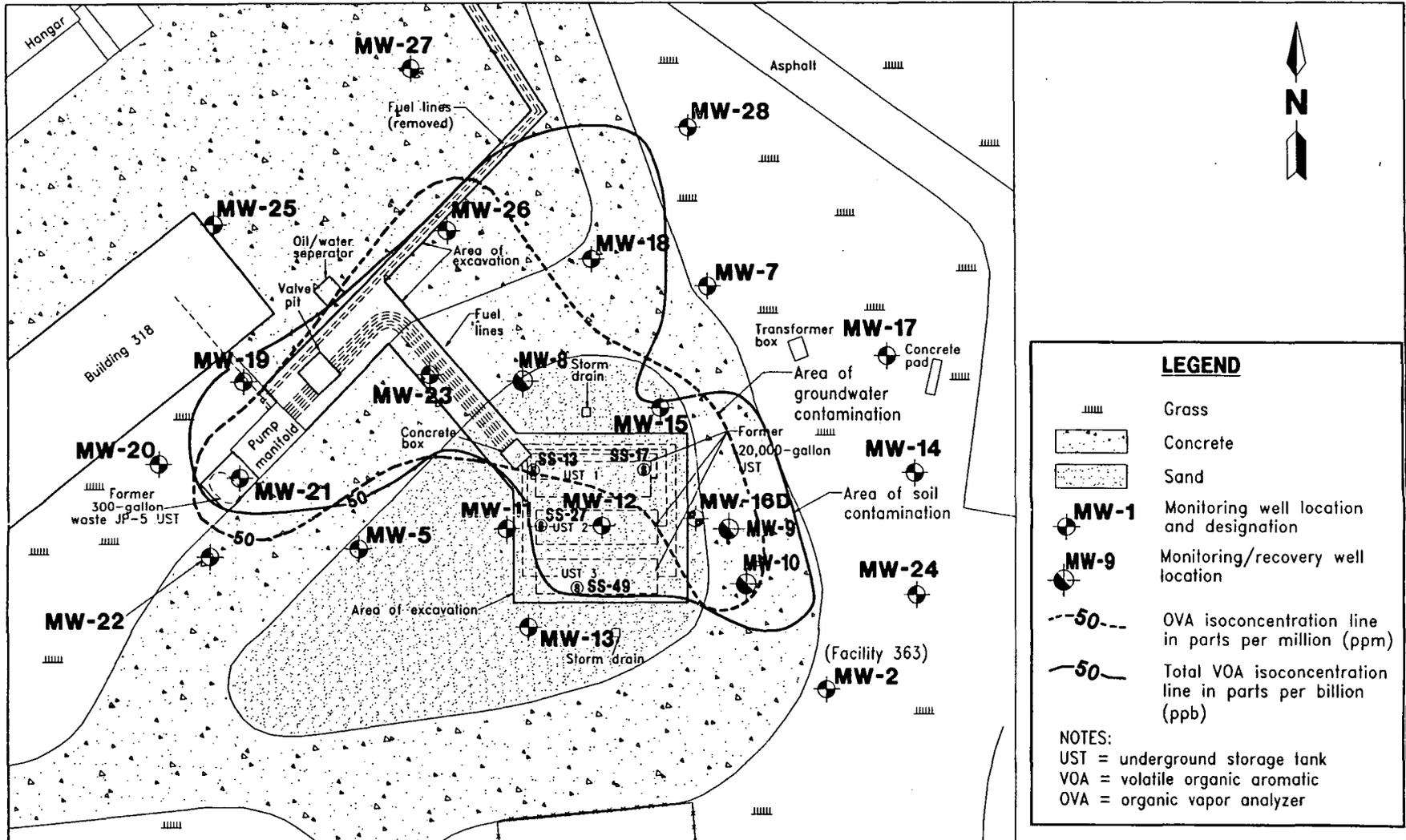
- The water table at the site was encountered at depths ranging from 5 to 7 feet below land surface (bls).
- The direction of groundwater flow in the surficial aquifer is to the east.
- Excessively contaminated soil was detected in the vicinity of the three former 20,000-gallon USTs along the pipelines extending to the pump station and helipads, and in the vicinity of the former 300-gallon waste JP-5 UST on the southwest side of the pump manifold. Much of the excessively contaminated soil is covered by asphalt or concrete.
- Free product was encountered only in monitoring well MW-26 and measured 0.90 foot in thickness.
- Total VOA, MTBE, PAH, TRPH, lead, and several chlorinated compounds were detected in groundwater samples. Total VOA, total PAH (excluding naphthalenes), total naphthalenes, TRPH, in TBE and lead concentrations were compared to Chapter 62-770, FAC, target levels for Class G-II groundwater. Because Class G-II groundwater target levels were not available for chlorinated compounds, these contaminants were compared to State groundwater guidance concentrations (FDEP, June 1994). Only PAH (excluding naphthalene in six of the perimeter monitoring wells) exceeded the Chapter 62-770, FAC, target levels for an MOP.
- The apparent sources of contamination, three 20,000-gallon USTs, one 300-gallon UST, and all associated pipelines have been removed from the site.
- No potable water sources were identified within a 0.25-mile radius of the site. There appears to be no risk of contamination of the CSS Panama City public water supply system from activities at the site.

CONCLUSIONS. Based on the findings of the CA and site conditions, the following can be concluded:

- Groundwater contamination at the site appears to be related to releases from the former USTs and associated pipelines. These sources have been removed; therefore, groundwater contaminant concentrations can be expected to decrease over time by natural attenuation.

- Free product at the site is likely associated with one or more previous releases from the UST system. Very little of the free product released at the site was recovered during the UST system removal and subsequent IRA. The free product observed in monitoring well MW-26 is probably part of an isolated pocket in the vadose zone that periodically migrates with water table fluctuations.

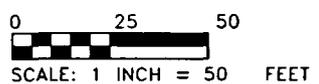
RECOMMENDATIONS. Based on the findings, conclusions, and interpretations of the CA, ABB-ES recommends an IRA for free product removal and development of a remedial action plan in accordance with Chapter 62-770, FAC.



LEGEND

- Grass
- Concrete
- Sand
- MW-1 Monitoring well location and designation
- MW-9 Monitoring/recovery well location
- 50 OVA isoconcentration line in parts per million (ppm)
- 50 Total VOA isoconcentration line in parts per billion (ppb)

NOTES:
 UST = underground storage tank
 VOA = volatile organic aromatic
 OVA = organic vapor analyzer



EXECUTIVE SUMMARY FIGURE



**CONTAMINATION ASSESSMENT
REPORT
FACILITY 325**

**COASTAL SYSTEMS STATION
PANAMA CITY, FLORIDA**

ACKNOWLEDGMENTS

In preparing this report, the Underground Storage Tank Section of the Comprehensive Long-Term Environmental Action, Navy Group at ABB Environmental Services, Inc. (ABB-ES), commends the support, assistance, and cooperation provided by the personnel at Coastal Systems Station (CSS), Panama City, Florida, and Southern Division, Naval Facilities Engineering Command.

TABLE OF CONTENTS

Contamination Assessment Report
Facility 325, Coastal Systems Station
Panama City, Florida

Chapter	Title	Page No.
1.0	INTRODUCTION	1-1
2.0	SITE BACKGROUND	2-1
3.0	SITE CONDITIONS	3-1
3.1	PHYSIOGRAPHY	3-1
3.2	HYDROGEOLOGY	3-1
	3.2.1 Regional and Local	3-1
	3.2.2 Site-Specific	3-1
4.0	METHODOLOGIES AND EQUIPMENT	4-1
4.1	SOIL SAMPLE COLLECTION AND OVA HEADSPACE ANALYSIS	4-1
4.2	MONITORING WELL INSTALLATION AND CONSTRUCTION	4-1
4.3	WATER TABLE ELEVATION MEASUREMENTS	4-4
4.4	GROUNDWATER SAMPLING AND ANALYSES	4-4
4.5	AQUIFER SLUG TESTS	4-4
5.0	CONTAMINATION ASSESSMENT RESULTS	5-1
5.1	SITE-SPECIFIC AQUIFER CHARACTERISTICS AND HYDROGEOLOGIC PARAMETERS	5-1
5.2	POTABLE WELL SURVEY	5-1
5.3	CONTAMINANT PLUME CHARACTERIZATION	5-1
	5.3.1 Soil Contamination Assessment	5-1
	5.3.2 Groundwater Contamination Assessment	5-11
	5.3.2.1 Total VOA in Groundwater	5-11
	5.3.2.2 MTBE in Groundwater	5-11
	5.3.2.3 PAH in Groundwater	5-11
	5.3.2.4 TRPH in Groundwater	5-20
	5.3.2.5 Lead in Groundwater	5-20
	5.3.2.6 Chlorinated Compounds in Groundwater	5-20
	5.3.3 Free Product Assessment	5-24
6.0	SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS	6-1
6.1	SUMMARY	6-1
6.2	CONCLUSIONS	6-2
6.3	RECOMMENDATIONS	6-2
7.0	PROFESSIONAL REVIEW CERTIFICATION	7-1

TABLE OF CONTENTS (Continued)

Contamination Assessment Report
Facility 325, Coastal Systems Station
Panama City, Florida

REFERENCES

APPENDICES

- Appendix A: Technical Memorandum
- Appendix B: Site Conditions
- Appendix C: Lithologic Logs
- Appendix D: Aquifer Parameter Calculations
- Appendix E: Slug Test Graphs
- Appendix F: Groundwater Sample Analytical Data

LIST OF FIGURES

Contamination Assessment Report
Facility 325, Coastal Systems Station
Panama City, Florida

<u>Figure</u>	<u>Title</u>	<u>Page No.</u>
2-1	Site Location Map	2-2
2-2	Site Plan	2-4
4-1	Soil Boring Location Map	4-2
4-2	Monitoring Well Location Map	4-3
4-3	Typical Shallow Monitoring Well Installation Detail	4-5
4-4	Typical Deep Monitoring Well Installation Detail	4-6
5-1	Water Table Elevation Contour Map, October 12, 1995	5-5
5-2	Water Table Elevation Contour Map, October 16, 1995	5-6
5-3	Location of Public Supply Wells, CSS Panama City	5-7
5-4	Soil Sample Organic Vapor Analyzer (OVA) Headspace Readings	5-12
5-5	Total VOA Concentrations in Groundwater, October 1995	5-14
5-6	Benzene Concentrations in Groundwater, October 1995	5-15
5-7	Total Naphthalenes Concentrations in Groundwater, October 1995	5-21
5-8	Total Recoverable Petroleum Hydrocarbons (TRPH), Groundwater, October 1995	5-22
5-9	Lead Concentrations in Groundwater October 1995	5-23

LIST OF TABLES

<u>Table</u>	<u>Title</u>	<u>Page No.</u>
5-1	Water Table Elevation Data, October 12, 1992, and October 16, 1995	5-2
5-2	Public Water Supply Wells Data	5-4
5-3	Soil Sample Organic Vapor Analyzer (OVA) Analyses, July 28, 1994, through September 30, 1995	5-8
5-4	Petroleum Contaminant Concentrations Exceeding State Regulatory Levels, October 1992 through October 1995	5-13
5-5	Summary of Groundwater Sample Laboratory Analysis, October 1992 through October 1995	5-16

GLOSSARY

ABB-ES	ABB Environmental Services, Inc.
BEL	Bechtel Environmental, Inc.
bls	below land surface
CA	contamination assessment
CAR	contamination assessment report
CSS	Coastal Systems Station
DCA	dichloroethane
DCB	dichlorobenzene
FAC	Florida Administrative Code
ft/day	feet per day
ft/ft	feet per foot
FDEP	Florida Department of Environmental Protection
FDER	Florida Department of environmental Regulation
ID	inside diameter
IRA	initial remedial action
K	hydraulic conductivity
MO	monitoring only
MOP	monitoring only plan
MTBE	methyl tert-butyl ether
msl	mean sea level
NFA	no further action
OVA	organic vapor analyzer
PAH	polynuclear aromatic hydrocarbons
ppb	parts per billion
ppm	parts per million
PVC	polyvinyl chloride
RAC	remedial action contract
SOUTHNAV- FACENCOM	Southern Division, Naval Facilities Engineering Command
TRPH	total recoverable petroleum hydrocarbons
USEPA	U.S. Environmental Protection Agency
UST	underground storage tank
V	velocity
VOA	volatile organic aromatic

1.0 INTRODUCTION

ABB Environmental Services, Inc. (ABB-ES), was contracted by the Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOM) to perform a contamination assessment (CA) and submit a contamination assessment report (CAR) for Facility 325, Coastal Systems Station (CSS) Panama City, Panama City, Florida. The scope of services is described in Contract Task Order No. 011 and the Plan of Action and includes the following:

- collecting soil samples in the unsaturated (vadose) zone for headspace analysis using an organic vapor analyzer (OVA) to assess the horizontal and vertical extent of petroleum-contaminated soil,
- installing and sampling groundwater monitoring wells to assess the horizontal and vertical extent of groundwater contamination,
- collecting water-level data to assess the groundwater flow direction and hydraulic gradient at the site,
- conducting a potable well inventory within a 0.25-mile radius of the site,
- conducting slug tests on selected wells to estimate aquifer characteristics, and
- reducing and analyzing pertinent data gathered during the CA to complete this CAR.

The CA field investigation was conducted from September 1992 through October 1995. The following sections of this CAR present the background information, data compilation, field investigation results, and recommendations for further action at the site.

2.0 SITE BACKGROUND

The Coastal Systems Station is a major Navy research and development facility located on St. Andrew Bay in Bay County, Florida (see Figure 2-1). It is situated approximately 103 miles east of Pensacola, 98 miles west of Tallahassee, and 7 miles west of Panama City. The Coastal Systems Station is bounded by U.S. Highway 98 to the north, St. Andrew Bay to the east, State Route 392B (Magnolia Beach Road) to the south, and State Route 392 (Thomas Drive) to the west.

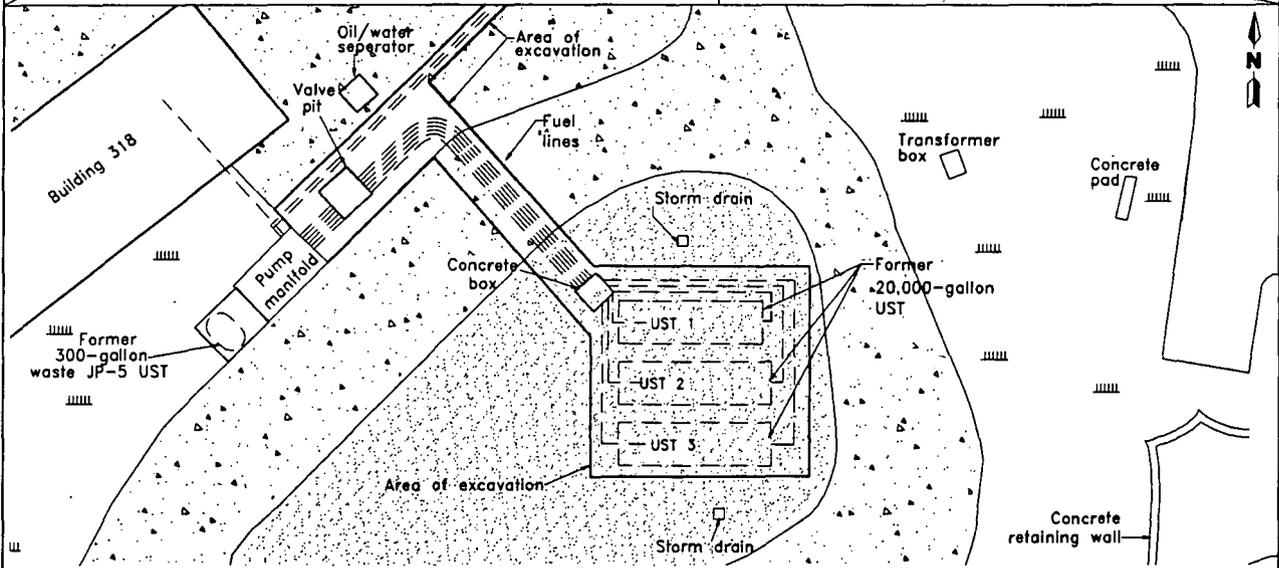
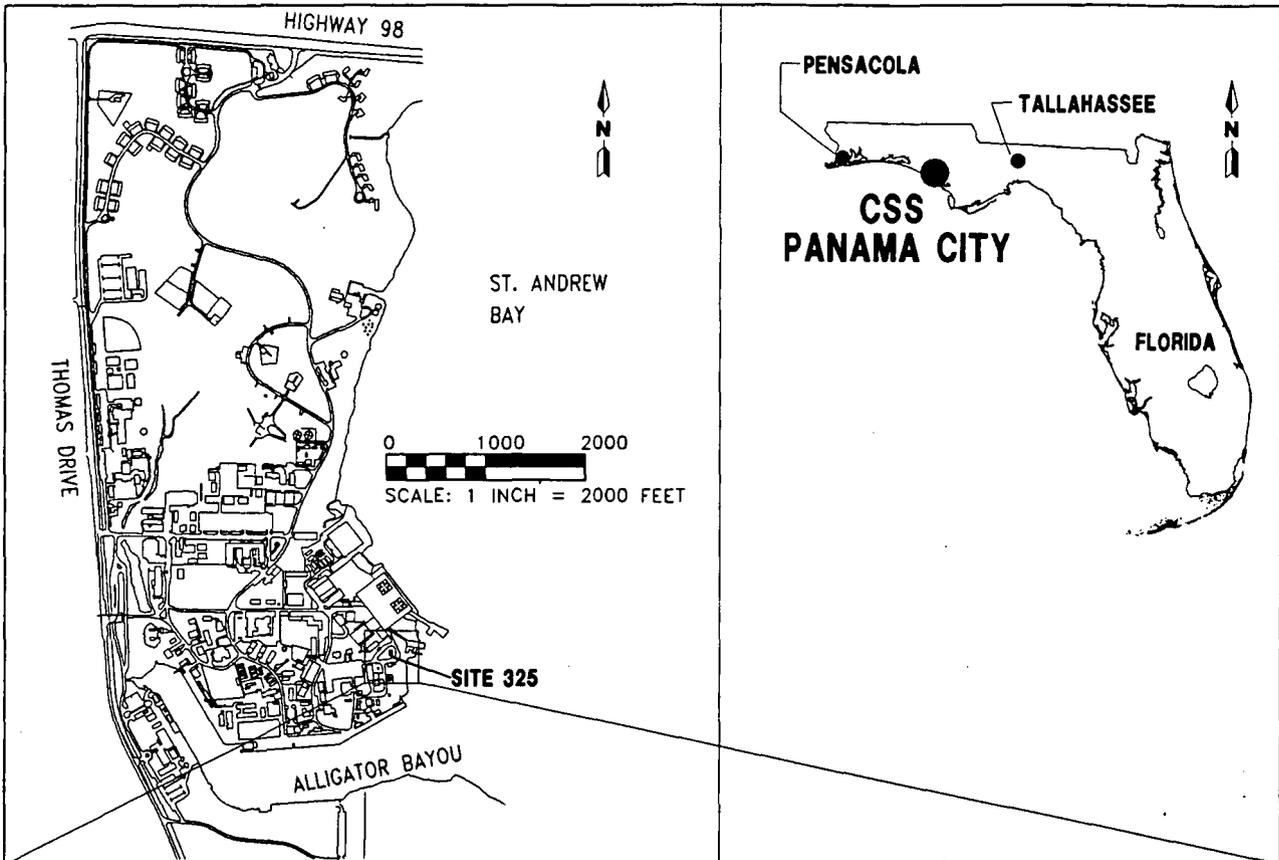
The Coastal Systems Station consists of two operational areas that encompass 657 acres. The laboratory area, situated north of Alligator Bayou (an inlet to St. Andrew Bay), covers approximately 350 acres and houses research facilities and various support activities and tenants. The ordnance area, south of Alligator Bayou, is approximately 300 acres and is used primarily for ordnance storage and limited research. Facility 325 is located in the laboratory area.

Site 325 was the location of three 20,000-gallon fiberglass underground storage tanks (USTs) containing JP-5 jet fuel and one 300-gallon UST containing waste JP-5 (Figure 2-1). The 20,000-gallon USTs were installed in 1976 and became operational in 1983. The 300-gallon UST was installed in 1984. As part of the Navy Release Detection program, four compliance monitoring wells were installed around the 20,000-gallon USTs in 1989. During the installation of the monitoring wells, petroleum-contaminated soil was detected.

ABB-ES initiated a CA at the site in September 1992. As part of the CA, 10 soil borings and three monitoring wells were installed. ABB-ES sampled all site monitoring wells in October 1992. Several groundwater samples slightly exceeded the State target levels for benzene and total naphthalenes. After reviewing the analytical data with the Florida Department of Environmental Protection (FDEP), a decision was made to resample all monitoring wells at the site. The wells were resampled in March 1993. Contaminant concentrations in one of the monitoring wells sampled suggested that a recent release or leak had occurred; therefore, ABB-ES recommended that the Activity conduct tightness testing on the 20,000-gallon USTs and associated pipelines. Activity personnel discovered 1.25 feet of free product in the same monitoring well in July 1993. Several tightness tests were conducted from May through July 1993, and a leak was discovered in the underground pipelines associated with UST #2, the middle UST. In August 1993, approximately 9 inches of free product were discovered in a different monitoring well. The Activity decided to abandon the UST system and begin free product removal as part of an initial remedial action (IRA). A technical memorandum presenting the findings of the CA up to March 1994 is attached in Appendix A.

ABB-ES mobilized to the site in July 1994 to install free product recovery wells. Fourteen soil borings were advanced at the site to locate the area of greatest free product thickness. One recovery well was installed on the north side of the tank pad, and two recovery wells were installed along the east side of the tank pad. After the installation of the recovery wells, only one well contained measurable free product (0.01 foot).

The Activity spent the next several months conducting a cost/benefit analysis comparing several possible courses of action at the site. The three options evaluated were: (1) removing the USTs and associated pipelines, (2) locating and



NOTE:

UST = underground storage tank
 CSS = Coastal Systems Station

**FIGURE 2-1
 SITE LOCATION MAP**



**CONTAMINATION ASSESSMENT
 REPORT
 FACILITY 325**

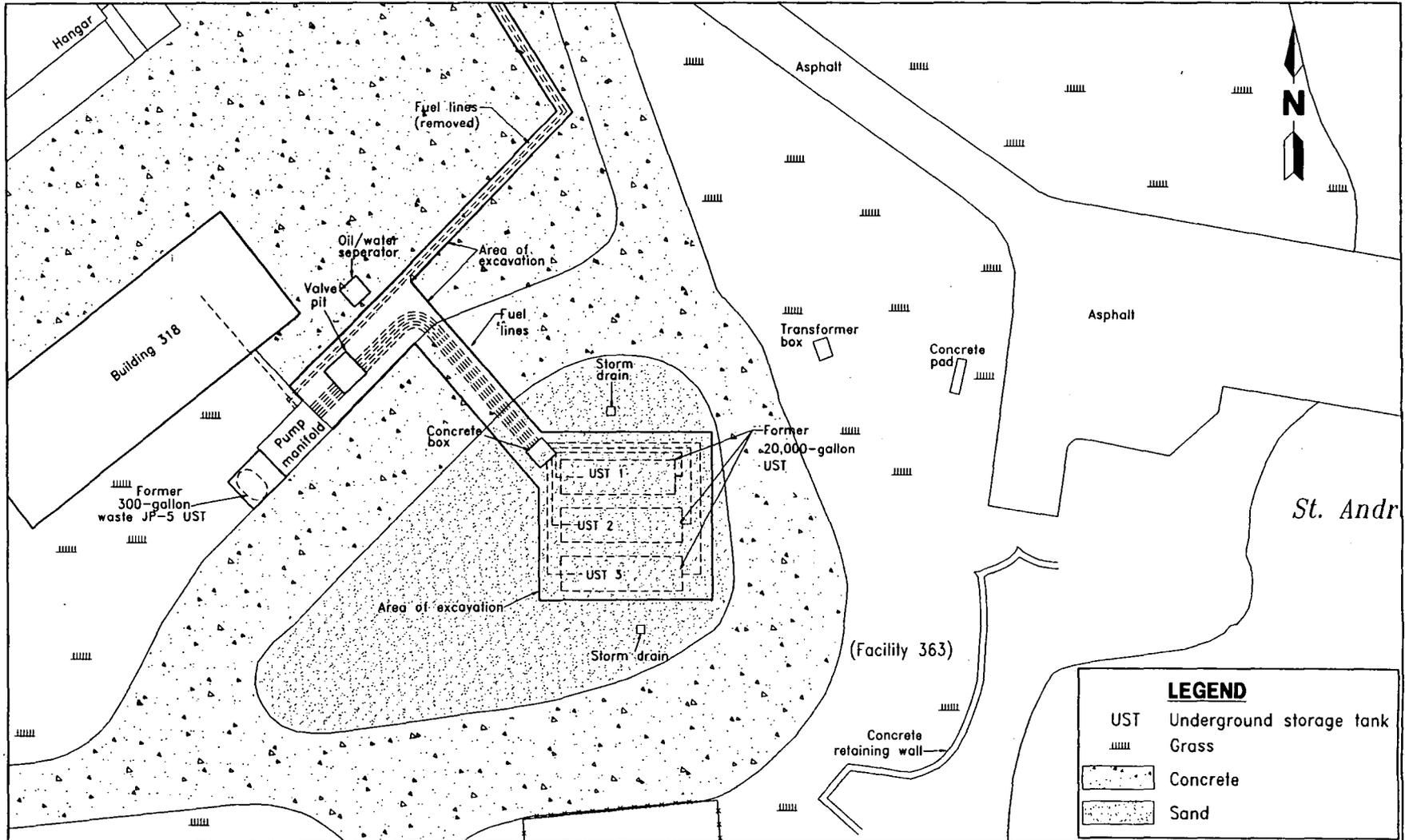
**COASTAL SYSTEMS STATION
 PANAMA CITY, FLORIDA**

H:\9590\180600\NP-CCK\01-18-96

repairing the fuel leak, or (3) hiring a subcontractor to transport fuel by truck directly to the helipad. The Activity made a decision to remove the USTs and pipelines and install a new system. SOUTHNAVFACENGCOM decided to use the remedial action contract (RAC) contractor, Bechtel Environmental, Inc. (BEI), to remove the USTs and free product from the site and requested that ABB-ES provide oversight of BEI during free product removal. ABB-ES's responsibilities were later revised to include UST, pipeline, and soil removal oversight.

ABB-ES, BEI, and BEI's subcontractor, Florida Petroleum Services, mobilized to the site to perform the IRA. The USTs and associated pipelines were removed in July and August 1995. During the excavation, 83 soil samples were collected from the backhoe bucket and screened with an OVA. Excessively contaminated soil (>50 parts per million [ppm]) in the area of the USTs and along the pipelines was removed and replaced with clean fill material (Figure 2-2). In total, approximately 490 cubic yards of excessively contaminated soil were removed from the site. Not all excessively contaminated soil was removed from the site, only the amount required to pull the tanks and pipes. The IRA scope of work also called for the removal of free product; however, only a slight sheen of free product was observed in the excavation. An attempt was made to remove the free product by vacuuming the groundwater surface for approximately 3 hours. The amount of free product removed was not measurable.

Following removal of the USTs, ABB-ES returned to the site to complete the CA. Twenty-three soil borings were advanced, and 18 monitoring wells were installed to assess the horizontal and vertical extent of soil and groundwater contamination. The following sections of this report present the findings and conclusions of the additional CA.



LEGEND	
UST	Underground storage tank
	Grass
▨	Concrete
▩	Sand

0 25 50
SCALE: 1 INCH = 50 FEET

FIGURE 2-2
SITE PLAN



CONTAMINATION ASSESSMENT
REPORT
FACILITY 325

COASTAL SYSTEMS STATION
PANAMA CITY, FLORIDA

3.0 SITE CONDITIONS

3.1 PHYSIOGRAPHY. Regional physiography is discussed in Appendix B, Site Conditions. Surface topography in Bay County varies from flat to slightly rolling hills with elevations less than 70 feet above mean sea level (msl). Ground elevations at the site vary from msl to approximately 10 feet above msl. The land surface east of the concrete driveway slopes gently downward to the bay. The remainder of the site is flat.

3.2 HYDROGEOLOGY.

3.2.1 Regional and Local The Panama City area is underlain by three water-bearing zones. These zones, in order of increasing depth, are the water-table aquifer, secondary artesian aquifer, and the Floridan aquifer system. A detailed discussion of these three aquifers is presented in Appendix B.

3.2.2 Site-Specific The principal aquifer of concern at the site is the water-table aquifer. The water-table aquifer was penetrated to a depth of 30 feet during this investigation. This zone is generally composed of quartz sand and nonplastic clay. The sand is fine-grained to medium-grained and varies from light brown to light gray. Clay content averages 10 percent. The water-table aquifer is unconfined, and was encountered at depths ranging from 5 to 7 feet below land surface (bls) during this investigation. Site-specific aquifer characteristics and other hydrogeologic parameters are discussed in Section 5.1.

4.0 METHODOLOGIES AND EQUIPMENT

All methodologies and equipment used during the field investigation were in conformance with the ABB-ES, FDEP-approved, Comprehensive Quality Assurance Program Plan.

4.1 SOIL SAMPLE COLLECTION AND OVA HEADSPACE ANALYSIS. Thirty-seven soil borings (designated SB-1 through SB-37) were advanced into the water table to assess the horizontal and vertical extent of petroleum contamination in the vadose zone, to characterize the type of subsurface material, and to aid in the placement of groundwater monitoring wells. Soil boring locations are shown on Figure 4-1. Soil borings advanced prior to the discovery of a leak in the UST pipes are not included in this report.

Soil borings were advanced using a truck-mounted drill rig with rotary drilling and hollow-stem augers. Soil samples were collected at 2-foot vertical intervals until the water table was encountered. Total depth to soil borings varied from 6 feet bls to 8 feet bls, depending on the depth to the water table.

Soil samples were collected from a split-spoon sampling device. The samples were placed in 16-ounce glass jars and sealed with a double layer of aluminum foil. Petroleum-contaminated soil was assessed by OVA headspace analysis in accordance with Chapter 62-770, Florida Administrative Code (FAC), and following the procedures outlined by FDEP (May 1994). Each sample was analyzed using an OVA equipped with a flame ionization detector. Because samples collected from 6 to 8 feet bls were below the water table, OVA headspace readings from these samples were not used for soil assessment. The results of the soil boring and soil sampling program are discussed in Subsection 5.2.1.

4.2 MONITORING WELL INSTALLATION AND CONSTRUCTION. Twenty-three shallow monitoring wells (designated CSS-325-MW-5 through CSS-325-MW-15, and CSS-325-MW-17 through CSS-325-MW-28) were installed to depths of 12 to 15 feet bls. One double-cased deep monitoring well (designated CSS-325-MW-16D) was installed to a depth of 30 feet bls. Monitoring well locations are shown on Figure 4-2. For convenience, the prefix "CSS-325" has been replaced with "MW" hereafter in tables, figures, and text throughout this report.

Borings for shallow monitoring wells were advanced with a truck-mounted drill rig using rotary drilling techniques with 4.25-inch and 6.25-inch inside diameter (ID) hollow-stem augers. The boring for the deep monitoring well was advanced with 8.25-inch ID hollow-stem augers and completed using mud rotary.

Free product recovery wells MW-8, MW-9, and MW-10 were constructed of 4-inch ID, schedule 40, polyvinyl chloride (PVC) casing. The remaining shallow monitoring wells were constructed of 2-inch ID, schedule 40, PVC casing. Each shallow well contains 10 feet of 0.010-inch machine-slotted screen. PVC well casing extends from the top of the screen to land surface. A 20/30 grade silica sand filter pack was placed in the annular space to approximately 1 foot above the top of the screened interval. A 12-inch thick fine sand (30/65) seal was placed on top of the filter pack. The remaining annular space was grouted to surface with a neat

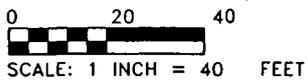
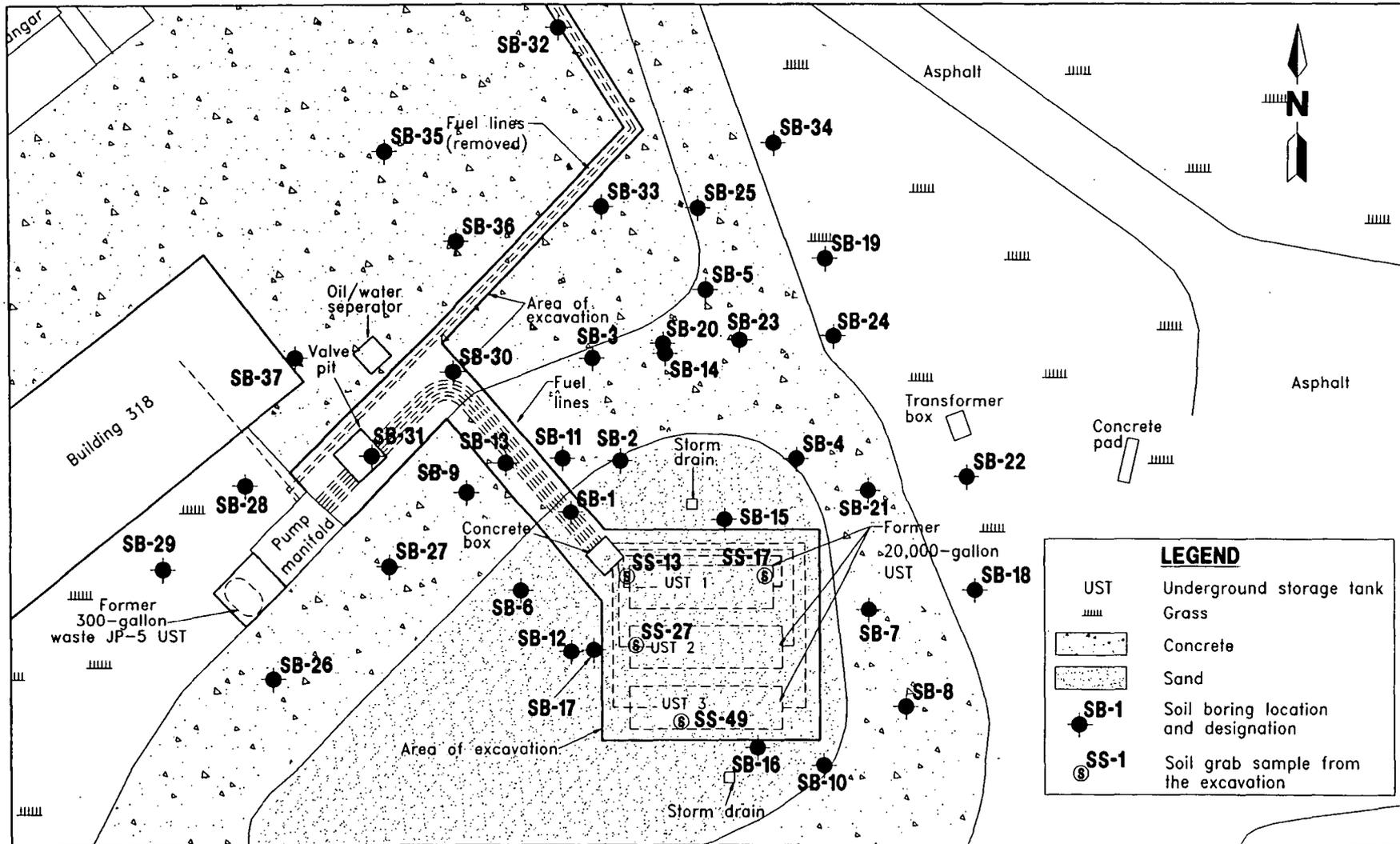
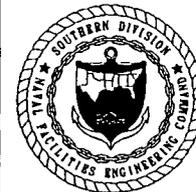
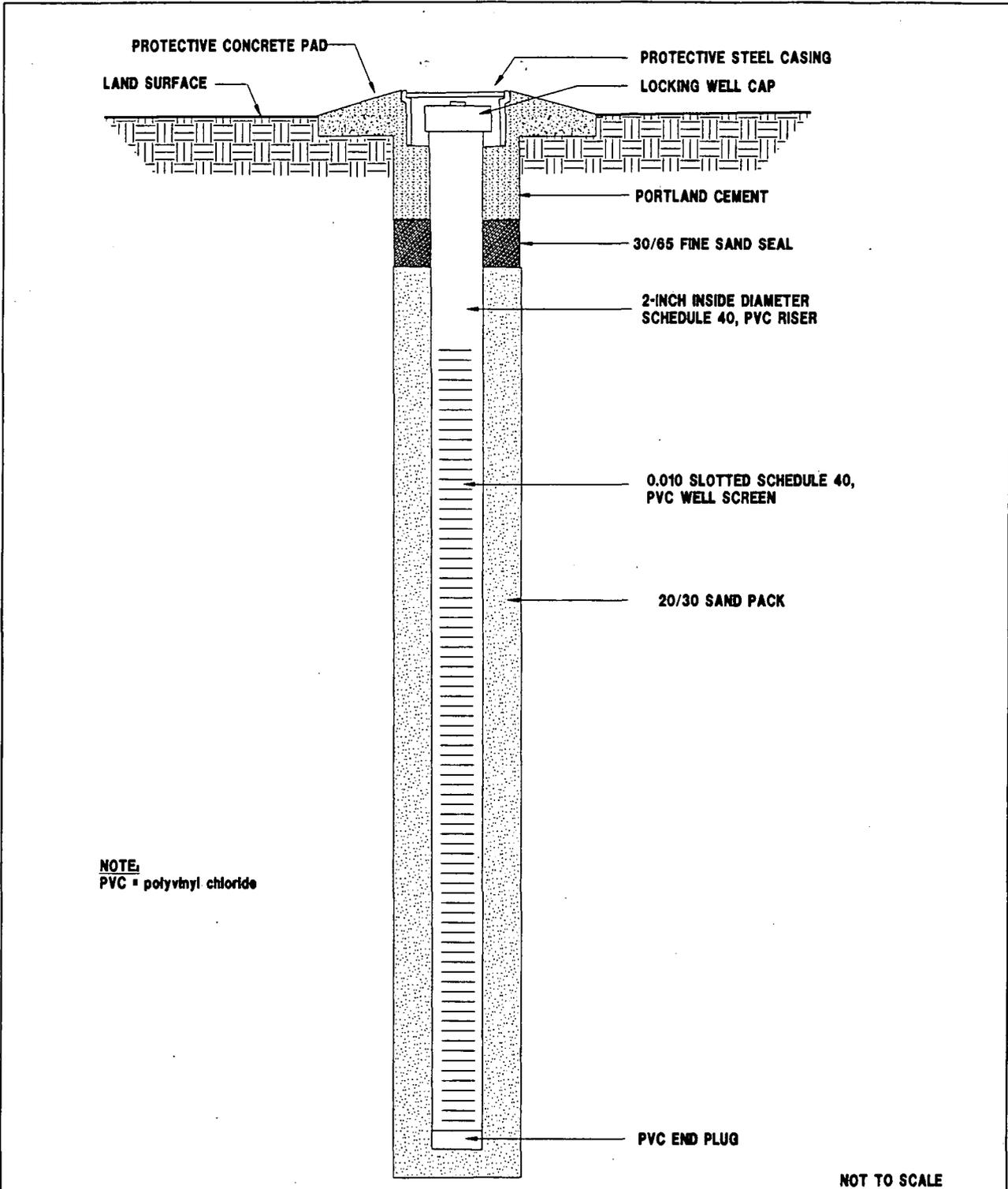


FIGURE 4-1
SOIL BORING LOCATION MAP



**CONTAMINATION ASSESSMENT
REPORT
FACILITY 325**

**COASTAL SYSTEMS STATION
PANAMA CITY, FLORIDA**



**FIGURE 4-3
TYPICAL SHALLOW MONITORING WELL
INSTALLATION DETAIL**



**CONTAMINATION ASSESSMENT
REPORT
FACILITY 325**

**COASTAL SYSTEMS STATION
PANAMA CITY, FLORIDA**

H:\9290\18040\CCX-140\12-06-85

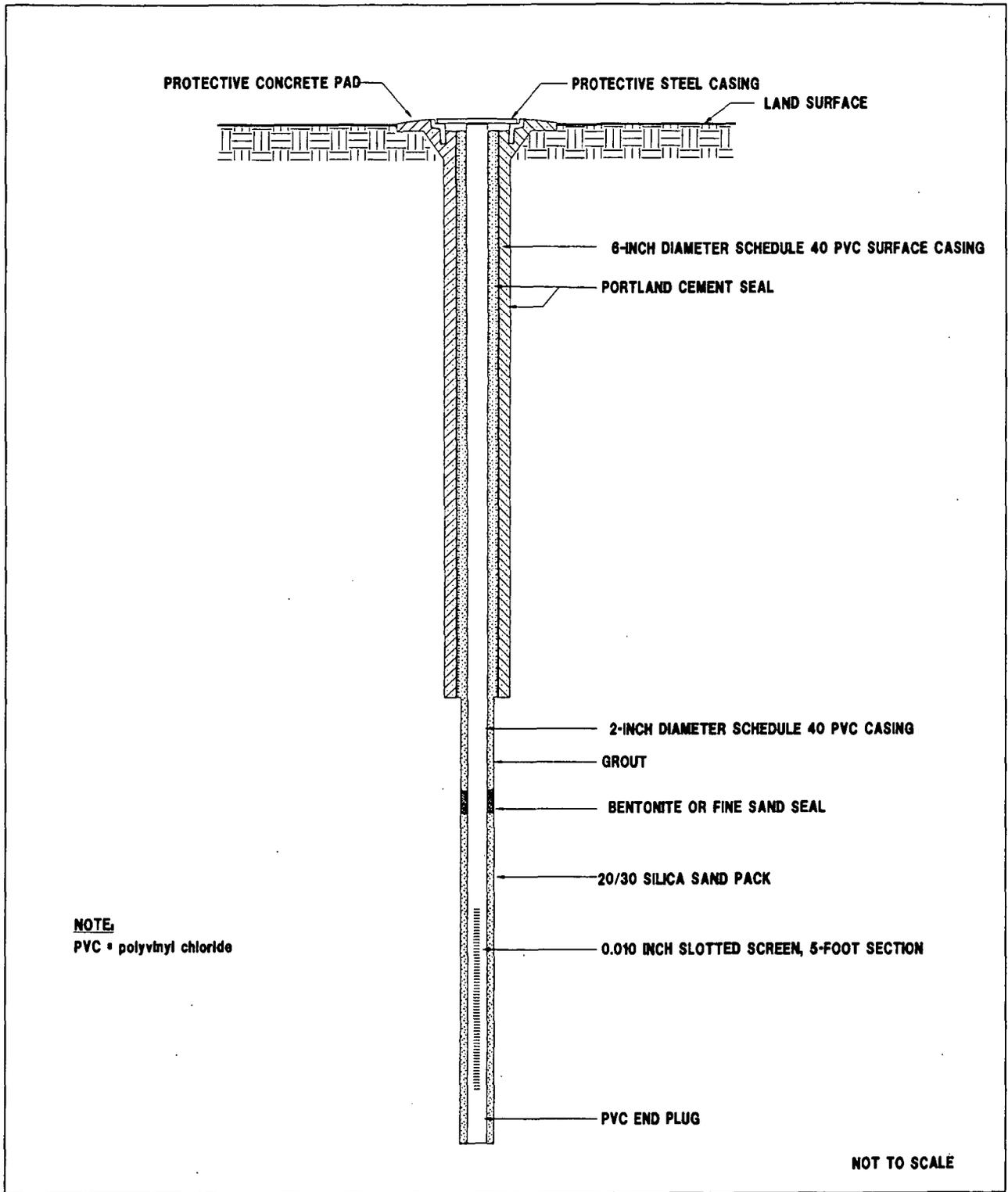


FIGURE 4-4
TYPICAL DEEP MONITORING WELL
INSTALLATION DETAIL



CONTAMINATION ASSESMENT
REPORT
FACILITY 325

COASTAL SYSTEMS STATION
PANAMA CITY, FLORIDA

The slug was constructed of 1-inch outside diameter PVC pipe, 5 feet in length, filled with sand, and capped watertight at both ends. The water-level changes in the monitoring wells were recorded using a data logger and pressure transducer. The pressure transducer was suspended near the bottom of the well, and an initial water level was recorded prior to beginning the test. The slug was then lowered into the well to a depth below the water table. Water levels were then recorded until they stabilized at the original level. The slug was quickly removed from the well, and the rate of the rising water level in the well was recorded until the water table had recovered to the initial value at the time of slug removal. Three tests were conducted in each well in order to obtain an average K value. Aquifer parameter calculations and slug test graphs are attached in Appendices D and E, respectively.

5.0 CONTAMINATION ASSESSMENT RESULTS

5.1 SITE-SPECIFIC AQUIFER CHARACTERISTICS AND HYDROGEOLOGIC PARAMETERS. Depth to water, top-of-casing, and water-table elevations were recorded October 12, 1992, and October 16, 1995, and are presented in Table 5-1. Water-table elevation contour maps for each date are shown on Figures 5-1 and 5-2, respectively (Note: the water-table elevation from deep monitoring well MW-16D was not used in water-table elevation contouring). The data from the shallow wells indicate an easterly groundwater flow direction at the site on both dates.

The calculated average hydraulic gradient at the site is 8.74×10^{-3} feet per foot (ft/ft). Slug test results indicate an average K value of 21.2 feet per day (ft/day). The calculated pore water velocity (V) is 0.74 ft/day. Equations and calculations used to estimate these values are presented in Appendix D, Aquifer Parameter Calculations.

5.2 POTABLE WELL SURVEY. A potable well survey was conducted to show the proximity of potable water sources to contamination associated with activities at Facility 325. There are four public water supply wells located at CSS Panama City (PWS-1, PWS-2, PWS-3, and PWS-4). Figure 5-3 shows the locations of these wells. Three of the wells, PWS-2, PWS-3, and PWS-4, are located within a 0.25-mile radius of the site. Only PWS-1 is currently in use. Well PWS-1 is used for heating and air conditioning purposes only and draws water from approximately 400 feet bls. The four public water supply wells are screened in the Floridan aquifer system at depths ranging from 350 to 400 feet bls. The remaining production wells (PWS 2, PWS 3, and PWS 4) are inactive. CSS Panama City's supply of potable water is obtained from the Panama City Municipal Water Supply. Well inventory data are presented in Table 5-2.

Kerosene analytical group compounds detected in the groundwater sample from vertical extent monitoring well MW-16D were less than the State target levels required for an MOP. Based on this information, contamination of the public water supply wells from activities at Facility 325 is not likely.

5.3 CONTAMINANT PLUME CHARACTERIZATION.

5.3.1 Soil Contamination Assessment A summary of the soil sample OVA analyses is presented in Table 5-3. (Note: Confirmatory soil samples collected during the IRA are not included in Table 5-3.) Soil containing constituents of the kerosene analytical group with OVA headspace readings exceeding 50 ppm are defined as "excessively contaminated" and must be remediated, except under extenuating circumstances. Soil with OVA headspace readings between 10 ppm and 50 ppm are considered to be contaminated and may or may not require remediation, depending on the impact of soil contamination on groundwater. Soil with OVA headspace readings less than 10 ppm is not considered to be contaminated.

Excessively contaminated soil was detected in the vicinity of the three former 20,000-gallon USTs, along the pipelines extending to the pump and helipad, and in the vicinity of the former 300-gallon waste JP-5 UST on the southwest side

Table 5-1
Water Table Elevation Data,
October 12, 1992, and October 16, 1995

Contamination Assessment Report
Facility 325, Coastal Systems Station
Panama City, Florida

Monitoring Well Number	Screen Interval (feet bls)	Top-of-Casing Elevation ¹ (feet)	October 12, 1992		October 16, 1995	
			Depth to Groundwater (feet)	Relative Groundwater Elevation (feet)	Depth to Groundwater (feet)	Relative Groundwater Elevation (feet)
MW-1	NA	7.89	5.29	2.60		Destroyed
MW-2	NA	7.92	5.62	2.30		Destroyed
MW-2 (Facility 363)	NA	10.28	NI	NI	6.28	4.00
MW-3	NA	7.82	5.49	2.33		Destroyed
MW-4	NA	7.97	5.30	2.67		Destroyed
MW-5	5-15	7.90, 10.05	4.92	2.98	4.39	5.66
MW-6	5-15	7.63	5.19	2.44		Destroyed
MW-7	5-15	7.54, 9.66	5.34	2.20	5.03	4.63
MW-8	2-12	9.78	NI	NI	4.60	5.18
MW-9	2-12	9.77	NI	NI	4.99	4.78
MW-10	2-12	10.03	NI	NI	5.46	4.57
MW-11	4-14	9.52	NI	NI	4.40	5.12
MW-12	4-14	9.12	NI	NI	4.15	4.97
MW-13	4-14	8.92	NI	NI	3.82	5.10
MW-14	2-12	6.84	NI	NI	2.89	3.95
MW-15	4-14	9.56	NI	NI	4.75	4.81
MW-16D	25-30	9.56	NI	NI	4.85	4.71
MW-17	2-12	6.86	NI	NI	2.74	4.12
MW-18	4-14	9.68	NI	NI	4.79	4.89
MW-19	4-14	10.10	NI	NI	4.32	5.78
MW-20	4-14	10.24	NI	NI	4.36	5.88
MW-21	4-14	9.42	NI	NI	3.64	5.78
MW-22	4-14	9.53	NI	NI	3.64	5.89
MW-23	4-14	9.88	NI	NI	4.57	5.31

See notes at end of table.

Table 5-1 (Continued)
Water Table Elevation Data,
October 12, 1992, and October 16, 1995

Contamination Assessment Report
 Facility 325, Coastal Systems Station
 Panama City, Florida

Monitoring Well Number	Screen Interval (feet bls)	Top-of-Casing Elevation ¹ (feet)	October 12, 1992		October 16, 1995	
			Depth to Groundwater (feet)	Relative Groundwater Elevation (feet)	Depth to Groundwater (feet)	Relative Groundwater Elevation (feet)
MW-24	2-12	8.80	NI	NI	5.02	3.78
MW-25	4-14	10.73	NI	NI	5.10	5.63
MW-26	4-14	10.81	NI	NI	5.62	5.19
MW-27	4-14	10.44	NI	NI	5.35	5.09
MW-28	3-13	9.88	NI	NI	5.24	4.64

¹ Elevations referenced to an arbitrary benchmark of 10.00 feet above mean sea level.
 Top-of-casing elevations were referenced to different benchmarks on October 12, 1992, and October 16, 1995.

