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CONTAMINATION ASSESSMENT REPORT ADDENDUM FOR BASE EXCHANGE SERVICE STATION BUILDING A 322 NAS KEY WEST FL

9/1/1993

ABB ENVIRONMENTAL SERVICES INC

23

CONTAMINATION ASSESSMENT REPORT ADDENDUM

BASE EXCHANGE SERVICE STATION BUILDING A-322 BOCA CHICA FIELD

NAVAL AIR STATION KEY WEST KEY WEST, FLORIDA

Unit Identification Code (UIC): N00213

Contract No. 62467-89-D-0317

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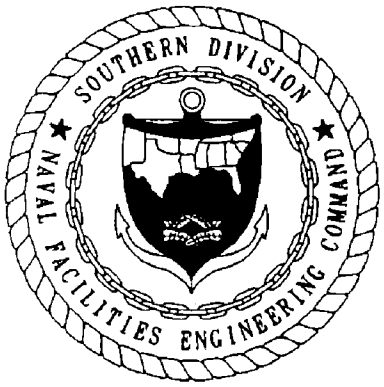

FOREWORD

Subtitle I of the Hazardous and Solid Waste Amendments of 1984 to the Solid Waste Disposal Act (SWDA) of 1965 established a national regulatory program for managing underground storage tanks (USTs) containing hazardous materials, especially petroleum products. Hazardous wastes stored in USTs were already regulated under the Resource Conservation and Recovery Act of 1976, which was also an amendment to SWDA. Subtitle I requires that the U.S. Environmental Protection Agency (USEPA) promulgate UST regulations. The program was designed to be administered by the individual States, who were allowed to develop more stringent standards, but not less stringent standards. Local governments were permitted to establish regulatory programs and standards that are more stringent, but not less stringent than either State or Federal regulations. The USEPA UST regulations are found in the Code of Federal Regulations (CFR), Title 40, Part 280 (40 CFR 280) (*Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks*) and Title 40, Part 281, (*Approval of State Underground Storage Tank Programs*). Title 40, Part 280, was revised and published on September 23, 1988, and became effective December 22, 1988.

The Navy's UST program policy is to comply with all Federal, State, and local regulations pertaining to USTs. This report was prepared to satisfy the requirements of Chapter 17-770, Florida Administrative Code (FAC) (*State Underground Petroleum Environmental Response*), regulations on petroleum contamination in Florida's environment as a result of spills or leaking tanks or piping.

Questions regarding this report should be addressed to the Environmental Coordinator, Naval Air Station, Key West, Florida, at 305-293-2194, or to Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOM), Code 1843, at DSN 563-0613 or 803-743-0613.

ACKNOWLEDGMENTS

In preparing this report, the Underground Storage Tank Section of the Comprehensive Long-Term Environmental Action, Navy (CLEAN) group at ABB Environmental Services, Inc. (ABB-ES), commends the support, assistance, and cooperation provided by the personnel of the Naval Air Station (NAS) Key West, Key West, Florida, and Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOM).

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GLOSSARY

ABB-ES	ABB Environmental Services, Inc.
bls	below land surface
CA	contamination assessment
CAP	Contamination Assessment Plan
CAR	Contamination Assessment Report
CFR	Code of Federal Regulations
CompQAPP	Comprehensive Quality Assurance Program Plan
CTO	Contract Task Order
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FDER	Florida Department of Environmental Regulation
FID	flame ionization detector
HSWA	Hazardous and Solid Waste Amendments of 1984
MOP	monitoring only plan
msl	mean sea level
MTBE	methyl tert-butyl ether
NAS	Naval Air Station
NFAP	No Further Action Proposal
OVA	organic vapor analyzer
PAH	polynuclear aromatic hydrocarbons
POA	Plan of Action
ppb	parts per billion
ppm	parts per million
PVC	polyvinyl chloride
SOUTHNAV-FACENGCOM	Southern Division, Naval Facilities Engineering Command
SWDA	Solid Waste Disposal Act of 1965
TIC	tentatively identified compound
TRPH	total recoverable petroleum hydrocarbons
UIC	uniform identification code
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey
UST	underground storage tank
VOA	volatile organic aromatics
VOC	volatile organic compound

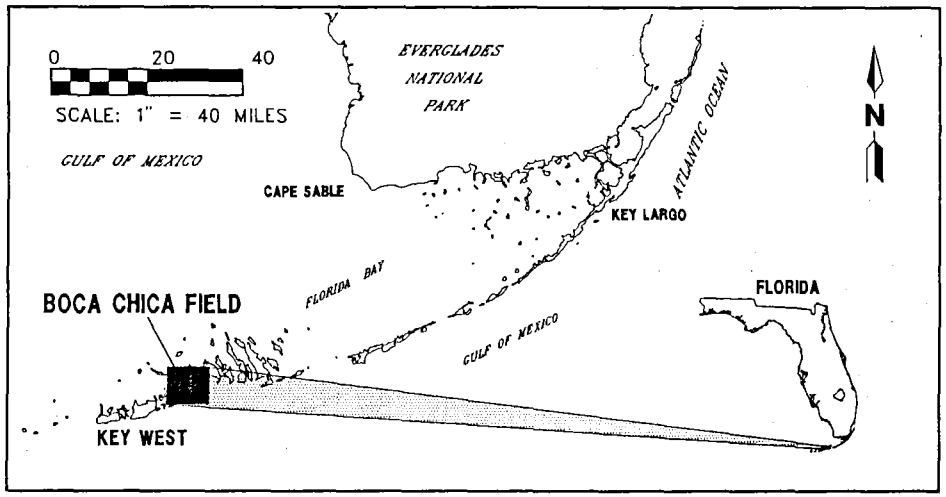
1.0 INTRODUCTION

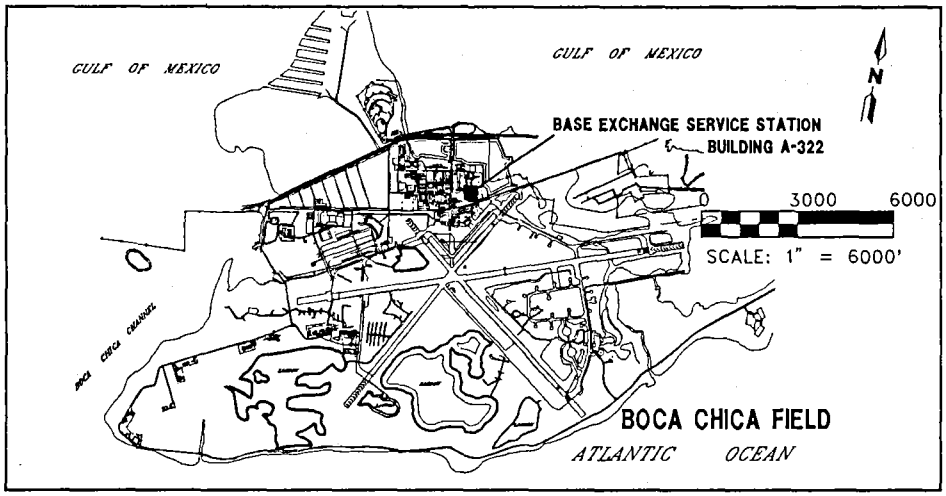
The Naval Air Station Key West (NAS Key West) is located approximately 150 miles southwest of Miami in Monroe County, Florida (Figure 1-1). NAS Key West, a complex of activities located in numerous areas of the Lower Florida Keys, encompasses approximately 5,000 acres. The majority of these activities are concentrated on Boca Chica Key and Key West. The mission of NAS Key West is to maintain and operate facilities and provide services and materials to support operations of aviation activities and units designated by the Chief of Naval Operations.

ABB Environmental Services, Inc. (ABB-ES), was contracted by Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOM) to perform a contamination assessment (CA) and submit a Contamination Assessment Report (CAR) for the reported leakage of petroleum underground storage tanks (USTs) at the Base Exchange Service Station at Boca Chica Field, NAS Key West. The scope of services is described in Contract Task Order (CTO) No. 007, the Plan of Action (POA), and the Contamination Assessment Plan (CAP) and included the following:

- drilling soil borings and analyzing site soil samples to assess the extent of soil contamination,
- installing and sampling groundwater monitoring wells to assess the 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 to estimate aquifer characteristics, and
- reducing and analyzing pertinent data gathered during the contamination assessment to complete a CAR.

The CA was conducted during July and August 1991. In February 1992, a CAR was submitted to the Florida Department of Environmental Regulation (FDER) (FDER became the Florida Department of Environmental Protection [FDEP] July 1, 1993]. At the request of FDER, a supplemental field investigation was performed, which was conducted during March and June 1993. This report is an addendum to the original CAR, and presents the findings and conclusions of the supplemental field investigation.





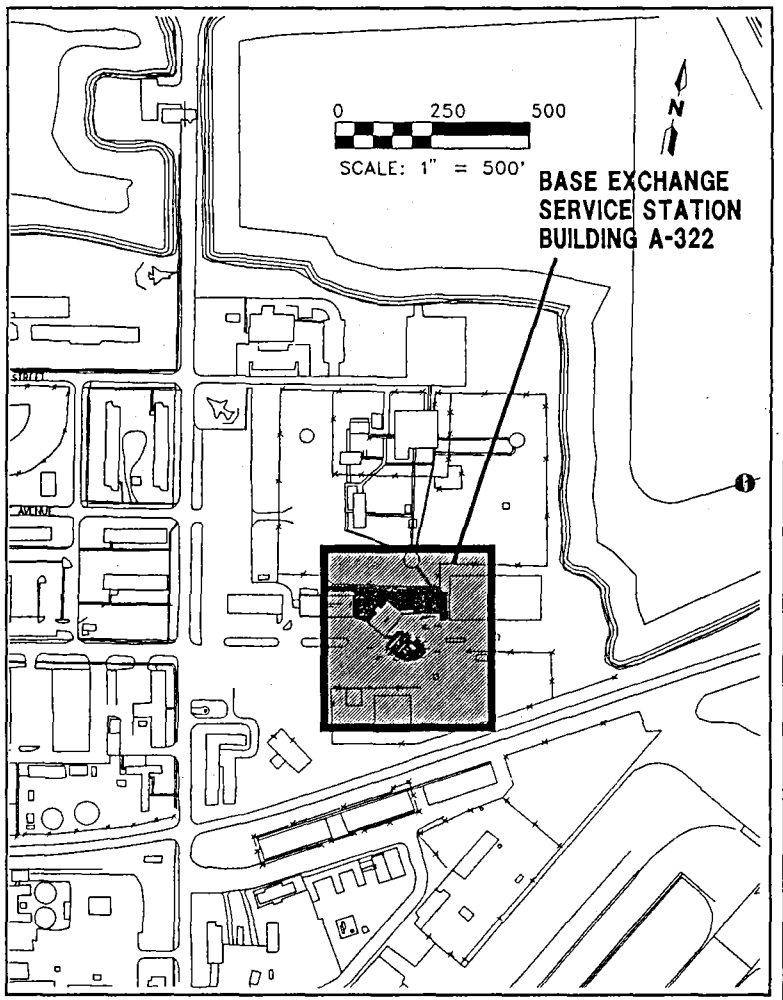


FIGURE 1-1
FACILITY LOCATION MAP

CONTAMINATION ASSESSMENT
BASE EXCHANGE SERVICE STATION

BOCA CHICA FIELD
NAVAL AIR STATION KEY WEST
KEY WEST, FLORIDA

BLDGA322/KGP/08/24/93

2.0 SITE BACKGROUND

2.1 SITE DESCRIPTION AND HISTORY. The Base Exchange Service Station (Building A-322) is located on Boca Chica Field, NAS Key West, at the east end of Langley Avenue (Figure 1-1). The Base Exchange Service Station has been in operation since 1961. The site is the location of three USTs and associated piping used to dispense unleaded and leaded gasoline. The volumes of two USTs are 5,900 gallons; the volume of the third UST is 9,400 gallons. The USTs and the dispensing system were installed in 1974 on the southeast side of Building A-322 (Figure 2-1). Precision tank testing, which was conducted in 1989, revealed that the dispensing system was leaking. A preliminary site visit revealed a 500-gallon, waste oil tank located on the northwest side of Building A-322. The age and length of service of the waste oil UST is not known. All USTs were emptied and taken out of service in 1990.

2.2 PREVIOUS SITE INVESTIGATION. During the previous site investigation, conducted in August 1991, 10 soil borings (KYW-A322-SB-1 through KYW-A322-SB-10) were drilled in the vicinity of the gasoline tank area and four borings (KYW-A322-SB-11 through KYW-A322-SB-14) were drilled in the vicinity of the waste oil tank. Eight monitoring wells (KYW-A322-MW-1 through KYW-A322-MW-8) were installed in the vicinity of the gasoline USTs and four monitoring wells (KYW-A322-MW-9 through KYW-A322-MW-12) were installed in the vicinity of the waste oil tank. Soil boring and monitoring well locations are shown in Figure 2-1. For convenience, the prefix (KYW-A322) is not shown in the tables and figures of this report.

Soil samples were collected from each boring and analyzed for volatile organic compounds (VOC) by organic vapor analyzer (OVA) headspace analysis. Groundwater samples were collected from monitoring wells in the vicinity of the gasoline USTs and were analyzed for constituents of the gasoline analytical group as defined in Chapter 17-770, Florida Administrative Code (FAC). Samples collected from monitoring wells installed in the vicinity of the waste oil UST were analyzed for constituents of the used oil group as defined in Chapter 17-770, FAC. A CAR was submitted to the Navy and FDER in February 1992.

The findings of the CAR are summarized below.

- Surficial and shallow subsurface materials are composed of white, slightly to heavily weathered, silty limestone.
- No petroleum-contaminated soil (OVA headspace readings greater than 10 parts per million [ppm]) was identified at the site. No visible staining or petroleum odors were observed in soil in the vicinity of the waste oil UST.
- Groundwater was encountered at depths of 2 to 3 feet below land surface (bls) and is classified as G-III (McKenzie, 1990).
- Groundwater flow direction at the site is predominantly to the south. Tidal fluctuations appear to cause slight changes in the groundwater flow direction. A tidal influence study indicates that groundwater flow direction varies from southwest to southeast.

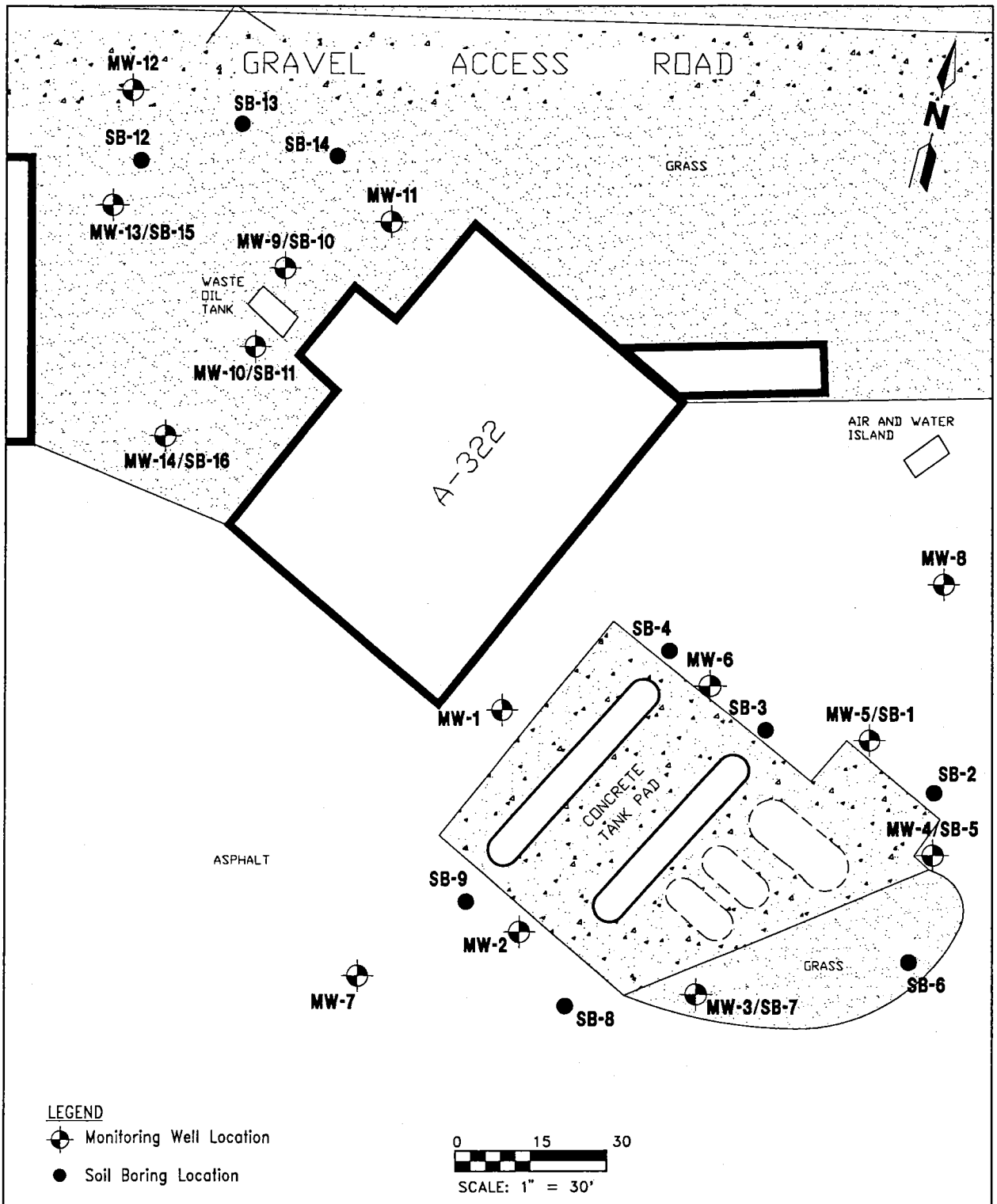


FIGURE 2-1
SITE PLAN SHOWING SOIL BORING AND MONITORING WELL LOCATIONS

BLDGA322/MP/9-23-93

CONTAMINATION ASSESSMENT REPORT ADDENDUM
BUILDING A-322
BOCA CHICA FIELD
NAVAL AIR STATION KEY WEST
KEY WEST, FLORIDA

- The only contaminants identified in groundwater samples exceeding State target levels or recommended guidance concentrations were total recoverable petroleum hydrocarbons (TRPH). TRPH were detected in samples collected from two monitoring wells in the vicinity of the waste oil UST (KYW-A322-MW-9 and KYW-A322-MW-10) at concentrations of 9 ppm and 3 ppm, respectively. The State target level for TRPH is 5 ppm for G-III groundwater. The areal extent of TRPH groundwater contamination exceeding the State target level appears to be restricted to a small, area (approximately 15 foot radius) surrounding the waste oil UST.

- Nine tentatively identified compounds were detected in samples collected from monitoring wells in the vicinity of the waste oil UST. Most of these compounds appear to be fuel constituents or breakdown products. Several unidentified compounds were also detected in samples collected from monitoring wells in the vicinity of the waste oil tank.

- No potable wells were identified within a 0.25-mile radius of the site.

- The gasoline UST system is scheduled to be removed and replaced with an aboveground system. The waste oil tank is also scheduled to be removed.

It was stated in the CAR that a No Further Action Proposal (NFAP) would be recommended if no excessively petroleum-contaminated soil and/or free product are found during tank removal activities. If free product or excessively petroleum-contaminated soil are found, the contamination will be removed during initial remedial activities, and a groundwater Monitoring Only Plan (MOP) will be implemented. The scope of the MOP would depend on the areal extent of contamination found during tank removal activities.

Upon completion of the CAR review and discussions between FDER and ABB-ES during a meeting held on April 17, 1992, it was agreed that a supplemental assessment would be conducted at the site to investigate contamination in the vicinity of the waste oil UST.

2.3 SCOPE. The scope of services developed to perform the supplemental assessment are outlined in the April 22, 1992, FDER (which became FDEP on July 1, 1993) Interoffice Memorandum from Jorge Caspary to Eric Nuzie, and the March 30, 1991, FDER Interoffice Memorandum from Jorge Caspary to Eric Nuzie (copies of these correspondences are attached in Appendix A, FDEP Correspondence). Supplemental assessment activities included the following:

- water table monitoring wells KYW-A322-MW-13 and KYW-A322-MW-14 were installed,

- monitoring wells KYW-A322-MW-9 through KYW-A322-MW-14 were sampled and analyzed for constituents of the used oil group and sulfur, and

- all data gathered during the field investigation were reduced and analyzed to prepare this CAR addendum.

3.0 SUPPLEMENTAL ASSESSMENT RESULTS

3.1 METHODOLOGIES AND EQUIPMENT. The supplemental assessment was conducted in March and July 1993. All methodologies and equipment used during the field investigation were in conformance with the ABB-ES, FDER-approved, Comprehensive Quality Assurance Program Plan (CompQAPP).

3.1.1 Soil Boring Advancement and Soil Sampling Two soil borings (KYW-A322-SB-15 and KYW-A322-SB-16) were advanced to a depth of 12 feet bls using rotary drilling and hollow-stem augers. For each boring, a soil sample was collected at a depth of 2 feet bls. Groundwater was encountered at a depth of approximately 3 feet bls. Soil samples collected above the water table were placed in 16-ounce glass jars and analyzed with an OVA equipped with a flame ionization detector (FID). Lithologic logs are attached in Appendix B, Lithologic Logs.

3.1.2 Monitoring Well Construction Monitoring wells KYW-A322-MW-13 and KYW-A322-MW-14 were installed in soil borings KYW-A322-SB-15 and KYW-A322-SB-16, respectively, to a depth of 11.5 feet bls and were constructed of 2-inch inside diameter, schedule 40, polyvinyl chloride (PVC) casing with flush-threaded joints and 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 screen. A 6- to 12-inch thick bentonite seal was placed on top of the filter pack. The remaining annular space was grouted to the surface with a neat cement grout. A protective traffic-bearing vault was installed to complete the well location. Monitoring wells are equipped with a locking well cap and a padlock. Monitoring well installation details are presented in Figure 3-1. All elevations are relative to an arbitrary reference elevation established at the site.

3.1.3 Water Table Elevation Measurements Groundwater elevations were recorded from each monitoring well at the site prior to groundwater sampling on March 27, 1993. Additional water level measurements were recorded from wells in the vicinity of the waste oil UST on June 7, 1993. Top of casing, depth to groundwater, and groundwater elevations for March 27, 1993, and June 7, 1993, are summarized in Table 3-1. All elevations are relative to an arbitrary reference elevation established at the site.

Depth to groundwater was measured using an electronic water level indicator. Water level elevations were calculated by subtracting the measured depth to groundwater from the elevation at the top of the well casing. Water level elevation contour maps for each date were prepared using this information.

3.1.4 Groundwater Sampling and Analyses Groundwater samples were collected for laboratory analysis of the used oil group and sulfur from monitoring wells KYW-A322-MW-9, KYW-A322-MW-10, and KYW-A322-MW-12 through KYW-A322-MW-14, on March 27, 1993. Because of laboratory complications, the wells were resampled on June 7, 1993, for U.S. Environmental Protection Agency (USEPA) Method 625. Because of bottle leakage, a duplicate lead analysis for the sample collected from monitoring well KYW-A322-SW12 is not available. Before sampling, each monitoring well was purged with a Teflon™ bailer until five well volumes had been removed. Groundwater samples were collected using an extruded Teflon™ bailer, placed into appropriate containers, properly preserved, placed on ice, and shipped to Wadsworth/ALERT Laboratories, Inc., in Tampa, Florida. A duplicate

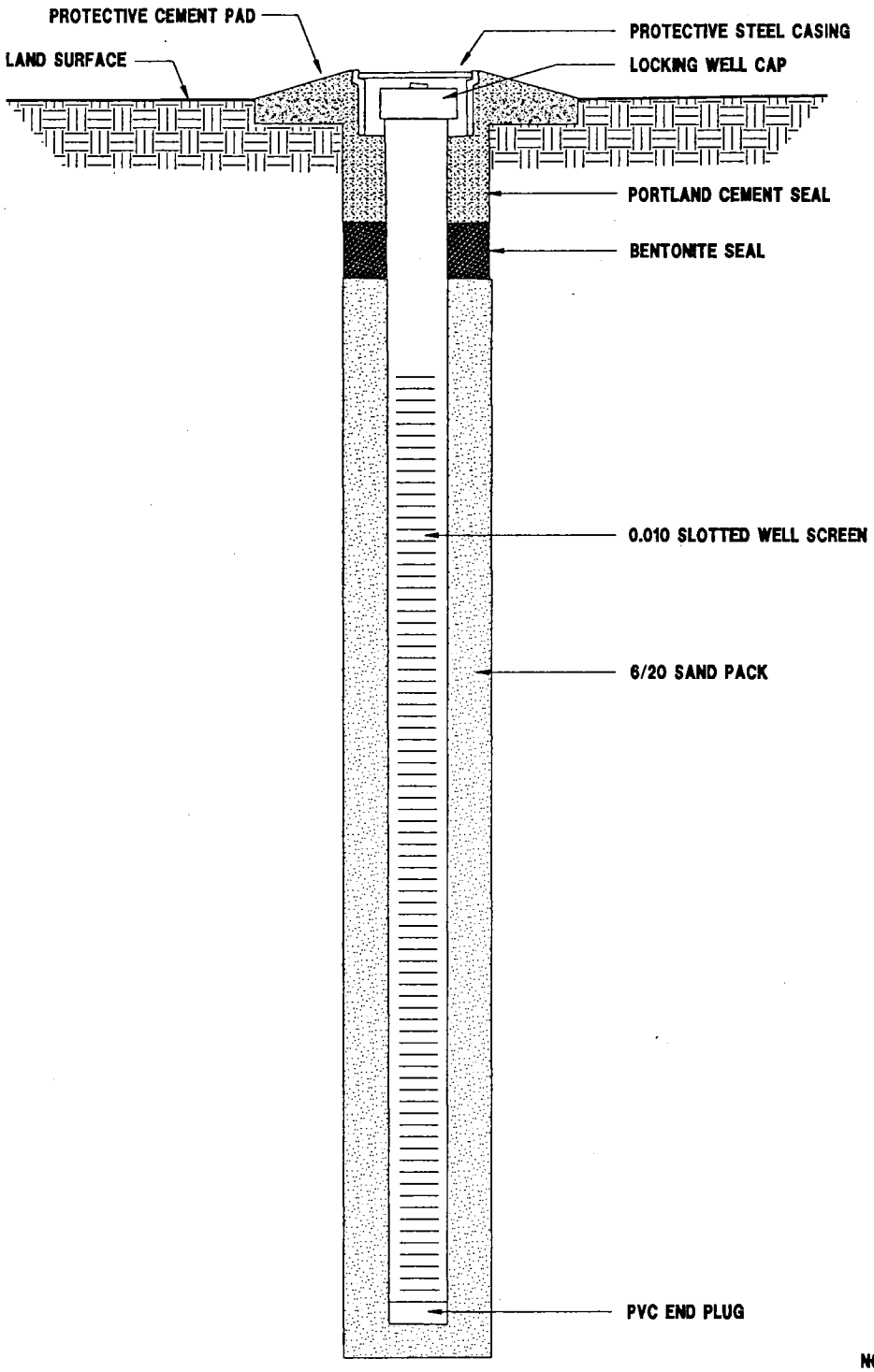


FIGURE 3-1
TYPICAL MONITORING WELL INSTALLATION DETAIL

KEYWELL/MP/9-23-93

CONTAMINATION ASSESSMENT REPORT ADDENDUM
BUILDING A-322
BOCA CHICA FIELD
NAVAL AIR STATION KEY WEST
KEY WEST, FLORIDA

Table 3-1
Top of Casing and Groundwater Elevations, March 27 and June 7, 1993

Contamination Assessment Report Addendum
Building A-322, Boca Chica Field
NAS Key West, Florida

Well Number	Top of Casing Elevation	March 27, 1993		June 7, 1993	
		Depth to Water (feet bls)	Groundwater Elevation[1] (feet)	Depth to Water (feet bls)	Groundwater Elevation[1] (feet)
MW-1	4.41	2.86	1.55	NM	--
MW-2	4.41	NM	--	NM	--
MW-3	4.35	2.96	1.39	NM	--
MW-4	3.42	2.00	1.42	NM	--
MW-5	4.12	2.75	1.37	NM	--
MW-6	4.29	2.89	1.40	NM	--
MW-7	3.65	NM	--	NM	--
MW-8	4.18	2.81	1.37	NM	--
MW-9	3.97	2.47	1.50	2.20	1.77
MW-10	4.34	2.86	1.48	2.62	1.72
MW-11	3.84	2.29	1.55	2.02	1.82
MW-12	3.94	2.48	1.46	2.10	1.84
MW-13	5.95	4.50	1.45	4.18	1.77
MW-14	5.37	3.83	1.54	3.64	1.73

[1] Top of casing and groundwater elevations relative to arbitrary site reference elevation.

Notes: bls = below land surface.
NM = not measured.
-- = no value.

sample, trip blank, and equipment blank were also analyzed. The duplicate sample was collected from monitoring well KYW-A322-MW-12.

3.2 SOIL ASSESSMENT RESULTS. No odors or discoloration were observed in the soil samples from either boring. No petroleum-contaminated soil was detected by OVA headspace analysis during this investigation or the previous investigation.

3.3 GROUNDWATER ASSESSMENT RESULTS.

3.3.1 Groundwater Flow Direction The direction of groundwater flow at the site is variable. A tidal influence study conducted during the previous investigation in August 1991, indicates that groundwater flow direction varies from southeast to southwest (ABB-ES, 1992). Water level measurements recorded on March 27, 1993, indicate a westerly flow direction in the vicinity of the waste oil UST and an easterly flow direction in the vicinity of the gasoline USTs, with an apparent piezometric "high " underneath Building A-322 (Figure 3-2). The direction of groundwater flow in the vicinity of the waste oil UST was predominantly to the southwest in August 1991. The measurements recorded on June 7, 1993, indicate a southerly flow direction (Figure 3-3).

3.3.2 Groundwater Contamination Groundwater analytical results are presented in Appendix C, and are summarized in Table 3-2 and in Figure 3-4. TRPH, methyl tert-butyl ether (MTBE), acetone, and sulfur were detected in groundwater samples collected at the site. In addition, 1,2,4,5,7,8-hexathionane, hexathiepane, and 1,2,4-trithiolane were tentatively identified. Two unknown compounds were detected in the sample collected from monitoring well KYW-A322-MW-9. Lead was detected only in the equipment blank associated with the March 27, 1993, sampling event.

TRPH were detected in the samples collected from the two monitoring wells located nearest to the waste oil UST, KYW-A322-MW-9 and KYW-A322-MW-10, at concentrations of 11 ppm and 3 ppm, respectively. The State target level for TRPH in G-III groundwater is 5 ppm.

MTBE was detected in the samples collected from wells KYW-A322-MW-9, KYW-A322-MW-10, and KYW-A322-MW-14, at concentrations of 3 parts per billion (ppb), 20 ppb, and 14 ppb, respectively. There is no State target level for MTBE for G-III groundwater; however, none of the reported MTBE concentrations exceeds the State target level of 50 ppb for G-II groundwater.

Acetone was detected in the samples collected from monitoring wells KYW-A322-MW-13 and KYW-A322-MW-14, at concentrations of 100 ppb and 310 ppb, respectively. The reported acetone concentrations are well below the State recommended guidance concentration of 700 ppb (FDER, February 1989). Because acetone is a breakdown product of isopropyl alcohol, which is used in the decontamination procedures of sampling equipment, the presence of acetone in these samples may be the result of equipment contamination.

Sulfur was detected in the samples collected from each of the monitoring wells, at concentrations ranging from 36 ppb to 130 ppb.