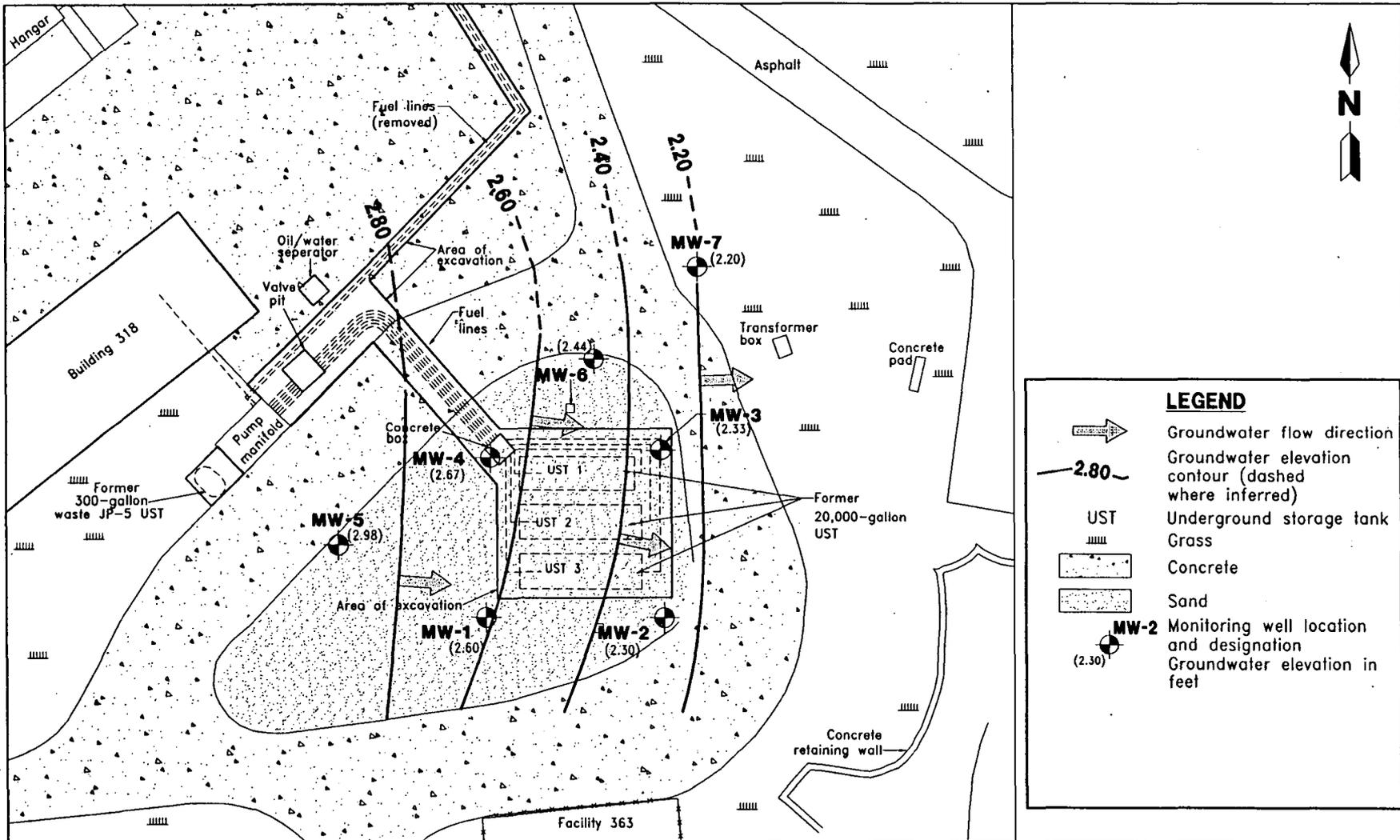
Notes: NI = not installed.
 NA = not available.
 bls = below land surface.

**Table 5-2
Public Water Supply Wells Data**

Contamination Assessment Report
Facility 325, Coastal Systems Station
Panama City, Florida

Well Identification Number/Local Number	Location	Total Depth (feet bls)	Casing Diameter (inches)
Building 394, PWS 1	Building 394	400	12
Building 281, PWS 2	Building 281	350	12
Building 10, PWS 3	Building 10	350	12
Building 101, PWS 4	Building 101	350	12

Note: bls = below land surface.



LEGEND

- Groundwater flow direction
- Groundwater elevation contour (dashed where inferred)
- UST
- Concrete
- Sand
- Monitoring well location and designation
- Groundwater elevation in feet

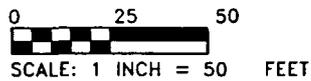
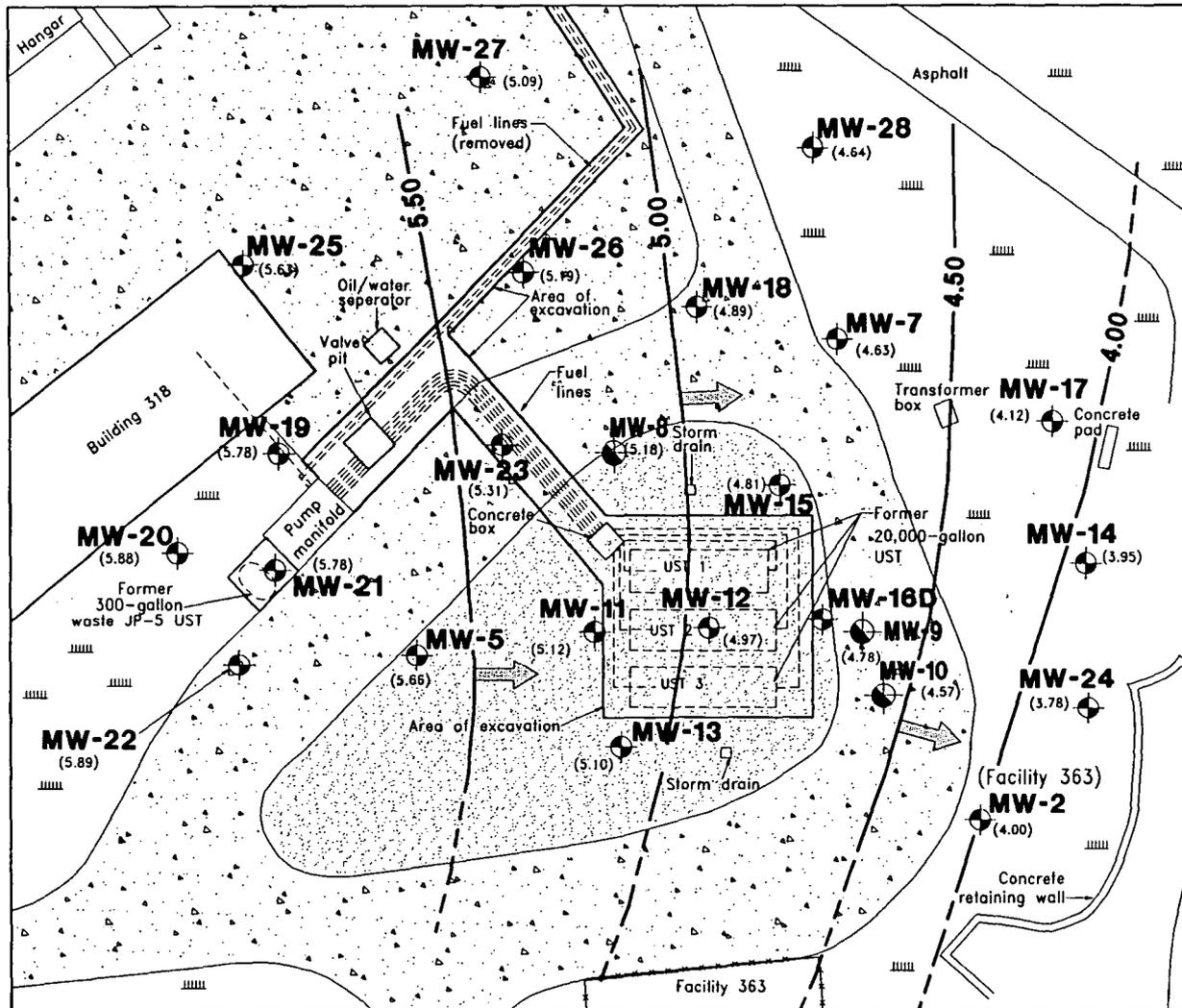


FIGURE 5-1
WATER TABLE ELEVATION CONTOUR MAP
OCTOBER 12, 1995



CONTAMINATION ASSESSMENT
REPORT
FACILITY 325

COASTAL SYSTEMS STATION
PANAMA CITY, FLORIDA



LEGEND

- Groundwater flow direction
- Water table elevation contour (dashed where inferred)
- UST
- Grass
- Concrete
- Sand
- MW-5 (5.66) Monitoring well location with groundwater elevation
- MW-16D Monitoring well location and designation
- MW-8 (5.18) Monitoring/recovery well location with groundwater elevation

NOTES:
Elevation for MW-16D was not used in contouring.
All elevations are referenced to an arbitrary benchmark.

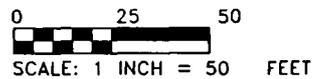
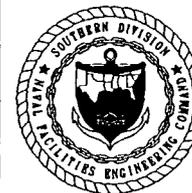


FIGURE 5-2
WATER TABLE ELEVATION CONTOUR MAP
OCTOBER 16, 1995



CONTAMINATION ASSESSMENT
REPORT
FACILITY 325

COASTAL SYSTEMS STATION
PANAMA CITY, FLORIDA

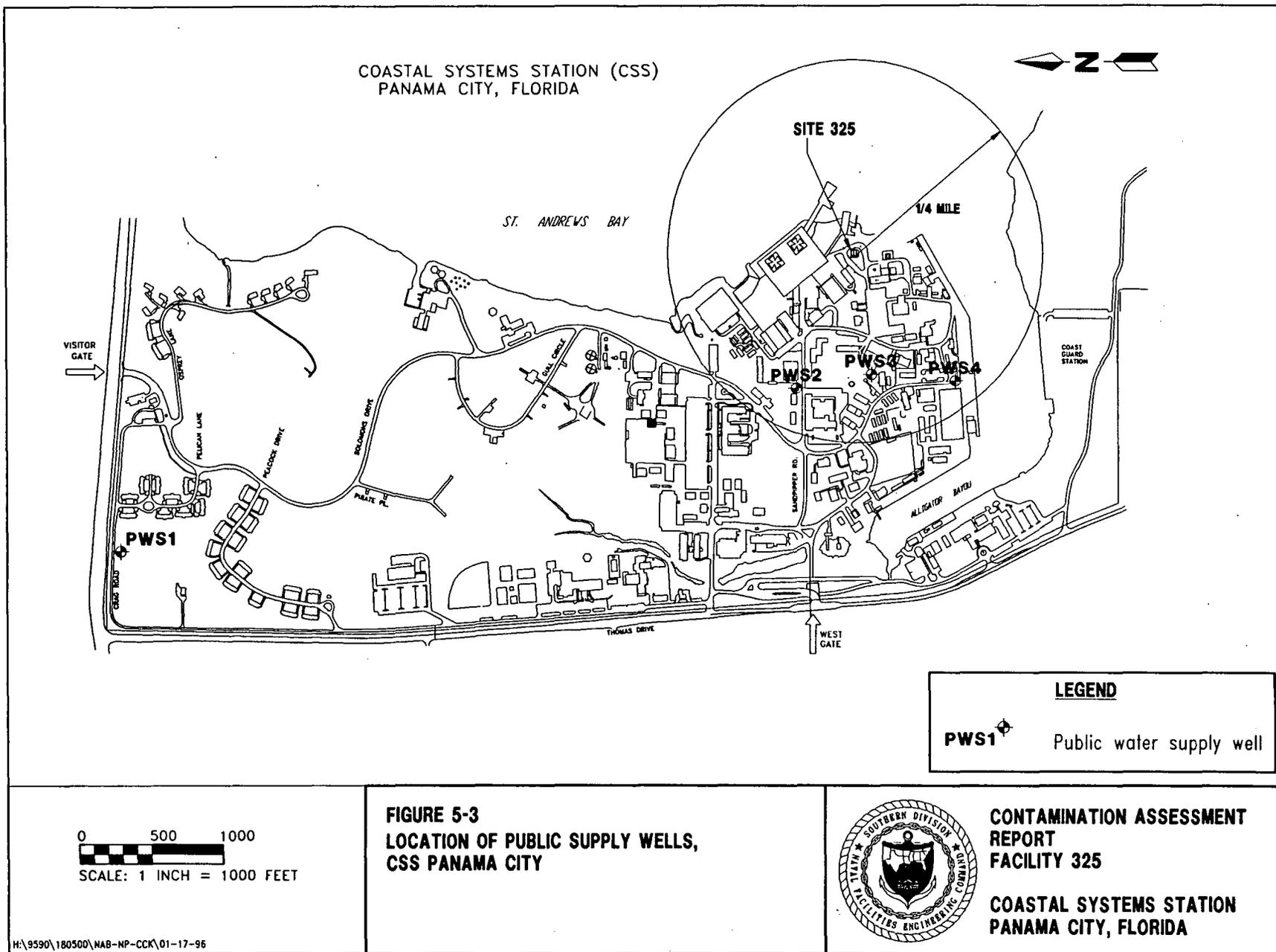


Table 5-3
Soil Sample Organic Vapor Analyzer (OVA) Analyses,
July 28, 1994, through September 30, 1995

Contamination Assessment Report
 Facility 325, Coastal Systems Station
 Panama City, Florida

Boring Designation	Depth (feet bls)	Concentration (ppm)	Comments
SB1	3 to 5	165	Petroleum odor.
	5 to 7	4,200	Petroleum odor, wet.
SB2	3 to 5	200	Petroleum odor.
	5 to 7	3,100	Petroleum odor, wet.
SB3	3 to 5	1,700	Petroleum odor.
	5 to 7	3,400	Petroleum odor, wet.
SB4	3 to 5	0	No odor.
	5 to 7	110	Slight odor, wet.
SB5	3 to 5	70	Petroleum odor.
	5 to 7	100	Petroleum odor.
SB6	0 to 2	0	Slight odor.
	2 to 4	120	Petroleum odor.
SB7	3 to 5	0	No odor.
	5 to 7	2,400	Strong petroleum odor.
SB8	3 to 5	0	No odor
	5 to 7	900	Petroleum odor
SB9	3 to 5	1,700	Strong petroleum odor.
	5 to 7	NS	Refusal at 5 feet.
SB10	3 to 5	2	No odor.
	5 to 7	3	No odor, wet.
SB11	3 to 5	1,200	Strong petroleum odor.
	5 to 7	>5,000	Strong petroleum odor, wet.
SB12	3	0	No odor.
	4	0	Met refusal.
SB13	3 to 5	850	Strong petroleum odor.
			Refusal at 5 feet.
SB14	3 to 5	NM	No odor.
SB15	0 to 2	0	No odor.
	2 to 4	1,300	Petroleum odor.
	4 to 6	2,700	Strong petroleum odor, wet.
SB16	0 to 2	0	No odor.
	2 to 4	0	No odor.
	4 to 6	0	No odor, wet.
SB17	0 to 2	0	No odor.
	2 to 4	0	No odor.
	4 to 6	0	No odor, wet.
SB18	0 to 2	0	No odor.
	2 to 4	6	No odor.
	4 to 6	0	No odor.
	6 to 8	1,000	No odor, wet.

See notes at end of table.

Table 5-3 (Continued)
Soil Sample Organic Vapor Analyzer (OVA) Analyses,
July 28, 1994, through September 30, 1995

Contamination Assessment Report
 Facility 325, Coastal Systems Station
 Panama City, Florida

Boring Designation	Depth (feet bls)	Concentration (ppm)	Comments
SB19	0 to 2	0	No odor.
	2 to 4	0	no odor.
	4 to 6	3,500	Petroleum odor, wet.
SB20	0 to 2	898	No odor.
	2 to 4	260	No odor.
	4 to 6	>5,000	Strong petroleum odor.
	6 to 8	2,700	Strong petroleum odor, wet.
SB21	0 to 2	<1	No odor.
	2 to 4	<1	No odor.
	4 to 6	85	Petroleum odor.
	6 to 8	1,800	Petroleum odor, wet
SB22	0 to 2	0	No odor.
	2 to 4	0	No odor.
	4 to 6	0	No odor.
	6 to 8	35	Slight odor, wet.
SB23	0 to 2	1,000	Slight petroleum odor.
	2 to 4	1,200	Petroleum odor.
	4 to 6	3,400	Petroleum odor.
	6 to 8	3,300	Petroleum odor, wet.
SB24	0 to 2	0	No odor.
	2 to 4	0	No odor.
	4 to 6	0	No odor.
	6 to 8	6	No odor, wet.
SB25	0 to 2	0	No odor.
	2 to 4	270	Slight petroleum odor.
	4 to 6	2,500	Petroleum odor.
	6 to 8	2,900	Strong petroleum odor, wet.
SB26	0 to 2	0	No odor.
	2 to 4	0	No odor.
	4 to 6	5	No odor, wet.
SB27	0 to 2	400	No odor.
	2 to 4	1,300	No odor.
	4 to 6	4,200	Petroleum odor, wet.
	6 to 8	4,400	Petroleum odor, wet.
SB28	0 to 2	0	No odor.
	2 to 4	70	No odor.
	4 to 6	2,500	Strong petroleum odor, wet.
SB29	0 to 2	0	No odor.
	2 to 4	0	No odor.
	4 to 6	0	No odor, wet.
SB30	0 to 2	350	Slight petroleum odor.
	2 to 4	3,000	Strong petroleum odor.
	4 to 6	4,000	Strong petroleum odor, wet.

See notes at end of table.

Table 5-3 (Continued)
Soil Sample Organic Vapor Analyzer (OVA) Analyses,
July 28, 1994, through September 30, 1995

Contamination Assessment Report
 Facility 325, Coastal Systems Station
 Panama City, Florida

Boring Designation	Depth (feet bls)	Concentration (ppm)	Comments
SB31	0 to 2	240	Slight petroleum odor.
	2 to 4	2,100	Strong petroleum odor.
	4 to 6	4,500	Strong petroleum odor, wet.
SB32	0 to 2	0	No odor.
	2 to 4	0	No odor.
	4 to 6	0	No odor.
	6 to 8	0	No odor, wet.
SB33	0 to 2	0	No odor.
	2 to 4	0	no odor
	4 to 6	1,900	Petroleum odor.
	6 to 8	2,200	Strong petroleum odor, wet.
SB34	0 to 2	0	No odor.
	2 to 4	11	No odor.
	4 to 6	0	No odor, wet.
SB35	0 to 2	0	No odor.
	2 to 4	0	No odor.
	4 to 6	5	No odor.
	6 to 8	0	No odor, wet
SB36	0 to 2	0	No odor.
	2 to 4	0	No odor.
	4 to 6	0	No odor.
	6 to 8	1,300	Petroleum odor, wet
SB37	0 to 2	0	No odor.
	2 to 4	0	No odor.
	4 to 6	60	Petroleum odor, wet.

Notes: bls = below land surface.
 ppm = parts per million.
 NS = not sampled.
 > = greater than.
 NM = not measured.
 < = less than.

of the pump manifold (Figure 5-4). The total area of excessively contaminated soil is outlined by the 50 ppm isoconcentration line shown on Figure 5-4. (Note: OVA readings of IRA confirmatory soil samples collected above and below the 300-gallon waste JP-5 UST were greater than 50 ppm. Therefore, this area is included within the 50 ppm isoconcentration line.) OVA readings in all borings increased with depth. In most of the borings, the highest OVA reading occurred immediately above the water table. Much of the excessively contaminated soil is covered by asphalt or concrete.

5.3.2 Groundwater Contamination Assessment. Analytical laboratory results for the groundwater samples collected October 14, 1992, March 8, 1993, and October 17 through October 19, 1995, are attached in Appendix F and summarized in Table 5-4. VOA, MTBE, PAH (including naphthalenes), TRPH, lead, and several chlorinated compounds were detected in groundwater samples. Free product was detected in monitoring well MW-26 at the site. For petroleum compounds regulated under Chapter 62-770, FAC, Class G-II groundwater target levels are used, where applicable. State no further action (NFA) or monitoring only (MO) target levels for G-II groundwater and no potable wells within 0.25 mile of the site have been established for benzene (50 parts per billion [ppb]), total VOA (50 ppb), MTBE (50 ppm), total naphthalenes (100 ppb), TRPH (5 ppm), and lead (50 ppb) (Florida Department of Environmental Regulation [FDER], October 1990). Total VOA is the sum of benzene, ethylbenzene, toluene, and xylenes. Chlorinated compounds are compared to State-recommended guidance concentrations of 700 ppb for 1,1-dichloroethane (DCA) and 75 ppb for 1,4-dichlorobenzene (DCB) (FDEP, June 1994). Petroleum contaminant concentrations exceeding State regulatory levels are presented in Table 5-4.

5.3.2.1 Total VOA in Groundwater Total VOA concentrations ranging from 3.6 ppb to 151 ppb were detected in the groundwater samples collected from several monitoring wells near the source(s) of petroleum contamination (source wells) at the site (Figure 5-5). Site 325 source wells are MW-8, MW-9, MW-10, MW-11, MW-12, MW-19, MW-21, MW-23, and MW-26. Total VOA concentrations in the source wells, however, did not exceed the State guidance concentration of 1,000 ppb recommended for a monitoring only proposal (MOP). Total VOA concentrations in groundwater samples collected from site monitoring wells located around the perimeter of the contaminant plume (perimeter wells) did not exceed the State MO guidance concentration of 50 ppb.

Benzene. Benzene concentrations ranging from less than 1 ppb to 20 ppb were detected in the groundwater samples collected at the site (Figure 5-6). The highest concentration, 20 ppb, detected in the sample from monitoring well MW-23 did not exceed the State MO guidance concentration of 50 ppb. No benzene was detected in the groundwater sample collected from vertical extent monitoring well MW-16D, which was screened from 25 to 30 feet bls.

5.3.2.2 MTBE in Groundwater MTBE was detected in the groundwater sample collected from monitoring well MW-14 (1.1 ppb) and vertical extent monitoring well MW-16D (1.4 ppb). The highest MTBE concentration, 1.4 ppb, did not exceed the Chapter 62-770, FAC, target level of 50 ppb.

5.3.2.3 PAH in Groundwater PAH were detected in the samples collected from monitoring wells MW-7 through MW-10, MW-12 through MW-19, MW-21, MW-23, MW-24, and MW-26 (Table 5-5). PAH detected in groundwater samples include naphthalene,

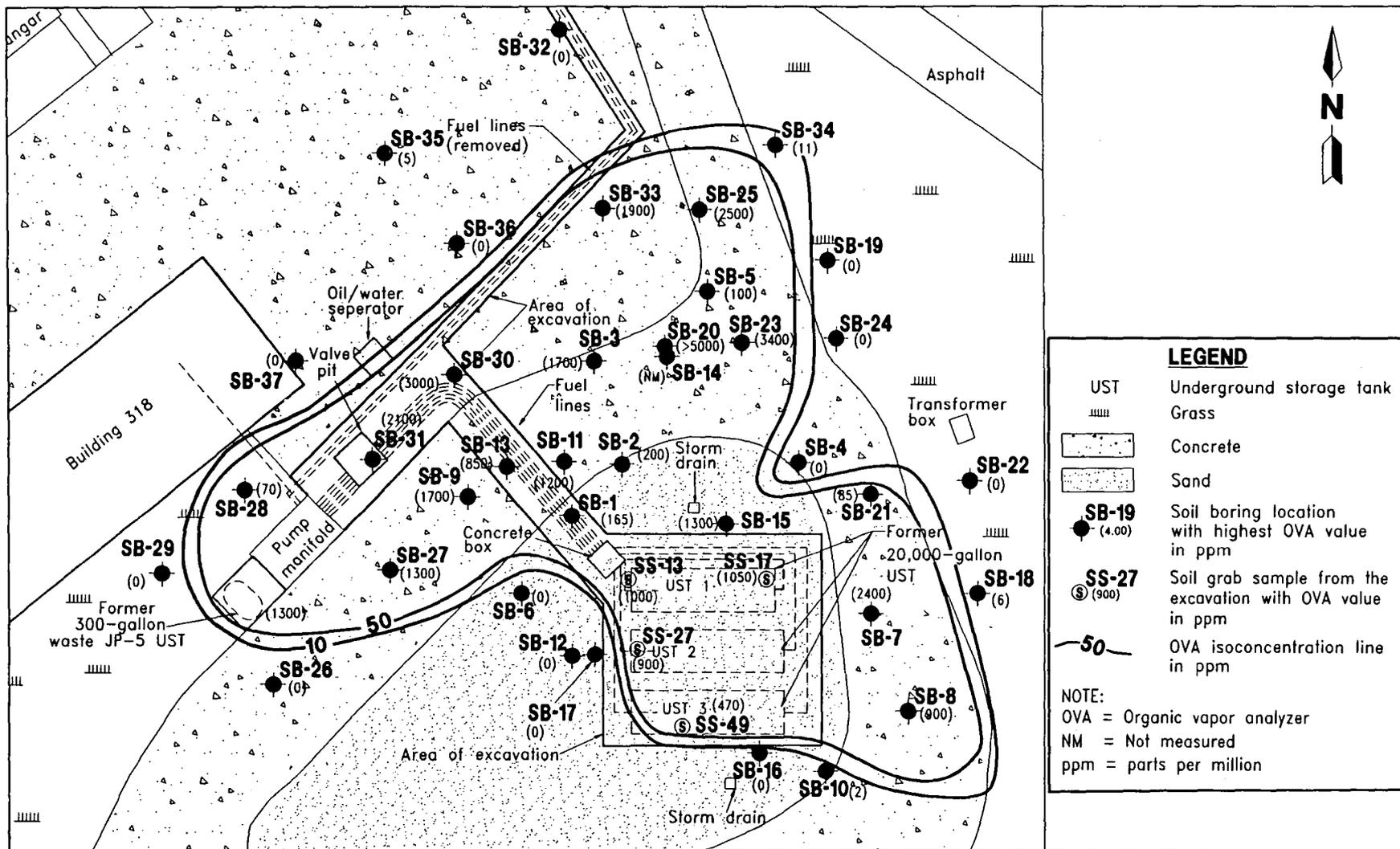


FIGURE 5-4
SOIL SAMPLE ORGANIC VAPOR
ANALYZER (OVA) HEADSPACE READINGS

0 20 40
SCALE: 1 INCH = 40 FEET



CONTAMINATION ASSESSMENT
REPORT
FACILITY 325

COASTAL SYSTEMS STATION
PANAMA CITY, FLORIDA

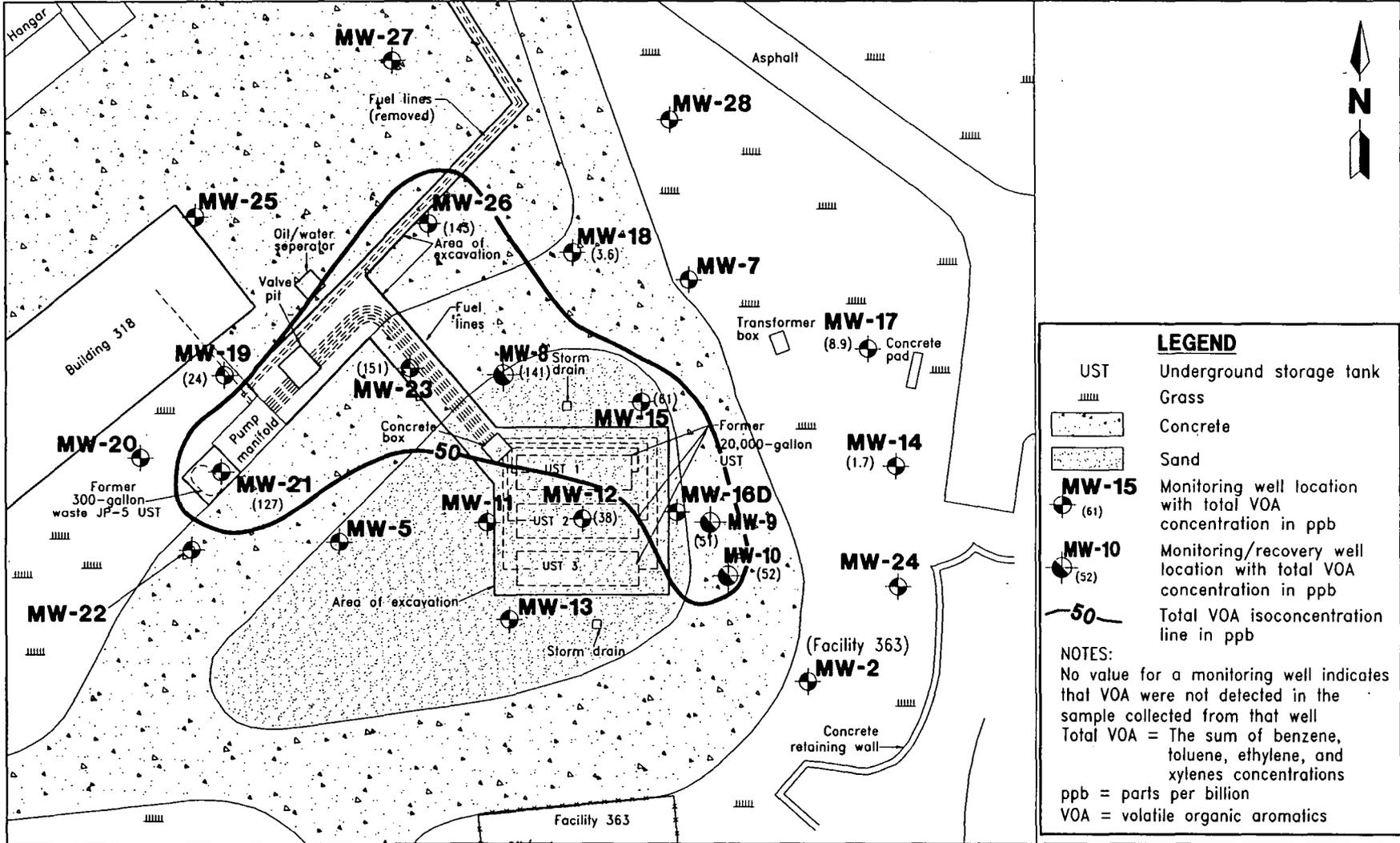
Table 5-4
Petroleum Contaminant Concentrations Exceeding State Regulatory Levels,
October 1992 through October 1995

Contamination Assessment Report
 Facility 325, Coastal Systems Station
 Panama City, Florida

Monitoring Well Designation	Year	Contaminant	Contaminant Concentration	Applied Standard ¹
MW-1	1992	Total naphthalenes	108	100
MW-2	1992	Total naphthalenes	123	100
MW-4	1993	Total VOA	228	50
		Total naphthalenes	133,000	100
		TRPH	15,000	5
MW-6	1993	Total VOA	70	50
		Total naphthalenes	185	100
MW-8	1995	Total VOA	141	50
		Total naphthalenes	750	100
MW-9	1995	Total VOA	51	50
		Total naphthalenes	221	100
		TRPH	6.1	5
MW-10	1995	Total VOA	52	50
		Total naphthalenes	164	100
MW-12	1995	TRPH	8.3	5
MW-15	1995	Total VOA	61	50
		Total naphthalenes	208	100
MW-21	1995	Total VOA	127	50
		Total naphthalenes	176	100
MW-23	1995	Total VOA	151	50
		Total naphthalenes	614	100
MW-26	1995	Total VOA	143	50
		Total naphthalenes	265	100
		TRPH	6.1	5

¹ State target level for Class G-II groundwater and no potable wells within 0.25 mile (FDEP, May 1994).

Notes: Concentrations are in parts per billion except TRPH, which is reported in parts per million.
 Total VOA is the sum of benzene, toluene, ethylbenzene, and xylenes.
 Total naphthalenes is the sum of naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene.
 VOA = volatile organic aromatics.
 TRPH = total recoverable petroleum hydrocarbons.
 FDEP = Florida Department of Environmental Protection.



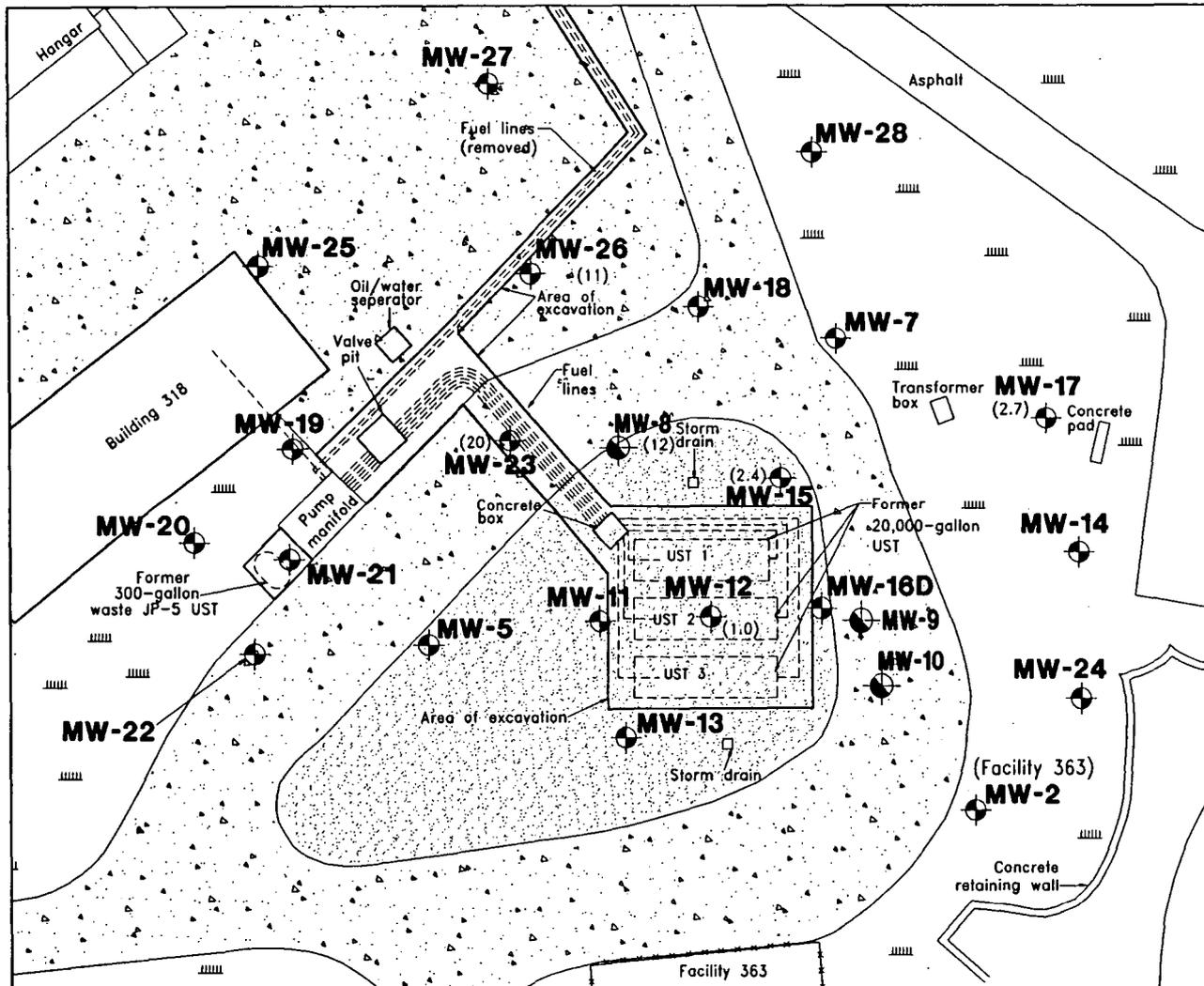
0 25 50
 SCALE: 1 INCH = 50 FEET

**FIGURE 5-5
 TOTAL VOA CONCENTRATIONS IN GROUNDWATER
 OCTOBER 1995**



**CONTAMINATION ASSESSMENT
 REPORT
 FACILITY 325**

**COASTAL SYSTEMS STATION
 PANAMA CITY, FLORIDA**



LEGEND

- UST Underground storage tank
- Grass
- Concrete
- Sand
- MW-17 (2.7) Monitoring well location with benzene concentration in parts per billion
- MW-10 Monitoring/recovery well location

NOTE:
No value for a monitoring well indicates that benzene was not detected in the sample collected from that well.

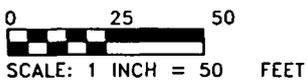
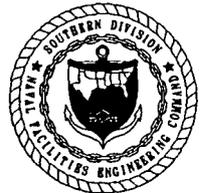


FIGURE 5-6
BENZENE CONCENTRATIONS IN GROUNDWATER
OCTOBER 1995



CONTAMINATION ASSESSMENT
REPORT
FACILITY 325

COASTAL SYSTEMS STATION
PANAMA CITY, FLORIDA

Table 5-5
Summary of Groundwater Sample
Laboratory Analysis,
October 1992 through October 1995

Contamination Assessment Report
 Facility 325, Coastal Systems Station
 Panama City, Florida

	Applied Standard	MW-1		MW-2			MW-3		MW-4		MW-5			
		1992	1993	1992	1992 Dup	1993	1992	1993	1992	1993	1992	1993	1993 Dup	1995
Benzene	¹ 50	ND	ND	5	6	ND	ND	2	ND	1	ND	ND	ND	ND
Toluene		ND	ND	ND	ND	ND	ND	ND	ND	8	ND	ND	ND	ND
Ethylbenzene		ND	ND	19	21	2	ND	8	ND	59	3	ND	ND	ND
Xylenes		ND	ND	19	22	3	ND	7	ND	160	6	ND	ND	ND
Total VOA	¹ 50	ND	ND	43	49	5	ND	17	ND	228	9	ND	ND	ND
MTBE	² 50	ND	ND	ND	ND	ND	1	ND	ND	ND	ND	ND	ND	ND
1,1-DCA	² 700	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-DCB	² 75	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene		70	ND	ND	82	ND	ND	17	ND	33,000	8	ND	ND	ND
1-Methyl-naphthalene		22	ND	ND	25	ND	ND	8	ND	50,000	9	ND	ND	ND
2-Methyl-naphthalene		16	ND	ND	16	ND	ND	ND	ND	50,000	7	ND	ND	ND
Total naphthalenes	¹ 100	108	ND	ND	123	ND	ND	25	ND	133,000	24	ND	ND	ND
Acenaphthylene		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthene		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluorene		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Phenanthrene		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Anthracene		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TRPH	¹ 5	ND	ND	ND	ND	ND	ND	ND	2	15,000	ND	ND	ND	ND
Lead	¹ 50	ND	ND	ND	ND	ND	ND	ND	6	ND	ND	ND	ND	2.2

See notes at end of table.

Table 5-5 (Continued)
Summary of Groundwater Sample
Laboratory Analysis,
October 1992 through October 1995

Contamination Assessment Report
 Facility 325, Coastal Systems Station
 Panama City, Florida

	Applied Standard	MW-6		MW-7			MW-8	MW-9	MW-10	MW-11	MW-12
		1992	1993	1992	1993	1995	1995	1995	1995	1995	1995
Benzene	¹ 50	2	5	ND	ND	ND	12	ND	ND	ND	1.0
Toluene		ND	ND	ND							
Ethylbenzene		5	34	ND	ND	ND	71	26	20	ND	35
Xylenes		2	31	ND	ND	ND	58	25	32	ND	2.1
Total VOA	¹ 50	9	70	ND	ND	ND	141	51	52	ND	38
MTBE	² 50	1	ND	ND	ND						
1,1-DCA	² 700	ND	ND	ND							
1,4-DCB	² 75	ND	ND	ND							
Naphthalene		42	110	ND	ND	2.3	420	130	98	ND	28
1-Methyl-naphthalene		26	40	ND	ND	1.4	170	38	34	ND	7.4
2-Methyl-naphthalene		25	35	ND	ND	ND	160	53	32	ND	29
Total naphthalenes	¹ 100	93	185	ND	ND	3.7	750	221	164	ND	64
Acenaphthylene		ND	ND	ND	ND	1.5	30	7.5	1.8	ND	17
Acenaphthene		ND	ND	ND	ND	ND	18	2.3	2.4	ND	1.6
Fluorene		ND	ND	ND	ND	2.6	9.2	7.1	6.6	ND	3.1
Phenanthrene		ND	1.9	ND	1.4						
Anthracene		ND	ND	ND							
TRPH	¹ 5	ND	ND	ND	ND	ND	1.4	6.1	2.0	ND	8.3
Lead	¹ 50	8	ND	8	ND	ND	ND	ND	1.2	1.2	ND

See notes at end of table.

Table 5-5 (Continued)
Summary of Groundwater Sample
Laboratory Analysis,
October 1992 through October 1995

Contamination Assessment Report
Facility 325, Coastal Systems Station
Panama City, Florida

	Applied Standard	MW-13	MW-14	MW-15	MW-16D	MW-17	MW-18	MW-19	MW-20	MW-21	MW-21 Dup	MW-22	MW-23
		1995	1995	1995	1995	1995	1995	1995	1995	1995	1995	1995	1995
Benzene	¹ 50	ND	ND	2.4	ND	2.7	ND	ND	ND	ND	ND	ND	20
Toluene		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene		ND	1.7	34	ND	6.2	1.6	10	ND	43	ND	ND	71
Xylenes		ND	ND	25	ND	ND	2.0	14	ND	84	3.9	ND	60
Total VOA	¹ 50	ND	1.7	61	ND	9.9	3.6	24	ND	127	3.9	ND	151
MTBE	² 50	1.1	ND	ND	1.4	ND	ND	ND	ND	ND	ND	ND	ND
1,1-DCA	² 700	ND	ND	ND	ND	ND	5.0	ND	ND	ND	ND	ND	ND
1,4-DCB	² 75	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene		ND	7.2	110	1.7	20	32	5.3	ND	6.1	53	ND	400
1-Methyl-naphthalene		ND	3.3	53	1.7	4.5	16	2.4	ND	8.4	67	ND	120
2-Methyl-naphthalene		ND	4.8	45	1.0	10	19	3.5	ND	28	56	ND	94
Total naphthalenes	¹ 100	ND	15	208	4.4	35	67	11	ND	43	176	ND	614
Acenaphthylene		ND	7.3	14	ND	2.3	2.6	ND	ND	5.2	3.8	ND	11
Acenaphthene		ND	19	10	ND	4.0	2.4	ND	ND	1.2	ND	ND	11
Fluorene		ND	6.4	22	ND	4.1	5.8	ND	ND	8.0	9.8	ND	ND
Phenanthrene		1.4	1.9	13	ND	1.3	1.3	ND	ND	5.9	3.4	ND	ND
Anthracene		ND	ND	7.5	ND	ND	ND	ND	ND	ND	ND	ND	ND
TRPH	¹ 5	1.0	1.5	3.1	ND	ND	1.9	ND	ND	1.7	1.5	1.2	1.0
Lead	¹ 50	ND	ND	ND	9.1	ND	ND	2.1	1.1	ND	ND	1.2	ND

See notes at end of table.

**Table 5-5 (Continued)
Summary of Groundwater Sample
Laboratory Analysis,
October 1992 through October 1995**

Contamination Assessment Report
Facility 325, Coastal Systems Station
Panama City, Florida

	Applied Standard	MW-23 Dup	MW-24	MW-25	MW-26	MW-26 DUP	MW-27	MW-28	Facility 363 MW-2
		1995	1995	1995	1995	1995	1995	1995	1995
Benzene	¹ 50	18	ND	ND	11	6.0	ND	ND	ND
Toluene		ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene		67	ND	ND	58	33	ND	ND	ND
Xylenes		59	ND	ND	74	40	ND	ND	ND
Total VOA	¹ 50	135	ND	ND	143	79	ND	ND	ND
MTBE	² 50	ND	ND	ND	ND	ND	ND	ND	ND
1,1-DCA	² 700	ND	ND	ND	ND	ND	ND	ND	ND
1,4-DCB	² 75	ND	ND	1.0	ND	ND	ND	ND	ND
Naphthalene		330	ND	ND	140	150	ND	ND	ND
1-Methyl-naphthalene		100	ND	ND	60	69	ND	ND	ND
2-Methyl-naphthalene		76	ND	ND	45	46	ND	ND	ND
Total naphthalenes	¹ 100	506	ND	ND	245	265	ND	ND	ND
Acenaphthylene		ND	ND	ND	17	31	ND	ND	ND
Acenaphthene		10	4.5	ND	11	4.1	ND	ND	ND
Fluorene		ND	2.0	ND	3.1	5.7	ND	ND	ND
Phenanthrene		ND	2.5	ND	ND	2.6	ND	ND	ND
Anthracene		ND	ND	ND	ND	ND	ND	ND	ND
TRPH	¹ 5	1.7	4.0	ND	3.3	6.1	ND	ND	ND
Lead	¹ 50	ND	ND	ND	ND	ND	ND	1.3	ND

¹ State NFA or MO target level for Class G-II groundwater and no potable wells within 0.25 mile (FDEP, May 1994).

² Groundwater guidance concentration (FDEP, June 1994).

Notes: Concentrations are in parts per billion except TRPH, which is reported in parts per million.
Total VOA = the sum of benzene, toluene, ethylbenzene, and xylenes.
Total naphthalenes is the sum of naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene.

Dup = Duplicate.

ND = not detected.

VOA² = volatile organic aromatic.

MTBE = methyl tert-butyl ether.

1,1-DCA = dichloroethane.

1,4-DCB = dichlorobenzene.

TRPH = total recoverable petroleum hydrocarbons.

NFA = no further action.

MO = monitoring only.

FDEP = Florida Department of Environmental Protection.

1-methylnaphthalene, 2-methylnaphthalene, acenaphthylene, acenaphthene, fluorene, phenanthrene, and anthracene.

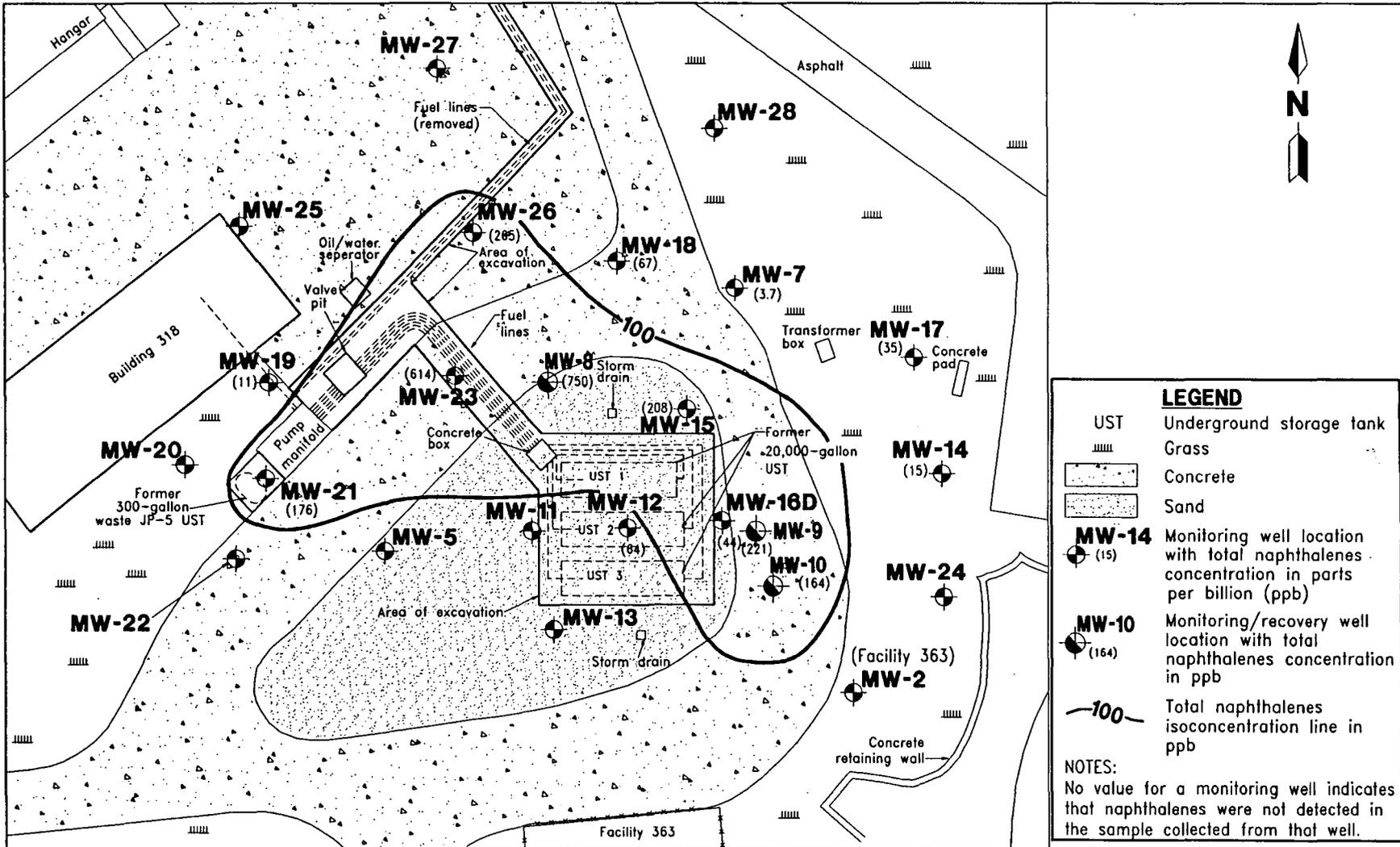
Total naphthalenes concentrations ranging from 11 ppb to 750 ppb were detected in the groundwater samples collected from several source wells (Figure 5-7). The highest concentration, 750 ppb, detected in the sample from source well MW-8, did not exceed the State target level of 2,000 ppb recommended for an MOP. The highest concentration detected in samples from the perimeter wells, 35 ppb, did not exceed the State target level of 100 ppb.

PAH (excluding naphthalenes) were detected in the groundwater samples collected from several source and perimeter monitoring wells. Acenaphthylene concentrations exceeding the State target level of 20 times the detection limit of 1 ppb (20 ppb) were detected in the samples from MW-8 (30 ppb) and MW-26 (31 ppb). Acenaphthylene was also detected in site perimeter monitoring wells MW-7 (1.5), MW-14 (7.3), and MW-17 (2.3). Acenaphthene concentrations in the samples collected from source wells did not exceed the State target level of 20 ppb. Acenaphthene was, however, detected in the samples from perimeter wells MW-14 (19 ppb), MW-17 (4.0 ppb), and MW-24 (4.5 ppb). A fluorene concentration exceeding the State target level of 20 ppb was detected in the sample collected from monitoring well MW-15 (22 ppb). Fluorene was also detected in the samples from site perimeter wells MW-7 (2.6 ppb), MW-14 (6.4 ppb), MW-17 (4.1 ppb), and MW-24 (2.0 ppb). Phenanthrene concentrations detected in the samples from source area wells did not exceed the State target level of 20 ppb. Phenanthrene was, however, detected in the samples from site perimeter wells MW-13 (1.4 ppb), MW-14 (1.9 ppb), MW-17 (1.3 ppb), and MW-24 (2.5 ppb). Anthracene concentrations detected in the samples from source area wells did not exceed the State target level of 20 ppb. Anthracene was not detected in the samples from site perimeter wells.

5.3.2.4 TRPH in Groundwater TRPH concentrations ranging from 1.0 ppm to 8.3 ppm were detected in the groundwater samples collected from several source wells at the site (Figure 5-8). The highest TRPH concentration, 8.3 ppm, detected in the sample from monitoring well MW-12, did not exceed the State target level of 100 ppm recommended for an MOP. The highest TRPH concentration detected in the samples from site perimeter wells, 4.0 ppm, did not exceed the Chapter 62-770, FAC, target level of 5 ppm. TRPH was not detected in the sample from vertical extent monitoring well MW-16D.

5.3.2.5 Lead in Groundwater Lead was detected in the groundwater samples from monitoring wells MW-5, MW-10, MW-11, MW-16D, MW-19, MW-20, MW-22, and MW-28. The highest lead concentration, 9.1 ppb, detected in the sample from monitoring well MW-16D, is less than the Chapter 62-770, FAC, target level of 50 ppb required for an MOP (Figure 5-9).

5.3.2.6 Chlorinated Compounds in Groundwater The chlorinated compounds 1,1-DCA and 1,4-DCB were detected in the groundwater samples from MW-18 and MW-25, respectively. The concentration of 1,1-DCA detected was 5.0 ppb, which is less than the State groundwater guidance concentration of 700 ppb (FDEP, June 1994). The concentration of 1,4-DCB detected was 1.0 ppb, which is less than the State groundwater guidance concentration of 75 ppb.



0 25 50
SCALE: 1 INCH = 50 FEET

FIGURE 5-7
TOTAL NAPHTHALENES CONCENTRATIONS
IN GROUNDWATER
OCTOBER 1995



CONTAMINATION ASSESSMENT
REPORT
FACILITY 325

COASTAL SYSTEMS STATION
PANAMA CITY, FLORIDA

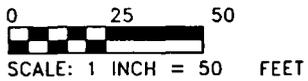
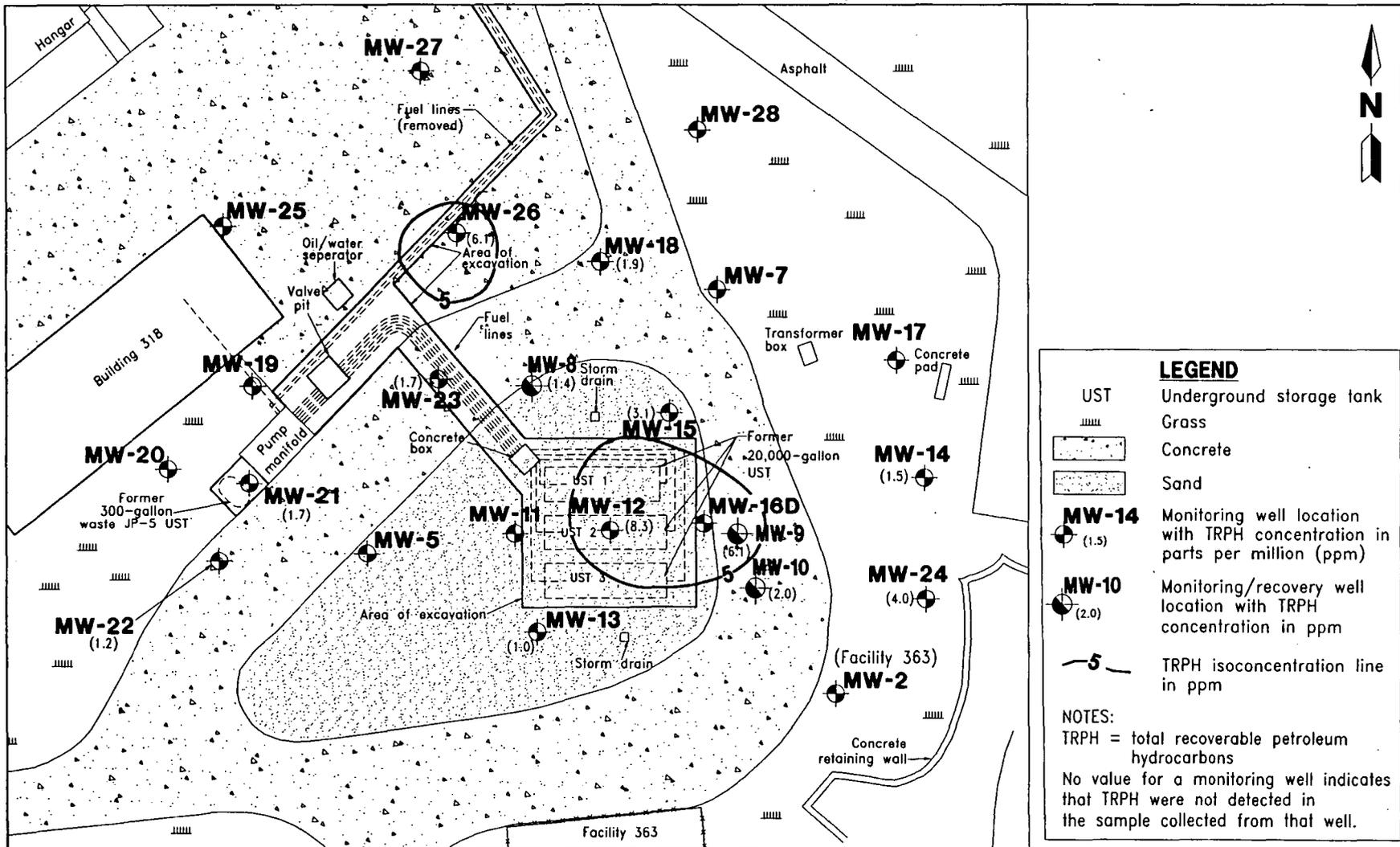
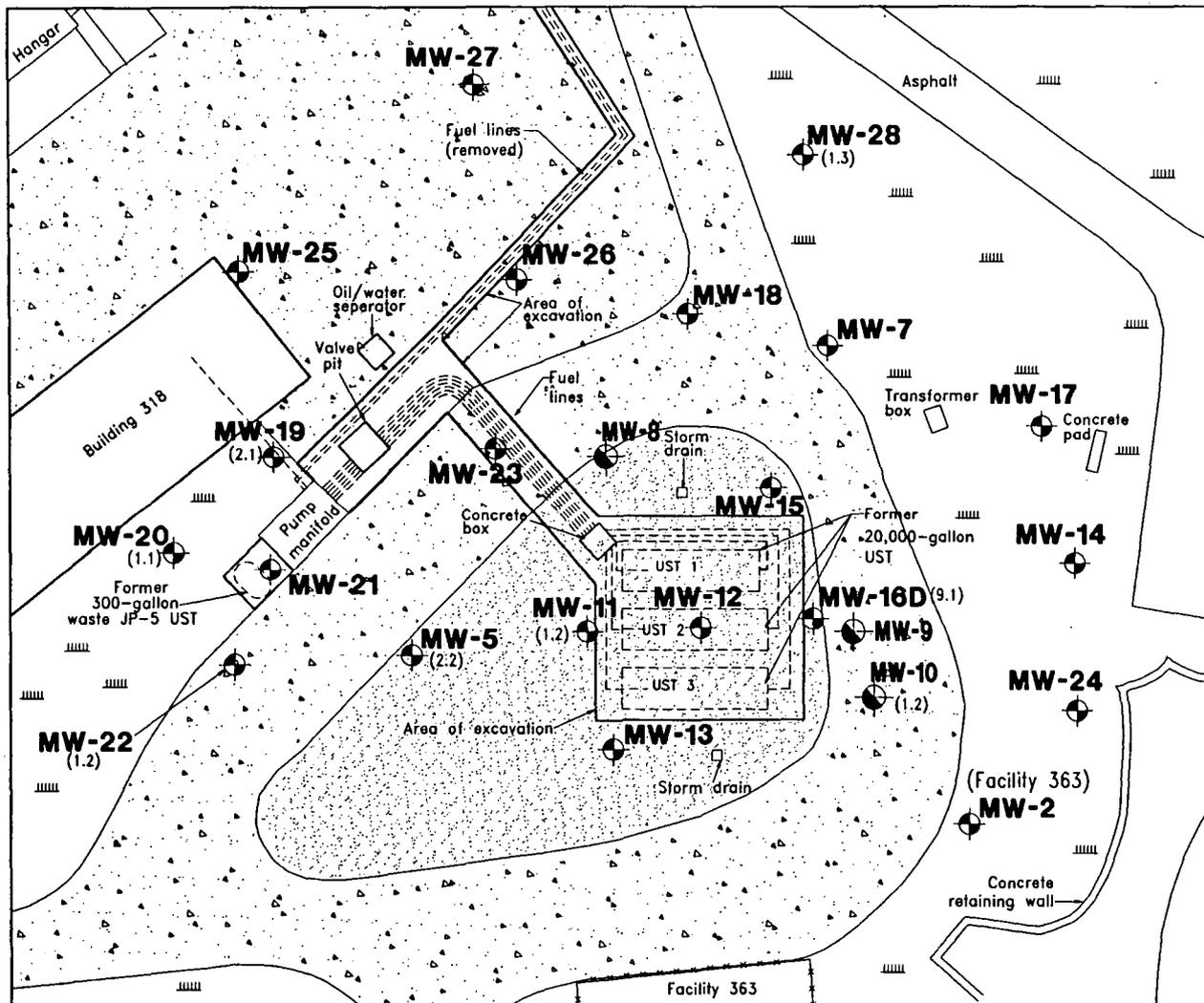


FIGURE 5-8
TOTAL RECOVERABLE PETROLEUM
HYDROCARBONS (TRPH) IN GROUNDWATER
OCTOBER 1995



CONTAMINATION ASSESSMENT
REPORT
FACILITY 325

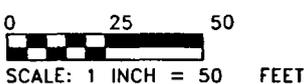
COASTAL SYSTEMS STATION
PANAMA CITY, FLORIDA



LEGEND

- UST Underground storage tank
- ||||| Grass
-  Concrete
-  Sand
- MW-28** Monitoring well location with lead concentration in ppb (1.3)
- MW-10** Monitoring/recovery well location with lead concentration in ppb (1.2)

NOTES:
 No value for a monitoring well indicates that lead was not detected in the sample collected from that well.
 ppb = parts per billion



**FIGURE 5-9
 LEAD CONCENTRATIONS IN GROUNDWATER
 OCTOBER 1995**



**CONTAMINATION ASSESSMENT
 REPORT
 FACILITY 325**

**COASTAL SYSTEMS STATION
 PANAMA CITY, FLORIDA**

5.3.3 Free Product Assessment A pilot study to remove free product from Site 278 monitoring wells was initiated by ABB-ES on December 22, 1995. No free product was detected in the Site 278 monitoring wells; therefore, monitoring wells MW-7, MW-8, MW-15, MW-18, and MW-26 at Site 325 were checked for free product. Free product was encountered only in monitoring well MW-26 and measured 0.90 foot in thickness. This was the first time measurable free product had been observed in any site monitoring or recovery well. The depth to groundwater in MW-26 on December 22, 1995, was 7.42 feet, indicating a lower water-table elevation than last measured on October 16, 1995. Free product may have accumulated in MW-26 as the water-table fluctuated through petroleum-saturated soil. No source of petroleum other than the JP-5 pipelines was identified in the vicinity of monitoring well MW-26. The free product was removed from MW-26 by a vacuum truck on December 22, 1995. Approximately 146 gallons of groundwater and 17 gallons of free product were removed. After vacuuming for 90 minutes, less than 0.01 foot of free product remained in MW-26. The free product was emptied into the oil-water separator on the northwest side of the site.

6.0 SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

6.1 SUMMARY. Based on the findings of the CA field investigations and laboratory analytical results, the following is a summary of existing conditions at the site.

- The primary water-bearing zone of concern at the site is the surficial aquifer. The surficial aquifer in the Panama City area is unconfined and classified as a G-II groundwater source.
- The surficial aquifer was penetrated to a depth of 30 feet bls during this investigation. Naturally occurring subsurface material is generally composed of fine- to medium-grained quartz sand, light brown to gray, well-sorted, with small amounts of clay (10 percent).
- The water table at the site was encountered at depths ranging from 5 to 7 feet bls.
- The direction of groundwater flow in the surficial aquifer is to the east.
- Excessively contaminated soil was detected in the vicinity of the three former 20,000-gallon USTs, along the pipelines extending to the pump station and helipad and in the vicinity of the former 300-gallon waste JP-5 UST on the southwest side of the pump manifold. Much of the excessively contaminated soil is covered by asphalt or concrete.
- Total VOA, MTBE, PAH, TRPH, lead, and several chlorinated compounds were detected in groundwater samples. Total VOA, total PAH (excluding naphthalenes), total naphthalenes, TRPH, MTBE, and lead concentrations were compared to Chapter 62-770, FAC, target levels for Class G-II groundwater. Because Class G-II groundwater target levels are not available for chlorinated compounds, these contaminants were compared to State groundwater guidance concentrations (FDEP, June 1994).

Only PAH (excluding naphthalenes) in six of the perimeter monitoring wells exceeded the Chapter 62-770, FAC, target levels for an MOP.

- Free product was encountered only in monitoring well MW-26 and measured 0.09 foot in thickness.
- The apparent sources of contamination, three 20,000-gallon USTs, one 300-gallon UST, and all associated pipelines have been removed from the site.
- No potable water sources were identified within a 0.25-mile radius of the site. There appears to be no risk of contamination of the CSS Panama City public water supply system from activities at the site.

6.2 CONCLUSIONS. Based on the findings of the CA and site conditions, the following can be concluded:

- Groundwater contamination at the site appears to be related to releases from the former USTs and associated pipelines. These sources have been removed; therefore, groundwater contaminant concentrations can be expected to decrease over time by natural attenuation.
- Free product at the site is likely associated with one or more previous releases from the UST system. Very little of the free product released at the site was recovered during the UST system removal and subsequent IRA. The free product observed in monitoring well MW-26 is probably part of an isolated pocket in the vadose zone that periodically migrates with water table fluctuations.
- Excessively contaminated soil at the site will require remediation to meet clean soil standards as outlined in Chapter 62-770, FAC.

6.3 RECOMMENDATIONS. Based on the findings, conclusions, and interpretations of the CA, ABB-ES recommends an IRA for free product removal and development of a remedial action plan in accordance with Chapter 62-770, FAC.

7.0 PROFESSIONAL REVIEW CERTIFICATION

This document entitled Contamination Assessment Report Facility 325, Coastal Systems Station Panama City, Panama City, Florida, has been prepared under the direction of a professional geologist registered in the State of Florida. The work and professional opinions rendered in this report were conducted or developed in accordance with commonly accepted procedures consistent with applicable standards of practice. This assessment is based on the geologic investigation and associated information detailed in the text and appended to this report or referenced in public literature. Recommendations are based upon interpretations of the applicable regulatory requirements, guidelines, and relevant issues discussed with regulatory personnel during the site investigation. If conditions that differ from those described are determined to exist, the undersigned geologist should be notified to evaluate the effects of any additional information on this assessment or the recommendations made in this report. This report meets the criteria set forth in Chapter 492 of the Florida Statutes with regard to good professional practices as applied to Chapter 62-770 for the FAC. This CAR was developed for the Facility 325 Site at CSS Panama City, Panama City, Florida, and should not be construed to apply to any other site.



Michael J. Williams
Professional Geologist
P.G. No. 334

1/24/96
Date

REFERENCES

- Bouwer, H. 1989, "The Bouwer and Rice Slug Test, an Update," *Groundwater*, Vol. 127, pp. 304-309.
- Bouwer, H., and R.C. Rice, 1976, "A Slug Test Method for Determining Hydraulic Conductivity of Unconfined Aquifers with Completely or Partially Penetrating Wells," *Water Resources Research*, Vol. 12, No. 3, pp. 423-28.
- Davis, S.N., and R.J.M. DeWiest, 1966, *Hydrogeology*, New York: John Wiley & Sons, Inc.
- Driscoll, Fletcher G., 1986, *Groundwater and Wells*, 2nd edition, St. Paul, Minnesota: Johnson Division.
- Florida Department of Environmental Regulation, October 1990, No Further Action and Monitoring Only Guidelines for Petroleum Contaminated Sites.
- Florida Department of Environmental Protection (FDEP), 1994, Groundwater guidance concentrations, compiled by R. Merchant, Division of Water Facilities, June.
- FDEP, 1994, Guidelines for Assessment and Remediation of Petroleum Contaminated Soils, Division of Waste Management, May.
- Geraghty & Miller, 1989, AQTESOLV™, aquifer test design and analysis, computer program version 1.00.
- White, W.A., 1970, The Geomorphology of the Florida Peninsula, Florida Bureau of Geology Bulletin No. 51.

APPENDIX A
TECHNICAL MEMORANDUM



June 1, 1994

07520-001

Southern Division
Naval Facilities Engineering Command
ATTN: Mr. Gabriel Magwood
P.O. Box 10068
2155 Eagle Drive
North Charleston, SC 29418

Dear Mr. Magwood:

SUBJECT: Letter Report, Technical Memorandum for Site 325, Coastal Systems Station (CSS), Panama City, Florida, Contract Task Order (CTO) No. 011, Contract No. N62467-89-D-0317

INTRODUCTION

ABB Environmental Services, Inc. (ABB-ES), was contracted by the Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOM) to perform a contamination assessment (CA) and submit a Contamination Assessment Report (CAR) for Facility 325 at CSS Panama City, Florida. The scope of services for the work at Site 325 is described in CTO No. 11, the Plan of Action (POA), and the Contamination Assessment Plan (CAP). On March 24, 1994, ABB-ES was directed by SOUTHNAVFACENGCOM to submit this technical memorandum instead of the CAR.

PURPOSE

The purpose of this Technical Memorandum is to present the findings and conclusions of the CA and recommend appropriate further action for the site.

The scope of services developed to perform the CA included:

- collection of soil samples from borings in the unsaturated zone for headspace analysis using an organic vapor analyzer (OVA),
- collection of saturated soil samples for field gas chromatograph (GC) screening to guide monitoring well placement,
- installation and sampling of groundwater monitoring wells to assess the extent of groundwater contamination,
- collection of water level data to assess the groundwater flow direction and hydraulic gradient at the site,

ABB Environmental Services, Inc.

- a tidal influence study to assess the effects of tidal fluctuations on water table elevations and groundwater flow direction,
- an inventory of all potable wells within a 0.25-mile radius of the site,
- slug tests on selected wells to estimate aquifer characteristics, and
- reduction and analysis of pertinent data gathered during the CA to complete the CAR.

SITE DESCRIPTION AND HISTORY

Site 325 is located immediately south of the heliport at CSS Panama City. The site consists of three 20,000-gallon fiberglass underground storage tanks (USTs) containing JP-5 jet fuel (see Figure 1). The USTs are buried under reinforced concrete. The associated piping for fueling at the adjacent heliport is installed aboveground in the tank pad area. A concrete driveway surrounds the tank pad area. A small grass-covered part of the area is used for parking equipment and industrial vehicles.

The three 20,000-gallon USTs were installed in 1976 and became operational in 1983. The associated piping is made of steel and coated with corrosion-resistant material. The tanks are gauged daily and inventory records are reconciled monthly. The tanks are equipped with overfill protection and alarms, which sound when a predetermined level of fuel in the tank is exceeded.

As part of the Navy Release Detection Program, monitoring wells were installed around the USTs in 1989. During this installation of the monitoring wells, petroleum odors were detected in the soils. Tank contents were reportedly restricted to JP-5 jet fuel.

SITE INVESTIGATION

On September 28 and 29, 1992, 10 soil borings, SB-1 through SB-10, were drilled at the site to assess the extent and levels of soil petroleum contamination, characterize the type of subsurface material, and aid in the placement of groundwater monitoring wells. Soil samples collected from split-spoon standard penetration tests (SPTs) were analyzed for petroleum constituents with an OVA equipped with a flame ionization detector (FID). OVA measurements are presented in Table 1 and are shown in Figure 2 next to the corresponding soil boring.

Upon completion of the soil boring program, three 2-inch inside diameter (ID) polyvinyl chloride (PVC) monitoring wells (PCY-325-5 through PCY-325-7) were installed at the site. These wells were installed in addition to four existing 2-inch ID PVC monitoring wells (PCY-325-1 through PCY-325-4), which had been installed in 1989. The three monitoring wells installed during this investigation, as well as the four previously installed monitoring wells, each contain 10 feet of slotted screen. Groundwater samples were collected from monitoring wells PCY-325-1 through PCY-325-7 on October 14, 1992, and sent to Wadsworth/ALERT Laboratories, Tampa, Florida, for analyses of kerosene analytical group compounds. For convenience, the monitoring wells have been designated as MW-1 through MW-7 on figures, tables, and text in this report.

After the monitoring wells were installed and sampled, the elevation and slope of the water table were calculated by surveying the top of the well casing at each monitoring well location and referencing to a

common datum. Depth to groundwater in each monitoring well was recorded on October 12, 1992, November 9, 1992, and March 8, 1993. Relative groundwater elevations are presented in Table 2. Water table elevation contour maps for October 12, 1992, and November 9, 1992, are shown in Figures 3 and 4, respectively.

Three rising head slug tests were performed in each of monitoring wells MW-5, MW-6, and MW-7 to estimate the hydraulic conductivity of the aquifer. In addition to the slug tests conducted at this site, a tidal influence study was performed in monitoring wells MW-5, MW-6, and MW-7 to assess the effect of tidal fluctuations on groundwater elevation and flow direction.

A potable well survey was conducted to show the proximity of potable water sources to contamination at Facility 325. There are four public water supply (PWS) wells located at CSS Panama City (PWS 1, PWS 2, PWS 3, and PWS 4). Only the well located near Building 394 (PWS 1) is currently in use. This well is used for heating and air conditioning purposes only and draws water from approximately 400 feet below land surface (bls). The remaining production wells (PWS 2, PWS 3, and PWS 4) are inactive. Based on the findings of the field investigation, contamination of the public water supply wells from sources at Facility 325 is not a concern.

During the CAR preparation, ABB-ES concluded that the Florida Department of Environmental Protection (FDEP) would not approve the CAR because the October 14, 1992, groundwater analytical data did not delineate the horizontal and vertical extent of groundwater contamination. Contaminants detected in site monitoring wells only slightly exceeded Chapter 17-770, Florida Administrative Code (FAC), target levels for benzene and total naphthalenes; however, groundwater data indicated possible contaminant migration from an upgradient source. The helicopter maintenance facility located northwest of the site was suspected as a possible source of contamination. After reviewing the data with FDEP, a decision was made to resample all Site 325 monitoring wells. ABB-ES also recommended that CSS Panama City Public Works Department (PWD) arrange for tightness testing on the USTs and associated piping.

Monitoring wells MW-1 through MW-7 were resampled on March 8, 1993. Groundwater samples were sent to Wadsworth/ALERT Laboratories in Tampa, Florida, for analyses of the kerosene analytical group compounds. Analytical laboratory results of groundwater samples collected October 14, 1992, and March 8, 1993, are presented in Table 3. The groundwater samples collected October 14, 1992, from MW-3, MW-5, and MW-6 slightly exceeded the State target level of 1 part per billion (ppb) for benzene (see Figure 5). The groundwater sample collected October 14, 1992, from MW-6 slightly exceeded the State target level of 100 ppb for total naphthalenes (see Figure 6). No contamination was detected in the sample collected March 8, 1993, from monitoring well MW-5. Benzene was again detected in MW-3 and MW-6 at concentrations slightly greater than the State target level of 1 ppb. The sample collected March 8, 1993, from MW-6 again contained total naphthalenes exceeding the State target level of 100 ppb. Of particular note, however, was the sample collected from MW-4, in which total naphthalenes were identified at 133 parts per million (ppm) (133,000 ppb) and total recoverable petroleum hydrocarbons (TRPHs) were identified at 15 ppm. The extremely high concentrations of total naphthalenes in MW-4, when compared to the earlier laboratory results in which no contaminants were detected, suggested that a recent release or leak had occurred (see Figure 6). ABB-ES urged CSS Panama City PWD personnel to arrange for tightness testing on the USTs and associated piping.

The following is a chronological account of events that took place at Site 325 after March 1993.

April 23, 1993: ABB-ES received notice from the CSS Panama City PWD that free product had been observed in monitoring well MW-4. The exact thickness of the free product was not recorded. The USTs and associated pipeline system were taken out of service.

May 10, 1993: The CSS Panama City PWD reported that the USTs and associated piping had been tightness tested. All three USTs and the pipelines associated with the middle tank passed the integrity tests; however, the pipelines associated with both end tanks could not be tested because of problems with fittings. The pipeline fittings would require replacement by the manufacturer before integrity testing could resume. No additional free product had been found in the monitoring wells since the pipeline system was taken out of service. Apparently, one of the pipelines was the source of the free product.

May 21, 1993: The CSS Panama City PWD reported that a contractor had replaced the gaskets that attach to the flanges from the pump motors to allow the pipelines from the two outside USTs to be tested. The USTs were then filled with JP-5.

May 24, 1993: A significant release of free product was observed at the site by CSS Panama City personnel. The free product was contained by absorbent pigs and was reportedly confined to the concrete pad above the tanks.

June 2, 1993: ABB-ES personnel visited the site and did not observe any evidence of excessively contaminated soil around the UST area from the May 24, 1993, release. CSS Panama City PWD personnel stated that integrity testing had been completed on the pipelines and a leak was discovered in the underground pipeline associated with UST No. 2, the middle tank. Activity personnel excavated the soil around the pipeline to pinpoint and repair the leak.

June 21, 1993: CSS Panama City PWD reported that the pipeline associated with UST No. 2 failed the second integrity test. The PWD planned to flush the lines and abandon them in place.

July 1993: The PWD began considering removing and replacing USTs No. 2 and No. 3, including the associated refueling lines. Free product was continuously found in monitoring well MW-4. On July 15, 1993, the measured thickness of free product in MW-4 was 1.25 feet. The measured thickness of free product appeared to correspond to pumping activities; the greatest thickness occurring the day after the system was operated. Free product was being removed from monitoring well MW-4 on a daily basis.

August 11, 1993: The PWD reported that 9 inches of free product was measured in monitoring well MW-6. It was the first time free product had been observed in this monitoring well. As a result, the PWD began free product removal from MW-6 daily. Monitoring well MW-4 was upgraded to free product removal twice daily. The system was then completely shut down.

November 24, 1993: CSS Panama City made a decision to abandon the present system and replace it with a similar system that used aboveground piping.

March 24, 1994: SOUTHNAVFACENGCOC announced the desire to use the Remedial Action Contractor (RAC), Bechtel, to remove free product from the site. They requested that ABB-ES prepare a technical memorandum outlining the results of the last field investigation and provide oversight of the RAC for free product removal.

The following sections summarize the findings of the Site 325 field investigation.

FINDINGS

- The sediments encountered during drilling operations onsite are comprised predominantly of pale orange to brown, very fine- to medium-grained sand.
- Groundwater beneath the site was encountered at depths ranging from 3 to 7 feet bls.
- The direction of groundwater flow in the water table aquifer is generally to the east.
- Hydraulic conductivity was calculated to be 12.2 feet per day (ft/day).
- The hydraulic gradient was calculated to be 5.8×10^{-3} foot per foot (ft/ft).
- The average pore water velocity was calculated to be 2.8 ft/day.
- The data collected during the tidal influence study indicate that the tides do not significantly contribute to contaminant migration from Facility 325 toward St. Andrew Bay.
- ~~Excessive soil contamination, as indicated by OVA readings from soil samples collected from SB-4, SB-5, and SB-10, was identified during the CA field investigation.~~ No excessively contaminated soil was identified at Site 325.
- Contaminants identified during the CA investigation include benzene, ethylbenzene, xylenes, naphthalene, 1-methylnaphthalene, 2-methyl-naphthalene, methyl tert-butyl ether, and acenaphthene.
- There are no active potable wells within a 0.25-mile radius of the site.

CONCLUSIONS

- When groundwater samples were first collected at the site on October 14, 1992, the extent of soil and groundwater contamination did not appear to be widespread. Groundwater contamination appeared to be restricted to the vicinity of monitoring wells MW-3 and MW-6. Soil contamination appeared to be restricted to the saturated zone in a small area extending approximately 50 feet east of the UST location.
- When groundwater samples were collected on March 9, 1993, the extent of groundwater contamination again appeared to be restricted to the vicinity of monitoring wells MW-3 and MW-6, although extremely high levels of petroleum compounds were detected in monitoring well MW-4, indicating a recent free product release.
- As a result of the leaking pipeline system associated with UST No. 2, additional soil investigations will be required to assess the extent of petroleum-contaminated soil.
- Depending on the effectiveness of the remedial action to remove free product at the site, additional monitoring wells may be needed to assess the vertical and horizontal extent of free product and groundwater contamination.

RECOMMENDATIONS

ABB-ES recommends that the RAC, Bechtel, proceed with free product removal at the site. After the free product has been removed, additional soil borings will be required to assess the extent of soil contamination. Additional monitoring wells may also be required to assess the extent of groundwater contamination.

Very truly yours,

ABB Environmental Services, Inc.


John P. Kaiser
Task Order Manager


Jay Koch
Geologist

Enclosures

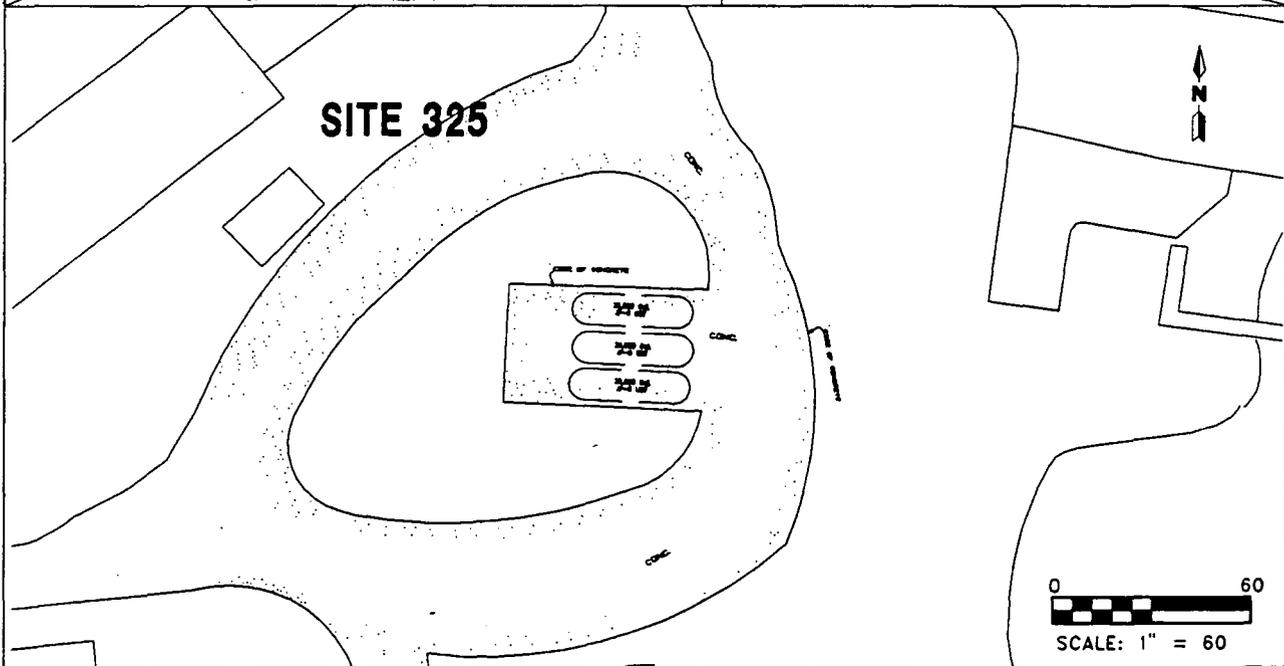
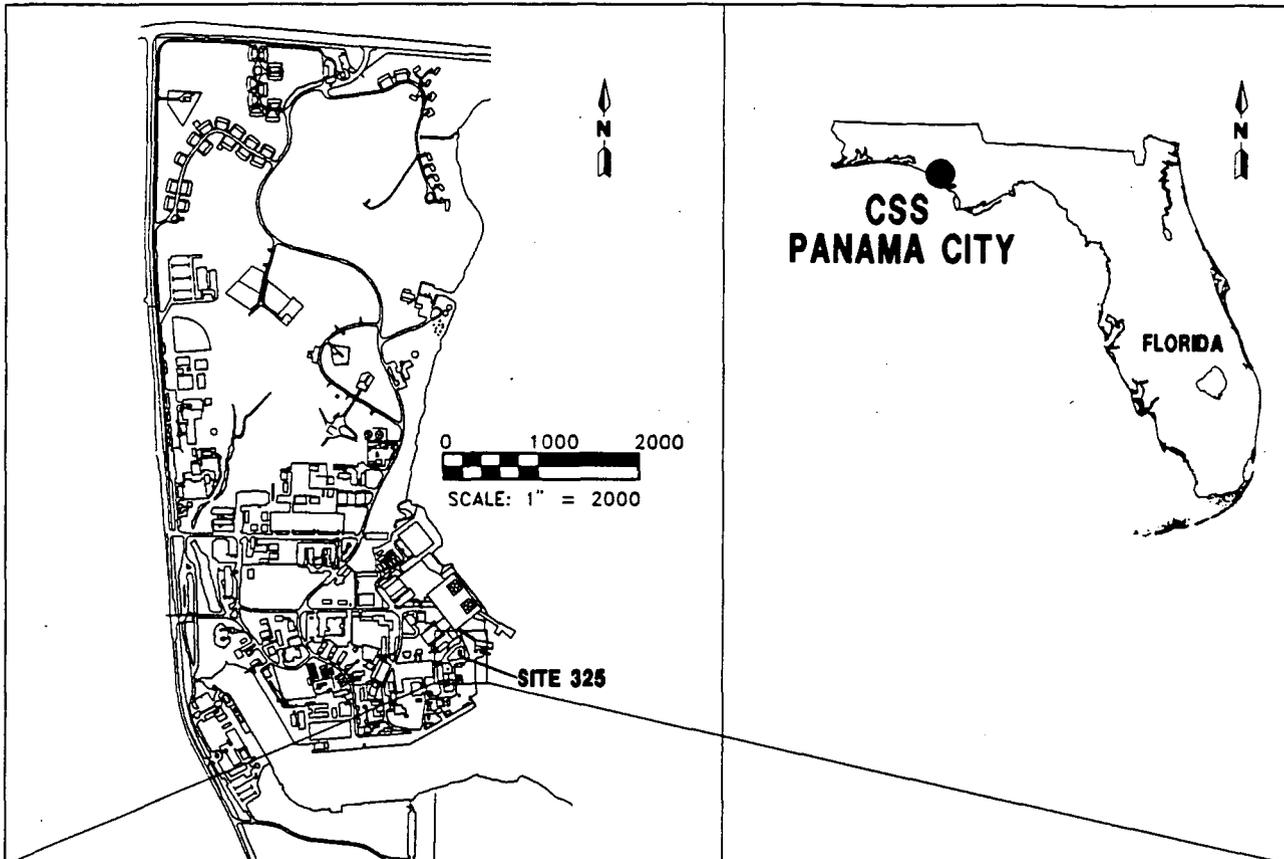
cc: File

PC_S_325.TM
MVL.05.94

ATTACHMENT A
FIGURES

LIST OF FIGURES

- Figure 1 Site Location Map
- Figure 2 Soil Contamination Distribution Map
- Figure 3 Water Table Elevation Contour Map, October 12, 1992
- Figure 4 Water Table Elevation Contour Map, November 9, 1992
- Figure 5 Benzene Contamination Distribution Map, October 14, 1992, and March 8, 1993
- Figure 6 Total Naphthalene Contamination Distribution Map, October 14, 1992, and March 8, 1993

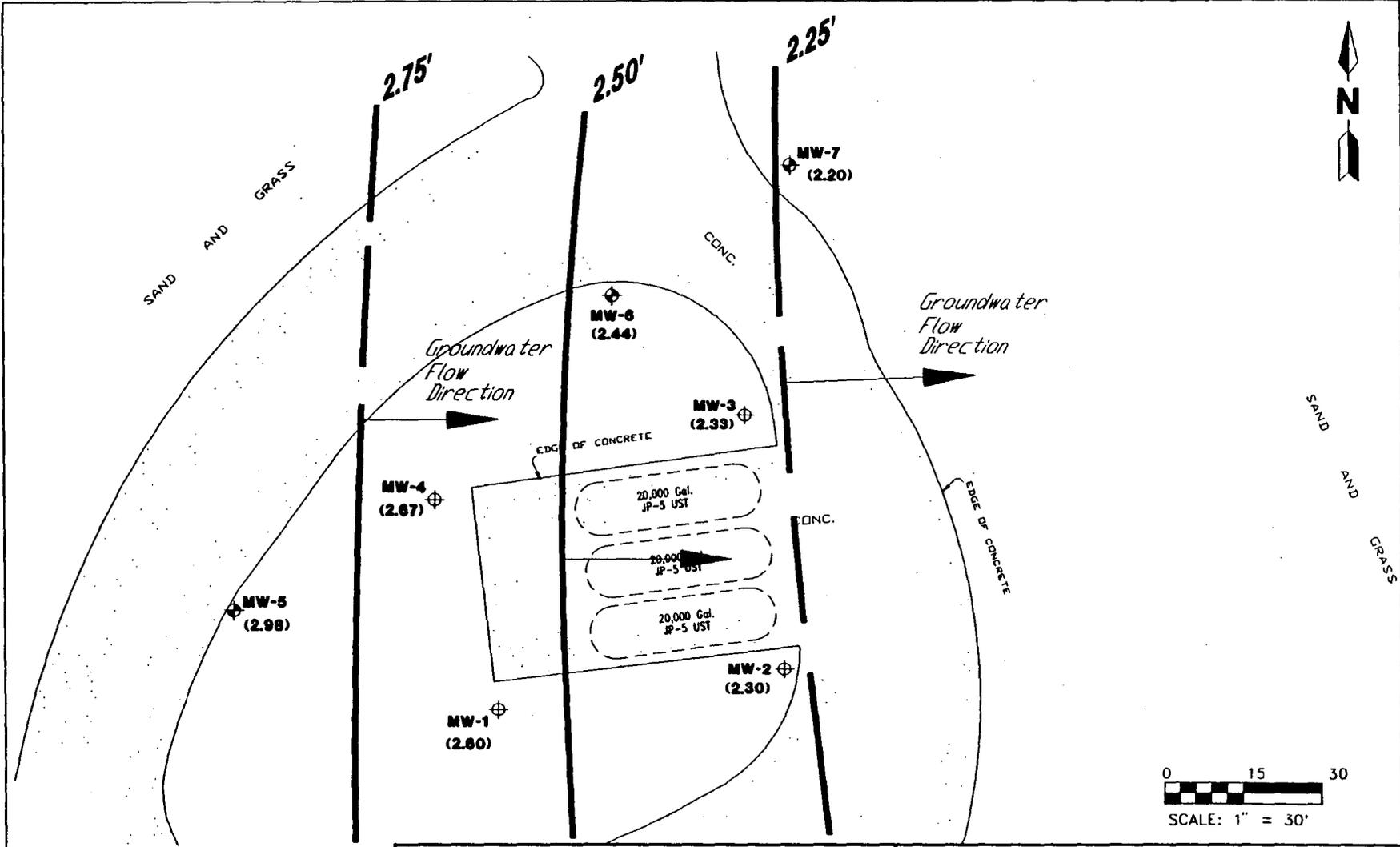


**FIGURE 1
LOCATION MAP**



**TECHNICAL MEMORANDUM
SITE 325**

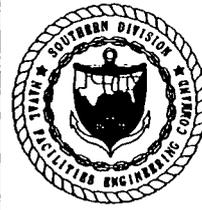
**COASTAL SYSTEMS CENTER
PANAMA CITY, FLORIDA**



LEGEND

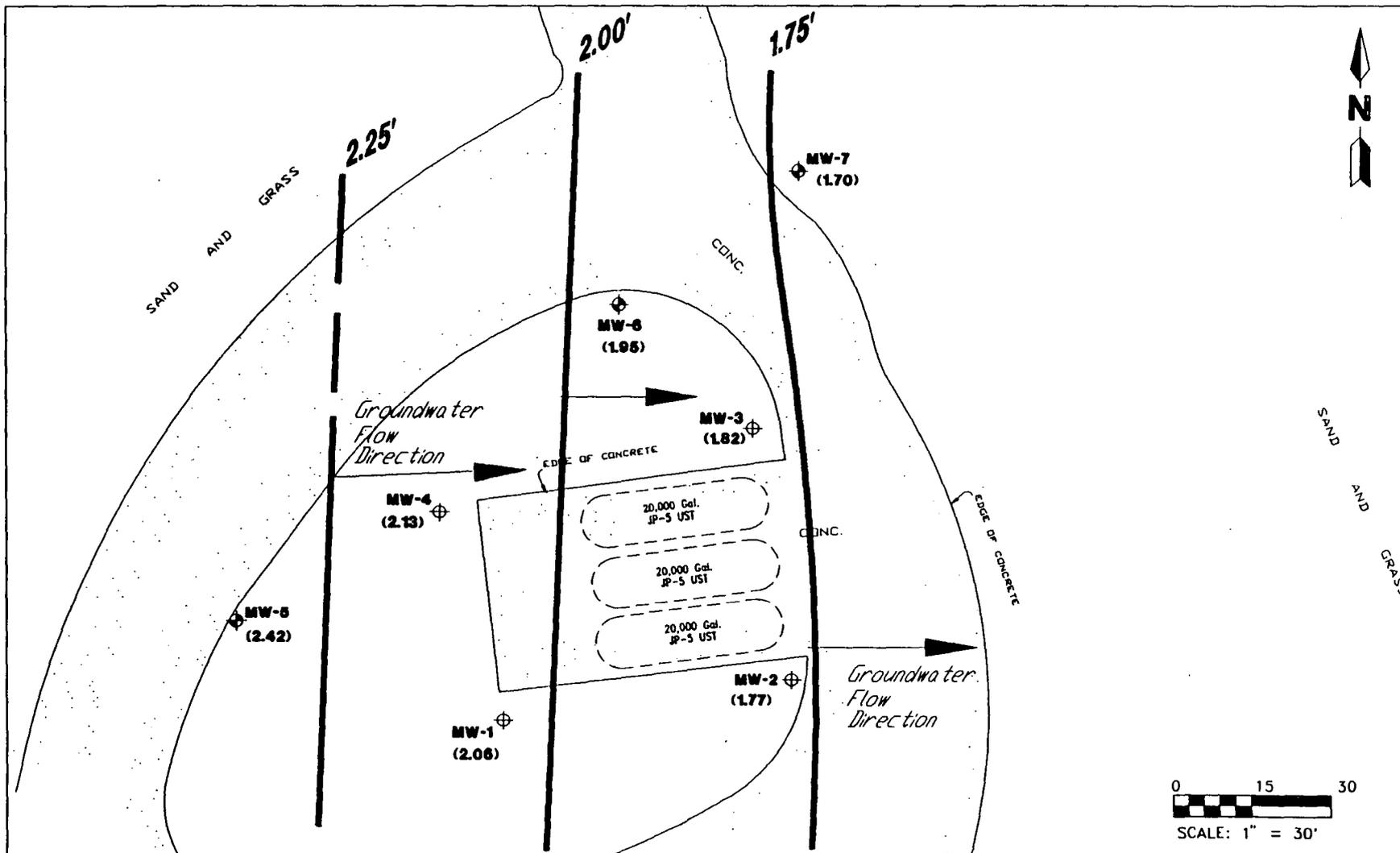
- ⊕ ABB-ES Monitoring Well
- ⊕ Existing UST Compliance Monitoring Well
- Groundwater Elevation Contour
Dashed Where Inferred
Contour Interval = 0.25'
- (2.60) Water Table Elevation (ft/mal)

FIGURE 3
WATER TABLE ELEVATION
CONTOUR MAP, OCTOBER 12, 1992



TECHNICAL MEMORANDUM
SITE 325

COASTAL SYSTEMS STATION
PANAMA CITY, FLORIDA



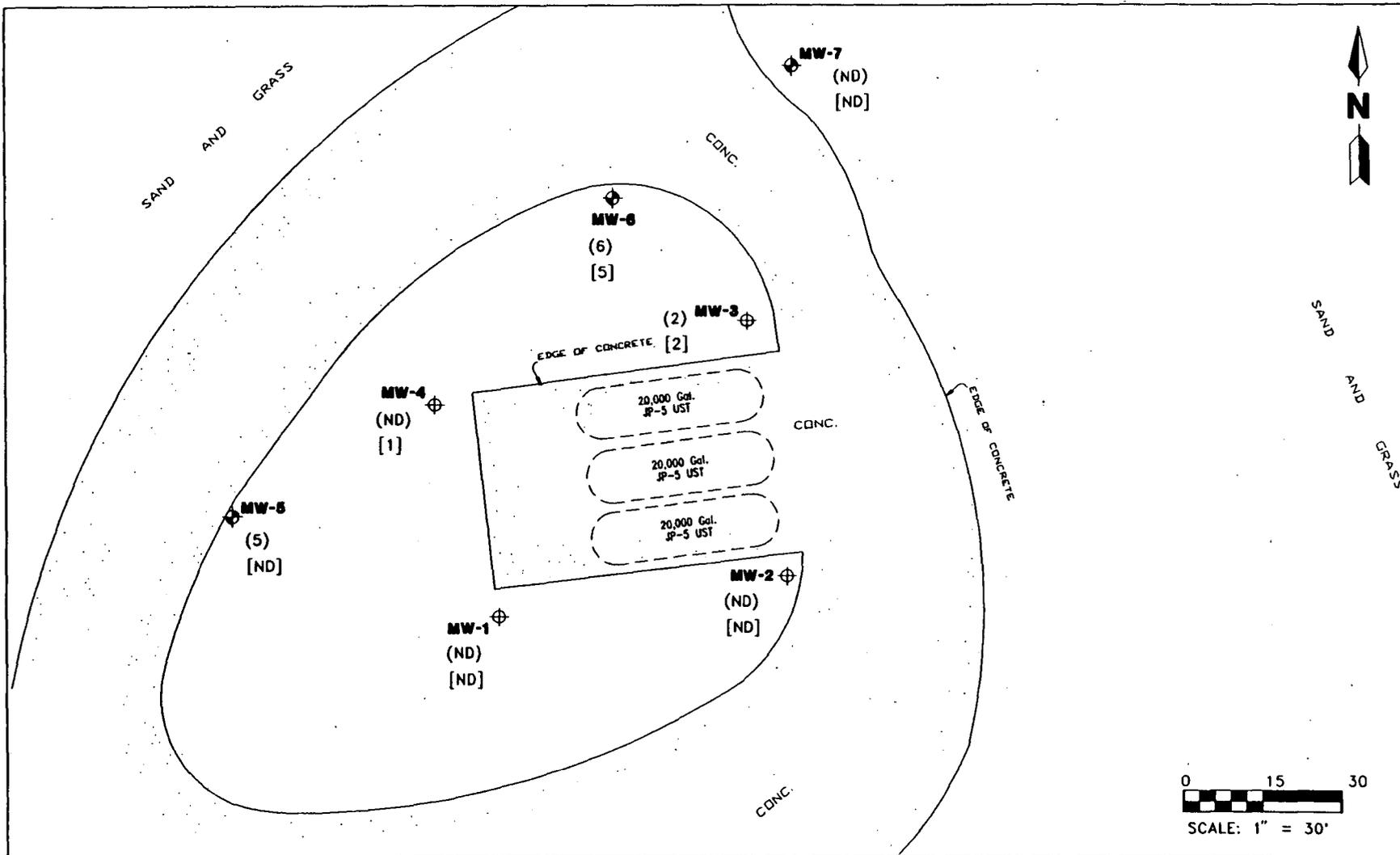
LEGEND	
	ABB-ES Monitoring Well
	Existing UST Compliance Monitoring Well
	Groundwater Elevation Contour Dashed Where Inferred Contour Interval = 0.25 Feet
	Water Table Elevation (2.06) (Feet above mean sea level)

FIGURE 4
WATER TABLE ELEVATION
CONTOUR MAP, NOVEMBER 9, 1992



TECHNICAL MEMORANDUM
SITE 325

COASTAL SYSTEMS STATION
PANAMA CITY, FLORIDA



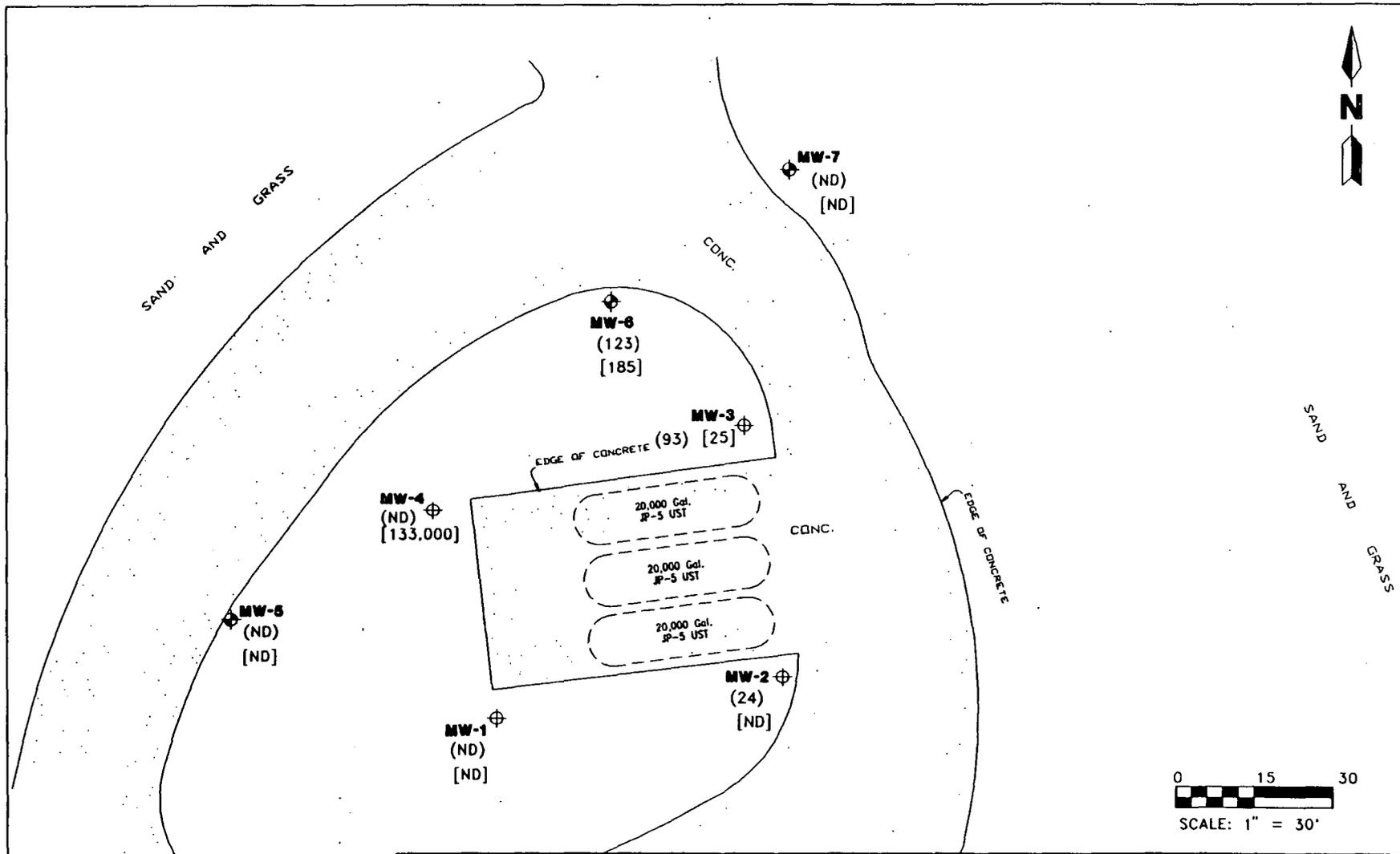
LEGEND	
◆	Monitoring Well Location
⊕	Existing UST Compliance Monitoring Well Location
(5)	Benzene Contamination in ppb October 14, 1992. Sampling Result
[1]	Benzene Contamination in ppb March 8, 1993. Sampling Result
ND	Not Detected (<1 ppb)

FIGURE 5
BENZENE CONTAMINATION DISTRIBUTION MAP
OCTOBER 14, 1992, AND MARCH 8, 1993



TECHNICAL MEMORANDUM
SITE 325

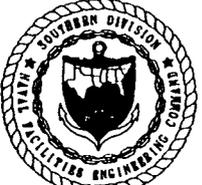
COASTAL SYSTEMS STATION
PANAMA CITY, FLORIDA



LEGEND

- ◆ Monitoring Well Location
- ⊕ Existing UST Compliance Monitoring Well Location
- (93) Total Naphthalene Contamination in ppb October 14, 1992, Sampling Result
- [25] Total Naphthalene Contamination in ppb March 8, 1993, Sampling Result
- ND Not Detected (<15 ppb)

FIGURE 6
TOTAL NAPHTHALENE CONTAMINATION
DISTRIBUTION MAP, OCTOBER 14, 1992,
AND MARCH 8, 1993



TECHNICAL MEMORANDUM
SITE 325

COASTAL SYSTEMS STATION
PANAMA CITY, FLORIDA

ATTACHMENT B
TABLES

LIST OF TABLES

- Table 1 Summary of Soil Sample Organic Vapor Analyzer (OVA) Headspace Analyses, September 28 and 29, 1992
- Table 2 Top of Casing and Groundwater Elevations, October 12, 1992, November 9, 1992, and March 8, 1993
- Table 3 Summary of Groundwater Sample Laboratory Analyses, October 14, 1992, and March 8, 1993

Table 1
Summary of Soil Sample Organic Vapor Analyzer (OVA) Headspace Analyses,
September 28 and 29, 1992

Technical Memorandum
 Site 325, Coastal System Station
 Panama City, Florida

Boring Designation	Depth (feet)	Concentration ¹ (ppm)	Comments
SB-1	0 to 2	0	No odor and no discoloration
	2 to 4	0	No odor and no discoloration
	4 to 6	0	No odor and no discoloration
SB-2	0 to 2	0	No odor and no discoloration
	2 to 4	0	No odor and no discoloration
	4 to 6	0	No odor and no discoloration
	6 to 8	49	Faint petroleum odor, damp
SB-3	0 to 2	0	No odor and no discoloration
	2 to 4	0	No odor and no discoloration
	4 to 6	13	No odor and no discoloration, damp
	6 to 8	0	No odor and no discoloration, saturated
SB-4	0 to 2	0	No odor and no discoloration, damp
	2 to 4	0	No odor and no discoloration
	4 to 6	3	No odor and no discoloration, saturated
SB-5	0 to 2	0	No odor and no discoloration
	2 to 4	2	No odor and no discoloration
	4 to 6	9	No odor and no discoloration, damp
	6 to 8	100	Slight petroleum odor, saturated
SB-6	0 to 2	0	No odor and no discoloration
	2 to 4	50	Slight petroleum odor, saturated
SB-7	0 to 2	0	No odor and no discoloration
	2 to 4	0	Saturated
SB-8	0 to 2	0	Saturated
	2 to 4	0	Saturated
SB-9	0 to 2	0	No odor and no discoloration
	2 to 4	0	No odor and no discoloration
	4 to 6	0	No odor and no discoloration
	6 to 8	0	No odor and no discoloration, saturated
SB-10	0 to 2	0	No odor and no discoloration
	2 to 4	0	No odor and no discoloration
	4 to 6	0	No odor and no discoloration
	6 to 8	14	No odor and no discoloration, saturated

¹Corrected for methane.