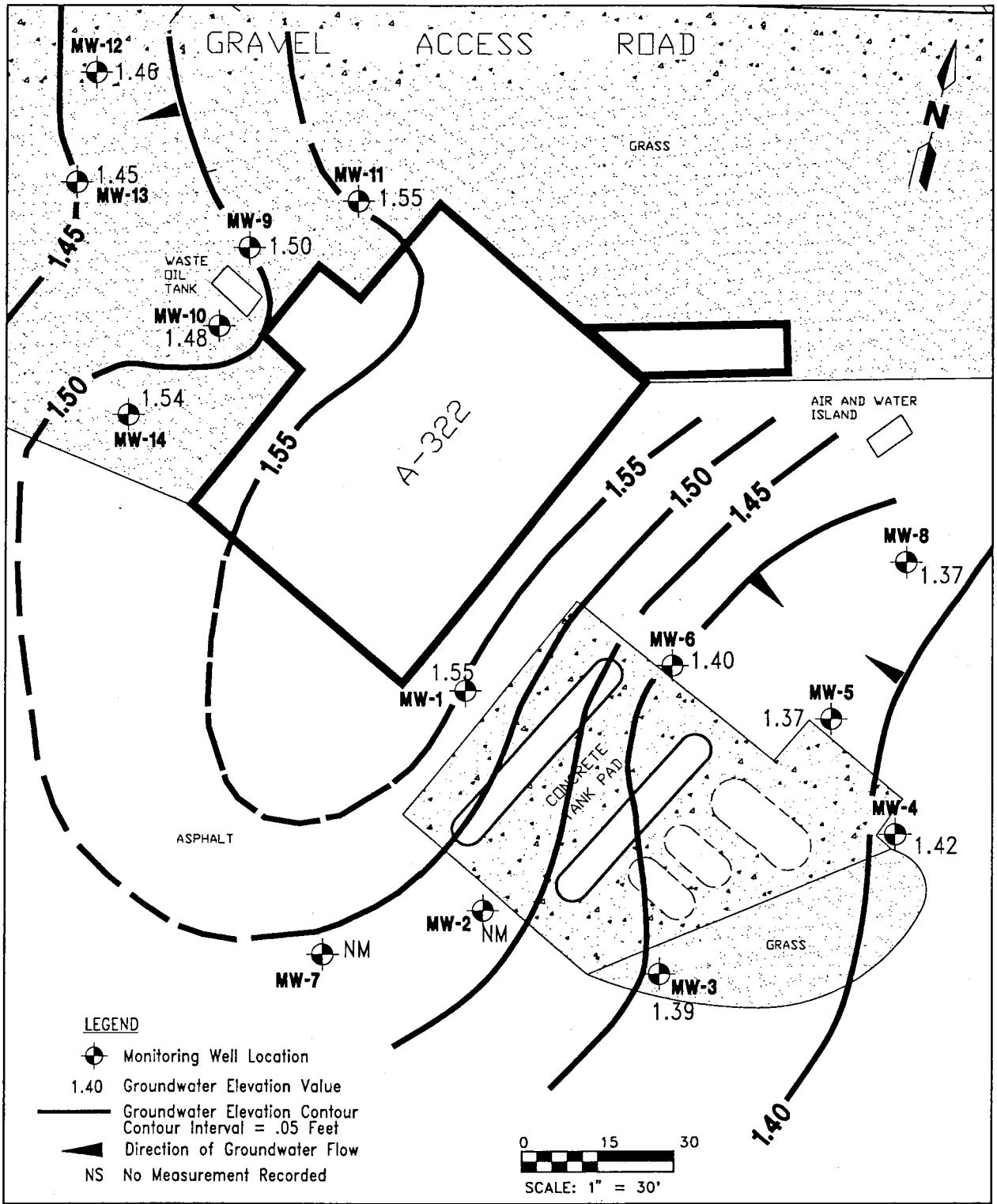


FIGURE 3-2
WATER TABLE ELEVATION CONTOUR MAP
SURFICIAL AQUIFER, MARCH 27, 1993

BLDGA322/KGP/9-23-93

CONTAMINATION ASSESSMENT
REPORT ADDENDUM
BUILDING A-322
BOCA CHICA FIELD
NAVAL AIR STATION KEY WEST
KEY WEST, FLORIDA

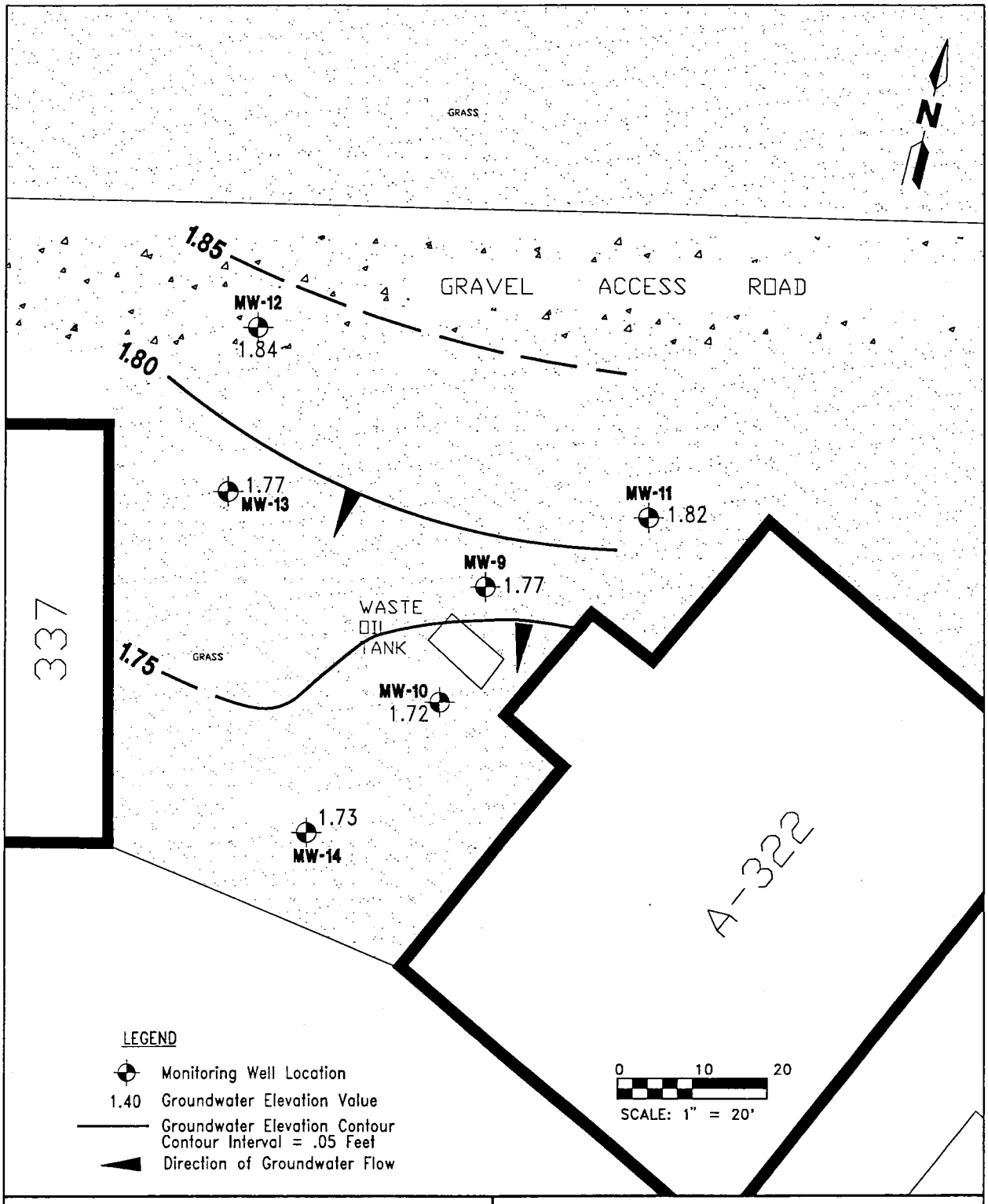


FIGURE 3-3
WATER TABLE ELEVATION CONTOUR MAP
SURFICIAL AQUIFER, JUNE 7, 1993

BUDGA322/MP/9-23-93

CONTAMINATION ASSESSMENT
REPORT ADDENDUM
BUILDING A-322
BOCA CHICA FIELD
NAVAL AIR STATION KEY WEST
KEY WEST, FLORIDA

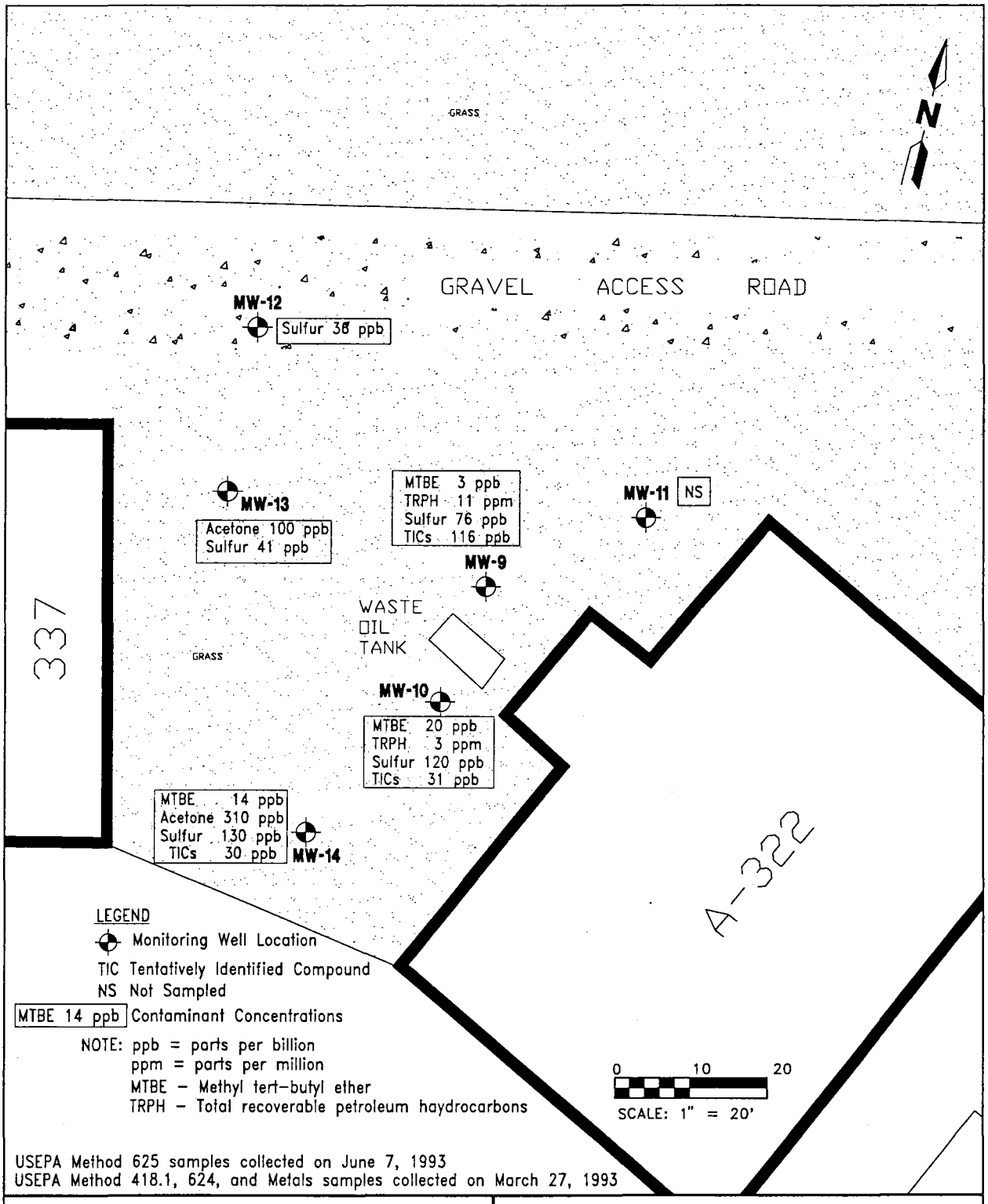


FIGURE 3-4
GROUNDWATER CONTAMINATION DISTRIBUTION MAP
MARCH 27, 1993, AND JUNE 7, 1993

CONTAMINATION ASSESSMENT REPORT ADDENDUM
BUILDING A-322
BOCA CHICA FIELD
NAVAL AIR STATION KEY WEST
KEY WEST, FLORIDA

BLDGA322/NP/9-23-93

Table 3-2
Summary of Groundwater Sample Laboratory Analyses, March 27 and June 7, 1993

Contamination Assessment Report Addendum
Building A-322, Boca Chica Field
Key West, Florida

Compound	State Target Level or Recommended Guidance Concentration	MW-9	MW-10	MW-12	MW-13	MW-14	DUP[1]	EB
MTBE	50[2]	3	20	ND	ND	14	ND	ND
Acetone	700[3]	ND	ND	ND	100	310	ND	ND
Sulfur		76	120	36	41	130	ND	ND
Lead	15	ND	ND	ND	ND	ND	NA	21
TRPH	5[2]	11	3	ND	ND	ND	ND	ND
1,2,4,5,7,8-Hexathionane[4]		74	ND	ND	ND	ND	ND	ND
Hexathiepane[4]		16	ND	ND	ND	18	ND	ND
1,2,4-Trithiolane[4]		ND	31	ND	ND	12	ND	ND
Unknowns		26	ND	ND	ND	ND	ND	ND
Total TICs		116	31	ND	ND	30	ND	ND

[1]Duplicate sample taken from MW-12.
[2]State target level, Chapter 17-770, Florida Administrative Code.
[3]Recommended guidance concentration, Florida Department of Environmental Regulation, February 1989.
[4]Tentatively identified compound.

Notes: All concentrations are in parts per billion except for TRPH, which is in parts per million.
EB = equipment blank.
MTBE = methyl tert-butyl ether
ND = not detected.
NA = not analyzed (see text for explanation.
TRPH = total recoverable petroleum hydrocarbons.
TIC = tentatively identified compound.

Lead was only detected in the equipment blank, at a concentration of 21 ppb. Because lead was not detected in any samples collected from monitoring wells, it does not appear to be a concern at this site. The source of lead in the equipment blank is not known.

3.3.2.1 **Total Recoverable Petroleum Hydrocarbons (TRPH)** TRPH were the only groundwater contaminants detected that exceeded State target levels or recommended guidance concentrations in both the August 1991 and March 1993 sampling events. TRPH concentrations from both of these sampling events are summarized in Figure 3-5. Because TRPH were detected in only the samples collected from monitoring wells KYW-A322-MW-9 and KYW-A322-MW-10, the areal extent of TRPH groundwater contamination, which is represented by the 5 ppm isocon in Figure 3-5, appears to be restricted to the immediate vicinity of the waste oil UST.

Although the areal extent of TRPH contamination ia limited, the occurrence of TRPH contamination appears to be persistent. TRPH concentrations in the samples collected from monitoring well KYW-A322-MW-9 increased slightly from 9 ppm in August 1991 to 11 ppm in March 1993. TRPH concentrations in the samples collected from monitoring well KYW-A322-MW-10 were 3 ppm for both the August 1991 and March 1993 sampling events.

3.3.2.2 **Tentatively Identified Compounds** Three tentatively identified compounds (TICs) were detected in samples collected from monitoring wells KYW-A322-MW-9, KYW-A322-MW-10, and KYW-A322-MW-14. Monitoring wells KYW-A322-MW-9 and KYW-A322-MW-10 are located within 10 feet of the waste oil UST. Monitoring well KYW-A322-MW-14 is located approximately 22 feet south of the waste oil UST.

The TIC's are hydrocarbons in which sulfur has substituted for carbon in the molecule. The compound 1,2,4,5,7,8-hexathionane was tentatively identified only in the sample collected from monitoring well KYW-A322-MW9, at an estimated concentration of 74 parts per billion (ppb). Hexathiepane was tentatively identified in the samples collected from monitoring wells KYW-A322-MW-9 and KYW-A322-MW-14 at estimated concentrations of 16 ppb and 18 ppb, respectively. The compound 1,2,4-trithiolane was tentatively identified in the samples collected from monitoring wells KYW-A322-MW-10 and KYW-A322-MW-12 at estimated concentrations of 31 ppb and 12 ppb, respectively.

Two unknown compounds were detected in the sample collected from monitoring well KYW-A322-MW-9, at a combined estimated concentration of 26 ppb.

The TICs and unknown compounds do not appear to be persistent in groundwater samples. For example, trifluoroacetic acid, 1,3-benzondioxole-5-carboxylic acid, and the four unknown compounds detected in the sample collected from monitoring well KYW-A322-MW-12 in the August 1991 sampling event were not detected in the March 1993 sampling event. No other compounds were detected in the March 1993 sample collected from monitoring well KYW-A322-MW-12. Hexathiepane, which was detected in the samples collected from monitoring well KYW-A322-MW-9 in the March 1993 sampling event, was not detected in the August 1991 sampling event. The compound 1,2,4,5,7,8-hexathionane, which was detected in the sample collected from monitoring well KYW-A322-MW-9 in the March 1993 sampling event, was not detected in the August 1991 sampling event.