Note: ppm = parts per million.

Table 2
Top of Casing and Groundwater Elevations,
October 12, 1992, November 9, 1992, and March 8, 1993

Technical Memorandum
 Site 325, Coastal Systems Station
 Panama City, Florida

Monitoring Well Number	Total Well Depth (feet)	Top of Casing Elevation ¹ (feet)	October 12, 1992		November 9, 1992		March 8, 1993	
			Depth to Groundwater (feet)	Relative Ground-water Elevation ¹ (feet)	Depth to Groundwater (feet)	Relative Ground-water Elevation ¹ (feet)	Depth to Groundwater (feet)	Relative Ground-water Elevation ¹ (feet)
MW-1	12.80	7.89	5.29	2.60	5.83	2.06	5.55	2.34
MW-2	13.21	7.92	5.62	2.30	6.15	1.77	5.90	2.02
MW-3	13.00	7.82	5.49	2.33	6.00	1.82	5.78	2.04
MW-4	13.15	7.97	5.30	2.67	5.84	2.13	6.37	1.60
MW-5	14.79	7.90	4.92	2.98	5.48	2.42	5.11	2.79
MW-6	14.88	7.63	5.19	2.44	5.68	1.95	5.45	2.18
MW-7	14.78	7.54	5.34	2.20	5.84	1.70	5.62	1.92

¹All elevations referenced to National Geodetic Vertical Datum of 1929.

Table 3
Summary of Groundwater Sample Laboratory Analyses,
October 14, 1992, and March 8, 1993

Technical Memorandum
 Site 325, Coastal Systems Station
 Panama City, Florida

Compound	Detection Limit	State Target Level or Guidance Concentration	October 14, 1992							March 8, 1993								
			MW 1	MW 2	MW 3	MW 4	MW 5	MW 6	DUP MW 6	MW 7	MW 1	MW 2	MW 3	MW 4	MW 5	DUP MW 5	MW 6	MW 7
Benzene	1	1	ND	ND	[2]	ND	[5]	ND	[6]	ND	ND	ND	[2]	[1]	ND	ND	[5]	ND
Ethylbenzene	1		ND	3	5	ND	19	ND	21	ND	ND	2	8	59	ND	ND	34	ND
Xylenes	1		ND	6	2	ND	19	ND	22	ND	ND	3	7	160	ND	ND	31	ND
Toluene	1		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	8	ND	ND	ND	ND
Total VOA ¹	4	50	ND	9	9	ND	43	ND	49	ND	ND	5	17	[228]	ND	ND	[70]	ND
MTBE	1	50	ND	ND	1	ND	ND	ND	ND	1	ND	ND	ND	ND	ND	ND	ND	ND
Methylene chloride	1		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1-Methylnaphthalene	5		ND	9	26	ND	ND	22	25	ND	ND	ND	8	50,000	ND	ND	40	ND
2-Methylnaphthalene	5		ND	7	25	ND	ND	16	16	ND	ND	ND	ND	50,000	ND	ND	35	ND
Naphthalene	5		ND	8	42	ND	ND	70	82	ND	ND	ND	17	33,000	ND	ND	110	ND
Total naphthalenes ²	15	100	ND	24	93	ND	ND	[108]	[123]	ND	ND	ND	25	[133,000]	ND	ND	[185]	ND
TRPH (ppm)	1	5	2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	[15,000]	ND	ND	ND	ND
Lead	5	50	6	ND	8	8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

¹State target level (Florida Department of Environmental Regulation [FDER], Chapter 17-770, Florida Administrative Code [FAC]).

²Total naphthalenes is the sum of naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene.

Notes: Concentrations are in parts per billion, unless noted otherwise.
 DUP = duplicate sample.
 ND = not detected.
 Total VOA = total volatile organic aromatics; the sum of benzene, ethylbenzene, toluene, and xylenes.
 MTBE = methyl tert-butyl ether.
 TRPH = total recoverable petroleum hydrocarbons.
 [] = equals or exceeds State target level.

ATTACHMENT C

GLOSSARY

GLOSSARY

ABB-ES	ABB Environmental Services, Inc.
bls	below land surface
CA	Contamination Assessment
CAP	Contamination Assessment Plan
CAR	Contamination Assessment Report
CSS	Coastal Systems Station
CTO	Contract Task Order
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FID	flame ionization detector
ft/day	feet per day
ft/ft	feet per foot
GC	gas chromatograph
ID	inside diameter
OVA	organic vapor analyzer
POA	Plan of Action
ppb	parts per billion
ppm	parts per million
PVC	polyvinyl chloride
PWD	Public Works Department
PWS	public water supply
RAC	Remedial Action Contractor
SOUTHNAVFACENGCOM	Southern Division, Naval Facilities Engineering Command
SPT	standard penetration test
TRPHs	total recoverable petroleum hydrocarbons
UST	underground storage tank

APPENDIX B
SITE CONDITIONS

Regional and Local Physiography

Florida has been divided into five topographic regions by Cooke (1939) as follows: the Coastal Lowlands, the Western Highlands, the Marianna Lowlands, the Tallahassee Hills, and the Central Highlands. Vernon (1951), on the basis of origin and age, divided the physiography into four major divisions: the Delta Plain Highlands, the Tertiary Highlands, the Terraced Coastal Lowlands, and the River Valley Lowlands. He further subdivided these major divisions into smaller units and applied local names to them. In 1964, Puri and Vernon divided Florida into six major physiographic groups. These six primary divisions are again subdivided into secondary and tertiary physiographic units. More recently, White (1970) reported on the geomorphology of the Florida Peninsula. His work divides the peninsula into three zones and then subdivides these zones based on local features. His study, however, does not include northwest Florida, where Bay County is located.

Other than the Puri and Vernon (1964) study, which deals with the entire state and thus includes Bay County, the only study that covers the Bay County area specifically is Musgrove and others (1965). That report deals primarily with water resources of the area, but does divide the county into four physiographic divisions: the sand hills, sinks and lakes, flat-woods forest, and beach dunes and wave-cut bluffs. The following is taken from the descriptions given by Musgrove and others (1965).

The physiographic divisions in Bay County have developed on a series of marine terraces that were carved into the surface deposits during Pleistocene times by sea level fluctuations. Low swampy areas occur throughout each of these divisions, but are more prevalent in the flat-woods forest.

The sand hills in the northern part of the county are erosional remnants of the higher marine terraces, which were between 100 feet and 270 feet above present sea level. Puri and Vernon (1964) called the high terrace remnant, a portion of which is in the northeast part of the county, the New Hope Ridge. They assign the remaining part of the sand hills in Bay County to the Greenhead Slope in the west and the Fountain Slope in the eastern part of Bay County. The sand hills are characterized by gently rolling forested land with a dendritic drainage pattern.

The sinks and lakes occur in the section of the county west of Econfinia Creek, where they have developed within the sand hills. This area is typified by irregular sand hills and numerous sinkholes and sinkhole lakes. The sinkholes range in diameter from a few feet to broad flat areas, such as those in the Deadening Lakes area in southern Washington County and north-central Bay County; these can be up to 2 miles wide. This area was developed by solution of the underlying limestone and the subsequent collapse of the overlying material into the solution chamber. Most of the lakes have no surface outlets; their drainage is mostly to the underlying groundwater system.

The flat-woods forest is the largest physiographic division in the county. It is slightly rolling to flat lying on the terraces below an elevation of 70 feet. Most of this region is covered with pines, except for the areas cleared for agriculture. The flat-woods forest is well drained with the exception of some low areas around the bays on the 0- to 10-foot and 10- to 25-foot terraces. During rainy weather these low areas of the flat woods become inundated. A few

small perennial swamps occur at various locations throughout the flat-woods forest.

The fourth division occurs adjacent to the Gulf coast and is characterized by beach dune deposits and wave-cut bluffs. The beach dune deposits are the youngest sediments in the basin and are the most rapidly changing physiographic feature. It is in this fourth division that our site of concern, Site 278, is located.

Puri and Vernon (1964) placed these last two divisions within their Gulf Coastal Lowlands province, which are gently sloping plains that extend to the coast from the highlands. The landforms in this province are composed of barrier islands, coastal ridges, estuaries, lagoons, relict spits and bars, and sand dune ridges. All of these features are generally parallel to the present coast, indicating an origin shaped by coastal environments.

Regional Hydrogeology

Coastal Systems Station (CSS) Panama City is underlain by three water bearing zones. These zones include the water-table aquifer, the secondary artesian aquifer, and the Floridan aquifer system.

The water-table aquifer is composed of highly permeable quartz sands with scattered lenses of clayey sands and sandy clays. It ranges in thickness from 65 to 140 feet. The depth to the water table ranges from 0 to 65 feet bls, and varies 3 to 5 feet periodically due to changes in rainfall. Groundwater flow direction generally follows local topography. Onsite flow is primarily toward the discharge areas of St. Andrew Bay and Alligator Bayou, to the east and south.

The groundwater in the water-table aquifer exhibits a high iron content, is acidic and corrosive, has high dissolved solids, and has a hardness ranging from 150 to 200 micrograms per liter ($\mu\text{g}/\ell$). Presently, it is considered unsuitable for domestic use and is not used as a potable water source.

The secondary artesian aquifer underlies the water-table aquifer and is composed of isolated sand and shell beds and discontinuous limestone lenses that range from 10 to 25 feet in thickness within the Intracoastal Formation. Clay and low permeability limestone bound these more permeable lenses, confining the water in them and producing artesian conditions. This aquifer does not produce sufficient water locally to make it a viable water source.

The Floridan aquifer system is separated from the overlying aquifers by semi-confining beds within the Intracoastal Formation. It is hydraulically connected with overlying strata in this area. The Floridan aquifer is recharged locally by seepage from the overlying water-table aquifer and, where the water table aquifer is breached, by sinks and lakes in the northern part of the county and in Washington County. Regional recharge takes place north of Bay County where the limestones are near the surface in Washington, Holmes, and Jackson counties, and in southern Alabama. This recharged water migrates down-dip to Bay County.

It has been estimated (Causey and Leve, 1976) that the thickness of the potable zone of the Floridan aquifer ranges between 250 feet and 1,000 feet in Bay County, increasing in thickness northward away from the coast. It has also been estimated (Pascale, 1975) that the yield of most fresh water wells (12 inches in

diameter) would vary from less than 250 gallons per minute (gpm) near the southeast coast to greater than 500 gpm in the northern part of the county. Along the coast, however, public supply wells (16 inches in diameter) rarely yield 500 gpm, although most 2-inch wells into the Floridan aquifer provide enough water for most domestic supplies. Panama City and surrounding subdivisions changed to a surface water supply in 1967. This was done because of the continually declining water levels in wells, and the increased potential for saltwater intrusion.

Local Hydrogeology

At CSS Panama City the Floridan aquifer system consists of the lower permeable beds of the Intracoastal Formation, the Bruce Creek Formation, the Suwannee Limestone, and the limestones of the Ocala Group. It is composed of limestone and dolomite, its upper units lie about 250 feet below sea level at CSS Panama City, and it is approximately 1,100 feet thick (Foster 1965; 1972). Groundwater flow within the aquifer is southwesterly toward the Gulf of Mexico.

Recharge is predominantly a result of local rainwater infiltration. Some recharge to the Floridan aquifer system occurs from north of Bay County. Water entering surface outcrops of limestone in Washington, Holmes, and Jackson counties and in southern Alabama travels down-dip, providing regional recharge. However, the majority of recharge to the Floridan aquifer in this area is probably a result of seepage from overlying formations.

Although the Floridan aquifer system yields up to 500 gpm in wells, the water is generally hard and has a high pH. Hardness, pH, and dissolved solids increase in the down-dip direction toward the coast.

CSS Panama City changed its primary source of potable water from onsite groundwater wells to municipal surface water in 1970 to avoid saltwater intrusion into the aquifer due to excessive pumping.

Water is now supplied by the Bay County Water System, which obtains water from Deer Point Lake (located 9 miles northeast of CSS Panama City). There are still two wells at CSS Panama City that can be used as nonpotable water sources. In addition, there are nine Floridan aquifer wells in the vicinity surrounding CSS Panama City that are used as water supply sources.

The direction of groundwater flow in the water-table aquifer in the site vicinity is predominantly southeasterly, although variations in topography and the presence of surface water bodies result in localized changes in the groundwater flow direction.

APPENDIX C
LITHOLOGIC LOGS

Construction information is unavailable for monitoring wells MW-1, MW-2, MW-3, and MW-4.

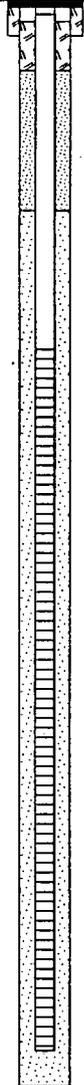
TITLE: CSS PANAMA CITY		LOG of WELL: CSS-325-5	BORING NO. N/A
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7520.31	
CONTRACTOR: Groundwater Protection, Inc.		DATE STARTED: 09/28/92	COMPLTD: 09/28/92
METHOD: 4.25" I.D. HSA	CASE SIZE: 2"	SCREEN INT.: 5-15	PROTECTION LEVEL: 0
TOC ELEV.: 7.90 FT.	MONITOR INST.: OVA	TOT DPTH: 15FT.	DPTH TO ∇ 4.92 FT.
LOGGED BY: P. Wagner	WELL DEVELOPMENT DATE: 09/28/92		SITE: 325

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
		posthole	0	SAND: Grayish orange pink, medium-grained, moderately sorted.		SP		
		posthole	0	SAND: Mottled dark gray and medium light gray, very fine- to fine- grained, moderately sorted.				
5		1.3/2	0	SAND: Grayish orange to medium light gray, fine- to medium-grained, poorly sorted, 1-inch clay lense, damp.				
		1.9/2	G.C.	SAND: Pale yellowish brown, medium-grained, well sorted, saturated.				
		2.0/2	G.C.	As above.				
10								
15								
20								

TITLE: CSS PANAMA CITY		LOG of WELL: CSS-325-6	BORING NO. N/A
CLIENT: SOUTHNAVFACENCOM		PROJECT NO: 7520.31	
CONTRACTOR: Groundwater Protection, Inc.		DATE STARTED: 09/28/92	COMPLTD: 09/28/92
METHOD: 4.25" I.D. HSA	CASE SIZE: 2"	SCREEN INT.: 5-15	PROTECTION LEVEL: D
TOC ELEV.: 7.63 FT.	MONITOR INST.: OVA	TOT DPTH: 15FT.	DPTH TO ∇ 5.19 FT.
LOGGED BY: P. Wagner	WELL DEVELOPMENT DATE: 09/28/92		SITE: 325

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
	posthole	0	SAND: Very pale orange, medium-grained, moderately sorted.		SP		
	posthole	0	SAND: Grayish orange pink, medium-grained, moderately sorted.				
5	1.8/2	0	SAND: Grayish orange pink, medium-grained, well sorted.				
	1.7/2	49	SAND: Grayish orange, medium-grained, moderately sorted, damp, slight petroleum odor.				
	2.0/2	G.C.	SAND: brownish gray, medium-grained, well sorted, wet, petroleum odor.				
10							
15							
20							

TITLE: CSS PANAMA CITY		LOG of WELL: CSS-325-7	BORING NO. N/A
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7520.31	
CONTRACTOR: Groundwater Protection, Inc.		DATE STARTED: 09/29/92	COMPLTD: 09/29/92
METHOD: 4.25" I.D. HSA	CASE SIZE: 2"	SCREEN INT.: 5-15	PROTECTION LEVEL: D
TOC ELEV.: 7.54 FT.	MONITOR INST.: OVA	TOT DPTH: 15FT.	DPTH TO ∇ 5.34 FT.
LOGGED BY: P. Wagner	WELL DEVELOPMENT DATE: 09/29/92		SITE: 325

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
		posthole	0	SAND: Very pale orange, medium-grained, well sorted.	SP	SP		
		posthole	0	As above.				
5		1.5/2	0	As above.				
		1.7/2	0	As above.				
10		2.0/2	30	SAND: Brownish gray, medium-grained, well sorted, wet, slight petroleum odor.				
15								
20								

TITLE: CSS PANAMA CITY		LOG of WELL: CSS-325-8	BORING NO. SB-2
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7520.31	
CONTRACTOR: Groundwater Protection, Inc.		DATE STARTED: 07/28/94	COMPLTD: 07/28/94
METHOD: 10" O.D. HSA	CASE SIZE: 4" I	SCREEN INT.: 2-12	PROTECTION LEVEL: D
TOC ELEV.: 9.78 FT.	MONITOR INST.: OVA	TOT DPTH: 12FT.	DPTH TO ∇ 4.60 FT.
LOGGED BY: J. Koch	WELL DEVELOPMENT DATE: 07/28/94		SITE: 325

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5			200	SAND: Light gray, medium gray, brown, fine- to medium-grained.	[Dotted pattern]	SP	[Blow count data]	[Well data]
			3,100	As above.				
10								
15								
20								

TITLE: CSS PANAMA CITY		LOG of WELL: CSS-325-9	BORING NO. SB-7
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7520.31	
CONTRACTOR: Groundwater Protection, Inc.		DATE STARTED: 07/29/94	COMPLTD: 07/29/94
METHOD: 10" O.D. HSA	CASE SIZE: 4"	SCREEN INT.: 2-12	PROTECTION LEVEL: 0
TOC ELEV.: 9.77 FT.	MONITOR INST.: OVA	TOT DPTH: 12FT.	DPTH TO ∇ 4.99 FT.
LOGGED BY: J. Koch	WELL DEVELOPMENT DATE: 07/29/94		SITE: 325

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
0			SAND: Medium brown to light gray, fine- to medium-grained.	[Dotted pattern]	SP		[Well diagram]
2.400			SAND: Light gray to dark gray, fine- to medium-grained with gravel.				
5							
10							
15							
20							

TITLE: CSS PANAMA CITY		LOG of WELL: CSS-325-10	BORING NO. SB-8
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7520.31	
CONTRACTOR: Groundwater Protection, Inc.		DATE STARTED: 07/30/94	COMPLTD: 07/30/94
METHOD: 10" O.D. HSA	CASE SIZE: 4"	SCREEN INT.: 2-12	PROTECTION LEVEL: D
TOC ELEV.: 10.03 FT.	MONITOR INST.: OVA	TOT DPTH: 12FT.	DPTH TO ∇ 5.46 FT.
LOGGED BY: J. Koch	WELL DEVELOPMENT DATE: 07/30/94		SITE: 325

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
0					SAND: Light gray, red, black, fine- to medium-grained, some clay (10%).	[Stippled pattern]	SP		[Well diagram]
5				900	SAND: As above, petroleum odor.				
10									
15									
20									

TITLE: CSS PANAMA CITY		LOG of WELL: CSS-325-11	BORING NO. SB-17
CLIENT: SOUTHNAVFACENCOM			PROJECT NO: 7520.31
CONTRACTOR: Groundwater Protection, Inc.		DATE STARTED: 09/26/95	COMPLTD: 09/26/95
METHOD: 4.25" I.D. HSA	CASE SIZE: 2"	SCREEN INT.: 4-14	PROTECTION LEVEL: D
TOC ELEV.: 9.52 FT.	MONITOR INST.: OVA	TOT DPTH: 14FT.	DPTH TO ∇ 4.40 FT.
LOGGED BY: J. Koch	WELL DEVELOPMENT DATE: 09/26/95		SITE: 325

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
0				SAND: Light brown to medium gray, fine- to medium-grained, some clay (10%)	[Stippled pattern]	SP		[Well diagram showing casing and screen]
0			As above					
0			As above					
5								
10								
15								
20								

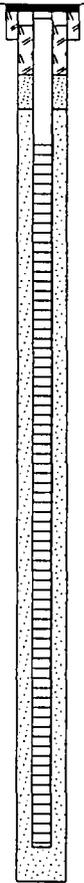
TITLE: CSS PANAMA CITY		LOG of WELL: CSS-325-12	BORING NO. N/A
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7520.31	
CONTRACTOR: Groundwater Protection, Inc.		DATE STARTED: 09/26/95	COMPLTD: 09/26/95
METHOD: 4.25" I.D. HSA	CASE SIZE: 2"	SCREEN INT.: 4-14	PROTECTION LEVEL: D
TOC ELEV.: 9.12 FT.	MONITOR INST.: OVA	TOT DPTH: 14FT.	DPTH TO ∇ 4.15 FT.
LOGGED BY: J. Koch	WELL DEVELOPMENT DATE: 09/26/95		SITE: 325

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5					SAND FILL		SP		
10					GRAVEL FILL: 1- to 1.5-inch diameter stones, light gray to medium gray, some sand		GP		
15									
20									

TITLE: CSS PANAMA CITY		LOG of WELL: CSS-325-13	BORING NO. N/A
CLIENT: SOUTHNAVFACENGCOM			PROJECT NO: 7520.31
CONTRACTOR: Groundwater Protection, Inc.		DATE STARTED: 09/27/95	COMPLTD: 09/27/95
METHOD: 4.25" I.D. HSA	CASE SIZE: 2"	SCREEN INT.: 4-14	PROTECTION LEVEL: D
TOC ELEV.: 8.92 FT.	MONITOR INST.: OVA	TOT DPTH: 14FT.	DPTH TO ∇ 3.82 FT.
LOGGED BY: J. Koch	WELL DEVELOPMENT DATE: 09/27/95		SITE: 325

DEPTH F.T.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
0						SP		
5				SAND: Light brown to light gray, fine- to medium-grained, well sorted				
10								
15								
20								

TITLE: CSS PANAMA CITY		LOG of WELL: CSS-325-14	BORING NO. N/A
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7520.31	
CONTRACTOR: Groundwater Protection, Inc.		DATE STARTED: 09/27/95	COMPLTD: 09/27/95
METHOD: 4.25" I.D. HSA	CASE SIZE: 2"	SCREEN INT.: 2-12	PROTECTION LEVEL: D
TOC ELEV.: 6.84 FT.	MONITOR INST.: OVA	TOT DPTH: 12FT.	DPTH TO ∇ 2.89 FT.
LOGGED BY: J. Koch	WELL DEVELOPMENT DATE: 09/27/95		SITE: 325

DEPTH F.T.	LABORATORY SAMPLE ID.	RECOVERY SAMPLE	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5			GC	SAND: Light brown to light gray, fine- to medium-grained, well sorted		SP		
10								
15								
20								

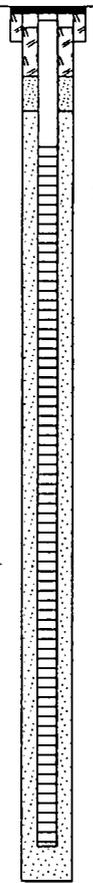
TITLE: CSS PANAMA CITY		LOG of WELL: CSS-325-15	BORING NO. N/A
CLIENT: SOUTHNAVFACENGCOM			PROJECT NO: 7520.31
CONTRACTOR: Groundwater Protection, Inc.		DATE STARTED: 09/27/95	COMPLTD: 09/27/95
METHOD: 4.25" I.D. HSA	CASE SIZE: 2"	SCREEN INT.: 4-14	PROTECTION LEVEL: D
TOC ELEV.: 9.56 FT.	MONITOR INST.: OVA	TOT DPTH: 14FT.	DPTH TO ∇ 4.75 FT.
LOGGED BY: J. Koch	WELL DEVELOPMENT DATE: 09/27/95		SITE: 325

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
0						SP		
5								
10			230	SAND: Light brown to light gray, fine- to medium-grained, well sorted				
15								
20								

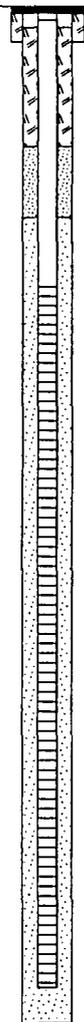
TITLE: CSS PANAMA CITY		LOG of WELL: CSS-325-16D	BORING NO. N/A
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7520.31	
CONTRACTOR: Groundwater Protection, Inc.		DATE STARTED: 09/28/95	COMPLTD: 10/01/95
METHOD: HSA, Mud Rotary	CASE SIZE: 2"; 6"	SCREEN INT.: 25-30	PROTECTION LEVEL: D
TOC ELEV.: 9.56 FT.	MONITOR INST.: OVA	TOT DPTH: 30FT.	DPTH TO ∇ 4.85 FT.
LOGGED BY: J. Koch	WELL DEVELOPMENT DATE: 10/16/95		SITE: 325

DEPTH F.T.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5				SAND FILL		SP		
1,100				GRAVEL: 1- to 1.5-inch diameter stones, light gray to medium gray, some sand, petroleum odor.		GP		
1,400				As above.				
1,000				As above, with fiberglass remains of the underground storage tanks				
500				As above.				
1,100				SAND: Light gray to medium gray, fine- to coarse-grained, slight petroleum odor.		SP		
450				As above.				
80				SAND: Light gray, fine- to coarse-grained, no odor.				
25				1 SAND: Medium gray, fine- to coarse-grained, no odor.				
5				As above.				
1				1 CLAYEY SAND: Medium gray, fine- to coarse-grained, no odor.		SC		

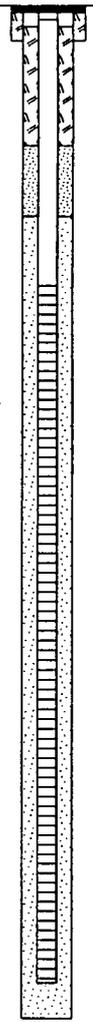
TITLE: CSS PANAMA CITY		LOG of WELL: CSS-325-17	BORING NO. N/A
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7520.31	
CONTRACTOR: Groundwater Protection, Inc.		DATE STARTED: 09/28/95	COMPLTD: 09/28/95
METHOD: 4.25" I.D. HSA	CASE SIZE: 2"	SCREEN INT.: 2-12	PROTECTION LEVEL: D
TOC ELEV.: 6.86 FT.	MONITOR INST.: OVA	TOT DPTH: 12FT.	DPTH TO ∇ 2.74 FT.
LOGGED BY: J. Koch	WELL DEVELOPMENT DATE: 09/28/95		SITE: 325

DEPTH F.T.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5				GC SAND: Light brown to light gray, fine- to medium-grained, well sorted		SP		
10								
15								
20								

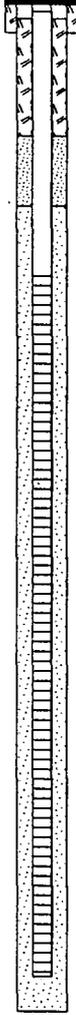
TITLE: CSS PANAMA CITY		LOG of WELL: CSS-325-18	BORING NO. N/A
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7520.31	
CONTRACTOR: Groundwater Protection, Inc.		DATE STARTED: 09/28/95	COMPLTD: 09/28/95
METHOD: 4.25" I.D. HSA	CASE SIZE: 2"	SCREEN INT.: 4-14	PROTECTION LEVEL: D
TOC ELEV.: 9.68 FT.	MONITOR INST.: OVA	TOT DPTH: 14FT.	DPTH TO ∇ 4.79 FT.
LOGGED BY: J. Koch	WELL DEVELOPMENT DATE: 09/28/95		SITE: 325

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5			GC	SAND: Light brown to light gray, fine- to medium-grained, well sorted		SP		
10								
15								
20								

TITLE: CSS PANAMA CITY		LOG of WELL: CSS-325-19	BORING NO. N/A
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7520.31	
CONTRACTOR: Groundwater Protection, Inc.		DATE STARTED: 09/29/95	COMPLTD: 09/29/95
METHOD: 4.25" I.D. HSA	CASE SIZE: 2"	SCREEN INT.: 4-14	PROTECTION LEVEL: D
TOC ELEV.: 10.10 FT.	MONITOR INST.: OVA	TOT DPTH: 14FT.	DPTH TO ∇ 4.32 FT.
LOGGED BY: J. Koch	WELL DEVELOPMENT DATE: 09/29/95		SITE: 325

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5			GC	SAND: Light brown to light gray, fine- to medium-grained, well sorted		SP		
10								
15								
20								

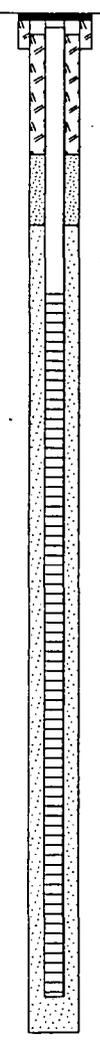
TITLE: CSS PANAMA CITY		LOG of WELL: CSS-325-20	BORING NO. SB-29
CLIENT: SOUTHNAVFACENGCOM			PROJECT NO: 7520.31
CONTRACTOR: Groundwater Protection, Inc.		DATE STARTED: 09/29/95	COMPLTD: 09/29/95
METHOD: 4.25" I.D. HSA	CASE SIZE: 2"	SCREEN INT.: 4-14	PROTECTION LEVEL: D
TOC ELEV.: 10.24 FT.	MONITOR INST.: OVA	TOT DPTH: 14FT.	DPTH TO ∇ 4.36 FT.
LOGGED BY: J. Koch	WELL DEVELOPMENT DATE: 09/29/95		SITE: 325

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
					SAND: Light brown to white, fine- to medium-grained.		SP		
5					CLAYEY SAND: Brown, gray, black, fine- to medium-grained, 40% clay. As above.		SC		
				GC			SP		
10									
15									
20									

TITLE: CSS PANAMA CITY		LOG of WELL: CSS-325-21	BORING NO. N/A
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7520.31	
CONTRACTOR: Groundwater Protection, Inc.		DATE STARTED: 09/29/95	COMPLTD: 09/29/95
METHOD: 4.25" I.D. HSA	CASE SIZE: 2"	SCREEN INT.: 4-14	PROTECTION LEVEL: D
TOC ELEV.: 9.42 FT.	MONITOR INST.: OVA	TOT DPTH: 14FT.	DPTH TO ∇ 3.64 FT.
LOGGED BY: J. Koch	WELL DEVELOPMENT DATE: 09/29/95		SITE: 325

DEPTH F.T.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5					SAND FILL		SP		
10					SAND: Light brown to light gray, fine- to medium-grained, well sorted		SP		
15									
20									

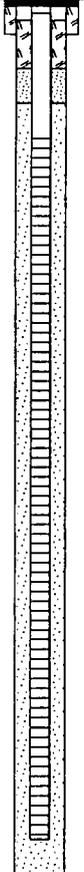
TITLE: CSS PANAMA CITY		LOG of WELL: CSS-325-22	BORING NO. N/A
CLIENT: SOUTHNAVFACENGCOM			PROJECT NO: 7520.31
CONTRACTOR: Groundwater Protection, Inc.		DATE STARTED: 09/29/95	COMPLTD: 09/29/95
METHOD: 4.25" I.D. HSA	CASE SIZE: 2"	SCREEN INT.: 4-14	PROTECTION LEVEL: D
TOC ELEV.: 9.53 FT.	MONITOR INST.: OVA	TOT DPTH: 14FT.	DPTH TO ∇ 3.64 FT.
LOGGED BY: J. Koch	WELL DEVELOPMENT DATE: 09/29/95		SITE: 325

DEPTH F.T.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5			GC	SAND: Light brown to light gray, fine- to medium-grained, well sorted		SP		
10								
15								
20								

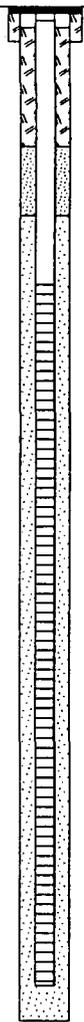
TITLE: CSS PANAMA CITY		LOG of WELL: CSS-325-23	BORING NO. N/A
CLIENT: SOUTHNAVFACENGCOM			PROJECT NO: 7520.31
CONTRACTOR: Groundwater Protection, Inc.		DATE STARTED: 09/29/95	COMPLTD: 09/29/95
METHOD: 4.25" I.D. HSA	CASE SIZE: 2"	SCREEN INT.: 4-14	PROTECTION LEVEL: D
TOC ELEV.: 9.88 FT.	MONITOR INST.: OVA	TOT DPTH: 14FT.	DPTH TO ∇ 4.57 FT.
LOGGED BY: J. Koch	WELL DEVELOPMENT DATE: 09/29/95		SITE: 325

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5				GC	SAND FILL	[Stippled pattern]	SP		[Well diagram showing casing and screen]
10					SAND: Light brown to light gray, fine- to medium-grained, well sorted	[Stippled pattern]	SP		
15									
20									

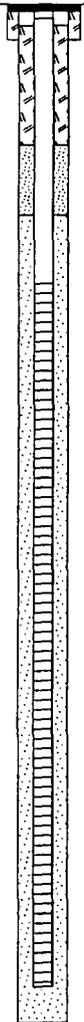
TITLE: CSS PANAMA CITY		LOG of WELL: CSS-325-24	BORING NO. N/A
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7520.31	
CONTRACTOR: Groundwater Protection, Inc.		DATE STARTED: 09/30/95	COMPLTD: 09/30/95
METHOD: 4.25" I.D. HSA	CASE SIZE: 2"	SCREEN INT.: 2-12	PROTECTION LEVEL: D
TOC ELEV.: 8.80 FT.	MONITOR INST.: OVA	TOT DPTH: 12FT.	DPTH TO ∇ 5.02 FT.
LOGGED BY: J. Koch	WELL DEVELOPMENT DATE: 09/30/95		SITE: 325

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5				SAND: Light brown to light gray, fine- to medium-grained, well sorted		SP		
10								
15								
20								

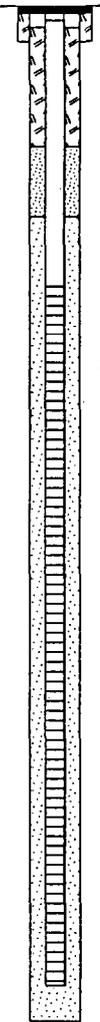
TITLE: CSS PANAMA CITY		LOG of WELL: CSS-325-25	BORING NO. N/A
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7520.31	
CONTRACTOR: Groundwater Protection, Inc.		DATE STARTED: 09/30/95	COMPLTD: 09/30/95
METHOD: 4.25" I.D. HSA	CASE SIZE: 2"	SCREEN INT.: 4-14	PROTECTION LEVEL: D
TOC ELEV.: 10.73 FT.	MONITOR INST.: OVA	TOT DPTH: 14FT.	DPTH TO ∇ 5.10 FT.
LOGGED BY: J. Koch	WELL DEVELOPMENT DATE: 09/30/95		SITE: 325

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5			GC	SAND: Light brown to light gray, fine- to medium-grained, well sorted		SP		
10								
15								
20								

TITLE: CSS PANAMA CITY		LOG of WELL: CSS-325-26	BORING NO. N/A
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7520.31	
CONTRACTOR: Groundwater Protection, Inc.		DATE STARTED: 09/30/95	COMPLTD: 09/30/95
METHOD: 4.25" I.D. HSA	CASE SIZE: 2"	SCREEN INT.: 4-14	PROTECTION LEVEL: D
TOC ELEV.: 10.81 FT.	MONITOR INST.: OVA	TOT DPTH: 14FT.	DPTH TO ∇ 5.62 FT.
LOGGED BY: J. Koch	WELL DEVELOPMENT DATE: 09/30/95		SITE: 325

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5			GC	SAND: Light brown, fine- to medium-grained, well sorted		SP		
10								
15								
20								

TITLE: CSS PANAMA CITY		LOG of WELL: CSS-325-27	BORING NO. N/A
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7520.31	
CONTRACTOR: Groundwater Protection, Inc.		DATE STARTED: 09/30/95	COMPLTD: 09/30/95
METHOD: 4.25" I.D. HSA	CASE SIZE: 2"	SCREEN INT.: 4-14	PROTECTION LEVEL: D
TOC ELEV.: 10.44 FT.	MONITOR INST.: OVA	TOT DPTH: 14FT.	DPTH TO ∇ 5.35 FT.
LOGGED BY: J. Koch	WELL DEVELOPMENT DATE: 09/30/95		SITE: 325

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5			GC	SAND: Light brown, fine- to medium-grained, well sorted		SP		
10								
15								
20								

TITLE: CSS PANAMA CITY		LOG of WELL: CSS-325-28	BORING NO. N/A
CLIENT: SOUTHNAVFACENCOM		PROJECT NO: 7520.31	
CONTRACTOR: Groundwater Protection, Inc.		DATE STARTED: 10/01/95	COMPLTD: 10/01/95
METHOD: 4.25" I.D. HSA	CASE SIZE: 2"	SCREEN INT.: 3-13	PROTECTION LEVEL: D
TOC ELEV.: 9.88 FT.	MONITOR INST.: OVA	TOT DPTH: 13FT.	DPTH TO ∇ 5.24 FT.
LOGGED BY: J. Koch	WELL DEVELOPMENT DATE: 10/01/95		SITE: 325

DEPTH F.T.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5				GC	SAND: Light brown, fine- to medium-grained, well sorted		SP		
10									
15									
20									

APPENDIX D

AQUIFER PARAMETER CALCULATIONS

Aquifer Parameter Calculations

Hydraulic Gradient

Water-table elevations were plotted on a map of the site. A water-table contour map was drawn with flow lines (depicting groundwater flow direction) perpendicular to the groundwater elevation contours. The groundwater hydraulic gradient was calculated by subtracting the differences in groundwater elevation (in feet) between two points on the map and dividing the elevation difference by the distance between the two points to obtain a resulting gradient in feet per foot (ft/ft). Water elevation data collected on October 16, 1995, were used to calculate hydraulic gradients at the site. Three traverses were made perpendicular to equipotential contour lines to calculate an average site hydraulic gradient. For each traverse, the hydraulic gradient was calculated as follows:

$$i = (h_1 - h_2) / d$$

where

i = hydraulic gradient (ft/ft),
 h_1 = water-table elevation, upgradient (feet),
 h_2 = water-table elevation, downgradient (feet), and
 d = horizontal distance (feet) between h_1 and h_2 along a flow line.

Hydraulic gradients calculated in this manner varied from 8.47×10^{-3} ft/ft to 9.25×10^{-3} ft/ft. The average hydraulic gradient at the site was calculated to be 8.74×10^{-3} ft/ft.

Hydraulic Conductivity

Hydraulic conductivity (K) from slug test data was calculated following the methods of Bouwer and Rice (1976) and Bouwer (1989) for partially penetrating wells screened in unconfined aquifers. The following well information was needed to assess the hydraulic conductivity:

- radius of well casing (r_c),
- r_w = radius of borehole (r_c plus radius of the sand pack surrounding the well screen),
- length of screened interval below the water table (L_s),
- effective well radius (r_e),
- depth of well below the water table (L_w),
- depth to confining unit or bottom of aquifer below the static water table (H), and
- plot of time versus the logarithm of y , where y is the difference between the static water level outside the well and the water level inside the well.

Figure D-1 is a well diagram depicting most of the aquifer and well parameters. Calculations were made assuming that $L_w < H$. K was calculated as follows:

$$K = [R_c^2 \ln(\frac{r_o}{r_w}) - 2L_o] [\frac{1}{t} \ln(\frac{y_o}{y_t})] \quad (1)$$

where

y_o = y at time zero, and
 y_t = y at time t .

The effective well radius, r_o , and the term $[(1/t)\ln(y_o/y_t)]$ were derived by using the computer program AQTESOLV[™] (Geraghty & Miller, Inc., 1989). This computer program follows procedures and assumptions outlined by Bouwer (1989).

Slug test graphs are attached at the end of this appendix. Values of y were calculated for a particular time, t , and plotted on the graph. The computer program selects a "best-fit" line through the data points by linear regression along a "straight-line" portion of the graph. The slope of the "best-fit" line is used to calculate the hydraulic conductivity, K .

Three slug tests each were performed inside monitoring wells MW-5, MW-6, and MW-7. K is reported in feet per minute on the slug test graphs and was recalculated to feet per day (ft/day). K was found to vary from 17.3 ft/day to 28.2 ft/day with an average K of 21.2 feet per day (ft/day).

Average Pore Water Velocity (V)

Estimates of V were obtained using the following formula:

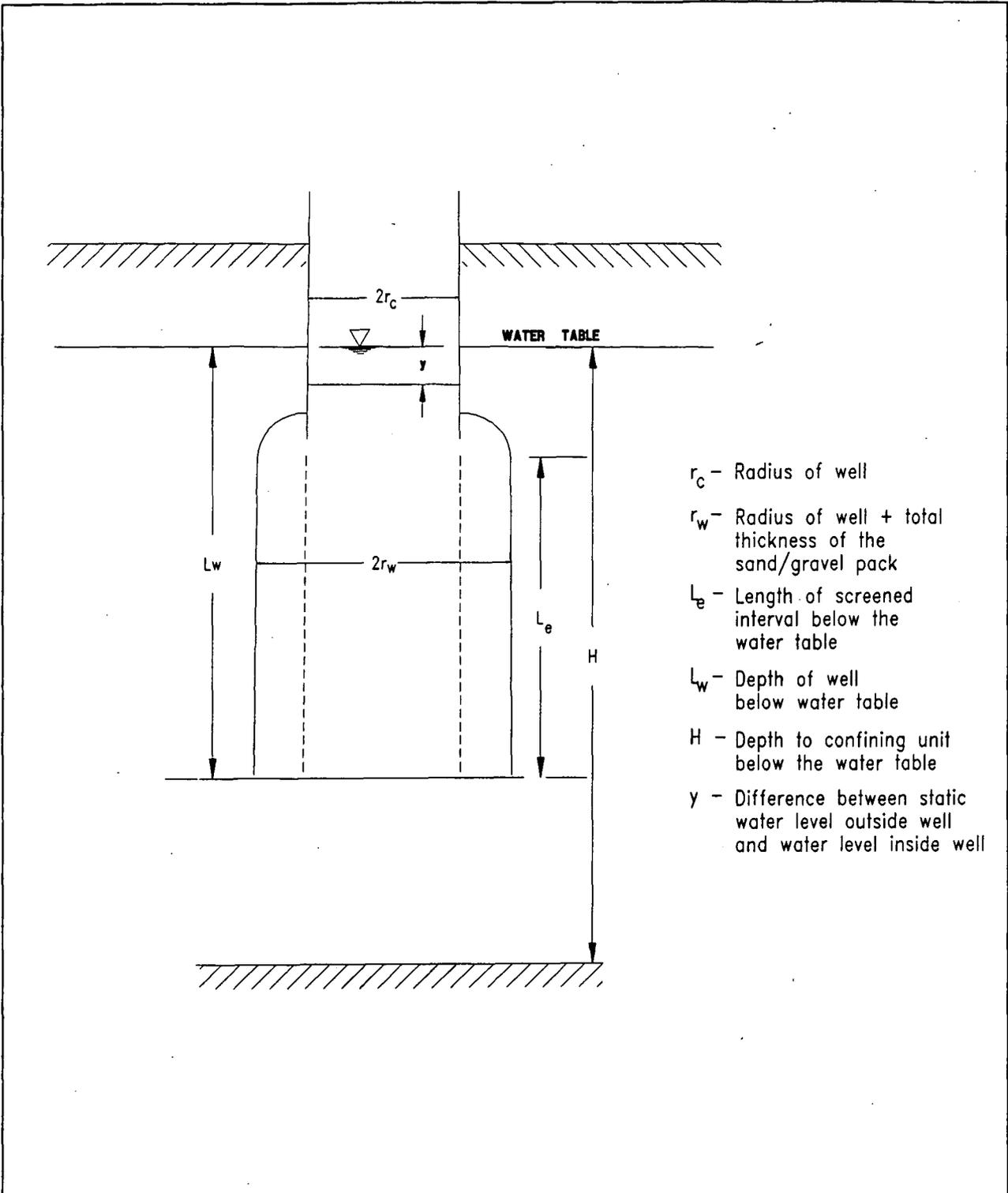
$$V = (K \cdot i) / n$$

where

V = seepage velocity in ft/day,
 K = hydraulic conductivity in ft/day,
 i = hydraulic gradient, and
 n = estimated porosity.