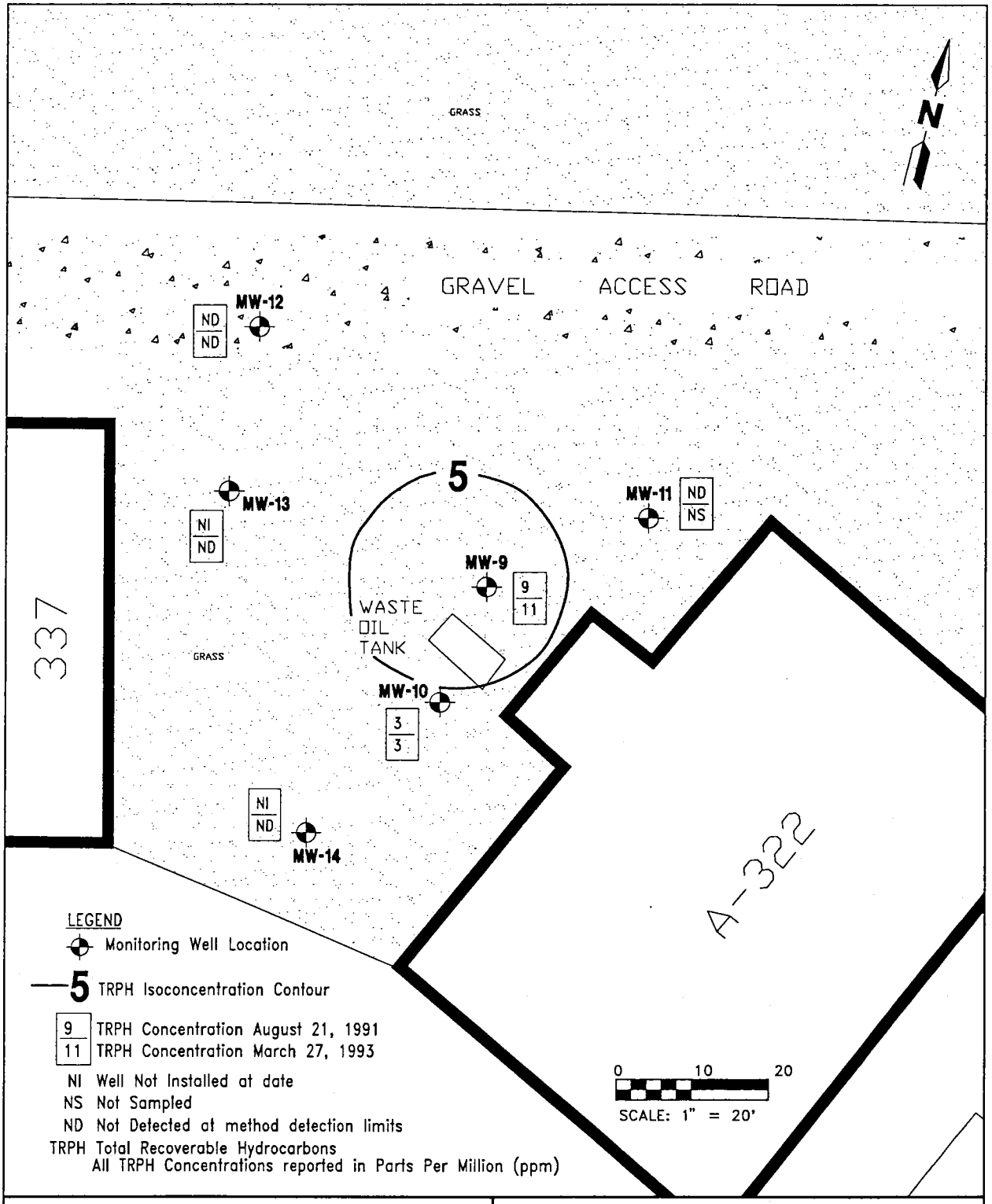


FIGURE 3-5
TOTAL RECOVERABLE HYDROCARBON (TRPH), GROUNDWATER CONTAMINATION DISTRIBUTION MAP, AUGUST 21, 1991, AND MARCH 27, 1993

BLDGA322/MP/9-23-93

CONTAMINATION ASSESSMENT REPORT ADDENDUM
BUILDING A-322
BOCA CHICA FIELD
NAVAL AIR STATION KEY WEST
KEY WEST, FLORIDA

4.0 SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

4.1 SUMMARY. Based on results of the August 1991 investigation and the additional field investigations conducted in March and June 1993, the following is a summary of the conditions at Building A-322.

- The surficial aquifer in the Key West area is classified as a Class G-III groundwater source. There are no known potable wells in the Key West area (McKenzie, 1990).

- No petroleum contaminated soil was identified at the site.

- No free product was found at the site.

- The findings of the CAR submitted in February 1992 for Building A-322 indicate there is no groundwater or soil contamination associated with the gasoline USTs at the site.

- The only contaminants identified in groundwater samples that exceed State target levels or recommended guidance concentrations are TRPH. TRPH were detected in samples collected from two monitoring wells in the vicinity of the waste oil UST at concentrations of 9 ppm and 3 ppm. The areal extent of groundwater contamination exceeding the State target level for TRPH is limited to a small area surrounding the waste oil UST.

- Nine tentatively identified compounds were detected in samples collected from monitoring wells in the vicinity of the waste oil UST. Most of these compounds appear to be petroleum constituents or petroleum-derived products. Low concentrations of several unidentified compounds were also detected in samples collected from monitoring wells in the vicinity of the waste oil tank.

4.2 CONCLUSIONS

- TRPH are the only groundwater contaminants detected in excess of State G-III groundwater target levels.

- Historical information and results of soil and groundwater analyses indicate the source of TRPH contamination in groundwater at the site is the waste oil UST. The source of contamination has been abated; the waste oil UST was emptied and taken out of service in 1990.

- Comparison of groundwater analytical data collected in August 1991 and March and June 1993 indicate that TRPH contamination in the groundwater is persistent; however, TRPH groundwater contamination does not appear to be migrating off the site.

4.3 RECOMMENDATIONS. Based on the findings and conclusions of the CAR and CAR Addendum, a Monitoring Only Proposal (MOP) is recommended for Site A322. It is recommended that groundwater samples be collected from monitoring wells KYW-A322-MW-9, KYW-A322-MW-10, KYW-A322-MW-11, and KYW-A322-MW-14 semi-annually for a period of 2 years and analyzed for used oil group parameters. Monitoring wells KYW-A322-MW-9 and KYW-A322-MW-10 are located inside the contaminant plume (Figure 3-4), KYW-A322-MW-11 is located upgradient of the plume, and KYW-A322-MW-14 is located downgradient of the plume. The sampling schedule is based on analytical data collected at the site, which indicate that TRPH concentrations in monitoring wells KYW-A322-MW-9 and KYW-A322-MW-10 have persisted during the past 2 years.

If contaminant levels drop below State target levels at the end of the monitoring period, a NFAP will be submitted. If contaminant levels persist above State target levels, then additional monitoring or remediation may be required.

5.0 PROFESSIONAL REVIEW CERTIFICATION

The contamination assessment contained in this report was prepared using sound, hydrogeologic principles and judgment. This assessment is based on the geologic investigation and associated information detailed in the CAR and in the text and appended to this report. If conditions are determined to exist that differ from those described, the undersigned geologist should be notified to evaluate the effects of any additional information on the assessment described in this report. This Contamination Assessment Report Addendum was developed for the 500-gallon waste oil UST located at the Base Exchange Service Station (Building A-322) at Boca Chica Field, Naval Air Station, Key West, Florida, and should not be construed to apply to any other site.

_____

Roger Durham
Professional Geologist
P.G. No. 001127

_____

Date

REFERENCES

ABB Environmental Services, Inc., 1992, Contamination Assessment Report, Base Exchange Service Station, Building A-322, Boca Chica Field, Naval Air Station, Key West, Florida: prepared for Southern Division, Naval Facilities Engineering Command, Charleston, South Carolina.

McKenzie, D.J., 1990, Water resources potential of the freshwater lens at Key West, Florida: U.S. Geological Survey Water-Resources Investigations Report 90-4115, 24 p.

APPENDIX A

FDEP CORRESPONDENCE

State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

For Routing To Other Than The Addressee
To _____ Location _____
To _____ Location _____
To _____ Location _____
From _____ Date _____

Interoffice Memorandum

TO: Eric S. Nuzie, Federal Facilities Coordinator

THROUGH: Dr. James J. Crane, PGIII/Administrator
Technical Review Section JJC

FROM: Jorge R. Caspary P.G., Base Coordinator
Technical Review Section J.R.C.

DATE: March 30, 1991

SUBJECT: Review of Draft Contamination Assessment Reports for Base Exchange Service Station Building A-322, PHMRON Maintenance Ramp Building 352, Public Works Motor Pool Building A-317, and Berthing Wharf Building 189. Key West Naval Air Station.

I have reviewed the aforementioned documents and offer the following comments for your consideration:

Base Exchange Service Station Bldg A-322

1- Two additional, permanent wells should be installed as follows:

A water table well located approximately 20 feet southwest of KYWA322-10 and another water table well located twenty feet southwest of KYWA322-12.

2- After installation of the supplemental monitoring wells, they should be sampled and analyzed for EPA Methods 624/625 (unknown peaks larger than 10 ppb should be identified), 418.1, and priority metals.

3- A complete round of sampling and analysis should be conducted at wells being influenced either by the gasoline or the waste oil tanks. Note, additional monitoring wells should be installed if significant contaminant concentrations are detected at any well.

4- The soil data from the tank excavations should accompany the final, revised document

For Routing To Other Than The Addressee

To _____ Location _____

To _____ Location _____

To _____ Location _____

From _____ Date _____

State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

Interoffice Memorandum

TO: Eric S. Nuzie, Federal Facilities Coordinator
Bureau of Waste Cleanup

THROUGH: Dr. James J. Crane, PGIII/Administrator JJC
Technical Review Section

FROM: Jorge R. Caspary P.G., Base Coordinator J.R.C.
Technical Review Section

DATE: April 22, 1992

SUBJECT: Meeting with ABB Environmental Services, Inc. on Contamination Assessment Reports for Base Exchange Station Bldg. A-322, PHMRON Maintenance Ramp Bldg. 352, Public Works Motor Pool Bldg. A-317, and Berthing Wharf Bldg. 189. Key West Naval Air Station

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As agreed during an April 17th meeting with an ABB Environmental Services, Inc. representative, and followed by a confirmatory telephone conversation on April 21st, the following comments are issued on a site specific basis.

Base Exchange Service Station Bldg. A-322

As accorded with the ABB project manager, comments 1 and 2 of the March 30th interoffice memorandum are left as optional. However, it must be noted that if significant contaminant concentrations are detected at wells KYWA322- 9, 10, and 11, the previously asked water table monitoring wells will be required.

Comment 3 is rescinded. Only wells number 9, 10, and 12 will be required to be sampled and analyzed. Said wells should be analyzed for EPA Methods 624 and 625 for listed compounds. Non Priority Pollutants with peaks larger than 10 ppb should also be identified. In addition, a confirmatory analysis for Sulfur in groundwater should be implemented.

PHMRON Maintenance Ramp Bldg. 352

An additional well is needed downgradient of the underground storage tank. Well KYW352-1 is lateral to the groundwater flow.

APPENDIX B

LITHOLOGIC LOGS

TITLE: NAS Key West, Truman Annex		**LOG of WELL:** KYW-A322-MW13	**BORING NO.** KYW-A322-SB15
CLIENT: SOUTHNAVFACENGCOM			**PROJECT NO:** 7519-30
CONTRACTOR: Groundwater Protection Inc.		**DATE STARTED:** 3/23/93	**COMPLTD:** 3/23/93
METHOD: 4.25" HSA	**CASE SIZE:** 2 inch	**SCREEN INT.:** 1.5-11.5 FT	**PROTECTION LEVEL:** D
TOC ELEV.: 5.95 FT.	**MONITOR INST.:** OVA	**TOT DPTH:** 11.5FT.	**DPTH TO ▽** 4.50 FT.
LOGGED BY: R. Durham	**WELL DEVELOPMENT DATE:** 3/23/93		**SITE:** Bldg. A322, Filling Station

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5				0	SAND: light tan, very fine-grained to silty, mixed with gray and tan limerock.		SM		▽
10									
15									
20									

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE: NAS Key West, Truman Annex	**LOG of WELL:** KYW-A322-MW14		**BORING NO.** KYW-A322-SB16
CLIENT: SOUTHNAVFACENGCOM			**PROJECT NO:** 7519-30
CONTRACTOR: Groundwater Protection Inc.		**DATE STARTED:** 3/23/93	**COMPLTD:** 3/23/93
METHOD: 4.25" HSA	**CASE SIZE:** 2 inch	**SCREEN INT.:** 1.5-11.5 FT	**PROTECTION LEVEL:** D
TOC ELEV.: 5.37 FT.	**MONITOR INST.:** OVA	**TOT DPTH:** 11.5FT.	**DPTH TO ▽** 3.83 FT.
LOGGED BY: R. Durham	**WELL DEVELOPMENT DATE:** 3/23/93		**SITE:** Bldg. A322, Filling Station

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
5				0	SAND: light tan, very fine-grained to silty, mixed with limerock.		SM		
10									
15									
20									

 ABB ENVIRONMENTAL SERVICES, INC.

APPENDIX C

GROUNDWATER ANALYTICAL DATA, MARCH 27, 1993 AND JUNE 7, 1993, SAMPLING EVENT

GROUNDWATER ANALYTICAL DATA
MARCH 27, 1993, SAMPLING EVENT

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: 0019

BOCA CHICA BLDG A322

Presented to:

ROGER DURHAM

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 20, 1993

ENSECO-WADSWORTH/ALERT
Laboratories

INVOLVEMENT

This report summarizes the analytical results of the Boca Chica Bldg A322 site submitted by ABB Environmental Services, Inc. to Enseco-Wadsworth/ALERT Laboratories who provided independent, analytical services for this project under the direction of Roger Durham. The samples were accepted into Wadsworth's Florida facility on 30 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 624
METALS	
Arsenic	** EPA Method 206.2
Cadmium	** EPA Method 200.7
Chromium	** EPA Method 200.7
Lead	** EPA Method 239.2
Sulfur	** EPA Method 200.7
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 Drinking Waters USEPA, 600/4-88/039, December, 1988.
Std. Methods	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.
SW846 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.

ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3C3102-1
MATRIX: WATER

DATE RECEIVED: 3/30/93
DATE EXTRACTED: NA
DATE ANALYZED: 4/ 7/93

SAMPLE ID: KYW-A322-MW9 BOCA CHICA-BLDG A322

CERTIFICATION #: E84059
HRS84297

VOLATILE ORGANICS
USEPA METHOD 624 - GC/MS

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

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
ND* (None Detected, lower detectable limit = 10 ug/L) as rec'd
ND** (None Detected, lower detectable limit = ug/L) as rec'd
J (Detected, but below quantitation limit; estimated value)
B (Compound detected in method blank associated with this sample)
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS WATER	SOLID	LOW LEVEL
1,2-Dichloroethane	86	(75-123)	(85-126)	(85-138)
Toluene-d8	92	(75-123)	(89-124)	(89-128)
Bromofluorobenzene	92	(86-115)	(84-124)	(83-128)

ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3C3102-1
MATRIX: WATER

DATE RECEIVED: 3/30/93
DATE EXTRACTED: NA
DATE ANALYZED: 4/ 7/93

SAMPLE ID: KYW-A322-MW9 BOCA CHICA-BLDG A322

CERTIFICATION #: E84059
HRS84297

VOLATILE ORGANICS
OTHER COMPOUNDS

Methyl-tert-butyl ether	3 ug/L

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS
with their estimated concentrations

ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 3/30/93
LAB #: 3C3102-1
MATRIX : WATER

SAMPLE ID : KYW-A322-MW9 BOCA CHICA-BLDG A322

CERTIFICATION #: E84059
HRS84297

METALS ANALYTICAL REPORT
SELECTED LIST

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Arsenic	4/ 2- 4/ 5/93	ND	10	ug/L
Cadmium	4/ 2- 4/ 7/93	ND	10	ug/L
Chromium	4/ 2- 4/ 7/93	ND	50	ug/L
Lead	4/ 2- 4/ 8/93	ND	5	ug/L
Sulfur	4/ 2- 4/ 7/93	76	10	mg/L

NOTE: ND (None Detected)

ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 3/30/93
LAB #: 3C3102-1
MATRIX : WATER

SAMPLE ID : KYW-A322-MW9 BOCA CHICA-BLDG A322

CERTIFICATION #: E84059
HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Tot Recoverable Pet Hydrocarbons	4/ 5- 4/ 6/93	11	5	mg/L

NOTE: ND (None Detected)

ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3C3102-2
MATRIX: WATER

DATE RECEIVED: 3/30/93
DATE EXTRACTED: NA
DATE ANALYZED: 4/ 7/93

SAMPLE ID: KYW-A322-MW10 BOCA CHICA-BLDG A322

CERTIFICATION #: E84059
HRS84297

VOLATILE ORGANICS
USEPA METHOD 624 - GC/MS

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

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
ND* (None Detected, lower detectable limit = 10 ug/L) as rec'd
ND** (None Detected, lower detectable limit = ug/L) as rec'd
J (Detected, but below quantitation limit; estimated value)
B (Compound detected in method blank associated with this sample)
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS WATER	SOLID	LOW LEVEL
1,2-Dichloroethane	91	(75-123)	(85-126)	(85-138)
Toluene-d8	94	(75-123)	(89-124)	(89-128)
Bromofluorobenzene	91	(86-115)	(84-124)	(83-128)

ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3C3102-2
MATRIX: WATER

DATE RECEIVED: 3/30/93
DATE EXTRACTED: NA
DATE ANALYZED: 4/ 7/93

SAMPLE ID: KYW-A322-MW10 BOCA CHICA-BLDG A322

CERTIFICATION #: E84059
HRS84297

VOLATILE ORGANICS
OTHER COMPOUNDS

Methyl-tert-butyl ether	20 ug/L

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS
with their estimated concentrations

ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 3/30/93
LAB #: 3C3102-2
MATRIX : WATER

SAMPLE ID : KYW-A322-MW10 BOCA CHICA-BLDG A322

CERTIFICATION #: E84059

METALS ANALYTICAL REPORT HRS84297
SELECTED LIST

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Arsenic	4/ 2- 4/ 5/93	ND	10	ug/L
Cadmium	4/ 2- 4/ 7/93	ND	10	ug/L
Chromium	4/ 2- 4/ 7/93	ND	50	ug/L
Lead	4/ 2- 4/ 8/93	ND	5	ug/L
Sulfur	4/ 2- 4/ 7/93	120	100	mg/L

NOTE: ND (None Detected)

ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 3/30/93
LAB #: 3C3102-2
MATRIX : WATER

SAMPLE ID : KYW-A322-MW10 BOCA CHICA-BLDG A322

CERTIFICATION #: E84059
HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Tot Recoverable Pet Hydrocarbons	4/ 5- 4/ 6/93	3	1	mg/L

NOTE: ND (None Detected)

ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3C3102-3
MATRIX: WATER

DATE RECEIVED: 3/30/93
DATE EXTRACTED: NA
DATE ANALYZED: 4/ 7/93

SAMPLE ID: KYW-A322-MW12 BOCA CHICA-BLDG A322

CERTIFICATION #: E84059
HRS84297

VOLATILE ORGANICS
USEPA METHOD 624 - GC/MS

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

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
ND* (None Detected, lower detectable limit = 10 ug/L) as rec'd
ND** (None Detected, lower detectable limit = ug/L) as rec'd
J (Detected, but below quantitation limit; estimated value)
B (Compound detected in method blank associated with this sample)
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS WATER	SOLID	LOW LEVEL
1,2-Dichloroethane	90	(75-123)	(85-126)	(85-138)
Toluene-d8	93	(75-123)	(89-124)	(89-128)
Bromofluorobenzene	90	(86-115)	(84-124)	(83-128)

ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 3/30/93
LAB #: 3C3102-3
MATRIX : WATER

SAMPLE ID : KYW-A322-MW12 BOCA CHICA-BLDG A322

CERTIFICATION #: E84059

METALS ANALYTICAL REPORT
SELECTED LIST

HRS84297

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Arsenic	4/ 2- 4/ 5/93	ND	10	ug/L
Cadmium	4/ 2- 4/ 7/93	ND	10	ug/L
Chromium	4/ 2- 4/ 7/93	ND	50	ug/L
Lead	4/ 2- 4/ 8/93	ND	5	ug/L
Sulfur	4/ 2- 4/ 7/93	36	10	mg/L

NOTE: ND (None Detected)

ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 3/30/93
LAB #: 3C3102-3
MATRIX : WATER

SAMPLE ID : KYW-A322-MW12 BOCA CHICA-BLDG A322

CERTIFICATION #: E84059
HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Tot Recoverable Pet Hydrocarbons	4/ 5- 4/ 6/93	ND	1	mg/L

NOTE: ND (None Detected)

ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3C3102-4
MATRIX: WATER

DATE RECEIVED: 3/30/93
DATE EXTRACTED: NA
DATE ANALYZED: 4/ 7/93

SAMPLE ID: KYW-A322-MW13 BOCA CHICA-BLDG A322

CERTIFICATION #: E84059
HRS84297

VOLATILE ORGANICS
USEPA METHOD 624 - GC/MS

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

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
ND* (None Detected, lower detectable limit = 10 ug/L) as rec'd
ND** (None Detected, lower detectable limit = ug/L) as rec'd
J (Detected, but below quantitation limit; estimated value)
B (Compound detected in method blank associated with this sample)
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS WATER	SOLID	LOW LEVEL
1,2-Dichloroethane	82	(75-123)	(85-126)	(85-138)
Toluene-d8	92	(75-123)	(89-124)	(89-128)
Bromofluorobenzene	89	(86-115)	(84-124)	(83-128)

ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3C3102-4
MATRIX: WATER

DATE RECEIVED: 3/30/93
DATE EXTRACTED: NA
DATE ANALYZED: 4/ 7/93

SAMPLE ID: KYW-A322-MW13 BOCA CHICA-BLDG A322

CERTIFICATION #: E84059
HRS84297

VOLATILE ORGANICS
OTHER COMPOUNDS

Acetone	100	ug/L

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS
with their estimated concentrations

ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 3/30/93
LAB #: 3C3102-4
MATRIX : WATER

SAMPLE ID : KYW-A322-MW13 BOCA CHICA-BLDG A322

CERTIFICATION #: E84059

METALS ANALYTICAL REPORT HRS84297
SELECTED LIST

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Arsenic	4/ 2- 4/ 5/93	ND	10	ug/L
Cadmium	4/ 2- 4/ 7/93	ND	10	ug/L
Chromium	4/ 2- 4/ 7/93	ND	50	ug/L
Lead	4/ 2- 4/ 8/93	ND	5	ug/L
Sulfur	4/ 2- 4/ 7/93	41	10	mg/L

NOTE: ND (None Detected)

ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 3/30/93
LAB #: 3C3102-4
MATRIX : WATER

SAMPLE ID : KYW-A322-MW13 BOCA CHICA-BLDG A322

CERTIFICATION #: E84059
HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Tot Recoverable Pet Hydrocarbons	4/ 5- 4/ 6/93	ND	1	mg/L

NOTE: ND (None Detected)

ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3C3102-5
MATRIX: WATER

DATE RECEIVED: 3/30/93
DATE EXTRACTED: NA
DATE ANALYZED: 4/ 7/93

SAMPLE ID: KYW-A322-MW14 BOCA CHICA-BLDG A322

CERTIFICATION #: E84059
HRS84297

VOLATILE ORGANICS
USEPA METHOD 624 - GC/MS

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

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
ND* (None Detected, lower detectable limit = 10 ug/L) as rec'd
ND** (None Detected, lower detectable limit = ug/L) as rec'd
J (Detected, but below quantitation limit; estimated value)
B (Compound detected in method blank associated with this sample)
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS WATER	SOLID	LOW LEVEL
1,2-Dichloroethane	75	(75-123)	(85-126)	(85-138)
Toluene-d8	96	(75-123)	(89-124)	(89-128)
Bromofluorobenzene	90	(86-115)	(84-124)	(83-128)

ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3C3102-5
MATRIX: WATER

DATE RECEIVED: 3/30/93
DATE EXTRACTED: NA
DATE ANALYZED: 4/ 7/93

SAMPLE ID: KYW-A322-MW14 BOCA CHICA-BLDG A322

CERTIFICATION #: E84059
HRS84297

VOLATILE ORGANICS
OTHER COMPOUNDS

Methyl-tert-butyl ether	14	ug/L
Acetone	310	ug/L

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS
with their estimated concentrations

ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 3/30/93
LAB #: 3C3102-5
MATRIX : WATER

SAMPLE ID : KYW-A322-MW14 BOCA CHICA-BLDG A322

CERTIFICATION #: E84059

METALS ANALYTICAL REPORT
SELECTED LIST

HRS84297

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Arsenic	4/ 2- 4/ 5/93	ND	10	ug/L
Cadmium	4/ 2- 4/ 7/93	ND	10	ug/L
Chromium	4/ 2- 4/ 7/93	ND	50	ug/L
Lead	4/ 2- 4/ 8/93	ND	5	ug/L
Sulfur	4/ 2- 4/ 7/93	130	100	mg/L

NOTE: ND (None Detected)

ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 3/30/93
LAB #: 3C3102-5
MATRIX : WATER

SAMPLE ID : KYW-A322-MW14 BOCA CHICA-BLDG A322

CERTIFICATION #: E84059
HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Tot Recoverable Pet Hydrocarbons	4/ 5- 4/ 6/93	ND	1	mg/L

NOTE: ND (None Detected)

ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3C3102-6
MATRIX: WATER

DATE RECEIVED: 3/30/93
DATE EXTRACTED: NA
DATE ANALYZED: 4/ 8/93

SAMPLE ID: KYW-A322-DUP BOCA CHICA-BLDG A322

CERTIFICATION #: E84059
HRS84297

VOLATILE ORGANICS
USEPA METHOD 624 - GC/MS

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

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
ND* (None Detected, lower detectable limit = 10 ug/L) as rec'd
ND** (None Detected, lower detectable limit = ug/L) as rec'd
J (Detected, but below quantitation limit; estimated value)
B (Compound detected in method blank associated with this sample)
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS WATER	SOLID	LOW LEVEL
1,2-Dichloroethane	97	(75-123)	(85-126)	(85-138)
Toluene-d8	99	(75-123)	(89-124)	(89-128)
Bromofluorobenzene	95	(86-115)	(84-124)	(83-128)

ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 3/30/93
LAB #: 3C3102-6
MATRIX : WATER

SAMPLE ID : KYW-A322-DUP BOCA CHICA-BLDG A322

CERTIFICATION #: E84059
HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Tot Recoverable Pet Hydrocarbons	4/ 5- 4/ 6/93	ND	1	mg/L

NOTE: ND (None Detected)

ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3C3102-7
MATRIX: WATER

DATE RECEIVED: 3/30/93
DATE EXTRACTED: NA
DATE ANALYZED: 4/ 8/93

SAMPLE ID: KYW-A322-EB BOCA CHICA-BLDG A322

CERTIFICATION #: E84059
HRS84297

VOLATILE ORGANICS
USEPA METHOD 624 - GC/MS

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

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
ND* (None Detected, lower detectable limit = 10 ug/L) as rec'd
ND** (None Detected, lower detectable limit = ug/L) as rec'd
J (Detected, but below quantitation limit; estimated value)
B (Compound detected in method blank associated with this sample)
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS WATER	SOLID	LOW LEVEL
1,2-Dichloroethane	86	(75-123)	(85-126)	(85-138)
Toluene-d8	93	(75-123)	(89-124)	(89-128)
Bromofluorobenzene	91	(86-115)	(84-124)	(83-128)

ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 3/30/93
LAB #: 3C3102-7
MATRIX : WATER

SAMPLE ID : KYW-A322-EB BOCA CHICA-BLDG A322

CERTIFICATION #: E84059

METALS ANALYTICAL REPORT HRS84297
SELECTED LIST

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Arsenic	4/ 2- 4/ 5/93	ND	10	ug/L
Cadmium	4/ 2- 4/ 7/93	ND	10	ug/L
Chromium	4/ 2- 4/ 7/93	ND	50	ug/L
Lead	4/ 2- 4/ 8/93	21	5	ug/L
Sulfur	4/ 2- 4/ 7/93	ND	10	mg/L

NOTE: ND (None Detected)

ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 3/30/93
LAB #: 3C3102-7
MATRIX : WATER

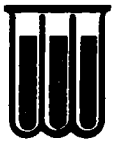
SAMPLE ID : KYW-A322-EB BOCA CHICA-BLDG A322

CERTIFICATION #: E84059
HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Tot Recoverable Pet Hydrocarbons	4/ 5- 4/ 6/93	ND	1	mg/L

NOTE: ND (None Detected)



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	Semi-volatiles	Metals
Methylene chloride	Dimethyl phthalate	Calcium
Toluene	Diethly phthalate	Magnesium
2-Butanone	Di-n-butyl phthalate	Sodium
Acetone	Butyl benzyl phthalate	
	Bis (2-ethylhexyl) phthalate	

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.

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	QC LIMITS 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 #: 3C3102-BK
MATRIX: WATER

DATE RECEIVED: 3/30/93
DATE EXTRACTED: NA
DATE ANALYZED: 4/ 7/93

SAMPLE ID: LABORATORY BLANK

CERTIFICATION #: E84059
HRS84297

VOLATILE ORGANICS
USEPA METHOD 624 - GC/MS

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

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
ND* (None Detected, lower detectable limit = 10 ug/L) as rec'd
ND** (None Detected, lower detectable limit = ug/L) as rec'd
J (Detected, but below quantitation limit; estimated value)
B (Compound detected in method blank associated with this sample)
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS WATER	SOLID	LOW LEVEL
1,2-Dichloroethane	104	(75-123)	(85-126)	(85-138)
Toluene-d8	99	(75-123)	(89-124)	(89-128)
Bromofluorobenzene	99	(86-115)	(84-124)	(83-128)

ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3C3102-BK
MATRIX: WATER

DATE RECEIVED: 3/30/93
DATE EXTRACTED: NA
DATE ANALYZED: 4/ 8/93

SAMPLE ID: LABORATORY BLANK

CERTIFICATION #: E84059
HRS84297

VOLATILE ORGANICS
USEPA METHOD 624 - GC/MS

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

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
ND* (None Detected, lower detectable limit = 10 ug/L) as rec'd
ND** (None Detected, lower detectable limit = ug/L) as rec'd
J (Detected, but below quantitation limit; estimated value)
B (Compound detected in method blank associated with this sample)
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS WATER	SOLID	LOW LEVEL
1,2-Dichloroethane	111	(75-123)	(85-126)	(85-138)
Toluene-d8	96	(75-123)	(89-124)	(89-128)
Bromofluorobenzene	99	(86-115)	(84-124)	(83-128)

ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 3/30/93
LAB #: 3C3102-BK
MATRIX : WATER

SAMPLE ID : LABORATORY BLANK

CERTIFICATION #: E84059

METALS ANALYTICAL REPORT
SELECTED LIST

HRS84297

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Arsenic	4/ 2- 4/ 5/93	ND	10	ug/L
Cadmium	4/ 2- 4/ 7/93	ND	10	ug/L
Chromium	4/ 2- 4/ 7/93	ND	50	ug/L
Lead	4/ 2- 4/ 8/93	ND	5	ug/L
Sulfur	4/ 2- 4/ 7/93	ND	10	mg/L

NOTE: ND (None Detected)

ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 3/30/93
LAB #: 3C3102-BK
MATRIX : WATER

SAMPLE ID : LABORATORY BLANK

CERTIFICATION #: E84059
HRS84297

ANALYTICAL REPORT

PARAMETER	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Tot Recoverable Pet Hydrocarbons	4/ 5- 4/ 6/93	ND	1	mg/L

NOTE: ND (None Detected)

ENSECO-WADSWORTH/ALERT
Laboratories

LAB ID : LCS
MATRIX : WATER
METHOD : 624
RUN ID : DW063

DATE EXTRACTED: N/A
DATE ANALYZED : 04/07/93

LABORATORY CONTROL SAMPLE RESULTS

COMPOUND	ANALYTICAL RUN ID #	LCS %REC	QC LIMITS RPD	QC LIMITS %REC
1,1-Dichloroethene	DW063	114	40	56-133
Trichloroethene		104	17	77-111
Chlorobenzene		101	21	78-122
Toluene		107	30	64-128
Benzene		110	21	83-123
Dichlorobromomethane		88	25	71-123