Assuming an estimated porosity of 25% for fine- to medium-grained sand with approximately 10% clay (Driscoll, 1986), an average hydraulic gradient of 8.74×10^{-3} ft/ft, and an average hydraulic conductivity of 21.2 ft/day, the V is calculated as follows:

$$V = (21.2 \text{ ft/day} * 8.74 \times 10^{-3} \text{ ft/ft}) / 0.25$$
$$V = 0.74 \text{ ft/day}$$



- r_c - Radius of well
- r_w - Radius of well + total thickness of the sand/gravel pack
- L_e - Length of screened interval below the water table
- L_w - Depth of well below water table
- H - Depth to confining unit below the water table
- y - Difference between static water level outside well and water level inside well

FIGURE D-1
DEFINITIONS OF SLUG TEST
PARAMETERS (From Bouwer, 1989)

H:/PANAMA/D-1/NAB/01-23-96

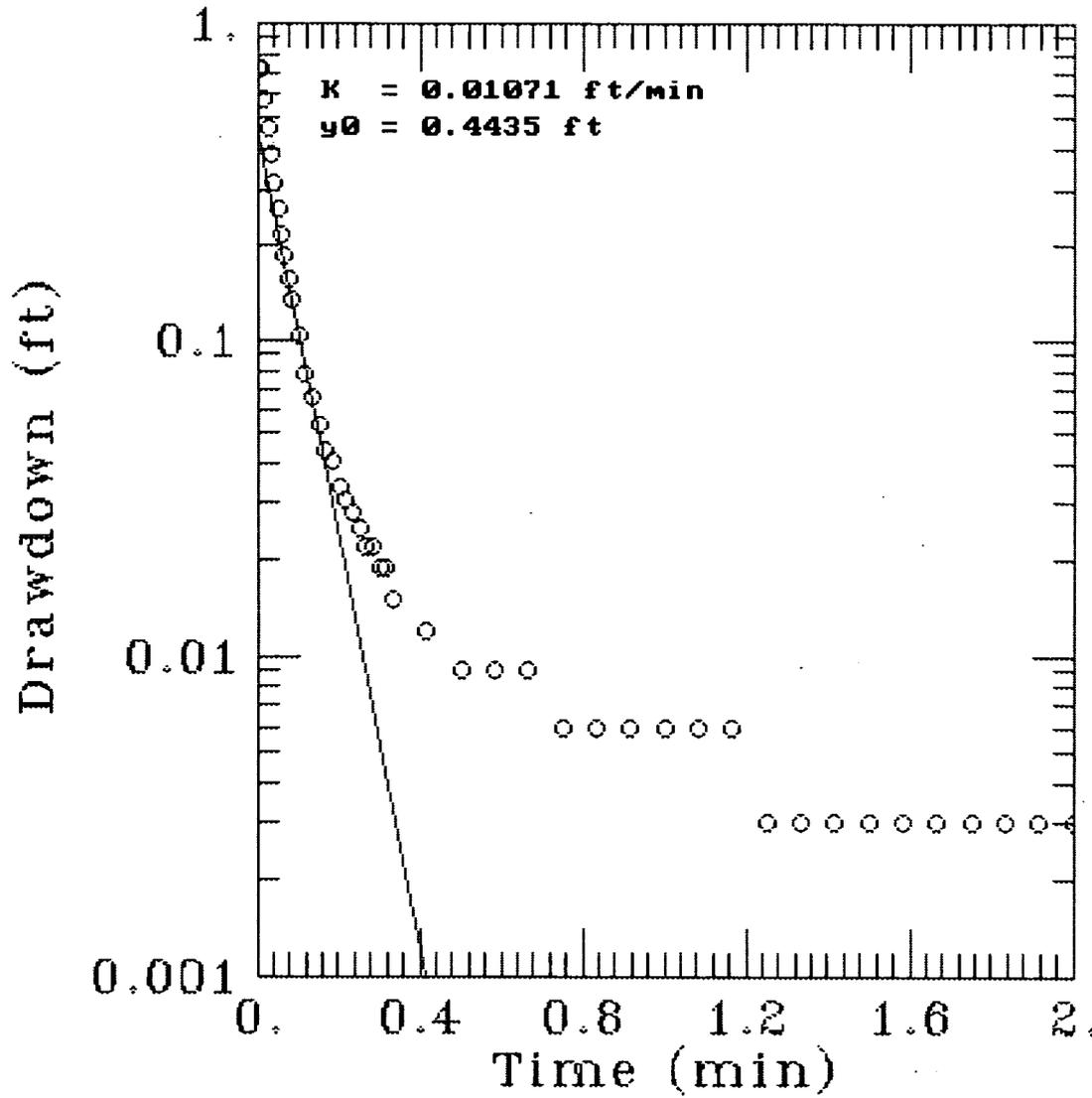


CONTAMINATION ASSESSMENT
REPORT

COASTAL SYSTEMS CENTER
PANAMA CITY, FLORIDA

APPENDIX E
SLUG TEST GRAPHS

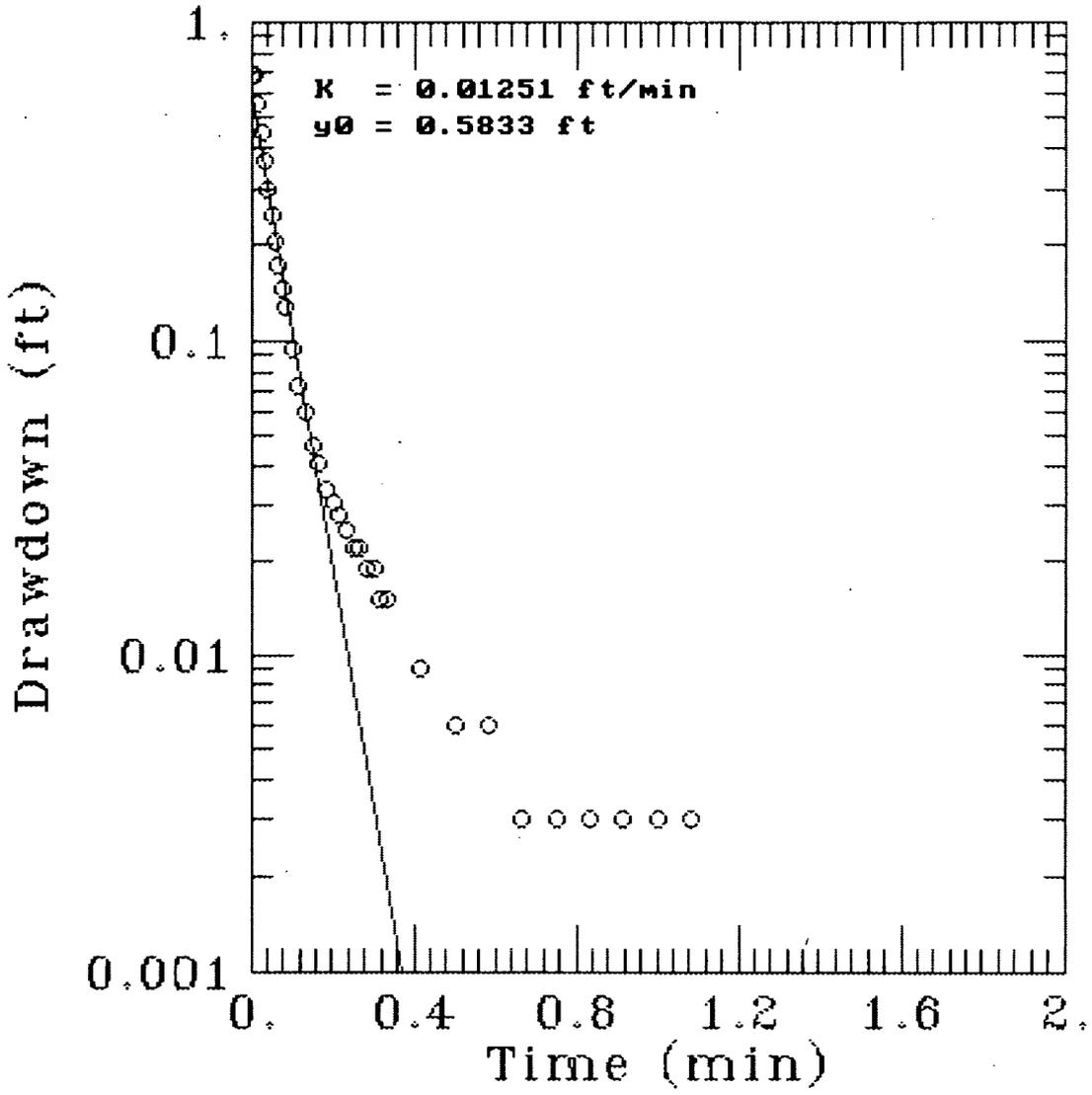
CSS-325-MW5 RUN#1



AQTESOLV

 GERAGHTY
& MILLER, INC.
Modeling Group

CSS-325-MW5 RUN#2

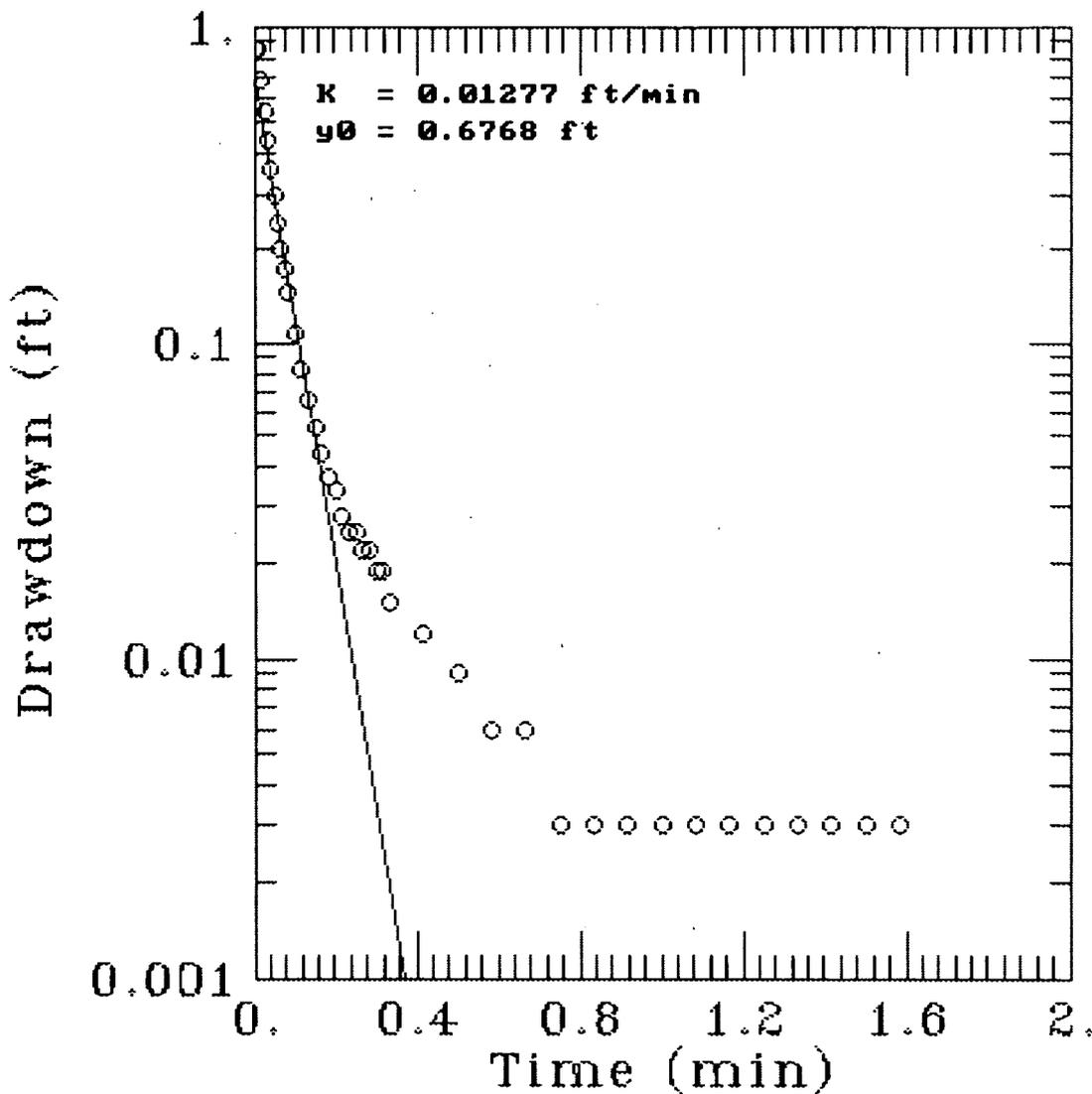


AQTESOLV



Modeling Group

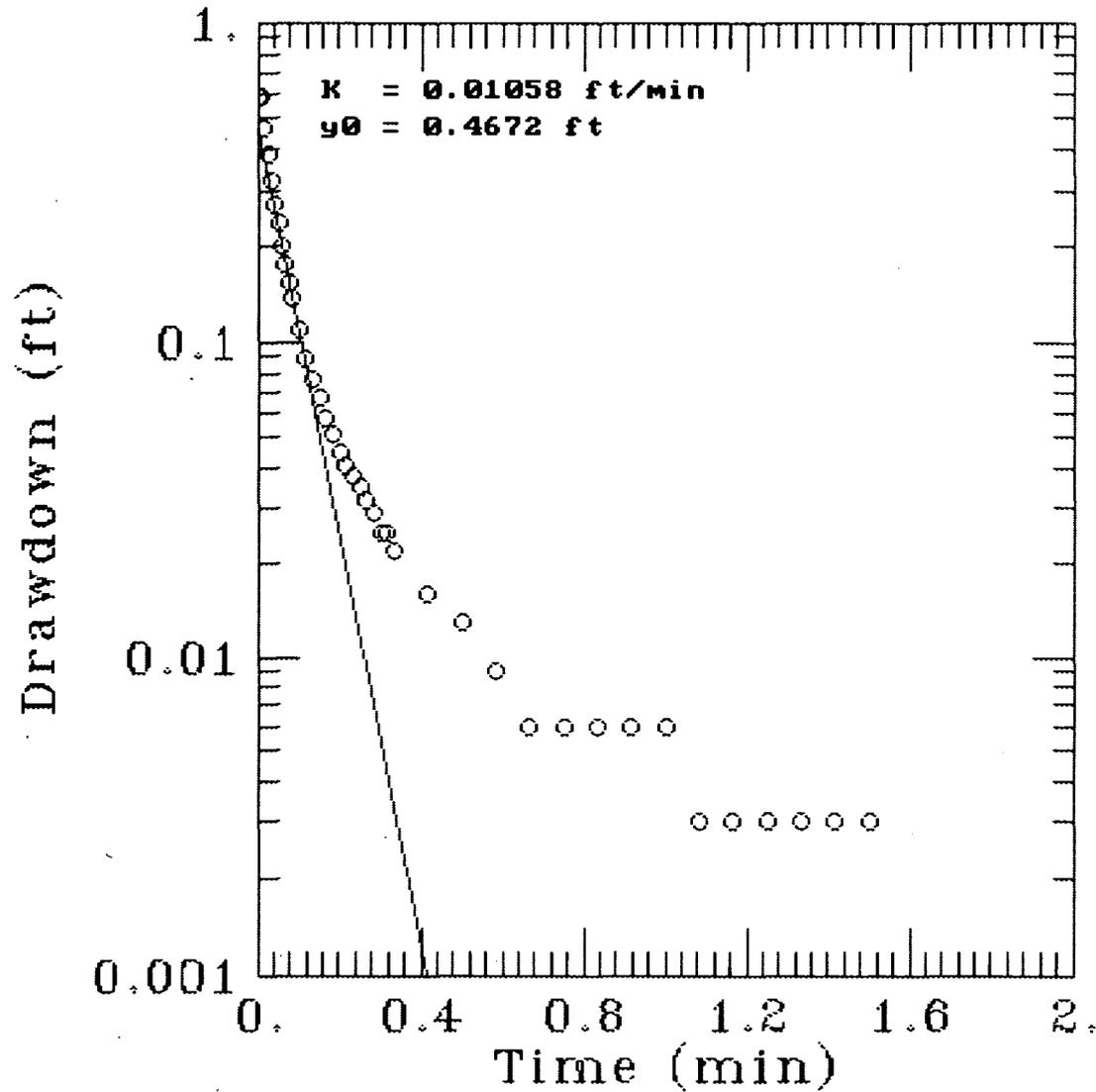
CSS-325-MW5 RUN#3



AQTESOLV

 GERAGHTY
& MILLER, INC.
Modeling Group

CSS-325-MW6 RUN#1

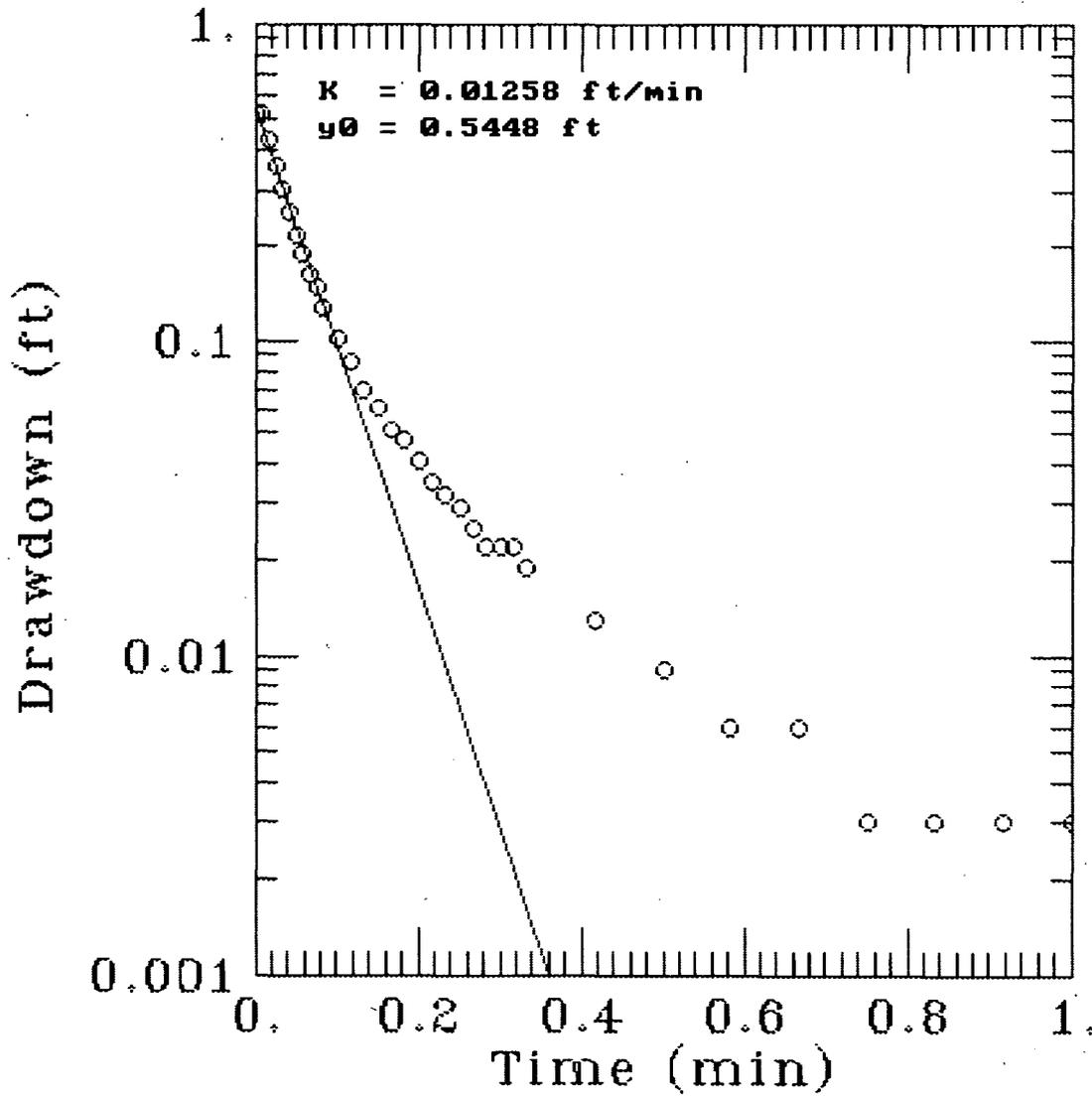


AQTESOLV

 GERAGHTY
& MILLER, INC.

 Modeling Group

CSS-325-MW6 RUN#2

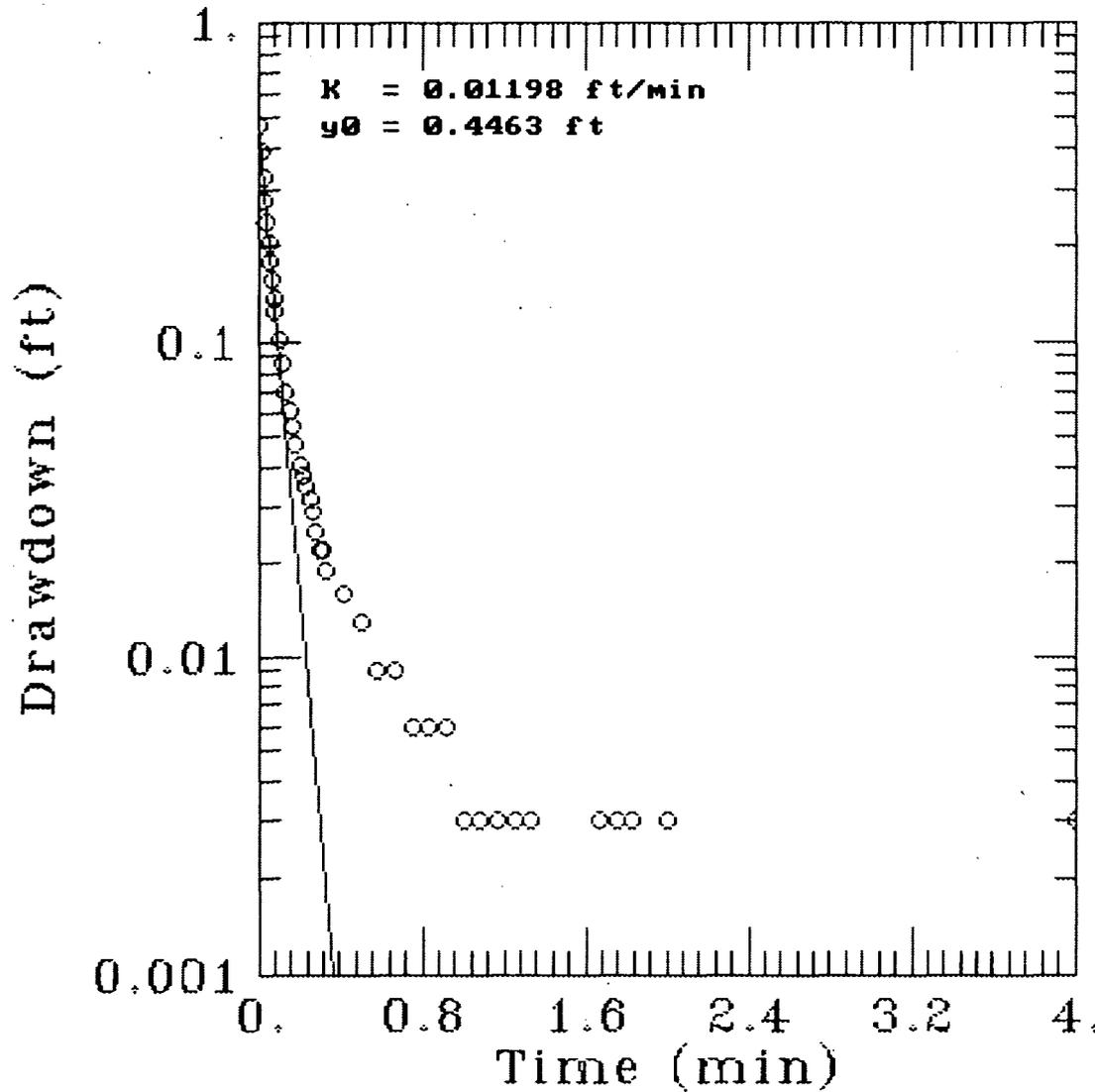


AQTESOLV

 GERAGHTY
& MILLER, INC.

 Modeling Group

CSS-325-MW6 RUN#3

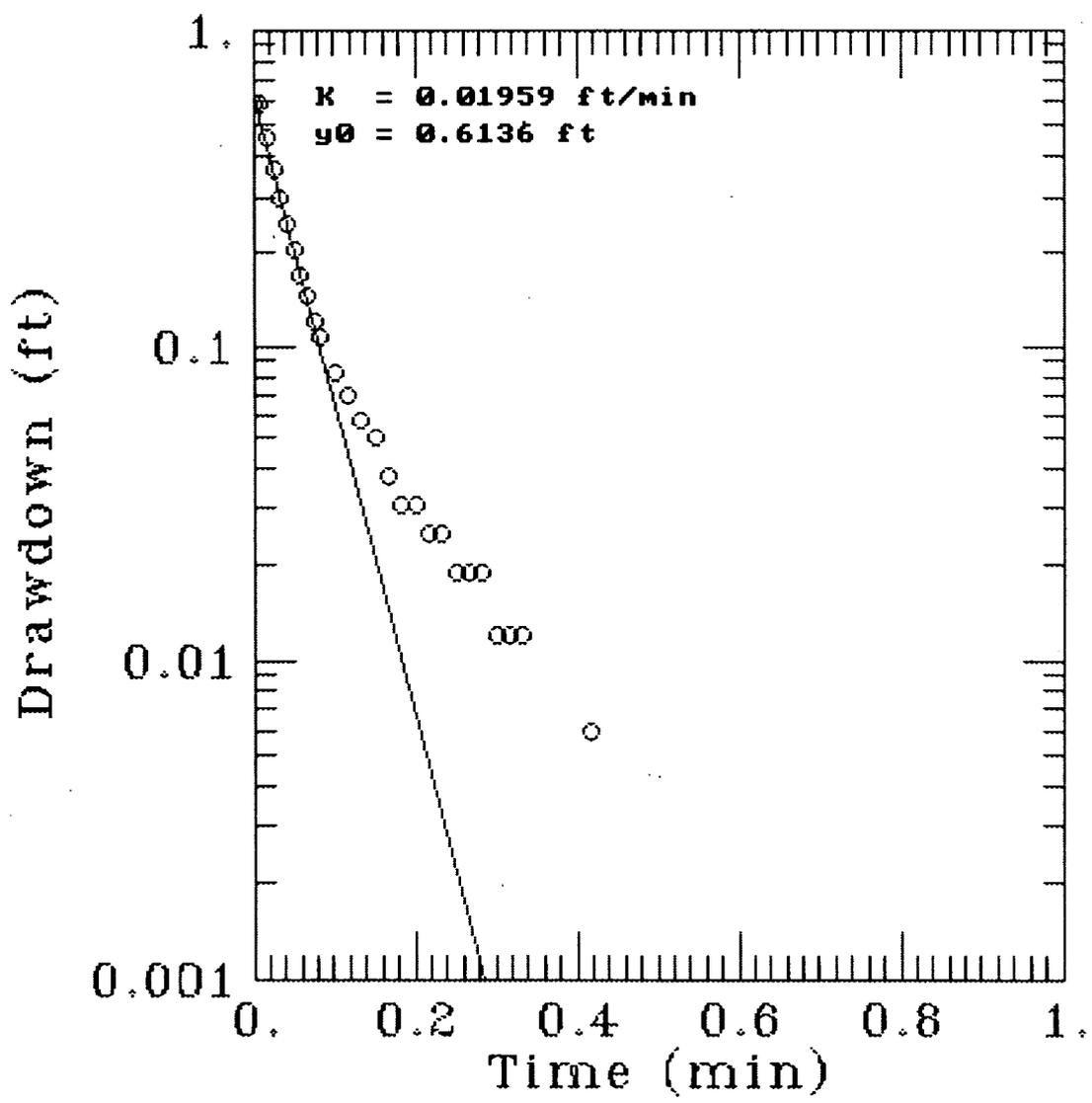


AQTESOLV

 GERAGHTY
& MILLER, INC.

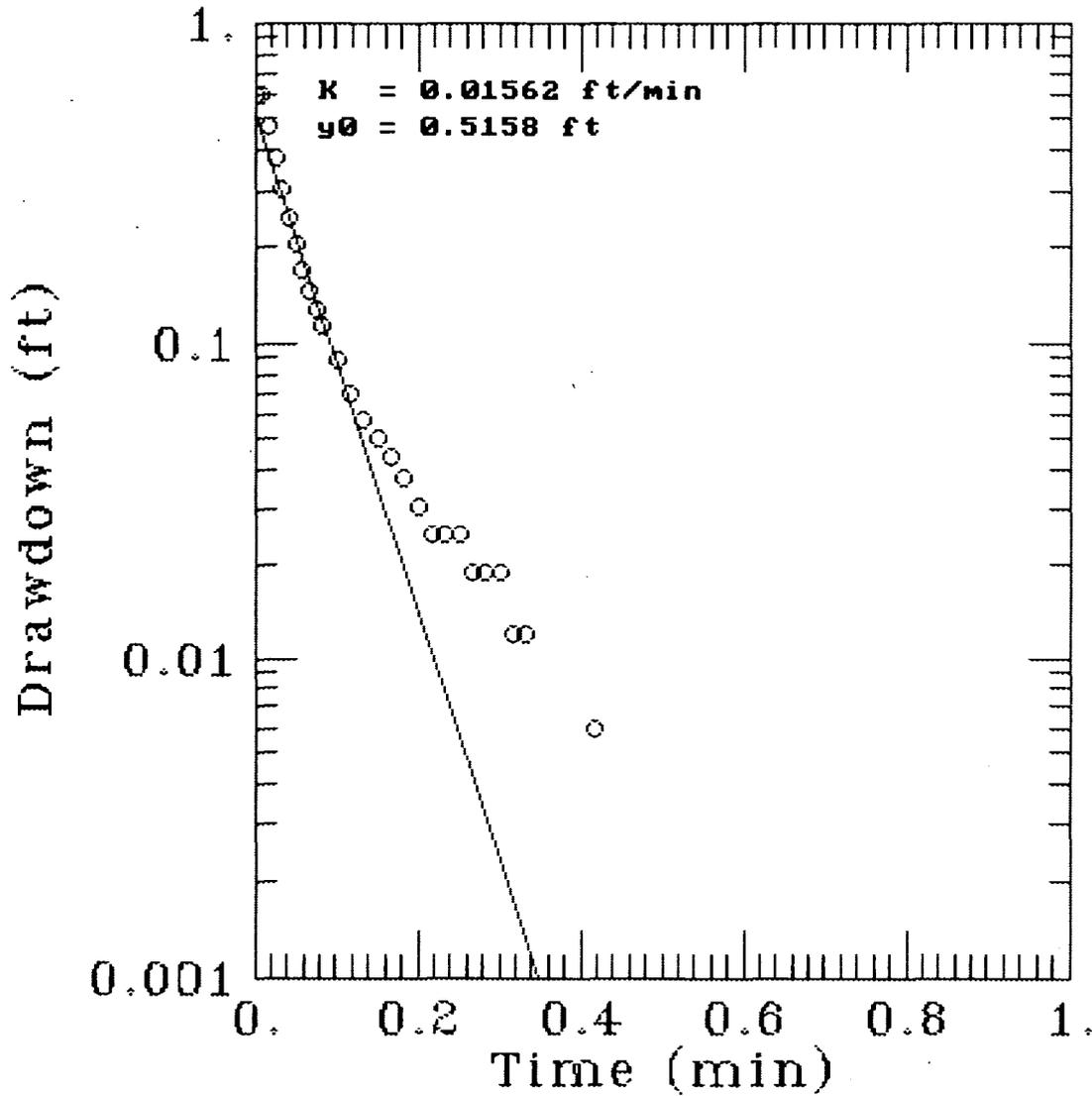
 Modeling Group

CSS-325-MW7 RUN#1



AQTESOLV
 **GERAGHTY
& MILLER, INC.**
 **Modeling Group**

CSS-325-MW7 RUN#2



AQTESOLV

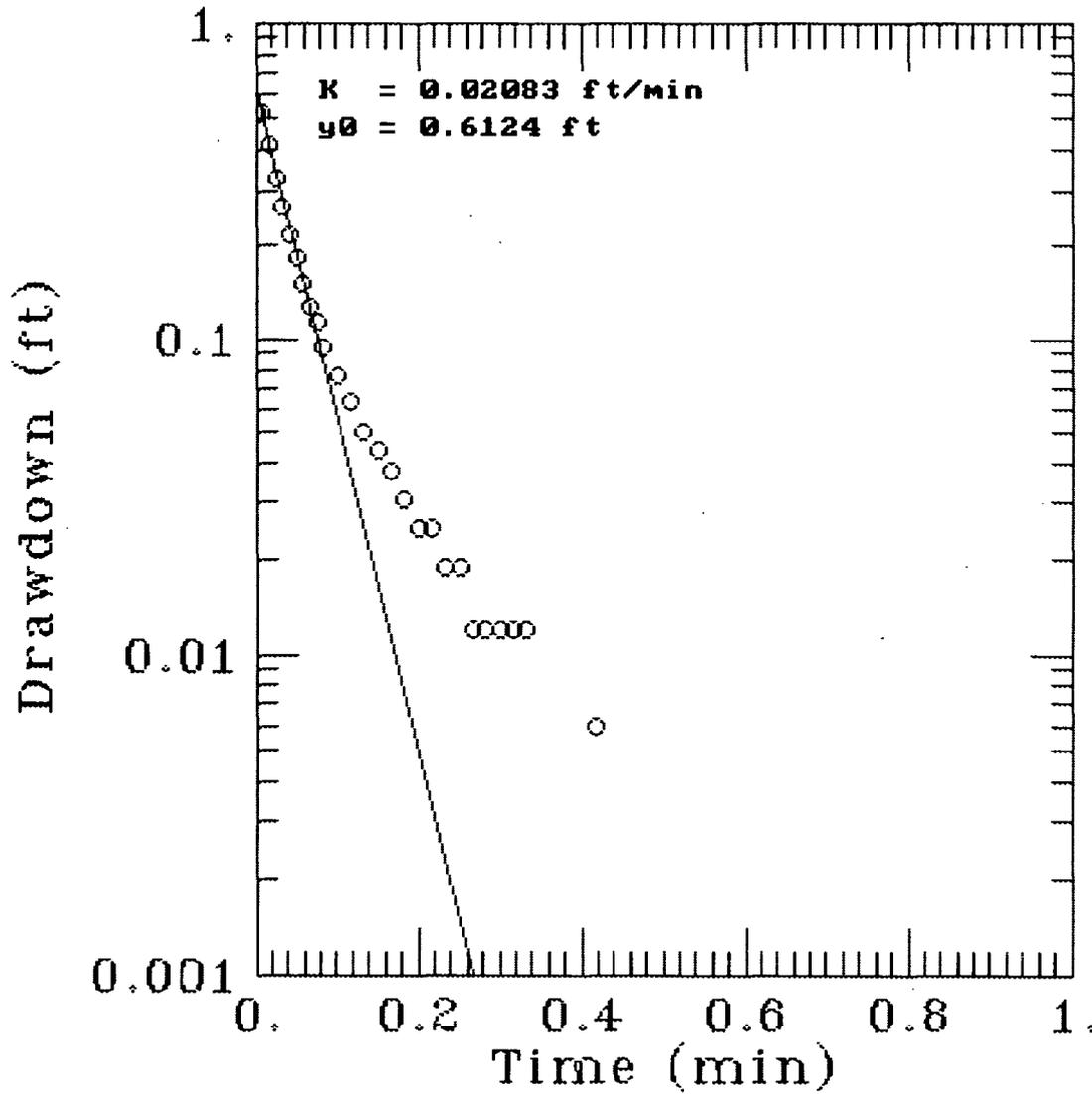


GERAGHTY
& MILLER, INC.

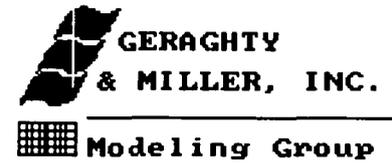


Modeling Group

CSS-325-MW7 RUN#3



AQTESOLV



APPENDIX F

GROUNDWATER SAMPLE ANALYTICAL DATA



**WADSWORTH/ALERT
LABORATORIES**
Sampling, testing, mobile labs

5910 Breckenridge Pkwy.
Suite H
Tampa, FL 33610

(813) 621-0784
Fax (813) 623-6021

Chain of Custody Record

Record _____ of _____

#2J1506-1 to 12 #09320

Client:		Project Name / Location			No. Of CONTAINERS	Parameter										Remarks
Sampler(s)		Project #:				VOC-6	PAH-125	METALS-12	TRPH-12	EDB-12						
Item #	Date	Time	MATRIX	Sample Location												
1	7/1/92	0702	water	POY-325-1101-4	1	3	1	1	3							
2	7/1/92	0702	water	POY-325-1101-5	1	3	1	1	3							
3	7/1/92	0702	water	POY-325-1101-6	12	3	1	1	3							* 1 gallon minimum for 9/2/92
4	7/1/92	0702	water	POY-325-1101-7	12	3	1	1	3							* 1 gallon minimum for 9/2/92
5	7/1/92	0702	water	POY-325-1101-8	12	3	1	1	3							* 1 gallon minimum for 9/2/92
6	7/1/92	0702	water	POY-325-1101-9	1	3	1	1	3							
7	7/1/92	0702	water	POY-325-1101-10	1	3	1	1	3							
8	7/1/92	0702	water	POY-325-1101-11	1	3	1	1	3							
9																
10																
11																

Total Containers **11**

Number of Coolers in Shipment **1**

Bailers **1**

Report To:	Transfer Number	Item Number(s)	Relinquished By / Company	Accepted By / Company	Date	Time
Additional Comments: - 100 gallons of water	1	1-3	Earl Ecker ^{water}	Fred Enj	7/1/92	7:20
	2	1-1				
	3			Richard [unclear]	7/1	
	4					
	5					
	6					

Original Accompanies Shipment



WADSWORTH/ALERT Laboratories

Division of Enseco Incorporated

5910 Breckenridge Parkway, Suite H
Tampa, FL 33610

813-621-0784
FAX 813-623-6021

ANALYTICAL REPORT

SUBCONTRACT NUMBER: 1-08-134

TASK ORDER NUMBER: ~~6069~~ 011

CSS-PANAMA CITY

Presented to:

PETER REDFERN

ABB ENVIRONMENTAL SERVICES, INC.

WADSWORTH/ALERT LABORATORIES

5910 BRECKENRIDGE PARKWAY, SUITE H

TAMPA, FL 33610

(813) 621-0784

**Dan Henson
Project Manager**

**Randall C. Grubbs
Laboratory Director - Florida**

October 29, 1992



WADSWORTH/ALERT Laboratories

INVOLVEMENT

This report summarizes the analytical results of the CSS-Panama City site submitted by ABB Environmental Services, Inc. to Wadsworth/ALERT Laboratories who provided independent, analytical services for this project under the direction of Peter Redfern. The samples were accepted into Wadsworth's Florida facility on 15 October 1992, in accordance with documented sample acceptance procedures. The associated analytical methods and sample results are outlined sequentially in this report.

Analytical results included in this report have been reviewed for compliance with the Laboratory QA/QC Plan as summarized in the Quality Control Section at the rear of the report. Sample custody documentation describing the number of samples and sample matrices is also included. Any qualifications and/or non-compliant items have been noted below.



WADSWORTH/ALERT Laboratories

ANALYTICAL METHODS

Wadsworth/ALERT Laboratories utilizes only USEPA approved analytical methods and instrumentation. The analytical methods utilized for the analysis of these samples are listed below.

PARAMETER	METHOD
ORGANICS	
Volatile Organics	** EPA Method 601/2
Ethylene Dibromide	** EPA Method 601 Mod.
Polynuclear Aromatic Hydrocarbons	** EPA Method 625
METALS	
Lead	** EPA Method 239.2
MISCELLANEOUS	
Tot. Rec. Petroleum Hydrocarbons	** EPA Method 418.1

NOTE: ** Indicates usage of this method to obtain results for this report.

(D) Indicates draft version of this method was used
EPA Methods Methods for Chemical Analysis of Water and Wastes, USEPA, 600/4-79-020, March, 1983. July, 1982
Std. Methods Drinking Waters USEPA, 600/4-88/039, December, 1988.
Standard Methods for the Examination of Water and Waste-water, APHA, 16th edition, 1985.
USEPA Methods From 40CFR Part 136, published in Federal Register on October 26, 1984.
846 Methods Test Methods for Evaluating Solid Waste Physical/Chemical Methods, 3rd Edition, USEPA, 1986.
ASTM Methods American Society for Testing and Materials.
NIOSH Method NIOSH Manual of Analytical Methods, National Institute for Occupational Safety and Health, 2nd Edition, April 1977.



WADSWORTH/ALERT Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB # 2J1506-1
MATRIX: WATER

DATE RECEIVED: 10/15/92
DATE EXTRACTED: NA
DATE ANALYZED: 10/23/92

SAMPLE ID: PCY-325-MW-1

PROJ# 7520-30

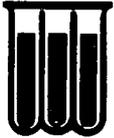
VOLATILE ORGANICS
METHOD 601/602 - GC

CERTIFICATION #: E84059
HRS84297

Benzene	ND	1,2-Dichloroethane	ND
Bromodichloromethane	ND	1,1-Dichloroethene	ND
Bromoform	ND	1,2-Dichloroethene (Total)	ND
Bromomethane	ND	1,2-Dichloropropane	ND
Carbon tetrachloride	ND	cis-1,3-Dichloropropene	ND
Chlorobenzene	ND	trans-1,3-Dichloropropene	ND
Chloroethane	ND	Ethylbenzene	ND
2-Chloroethylvinyl ether	ND	Methylene chloride	ND
Chloroform	ND	1,1,2,2-Tetrachloroethane	ND
Chloromethane	ND	Tetrachloroethene	ND
Dibromochloromethane	ND	Toluene	ND
1,2-Dichlorobenzene	ND	1,1,1-Trichloroethane	ND
1,3-Dichlorobenzene	ND	1,1,2-Trichloroethane	ND
1,4-Dichlorobenzene	ND	Trichloroethene	ND
Dichlorodifluoromethane	ND	Trichlorofluoromethane	ND
1,1-Dichloroethane	ND	Vinyl chloride	ND
		Xylenes	ND
		Methyl-tert-butylether	ND

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
ND* (None Detected, lower detectable limit = ug/L) as rec'd
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS
Dibromochloromethane (HECD)	89	(78-122)
Trifluorotoluene (PID)	99	(73-131)



WADSWORTH/ALERT Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2J1506-1
MATRIX: WATER

DATE RECEIVED: 10/15/92
DATE EXTRACTED: NA
DATE ANALYZED: 10/16/92

SAMPLE ID: PCY-325-MW-1 PROJ# 7520-30

CERTIFICATION #: E84059
HRS84297

SELECTED ORGANIC COMPOUNDS ANALYTICAL REPORT

PARAMETER	RESULT (ug/L)	DETECTION LIMIT
Ethylene dibromide	ND	0.02

NOTE: ND (None Detected) as rec'd
J (Detected, but below quantitation limit; estimated value)

SURROGATE RECOVERY:	ACCEPTABLE LIMITS		%
	WATER	SOLID	
Bromoform (ECD)	(41-152)	(41-152)	89



WADSWORTH/ALERT Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2J1506-1
MATRIX: WATER

DATE RECEIVED: 10/15/92
DATE EXTRACTED: 10/16/92
DATE ANALYZED: 10/21/92

SAMPLE ID: PCY-325-MW-1

PROJ# 7520-30

CERTIFICATION #: E84059

POLYNUCLEAR AROMATIC HYDROCARBONS
METHOD 625 HSL/TCL LIST - GC/MS

HRS84297

Acenaphthene	ND
Acenaphthylene	ND
Anthracene	ND
Benzo (a) anthracene	ND
Benzo (a) pyrene	ND
Benzo (b) fluoranthene	ND
Benzo (ghi) perylene	ND
Benzo (k) fluoranthene	ND
Chrysene	ND
Dibenz (a, h) anthracene	ND
Fluoranthene	ND
Fluorene	ND
Indeno (1, 2, 3 - cd) pyrene	ND
1-Methylnaphthalene	22
2-Methylnaphthalene	16
Naphthalene	70
Phenanthrene	ND
Pyrene	ND

NOTE: ND (None Detected, lower detectable limit = 5 ug/L) as rec'd
 ND* (None Detected, lower detectable limit = ug/L) as rec'd
 -- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS	
		WATER	SOLID
1,2,4-Trichlorobenzene-d5	63	(22-135)	(10-155)
Fluorobiphenyl	65	(34-140)	(12-153)
Terphenyl-d14	21	(10-132)	(13-140)



WADSWORTH/ALERT Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2J1506-1
MATRIX : WATER

DATE RECEIVED: 10/15/92

SAMPLE ID : PCY-325-MW-1

PROJ# 7520-30

CERTIFICATION #: E84059
HRS84297

METALS ANALYTICAL REPORT
SELECTED LIST

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Lead	10/27/92	ND	5	ug/L

NOTE: ND (None Detected)



WADSWORTH/ALERT Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB # : 2J1506-1
MATRIX : WATER

DATE RECEIVED: 10/15/92

SAMPLE ID : PCY-325-MW-1

PROJ# 7520-30

CERTIFICATION #: E84059
HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
Tot Recoverable Pet Hydrocarbons	10/21/92	ND	1. mg/L

NOTE: ND (None Detected)



WADSWORTH/ALERT Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB # 2J1506-2
MATRIX: WATER

DATE RECEIVED: 10/15/92
DATE EXTRACTED: NA
DATE ANALYZED: 10/23/92

SAMPLE ID: PCY-325-MW-2

PROJ# 7520-30

CERTIFICATION #: E84059
HRS84297

VOLATILE ORGANICS
METHOD 601/602 - GC

Benzene	5	1,2-Dichloroethane	ND
Bromodichloromethane	ND	1,1-Dichloroethene	ND
Bromoform	ND	1,2-Dichloroethene (Total)	ND
Bromomethane	ND	1,2-Dichloropropane	ND
Carbon tetrachloride	ND	cis-1,3-Dichloropropene	ND
Chlorobenzene	ND	trans-1,3-Dichloropropene	ND
Chloroethane	ND	Ethylbenzene	19
2-Chloroethylvinyl ether	ND	Methylene chloride	ND
Chloroform	ND	1,1,2,2-Tetrachloroethane	ND
Chloromethane	ND	Tetrachloroethene	ND
Dibromochloromethane	ND	Toluene	ND
1,2-Dichlorobenzene	ND	1,1,1-Trichloroethane	ND
1,3-Dichlorobenzene	ND	1,1,2-Trichloroethane	ND
1,4-Dichlorobenzene	ND	Trichloroethene	ND
Dichlorodifluoromethane	ND	Trichlorofluoromethane	ND
1,1-Dichloroethane	ND	Vinyl chloride	ND
		Xylenes	19
		Methyl-tert-butylether	ND

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
ND* (None Detected, lower detectable limit = ug/L) as rec'd
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS
Bromochloromethane (HECD)	94	(78-122)
Trifluorotoluene (PID)	99	(73-131)



WADSWORTH/ALERT Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2J1506-2
MATRIX: WATER

DATE RECEIVED: 10/15/92
DATE EXTRACTED: NA
DATE ANALYZED: 10/16/92

SAMPLE ID: PCY-325-MW-2

PROJ# 7520-30

CERTIFICATION #: E84059
HRS84297

SELECTED ORGANIC COMPOUNDS ANALYTICAL REPORT

PARAMETER	RESULT (ug/L)	DETECTION LIMIT
Ethylene dibromide	ND	0.02

NOTE: ND (None Detected) as rec'd
J (Detected, but below quantitation limit; estimated value)

SURROGATE RECOVERY:	ACCEPTABLE LIMITS		%
	WATER	SOLID	
Bromoform (ECD)	(41-152)	(41-152)	101



WADSWORTH/ALERT Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2J1506-2
MATRIX: WATER

DATE RECEIVED: 10/15/92
DATE EXTRACTED: 10/16/92
DATE ANALYZED: 10/21/92

SAMPLE ID: PCY-325-MW-2

PROJ# 7520-30

CERTIFICATION #: E84059

POLYNUCLEAR AROMATIC HYDROCARBONS
METHOD 625 HSL/TCL LIST - GC/MS

HRS84297

Acenaphthene	ND
Acenaphthylene	ND
Anthracene	ND
Benzo (a) anthracene	ND
Benzo (a) pyrene	ND
Benzo (b) fluoranthene	ND
Benzo (ghi) perylene	ND
Benzo (k) fluoranthene	ND
Chrysene	ND
Dibenz (a, h) anthracene	ND
Fluoranthene	ND
Fluorene	ND
Indeno (1, 2, 3 - cd) pyrene	ND
1-Methylnaphthalene	ND
2-Methylnaphthalene	ND
Naphthalene	ND
Phenanthrene	ND
Pyrene	ND

NOTE: ND (None Detected, lower detectable limit = 5 ug/L) as rec'd
 ND* (None Detected, lower detectable limit = ug/L) as rec'd
 -- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS	
		WATER	SOLID
Nitrobenzene-d5	79	(22-135)	(10-155)
Fluorobiphenyl	73	(34-140)	(12-153)
Terphenyl-d14	55	(10-132)	(13-140)



WADSWORTH/ALERT Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2J1506-2
MATRIX : WATER

DATE RECEIVED: 10/15/92

SAMPLE ID : PCY-325-MW-2

PROJ# 7520-30

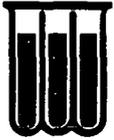
CERTIFICATION #: E84059
HRS84297

METALS ANALYTICAL REPORT
SELECTED LIST

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Lead	10/27/92	ND	5	ug/L

NOTE: ND (None Detected)



WADSWORTH/ALERT Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2J1506-2
MATRIX : WATER

DATE RECEIVED: 10/15/92

SAMPLE ID : PCY-325-MW-2

PROJ# 7520-30

CERTIFICATION #: E84059
HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Tot Recoverable Pet Hydrocarbons	10/21/92	ND	1	mg/L

NOTE: ND (None Detected)



WADSWORTH/ALERT Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB # 2J1506-3
MATRIX: WATER

DATE RECEIVED: 10/15/92
DATE EXTRACTED: NA
DATE ANALYZED: 10/23/92

SAMPLE ID: PCY-325-MW-3

PROJ# 7520-30

CERTIFICATION #: E84059
HRS84297

VOLATILE ORGANICS
METHOD 601/602 - GC

Benzene	ND	1,2-Dichloroethane	ND
Bromodichloromethane	ND	1,1-Dichloroethene	ND
Bromoform	ND	1,2-Dichloroethene (Total)	ND
Bromomethane	ND	1,2-Dichloropropane	ND
Carbon tetrachloride	ND	cis-1,3-Dichloropropene	ND
Chlorobenzene	ND	trans-1,3-Dichloropropene	ND
Chloroethane	ND	Ethylbenzene	ND
2-Chloroethylvinyl ether	ND	Methylene chloride	ND
Chloroform	ND	1,1,2,2-Tetrachloroethane	ND
Chloromethane	ND	Tetrachloroethene	ND
Dibromochloromethane	ND	Toluene	ND
1,2-Dichlorobenzene	ND	1,1,1-Trichloroethane	ND
1,3-Dichlorobenzene	ND	1,1,2-Trichloroethane	ND
1,4-Dichlorobenzene	ND	Trichloroethene	ND
Dichlorodifluoromethane	ND	Trichlorofluoromethane	ND
1,1-Dichloroethane	ND	Vinyl chloride	ND
		Xylenes	ND
		Methyl-tert-butylether	1

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
ND* (None Detected, lower detectable limit = 1 ug/L) as rec'd
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS
Bromochloromethane (HECD)	94	(78-122)
Trifluorotoluene (PID)	98	(73-131)



WADSWORTH/ALERT Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2J1506-3
MATRIX: WATER

DATE RECEIVED: 10/15/92
DATE EXTRACTED: NA
DATE ANALYZED: 10/16/92

SAMPLE ID: PCY-325-MW-3

PROJ# 7520-30

CERTIFICATION #: E84059
HRS84297

SELECTED ORGANIC COMPOUNDS ANALYTICAL REPORT

PARAMETER	RESULT (ug/L)	DETECTION LIMIT
Ethylene dibromide	ND	0.02

NOTE: ND (None Detected) as rec'd
J (Detected, but below quantitation limit; estimated value)

SURROGATE RECOVERY:	ACCEPTABLE LIMITS		%
	WATER	SOLID	
Bromoform (ECD)	(41-152)	(41-152)	100



WADSWORTH/ALERT Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2J1506-3
MATRIX: WATER

DATE RECEIVED: 10/15/92
DATE EXTRACTED: 10/16/92
DATE ANALYZED: 10/21/92

SAMPLE ID: PCY-325-MW-3

PROJ# 7520-30

CERTIFICATION #: E84059

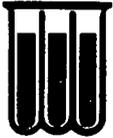
POLYNUCLEAR AROMATIC HYDROCARBONS
METHOD 625 HSL/TCL LIST - GC/MS

HRS84297

Acenaphthene	ND
Acenaphthylene	ND
Anthracene	ND
Benzo (a) anthracene	ND
Benzo (a) pyrene	ND
Benzo (b) fluoranthene	ND
Benzo (ghi) perylene	ND
Benzo (k) fluoranthene	ND
Fluorene	ND
Dibenz (a, h) anthracene	ND
Fluoranthene	ND
Fluorene	ND
Indeno (1, 2, 3 -cd) pyrene	ND
1-Methylnaphthalene	ND
2-Methylnaphthalene	ND
Naphthalene	ND
Phenanthrene	ND
Pyrene	ND

NOTE: ND (None Detected, lower detectable limit = 5 ug/L) as rec'd
 ND* (None Detected, lower detectable limit = 5 ug/L) as rec'd
 -- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS	
		WATER	SOLID
1,4-Dichlorobenzene-d5	70	(22-135)	(10-155)
Fluorobiphenyl	71	(34-140)	(12-153)
Terphenyl-d14	47	(10-132)	(13-140)



WADSWORTH/ALERT Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB # : 2J1506-3
MATRIX : WATER

DATE RECEIVED: 10/15/92

SAMPLE ID : PCY-325-MW-3

PROJ# 7520-30

CERTIFICATION #: E84059
HRS84297

METALS ANALYTICAL REPORT
SELECTED LIST

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Lead	10/27/92	ND	5	ug/L

NOTE: ND (None Detected)



WADSWORTH/ALERT Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB # : 2J1506-3
MATRIX : WATER

DATE RECEIVED: 10/15/92

SAMPLE ID : PCY-325-MW-3

PROJ# 7520-30

CERTIFICATION #: E84059
HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Tot Recoverable Pet Hydrocarbons	10/21/92	ND	1	mg/L

NOTE: ND (None Detected)



WADSWORTH/ALERT Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB # 2J1506-4
MATRIX: WATER

DATE RECEIVED: 10/15/92
DATE EXTRACTED: NA
DATE ANALYZED: 10/23/92

SAMPLE ID: PCY-325-MW-4

PROJ# 7520-30

CERTIFICATION #: E84059
HRS84297

VOLATILE ORGANICS
METHOD 601/602 - GC

Benzene	ND	1,2-Dichloroethane	ND
Bromodichloromethane	ND	1,1-Dichloroethene	ND
Bromoform	ND	1,2-Dichloroethene (Total)	ND
Bromomethane	ND	1,2-Dichloropropane	ND
Carbon tetrachloride	ND	cis-1,3-Dichloropropene	ND
Chlorobenzene	ND	trans-1,3-Dichloropropene	ND
Chloroethane	ND	Ethylbenzene	ND
2-Chloroethylvinyl ether	ND	Methylene chloride	ND
Chloroform	ND	1,1,2,2-Tetrachloroethane	ND
Chloromethane	ND	Tetrachloroethene	ND
Dibromochloromethane	ND	Toluene	ND
1,2-Dichlorobenzene	ND	1,1,1-Trichloroethane	ND
1,3-Dichlorobenzene	ND	1,1,2-Trichloroethane	ND
1,4-Dichlorobenzene	ND	Trichloroethene	ND
Dichlorodifluoromethane	ND	Trichlorofluoromethane	ND
1,1-Dichloroethane	ND	Vinyl chloride	ND
		Xylenes	ND
		Methyl-tert-butylether	ND

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
 ND* (None Detected, lower detectable limit = 1 ug/L) as rec'd
 -- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS
Bromochloromethane (HECD)	95	(78-122)
Trifluorotoluene (PID)	99	(73-131)



WADSWORTH/ALERT Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2J1506-4
MATRIX: WATER

DATE RECEIVED: 10/15/92
DATE EXTRACTED: NA
DATE ANALYZED: 10/16/92

SAMPLE ID: PCY-325-MW-4

PROJ# 7520-30

CERTIFICATION #: E84059
HRS84297

SELECTED ORGANIC COMPOUNDS ANALYTICAL REPORT

PARAMETER	RESULT (ug/L)	DETECTION LIMIT
Ethylene dibromide	ND	0.02

NOTE: ND (None Detected) as rec'd
J (Detected, but below quantitation limit; estimated value)

SURROGATE RECOVERY:	ACCEPTABLE LIMITS		%
	WATER	SOLID	
Bromoform (ECD)	(41-152)	(41-152)	103



WADSWORTH/ALERT Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2J1506-4
MATRIX: WATER

DATE RECEIVED: 10/15/92
DATE EXTRACTED: 10/16/92
DATE ANALYZED: 10/21/92

SAMPLE ID: PCY-325-MW-4

PROJ# 7520-30

CERTIFICATION #: E84059

POLYNUCLEAR AROMATIC HYDROCARBONS
METHOD 625 HSL/TCL LIST - GC/MS

HRS84297

Acenaphthene	ND
Acenaphthylene	ND
Anthracene	ND
Benzo (a) anthracene	ND
Benzo (a) pyrene	ND
Benzo (b) fluoranthene	ND
Benzo (ghi) perylene	ND
Benzo (k) fluoranthene	ND
Chrysene	ND
Dibenz (a, h) anthracene	ND
Fluoranthene	ND
Fluorene	ND
Indeno (1, 2, 3 - cd) pyrene	ND
1-Methylnaphthalene	ND
2-Methylnaphthalene	ND
Naphthalene	ND
Phenanthrene	ND
Pyrene	ND

NOTE: ND (None Detected, lower detectable limit = 5 ug/L) as rec'd
 ND* (None Detected, lower detectable limit = ug/L) as rec'd
 -- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS	
		WATER	SOLID
Nitrobenzene-d5	67	(22-135)	(10-155)
Fluorobiphenyl	63	(34-140)	(12-153)
Terphenyl-d14	25	(10-132)	(13-140)