ENSECO-WADSWORTH/ALERT
Laboratories

LAB ID : LCS MATRIX : WATER

LABORATORY CONTROL SAMPLE RESULTS
METALS

ELEMENT	DATE PREPARED	DATE ANALYZED	LCS %REC	QC LIMITS RPD	QC LIMITS %REC	
Arsenic (furnace)	04/02/93	04/05/93	101	38	53-131	LCS
Cadmium	04/02/93	04/07/93	91	18	77-113	
Chromium	04/02/93	04/07/93	102	21	79-121	
Lead (furnace)	04/02/93	04/08/93	99	33	64-132	
Sulfur	04/02/93	04/07/93	89	20	76-126	

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	QC LIMITS %REC	
TRPH (IR)	04/05/93	04/06/93	99	24	75-124	LCS

ENSECO-WADSWORTH/ALERT
Laboratories

LAB ID : LCS
MATRIX : WATER
METHOD : 624
RUN ID : DW077

DATE EXTRACTED: N/A
DATE ANALYZED : 04/08/93

LABORATORY CONTROL SAMPLE RESULTS

COMPOUND	ANALYTICAL RUN ID #	LCS %REC	QC LIMITS RPD	QC LIMITS %REC
1,1-Dichloroethene	DW077	92	40	56-133
Trichloroethene		92	17	77-111
Chlorobenzene		106	21	78-122
Toluene		104	30	64-128
Benzene		96	21	83-123
Dichlorobromomethane		83	25	71-123

ENSECO-WADSWORTH/ALERT
Laboratories

LAB ID : 3C3102-1
MATRIX : WATER
METHOD : 624
RUN ID : DW083/DW085

DATE RECEIVED : 03/30/93
DATE PREPARED : N/A
DATE ANALYZED : 04/08/93

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

COMPOUND	ANALYTICAL RUN ID #	MS %REC	MSD %REC	RPD	QC LIMITS RPD	QC LIMITS %REC
1,1-Dichloroethene	DW083/DW085	79	85	7	19	63-123
Trichloroethene		89	89	0	10	75-115
Chlorobenzene		100	103	3	13	74-113
Toluene		102	107	5	23	75-122
Benzene		95	94	1	16	76-126
Dichlorobromomethane		79	77	3	15	67-114

* = Diluted Out

ENSECO-WADSWORTH/ALERT
Laboratories

LAB ID : 3C3102-3 DATE RECEIVED : 03/30/93
MATRIX : WATER

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY
INORGANIC PARAMETERS - METALS

ELEMENT	DATE PREPARED	DATE ANALYZED	MS %REC	MSD %REC	RPD	QC LIMITS RPD	QC LIMITS %REC	LAB ID
Arsenic (furnace)	04/02/93	04/05/93	81	80	1	19	80-119	3C3102-3
Cadmium	04/02/93	04/07/93	94	98	4	15	76-110	
Chromium	04/02/93	04/07/93	103	106	3	21	74-117	
Lead (furnace)	04/02/93	04/08/93	97	95	2	24	76-124	
Sulfur	04/02/93	04/07/93	103	98	5	30	76-126	

* = Diluted out

ENSECO-WADSWORTH/ALERT LABORATORIES
SAMPLE SHIPPER EVALUATION AND RECEIPT FORM

Client: ABB Project Name/Number: Bldg 103/Bldg 189 Bldg 352/Bldg A-322

Samples Received By: Carol McNulty (Signature) Date Received: 3/30/93.

Sample Evaluation Form By: Carol McNulty (Signature) LAB No: 6663/3C3102

Type of shipping container samples received in? WAL Cooler X

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?	X	
2.	Were custody papers properly included with samples?	X	
3.	Were custody papers properly filled out (ink, signed, match labels)?	X	
4.	Did all bottles arrive in good condition (unbroken)?	X *see below	
5.	Were all bottle labels complete (Sample No., date, signed, analysis preservatives)?	X	
6.	Were correct bottles used for the tests indicated?	X	
7.	Were proper sample preservation techniques indicated?	X	
8.	Were samples received within adequate holding time?	X	
9.	Were all VOA bottles checked for the presence of air bubbles? (If air bubbles were found indicate in comment section)	X	
10.	Were samples in direct contact with wet ice? (NOTE TEMPERATURE BELOW)	X	
11.	Were samples accepted into the laboratory?	X	

(If no see comments) #86 6 #82 10 °C #288 8°C

Cooler # 322 Temp 8 °C Cooler # 301 Temp 6 °C #301 7°C

Cooler # 59 Temp 8 °C Cooler # 90 Temp 6 °C #323 10°

#103 5°C #101 5 °C

Comments: #92 4 °C #222 10 °C

Copy COC Rec'd

bottles have sample dates as 3/27/93 - COC copy 12/27/93

* Metals Bottle for A322-Dup Rec'd w/lid off + turned over in Cooler - No Sample

noted on COC → Rec'd 1 Soil Sample for KYW-103-SB6 Sampled 3/26/93 for 8270, RCRA, TRPH

ENSECO-WADSWORTH/ALERT LABORATORIES
SAMPLE SHIPPER EVALUATION AND RECEIPT FORM

Client: ABB Project Name/Number: Key West CTC7

Samples Received By: [signature] Date Received: 3-31-93

(Signature)

3C3005, 3C3010, 3C3014, 3C3102 received vials for projects received 3C3109/10/11

Sample Evaluation Form By: [signature] LAB No:

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

Cooler # — Temp 4 °C Cooler # — Temp 5 °C

Cooler # — Temp 4 °C Cooler # — Temp 4 °C

Comments: Approximately half the vials have headspace
received voas only on 3-31-93, 3 voas
each sample to be analyzed for 624

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

10559

Client: ABB-ES

Project Name / Location: Boca Chica - Bldg A322

Sampler(s): R. Durham P. Wagner

Project #: KEYWEST-CTO 1

Item #	Date	Time	MATRIX	Sample Location	No. Of CONTAINERS	VOC - 624/602	PAH -	METALS	TRPH -	EDB -						Remarks
1	12-27-93	9:25	H_2O	K-YW-A322-MW12	5	3		1	1							
2	12-27-93	9:45	↓	KYW-A322-MW9	5	3		1	1							
3	12-27-93	9:55		KYW-A322-MW10	5	3		1	1							
4	12-27-93	10:00		KYW-A322-MW13	5	3		1	1							
5	12-27-93	10:05		KYW-A322-MW14	5	3		1	1							
6	12-27-93	—		KYW-A322-DUP	5	3		1	1							
7	12-27-93	9:35	↓	KYW-A322-EB	5	3		1	1							
8					5	3		1	1							
9					5	3		1	1							
10																
11																

Total Containers: 45

Number of Coolers in Shipment:

Bailers:

Report To:

Additional Comments:

Sample times are not recorded on bottles.
No VOA's [illegible] [illegible]

Transfer Number	Item Number(s)	Relinquished By / Company	Accepted By / Company	Date	Time
1		ABB-ES			
2					
3					
4					
5					
6					

Original Accompanies Shipment

GROUNDWATER ANALYTICAL DATA
JUNE 7, 1993, SAMPLING EVENT

ENSECO-WADSWORTH/ALERT Laboratories
Division of Corning Lab Services, Inc.

5910 Breckenridge Parkway, Suite H 813-621-0784
Tampa, FL 33610 FAX 813-623-6021

ANALYTICAL REPORT

SUBCONTRACT NUMBER: SE1-08-013-35

TASK ORDER NUMBER: 35

BOCA CHICA FIELD &

NAS KEY WEST/BLDG A-322

Presented to:

ROGER DURHAM

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

June 23, 1993

ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3F0809-1
MATRIX: WATER

DATE RECEIVED: 6/ 8/93
DATE EXTRACTED: 6/ 8/93
DATE ANALYZED: 6/16/93

SAMPLE ID: MW-9 NAS KEY WEST/BLDG A-322

CERTIFICATION #: E84059
HRS84297

BASE/NEUTRAL -- EXTRACTABLE ORGANICS
USEPA METHOD 625 - GC/MS (1 of 2)

Acenaphthene	ND	Dibenzo(a,h)anthracene	ND
Acenaphthylene	ND	Di-n-butyl phthalate	ND
Anthracene	ND	1,2-Dichlorobenzene	ND
Benzidine	ND*	1,3-Dichlorobenzene	ND
Benzo(a)anthracene	ND	1,4-Dichlorobenzene	ND
Benzo(b)fluoranthene	ND	3,3'-Dichlorobenzidine	ND*
Benzo(k)fluoranthene	ND	Diethyl phthalate	ND
Benzo(ghi)perylene	ND	Dimethyl phthalate	ND
Benzo(a)pyrene	ND	2,4-Dinitrotoluene	ND
Bis(2-Chloroethoxy)methane	ND	2,6-Dinitrotoluene	ND
Bis(2-Chloroethyl)ether	ND	Di-n-octyl phthalate	ND
Bis(2-Chloroisopropyl)ether	ND	Fluoranthene	ND
Bis(2-Ethylhexyl)phthalate	ND	Fluorene	ND
4-Bromophenyl phenyl ether	ND	Hexachlorobenzene	ND
Butyl benzyl phthalate	ND	Hexachlorobutadiene	ND
2-Chloronaphthalene	ND	Hexachlorocyclopentadiene	ND
4-Chlorophenyl phenyl ether	ND	Hexachloroethane	ND
Chrysene	ND	Indeno(1,2,3-cd)pyrene	ND

NOTE: ND (None Detected, lower detectable limit = 10 ug/L) as rec'd
ND* (None Detected, lower detectable limit = 50 ug/L) as rec'd
J (Detected, but below quantitation limit; estimated value)
B (Compound detected in method blank associated with this sample)
-- (Not Analyzed)

ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3F0809-1
MATRIX: WATER

DATE RECEIVED: 6/ 8/93
DATE EXTRACTED: 6/ 8/93
DATE ANALYZED: 6/16/93

SAMPLE ID: MW-9 NAS KEY WEST/BLDG A-322

CERTIFICATION #: E84059

BASE/NEUTRAL EXTRACTABLE ORGANICS HRS84297
USEPA METHOD 625 - GC/MS (2 of 2)

Isophorone	ND
Naphthalene	ND
Nitrobenzene	ND
N-Nitrosodimethylamine	ND
N-Nitrosodiphenylamine	ND
N-Nitrosodi-n-propylamine	ND
Phenanthrene	ND
Pyrene	ND
1,2,4-Trichlorobenzene	ND

NOTE: ND (None Detected, lower detectable limit = 10 ug/L) as rec'd
ND* (None Detected, lower detectable limit = 50 ug/L) as rec'd
J (Detected, but below quantitation limit: estimated value)
B (Compound detected in method blank associated with this sample)
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS WATER	SOLID
Nitrobenzene-d5	59	(26-131)	(10-155)
Fluorobiphenyl	56	(27-119)	(12-153)
Terphenyl-d14	62	(10-165)	(13-140)

ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3F0809-1
MATRIX: WATER

DATE RECEIVED: 6/ 8/93
DATE EXTRACTED: 6/ 8/93
DATE ANALYZED: 6/16/93

SAMPLE ID: MW-9

NAS KEY WEST/BLDG A-322

CERTIFICATION #: E84059
HRS84297

ACID EXTRACTABLE ORGANICS
USEPA METHOD 625 - GC/MS

4-Chloro-3-methylphenol	ND
2-Chlorophenol	ND
2,4-Dichlorophenol	ND
2,4-Dimethylphenol	ND
2,4-Dinitrophenol	ND*
2-Methyl-4,6-dinitrophenol	ND*
2-Nitrophenol	ND
4-Nitrophenol	ND*
Pentachlorophenol	ND*
Phenol	ND
2,4,6-Trichlorophenol	ND

NOTE: ND (None Detected, lower detectable limit = 10 ug/L) as rec'd
ND* (None Detected, lower detectable limit = 50 ug/L) as rec'd
J (Detected, but below quantitation limit; estimated value)
B (Compound detected in method blank associated with this sample)
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS WATER	SOLID
2-Fluorophenol	47	(10-116)	(24-118)
Phenol-d6	62	(10-175)	(17-124)
2,4,6-Tribromophenol	58	(10-155)	(10-156)

ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3F0809-1
MATRIX: WATER

DATE RECEIVED: 6/ 8/93
DATE EXTRACTED: 6/ 8/93
DATE ANALYZED: 6/16/93

SAMPLE ID: MW-9 NAS KEY WEST/BLDG A-322

CERTIFICATION #: E84059
HRS84297

EXTRACTABLE ORGANICS
OTHER COMPOUNDS

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS
with their estimated concentrations

1,2,4,5,7,8-Hexathionane	74	ug/L
Hexathiepane	16	ug/L
2-Unknowns	26	ug/L

ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3F0809-2
MATRIX: WATER

DATE RECEIVED: 6/ 8/93
DATE EXTRACTED: 6/ 8/93
DATE ANALYZED: 6/16/93

SAMPLE ID: MW-10 NAS KEY WEST/BLDG A-322

CERTIFICATION #: E84059

BASE/NEUTRAL -- EXTRACTABLE ORGANICS HRS84297
USEPA METHOD 625 - GC/MS (1 of 2)

Acenaphthene	ND	Dibenzo(a,h)anthracene	ND
Acenaphthylene	ND	Di-n-butyl phthalate	ND
Anthracene	ND	1,2-Dichlorobenzene	ND
Benzidine	ND*	1,3-Dichlorobenzene	ND
Benzo(a)anthracene	ND	1,4-Dichlorobenzene	ND
Benzo(b)fluoranthene	ND	3,3'-Dichlorobenzidine	ND*
Benzo(k)fluoranthene	ND	Diethyl phthalate	ND
Benzo(ghi)perylene	ND	Dimethyl phthalate	ND
Benzo(a)pyrene	ND	2,4-Dinitrotoluene	ND
Bis(2-Chloroethoxy)methane	ND	2,6-Dinitrotoluene	ND
Bis(2-Chloroethyl)ether	ND	Di-n-octyl phthalate	ND
Bis(2-Chloroisopropyl)ether	ND	Fluoranthene	ND
Bis(2-Ethylhexyl)phthalate	ND	Fluorene	ND
4-Bromophenyl phenyl ether	ND	Hexachlorobenzene	ND
Butyl benzyl phthalate	ND	Hexachlorobutadiene	ND
2-Chloronaphthalene	ND	Hexachlorocyclopentadiene	ND
4-Chlorophenyl phenyl ether	ND	Hexachloroethane	ND
Chrysene	ND	Indeno(1,2,3-cd)pyrene	ND

NOTE: ND (None Detected, lower detectable limit = 10 ug/L) as rec'd
ND* (None Detected, lower detectable limit = 50 ug/L) as rec'd
J (Detected, but below quantitation limit; estimated value)
B (Compound detected in method blank associated with this sample)
-- (Not Analyzed)

ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3F0809-2
MATRIX: WATER

DATE RECEIVED: 6/ 8/93
DATE EXTRACTED: 6/ 8/93
DATE ANALYZED: 6/16/93

SAMPLE ID: MW-10 NAS KEY WEST/BLDG A-322

CERTIFICATION #: E84059

BASE/NEUTRAL EXTRACTABLE ORGANICS HRS84297
USEPA METHOD 625 - GC/MS (2 of 2)

Isophorone	ND
Naphthalene	ND
Nitrobenzene	ND
N-Nitrosodimethylamine	ND
N-Nitrosodiphenylamine	ND
N-Nitrosodi-n-propylamine	ND
Phenanthrene	ND
Pyrene	ND
1,2,4-Trichlorobenzene	ND

NOTE: ND (None Detected, lower detectable limit = 10 ug/L) as rec'd
ND* (None Detected, lower detectable limit = 50 ug/L) as rec'd
J (Detected, but below quantitation limit: estimated value)
B (Compound detected in method blank associated with this sample)
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS WATER	SOLID
Nitrobenzene-d5	63	(26-131)	(10-155)
Fluorobiphenyl	49	(27-119)	(12-153)
Terphenyl-d14	18	(10-165)	(13-140)

ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3F0809-2
MATRIX: WATER

DATE RECEIVED: 6/ 8/93
DATE EXTRACTED: 6/ 8/93
DATE ANALYZED: 5/16/93

SAMPLE ID: MW-10 NAS KEY WEST/BLDG A-322

CERTIFICATION #: E84059
HRS84297

EXTRACTABLE ORGANICS
OTHER COMPOUNDS

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS
with their estimated concentrations

1,2,4-Trithiolane	31	ug/L

ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3F0809-2
MATRIX: WATER

DATE RECEIVED: 6/ 8/93
DATE EXTRACTED: 6/ 8/93
DATE ANALYZED: 6/16/93

SAMPLE ID: MW-10

NAS KEY WEST/BLDG A-322

CERTIFICATION #: E84059
HRS84297

ACID EXTRACTABLE ORGANICS
USEPA METHOD 625 - GC/MS

4-Chloro-3-methylphenol	ND
2-Chlorophenol	ND
2,4-Dichlorophenol	ND
2,4-Dimethylphenol	ND
2,4-Dinitrophenol	ND*
2-Methyl-4,6-dinitrophenol	ND*
2-Nitrophenol	ND
4-Nitrophenol	ND*
Pentachlorophenol	ND*
Phenol	ND
2,4,6-Trichlorophenol	ND

NOTE:
ND (None Detected, lower detectable limit = 10 ug/L) as rec'd
ND* (None Detected, lower detectable limit = 50 ug/L) as rec'd
J (Detected, but below quantitation limit; estimated value)
B (Compound detected in method blank associated with this sample)
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS WATER	SOLID
2-Fluorophenol	47	(10-116)	(24-118)
Phenol-d6	60	(10-175)	(17-124)
2,4,6-Tribromophenol	53	(10-155)	(10-156)

ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3F0809-3
MATRIX: WATER

DATE RECEIVED: 6/ 8/93
DATE EXTRACTED: 6/ 8/93
DATE ANALYZED: 6/16/93

SAMPLE ID: MW-12 NAS KEY WEST/BLDG A-322

CERTIFICATION #: E84059

BASE/NEUTRAL -- EXTRACTABLE ORGANICS HRS84297
USEPA METHOD 625 - GC/MS (1 of 2)

Acenaphthene	ND	Dibenzo(a,h)anthracene	ND
Acenaphthylene	ND	Di-n-butyl phthalate	ND
Anthracene	ND	1,2-Dichlorobenzene	ND
Benzidine	ND*	1,3-Dichlorobenzene	ND
Benzo(a)anthracene	ND	1,4-Dichlorobenzene	ND
Benzo(b)fluoranthene	ND	3,3'-Dichlorobenzidine	ND*
Benzo(k)fluoranthene	ND	Diethyl phthalate	ND
Benzo(ghi)perylene	ND	Dimethyl phthalate	ND
Benzo(a)pyrene	ND	2,4-Dinitrotoluene	ND
Bis(2-Chloroethoxy)methane	ND	2,6-Dinitrotoluene	ND
Bis(2-Chloroethyl)ether	ND	Di-n-octyl phthalate	ND
Bis(2-Chloroisopropyl)ether	ND	Fluoranthene	ND
Bis(2-Ethylhexyl)phthalate	ND	Fluorene	ND
4-Bromophenyl phenyl ether	ND	Hexachlorobenzene	ND
Butyl benzyl phthalate	ND	Hexachlorobutadiene	ND
2-Chloronaphthalene	ND	Hexachlorocyclopentadiene	ND
4-Chlorophenyl phenyl ether	ND	Hexachloroethane	ND
Chrysene	ND	Indeno(1,2,3-cd)pyrene	ND

NOTE:
ND (None Detected, lower detectable limit = 10 ug/L) as rec'd
ND* (None Detected, lower detectable limit = 50 ug/L) as rec'd
J (Detected, but below quantitation limit; estimated value)
B (Compound detected in method blank associated with this sample)
-- (Not Analyzed)

ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3F0809-3
MATRIX: WATER

DATE RECEIVED: 6/ 8/93
DATE EXTRACTED: 6/ 8/93
DATE ANALYZED: 6/16/93

SAMPLE ID: MW-12 NAS KEY WEST/BLDG A-322

CERTIFICATION #: E84059

BASE/NEUTRAL EXTRACTABLE ORGANICS HRS84297
USEPA METHOD 625 - GC/MS (2 of 2)

Isophorone	ND
Naphthalene	ND
Nitrobenzene	ND
N-Nitrosodimethylamine	ND
N-Nitrosodiphenylamine	ND
N-Nitrosodi-n-propylamine	ND
Phenanthrene	ND
Pyrene	ND
1,2,4-Trichlorobenzene	ND

NOTE:
- ND (None Detected, lower detectable limit = 10 ug/L) as rec'd
- ND* (None Detected, lower detectable limit = 50 ug/L) as rec'd
- J (Detected, but below quantitation limit: estimated value)
- B (Compound detected in method blank associated with this sample)
- -- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS WATER	SOLID
Nitrobenzene-d5	68	(26-131)	(10-155)
Fluorobiphenyl	60	(27-119)	(12-153)
Terphenyl-d14	50	(10-165)	(13-140)

ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3F0809-3
MATRIX: WATER

DATE RECEIVED: 6/ 8/93
DATE EXTRACTED: 6/ 8/93
DATE ANALYZED: 6/16/93

SAMPLE ID: MW-12

NAS KEY WEST/BLDG A-322

CERTIFICATION #: E84059
HRS84297

ACID EXTRACTABLE ORGANICS
USEPA METHOD 625 - GC/MS

4-Chloro-3-methylphenol	ND
2-Chlorophenol	ND
2,4-Dichlorophenol	ND
2,4-Dimethylphenol	ND
2,4-Dinitrophenol	ND*
2-Methyl-4,6-dinitrophenol	ND*
2-Nitrophenol	ND
4-Nitrophenol	ND*
Pentachlorophenol	ND*
Phenol	ND
2,4,6-Trichlorophenol	ND

NOTE: ND (None Detected, lower detectable limit = 10 ug/L) as rec'd
ND* (None Detected, lower detectable limit = 50 ug/L) as rec'd
J (Detected, but below quantitation limit; estimated value)
B (Compound detected in method blank associated with this sample)
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS WATER	SOLID
2-Fluorophenol	52	(10-116)	(24-118)
Phenol-d6	63	(10-175)	(17-124)
2,4,6-Tribromophenol	57	(10-155)	(10-156)

ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3F0809-4
MATRIX: WATER

DATE RECEIVED: 6/ 8/93
DATE EXTRACTED: 6/ 8/93
DATE ANALYZED: 6/16/93

SAMPLE ID: MW-13 NAS KEY WEST/BLDG A-322

CERTIFICATION #: E84059

BASE/NEUTRAL -- EXTRACTABLE ORGANICS HRS84297
USEPA METHOD 625 - GC/MS (1 of 2)

Acenaphthene	ND	Dibenzo(a,h)anthracene	ND
Acenaphthylene	ND	Di-n-butyl phthalate	ND
Anthracene	ND	1,2-Dichlorobenzene	ND
Benzidine	ND*	1,3-Dichlorobenzene	ND
Benzo(a)anthracene	ND	1,4-Dichlorobenzene	ND
Benzo(b)fluoranthene	ND	3,3'-Dichlorobenzidine	ND*
Benzo(k)fluoranthene	ND	Diethyl phthalate	ND
Benzo(ghi)perylene	ND	Dimethyl phthalate	ND
Benzo(a)pyrene	ND	2,4-Dinitrotoluene	ND
Bis(2-Chloroethoxy)methane	ND	2,6-Dinitrotoluene	ND
Bis(2-Chloroethyl)ether	ND	Di-n-octyl phthalate	ND
Bis(2-Chloroisopropyl)ether	ND	Fluoranthene	ND
Bis(2-Ethylhexyl)phthalate	ND	Fluorene	ND
4-Bromophenyl phenyl ether	ND	Hexachlorobenzene	ND
Butyl benzyl phthalate	ND	Hexachlorobutadiene	ND
2-Chloronaphthalene	ND	Hexachlorocyclopentadiene	ND
4-Chlorophenyl phenyl ether	ND	Hexachloroethane	ND
Chrysene	ND	Indeno(1,2,3-cd)pyrene	ND

NOTE: ND (None Detected, lower detectable limit = 10 ug/L) as rec'd
ND* (None Detected, lower detectable limit = 50 ug/L) as rec'd
J (Detected, but below quantitation limit; estimated value)
B (Compound detected in method blank associated with this sample)
-- (Not Analyzed)

ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3F0809-4
MATRIX: WATER

DATE RECEIVED: 6/ 8/93
DATE EXTRACTED: 6/ 8/93
DATE ANALYZED: 6/16/93

SAMPLE ID: MW-13 NAS KEY WEST/BLDG A-322

CERTIFICATION #: E84059

BASE/NEUTRAL EXTRACTABLE ORGANICS HRS84297
USEPA METHOD 625 - GC/MS (2 of 2)

Isophorone	ND
Naphthalene	ND
Nitrobenzene	ND
N-Nitrosodimethylamine	ND
N-Nitrosodiphenylamine	ND
N-Nitrosodi-n-propylamine	ND
Phenanthrene	ND
Pyrene	ND
1,2,4-Trichlorobenzene	ND

NOTE: ND (None Detected, lower detectable limit = 10 ug/L) as rec'd
ND* (None Detected, lower detectable limit = 50 ug/L) as rec'd
J (Detected, but below quantitation limit: estimated value)
B (Compound detected in method blank associated with this sample)
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS WATER	SOLID
Nitrobenzene-d5	71	(26-131)	(10-155)
Fluorobiphenyl	61	(27-119)	(12-153)
Terphenyl-d14	40	(10-165)	(13-140)

ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3F0809-4
MATRIX: WATER

DATE RECEIVED: 6/ 8/93
DATE EXTRACTED: 6/ 8/93
DATE ANALYZED: 6/16/93

SAMPLE ID: MW-13

NAS KEY WEST/BLDG A-322

CERTIFICATION #: E84059
HRS84297

ACID EXTRACTABLE ORGANICS
USEPA METHOD 625 - GC/MS

4-Chloro-3-methylphenol	ND
2-Chlorophenol	ND
2,4-Dichlorophenol	ND
2,4-Dimethylphenol	ND
2,4-Dinitrophenol	ND*
2-Methyl-4,6-dinitrophenol	ND*
2-Nitrophenol	ND
4-Nitrophenol	ND*
Pentachlorophenol	ND*
Phenol	ND
2,4,6-Trichlorophenol	ND

NOTE: ND (None Detected, lower detectable limit = 10 ug/L) as rec'd
ND* (None Detected, lower detectable limit = 50 ug/L) as rec'd
J (Detected, but below quantitation limit; estimated value)
B (Compound detected in method blank associated with this sample)
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS WATER	SOLID
2-Fluorophenol	53	(10-116)	(24-118)
Phenol-d6	65	(10-175)	(17-124)
2,4,6-Tribromophenol	57	(10-155)	(10-156)

ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3F0809-5
MATRIX: WATER

DATE RECEIVED: 6/ 8/93
DATE EXTRACTED: 6/ 8/93
DATE ANALYZED: 6/16/93

SAMPLE ID: MW-14 NAS KEY WEST/BLDG A-322

CERTIFICATION #: E84059
HRS84297

BASE/NEUTRAL -- EXTRACTABLE ORGANICS
USEPA METHOD 625 - GC/MS (1 of 2)

Acenaphthene	ND	Dibenzo(a,h)anthracene	ND
Acenaphthylene	ND	Di-n-butyl phthalate	ND
Anthracene	ND	1,2-Dichlorobenzene	ND
Benzidine	ND*	1,3-Dichlorobenzene	ND
Benzo(a)anthracene	ND	1,4-Dichlorobenzene	ND
Benzo(b)fluoranthene	ND	3,3'-Dichlorobenzidine	ND*
Benzo(k)fluoranthene	ND	Diethyl phthalate	ND
Benzo(ghi)perylene	ND	Dimethyl phthalate	ND
Benzo(a)pyrene	ND	2,4-Dinitrotoluene	ND
Bis(2-Chloroethoxy)methane	ND	2,6-Dinitrotoluene	ND
Bis(2-Chloroethyl)ether	ND	Di-n-octyl phthalate	ND
Bis(2-Chloroisopropyl)ether	ND	Fluoranthene	ND
Bis(2-Ethylhexyl)phthalate	ND	Fluorene	ND
4-Bromophenyl phenyl ether	ND	Hexachlorobenzene	ND
Butyl benzyl phthalate	ND	Hexachlorobutadiene	ND
2-Chloronaphthalene	ND	Hexachlorocyclopentadiene	ND
4-Chlorophenyl phenyl ether	ND	Hexachloroethane	ND
Chrysene	ND	Indeno(1,2,3-cd)pyrene	ND

NOTE:
ND (None Detected, lower detectable limit = 10 ug/L) as rec'd
ND* (None Detected, lower detectable limit = 50 ug/L) as rec'd
J (Detected, but below quantitation limit; estimated value)
B (Compound detected in method blank associated with this sample)
-- (Not Analyzed)

ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3F0809-5
MATRIX: WATER

DATE RECEIVED: 6/ 8/93
DATE EXTRACTED: 6/ 8/93
DATE ANALYZED: 6/16/93

SAMPLE ID: MW-14 NAS KEY WEST/BLDG A-322

CERTIFICATION #: E84059

BASE/NEUTRAL EXTRACTABLE ORGANICS HRS84297
USEPA METHOD 625 - GC/MS (2 of 2)

Isophorone	ND
Naphthalene	ND
Nitrobenzene	ND
N-Nitrosodimethylamine	ND
N-Nitrosodiphenylamine	ND
N-Nitrosodi-n-propylamine	ND
Phenanthrene	ND
Pyrene	ND
1,2,4-Trichlorobenzene	ND

NOTE: ND (None Detected, lower detectable limit = 10 ug/L) as rec'd
ND* (None Detected, lower detectable limit = 50 ug/L) as rec'd
J (Detected, but below quantitation limit: estimated value)
B (Compound detected in method blank associated with this sample)
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS WATER	SOLID
Nitrobenzene-d5	74	(26-131)	(10-155)
Fluorobiphenyl	63	(27-119)	(12-153)
Terphenyl-d14	34	(10-165)	(13-140)

ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3F0809-5
MATRIX: WATER

DATE RECEIVED: 6/ 8/93
DATE EXTRACTED: 6/ 8/93
DATE ANALYZED: 6/16/93

SAMPLE ID: MW-14 NAS KEY WEST/BLDG A-322

CERTIFICATION #: E84059
HRS84297

ACID EXTRACTABLE ORGANICS
USEPA METHOD 625 - GC/MS

4-Chloro-3-methylphenol	ND
2-Chlorophenol	ND
2,4-Dichlorophenol	ND
2,4-Dimethylphenol	ND
2,4-Dinitrophenol	ND*
2-Methyl-4,6-dinitrophenol	ND*
2-Nitrophenol	ND
4-Nitrophenol	ND*
Pentachlorophenol	ND*
Phenol	ND
2,4,6-Trichlorophenol	ND

NOTE: ND (None Detected, lower detectable limit = 10 ug/L) as rec'd
ND* (None Detected, lower detectable limit = 50 ug/L) as rec'd
J (Detected, but below quantitation limit; estimated value)
B (Compound detected in method blank associated with this sample)
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS WATER	SOLID
2-Fluorophenol	56	(10-116)	(24-118)
Phenol-d6	72	(10-175)	(17-124)
2,4,6-Tribromophenol	57	(10-155)	(10-156)

ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3F0809-5
MATRIX: WATER

DATE RECEIVED: 6/ 8/93
DATE EXTRACTED: 6/ 8/93
DATE ANALYZED: 6/16/93

SAMPLE ID: MW-14 NAS KEY WEST/BLDG A-322

CERTIFICATION #: E84059
HRS84297

EXTRACTABLE ORGANICS
OTHER COMPOUNDS

MASS SPECTROMETER/DATA SYSTEM (MSDS) TENTATIVELY IDENTIFIED COMPOUNDS
with their estimated concentrations

1,2,4-Trithiolane	12	ug/L
Hexathiepane	18	ug/L

ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3F0809-6
MATRIX: WATER

DATE RECEIVED: 6/ 8/93
DATE EXTRACTED: 6/ 8/93
DATE ANALYZED: 6/16/93

SAMPLE ID: DUPLICATE NAS KEY WEST/BLDG A-322

CERTIFICATION #: E84059
HRS84297

BASE/NEUTRAL -- EXTRACTABLE ORGANICS
USEPA METHOD 625 - GC/MS (1 of 2)

Acenaphthene	ND	Dibenzo(a,h)anthracene	ND
Acenaphthylene	ND	Di-n-butyl phthalate	ND
Anthracene	ND	1,2-Dichlorobenzene	ND
Benzidine	ND*	1,3-Dichlorobenzene	ND
Benzo(a)anthracene	ND	1,4-Dichlorobenzene	ND
Benzo(b)fluoranthene	ND	3,3'-Dichlorobenzidine	ND*
Benzo(k)fluoranthene	ND	Diethyl phthalate	ND
Benzo(ghi)perylene	ND	Dimethyl phthalate	ND
Benzo(a)pyrene	ND	2,4-Dinitrotoluene	ND
Bis(2-Chloroethoxy)methane	ND	2,6-Dinitrotoluene	ND
Bis(2-Chloroethyl)ether	ND	Di-n-octyl phthalate	ND
Bis(2-Chloroisopropyl)ether	ND	Fluoranthene	ND
Bis(2-Ethylhexyl)phthalate	ND	Fluorene	ND
4-Bromophenyl phenyl ether	ND	Hexachlorobenzene	ND
Butyl benzyl phthalate	ND	Hexachlorobutadiene	ND
2-Chloronaphthalene	ND	Hexachlorocyclopentadiene	ND
4-Chlorophenyl phenyl ether	ND	Hexachloroethane	ND
Chrysene	ND	Indeno(1,2,3-cd)pyrene	ND

NOTE:
ND (None Detected, lower detectable limit = 10 ug/L) as rec'd
ND* (None Detected, lower detectable limit = 50 ug/L) as rec'd
J (Detected, but below quantitation limit; estimated value)
B (Compound detected in method blank associated with this sample)
-- (Not Analyzed)

ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3F0809-6
MATRIX: WATER

DATE RECEIVED: 6/ 8/93
DATE EXTRACTED: 6/ 8/93
DATE ANALYZED: 6/16/93

SAMPLE ID: DUPLICATE NAS KEY WEST/BLDG A-322

CERTIFICATION #: E84059

BASE/NEUTRAL EXTRACTABLE ORGANICS HRS84297
USEPA METHOD 625 - GC/MS (2 of 2)

Isophorone	ND
Naphthalene	ND
Nitrobenzene	ND
N-Nitrosodimethylamine	ND
N-Nitrosodiphenylamine	ND
N-Nitrosodi-n-propylamine	ND
Phenanthrene	ND
Pyrene	ND
1,2,4-Trichlorobenzene	ND

NOTE: ND (None Detected, lower detectable limit = 10 ug/L) as rec'd
ND* (None Detected, lower detectable limit = 50 ug/L) as rec'd
J (Detected, but below quantitation limit: estimated value)
B (Compound detected in method blank associated with this sample)
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS WATER	SOLID
Nitrobenzene-d5	63	(26-131)	(10-155)
Fluorobiphenyl	57	(27-119)	(12-153)
Terphenyl-d14	39	(10-165)	(13-140)

ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3F0809-6
MATRIX: WATER

DATE RECEIVED: 6/ 8/93
DATE EXTRACTED: 6/ 8/93
DATE ANALYZED: 6/16/93

SAMPLE ID: DUPLICATE NAS KEY WEST/BLDG A-322

CERTIFICATION #: E84059
HRS84297

ACID EXTRACTABLE ORGANICS
USEPA METHOD 625 - GC/MS

4-Chloro-3-methylphenol	ND
2-Chlorophenol	ND
2,4-Dichlorophenol	ND
2,4-Dimethylphenol	ND
2,4-Dinitrophenol	ND*
2-Methyl-4,6-dinitrophenol	ND*
2-Nitrophenol	ND
4-Nitrophenol	ND*
Pentachlorophenol	ND*
Phenol	ND
2,4,6-Trichlorophenol	ND

NOTE: ND (None Detected, lower detectable limit = 10 ug/L) as rec'd
ND* (None Detected, lower detectable limit = 50 ug/L) as rec'd
J (Detected, but below quantitation limit; estimated value)
B (Compound detected in method blank associated with this sample)
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS WATER	SOLID
2-Fluorophenol	44	(10-116)	(24-118)
Phenol-d6	50	(10-175)	(17-124)
2,4,6-Tribromophenol	43	(10-155)	(10-156)

ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3F0809-7
MATRIX: WATER

DATE RECEIVED: 6/ 8/93
DATE EXTRACTED: 6/ 8/93
DATE ANALYZED: 6/16/93

SAMPLE ID: EQUIPMENT BLANK NAS KEY WEST/BLDG A-322

CERTIFICATION #: E84059

BASE/NEUTRAL -- EXTRACTABLE ORGANICS HRS84297
USEPA METHOD 625 - GC/MS (1 of 2)

Acenaphthene	ND	Dibenzo(a,h)anthracene	ND
Acenaphthylene	ND	Di-n-butyl phthalate	ND
Anthracene	ND	1,2-Dichlorobenzene	ND
Benzidine	ND*	1,3-Dichlorobenzene	ND
Benzo(a)anthracene	ND	1,4-Dichlorobenzene	ND
Benzo(b)fluoranthene	ND	3,3'-Dichlorobenzidine	ND*
Benzo(k)fluoranthene	ND	Diethyl phthalate	ND
Benzo(ghi)perylene	ND	Dimethyl phthalate	ND
Benzo(a)pyrene	ND	2,4-Dinitrotoluene	ND
Bis(2-Chloroethoxy)methane	ND	2,6-Dinitrotoluene	ND
Bis(2-Chloroethyl)ether	ND	Di-n-octyl phthalate	ND
Bis(2-Chloroisopropyl)ether	ND	Fluoranthene	ND
Bis(2-Ethylhexyl)phthalate	ND	Fluorene	ND
4-Bromophenyl phenyl ether	ND	Hexachlorobenzene	ND
Butyl benzyl phthalate	ND	Hexachlorobutadiene	ND
2-Chloronaphthalene	ND	Hexachlorocyclopentadiene	ND
4-Chlorophenyl phenyl ether	ND	Hexachloroethane	ND
Chrysene	ND	Indeno(1,2,3-cd)pyrene	ND

NOTE:
ND (None Detected, lower detectable limit = 10 ug/L) as rec'd
ND* (None Detected, lower detectable limit = 50 ug/L) as rec'd
J (Detected, but below quantitation limit; estimated value)
B (Compound detected in method blank associated with this sample)
-- (Not Analyzed)

ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3F0809-7
MATRIX: WATER

DATE RECEIVED: 6/ 8/93
DATE EXTRACTED: 6/ 8/93
DATE ANALYZED: 6/16/93

SAMPLE ID: EQUIPMENT BLANK NAS KEY WEST/BLDG A-322

CERTIFICATION #: E84059

BASE/NEUTRAL EXTRACTABLE ORGANICS HRS84297
USEPA METHOD 625 - GC/MS (2 of 2)

Isophorone	ND
Naphthalene	ND
Nitrobenzene	ND
N-Nitrosodimethylamine	ND
N-Nitrosodiphenylamine	ND
N-Nitrosodi-n-propylamine	ND
Phenanthrene	ND
Pyrene	ND
1,2,4-Trichlorobenzene	ND

NOTE: ND (None Detected, lower detectable limit = 10 ug/L) as rec'd
ND* (None Detected, lower detectable limit = 50 ug/L) as rec'd
J (Detected, but below quantitation limit: estimated value)
B (Compound detected in method blank associated with this sample)
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS WATER	SOLID
Nitrobenzene-d5	77	(26-131)	(10-155)
Fluorobiphenyl	65	(27-119)	(12-153)
Terphenyl-d14	75	(10-165)	(13-140)

ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3F0809-7
MATRIX: WATER

DATE RECEIVED: 6/ 8/93
DATE EXTRACTED: 6/ 8/93
DATE ANALYZED: 6/16/93

SAMPLE ID: EQUIPMENT BLANK NAS KEY WEST/BLDG A-322

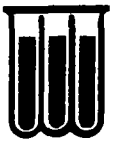
CERTIFICATION #: E84059
HRS84297

ACID EXTRACTABLE ORGANICS
USEPA METHOD 625 - GC/MS

4-Chloro-3-methylphenol	ND
2-Chlorophenol	ND
2,4-Dichlorophenol	ND
2,4-Dimethylphenol	ND
2,4-Dinitrophenol	ND*
2-Methyl-4,6-dinitrophenol	ND*
2-Nitrophenol	ND
4-Nitrophenol	ND*
Pentachlorophenol	ND*
Phenol	ND
2,4,6-Trichlorophenol	ND

NOTE: ND (None Detected, lower detectable limit = 10 ug/L) as rec'd
ND* (None Detected, lower detectable limit = 50 ug/L) as rec'd
J (Detected, but below quantitation limit; estimated value)
B (Compound detected in method blank associated with this sample)
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS WATER	SOLID
2-Fluorophenol	60	(10-116)	(24-118)
Phenol-d6	72	(10-175)	(17-124)
2,4,6-Tribromophenol	55	(10-155)	(10-156)



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	Semi-volatiles	Metals
Methylene chloride	Dimethyl phthalate	Calcium
Toluene	Diethly phthalate	Magnesium
2-Butanone	Di-n-butyl phthalate	Sodium
Acetone	Butyl benzyl phthalate	
	Bis (2-ethylhexyl) phthalate	

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.

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	QC LIMITS 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 #: 3F0809-BK
MATRIX: WATER

DATE RECEIVED: 6/ 8/93
DATE EXTRACTED: 6/ 8/93
DATE ANALYZED: 6/16/93

SAMPLE ID: LABORATORY BLANK

CERTIFICATION #: E84059

Acenaphthene	ND	Dibenzo(a,h)anthracene	ND
Acenaphthylene	ND	Di-n-butyl phthalate	ND
Anthracene	ND	1,2-Dichlorobenzene	ND
Benzidine	ND*	1,3-Dichlorobenzene	ND
Benzo(a)anthracene	ND	1,4-Dichlorobenzene	ND
Benzo(b)fluoranthene	ND	3,3'-Dichlorobenzidine	ND*
Benzo(k)fluoranthene	ND	Diethyl phthalate	ND
Benzo(ghi)perylene	ND	Dimethyl phthalate	ND
Benzo(a)pyrene	ND	2,4-Dinitrotoluene	ND
Bis(2-Chloroethoxy)methane	ND	2,6-Dinitrotoluene	ND
Bis(2-Chloroethyl)ether	ND	Di-n-octyl phthalate	ND
Bis(2-Chloroisopropyl)ether	ND	Fluoranthene	ND
Bis(2-Ethylhexyl)phthalate	ND	Fluorene	ND
4-Bromophenyl phenyl ether	ND	Hexachlorobenzene	ND
Butyl benzyl phthalate	ND	Hexachlorobutadiene	ND
2-Chloronaphthalene	ND	Hexachlorocyclopentadiene	ND
4-Chlorophenyl phenyl ether	ND	Hexachloroethane	ND
Chrysene	ND	Indeno(1,2,3-cd)pyrene	ND

NOTE:
- ND (None Detected, lower detectable limit = 10 ug/L) as rec'd
- ND* (None Detected, lower detectable limit = 50 ug/L) as rec'd
- J (Detected, but below quantitation limit; estimated value)
- B (Compound detected in method blank associated with this sample)
- -- (Not Analyzed)

ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3F0809-BK
MATRIX: WATER

DATE RECEIVED: 6/ 8/93
DATE EXTRACTED: 6/ 8/93
DATE ANALYZED: 6/16/93

SAMPLE ID: LABORATORY BLANK

CERTIFICATION #: E84059

Isophorone	ND
Naphthalene	ND
Nitrobenzene	ND
N-Nitrosodimethylamine	ND
N-Nitrosodiphenylamine	ND
N-Nitrosodi-n-propylamine	ND
Phenanthrene	ND
Pyrene	ND
1,2,4-Trichlorobenzene	ND

NOTE: ND (None Detected, lower detectable limit = 10 ug/L) as rec'd
ND* (None Detected, lower detectable limit = 50 ug/L) as rec'd
J (Detected, but below quantitation limit: estimated value)
B (Compound detected in method blank associated with this sample)
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS WATER	SOLID
Nitrobenzene-d5	79	(26-131)	(10-155)
Fluorobiphenyl	72	(27-119)	(12-153)
Terphenyl-d14	78	(10-165)	(13-140)

ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3F0809-BK
MATRIX: WATER

DATE RECEIVED: 6/ 8/93
DATE EXTRACTED: 6/ 8/93
DATE ANALYZED: 6/16/93

SAMPLE ID: LABORATORY BLANK

CERTIFICATION #: E84059
HRS84297

ACID EXTRACTABLE ORGANICS
USEPA METHOD 625 - GC/MS

4-Chloro-3-methylphenol	ND
2-Chlorophenol	ND
2,4-Dichlorophenol	ND
2,4-Dimethylphenol	ND
2,4-Dinitrophenol	ND*
2-Methyl-4,6-dinitrophenol	ND*
2-Nitrophenol	ND
4-Nitrophenol	ND*
Pentachlorophenol	ND*
Phenol	ND
2,4,6-Trichlorophenol	ND

NOTE: ND (None Detected, lower detectable limit = 10 ug/L) as rec'd
ND* (None Detected, lower detectable limit = 50 ug/L) as rec'd
J (Detected, but below quantitation limit; estimated value)
B (Compound detected in method blank associated with this sample)
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS WATER	SOLID
2-Fluorophenol	62	(10-116)	(24-118)
Phenol-d6	74	(10-175)	(17-124)
2,4,6-Tribromophenol	73	(10-155)	(10-156)

ENSECO-WADSWORTH/ALERT
Laboratories

LAB ID : LCS
MATRIX : WATER
METHOD : 625
RUN ID : F0212

DATE EXTRACTED: 06/08/93
DATE ANALYZED : 06/16/93

LABORATORY CONTROL SAMPLE RESULTS

COMPOUND	ANALYTICAL RUN ID #	LCS %REC	QC LIMITS RPD	QC LIMITS %REC
1,4-Dichlorobenzene	F0212	85	45	19-108
N-Nitrosodi-n-propylamine		88	43	38-123
1,2,4 Trichlorobenzene		76	52	15-119
Acenaphthene		120	42	51-136
2,4-Dinitrotoluene		74	45	26-117
Pyrene		77	55	28-138

ENSECO-WADSWORTH/ALERT
Laboratories

LAB ID : LCS
MATRIX : WATER
METHOD : 625
RUN ID : F0212

DATE EXTRACTED: 06/08/93
DATE ANALYZED : 06/16/93

LABORATORY CONTROL SAMPLE RESULTS

COMPOUND	ANALYTICAL RUN ID #	LCS %REC	QC LIMITS RPD	QC LIMITS %REC
Phenol	F0212	67	49	15-112
2-Chlorophenol		71	45	19-109
4-Chloro-3-methylphenol		72	47	27-120
4-Nitrophenol		66	54	10-113
Pentachlorophenol		38	47	10-104

ENSECO-WADSWORTH/ALERT
Laboratories

LAB ID : 3F0809-5
MATRIX : WATER
METHOD : 625
RUN ID : F0218/F0219

DATE RECEIVED : 06/08/93
DATE PREPARED : 06/08/93
DATE ANALYZED : 06/16/93

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

COMPOUND	ANALYTICAL RUN ID #	MS %REC	MSD %REC	RPD	QC LIMITS RPD	QC LIMITS %REC
1,4-Dichlorobenzene	F0218/F0219	85	84	1	20	16-56
N-Nitrosodi-n-propylamine		78	78	0	29	40-127
1,2,4 Trichlorobenzene		71	71	0	15	27-65
Acenaphthene		99	99	0	24	57-104
2,4-Dinitrotoluene		67	68	1	22	22-81
Pyrene		67	69	3	30	58-148

* = Diluted Out

ENSECO-WADSWORTH/ALERT
Laboratories

LAB ID : 3E1901-5
MATRIX : WATER
METHOD : 625
RUN ID : F0218/F0219

DATE RECEIVED : 06/08/93
DATE PREPARED : 06/08/93
DATE ANALYZED : 06/16/93

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

COMPOUND	ANALYTICAL RUN ID #	MS %REC	MSD