WADSWORTH/ALERT Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2J1506-4
MATRIX : WATER

DATE RECEIVED: 10/15/92

SAMPLE ID : PCY-325-MW-4

PROJ# 7520-30

CERTIFICATION #: E84059
HRS84297

METALS ANALYTICAL REPORT
SELECTED LIST

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Lead	10/27/92	6	5	ug/L

NOTE: ND (None Detected)



WADSWORTH/ALERT Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB # : 2J1506-4
MATRIX : WATER

DATE RECEIVED: 10/15/92

SAMPLE ID : PCY-325-MW-4

PROJ# 7520-30

CERTIFICATION #: E84059
HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Tot Recoverable Pet Hydrocarbons	10/21/92	2	1	mg/L

NOTE: ND (None Detected)



WADSWORTH/ALERT Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB # 2J1506-5
MATRIX: WATER

DATE RECEIVED: 10/15/92
DATE EXTRACTED: NA
DATE ANALYZED: 10/23/92

SAMPLE ID: PCY-325-MW-5

PROJ# 7520-30

CERTIFICATION #: E84059
HRS84297

VOLATILE ORGANICS
METHOD 601/602 - GC

Benzene	ND	1,2-Dichloroethane	ND
Bromodichloromethane	ND	1,1-Dichloroethene	ND
Bromoform	ND	1,2-Dichloroethene (Total)	ND
Bromomethane	ND	1,2-Dichloropropane	ND
Carbon tetrachloride	ND	cis-1,3-Dichloropropene	ND
Chlorobenzene	ND	trans-1,3-Dichloropropene	ND
Chloroethane	ND	Ethylbenzene	3
2-Chloroethylvinyl ether	ND	Methylene chloride	ND
Chloroform	ND	1,1,2,2-Tetrachloroethane	ND
Chloromethane	ND	Tetrachloroethene	ND
Dibromochloromethane	ND	Toluene	ND
1,2-Dichlorobenzene	ND	1,1,1-Trichloroethane	ND
1,3-Dichlorobenzene	ND	1,1,2-Trichloroethane	ND
1,4-Dichlorobenzene	ND	Trichloroethene	ND
Dichlorodifluoromethane	ND	Trichlorofluoromethane	ND
1,1-Dichloroethane	ND	Vinyl chloride	ND
		Xylenes	6
		Methyl-tert-butylether	ND

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
 ND* (None Detected, lower detectable limit = ug/L) as rec'd
 -- (Not Analyzed)

STURROGATE RECOVERY:	%	ACCEPTABLE LIMITS
Bromochloromethane (HECD)	88	(78-122)
Trifluorotoluene (PID)	101	(73-131)



WADSWORTH/ALERT Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2J1506-5
MATRIX: WATER

DATE RECEIVED: 10/15/92
DATE EXTRACTED: NA
DATE ANALYZED: 10/16/92

SAMPLE ID: PCY-325-MW-5

PROJ# 7520-30

CERTIFICATION #: E84059
HRS84297

SELECTED ORGANIC COMPOUNDS ANALYTICAL REPORT

PARAMETER	RESULT (ug/L)	DETECTION LIMIT
Ethylene dibromide	ND	0.02

NOTE: ND (None Detected) as rec'd
J (Detected, but below quantitation limit; estimated value)

SURROGATE RECOVERY:	ACCEPTABLE LIMITS		%
	WATER	SOLID	
Bromoform (ECD)	(41-152)	(41-152)	111



WADSWORTH/ALERT Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2J1506-5
MATRIX: WATER

DATE RECEIVED: 10/15/92
DATE EXTRACTED: 10/16/92
DATE ANALYZED: 10/22/92

SAMPLE ID: PCY-325-MW-5 PROJ# 7520-30

CERTIFICATION #: E84059
POLYNUCLEAR AROMATIC HYDROCARBONS HRS84297
METHOD 625 HSL/TCL LIST - GC/MS

Acenaphthene	ND
Acenaphthylene	ND
Anthracene	ND
Benzo (a) anthracene	ND
Benzo (a) pyrene	ND
Benzo (b) fluoranthene	ND
Benzo (ghi) perylene	ND
Benzo (k) fluoranthene	ND
Fluorene	ND
Dibenz (a, h) anthracene	ND
Fluoranthene	ND
Fluorene	ND
Indeno (1, 2, 3 -cd) pyrene	ND
1-Methylnaphthalene	9
2-Methylnaphthalene	7
Naphthalene	8
Phenanthrene	ND
Pyrene	ND

NOTE: ND (None Detected, lower detectable limit = 5 ug/L) as rec'd
 ND* (None Detected, lower detectable limit = 5 ug/L) as rec'd
 -- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS	
		WATER	SOLID
1,2,4-Trichlorobenzene-d5	82	(22-135)	(10-155)
Fluorobiphenyl	79	(34-140)	(12-153)
Terphenyl-d14	40	(10-132)	(13-140)



WADSWORTH/ALERT Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB # : 2J1506-5
MATRIX : WATER

DATE RECEIVED: 10/15/92

SAMPLE ID : PCY-325-MW-5

PROJ# 7520-30

CERTIFICATION #: E84059
HRS84297

METALS ANALYTICAL REPORT
SELECTED LIST

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Lead	10/27/92	ND	5	ug/L

NOTE: ND (None Detected)



WADSWORTH/ALERT Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB # : 2J1506-5
MATRIX : WATER

DATE RECEIVED: 10/15/92

SAMPLE ID : PCY-325-MW-5

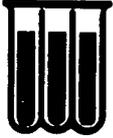
PROJ# 7520-30

CERTIFICATION #: E84059
HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Tot Recoverable Pet Hydrocarbons	10/21/92	ND	1	mg/L

NOTE: ND (None Detected)



WADSWORTH/ALERT Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB # 2J1506-6
MATRIX: WATER

DATE RECEIVED: 10/15/92
DATE EXTRACTED: NA
DATE ANALYZED: 10/24/92

SAMPLE ID: PCY-325-MW-6

PROJ# 7520-30

CERTIFICATION #: E84059
HRS84297

VOLATILE ORGANICS
METHOD 601/602 - GC

Benzene	2	1,2-Dichloroethane	ND
Bromodichloromethane	ND	1,1-Dichloroethene	ND
Bromoform	ND	1,2-Dichloroethene (Total)	ND
Bromomethane	ND	1,2-Dichloropropane	ND
Carbon tetrachloride	ND	cis-1,3-Dichloropropene	ND
Chlorobenzene	ND	trans-1,3-Dichloropropene	ND
Chloroethane	ND	Ethylbenzene	5
2-Chloroethylvinyl ether	ND	Methylene chloride	ND
Chloroform	ND	1,1,2,2-Tetrachloroethane	ND
Chloromethane	ND	Tetrachloroethene	ND
Dibromochloromethane	ND	Toluene	ND
1,2-Dichlorobenzene	ND	1,1,1-Trichloroethane	ND
1,3-Dichlorobenzene	ND	1,1,2-Trichloroethane	ND
1,4-Dichlorobenzene	ND	Trichloroethene	ND
Dichlorodifluoromethane	ND	Trichlorofluoromethane	ND
1,1-Dichloroethane	ND	Vinyl chloride	ND
		Xylenes	2
		Methyl-tert-butylether	1

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
 ND* (None Detected, lower detectable limit = ug/L) as rec'd
 -- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS
Bromochloromethane (HECD)	87	(78-122)
Trifluorotoluene (PID)	101	(73-131)



WADSWORTH/ALERT Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2J1506-6
MATRIX: WATER

DATE RECEIVED: 10/15/92
DATE EXTRACTED: NA
DATE ANALYZED: 10/16/92

SAMPLE ID: PCY-325-MW-6

PROJ# 7520-30

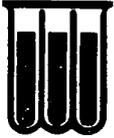
CERTIFICATION #: E84059
HRS84297

SELECTED ORGANIC COMPOUNDS ANALYTICAL REPORT

PARAMETER	RESULT (ug/L)	DETECTION LIMIT
Ethylene dibromide	ND	0.02

NOTE: ND (None Detected) as rec'd
J (Detected, but below quantitation limit; estimated value)

SURROGATE RECOVERY:	ACCEPTABLE LIMITS		%
	WATER	SOLID	
Bromoform (ECD)	(41-152)	(41-152)	92



WADSWORTH/ALERT Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2J1506-6
MATRIX: WATER

DATE RECEIVED: 10/15/92
DATE EXTRACTED: 10/16/92
DATE ANALYZED: 10/22/92

SAMPLE ID: PCY-325-MW-6

PROJ# 7520-30

CERTIFICATION #: E84059

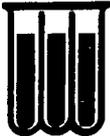
POLYNUCLEAR AROMATIC HYDROCARBONS
METHOD 625 HSL/TCL LIST - GC/MS

HRS84297

Acenaphthene	ND
Acenaphthylene	ND
Anthracene	ND
Benzo (a) anthracene	ND
Benzo (a) pyrene	ND
Benzo (b) fluoranthene	ND
Benzo (ghi) perylene	ND
Benzo (k) fluoranthene	ND
Chrysene	ND
Dibenz (a, h) anthracene	ND
Fluoranthene	ND
Fluorene	ND
Indeno (1, 2, 3-cd) pyrene	ND
1-Methylnaphthalene	26
2-Methylnaphthalene	25
Naphthalene	42
Phenanthrene	ND
Pyrene	ND

NOTE: ND (None Detected, lower detectable limit = 5 ug/L) as rec'd
 ND* (None Detected, lower detectable limit = ug/L) as rec'd
 -- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS	
		WATER	SOLID
Nitrobenzene-d5	76	(22-135)	(10-155)
Fluorobiphenyl	77	(34-140)	(12-153)
Terphenyl-d14	42	(10-132)	(13-140)



WADSWORTH/ALERT Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB # : 2J1506-6
MATRIX : WATER

DATE RECEIVED: 10/15/92

SAMPLE ID : PCY-325-MW-6

PROJ# 7520-30

CERTIFICATION #: E84059
HRS84297

METALS ANALYTICAL REPORT
SELECTED LIST

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Lead	10/27/92	8	5	ug/L

NOTE: ND (None Detected)



WADSWORTH/ALERT Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB # : 2J1506-6
MATRIX : WATER

DATE RECEIVED: 10/15/92

SAMPLE ID : PCY-325-MW-6

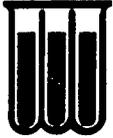
PROJ# 7520-30

CERTIFICATION #: E84059
HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Tot Recoverable Pet Hydrocarbons	10/21/92	ND	1	mg/L

NOTE: ND (None Detected)



WADSWORTH/ALERT Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB # 2J1506-7
MATRIX: WATER

DATE RECEIVED: 10/15/92
DATE EXTRACTED: NA
DATE ANALYZED: 10/24/92

SAMPLE ID: PCY-325-MW-7

PROJ# 7520-30

VOLATILE ORGANICS
METHOD 601/602 - GC

CERTIFICATION #: E84059
HRS84297

Benzene	ND	1,2-Dichloroethane	ND
Bromodichloromethane	ND	1,1-Dichloroethene	ND
Bromoform	ND	1,2-Dichloroethene (Total)	ND
Bromomethane	ND	1,2-Dichloropropane	ND
Carbon tetrachloride	ND	cis-1,3-Dichloropropene	ND
Chlorobenzene	ND	trans-1,3-Dichloropropene	ND
Chloroethane	ND	Ethylbenzene	ND
2-Chloroethylvinyl ether	ND	Methylene chloride	ND
Chloroform	ND	1,1,2,2-Tetrachloroethane	ND
Chloromethane	ND	Tetrachloroethene	ND
Dibromochloromethane	ND	Toluene	ND
1,2-Dichlorobenzene	ND	1,1,1-Trichloroethane	ND
1,3-Dichlorobenzene	ND	1,1,2-Trichloroethane	ND
1,4-Dichlorobenzene	ND	Trichloroethene	ND
Dichlorodifluoromethane	ND	Trichlorofluoromethane	ND
1,1-Dichloroethane	ND	Vinyl chloride	ND
		Xylenes	ND
		Methyl-tert-butylether	ND

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
ND* (None Detected, lower detectable limit = ug/L) as rec'd
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS
Bromochloromethane (HECD)	93	(78-122)
Trifluorotoluene (PID)	99	(73-131)



WADSWORTH/ALERT Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2J1506-7
MATRIX: WATER

DATE RECEIVED: 10/15/92
DATE EXTRACTED: NA
DATE ANALYZED: 10/16/92

SAMPLE ID: PCY-325-MW-7

PROJ# 7520-30

CERTIFICATION #: E84059
HRS84297

SELECTED ORGANIC COMPOUNDS ANALYTICAL REPORT

PARAMETER	RESULT (ug/L)	DETECTION LIMIT
Ethylene dibromide	ND	0.02

NOTE: ND (None Detected) as rec'd
J (Detected, but below quantitation limit; estimated value)

SURROGATE RECOVERY:	ACCEPTABLE LIMITS		%
	WATER	SOLID	
Bromoform (ECD)	(41-152)	(41-152)	106



WADSWORTH/ALERT Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2J1506-7
MATRIX: WATER

DATE RECEIVED: 10/15/92
DATE EXTRACTED: 10/16/92
DATE ANALYZED: 10/22/92

SAMPLE ID: PCY-325-MW-7

PROJ# 7520-30

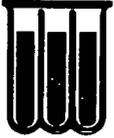
CERTIFICATION #: E84059
HRS84297

POLYNUCLEAR AROMATIC HYDROCARBONS
METHOD 625 HSL/TCL LIST - GC/MS

Acenaphthene	ND
Acenaphthylene	ND
Anthracene	ND
Benzo (a) anthracene	ND
Benzo (a) pyrene	ND
Benzo (b) fluoranthene	ND
Benzo (ghi) perylene	ND
Benzo (k) fluoranthene	ND
Fluorene	ND
Dibenz (a, h) anthracene	ND
Fluoranthene	ND
Fluorene	ND
Indeno (1, 2, 3 - cd) pyrene	ND
1-Methylnaphthalene	ND
2-Methylnaphthalene	ND
Naphthalene	ND
Phenanthrene	ND
Pyrene	ND

NOTE: ND (None Detected, lower detectable limit = 5 ug/L) as rec'd
 ND* (None Detected, lower detectable limit = ug/L) as rec'd
 -- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS	
		WATER	SOLID
Nitrobenzene-d5	70	(22-135)	(10-155)
Fluorobiphenyl	69	(34-140)	(12-153)
Terphenyl-d14	58	(10-132)	(13-140)



WADSWORTH/ALERT Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB # : 2J1506-7
MATRIX : WATER

DATE RECEIVED: 10/15/92

SAMPLE ID : PCY-325-MW-7

PROJ# 7520-30

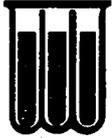
CERTIFICATION #: E84059
HRS84297

METALS ANALYTICAL REPORT
SELECTED LIST

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Lead	10/27/92	8	5	ug/L

NOTE: ND (None Detected)



WADSWORTH/ALERT Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB # : 2J1506-7
MATRIX : WATER

DATE RECEIVED: 10/15/92

SAMPLE ID : PCY-325-MW-7

PROJ# 7520-30

CERTIFICATION #: E84059
HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Tot Recoverable Pet Hydrocarbons	10/21/92	ND	1	mg/L

NOTE: ND (None Detected)



WADSWORTH/ALERT Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB # 2J1506-8
MATRIX: WATER

DATE RECEIVED: 10/15/92
DATE EXTRACTED: NA
DATE ANALYZED: 10/24/92

SAMPLE ID: PCY-325-MW-DUP

PROJ# 7520-30

VOLATILE ORGANICS
METHOD 601/602 - GC

CERTIFICATION #: E84059
HRS84297

Benzene	6	1,2-Dichloroethane	ND
Bromodichloromethane	ND	1,1-Dichloroethene	ND
Bromoform	ND	1,2-Dichloroethene (Total)	ND
Bromomethane	ND	1,2-Dichloropropane	ND
Carbon tetrachloride	ND	cis-1,3-Dichloropropene	ND
Chlorobenzene	ND	trans-1,3-Dichloropropene	ND
Chloroethane	ND	Ethylbenzene	21
2-Chloroethylvinyl ether	ND	Methylene chloride	ND
Chloroform	ND	1,1,2,2-Tetrachloroethane	ND
Chloromethane	ND	Tetrachloroethene	ND
Dibromochloromethane	ND	Toluene	ND
1,2-Dichlorobenzene	ND	1,1,1-Trichloroethane	ND
1,3-Dichlorobenzene	ND	1,1,2-Trichloroethane	ND
1,4-Dichlorobenzene	ND	Trichloroethene	ND
Dichlorodifluoromethane	ND	Trichlorofluoromethane	ND
1,1-Dichloroethane	ND	Vinyl chloride	ND
		Xylenes	22
		Methyl-tert-butylether	ND

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
 ND* (None Detected, lower detectable limit = ug/L) as rec'd
 -- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS
Bromochloromethane (HECD)	86	(78-122)
Trifluorotoluene (PID)	97	(73-131)



WADSWORTH/ALERT Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2J1506-8
MATRIX: WATER

DATE RECEIVED: 10/15/92
DATE EXTRACTED: NA
DATE ANALYZED: 10/16/92

SAMPLE ID: PCY-325-MW-DUP PROJ# 7520-30

CERTIFICATION #: E84059
HRS84297

SELECTED ORGANIC COMPOUNDS ANALYTICAL REPORT

PARAMETER	RESULT (ug/L)	DETECTION LIMIT
Ethylene dibromide	ND	0.02

NOTE: ND (None Detected) as rec'd
J (Detected, but below quantitation limit; estimated value)

SURROGATE RECOVERY:	ACCEPTABLE LIMITS		%
	WATER	SOLID	
Bromoform (ECD)	(41-152)	(41-152)	97



WADSWORTH/ALERT Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2J1506-8
MATRIX: WATER

DATE RECEIVED: 10/15/92
DATE EXTRACTED: 10/16/92
DATE ANALYZED: 10/22/92

SAMPLE ID: PCY-325-MW-DUP

PROJ# 7520-30

CERTIFICATION #: E84059

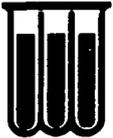
POLYNUCLEAR AROMATIC HYDROCARBONS
METHOD 625 HSL/TCL LIST - GC/MS

HRS84297

Acenaphthene	ND
Acenaphthylene	ND
Anthracene	ND
Benzo (a) anthracene	ND
Benzo (a) pyrene	ND
Benzo (b) fluoranthene	ND
Benzo (ghi) perylene	ND
Benzo (k) fluoranthene	ND
Chrysene	ND
Dibenz (a, h) anthracene	ND
Fluoranthene	ND
Fluorene	ND
Indeno (1, 2, 3 - cd) pyrene	ND
1-Methylnaphthalene	25
2-Methylnaphthalene	16
Naphthalene	82
Phenanthrene	ND
Pyrene	ND

NOTE: ND (None Detected, lower detectable limit = 5 ug/L) as rec'd
 ND* (None Detected, lower detectable limit = ug/L) as rec'd
 -- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS	
		WATER	SOLID
Nitrobenzene-d5	71	(22-135)	(10-155)
Fluorobiphenyl	73	(34-140)	(12-153)
Terphenyl-d14	42	(10-132)	(13-140)



WADSWORTH/ALERT Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB # : 2J1506-8
MATRIX : WATER

DATE RECEIVED: 10/15/92

SAMPLE ID : PCY-325-MW-DUP

PROJ# 7520-30

CERTIFICATION #: E84059
HRS84297

METALS ANALYTICAL REPORT
SELECTED LIST

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Lead	10/27/92	ND	5	ug/L

NOTE: ND (None Detected)



WADSWORTH/ALERT Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB # : 2J1506-8
MATRIX : WATER

DATE RECEIVED: 10/15/92

SAMPLE ID : PCY-325-MW-DUP

PROJ# 7520-30

CERTIFICATION #: E84059
HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Tot Recoverable Pet Hydrocarbons	10/21/92	ND	1	mg/L

NOTE: ND (None Detected)



WADSWORTH/ALERT Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB # 2J1506-9
MATRIX: WATER

DATE RECEIVED: 10/15/92
DATE EXTRACTED: NA
DATE ANALYZED: 10/24/92

SAMPLE ID: TRIP BLANK

PROJ# 7520-30

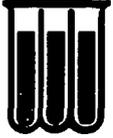
VOLATILE ORGANICS
METHOD 601/602 - GC

CERTIFICATION #: E84059
HRS84297

Benzene	ND	1,2-Dichloroethane	ND
Bromodichloromethane	ND	1,1-Dichloroethene	ND
Bromoform	ND	1,2-Dichloroethene (Total)	ND
Bromomethane	ND	1,2-Dichloropropane	ND
Carbon tetrachloride	ND	cis-1,3-Dichloropropene	ND
Chlorobenzene	ND	trans-1,3-Dichloropropene	ND
Chloroethane	ND	Ethylbenzene	ND
2-Chloroethylvinyl ether	ND	Methylene chloride	ND
Chloroform	ND	1,1,2,2-Tetrachloroethane	ND
Chloromethane	ND	Tetrachloroethene	ND
Dibromochloromethane	ND	Toluene	ND
1,2-Dichlorobenzene	ND	1,1,1-Trichloroethane	ND
1,3-Dichlorobenzene	ND	1,1,2-Trichloroethane	ND
1,4-Dichlorobenzene	ND	Trichloroethene	ND
Dichlorodifluoromethane	ND	Trichlorofluoromethane	ND
1,1-Dichloroethane	ND	Vinyl chloride	ND
		Xylenes	ND
		Methyl-tert-butylether	ND

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
ND* (None Detected, lower detectable limit = 1 ug/L) as rec'd
-- (Not Analyzed)

SURROGATE RECOVERY: % ACCEPTABLE LIMITS
Bromochloromethane (HECD) 90 (78-122)
1,1-Difluorotoluene (PID) 99 (73-131)



WADSWORTH/ALERT Laboratories

QUALITY CONTROL SECTION

- Quality Control Summary
- Laboratory Blanks
- Laboratory Control Sample
- Matrix Spike/Matrix Spike Duplicate Results
- Sample Custody Documentation



WADSWORTH/ALERT Laboratories

QUALITY ASSURANCE / QUALITY CONTROL
PROGRAM SUMMARY

Wadsworth/ALERT Laboratories considers continuous analytical method performance evaluations to be an integral portion of the data package, and routinely includes the pertinent QA/QC data associated with various analytical result reports. Brief discussions of the various QA/QC procedures utilized to measure acceptable method and matrix performance follow.

Surrogate Spike Recovery Evaluations

Known concentrations of designated surrogate spikes, consisting of a number of similar, non-method compounds or method compound analogues, are added, as appropriate, to routine GC and GC/MS sample fractions prior to extraction and analysis. The percent recovery determinations calculated from the subsequent analysis is an indication of the overall method efficiency for the individual sample. This surrogate spike recovery data is displayed alongside acceptable analytical method performance limits at the bottom of each applicable analytical result report sheet.

NOTE: Acceptable method performance for Base/Neutral Acid extractables is indicated by two (2) of three (3) surrogates for each fraction with a minimum recovery of ten (10) percent each. For Pesticides one (1) of two (2) surrogates meeting performance criteria is acceptable.

Laboratory Analytical Method Blank Evaluations

Laboratory analytical method blanks are systematically prepared and analyzed in order to continuously evaluate the system interferences and background contamination levels associated with each analytical method. These method blanks include all aspects of actual laboratory method analysis (chemical reagents, glassware, etc.), substituting laboratory reagent water or solid for actual sample. The method blank must not contain any analytes above the reported detection limit. The following common laboratory contaminants are exceptions to this rule provided they are not present at greater than five times the detection limit.

Volatiles

Methylene chloride
Toluene
2-Butanone
Acetone

Semi-volatiles

Dimethyl phthalate
Diethyl phthalate
Di-n-butyl phthalate
Butyl benzyl phthalate
Bis (2-ethylhexyl) phthalate

Metals

Calcium
Magnesium
Sodium

A minimum of five percent (5%) of all laboratory analyses are laboratory analytical method blanks.

Laboratory Analytical Method Check Sample Evaluations

Known concentrations of designated matrix spikes (actual analytical method compounds) are added to a laboratory reagent blank prior to extraction and analysis. Percent recovery determinations demonstrate the performance of the analytical method. Failure of a check sample to meet established laboratory recovery criteria is cause to stop the analysis until the problem is resolved.



WADSWORTH/ALERT Laboratories

QUALITY ASSURANCE / QUALITY CONTROL
PROGRAM SUMMARY
(cont'd)

At that time all associated samples must be re-analyzed. A minimum of five percent (5%) of all laboratory analyses are laboratory analytical method check samples.

Matrix Spike (MS)/Matrix Spike Duplicate (MSD) Recovery Evaluations

Known concentrations of designated matrix spikes (actual analytical method compounds) are added to two of three separate aliquots of a sequentially predetermined sample prior to extraction and analysis. Percent recovery determinations are calculated from both of the spiked samples by comparison to the actual values generated from the unspiked sample. These percent recovery determinations indicate the accuracy of the analysis at recovering actual analytical method compounds from the matrix. Relative percent difference determinations calculated from a comparison of the MS/MSD recoveries demonstrate the precision of the analytical method. Actual percent recovery and relative percent difference data is displayed alongside their respective acceptable analytical method performance limits in the QA/QC section of the report. The MS/MSD are considered in control when the precision is within established control limits and the associated check sample has been found to be acceptable. A minimum of ten percent (10%) of all analyses are MS/MSD quality control samples.

*****EXAMPLE*****

COMPOUND	SAMPLE CONC.	MS %REC	MSD %REC	RPD	RPD	QC LIMITS RECOVERY
4,4'-DDT	0	95	112	16	22	66-119
Benzene	10	86	93	8	20	39-150
(cmpd. name)	sample result	1st% recov.	2nd% recov.	Rel.% diff.		accep. method perform range

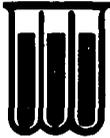
Analytical Result Qualifiers

The following qualifiers, as defined below, may be appended to analytical results in order to allow proper interpretation of the results presented:

J - indicates an estimated concentration (typically used when a dilution, matrix interference or instrumental limitation prevents accurate quantitation of a particular analyte).

B - indicates the presence of a particular analyte in the laboratory blank analyzed concurrently with the samples. Results must be interpreted accordingly.

DIL - indicates that because of matrix interferences and/or high analyte concentrations, it was necessary to dilute the sample to a point where the surrogate or spike concentrations fell below a quantifiable amount and could not be reported.



WADSWORTH/ALERT Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB # 2J1506-BK
MATRIX: WATER

DATE RECEIVED: 10/15/92
DATE EXTRACTED: NA
DATE ANALYZED: 10/23/92

SAMPLE ID: LABORATORY BLANK

VOLATILE ORGANICS
METHOD 601/602 - GC

CERTIFICATION #: E84059
HRS84297

Benzene	ND	1,2-Dichloroethane	ND
Bromodichloromethane	ND	1,1-Dichloroethene	ND
Bromoform	ND	1,2-Dichloroethene (Total)	ND
Bromomethane	ND	1,2-Dichloropropane	ND
Carbon tetrachloride	ND	cis-1,3-Dichloropropene	ND
Chlorobenzene	ND	trans-1,3-Dichloropropene	ND
Chloroethane	ND	Ethylbenzene	ND
2-Chloroethylvinyl ether	ND	Methylene chloride	ND
Chloroform	ND	1,1,2,2-Tetrachloroethane	ND
Chloromethane	ND	Tetrachloroethene	ND
Dibromochloromethane	ND	Toluene	ND
1,2-Dichlorobenzene	ND	1,1,1-Trichloroethane	ND
1,3-Dichlorobenzene	ND	1,1,2-Trichloroethane	ND
1,4-Dichlorobenzene	ND	Trichloroethene	ND
Dichlorodifluoromethane	ND	Trichlorofluoromethane	ND
1,1-Dichloroethane	ND	Vinyl chloride	ND
		Xylenes	ND
		Methyl-tert-butylether	ND

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
 ND* (None Detected, lower detectable limit = 1 ug/L) as rec'd
 -- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS
Dibromochloromethane (HECD)	84	(78-122)
Trifluorotoluene (PID)	99	(73-131)



WADSWORTH/ALERT Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2J1506-BK
MATRIX: WATER

DATE RECEIVED: 10/15/92
DATE EXTRACTED: NA
DATE ANALYZED: 10/16/92

SAMPLE ID: LABORATORY BLANK

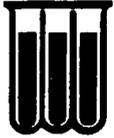
CERTIFICATION #: E84059
HRS84297

SELECTED ORGANIC COMPOUNDS ANALYTICAL REPORT

PARAMETER	RESULT (ug/L)	DETECTION LIMIT
Ethylene dibromide	ND	0.02

NOTE: ND (None Detected) as rec'd
J (Detected, but below quantitation limit; estimated value)

SURROGATE RECOVERY:	ACCEPTABLE LIMITS		%
	WATER	SOLID	
Bromoform (ECD)	(41-152)	(41-152)	101



WADSWORTH/ALERT Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2J1506-BK
MATRIX: WATER

DATE RECEIVED: 10/15/92
DATE EXTRACTED: NA
DATE ANALYZED: 10/19/92

SAMPLE ID: LABORATORY BLANK

CERTIFICATION #: E84059
HRS84297

SELECTED ORGANIC COMPOUNDS ANALYTICAL REPORT

PARAMETER	RESULT (ug/L)	DETECTION LIMIT
Ethylene dibromide	ND	0.02

NOTE: ND (None Detected) as rec'd
J (Detected, but below quantitation limit; estimated value)

SURROGATE RECOVERY:	ACCEPTABLE LIMITS		%
	WATER	SOLID	
Bromoform (ECD)	(41-152)	(41-152)	89



WADSWORTH/ALERT Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2J1506-BK
MATRIX: WATER

DATE RECEIVED: 10/15/92
DATE EXTRACTED: 10/16/92
DATE ANALYZED: 10/21/92

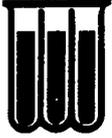
SAMPLE ID: LABORATORY BLANK

POLYNUCLEAR AROMATIC HYDROCARBONS
METHOD 625 HSL/TCL LIST - GC/MS
CERTIFICATION #: E84059
HRS84297

Acenaphthene	ND
Acenaphthylene	ND
Anthracene	ND
Benzo (a) anthracene	ND
Benzo (a) pyrene	ND
Benzo (b) fluoranthene	ND
Benzo (ghi) perylene	ND
Benzo (k) fluoranthene	ND
Chrysene	ND
Dibenz (a, h) anthracene	ND
Fluoranthene	ND
Fluorene	ND
Indeno (1, 2, 3-cd) pyrene	ND
1-Methylnaphthalene	ND
2-Methylnaphthalene	ND
Naphthalene	ND
Phenanthrene	ND
Pyrene	ND

NOTE: ND (None Detected, lower detectable limit = 5 ug/L) as rec'd
 ND* (None Detected, lower detectable limit = ug/L) as rec'd
 -- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS	
		WATER	SOLID
Nitrobenzene-d5	73	(22-135)	(10-155)
Fluorobiphenyl	70	(34-140)	(12-153)
Terphenyl-d14	84	(10-132)	(13-140)



WADSWORTH/ALERT Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB # : 2J1506-BK
MATRIX : WATER

DATE RECEIVED: 10/15/92

SAMPLE ID : LABORATORY BLANK

CERTIFICATION #: E84059
HRS84297

METALS ANALYTICAL REPORT
SELECTED LIST

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Lead	10/27/92	ND	5	ug/L

NOTE: ND (None Detected)



WADSWORTH/ALERT Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB # : 2J1506-BK
MATRIX : WATER

DATE RECEIVED: 10/15/92

SAMPLE ID : LABORATORY BLANK

CERTIFICATION #: E84059
HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Tot Recoverable Pet Hydrocarbons	10/21/92	ND	1	mg/L

NOTE: ND (None Detected)



WADSWORTH/ALERT Laboratories

LAB ID : LCS
MATRIX : WATER
METHOD : 601/2
RUN ID : MA/MB02335A

DATE EXTRACTED: N/A
DATE ANALYZED : 10/23/92

LABORATORY CONTROL SAMPLE RESULTS

COMPOUND	ANALYTICAL RUN ID #	LCS %REC	QC LIMITS RPD %REC
Benzene	MA/MB02335A	98	15 70-117
Toluene		93	16 70-117
Chlorobenzene		90	24 58-133
1,1-Dichloroethene		89	28 43-131
Trichloroethene		91	13 75-123
Dichlorobromomethane		80	22 61-133



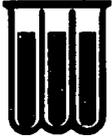
WADSWORTH/ALERT Laboratories

LAB ID : LCS
MATRIX : WATER
METHOD : 601 Mod.
RUN ID : 620

DATE EXTRACTED: N/A
DATE ANALYZED : 10/16/92

LABORATORY CONTROL SAMPLE RESULTS

COMPOUND	ANALYTICAL RUN ID #	LCS %REC	QC LIMITS RPD %REC
Ethylene Dibromide	620	93	25 81-135



WADSWORTH/ALERT Laboratories

LAB ID : LCS
MATRIX : WATER
METHOD : 601 Mod.
RUN ID : 644

DATE EXTRACTED: N/A
DATE ANALYZED : 10/19/92

LABORATORY CONTROL SAMPLE RESULTS

COMPOUND	ANALYTICAL RUN ID #	LCS %REC	QC LIMITS RPD %REC
Ethylene Dibromide	644	92	25 81-135



WADSWORTH/ALERT Laboratories

LAB ID : LCS
MATRIX : WATER
METHOD : 625
RUN ID : EE625

DATE EXTRACTED: 10/16/92
DATE ANALYZED : 10/21/92

LABORATORY CONTROL SAMPLE RESULTS

COMPOUND	ANALYTICAL RUN ID #	LCS %REC	QC LIMITS	
			RPD	%REC
Naphthalene	EE625	113	43	10-139
1-Methylnaphthalene		114	48	10-150
Acenaphthene		127	29	45-130
Fluorene		120	24	37-133
Pyrene		31	41	20-144
Chrysene		32	45	15-152



WADSWORTH/ALERT Laboratories

LAB ID : LCS

MATRIX : WATER

LABORATORY CONTROL SAMPLE RESULTS
METALS

ELEMENT	DATE PREPARED	DATE ANALYZED	LCS %REC	QC LIMITS RPD %REC	
Lead (furnace)	10/27/92	10/27/92	96	33 64-132	LCS



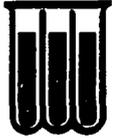
WADSWORTH/ALERT Laboratories

LAB ID : LCS

MATRIX : WATER

LABORATORY CONTROL SAMPLE RESULTS
WET CHEMISTRY

PARAMETER	DATE	DATE	LCS	QC LIMITS		
	PREPARED	ANALYZED	%REC	RPD	%REC	
TRPH (IR)	10/21/92	10/21/92	97	24	75-124	LCS



WADSWORTH/ALERT Laboratories

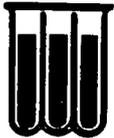
LAB ID : 2J1506-5
MATRIX : WATER
METHOD : 601/2
RUN ID : MA/MB02354/02355

DATE RECEIVED : 10/15/92
DATE PREPARED : N/A
DATE ANALYZED : 10/24/92

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

COMPOUND	ANALYTICAL RUN ID #	MS %REC	MSD %REC	RPD	QC LIMITS RPD %REC
Benzene	MA/MB02354/02355	103	107	4	16 76-126
Toluene		99	102	3	23 75-122
Chlorobenzene		94	97	3	13 74-113
1,1-Dichloroethene		112	113	1	19 63-123
Trichloroethene		115	108	6	10 75-115
Dichlorobromomethane		67	66	2	15 67-114

* = Diluted Out



WADSWORTH/ALERT Laboratories

LAB ID : 2J1506-6
MATRIX : WATER
METHOD : 601 Mod.
RUN ID : 656

DATE RECEIVED : 10/15/92
DATE PREPARED : N/A
DATE ANALYZED : 10/19/92

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

COMPOUND	ANALYTICAL RUN ID #	MS %REC	MSD %REC	RPD	QC LIMITS RPD %REC
Ethylene Dibromide	656	108	94	14	25 81-135

* = Diluted Out



WADSWORTH/ALERT Laboratories

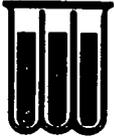
LAB ID : 2J1506-1
MATRIX : WATER

DATE RECEIVED : 10/15/92

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY
INORGANIC PARAMETERS - WET CHEMISTRY

PARAMETER	DATE PREPARED	DATE ANALYZED	MS %REC	MSD %REC	RPD	QC LIMITS RPD %REC	LAB ID
TRPH (IR)	10/21/92	10/21/92	95	100	5	24 75-124	2J1506-1

* = Diluted out



WADSWORTH/ALERT Laboratories

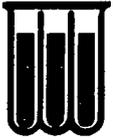
LAB ID : 2J1506-2
MATRIX : WATER

DATE RECEIVED : 10/15/92

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY
INORGANIC PARAMETERS - WET CHEMISTRY

PARAMETER	DATE PREPARED	DATE ANALYZED	MS %REC	MSD %REC	RPD	QC LIMITS RPD	%REC	LAB ID
TRPH (IR)	10/21/92	10/21/92	90	95	5	24 75-124		2J1506-2

* = Diluted out



WADSWORTH/ALERT Laboratories

LAB ID : 2J1506-3
MATRIX : WATER

DATE RECEIVED : 10/15/92

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY
INORGANIC PARAMETERS - WET CHEMISTRY

PARAMETER	DATE PREPARED	DATE ANALYZED	MS %REC	MSD %REC	RPD	QC LIMITS RPD %REC	LAB ID
TRPH (IR)	10/21/92	10/21/92	104	108	4	24 75-124	2J1506-3

* = Diluted out

**WADSWORTH/ALERT LABORATORIES
SAMPLE SHIPPER EVALUATION AND RECEIPT FORM**

4520-31

Client: ABB Enviro Project Name/Number: CSS - Panama City

Samples Received By: Zachary Butler Date Received: 10/15/92
(Signature)

Sample Evaluation Form By: Zachary Butler LAB No: 5480/21506-1 to 12
(Signature)

Type of shipping container samples received in? WAL Cooler
Client Cooler WAL Shipper Box Other

Any "NO" responses or discrepancies should be explained in comments section.

- | | YES | NO |
|--|-------------------------------------|--------------------------|
| 1. Were custody seals on shipping container(s) intact? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Were custody papers properly included with samples? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Were custody papers properly filled out (ink, signed, match labels)? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 4. Did all bottles arrive in good condition (unbroken)? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 5. Were all bottle labels complete (Sample No., date, signed, analysis preservatives)? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 6. Were correct bottles used for the tests indicated? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 7. Were proper sample preservation techniques indicated? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 8. Were samples received within adequate holding time? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 9. Were all VOA bottles checked for the presence of air bubbles? (If air bubbles were found indicate in comment section) | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 10. Were samples in direct contact with wet ice? (NOTE TEMPERATURE BELOW) | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 11. Were samples accepted into the laboratory? (If no see comments) | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

Cooler # Temp 2 °C Cooler # Temp 2 °C
Cooler # 48-12 Temp 2 °C Cooler # Temp 2 °C

Comments: MW-07, Dup contain Air bubbles in vials
used EDB vials to make Pb sample not received
for MW-DUP.



**WADSWORTH/ALERT
LABORATORIES**
Sampling, testing, mobile labs

5910 Breckenridge Pkwy.
Suite H
Tampa, FL 33610

(813) 621-0784
Fax (813) 623-6021

Chain of Custody Record

Record of

07619

#3C0901

Client:		Project Name / Location			No. Of CONTAINERS	Parameter										Remarks	
Sampler(s)		Project #:				VOC	PAH	METALS	TRPH	EDB							
Item #	Date	Time	MATRIX	Sample Location													
1																	
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	
11																	

Total Containers

Number of Coolers in Shipment

Bailers

Report To:	Transfer Number	Item Number(s)	Relinquished By / Company	Accepted By / Company	Date	Time
Additional Comments:	1	1-11	<i>[Signature]</i>	<i>[Signature]</i>	7/1/93	1900
	2	1-4	<i>[Signature]</i>	<i>[Signature]</i>	1-7-1	1-42
	3					
	4					
	5					
	6					

Original Accompanies Shipment



WADSWORTH/ALERT Laboratories

Division of Enseco Incorporated

5910 Breckenridge Parkway, Suite H
Tampa, FL 33610

813-621-0784
FAX 813-623-6021

ANALYTICAL REPORT

PROJECT NUMBER CT0-11

TASK ORDER #31

Presented to:

CELORA JACKSON

ABB ENVIRONMENTAL SERVICES, INC.

ENSECO-WADSWORTH/ALERT LABORATORIES

5910 BRECKENRIDGE PARKWAY, SUITE H

TAMPA, FLORIDA 33610

(813) 621-0784

**Joanne Anderson
Project Manager**

**Randall C. Grubbs
Laboratory Director - Florida**

April 1, 1993



ENSECO-WADSWORTH/ALERT
Laboratories

INVOLVEMENT

This report summarizes the analytical results of the Facility 325, CSS Panama City site submitted by ABB Environmental Services, Inc. to Enseco-Wadsworth/ALERT Laboratories who provided independent, analytical services for this project under the direction of Celora Jackson. The samples were accepted into Wadsworth's Florida facility on 09 March 1993, in accordance with documented sample acceptance procedures. The associated analytical methods and sample results are outlined sequentially in this report.

Analytical results included in this report have been reviewed for compliance with the Laboratory QA/QC Plan as summarized in the Quality Control Section at the rear of the report. Sample custody documentation describing the number of samples and sample matrices is also included. Any qualifications and/or non-compliant items have been noted below.



ENSECO-WADSWORTH/ALERT
Laboratories

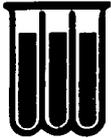
ANALYTICAL METHODS

Wadsworth/ALERT Laboratories utilizes only USEPA approved analytical methods and instrumentation. The analytical methods utilized for the analysis of these samples are listed below.

PARAMETER	METHOD
ORGANICS	
Volatile Organics	** EPA Method 601/2
Ethylene Dibromide	** EPA Method 601 Mod.
Polynuclear Aromatic Hydrocarbons	** EPA Method 625
METALS	
Lead	** EPA Method 239.2
MISCELLANEOUS	
Tot. Rec. Petroleum Hydrocarbons	** EPA Method 418.1

NOTE: ** Indicates usage of this method to obtain results for this report.

(D) Indicates draft version of this method was used
EPA Methods Methods for Chemical Analysis of Water and Wastes, USEPA, 600/4-79-020, March, 1983. July, 1982
Std. Methods Drinking Waters USEPA, 600/4-88/039, December, 1988.
USEPA Methods Standard Methods for the Examination of Water and Waste-water, APHA, 16th edition, 1985.
846 Methods From 40CFR Part 136, published in Federal Register on October 26, 1984.
ASTM Methods Test Methods for Evaluating Solid Waste Physical/Chemical Methods, 3rd Edition, USEPA, 1986.
NIOSH Method American Society for Testing and Materials.
NIOSH Manual of Analytical Methods, National Institute for Occupational Safety and Health, 2nd Edition, April 1977.



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB # 3C0901-1
MATRIX: WATER

DATE RECEIVED: 3/ 9/93
DATE EXTRACTED: NA
DATE ANALYZED: 3/16/93

SAMPLE ID: CSS-325-MW1

CSS PANAMA CITY

CERTIFICATION #: E84059
HRS84297

VOLATILE ORGANICS
METHOD 601/602 - GC

Benzene	ND	1,2-Dichloroethane	ND
Bromodichloromethane	ND	1,1-Dichloroethene	ND
Bromoform	ND	1,2-Dichloroethene (Total)	ND
Bromomethane	ND	1,2-Dichloropropane	ND
Carbon tetrachloride	ND	cis-1,3-Dichloropropene	ND
Chlorobenzene	ND	trans-1,3-Dichloropropene	ND
Chloroethane	ND	Ethylbenzene	ND
2-Chloroethylvinyl ether	ND	Methylene chloride	ND
Chloroform	ND	1,1,2,2-Tetrachloroethane	ND
Chloromethane	ND	Tetrachloroethene	ND
Dibromochloromethane	ND	Toluene	ND
1,2-Dichlorobenzene	ND	1,1,1-Trichloroethane	ND
1,3-Dichlorobenzene	ND	1,1,2-Trichloroethane	ND
1,4-Dichlorobenzene	ND	Trichloroethene	ND
Dichlorodifluoromethane	ND	Trichlorofluoromethane	ND
1,1-Dichloroethane	ND	Vinyl chloride	ND
		Xylenes	ND
		Methyl-tert-butylether	ND

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
 ND* (None Detected, lower detectable limit = ug/L) as rec'd
 -- (Not Analyzed)

SPURIOUS RECOVERY:	%	ACCEPTABLE LIMITS
1,1-Dichloroethane (HECD)	85	(78-122)
Trifluorotoluene (PID)	100	(73-131)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3C0901-1
MATRIX: WATER

DATE RECEIVED: 3/ 9/93
DATE EXTRACTED: NA
DATE ANALYZED: 3/10/93

SAMPLE ID: CSS-325-MW1 CSS PANAMA CITY

CERTIFICATION #: E84059
HRS84297

SELECTED ORGANIC COMPOUNDS ANALYTICAL REPORT

PARAMETER	RESULT (ug/L)	DETECTION LIMIT
Ethylene dibromide	ND	0.02

NOTE: ND (None Detected) as rec'd
J (Detected, but below quantitation limit; estimated value)

SURROGATE RECOVERY:	ACCEPTABLE LIMITS		%
	WATER	SOLID	
Bromoform (ECD)	(41-152)	(41-152)	105



**ENSECO-WADSWORTH/ALERT
Laboratories**

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3C0901-1
MATRIX: WATER

DATE RECEIVED: 3/ 9/93
DATE EXTRACTED: 3/10/93
DATE ANALYZED: 3/18/93

SAMPLE ID: CSS-325-MW1 CSS PANAMA CITY

CERTIFICATION #: E84059
HRS84297

POLYNUCLEAR AROMATIC HYDROCARBONS
METHOD 625 HSL/TCL LIST - GC/MS

Acenaphthene	ND
Acenaphthylene	ND
Anthracene	ND
Benzo (a) anthracene	ND
Benzo (a) pyrene	ND
Benzo (b) fluoranthene	ND
Benzo (ghi) perylene	ND
Benzo (k) fluoranthene	ND
ysene	ND
Dibenz (a, h) anthracene	ND
Fluoranthene	ND
Fluorene	ND
Indeno (1, 2, 3-cd) pyrene	ND
1-Methylnaphthalene	ND
2-Methylnaphthalene	ND
Naphthalene	ND
Phenanthrene	ND
Pyrene	ND

NOTE: ND (None Detected, lower detectable limit = 5 ug/L) as rec'd
 ND* (None Detected, lower detectable limit = ug/L) as rec'd
 -- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS	
		WATER	SOLID
Nitrobenzene-d5	103	(22-135)	(10-155)
Fluorobiphenyl	132	(34-140)	(12-153)
Terphenyl-d14	47	(10-132)	(13-140)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3C0901-1
MATRIX : WATER

DATE RECEIVED: 3/ 9/93

SAMPLE ID : CSS-325-MW1

CSS PANAMA CITY

CERTIFICATION #: E84059
HRS84297

METALS ANALYTICAL REPORT
SELECTED LIST

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Lead	3/16/93	ND	5	ug/L

NOTE: ND (None Detected)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB ID: 3C0901-1
MATRIX : WATER

DATE RECEIVED: 3/ 9/93
DATE EXTRACTED: 3/ 9/93
DATE ANALYZED: 3/10/93

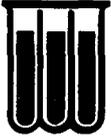
SAMPLE ID: CSS-325-MW1 CSS PANAMA CITY

CERTIFICATION #: E84059
HRS84297

TOTAL RECOVERABLE PETROLEUM HYDROCARBONS REPORT

	RESULT	UNITS	LOWER DETECTION LIMIT
Total Recoverable Petroleum Hydrocarbons	ND	mg/L	1

NOTE: ND (None Detected)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB # 3C0901-2
MATRIX: WATER

DATE RECEIVED: 3/ 9/93
DATE EXTRACTED: NA
DATE ANALYZED: 3/16/93

SAMPLE ID: CSS-325-MW2

CSS PANAMA CITY

CERTIFICATION #: E84059
HRS84297

VOLATILE ORGANICS
METHOD 601/602 - GC

Benzene	ND	1,2-Dichloroethane	ND
Bromodichloromethane	ND	1,1-Dichloroethene	ND
Bromoform	ND	1,2-Dichloroethene (Total)	ND
Bromomethane	ND	1,2-Dichloropropane	ND
Carbon tetrachloride	ND	cis-1,3-Dichloropropene	ND
Chlorobenzene	ND	trans-1,3-Dichloropropene	ND
Chloroethane	ND	Ethylbenzene	2
2-Chloroethylvinyl ether	ND	Methylene chloride	ND
Chloroform	ND	1,1,2,2-Tetrachloroethane	ND
Chloromethane	ND	Tetrachloroethene	ND
Dibromochloromethane	ND	Toluene	ND
1,2-Dichlorobenzene	ND	1,1,1-Trichloroethane	ND
1,3-Dichlorobenzene	ND	1,1,2-Trichloroethane	ND
1,4-Dichlorobenzene	ND	Trichloroethene	ND
Dichlorodifluoromethane	ND	Trichlorofluoromethane	ND
1,1-Dichloroethane	ND	Vinyl chloride	ND
		Xylenes	3
		Methyl-tert-butylether	ND

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
 ND* (None Detected, lower detectable limit = ug/L) as rec'd
 -- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS
Bromochloromethane (HECD)	78	(78-122)
Trifluorotoluene (PID)	103	(73-131)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3C0901-2
MATRIX: WATER

DATE RECEIVED: 3/ 9/93
DATE EXTRACTED: NA
DATE ANALYZED: 3/10/93

SAMPLE ID: CSS-325-MW2 CSS PANAMA CITY

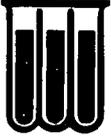
CERTIFICATION #: E84059
HRS84297

SELECTED ORGANIC COMPOUNDS ANALYTICAL REPORT

PARAMETER	RESULT (ug/L)	DETECTION LIMIT
Ethylene dibromide	ND	0.02

NOTE: ND (None Detected) as rec'd
J (Detected, but below quantitation limit; estimated value)

SURROGATE RECOVERY:	ACCEPTABLE LIMITS		%
	WATER	SOLID	
Bromoform (ECD)	(41-152)	(41-152)	114



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3C0901-2
MATRIX: WATER

DATE RECEIVED: 3/ 9/93
DATE EXTRACTED: 3/10/93
DATE ANALYZED: 3/18/93

SAMPLE ID: CSS-325-MW2

CSS PANAMA CITY

CERTIFICATION #: E84059

POLYNUCLEAR AROMATIC HYDROCARBONS
METHOD 625 HSL/TCL LIST - GC/MS

HRS84297

Acenaphthene	ND
Acenaphthylene	ND
Anthracene	ND
Benzo (a) anthracene	ND
Benzo (a) pyrene	ND
Benzo (b) fluoranthene	ND
Benzo (ghi) perylene	ND
Benzo (k) fluoranthene	ND
Chrysene	ND
Dibenz (a, h) anthracene	ND
Fluoranthene	ND
Fluorene	ND
Indeno (1, 2, 3-cd) pyrene	ND
1-Methylnaphthalene	ND
2-Methylnaphthalene	ND
Naphthalene	ND
Phenanthrene	ND
Pyrene	ND

NOTE: ND (None Detected, lower detectable limit = 5 ug/L) as rec'd
 ND* (None Detected, lower detectable limit = ug/L) as rec'd
 -- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS	
		WATER	SOLID
Nitrobenzene-d5	124	(22-135)	(10-155)
Fluorobiphenyl	152	(34-140)	(12-153)
Terphenyl-d14	56	(10-132)	(13-140)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB # : 3C0901-2
MATRIX : WATER

DATE RECEIVED: 3/ 9/93

SAMPLE ID : CSS-325-MW2

CSS PANAMA CITY

CERTIFICATION #: E84059
HRS84297

METALS ANALYTICAL REPORT
SELECTED LIST

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Lead	3/16/93	ND	5	ug/L

NOTE: ND (None Detected)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB ID: 3C0901-2
MATRIX : WATER

DATE RECEIVED: 3/ 9/93
DATE EXTRACTED: 3/ 9/93
DATE ANALYZED: 3/10/93

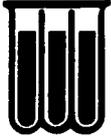
SAMPLE ID: CSS-325-MW2 CSS PANAMA CITY

CERTIFICATION #: E84059
HRS84297

TOTAL RECOVERABLE PETROLEUM HYDROCARBONS REPORT

	RESULT	UNITS	LOWER DETECTION LIMIT
Total Recoverable Petroleum Hydrocarbons	ND	mg/L	1

NOTE: ND (None Detected)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB # 3C0901-3
MATRIX: WATER

DATE RECEIVED: 3/ 9/93
DATE EXTRACTED: NA
DATE ANALYZED: 3/16/93

SAMPLE ID: CSS-325-MW3

CSS PANAMA CITY

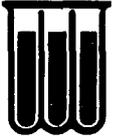
CERTIFICATION #: E84059
HRS84297

VOLATILE ORGANICS
METHOD 601/602 - GC

Benzene	2	1,2-Dichloroethane	ND
Bromodichloromethane	ND	1,1-Dichloroethene	ND
Bromoform	ND	1,2-Dichloroethene (Total)	ND
Bromomethane	ND	1,2-Dichloropropane	ND
Carbon tetrachloride	ND	cis-1,3-Dichloropropene	ND
Chlorobenzene	ND	trans-1,3-Dichloropropene	ND
Chloroethane	ND	Ethylbenzene	8
2-Chloroethylvinyl ether	ND	Methylene chloride	ND
Chloroform	ND	1,1,2,2-Tetrachloroethane	ND
Chloromethane	ND	Tetrachloroethene	ND
Dibromochloromethane	ND	Toluene	ND
1,2-Dichlorobenzene	ND	1,1,1-Trichloroethane	ND
1,3-Dichlorobenzene	ND	1,1,2-Trichloroethane	ND
1,4-Dichlorobenzene	ND	Trichloroethene	ND
Dichlorodifluoromethane	ND	Trichlorofluoromethane	ND
1,1-Dichloroethane	ND	Vinyl chloride	ND
		Xylenes	7
		Methyl-tert-butylether	ND

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
 ND* (None Detected, lower detectable limit = ug/L) as rec'd
 -- (Not Analyzed)

STURROGATE RECOVERY:	%	ACCEPTABLE LIMITS
Dibromochloromethane (HECD)	98	(78-122)
Trifluorotoluene (PID)	100	(73-131)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3C0901-3
MATRIX: WATER

DATE RECEIVED: 3/ 9/93
DATE EXTRACTED: NA
DATE ANALYZED: 3/10/93

SAMPLE ID: CSS-325-MW3 CSS PANAMA CITY

CERTIFICATION #: E84059
HRS84297

SELECTED ORGANIC COMPOUNDS ANALYTICAL REPORT

PARAMETER	RESULT (ug/L)	DETECTION LIMIT
Ethylene dibromide	ND	0.02

NOTE: ND (None Detected) as rec'd
J (Detected, but below quantitation limit; estimated value)

SURROGATE RECOVERY:	ACCEPTABLE LIMITS		%
	WATER	SOLID	
Bromoform (ECD)	(41-152)	(41-152)	114



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3C0901-3
MATRIX: WATER

DATE RECEIVED: 3/ 9/93
DATE EXTRACTED: 3/10/93
DATE ANALYZED: 3/18/93

SAMPLE ID: CSS-325-MW3

CSS PANAMA CITY

CERTIFICATION #: E84059
HRS84297

POLYNUCLEAR AROMATIC HYDROCARBONS
METHOD 625 HSL/TCL LIST - GC/MS

Acenaphthene	ND
Acenaphthylene	ND
Anthracene	ND
Benzo (a) anthracene	ND
Benzo (a) pyrene	ND
Benzo (b) fluoranthene	ND
Benzo (ghi) perylene	ND
Benzo (k) fluoranthene	ND
Fluorene	ND
Dibenz (a, h) anthracene	ND
Fluoranthene	ND
Fluorene	ND
Indeno (1, 2, 3-cd) pyrene	ND
1-Methylnaphthalene	8
2-Methylnaphthalene	ND
Naphthalene	17
Phenanthrene	ND
Pyrene	ND

NOTE: ND (None Detected, lower detectable limit = 5 ug/L) as rec'd
 ND* (None Detected, lower detectable limit = 5 ug/L) as rec'd
 -- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS	
		WATER	SOLID
Nitrobenzene-d5	109	(22-135)	(10-155)
Fluorobiphenyl	136	(34-140)	(12-153)
Terphenyl-d14	54	(10-132)	(13-140)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3C0901-3
MATRIX : WATER

DATE RECEIVED: 3/ 9/93

SAMPLE ID : CSS-325-MW3

CSS PANAMA CITY

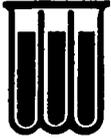
CERTIFICATION #: E84059
HRS84297

METALS ANALYTICAL REPORT
SELECTED LIST

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Lead	3/16/93	ND	5	ug/L

NOTE: ND (None Detected)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB ID: 3C0901-3
MATRIX : WATER

DATE RECEIVED: 3/ 9/93
DATE EXTRACTED: 3/ 9/93
DATE ANALYZED: 3/10/93

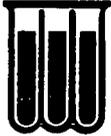
SAMPLE ID: CSS-325-MW3 CSS PANAMA CITY

CERTIFICATION #: E84059
HRS84297

TOTAL RECOVERABLE PETROLEUM HYDROCARBONS REPORT

	RESULT	UNITS	LOWER DETECTION LIMIT
Total Recoverable Petroleum Hydrocarbons	ND	mg/L	1

NOTE: ND (None Detected)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB # 3C0901-4
MATRIX: WATER

DATE RECEIVED: 3/ 9/93
DATE EXTRACTED: NA
DATE ANALYZED: 3/18/93

SAMPLE ID: CSS-325-MW4

CSS PANAMA CITY

CERTIFICATION #: E84059
HRS84297

VOLATILE ORGANICS
METHOD 601/602 - GC

Benzene	1	1,2-Dichloroethane	ND
Bromodichloromethane	ND	1,1-Dichloroethene	ND
Bromoform	ND	1,2-Dichloroethene (Total)	ND
Bromomethane	ND	1,2-Dichloropropane	ND
Carbon tetrachloride	ND	cis-1,3-Dichloropropene	ND
Chlorobenzene	ND	trans-1,3-Dichloropropene	ND
Chloroethane	ND	Ethylbenzene	59
2-Chloroethylvinyl ether	ND	Methylene chloride	ND
Chloroform	ND	1,1,2,2-Tetrachloroethane	ND
Chloromethane	ND	Tetrachloroethene	ND
Dibromochloromethane	ND	Toluene	8
1,2-Dichlorobenzene	ND	1,1,1-Trichloroethane	ND
1,3-Dichlorobenzene	ND	1,1,2-Trichloroethane	ND
1,4-Dichlorobenzene	ND	Trichloroethene	ND
Dichlorodifluoromethane	ND	Trichlorofluoromethane	ND
1,1-Dichloroethane	ND	Vinyl chloride	ND
		Xylenes	160
		Methyl-tert-butylether	ND

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
 ND* (None Detected, lower detectable limit = ug/L) as rec'd
 -- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS
Bromochloromethane (HECD)	93	(78-122)
Trifluorotoluene (PID)	102	(73-131)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3C0901-4
MATRIX: WATER

DATE RECEIVED: 3/ 9/93
DATE EXTRACTED: NA
DATE ANALYZED: 3/10/93

SAMPLE ID: CSS-325-MW4 CSS PANAMA CITY

CERTIFICATION #: E84059
HRS84297

SELECTED ORGANIC COMPOUNDS ANALYTICAL REPORT

PARAMETER	RESULT (ug/L)	DETECTION LIMIT
Ethylene dibromide	ND	0.02

NOTE: ND (None Detected) as rec'd
J (Detected, but below quantitation limit; estimated value)

SURROGATE RECOVERY:	ACCEPTABLE LIMITS		%
	WATER	SOLID	
Bromoform (ECD)	(41-152)	(41-152)	107



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3C0901-4
MATRIX: WATER

DATE RECEIVED: 3/9/93
DATE EXTRACTED: 3/10/93
DATE ANALYZED: 3/24/93

SAMPLE ID: CSS-325-MW4

CSS PANAMA CITY

CERTIFICATION #: E84059

POLYNUCLEAR AROMATIC HYDROCARBONS
METHOD 625 HSL/TCL LIST - GC/MS

HRS84297

Acenaphthene	ND
Acenaphthylene	ND
Anthracene	ND
Benzo (a) anthracene	ND
Benzo (a) pyrene	ND
Benzo (b) fluoranthene	ND
Benzo (ghi) perylene	ND
Benzo (k) fluoranthene	ND
Chrysene	ND
Dibenz (a, h) anthracene	ND
Fluoranthene	ND
Fluorene	ND
Indeno (1, 2, 3-cd) pyrene	ND
1-Methylnaphthalene	50,000
2-Methylnaphthalene	50,000
Naphthalene	33,000
Phenanthrene	ND
Pyrene	ND

NOTE: ND (None Detected, lower detectable limit = 14,000 ug/L) as rec'd
 ND* (None Detected, lower detectable limit = ug/L) as rec'd
 -- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS	
		WATER	SOLID
Nitrobenzene-d5	DIL	(22-135)	(10-155)
Fluorobiphenyl	DIL	(34-140)	(12-153)
Terphenyl-d14	DIL	(10-132)	(13-140)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3C0901-4
MATRIX : WATER

DATE RECEIVED: 3/ 9/93

SAMPLE ID : CSS-325-MW4

CSS PANAMA CITY

CERTIFICATION #: E84059
HRS84297

METALS ANALYTICAL REPORT
SELECTED LIST

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Lead	3/16/93	ND	5	ug/L

NOTE: ND (None Detected)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB ID: 3C0901-4
MATRIX : WATER

DATE RECEIVED: 3/ 9/93
DATE EXTRACTED: 3/ 9/93
DATE ANALYZED: 3/10/93

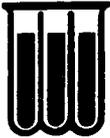
SAMPLE ID: CSS-325-MW4 CSS PANAMA CITY

CERTIFICATION #: E84059
HRS84297

TOTAL RECOVERABLE PETROLEUM HYDROCARBONS REPORT

	RESULT	UNITS	LOWER DETECTION LIMIT
Total Recoverable Petroleum Hydrocarbons	15,000	mg/L	2,500

NOTE: ND (None Detected)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB # 3C0901-5
MATRIX: WATER

DATE RECEIVED: 3/ 9/93
DATE EXTRACTED: NA
DATE ANALYZED: 3/16/93

SAMPLE ID: CSS-325-MW5

CSS PANAMA CITY

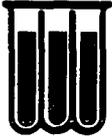
CERTIFICATION #: E84059
HRS84297

VOLATILE ORGANICS
METHOD 601/602 - GC

Benzene	ND	1,2-Dichloroethane	ND
Bromodichloromethane	ND	1,1-Dichloroethene	ND
Bromoform	ND	1,2-Dichloroethene (Total)	ND
Bromomethane	ND	1,2-Dichloropropane	ND
Carbon tetrachloride	ND	cis-1,3-Dichloropropene	ND
Chlorobenzene	ND	trans-1,3-Dichloropropene	ND
Chloroethane	ND	Ethylbenzene	ND
2-Chloroethylvinyl ether	ND	Methylene chloride	ND
Chloroform	ND	1,1,2,2-Tetrachloroethane	ND
Chloromethane	ND	Tetrachloroethene	ND
Dibromochloromethane	ND	Toluene	ND
1,2-Dichlorobenzene	ND	1,1,1-Trichloroethane	ND
1,3-Dichlorobenzene	ND	1,1,2-Trichloroethane	ND
1,4-Dichlorobenzene	ND	Trichloroethene	ND
Dichlorodifluoromethane	ND	Trichlorofluoromethane	ND
1,1-Dichloroethane	ND	Vinyl chloride	ND
		Xylenes	ND
		Methyl-tert-butylether	ND

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
 ND* (None Detected, lower detectable limit = 1 ug/L) as rec'd
 -- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS
Bromochloromethane (HECD)	84	(78-122)
Trifluorotoluene (PID)	100	(73-131)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3C0901-5
MATRIX: WATER

DATE RECEIVED: 3/ 9/93
DATE EXTRACTED: NA
DATE ANALYZED: 3/10/93

SAMPLE ID: CSS-325-MW5 CSS PANAMA CITY

CERTIFICATION #: E84059
HRS84297

SELECTED ORGANIC COMPOUNDS ANALYTICAL REPORT

PARAMETER	RESULT (ug/L)	DETECTION LIMIT
Ethylene dibromide	ND	0.02

NOTE: ND (None Detected) as rec'd
J (Detected, but below quantitation limit; estimated value)

SURROGATE RECOVERY:	ACCEPTABLE LIMITS		%
	WATER	SOLID	
Bromoform (ECD)	(41-152)	(41-152)	112



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3C0901-5
MATRIX: WATER

DATE RECEIVED: 3/ 9/93
DATE EXTRACTED: 3/10/93
DATE ANALYZED: 3/18/93

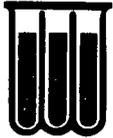
SAMPLE ID: CSS-325-MW5 CSS PANAMA CITY

POLYNUCLEAR AROMATIC HYDROCARBONS
METHOD 625 HSL/TCL LIST - GC/MS
CERTIFICATION #: E84059
HRS84297

Acenaphthene	ND
Acenaphthylene	ND
Anthracene	ND
Benzo (a) anthracene	ND
Benzo (a) pyrene	ND
Benzo (b) fluoranthene	ND
Benzo (ghi) perylene	ND
Benzo (k) fluoranthene	ND
Pyrene	ND
Dibenz (a, h) anthracene	ND
Fluoranthene	ND
Fluorene	ND
Indeno (1, 2, 3 -cd) pyrene	ND
1-Methylnaphthalene	ND
2-Methylnaphthalene	ND
Naphthalene	ND
Phenanthrene	ND
Pyrene	ND

NOTE: ND (None Detected, lower detectable limit = 5 ug/L) as rec'd
 ND* (None Detected, lower detectable limit = ug/L) as rec'd
 -- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS	
		WATER	SOLID
Nitrobenzene-d5	109	(22-135)	(10-155)
Fluorobiphenyl	147	(34-140)	(12-153)
Terphenyl-d14	66	(10-132)	(13-140)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3C0901-5
MATRIX : WATER

DATE RECEIVED: 3/ 9/93

SAMPLE ID : CSS-325-MW5 CSS PANAMA CITY

CERTIFICATION #: E84059
HRS84297

METALS ANALYTICAL REPORT
SELECTED LIST

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Lead	3/16/93	ND	5	ug/L

NOTE: ND (None Detected)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB ID: 3C0901-5
MATRIX : WATER

DATE RECEIVED: 3/ 9/93
DATE EXTRACTED: 3/ 9/93
DATE ANALYZED: 3/10/93

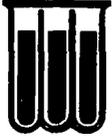
SAMPLE ID: CSS-325-MW5 CSS PANAMA CITY

CERTIFICATION #: E84059
HRS84297

TOTAL RECOVERABLE PETROLEUM HYDROCARBONS REPORT

	RESULT	UNITS	LOWER DETECTION LIMIT
Total Recoverable Petroleum Hydrocarbons	ND	mg/L	1

NOTE: ND (None Detected)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB # 3C0901-6
MATRIX: WATER

DATE RECEIVED: 3/ 9/93
DATE EXTRACTED: NA
DATE ANALYZED: 3/16/93

SAMPLE ID: CSS-325-MW6

CSS PANAMA CITY

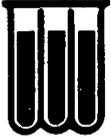
CERTIFICATION #: E84059
HRS84297

VOLATILE ORGANICS
METHOD 601/602 - GC

Benzene	5	1,2-Dichloroethane	ND
Bromodichloromethane	ND	1,1-Dichloroethene	ND
Bromoform	ND	1,2-Dichloroethene (Total)	ND
Bromomethane	ND	1,2-Dichloropropane	ND
Carbon tetrachloride	ND	cis-1,3-Dichloropropene	ND
Chlorobenzene	ND	trans-1,3-Dichloropropene	ND
Chloroethane	ND	Ethylbenzene	34
2-Chloroethylvinyl ether	ND	Methylene chloride	ND
Chloroform	ND	1,1,2,2-Tetrachloroethane	ND
Chloromethane	ND	Tetrachloroethene	ND
Dibromochloromethane	ND	Toluene	ND
1,2-Dichlorobenzene	ND	1,1,1-Trichloroethane	ND
1,3-Dichlorobenzene	ND	1,1,2-Trichloroethane	ND
1,4-Dichlorobenzene	ND	Trichloroethene	ND
Dichlorodifluoromethane	ND	Trichlorofluoromethane	ND
1,1-Dichloroethane	ND	Vinyl chloride	ND
		Xylenes	31
		Methyl-tert-butylether	ND

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
 ND* (None Detected, lower detectable limit = ug/L) as rec'd
 -- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS
Bromochloromethane (HECD)	90	(78-122)
Trifluorotoluene (PID)	101	(73-131)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3C0901-6
MATRIX: WATER

DATE RECEIVED: 3/ 9/93
DATE EXTRACTED: NA
DATE ANALYZED: 3/11/93

SAMPLE ID: CSS-325-MW6 CSS PANAMA CITY

CERTIFICATION #: E84059
HRS84297

SELECTED ORGANIC COMPOUNDS ANALYTICAL REPORT

PARAMETER	RESULT (ug/L)	DETECTION LIMIT
Ethylene dibromide	ND	0.02

NOTE: ND (None Detected) as rec'd
J (Detected, but below quantitation limit; estimated value)

SURROGATE RECOVERY:	ACCEPTABLE LIMITS		%
	WATER	SOLID	
Bromoform (ECD)	(41-152)	(41-152)	101



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3C0901-6
MATRIX: WATER

DATE RECEIVED: 3/ 9/93
DATE EXTRACTED: 3/10/93
DATE ANALYZED: 3/19/93

SAMPLE ID: CSS-325-MW6

CSS PANAMA CITY

CERTIFICATION #: E84059

POLYNUCLEAR AROMATIC HYDROCARBONS
METHOD 625 HSL/TCL LIST - GC/MS

HRS84297

Acenaphthene	ND
Acenaphthylene	ND
Anthracene	ND
Benzo (a) anthracene	ND
Benzo (a) pyrene	ND
Benzo (b) fluoranthene	ND
Benzo (ghi) perylene	ND
Benzo (k) fluoranthene	ND
Chrysene	ND
Dibenz (a, h) anthracene	ND
Fluoranthene	ND
Fluorene	ND
Indeno (1, 2, 3 -cd) pyrene	ND
1-Methylnaphthalene	40
2-Methylnaphthalene	35
Naphthalene	110
Phenanthrene	ND
Pyrene	ND

NOTE: ND (None Detected, lower detectable limit = 11 ug/L) as rec'd
 ND* (None Detected, lower detectable limit = ug/L) as rec'd
 -- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS	
		WATER	SOLID
Nitrobenzene-d5	62	(22-135)	(10-155)
Fluorobiphenyl	65	(34-140)	(12-153)
Terphenyl-d14	21	(10-132)	(13-140)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB # : 3C0901-6
MATRIX : WATER

DATE RECEIVED: 3/ 9/93

SAMPLE ID : CSS-325-MW6

CSS PANAMA CITY

METALS ANALYTICAL REPORT
SELECTED LIST

CERTIFICATION #: E84059
HRS84297

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
Lead	3/16/93	ND	5 ug/L

NOTE: ND (None Detected)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB ID: 3C0901-6
MATRIX : WATER

DATE RECEIVED: 3/ 9/93
DATE EXTRACTED: 3/ 9/93
DATE ANALYZED: 3/10/93

SAMPLE ID: CSS-325-MW6 CSS PANAMA CITY

CERTIFICATION #: E84059
HRS84297

TOTAL RECOVERABLE PETROLEUM HYDROCARBONS REPORT

	RESULT	UNITS	LOWER DETECTION LIMIT
Total Recoverable Petroleum Hydrocarbons	ND	mg/L	1

NOTE: ND (None Detected)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB # 3C0901-7
MATRIX: WATER

DATE RECEIVED: 3/ 9/93
DATE EXTRACTED: NA
DATE ANALYZED: 3/16/93

SAMPLE ID: CSS-325-MW7

CSS PANAMA CITY

CERTIFICATION #: E84059
HRS84297

VOLATILE ORGANICS
METHOD 601/602 - GC

Benzene	ND	1,2-Dichloroethane	ND
Bromodichloromethane	ND	1,1-Dichloroethene	ND
Bromoform	ND	1,2-Dichloroethene (Total)	ND
Bromomethane	ND	1,2-Dichloropropane	ND
Carbon tetrachloride	ND	cis-1,3-Dichloropropene	ND
Chlorobenzene	ND	trans-1,3-Dichloropropene	ND
Chloroethane	ND	Ethylbenzene	ND
2-Chloroethylvinyl ether	ND	Methylene chloride	ND
Chloroform	ND	1,1,2,2-Tetrachloroethane	ND
Chloromethane	ND	Tetrachloroethene	ND
Dibromochloromethane	ND	Toluene	ND
1,2-Dichlorobenzene	ND	1,1,1-Trichloroethane	ND
1,3-Dichlorobenzene	ND	1,1,2-Trichloroethane	ND
1,4-Dichlorobenzene	ND	Trichloroethene	ND
Dichlorodifluoromethane	ND	Trichlorofluoromethane	ND
1,1-Dichloroethane	ND	Vinyl chloride	ND
		Xylenes	ND
		Methyl-tert-butylether	ND

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
 ND* (None Detected, lower detectable limit = ug/L) as rec'd
 -- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS
Dibromochloromethane (HECD)	90	(78-122)
Trifluorotoluene (PID)	100	(73-131)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3C0901-7
MATRIX: WATER

DATE RECEIVED: 3/ 9/93
DATE EXTRACTED: NA
DATE ANALYZED: 3/11/93

SAMPLE ID: CSS-325-MW7 CSS PANAMA CITY

CERTIFICATION #: E84059
HRS84297

SELECTED ORGANIC COMPOUNDS ANALYTICAL REPORT

PARAMETER	RESULT (ug/L)	DETECTION LIMIT
Ethylene dibromide	ND	0.02

NOTE: ND (None Detected) as rec'd
J (Detected, but below quantitation limit; estimated value)

SURROGATE RECOVERY:	ACCEPTABLE LIMITS		%
	WATER	SOLID	
Bromoform (ECD)	(41-152)	(41-152)	120



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3C0901-7
MATRIX: WATER

DATE RECEIVED: 3/ 9/93
DATE EXTRACTED: 3/10/93
DATE ANALYZED: 3/19/93

SAMPLE ID: CSS-325-MW7

CSS PANAMA CITY

CERTIFICATION #: E84059

POLYNUCLEAR AROMATIC HYDROCARBONS
METHOD 625 HSL/TCL LIST - GC/MS

HRS84297

Acenaphthene	ND
Acenaphthylene	ND
Anthracene	ND
Benzo (a) anthracene	ND
Benzo (a) pyrene	ND
Benzo (b) fluoranthene	ND
Benzo (ghi) perylene	ND
Benzo (k) fluoranthene	ND
Fluoranthene	ND
Fluorene	ND
Dibenz (a, h) anthracene	ND
Fluoranthene	ND
Fluorene	ND
Indeno (1, 2, 3 - cd) pyrene	ND
1-Methylnaphthalene	ND
2-Methylnaphthalene	ND
Naphthalene	ND
Phenanthrene	ND
Pyrene	ND

NOTE: ND (None Detected, lower detectable limit = 5 ug/L) as rec'd
 ND* (None Detected, lower detectable limit = ug/L) as rec'd
 -- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS	
		WATER	SOLID
Nitrobenzene-d5	109	(22-135)	(10-155)
Fluorobiphenyl	146	(34-140)	(12-153)
Terphenyl-d14	81	(10-132)	(13-140)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB # : 3C0901-7
MATRIX : WATER

DATE RECEIVED: 3/ 9/93

SAMPLE ID : CSS-325-MW7

CSS PANAMA CITY

CERTIFICATION #: E84059
HRS84297

METALS ANALYTICAL REPORT
SELECTED LIST

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Lead	3/16/93	ND	5	ug/L

NOTE: ND (None Detected)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB ID: 3C0901-7
MATRIX : WATER

DATE RECEIVED: 3/ 9/93
DATE EXTRACTED: 3/ 9/93
DATE ANALYZED: 3/10/93

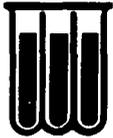
SAMPLE ID: CSS-325-MW7 CSS PANAMA CITY

CERTIFICATION #: E84059
HRS84297

TOTAL RECOVERABLE PETROLEUM HYDROCARBONS REPORT

	RESULT	UNITS	LOWER DETECTION LIMIT
Total Recoverable Petroleum Hydrocarbons	ND	mg/L	1

NOTE: ND (None Detected)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB # 3C0901-8
MATRIX: WATER

DATE RECEIVED: 3/ 9/93
DATE EXTRACTED: NA
DATE ANALYZED: 3/16/93

SAMPLE ID: CSS-325-DUP

CSS PANAMA CITY

CERTIFICATION #: E84059
HRS84297

VOLATILE ORGANICS
METHOD 601/602 - GC

Benzene	ND	1,2-Dichloroethane	ND
Bromodichloromethane	ND	1,1-Dichloroethene	ND
Bromoform	ND	1,2-Dichloroethene (Total)	ND
Bromomethane	ND	1,2-Dichloropropane	ND
Carbon tetrachloride	ND	cis-1,3-Dichloropropene	ND
Chlorobenzene	ND	trans-1,3-Dichloropropene	ND
Chloroethane	ND	Ethylbenzene	ND
2-Chloroethylvinyl ether	ND	Methylene chloride	ND
Chloroform	ND	1,1,2,2-Tetrachloroethane	ND
Chloromethane	ND	Tetrachloroethene	ND
Dibromochloromethane	ND	Toluene	ND
1,2-Dichlorobenzene	ND	1,1,1-Trichloroethane	ND
1,3-Dichlorobenzene	ND	1,1,2-Trichloroethane	ND
1,4-Dichlorobenzene	ND	Trichloroethene	ND
Dichlorodifluoromethane	ND	Trichlorofluoromethane	ND
1,1-Dichloroethane	ND	Vinyl chloride	ND
		Xylenes	ND
		Methyl-tert-butylether	ND

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
 ND* (None Detected, lower detectable limit = ug/L) as rec'd
 -- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS
Bromochloromethane (HECD)	84	(78-122)
Trifluorotoluene (PID)	99	(73-131)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3C0901-8
MATRIX: WATER

DATE RECEIVED: 3/ 9/93
DATE EXTRACTED: NA
DATE ANALYZED: 3/11/93

SAMPLE ID: CSS-325-DUP CSS PANAMA CITY

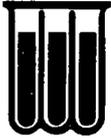
CERTIFICATION #: E84059
HRS84297

SELECTED ORGANIC COMPOUNDS ANALYTICAL REPORT

PARAMETER	RESULT (ug/L)	DETECTION LIMIT
Ethylene dibromide	ND	0.02

NOTE: ND (None Detected) as rec'd
J (Detected, but below quantitation limit; estimated value)

SURROGATE RECOVERY:	ACCEPTABLE LIMITS		%
	WATER	SOLID	
Bromoform (ECD)	(41-152)	(41-152)	103



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3C0901-8
MATRIX: WATER

DATE RECEIVED: 3/ 9/93
DATE EXTRACTED: 3/10/93
DATE ANALYZED: 3/19/93

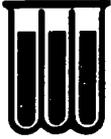
SAMPLE ID: CSS-325-DUP CSS PANAMA CITY

POLYNUCLEAR AROMATIC HYDROCARBONS
METHOD 625 HSL/TCL LIST - GC/MS
CERTIFICATION #: E84059
HRS84297

Acenaphthene	ND
Acenaphthylene	ND
Anthracene	ND
Benzo (a) anthracene	ND
Benzo (a) pyrene	ND
Benzo (b) fluoranthene	ND
Benzo (ghi) perylene	ND
Benzo (k) fluoranthene	ND
Chrysene	ND
Dibenz (a, h) anthracene	ND
Fluoranthene	ND
Fluorene	ND
Indeno (1, 2, 3 -cd) pyrene	ND
1-Methylnaphthalene	ND
2-Methylnaphthalene	ND
Naphthalene	ND
Phenanthrene	ND
Pyrene	ND

NOTE: ND (None Detected, lower detectable limit = 5 ug/L) as rec'd
 ND* (None Detected, lower detectable limit = ug/L) as rec'd
 -- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS	
		WATER	SOLID
Nitrobenzene-d5	106	(22-135)	(10-155)
Fluorobiphenyl	144	(34-140)	(12-153)
Terphenyl-d14	67	(10-132)	(13-140)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB # : 3C0901-8
MATRIX : WATER

DATE RECEIVED: 3/ 9/93

SAMPLE ID : CSS-325-DUP

CSS PANAMA CITY

CERTIFICATION #: E84059
HRS84297

METALS ANALYTICAL REPORT
SELECTED LIST

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Lead	3/16/93	ND	5	ug/L

NOTE: ND (None Detected)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB ID: 3C0901-8
MATRIX : WATER

DATE RECEIVED: 3/ 9/93
DATE EXTRACTED: 3/ 9/93
DATE ANALYZED: 3/10/93

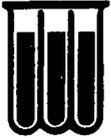
SAMPLE ID: CSS-325-DUP CSS PANAMA CITY

CERTIFICATION #: E84059
HRS84297

TOTAL RECOVERABLE PETROLEUM HYDROCARBONS REPORT

	RESULT	UNITS	LOWER DETECTION LIMIT
Total Recoverable Petroleum Hydrocarbons	ND	mg/L	1

NOTE: ND (None Detected)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB # 3C0901-9
MATRIX: WATER

DATE RECEIVED: 3/ 9/93
DATE EXTRACTED: NA
DATE ANALYZED: 3/16/93

SAMPLE ID: CSS-325-EQUIP BLK CSS PANAMA CITY

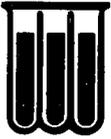
VOLATILE ORGANICS
METHOD 601/602 - GC

CERTIFICATION #: E84059
HRS84297

Benzene	ND	1,2-Dichloroethane	ND
Bromodichloromethane	ND	1,1-Dichloroethene	ND
Bromoform	ND	1,2-Dichloroethene (Total)	ND
Bromomethane	ND	1,2-Dichloropropane	ND
Carbon tetrachloride	ND	cis-1,3-Dichloropropene	ND
Chlorobenzene	ND	trans-1,3-Dichloropropene	ND
Chloroethane	ND	Ethylbenzene	ND
2-Chloroethylvinyl ether	ND	Methylene chloride	ND
Chloroform	ND	1,1,2,2-Tetrachloroethane	ND
Chloromethane	ND	Tetrachloroethene	ND
Dibromochloromethane	ND	Toluene	ND
1,2-Dichlorobenzene	ND	1,1,1-Trichloroethane	ND
1,3-Dichlorobenzene	ND	1,1,2-Trichloroethane	ND
1,4-Dichlorobenzene	ND	Trichloroethene	ND
Dichlorodifluoromethane	ND	Trichlorofluoromethane	10
1,1-Dichloroethane	ND	Vinyl chloride	ND
		Xylenes	ND
		Methyl-tert-butylether	ND

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
 ND* (None Detected, lower detectable limit = 1 ug/L) as rec'd
 -- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS
Dibromochloromethane (HECD)	95	(78-122)
Trifluorotoluene (PID)	99	(73-131)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3C0901-9
MATRIX: WATER

DATE RECEIVED: 3/ 9/93
DATE EXTRACTED: NA
DATE ANALYZED: 3/11/93

SAMPLE ID: CSS-325-EQUIP BLK CSS PANAMA CITY

CERTIFICATION #: E84059
HRS84297

SELECTED ORGANIC COMPOUNDS ANALYTICAL REPORT

PARAMETER	RESULT (ug/L)	DETECTION LIMIT
Ethylene dibromide	ND	0.02

NOTE: ND (None Detected) as rec'd
J (Detected, but below quantitation limit; estimated value)

SURROGATE RECOVERY:	ACCEPTABLE LIMITS		%
	WATER	SOLID	
Bromoform (ECD)	(41-152)	(41-152)	101



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3C0901-9
MATRIX: WATER

DATE RECEIVED: 3/ 9/93
DATE EXTRACTED: 3/10/93
DATE ANALYZED: 3/19/93

SAMPLE ID: CSS-325-EQUIP BLK CSS PANAMA CITY

POLYNUCLEAR AROMATIC HYDROCARBONS
METHOD 625 HSL/TCL LIST - GC/MS

CERTIFICATION #: E84059
HRS84297

Acenaphthene	ND
Acenaphthylene	ND
Anthracene	ND
Benzo (a) anthracene	ND
Benzo (a) pyrene	ND
Benzo (b) fluoranthene	ND
Benzo (ghi) perylene	ND
Benzo (k) fluoranthene	ND
Pyrene	ND
Dibenz (a, h) anthracene	ND
Fluoranthene	ND
Fluorene	ND
Indeno (1, 2, 3 - cd) pyrene	ND
1-Methylnaphthalene	ND
2-Methylnaphthalene	ND
Naphthalene	ND
Phenanthrene	ND
Pyrene	ND

NOTE: ND (None Detected, lower detectable limit = 5 ug/L) as rec'd
 ND* (None Detected, lower detectable limit = ug/L) as rec'd
 -- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS	
		WATER	SOLID
Nitrobenzene-d5	119	(22-135)	(10-155)
Fluorobiphenyl	155	(34-140)	(12-153)
Terphenyl-d14	120	(10-132)	(13-140)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB # : 3C0901-9
MATRIX : WATER

DATE RECEIVED: 3/ 9/93

SAMPLE ID : CSS-325-EQUIP BLK CSS PANAMA CITY

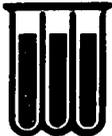
CERTIFICATION #: E84059
HRS84297

METALS ANALYTICAL REPORT
SELECTED LIST

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Lead	3/16/93	ND	5	ug/L

NOTE: ND (None Detected)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB ID: 3C0901-9
MATRIX : WATER

DATE RECEIVED: 3/ 9/93
DATE EXTRACTED: 3/ 9/93
DATE ANALYZED: 3/10/93

SAMPLE ID: CSS-325-EQUIP BLK CSS PANAMA CITY

CERTIFICATION #: E84059
HRS84297

TOTAL RECOVERABLE PETROLEUM HYDROCARBONS REPORT

	RESULT	UNITS	LOWER DETECTION LIMIT
Total Recoverable Petroleum Hydrocarbons	ND	mg/L	1

NOTE: ND (None Detected)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB # 3C0901-10
MATRIX: WATER

DATE RECEIVED: 3/ 9/93
DATE EXTRACTED: NA
DATE ANALYZED: 3/16/93

SAMPLE ID: CSS-325-FIELD BLK CSS PANAMA CITY

VOLATILE ORGANICS
METHOD 601/602 - GC

CERTIFICATION #: E84059
HRS84297

Benzene	ND	1,2-Dichloroethane	ND
Bromodichloromethane	ND	1,1-Dichloroethene	ND
Bromoform	ND	1,2-Dichloroethene (Total)	ND
Bromomethane	ND	1,2-Dichloropropane	ND
Carbon tetrachloride	ND	cis-1,3-Dichloropropene	ND
Chlorobenzene	ND	trans-1,3-Dichloropropene	ND
Chloroethane	ND	Ethylbenzene	ND
2-Chloroethylvinyl ether	ND	Methylene chloride	ND
Chloroform	ND	1,1,2,2-Tetrachloroethane	ND
Chloromethane	ND	Tetrachloroethene	ND
Dibromochloromethane	ND	Toluene	ND
1,2-Dichlorobenzene	ND	1,1,1-Trichloroethane	ND
1,3-Dichlorobenzene	ND	1,1,2-Trichloroethane	ND
1,4-Dichlorobenzene	ND	Trichloroethene	ND
Dichlorodifluoromethane	ND	Trichlorofluoromethane	7
1,1-Dichloroethane	ND	Vinyl chloride	ND
		Xylenes	ND
		Methyl-tert-butylether	ND

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
ND* (None Detected, lower detectable limit = ug/L) as rec'd
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS
Bromochloromethane (HECD)	90	(78-122)
Trifluorotoluene (PID)	99	(73-131)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3C0901-10
MATRIX: WATER

DATE RECEIVED: 3/ 9/93
DATE EXTRACTED: NA
DATE ANALYZED: 3/11/93

SAMPLE ID: CSS-325-FIELD BLK CSS PANAMA CITY

CERTIFICATION #: E84059
HRS84297

SELECTED ORGANIC COMPOUNDS ANALYTICAL REPORT

PARAMETER	RESULT (ug/L)	DETECTION LIMIT
Ethylene dibromide	ND	0.02

NOTE: ND (None Detected) as rec'd
J (Detected, but below quantitation limit; estimated value)

SURROGATE RECOVERY:	ACCEPTABLE LIMITS		%
	WATER	SOLID	
Bromoform (ECD)	(41-152)	(41-152)	95



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3C0901-10
MATRIX: WATER

DATE RECEIVED: 3/ 9/93
DATE EXTRACTED: 3/10/93
DATE ANALYZED: 3/19/93

SAMPLE ID: CSS-325-FIELD BLK CSS PANAMA CITY

CERTIFICATION #: E84059
HRS84297

POLYNUCLEAR AROMATIC HYDROCARBONS
METHOD 625 HSL/TCL LIST - GC/MS

Acenaphthene	ND
Acenaphthylene	ND
Anthracene	ND
Benzo (a) anthracene	ND
Benzo (a) pyrene	ND
Benzo (b) fluoranthene	ND
Benzo (ghi) perylene	ND
Benzo (k) fluoranthene	ND
Chrysene	ND
Dibenz (a, h) anthracene	ND
Fluoranthene	ND
Fluorene	ND
Indeno (1, 2, 3 - cd) pyrene	ND
1-Methylnaphthalene	ND
2-Methylnaphthalene	ND
Naphthalene	ND
Phenanthrene	ND
Pyrene	ND

NOTE: ND (None Detected, lower detectable limit = 5 ug/L) as rec'd
 ND* (None Detected, lower detectable limit = ug/L) as rec'd
 -- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS	
		WATER	SOLID
Nitrobenzene-d5	126	(22-135)	(10-155)
Fluorobiphenyl	135	(34-140)	(12-153)
Terphenyl-d14	119	(10-132)	(13-140)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3C0901-10
MATRIX : WATER

DATE RECEIVED: 3/ 9/93

SAMPLE ID : CSS-325-FIELD BLK CSS PANAMA CITY

CERTIFICATION #: E84059
HRS84297

METALS ANALYTICAL REPORT
SELECTED LIST

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT
Lead	3/16/93	ND	5 ug/L

NOTE: ND (None Detected)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB ID: 3C0901-10
MATRIX : WATER

DATE RECEIVED: 3/ 9/93
DATE EXTRACTED: 3/ 9/93
DATE ANALYZED: 3/10/93

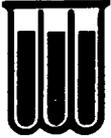
SAMPLE ID: CSS-325-FIELD BLK CSS PANAMA CITY

CERTIFICATION #: E84059
HRS84297

TOTAL RECOVERABLE PETROLEUM HYDROCARBONS REPORT

	RESULT	UNITS	LOWER DETECTION LIMIT
Total Recoverable Petroleum Hydrocarbons	ND	mg/L	1

NOTE: ND (None Detected)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB # 3C0901-11
MATRIX: WATER

DATE RECEIVED: 3/ 9/93
DATE EXTRACTED: NA
DATE ANALYZED: 3/16/93

SAMPLE ID: TRIP BLANK

CSS PANAMA CITY

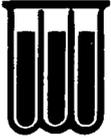
CERTIFICATION #: E84059
HRS84297

VOLATILE ORGANICS
METHOD 601/602 - GC

Benzene	ND	1,2-Dichloroethane	ND
Bromodichloromethane	ND	1,1-Dichloroethene	ND
Bromoform	ND	1,2-Dichloroethene (Total)	ND
Bromomethane	ND	1,2-Dichloropropane	ND
Carbon tetrachloride	ND	cis-1,3-Dichloropropene	ND
Chlorobenzene	ND	trans-1,3-Dichloropropene	ND
Chloroethane	ND	Ethylbenzene	ND
2-Chloroethylvinyl ether	ND	Methylene chloride	ND
Chloroform	ND	1,1,2,2-Tetrachloroethane	ND
Chloromethane	ND	Tetrachloroethene	ND
Dibromochloromethane	ND	Toluene	ND
1,2-Dichlorobenzene	ND	1,1,1-Trichloroethane	ND
1,3-Dichlorobenzene	ND	1,1,2-Trichloroethane	ND
1,4-Dichlorobenzene	ND	Trichloroethene	ND
Dichlorodifluoromethane	ND	Trichlorofluoromethane	ND
1,1-Dichloroethane	ND	Vinyl chloride	ND
		Xylenes	ND
		Methyl-tert-butylether	ND

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
 ND* (None Detected, lower detectable limit = 1 ug/L) as rec'd
 -- (Not Analyzed)

SPURROGATE RECOVERY:	%	ACCEPTABLE LIMITS
Bromochloromethane (HECD)	83	(78-122)
Trifluorotoluene (PID)	99	(73-131)



ENSECO-WADSWORTH/ALERT
Laboratories

QUALITY CONTROL SECTION

- **Quality Control Summary**
- **Laboratory Blanks**
- **Laboratory Control Sample**
- **Matrix Spike/Matrix Spike Duplicate Results**
- **Sample Custody Documentation**



ENSECO-WADSWORTH/ALERT
Laboratories

QUALITY ASSURANCE / QUALITY CONTROL
PROGRAM SUMMARY

Wadsworth/ALERT Laboratories considers continuous analytical method performance evaluations to be an integral portion of the data package, and routinely includes the pertinent QA/QC data associated with various analytical result reports. Brief discussions of the various QA/QC procedures utilized to measure acceptable method and matrix performance follow.

Surrogate Spike Recovery Evaluations

Known concentrations of designated surrogate spikes, consisting of a number of similar, non-method compounds or method compound analogues, are added, as appropriate, to routine GC and GC/MS sample fractions prior to extraction and analysis. The percent recovery determinations calculated from the subsequent analysis is an indication of the overall method efficiency for the individual sample. This surrogate spike recovery data is displayed alongside acceptable analytical method performance limits at the bottom of each applicable analytical result report sheet.

NOTE: Acceptable method performance for Base/Neutral Acid extractables is indicated by two (2) of three (3) surrogates for each fraction with a minimum recovery of ten (10) percent each. For Pesticides one (1) of two (2) surrogates meeting performance criteria is acceptable.

Laboratory Analytical Method Blank Evaluations

Laboratory analytical method blanks are systematically prepared and analyzed in order to continuously evaluate the system interferences and background contamination levels associated with each analytical method. These method blanks include all aspects of actual laboratory method analysis (chemical reagents, glassware, etc.), substituting laboratory reagent water or solid for actual sample. The method blank must not contain any analytes above the reported detection limit. The following common laboratory contaminants are exceptions to this rule provided they are not present at greater than five times the detection limit.

Volatiles

Methylene chloride
Toluene
2-Butanone
Acetone

Semi-volatiles

Dimethyl phthalate
Diethyl phthalate
Di-n-butyl phthalate
Butyl benzyl phthalate
Bis (2-ethylhexyl) phthalate

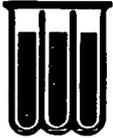
Metals

Calcium
Magnesium
Sodium

A minimum of five percent (5%) of all laboratory analyses are laboratory analytical method blanks.

Laboratory Analytical Method Check Sample Evaluations

Known concentrations of designated matrix spikes (actual analytical method compounds) are added to a laboratory reagent blank prior to extraction and analysis. Percent recovery determinations demonstrate the performance of the analytical method. Failure of a check sample to meet established laboratory recovery criteria is cause to stop the analysis until the problem is resolved.



ENSECO-WADSWORTH/ALERT
Laboratories

QUALITY ASSURANCE / QUALITY CONTROL
PROGRAM SUMMARY
(cont'd)

At that time all associated samples must be re-analyzed. A minimum of five percent (5%) of all laboratory analyses are laboratory analytical method check samples.

Matrix Spike (MS)/Matrix Spike Duplicate (MSD) Recovery Evaluations

Known concentrations of designated matrix spikes (actual analytical method compounds) are added to two of three separate aliquots of a sequentially predetermined sample prior to extraction and analysis. Percent recovery determinations are calculated from both of the spiked samples by comparison to the actual values generated from the unspiked sample. These percent recovery determinations indicate the accuracy of the analysis at recovering actual analytical method compounds from the matrix. Relative percent difference determinations calculated from a comparison of the MS/MSD recoveries demonstrate the precision of the analytical method. Actual percent recovery and relative percent difference data is displayed alongside their respective acceptable analytical method performance limits in the QA/QC section of the report. The MS/MSD are considered in control when the precision is within established control limits and the associated check sample has been found to be acceptable. A minimum of ten percent (10%) of all analyses are MS/MSD quality control samples.

*****EXAMPLE*****

COMPOUND	SAMPLE CONC.	MS %REC	MSD %REC	RPD	RPD	QC LIMITS RECOVERY
4,4'-DDT	0	95	112	16	22	66-119
Benzene	10	86	93	8	20	39-150
(cmpd. name)	sample result	1st% recov.	2nd% recov.	Rel.% diff.		accep. method perform range

Analytical Result Qualifiers

The following qualifiers, as defined below, may be appended to analytical results in order to allow proper interpretation of the results presented:

J - indicates an estimated concentration (typically used when a dilution, matrix interference or instrumental limitation prevents accurate quantitation of a particular analyte).

B - indicates the presence of a particular analyte in the laboratory blank analyzed concurrently with the samples. Results must be interpreted accordingly.

DIL - indicates that because of matrix interferences and/or high analyte concentrations, it was necessary to dilute the sample to a point where the surrogate or spike concentrations fell below a quantifiable amount and could not be reported.



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB # 3C0901-BK
MATRIX: WATER

DATE RECEIVED: 3/ 9/93
DATE EXTRACTED: NA
DATE ANALYZED: 3/16/93

SAMPLE ID: LABORATORY BLANK

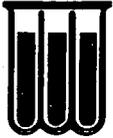
CERTIFICATION #: E84059
HRS84297

VOLATILE ORGANICS
METHOD 601/602 - GC

Benzene	ND	1,2-Dichloroethane	ND
Bromodichloromethane	ND	1,1-Dichloroethene	ND
Bromoform	ND	1,2-Dichloroethene (Total)	ND
Bromomethane	ND	1,2-Dichloropropane	ND
Carbon tetrachloride	ND	cis-1,3-Dichloropropene	ND
Chlorobenzene	ND	trans-1,3-Dichloropropene	ND
Chloroethane	ND	Ethylbenzene	ND
2-Chloroethylvinyl ether	ND	Methylene chloride	ND
Chloroform	ND	1,1,2,2-Tetrachloroethane	ND
Chloromethane	ND	Tetrachloroethene	ND
Dibromochloromethane	ND	Toluene	ND
1,2-Dichlorobenzene	ND	1,1,1-Trichloroethane	ND
1,3-Dichlorobenzene	ND	1,1,2-Trichloroethane	ND
1,4-Dichlorobenzene	ND	Trichloroethene	ND
Dichlorodifluoromethane	ND	Trichlorofluoromethane	ND
1,1-Dichloroethane	ND	Vinyl chloride	ND
		Xylenes	ND
		Methyl-tert-butylether	ND

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
 ND* (None Detected, lower detectable limit = 1 ug/L) as rec'd
 -- (Not Analyzed)

PERROGATE RECOVERY:	%	ACCEPTABLE LIMITS
Bromochloromethane (HECD)	90	(78-122)
Trifluorotoluene (PID)	100	(73-131)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB # 3C0901-BK
MATRIX: WATER

DATE RECEIVED: 3/ 9/93
DATE EXTRACTED: NA
DATE ANALYZED: 3/18/93

SAMPLE ID: LABORATORY BLANK

VOLATILE ORGANICS
METHOD 601/602 - GC

CERTIFICATION #: E84059
HRS84297

Benzene	ND	1,2-Dichloroethane	ND
Bromodichloromethane	ND	1,1-Dichloroethene	ND
Bromoform	ND	1,2-Dichloroethene (Total)	ND
Bromomethane	ND	1,2-Dichloropropane	ND
Carbon tetrachloride	ND	cis-1,3-Dichloropropene	ND
Chlorobenzene	ND	trans-1,3-Dichloropropene	ND
Chloroethane	ND	Ethylbenzene	ND
2-Chloroethylvinyl ether	ND	Methylene chloride	ND
Chloroform	ND	1,1,2,2-Tetrachloroethane	ND
Chloromethane	ND	Tetrachloroethene	ND
Dibromochloromethane	ND	Toluene	ND
1,2-Dichlorobenzene	ND	1,1,1-Trichloroethane	ND
1,3-Dichlorobenzene	ND	1,1,2-Trichloroethane	ND
1,4-Dichlorobenzene	ND	Trichloroethene	ND
Dichlorodifluoromethane	ND	Trichlorofluoromethane	ND
1,1-Dichloroethane	ND	Vinyl chloride	ND
		Xylenes	ND
		Methyl-tert-butylether	ND

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
 ND* (None Detected, lower detectable limit = ug/L) as rec'd
 -- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS
Bromochloromethane (HECD)	97	(78-122)
Trifluorotoluene (PID)	98	(73-131)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3C0901-BK
MATRIX: WATER

DATE RECEIVED: 3/ 9/93
DATE EXTRACTED: NA
DATE ANALYZED: 3/10/93

SAMPLE ID: LABORATORY BLANK

CERTIFICATION #: E84059
HRS84297

SELECTED ORGANIC COMPOUNDS ANALYTICAL REPORT

PARAMETER	RESULT (ug/L)	DETECTION LIMIT
Ethylene dibromide	ND	0.02

NOTE: ND (None Detected) as rec'd
J (Detected, but below quantitation limit; estimated value)

SPURIOUS RECOVERY:	ACCEPTABLE LIMITS		%
	WATER	SOLID	
Bromoform (ECD)	(41-152)	(41-152)	96



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3C0901-BK
MATRIX: WATER

DATE RECEIVED: 3/ 9/93
DATE EXTRACTED: NA
DATE ANALYZED: 3/11/93

SAMPLE ID: LABORATORY BLANK

CERTIFICATION #: E84059
HRS84297

SELECTED ORGANIC COMPOUNDS ANALYTICAL REPORT

PARAMETER	RESULT (ug/L)	DETECTION LIMIT
Ethylene dibromide	ND	0.02

NOTE: ND (None Detected) as rec'd
J (Detected, but below quantitation limit; estimated value)

SURROGATE RECOVERY:	ACCEPTABLE LIMITS		%
	WATER	SOLID	
Bromoform (ECD)	(41-152)	(41-152)	91



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3C0901-BK
MATRIX: WATER

DATE RECEIVED: 3/ 9/93
DATE EXTRACTED: 3/10/93
DATE ANALYZED: 3/16/93

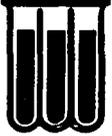
SAMPLE ID: LABORATORY BLANK

CERTIFICATION #: E84059
POLYNUCLEAR AROMATIC HYDROCARBONS HRS84297
METHOD 625 HSL/TCL LIST - GC/MS

Acenaphthene	ND
Acenaphthylene	ND
Anthracene	ND
Benzo (a) anthracene	ND
Benzo (a) pyrene	ND
Benzo (b) fluoranthene	ND
Benzo (ghi) perylene	ND
Benzo (k) fluoranthene	ND
Fluorene	ND
Dibenz (a, h) anthracene	ND
Fluoranthene	ND
Fluorene	ND
Indeno (1, 2, 3-cd) pyrene	ND
1-Methylnaphthalene	ND
2-Methylnaphthalene	ND
Naphthalene	ND
Phenanthrene	ND
Pyrene	ND

NOTE: ND (None Detected, lower detectable limit = 5 ug/L) as rec'd
 ND* (None Detected, lower detectable limit = 5 ug/L) as rec'd
 -- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS	
		WATER	SOLID
Nitrobenzene-d5	33	(22-135)	(10-155)
Fluorobiphenyl	52	(34-140)	(12-153)
Terphenyl-d14	77	(10-132)	(13-140)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3C0901-BK
MATRIX : WATER

DATE RECEIVED: 3/ 9/93

SAMPLE ID : LABORATORY BLANK

CERTIFICATION #: E84059
HRS84297

METALS ANALYTICAL REPORT
SELECTED LIST

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Lead	3/16/93	ND	5	ug/L

NOTE: ND (None Detected)



ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB ID: 3C0901-BK
MATRIX : WATER

DATE RECEIVED: 3/ 9/93
DATE EXTRACTED: 3/ 9/93
DATE ANALYZED: 3/10/93

SAMPLE ID: LABORATORY BLANK

CERTIFICATION #: E84059
HRS84297

TOTAL RECOVERABLE PETROLEUM HYDROCARBONS REPORT

	RESULT	UNITS	LOWER DETECTION LIMIT
Total Recoverable Petroleum Hydrocarbons	ND	mg/L	1

NOTE: ND (None Detected)



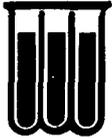
ENSECO-WADSWORTH/ALERT
Laboratories

LAB ID : LCS
MATRIX : WATER
METHOD : 601/2
RUN ID : 2A/2B122

DATE EXTRACTED: NA
DATE ANALYZED : 03/16/93

LABORATORY CONTROL SAMPLE RESULTS

COMPOUND	ANALYTICAL RUN ID #	LCS	QC LIMITS
		%REC	RPD %REC
Benzene	2A/2B122	97	15 70-117
Toluene		99	16 70-117
Chlorobenzene		96	24 58-133
1,1-Dichloroethene		83	28 43-131
Trichloroethene		81	13 75-123
Dichlorobromomethane		91	22 61-133



ENSECO-WADSWORTH/ALERT
Laboratories

LAB ID : LCS
MATRIX : WATER
METHOD : 601/2
RUN ID : 1A/1B4340

DATE EXTRACTED: NA
DATE ANALYZED : 03/18/93

LABORATORY CONTROL SAMPLE RESULTS

COMPOUND	ANALYTICAL RUN ID #	LCS %REC	QC LIMITS	
			RPD	%REC
Benzene	1A/1B4340	99	15	70-117
Toluene		100	16	70-117
Chlorobenzene		96	24	58-133
1,1-Dichloroethene		114	28	43-131
Trichloroethene		94	13	75-123
Dichlorobromomethane		103	22	61-133



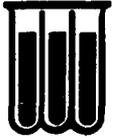
ENSECO-WADSWORTH/ALERT
Laboratories

LAB ID : LCS
MATRIX : WATER
METHOD : 601 MOD.
RUN ID : EDB0493A

DATE EXTRACTED: NA
DATE ANALYZED : 03/10/93

LABORATORY CONTROL SAMPLE RESULTS

COMPOUND	ANALYTICAL RUN ID #	LCS %REC	QC LIMITS RPD %REC
Ethylene Dibromide	EDB0493A	98	25 81-135



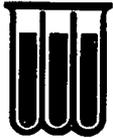
ENSECO-WADSWORTH/ALERT
Laboratories

LAB ID : LCS
MATRIX : WATER
METHOD : 601 MOD.
RUN ID : EDB0517

DATE EXTRACTED: NA
DATE ANALYZED : 03/11/93

LABORATORY CONTROL SAMPLE RESULTS

COMPOUND	ANALYTICAL RUN ID #	LCS %REC	QC LIMITS RPD %REC
Ethylene Dibromide	EDB0517	91	25 81-135



ENSECO-WADSWORTH/ALERT
Laboratories

LAB ID : LCS
MATRIX : WATER
METHOD : 625
RUN ID : C0157

DATE EXTRACTED: 03/10/93
DATE ANALYZED : 03/16/93

LABORATORY CONTROL SAMPLE RESULTS

COMPOUND	ANALYTICAL RUN ID #	LCS %REC	QC LIMITS	
			RPD	%REC
Naphthalene	C0157	60	43	10-139
1-Methylnaphthalene		67	48	10-150
Acenaphthene		59	29	45-130
Fluorene		65	24	37-133
Pyrene		86	41	20-144
Chrysene		67	45	15-152



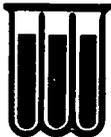
ENSECO-WADSWORTH/ALERT
Laboratories

LAB ID : LCS

MATRIX : WATER

LABORATORY CONTROL SAMPLE RESULTS
METALS

ELEMENT	DATE PREPARED	DATE ANALYZED	LCS %REC	QC LIMITS RPD %REC	
Lead (furnace)	03/16/93	03/16/93	78	33 64-132	LCS



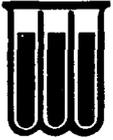
ENSECO-WADSWORTH/ALERT
Laboratories

LAB ID : LCS

MATRIX : WATER

LABORATORY CONTROL SAMPLE RESULTS
WET CHEMISTRY

PARAMETER	DATE PREPARED	DATE ANALYZED	LCS %REC	QC LIMITS RPD %REC	
TRPH (IR)	03/09/93	03/10/93	92	24 75-124	LCS



ENSECO-WADSWORTH/ALERT
Laboratories

LAB ID : 3C0901-2
MATRIX : WATER
METHOD : 601 MOD.
RUN ID : EDB0546

DATE RECEIVED : 03/09/93
DATE PREPARED : NA
DATE ANALYZED : 03/11/93

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

COMPOUND	ANALYTICAL RUN ID #	MS %REC	MSD %REC	RPD	QC LIMITS RPD %REC
Ethylene Dibromide	EDB0546	85	96	12	25 81-135

* = Diluted Out



ENSECO-WADSWORTH/ALERT
Laboratories

LAB ID : 3C0901-1
MATRIX : WATER
METHOD : 625
RUN ID : C0197/C0198

DATE RECEIVED : 03/09/93
DATE PREPARED : 03/10/93
DATE ANALYZED : 03/19/93

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

COMPOUND	ANALYTICAL RUN ID #	MS	MSD	RPD	QC LIMITS	
		%REC	%REC		RPD	%REC
Naphthalene	C0197/C0198	78	95	20	23	25-97
1-Methylnaphthalene		80	101	23	24	48-101
Acenaphthene		85	106	22	24	57-104
Fluorene		91	106	15	28	34-118
Pyrene		70	94	29	30	58-148
Chrysene		57	82	36	36	48-118

* = Diluted Out



ENSECO-WADSWORTH/ALERT
Laboratories

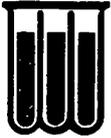
LAB ID : 3C0901-6
MATRIX : WATER

DATE RECEIVED : 03/09/93

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY
INORGANIC PARAMETERS - METALS

ELEMENT	DATE PREPARED	DATE ANALYZED	MS %REC	MSD %REC	RPD	QC LIMITS RPD %REC	LAB ID
Lead (furnace)	03/16/93	03/16/93	82	82	0	24 76-124	3C0901-6

* = Diluted out



ENSECO-WADSWORTH/ALERT
Laboratories

LAB ID : 3C0901-1
MATRIX : WATER

DATE RECEIVED : 03/09/93

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY
INORGANIC PARAMETERS - WET CHEMISTRY

PARAMETER	DATE PREPARED	DATE ANALYZED	MS %REC	MSD %REC	RPD	QC LIMITS RPD %REC	LAB ID
TRPH (IR)	03/09/93	03/10/93	104	103	1	24 75-124	3C0901-1

* = Diluted out

ENSECO-WADSWORTH/ALERT LABORATORIES SAMPLE SHIPPER EVALUATION AND RECEIPT FORM

Client: ABB Project Name/Number: CTO-11 CSS Panama City

Samples Received By: Carol McNulty (Signature) Date Received: 3/9/93

Sample Evaluation Form By: Carol McNulty (Signature) LAB No: 6492/3c 0901

Type of shipping container samples received in? WAL Cooler
 Client Cooler WAL Shipper Box Other

Any "NO" responses or discrepancies should be explained in comments section.

- | | YES | NO |
|--|-------------------------------------|-------------------------------------|
| 1. Were custody seals on shipping container(s) intact? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Were custody papers properly included with samples? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Were custody papers properly filled out (ink, signed, match labels)? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 4. Did all bottles arrive in good condition (unbroken)? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 5. Were all bottle labels complete (Sample No., date, signed, analysis preservatives)? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 6. Were correct bottles used for the tests indicated? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 7. Were proper sample preservation techniques indicated? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 8. Were samples received within adequate holding time? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 9. Were all VOA bottles checked for the presence of air bubbles? (If air bubbles were found indicate in comment section) | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 10. Were samples in direct contact with wet ice? (NOTE TEMPERATURE BELOW) | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 11. Were samples accepted into the laboratory? (If no see comments) | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

Cooler # 48-191 Temp 6 °C Cooler # 48-94 Temp 4 °C
 Cooler # 48B96 Temp 5 °C Cooler # 48-206 Temp 4 °C

Comments: Rec'd 1 lt broken for IAH for CSS-325-7

PANAMA CITY -- SITE 325 -- REPORT NO. 7229
GROUNDWATER -- KEROSENE GROUP -- HITS REPORT

Lab Sample Number:
Site
Locator
Collect Date:

9515069
PANAMA CITY 325
10G00201
17-OCT-95

9515083
PANAMA CITY 325
17G00501
18-OCT-95

9515073
PANAMA CITY 325
17G00701
17-OCT-95

9515225
PANAMA CITY 325
17G00801
19-OCT-95

VALUE QUAL UNITS DL VALUE QUAL UNITS DL VALUE QUAL UNITS DL VALUE QUAL UNITS DL

Kerosene Group

1,1,1-Trichloroethane	1 U	ug/l	1									
1,1,2,2-Tetrachloroethane	1 U	ug/l	1									
1,1,2-Trichloroethane	1 U	ug/l	1									
1,1-Dichloroethane	1 U	ug/l	1									
1,2-Dichloroethane	1 U	ug/l	1									
1,1-Dichloroethene	1 U	ug/l	1									
1,2-Dichloropropane	1 U	ug/l	1									
1,2-Dichlorobenzene	1 U	ug/l	1									
2-Chloroethyl vinyl ether	1 U	ug/l	1									
1,2-Dibromoethane	.019 U	ug/l	.019	.019 U	ug/l	.019	.018 U	ug/l	.018	.019 U	ug/l	.019
1,3-Dichlorobenzene	1 U	ug/l	1									
1,4-Dichlorobenzene	1 U	ug/l	1									
1-Methylnaphthalene	1 U	ug/l	1	1 U	ug/l	1	1.4	ug/l	1	170	ug/l	5
2-Methylnaphthalene	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1	160	ug/l	5
Acenaphthene	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1	18	ug/l	5
Acenaphthylene	1 U	ug/l	1	1 U	ug/l	1	1.5	ug/l	1	30	ug/l	5
Anthracene	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1	5 U	ug/l	5
Benzo (a) anthracene	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1	5 U	ug/l	5
Benzo (b,k) fluoranthene	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1	5 U	ug/l	5
Benzo (g,h,i) perylene	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1	5 U	ug/l	5
Benzo (a) pyrene	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1	5 U	ug/l	5
Benzene	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1	12	ug/l	1
Bromodichloromethane	1 U	ug/l	1									
Bromoform	1 U	ug/l	1									
Bromomethane	1 U	ug/l	1									
Carbon tetrachloride	1 U	ug/l	1									
Chlorobenzene	1 U	ug/l	1									
Chloroethane	1 U	ug/l	1									
Chloroform	1 U	ug/l	1									
Chloromethane	1 U	ug/l	1									
Dibromochloromethane	1 U	ug/l	1									
Dibromochloromethane	1 U	ug/l	1									
Dichlorodifluoromethane	1 U	ug/l	1									
Dibenzo (a,h) anthracene	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1	5 U	ug/l	5
Ethylbenzene	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1	71	ug/l	1
Fluoranthene	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1	5 U	ug/l	5
Fluorene	1 U	ug/l	1	1 U	ug/l	1	2.6	ug/l	1	9.2	ug/l	5
Indeno (1,2,3-cd) pyrene	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1	5 U	ug/l	5
Lead	1 U	ug/l	1	2.2 J	ug/l	1	1 U	ug/l	1	1 U	ug/l	1
Methylene chloride	1 U	ug/l	1									
Methyl tert-butyl ether	1 U	ug/l	1									
Naphthalene	1 U	ug/l	1	1 U	ug/l	1	2.3	ug/l	1	420	ug/l	5
Phenanthrene	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1	5 U	ug/l	5
Pyrene	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1	5 U	ug/l	5
Tetrachloroethene	1 U	ug/l	1									
Trichloroethene	1 U	ug/l	1									
Trichlorofluoromethane	1 U	ug/l	1									
Total petroleum hydrocarbons	1 U	mg/l	1	1 U	mg/l	1	1 U	mg/l	1	1.4	mg/l	1
Toluene	1 U	ug/l	1									
Vinyl chloride	1 U	ug/l	1									

PANAMA CITY -- SITE 325 -- REPORT NO. 7229
 GROUNDWATER -- KEROSENE GROUP -- HITS REPORT

Lab Sample Number:	9515069	9515083	9515073	9515225								
Site	PANAMA CITY 325	PANAMA CITY 325	PANAMA CITY 325	PANAMA CITY 325								
Locator	10G00201	17G00501	17G00701	17G00801								
Collect Date:	17-OCT-95	18-OCT-95	17-OCT-95	19-OCT-95								
	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL

cis-1,3-Dichloropropene	1	U	ug/l	1	1	U	ug/l	1	1	1	U	ug/l	1	1	U	ug/l	1
trans-1,3-Dichloropropene	1	U	ug/l	1	1	U	ug/l	1	1	1	U	ug/l	1	1	U	ug/l	1
trans-1,2-Dichloroethene	1	U	ug/l	1	1	U	ug/l	1	1	1	U	ug/l	1	1	U	ug/l	1
m-Xylene + p-Xylene	1	U	ug/l	1	1	U	ug/l	1	1	1	U	ug/l	1	58	U	ug/l	1
o-Xylene	1	U	ug/l	1	1	U	ug/l	1	1	1	U	ug/l	1	1	U	ug/l	1

U = NOT DETECTED J = ESTIMATED VALUE
 UJ = REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED

PANAMA CITY -- SITE 325 -- REPORT NO. 7229
GROUNDWATER -- KEROSENE GROUP -- HITS REPORT

Lab Sample Number:	9515085	9515229	9515078	9515228							
Site	PANAMA CITY 325	PANAMA CITY 325	PANAMA CITY 325	PANAMA CITY 325							
Locator	17G00901	17G01001	17G01101	17G01201							
Collect Date:	18-OCT-95	19-OCT-95	17-OCT-95	19-OCT-95							
VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL

Kerosene Group

1,1,1-Trichloroethane	1 U	ug/l	1									
1,1,2,2-Tetrachloroethane	1 U	ug/l	1									
1,1,2-Trichloroethane	1 U	ug/l	1									
1,1-Dichloroethane	1 U	ug/l	1									
1,2-Dichloroethane	1 U	ug/l	1									
1,1-Dichloroethene	1 U	ug/l	1									
1,2-Dichloropropane	1 U	ug/l	1									
1,2-Dichlorobenzene	1 U	ug/l	1									
2-Chloroethyl vinyl ether	1 U	ug/l	1									
1,2-Dibromoethane	.019 U	ug/l	.019									
1,3-Dichlorobenzene	1 U	ug/l	1									
1,4-Dichlorobenzene	1 U	ug/l	1									
1-Methylnaphthalene	38	ug/l	2	34	ug/l	1	1 U	ug/l	1	7.4	ug/l	1
2-Methylnaphthalene	53	ug/l	2	32	ug/l	1	1 U	ug/l	1	29	ug/l	1
Acenaphthene	2.3	ug/l	2	2.4	ug/l	1	1 U	ug/l	1	1.6	ug/l	1
Acenaphthylene	7.5	ug/l	2	1.8	ug/l	1	1 U	ug/l	1	17	ug/l	1
Anthracene	2 U	ug/l	2	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1
Benzo (a) anthracene	2 U	ug/l	2	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1
Benzo (b,k) fluoranthene	2 U	ug/l	2	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1
Benzo (g,h,i) perylene	2 U	ug/l	2	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1
Benzo (a) pyrene	2 U	ug/l	2	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1
Benzene	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1	1	ug/l	1
Bromodichloromethane	1 U	ug/l	1									
Bromoform	1 U	ug/l	1									
Bromomethane	1 U	ug/l	1									
Carbon tetrachloride	1 U	ug/l	1									
Chlorobenzene	1 U	ug/l	1									
Chloroethane	1 U	ug/l	1									
Chloroform	1 U	ug/l	1									
Chloromethane	1 U	ug/l	1									
Dibromochloromethane	1 U	ug/l	1									
Dibromochloromethane	1 U	ug/l	1									
Dichlorodifluoromethane	1 U	ug/l	1									
Dibenzo (a,h) anthracene	2 U	ug/l	2	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1
Ethylbenzene	26	ug/l	1	20	ug/l	1	1 U	ug/l	1	35	ug/l	1
Fluoranthene	2 U	ug/l	2	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1
Fluorene	7.1	ug/l	2	6.6	ug/l	1	1 U	ug/l	1	3.1	ug/l	1
Indeno (1,2,3-cd) pyrene	2 U	ug/l	2	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1
Lead	1 U	ug/l	1	1.2 J	ug/l	1	1.2 J	ug/l	1	1 U	ug/l	1
Methylene chloride	1 U	ug/l	1									

PANAMA CITY -- SITE 325 -- REPORT NO. 7229
GROUNDWATER -- KEROSENE GROUP -- HITS REPORT

	9515085			9515229			9515078			9515228		
	VALUE	QUAL UNITS	DL									
Lab Sample Number:	9515085			9515229			9515078			9515228		
Site	PANAMA CITY 325											
Locator	17G00901			17G01001			17G01101			17G01201		
Collect Date:	18-OCT-95			19-OCT-95			17-OCT-95			19-OCT-95		
Methyl tert-butyl ether	1 U	ug/l	1									
Naphthalene	130	ug/l	2	98	ug/l	1	1 U	ug/l	1	28	ug/l	1
Phenanthrene	2 U	ug/l	2	1.9	ug/l	1	1 U	ug/l	1	1.4	ug/l	1
Pyrene	2 U	ug/l	2	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1
Tetrachloroethene	1 U	ug/l	1									
Trichloroethene	1 U	ug/l	1									
Trichlorofluoromethane	1 U	ug/l	1									
Total petroleum hydrocarbons	6.1	mg/l	1	2	mg/l	1	1 U	mg/l	1	8.3	mg/l	1
Toluene	1 U	ug/l	1									
Vinyl chloride	1 U	ug/l	1									
cis-1,3-Dichloropropene	1 U	ug/l	1									
trans-1,3-Dichloropropene	1 U	ug/l	1									
trans-1,2-Dichloroethene	1 U	ug/l	1									
m-Xylene + p-Xylene	25	ug/l	1	30	ug/l	1	1 U	ug/l	1	2.1	ug/l	1
o-Xylene	1 U	ug/l	1	1.7	ug/l	1	1 U	ug/l	1	1 U	ug/l	1

U = NOT DETECTED J = ESTIMATED VALUE
UJ = REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED

PANAMA CITY -- SITE 325 -- REPORT NO. 7229
GROUNDWATER -- KEROSENE GROUP -- HITS REPORT

Lab Sample Number:
Site
Locator
Collect Date:

9515075
PANAMA CITY 325
17G01301
17-OCT-95

9515070
PANAMA CITY 325
17G01401
17-OCT-95

9515076
PANAMA CITY 325
17G01501
17-OCT-95

9515081
PANAMA CITY 325
17G01601
18-OCT-95

	VALUE	QUAL	UNITS	DL												
Kerosene Group																
1,1,1-Trichloroethane	1	U	ug/l	1												
1,1,2,2-Tetrachloroethane	1	U	ug/l	1												
1,1,2-Trichloroethane	1	U	ug/l	1												
1,1-Dichloroethane	1	U	ug/l	1												
1,2-Dichloroethane	1	U	ug/l	1												
1,1-Dichloroethene	1	U	ug/l	1												
1,2-Dichloropropane	1	U	ug/l	1												
1,2-Dichlorobenzene	1	U	ug/l	1												
2-Chloroethyl vinyl ether	1	U	ug/l	1												
1,2-Dibromoethane	.018	U	ug/l	.018	.019	U	ug/l	.019	.019	U	ug/l	.019	.019	U	ug/l	.019
1,3-Dichlorobenzene	1	U	ug/l	1												
1,4-Dichlorobenzene	1	U	ug/l	1												
1-Methylnaphthalene	1	U	ug/l	1	3.3	U	ug/l	1	53	U	ug/l	2	1.7	U	ug/l	1
2-Methylnaphthalene	1	U	ug/l	1	4.8	U	ug/l	1	45	U	ug/l	2	1	U	ug/l	1
Acenaphthene	1	U	ug/l	1	19	U	ug/l	1	10	U	ug/l	2	1	U	ug/l	1
Acenaphthylene	1	U	ug/l	1	7.3	U	ug/l	1	14	U	ug/l	2	1	U	ug/l	1
Anthracene	1	U	ug/l	1	1	U	ug/l	1	7.5	U	ug/l	2	1	U	ug/l	1
Benzo (a) anthracene	1	U	ug/l	1	1	U	ug/l	1	2	U	ug/l	2	1	U	ug/l	1
Benzo (b,k) fluoranthene	1	U	ug/l	1	1	U	ug/l	1	2	U	ug/l	2	1	U	ug/l	1
Benzo (g,h,i) perylene	1	U	ug/l	1	1	U	ug/l	1	2	U	ug/l	2	1	U	ug/l	1
Benzo (a) pyrene	1	U	ug/l	1	1	U	ug/l	1	2	U	ug/l	2	1	U	ug/l	1
Benzene	1	U	ug/l	1	1	U	ug/l	1	2.4	U	ug/l	2	1	U	ug/l	1
Bromodichloromethane	1	U	ug/l	1												
Bromoform	1	U	ug/l	1												
Bromomethane	1	U	ug/l	1												
Carbon tetrachloride	1	U	ug/l	1												
Chlorobenzene	1	U	ug/l	1												
Chloroethane	1	U	ug/l	1												
Chloroform	1	U	ug/l	1												
Chloromethane	1	U	ug/l	1												
Dibromochloromethane	1	U	ug/l	1												
Dibromochloromethane	1	U	ug/l	1												
Dichlorodifluoromethane	1	U	ug/l	1												
Dibenzo (a,h) anthracene	1	U	ug/l	1	1	U	ug/l	1	2	U	ug/l	2	1	U	ug/l	1
Ethylbenzene	1	U	ug/l	1	1.7	U	ug/l	1	34	U	ug/l	1	1	U	ug/l	1
Fluoranthene	1	U	ug/l	1	1	U	ug/l	1	2	U	ug/l	2	1	U	ug/l	1
Fluorene	1	U	ug/l	1	6.4	U	ug/l	1	22	U	ug/l	2	1	U	ug/l	1
Indeno (1,2,3-cd) pyrene	1	U	ug/l	1	1	U	ug/l	1	2	U	ug/l	2	1	U	ug/l	1
Lead	1	U	ug/l	1	5	U	ug/l	5	1	U	ug/l	1	9.1	U	ug/l	1
Methylene chloride	1	U	ug/l	1												

PANAMA CITY -- SITE 325 -- REPORT NO. 7229
GROUNDWATER -- KEROSENE GROUP -- HITS REPORT

Lab Sample Number:	9515075	9515070	9515076	9515081								
Site	PANAMA CITY 325	PANAMA CITY 325	PANAMA CITY 325	PANAMA CITY 325								
Locator	17G01301	17G01401	17G01501	17G01601								
Collect Date:	17-OCT-95	17-OCT-95	17-OCT-95	18-OCT-95								
	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL

Methyl tert-butyl ether	1.1	ug/l	1	1 U	ug/l	1	1 U	ug/l	1	1.4	ug/l	1
Naphthalene	1 U	ug/l	1	7.2	ug/l	1	110	ug/l	2	1.7	ug/l	1
Phenanthrene	1.4	ug/l	1	1.9	ug/l	1	13	ug/l	2	1 U	ug/l	1
Pyrene	1 U	ug/l	1	1 U	ug/l	1	2 U	ug/l	2	1 U	ug/l	1
Tetrachloroethene	1 U	ug/l	1									
Trichloroethene	1 U	ug/l	1									
Trichlorofluoromethane	1 U	ug/l	1									
Total petroleum hydrocarbons	1	mg/l	1	1.5	mg/l	1	3.1	mg/l	1	1 U	mg/l	1
Toluene	1 U	ug/l	1									
Vinyl chloride	1 U	ug/l	1									
cis-1,3-Dichloropropene	1 U	ug/l	1									
trans-1,3-Dichloropropene	1 U	ug/l	1									
trans-1,2-Dichloroethene	1 U	ug/l	1									
m-Xylene + p-Xylene	1 U	ug/l	1	1 U	ug/l	1	23	ug/l	1	1 U	ug/l	1
o-Xylene	1 U	ug/l	1	1 U	ug/l	1	1.6	ug/l	1	1 U	ug/l	1

U = NOT DETECTED J = ESTIMATED VALUE
UJ = REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED

PANAMA CITY -- SITE 325 -- REPORT NO. 7229
 GROUNDWATER -- KEROSENE GROUP -- HITS REPORT

Lab Sample Number:
 Site
 Locator
 Collect Date:

9515071
 PANAMA CITY 325
 17G01701
 17-OCT-95

9515074
 PANAMA CITY 325
 17G01801
 17-OCT-95

9515224
 PANAMA CITY 325
 17G01901
 19-OCT-95

9515084
 PANAMA CITY 325
 17G02001
 18-OCT-95

VALUE QUAL UNITS DL VALUE QUAL UNITS DL VALUE QUAL UNITS DL VALUE QUAL UNITS DL

Kerosene Group

1,1,1-Trichloroethane	1 U	ug/l	1									
1,1,2,2-Tetrachloroethane	1 U	ug/l	1									
1,1,2-Trichloroethane	1 U	ug/l	1									
1,1-Dichloroethane	1 U	ug/l	1	5	ug/l	1	1 U	ug/l	1	1 U	ug/l	1
1,2-Dichloroethane	1 U	ug/l	1									
1,1-Dichloroethene	1 U	ug/l	1									
1,2-Dichloropropane	1 U	ug/l	1									
1,2-Dichlorobenzene	1 U	ug/l	1									
2-Chloroethyl vinyl ether	1 U	ug/l	1									
1,2-Dibromoethane	.018 U	ug/l	.018	.018 U	ug/l	.018	.019 U	ug/l	.019	.018 U	ug/l	.018
1,3-Dichlorobenzene	1 U	ug/l	1									
1,4-Dichlorobenzene	1 U	ug/l	1									
1-Methylnaphthalene	4.5	ug/l	1	16	ug/l	1	2.4	ug/l	1	1 U	ug/l	1
2-Methylnaphthalene	10	ug/l	1	19	ug/l	1	3.5	ug/l	1	1 U	ug/l	1
Acenaphthene	4	ug/l	1	2.4	ug/l	1	1 U	ug/l	1	1 U	ug/l	1
Acenaphthylene	2.3	ug/l	1	2.6	ug/l	1	1 U	ug/l	1	1 U	ug/l	1
Anthracene	1 U	ug/l	1									
Benzo (a) anthracene	1 U	ug/l	1									
Benzo (b,k) fluoranthene	1 U	ug/l	1									
Benzo (g,h,i) perylene	1 U	ug/l	1									
Benzo (a) pyrene	1 U	ug/l	1									
Benzene	2.7	ug/l	1	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1
Bromodichloromethane	1 U	ug/l	1									
Bromoform	1 U	ug/l	1									
Bromomethane	1 U	ug/l	1									
Carbon tetrachloride	1 U	ug/l	1									
Chlorobenzene	1 U	ug/l	1									
Chloroethane	1 U	ug/l	1									
Chloroform	1 U	ug/l	1									
Chloromethane	1 U	ug/l	1									
Dibromochloromethane	1 U	ug/l	1									
Dibromochloromethane	1 U	ug/l	1									
Dichlorodifluoromethane	1 U	ug/l	1									
Dibenzo (a,h) anthracene	1 U	ug/l	1									
Ethylbenzene	6.2	ug/l	1	1.6	ug/l	1	10	ug/l	1	1 U	ug/l	1
Fluoranthene	1 U	ug/l	1									
Fluorene	4.1	ug/l	1	5.8	ug/l	1	1 U	ug/l	1	1 U	ug/l	1
Indeno (1,2,3-cd) pyrene	1 U	ug/l	1									
Lead	5 U	ug/l	5	1 U	ug/l	1	2.1 J	ug/l	1	1.1 J	ug/l	1
Methylene chloride	1 U	ug/l	1									

PANAMA CITY -- SITE 325 -- REPORT NO. 7229
GROUNDWATER -- KEROSENE GROUP -- HITS REPORT

	9515071			9515074			9515224			9515084		
	VALUE	QUAL UNITS	DL									
Lab Sample Number:	9515071			9515074			9515224			9515084		
Site	PANAMA CITY 325											
Locator	17G01701			17G01801			17G01901			17G02001		
Collect Date:	17-OCT-95			17-OCT-95			19-OCT-95			18-OCT-95		
Methyl tert-butyl ether	1 U	ug/l	1									
Naphthalene	20	ug/l	1	32	ug/l	1	5.3	ug/l	1	1 U	ug/l	1
Phenanthrene	1.3	ug/l	1	1.3	ug/l	1	1 U	ug/l	1	1 U	ug/l	1
Pyrene	1 U	ug/l	1									
Tetrachloroethene	1 U	ug/l	1									
Trichloroethene	1 U	ug/l	1									
Trichlorofluoromethane	1 U	ug/l	1									
Total petroleum hydrocarbons	1 U	mg/l	1	1.9	mg/l	1	1 U	mg/l	1	1 U	mg/l	1
Toluene	1 U	ug/l	1									
Vinyl chloride	1 U	ug/l	1									
cis-1,3-Dichloropropene	1 U	ug/l	1									
trans-1,3-Dichloropropene	1 U	ug/l	1									
trans-1,2-Dichloroethene	1 U	ug/l	1									
m-Xylene + p-Xylene	1 U	ug/l	1	2	ug/l	1	14	ug/l	1	1 U	ug/l	1
o-Xylene	1 U	ug/l	1									

U = NOT DETECTED J = ESTIMATED VALUE
UJ = REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED

PANAMA CITY -- SITE 325 -- REPORT NO. 7229
 GROUNDWATER -- KEROSENE GROUP -- HITS REPORT

Lab Sample Number:
 Site
 Locator
 Collect Date:

9515222
 PANAMA CITY 325
 17G02101
 19-OCT-95

9515082
 PANAMA CITY 325
 17G02201
 18-OCT-95

9515223
 PANAMA CITY 325
 17G02301
 19-OCT-95

9515068
 PANAMA CITY 325
 17G02401
 17-OCT-95

VALUE QUAL UNITS DL VALUE QUAL UNITS DL VALUE QUAL UNITS DL VALUE QUAL UNITS DL

Kerosene Group

1,1,1-Trichloroethane	1 U	ug/l	1									
1,1,2,2-Tetrachloroethane	1 U	ug/l	1									
1,1,2-Trichloroethane	1 U	ug/l	1									
1,1-Dichloroethane	1 U	ug/l	1									
1,2-Dichloroethane	1 U	ug/l	1									
1,1-Dichloroethene	1 U	ug/l	1									
1,2-Dichloropropane	1 U	ug/l	1									
1,2-Dichlorobenzene	1 U	ug/l	1									
2-Chloroethyl vinyl ether	1 U	ug/l	1									
1,2-Dibromoethane	.019 U	ug/l	.019	.019 U	ug/l	.019	.019 U	ug/l	.019	.018 U	ug/l	.018
1,3-Dichlorobenzene	1 U	ug/l	1									
1,4-Dichlorobenzene	1 U	ug/l	1									
1-Methylnaphthalene	8.4	ug/l	1	1 U	ug/l	1	120	ug/l	5	1 U	ug/l	1
2-Methylnaphthalene	28	ug/l	1	1 U	ug/l	1	94	ug/l	5	1 U	ug/l	1
Acenaphthene	1.2	ug/l	1	1 U	ug/l	1	11	ug/l	5	4.5	ug/l	1
Acenaphthylene	5.2	ug/l	1	1 U	ug/l	1	11	ug/l	5	1 U	ug/l	1
Anthracene	1 U	ug/l	1	1 U	ug/l	1	5 U	ug/l	5	1 U	ug/l	1
Benzo (a) anthracene	1 U	ug/l	1	1 U	ug/l	1	5 U	ug/l	5	1 U	ug/l	1
Benzo (b,k) fluoranthene	1 U	ug/l	1	1 U	ug/l	1	5 U	ug/l	5	1 U	ug/l	1
Benzo (g,h,i) perylene	1 U	ug/l	1	1 U	ug/l	1	5 U	ug/l	5	1 U	ug/l	1
Benzo (a) pyrene	1 U	ug/l	1	1 U	ug/l	1	5 U	ug/l	5	1 U	ug/l	1
Benzene	1 U	ug/l	1	1 U	ug/l	1	20	ug/l	1	1 U	ug/l	1
Bromodichloromethane	1 U	ug/l	1									
Bromoform	1 U	ug/l	1									
Bromomethane	1 U	ug/l	1									
Carbon tetrachloride	1 U	ug/l	1									
Chlorobenzene	1 U	ug/l	1									
Chloroethane	1 U	ug/l	1									
Chloroform	1 U	ug/l	1									
Chloromethane	1 U	ug/l	1									
Dibromochloromethane	1 U	ug/l	1									
Dibromochloromethane	1 U	ug/l	1									
Dichlorodifluoromethane	1 U	ug/l	1									
Dibenzo (a,h) anthracene	1 U	ug/l	1	1 U	ug/l	1	5 U	ug/l	5	1 U	ug/l	1
Ethylbenzene	43	ug/l	1	1 U	ug/l	1	71	ug/l	1	1 U	ug/l	1
Fluoranthene	1 U	ug/l	1	1 U	ug/l	1	5 U	ug/l	5	1 U	ug/l	1
Fluorene	8	ug/l	1	1 U	ug/l	1	5 U	ug/l	5	2	ug/l	1
Indeno (1,2,3-cd) pyrene	1 U	ug/l	1	1 U	ug/l	1	5 U	ug/l	5	1 U	ug/l	1
Lead	1 U	ug/l	1	1.2 J	ug/l	1	1 UJ	ug/l	1	1 U	ug/l	1
Methylene chloride	1 U	ug/l	1									

PANAMA CITY -- SITE 325 -- REPORT NO. 7229
GROUNDWATER -- KEROSENE GROUP -- HITS REPORT

Lab Sample Number: Site Locator Collect Date:	9515222 PANAMA CITY 325 17G02101 19-OCT-95			9515082 PANAMA CITY 325 17G02201 18-OCT-95			9515223 PANAMA CITY 325 17G02301 19-OCT-95			9515068 PANAMA CITY 325 17G02401 17-OCT-95		
	VALUE	QUAL UNITS	DL									
Methyl tert-butyl ether	1 U	ug/l	1									
Naphthalene	6.1	ug/l	1	1 U	ug/l	1	400	ug/l	5	1 U	ug/l	1
Phenanthrene	5.9	ug/l	1	1 U	ug/l	1	5 U	ug/l	5	2.5	ug/l	1
Pyrene	1 U	ug/l	1	1 U	ug/l	1	5 U	ug/l	5	1 U	ug/l	1
Tetrachloroethene	1 U	ug/l	1									
Trichloroethene	1 U	ug/l	1									
Trichlorofluoromethane	1 U	ug/l	1									
Total petroleum hydrocarbons	1.7	mg/l	1	1.2	mg/l	1	1	mg/l	1	4	mg/l	1
Toluene	1 U	ug/l	1									
Vinyl chloride	1 U	ug/l	1									
cis-1,3-Dichloropropene	1 U	ug/l	1									
trans-1,3-Dichloropropene	1 U	ug/l	1									
trans-1,2-Dichloroethene	1 U	ug/l	1									
m-Xylene + p-Xylene	82	ug/l	1	1 U	ug/l	1	60	ug/l	1	1 U	ug/l	1
o-Xylene	2	ug/l	1	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1

U = NOT DETECTED J = ESTIMATED VALUE
UJ = REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED

PANAMA CITY -- SITE 325 -- REPORT NO. 7229
GROUNDWATER -- KEROSENE GROUP -- HITS REPORT

Lab Sample Number:	9515086	9515226	9515080	9515072							
Site	PANAMA CITY 325	PANAMA CITY 325	PANAMA CITY 325	PANAMA CITY 325							
Locator	17G02501	17G02601	17G02701	17G02801							
Collect Date:	18-OCT-95	19-OCT-95	18-OCT-95	17-OCT-95							
VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL

	VALUE	QUAL UNITS	DL									
Kerosene Group												
1,1,1-Trichloroethane	1 U	ug/l	1									
1,1,2,2-Tetrachloroethane	1 U	ug/l	1									
1,1,2-Trichloroethane	1 U	ug/l	1									
1,1-Dichloroethane	1 U	ug/l	1									
1,2-Dichloroethane	1 U	ug/l	1									
1,1-Dichloroethene	1 U	ug/l	1									
1,2-Dichloropropane	1 U	ug/l	1									
1,2-Dichlorobenzene	1 U	ug/l	1									
2-Chloroethyl vinyl ether	1 U	ug/l	1									
1,2-Dibromoethane	.019 U	ug/l	.019									
1,3-Dichlorobenzene	1 U	ug/l	1									
1,4-Dichlorobenzene	1 U	ug/l	1									
1-Methylnaphthalene	1 U	ug/l	1	60	ug/l	2	1 U	ug/l	1	1 U	ug/l	1
2-Methylnaphthalene	1 U	ug/l	1	45	ug/l	2	1 U	ug/l	1	1 U	ug/l	1
Acenaphthene	1 U	ug/l	1	11	ug/l	2	1 U	ug/l	1	1 U	ug/l	1
Acenaphthylene	1 U	ug/l	1	17	ug/l	2	1 U	ug/l	1	1 U	ug/l	1
Anthracene	1 U	ug/l	1	2 U	ug/l	2	1 U	ug/l	1	1 U	ug/l	1
Benzo (a) anthracene	1 U	ug/l	1	2 U	ug/l	2	1 U	ug/l	1	1 U	ug/l	1
Benzo (b,k) fluoranthene	1 U	ug/l	1	2 U	ug/l	2	1 U	ug/l	1	1 U	ug/l	1
Benzo (g,h,i) perylene	1 U	ug/l	1	2 U	ug/l	2	1 U	ug/l	1	1 U	ug/l	1
Benzo (a) pyrene	1 U	ug/l	1	2 U	ug/l	2	1 U	ug/l	1	1 U	ug/l	1
Benzene	1 U	ug/l	1	11	ug/l	1	1 U	ug/l	1	1 U	ug/l	1
Bromodichloromethane	1 U	ug/l	1									
Bromoform	1 U	ug/l	1									
Bromomethane	1 U	ug/l	1									
Carbon tetrachloride	1 U	ug/l	1									
Chlorobenzene	1 U	ug/l	1									
Chloroethane	1 U	ug/l	1									
Chloroform	1 U	ug/l	1									
Chloromethane	1 U	ug/l	1									
Dibromochloromethane	1 U	ug/l	1									
Dibromochloromethane	1 U	ug/l	1									
Dichlorodifluoromethane	1 U	ug/l	1									
Dibenzo (a,h) anthracene	1 U	ug/l	1	2 U	ug/l	2	1 U	ug/l	1	1 U	ug/l	1
Ethylbenzene	1 U	ug/l	1	58	ug/l	1	1 U	ug/l	1	1 U	ug/l	1
Fluoranthene	1 U	ug/l	1	2 U	ug/l	2	1 U	ug/l	1	1 U	ug/l	1
Fluorene	1 U	ug/l	1	3.1	ug/l	2	1 U	ug/l	1	1 U	ug/l	1
Indeno (1,2,3-cd) pyrene	1 U	ug/l	1	2 U	ug/l	2	1 U	ug/l	1	1 U	ug/l	1
Lead	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1	1.3 J	ug/l	1
Methylene chloride	1 U	ug/l	1									

PANAMA CITY -- SITE 325 -- REPORT NO. 7229
GROUNDWATER -- KEROSENE GROUP -- HITS REPORT

Lab Sample Number:
Site
Locator
Collect Date:

9515086
PANAMA CITY 325
17G02501
18-OCT-95

9515226
PANAMA CITY 325
17G02601
19-OCT-95

9515080
PANAMA CITY 325
17G02701
18-OCT-95

9515072
PANAMA CITY 325
17G02801
17-OCT-95

	VALUE	QUAL	UNITS	DL												
Methyl tert-butyl ether	1	U	ug/l	1												
Naphthalene	1	U	ug/l	1	140	U	ug/l	2	1	U	ug/l	1	1	U	ug/l	1
Phenanthrene	1	U	ug/l	1	2	U	ug/l	2	1	U	ug/l	1	1	U	ug/l	1
Pyrene	1	U	ug/l	1	2	U	ug/l	2	1	U	ug/l	1	1	U	ug/l	1
Tetrachloroethene	1	U	ug/l	1												
Trichloroethene	1	U	ug/l	1												
Trichlorofluoromethane	1	U	ug/l	1												
Total petroleum hydrocarbons	1	U	mg/l	1	3.3	U	mg/l	1	1	U	mg/l	1	1	U	mg/l	1
Toluene	1	U	ug/l	1												
Vinyl chloride	1	U	ug/l	1												
cis-1,3-Dichloropropene	1	U	ug/l	1												
trans-1,3-Dichloropropene	1	U	ug/l	1												
trans-1,2-Dichloroethene	1	U	ug/l	1												
m-Xylene + p-Xylene	1	U	ug/l	1	64	U	ug/l	1	1	U	ug/l	1	1	U	ug/l	1
o-Xylene	1	U	ug/l	1	9.9	U	ug/l	1	1	U	ug/l	1	1	U	ug/l	1

U = NOT DETECTED J = ESTIMATED VALUE
UJ = REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED

PANAMA CITY -- SITE 325 -- REPORT NO. 7229
 GROUNDWATER -- KEROSENE GROUP -- HITS REPORT

Lab Sample Number:	9515233			9515232			9515231			9515077		
	Site	PANAMA CITY 325		Site	PANAMA CITY 325		Site	PANAMA CITY 325		Site	PANAMA CITY 325	
Locator	17GDP101			17GDP201			17GDP301			17GEB101		
Collect Date:	19-OCT-95			19-OCT-95			19-OCT-95			17-OCT-95		
	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL
Kerosene Group												
1,1,1-Trichloroethane	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1
1,1,2,2-Tetrachloroethane	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1
1,1,2-Trichloroethane	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1
1,1-Dichloroethane	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1
1,2-Dichloroethane	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1
1,1-Dichloroethene	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1
1,2-Dichloropropane	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1
1,2-Dichlorobenzene	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1
2-Chloroethyl vinyl ether	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1
1,2-Dibromoethane	.019 U	ug/l	.019	.02 U	ug/l	.02	.019 U	ug/l	.019	.018 U	ug/l	.018
1,3-Dichlorobenzene	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1
1,4-Dichlorobenzene	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1
1-Methylnaphthalene	67	ug/l	1	100	ug/l	5	69	ug/l	2	1 U	ug/l	1
2-Methylnaphthalene	56	ug/l	1	76	ug/l	5	46	ug/l	2	1 U	ug/l	1
Acenaphthene	1 U	ug/l	1	10	ug/l	5	4.1	ug/l	2	1 U	ug/l	1
Acenaphthylene	3.8	ug/l	1	5 U	ug/l	5	31	ug/l	2	1 U	ug/l	1
Anthracene	1 U	ug/l	1	5 U	ug/l	5	2 U	ug/l	2	1 U	ug/l	1
Benzo (a) anthracene	1 U	ug/l	1	5 U	ug/l	5	2 U	ug/l	2	1 U	ug/l	1
Benzo (b,k) fluoranthene	1 U	ug/l	1	5 U	ug/l	5	2 U	ug/l	2	1 U	ug/l	1
Benzo (g,h,i) perylene	1 U	ug/l	1	5 U	ug/l	5	2 U	ug/l	2	1 U	ug/l	1
Benzo (a) pyrene	1 U	ug/l	1	5 U	ug/l	5	2 U	ug/l	2	1 U	ug/l	1
Benzene	1 U	ug/l	1	18	ug/l	1	6	ug/l	1	1 U	ug/l	1
Bromodichloromethane	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1
Bromoform	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1
Bromomethane	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1
Carbon tetrachloride	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1
Chlorobenzene	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1
Chloroethane	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1
Chloroform	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1
Chloromethane	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1
Dibromochloromethane	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1
Dibromochloromethane	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1
Dichlorodifluoromethane	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1
Dibenzo (a,h) anthracene	1 U	ug/l	1	5 U	ug/l	5	2 U	ug/l	2	1 U	ug/l	1
Ethylbenzene	1 U	ug/l	1	67	ug/l	1	33	ug/l	1	1 U	ug/l	1
Fluoranthene	1 U	ug/l	1	5 U	ug/l	5	2 U	ug/l	2	1 U	ug/l	1
Fluorene	9.8	ug/l	1	5 U	ug/l	5	5.7	ug/l	2	1 U	ug/l	1
Indeno (1,2,3-cd) pyrene	1 U	ug/l	1	5 U	ug/l	5	2 U	ug/l	2	1 U	ug/l	1
Lead	1 UJ	ug/l	1	1 UJ	ug/l	1	1 UJ	ug/l	1	1 U	ug/l	1
Methylene chloride	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1

PANAMA CITY -- SITE 325 -- REPORT NO. 7229
GROUNDWATER -- KEROSENE GROUP -- HITS REPORT

Lab Sample Number:
Site
Locator
Collect Date:

9515233
PANAMA CITY 325
17GDP101
19-OCT-95

9515232
PANAMA CITY 325
17GDP201
19-OCT-95

9515231
PANAMA CITY 325
17GDP301
19-OCT-95

9515077
PANAMA CITY 325
17GEB101
17-OCT-95

	VALUE	QUAL	UNITS	DL												
Methyl tert-butyl ether	1	U	ug/l	1												
Naphthalene	53		ug/l	1	330		ug/l	5	150		ug/l	2	1	U	ug/l	1
Phenanthrene	3.6		ug/l	1	5	U	ug/l	5	2.6		ug/l	2	1	U	ug/l	1
Pyrene	1	U	ug/l	1	5	U	ug/l	5	2	U	ug/l	2	1	U	ug/l	1
Tetrachloroethene	1	U	ug/l	1												
Trichloroethene	1	U	ug/l	1												
Trichlorofluoromethane	1	U	ug/l	1												
Total petroleum hydrocarbons	1.5		mg/l	1	1.7		mg/l	1	6.1		mg/l	1	1	U	mg/l	1
Toluene	1	U	ug/l	1												
Vinyl chloride	1	U	ug/l	1												
cis-1,3-Dichloropropene	1	U	ug/l	1												
trans-1,3-Dichloropropene	1	U	ug/l	1												
trans-1,2-Dichloroethene	1	U	ug/l	1												
m-Xylene + p-Xylene	2.4		ug/l	1	50		ug/l	1	35		ug/l	1	1	U	ug/l	1
o-Xylene	1.5		ug/l	1	1	U	ug/l	1	5.5		ug/l	1	1	U	ug/l	1

U = NOT DETECTED J = ESTIMATED VALUE
UJ = REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED

PANAMA CITY -- SITE 325 -- REPORT NO. 7229
GROUNDWATER -- KEROSENE GROUP -- HITS REPORT

Lab Sample Number:	9515227	9515079	9515230					
Site	PANAMA CITY 325	PANAMA CITY 325	PANAMA CITY 325					
Locator	17GEB201	TRIP BLANK	TRIP BLANK					
Collect Date:	19-OCT-95	17-OCT-95	19-OCT-95					
VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL

Kerosene Group

1,1,1-Trichloroethane	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1
1,1,2,2-Tetrachloroethane	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1
1,1,2-Trichloroethane	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1
1,1-Dichloroethane	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1
1,2-Dichloroethane	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1
1,1-Dichloroethene	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1
1,2-Dichloropropane	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1
1,2-Dichlorobenzene	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1
2-Chloroethyl vinyl ether	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1
1,2-Dibromoethane	.019 U	ug/l	.019	-					
1,3-Dichlorobenzene	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1
1,4-Dichlorobenzene	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1
1-Methylnaphthalene	1 U	ug/l	1	-					
2-Methylnaphthalene	1 U	ug/l	1	-					
Acenaphthene	1 U	ug/l	1	-					
Acenaphthylene	1 U	ug/l	1	-					
Anthracene	1 U	ug/l	1	-					
Benzo (a) anthracene	1 U	ug/l	1	-					
Benzo (b,k) fluoranthene	1 U	ug/l	1	-					
Benzo (g,h,i) perylene	1 U	ug/l	1	-					
Benzo (a) pyrene	1 U	ug/l	1	-					
Benzene	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1
Bromodichloromethane	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1
Bromoform	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1
Bromomethane	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1
Carbon tetrachloride	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1
Chlorobenzene	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1
Chloroethane	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1
Chloroform	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1
Chloromethane	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1
Dibromochloromethane	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1
Dibromochloromethane	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1
Dichlorodifluoromethane	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1
Dibenzo (a,h) anthracene	1 U	ug/l	1	-					
Ethylbenzene	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1
Fluoranthene	1 U	ug/l	1	-					
Fluorene	1 U	ug/l	1	-					
Indeno (1,2,3-cd) pyrene	1 U	ug/l	1	-					
Lead	1 UJ	ug/l	1	-					
Methylene chloride	1 U	ug/l	1	1 U	ug/l	1	1 U	ug/l	1

PANAMA CITY -- SITE 325 -- REPORT NO. 7229
GROUNDWATER -- KEROSENE GROUP -- HITS REPORT

Lab Sample Number:
Site
Locator
Collect Date:

9515227
PANAMA CITY 325
17GE8201
19-OCT-95

9515079
PANAMA CITY 325
TRIP BLANK
17-OCT-95

9515230
PANAMA CITY 325
TRIP BLANK
19-OCT-95

	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL	VALUE	QUAL	UNITS	DL
Methyl tert-butyl ether	1	U	ug/l	1	1	U	ug/l	1	1	U	ug/l	1
Naphthalene	1	U	ug/l	1	-				-			
Phenanthrene	1	U	ug/l	1	-				-			
Pyrene	1	U	ug/l	1	-				-			
Tetrachloroethene	1	U	ug/l	1	1	U	ug/l	1	1	U	ug/l	1
Trichloroethene	1	U	ug/l	1	1	U	ug/l	1	1	U	ug/l	1
Trichlorofluoromethane	1	U	ug/l	1	1	U	ug/l	1	1	U	ug/l	1
Total petroleum hydrocarbons	1.2		mg/l	1	-				-			
Toluene	1	U	ug/l	1	1	U	ug/l	1	1	U	ug/l	1
Vinyl chloride	1	U	ug/l	1	1	U	ug/l	1	1	U	ug/l	1
cis-1,3-Dichloropropene	1	U	ug/l	1	1	U	ug/l	1	1	U	ug/l	1
trans-1,3-Dichloropropene	1	U	ug/l	1	1	U	ug/l	1	1	U	ug/l	1
trans-1,2-Dichloroethene	1	U	ug/l	1	1	U	ug/l	1	1	U	ug/l	1
m-Xylene + p-Xylene	1	U	ug/l	1	1	U	ug/l	1	1	U	ug/l	1
o-Xylene	1	U	ug/l	1	1	U	ug/l	1	1	U	ug/l	1

U = NOT DETECTED J = ESTIMATED VALUE
UJ = REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED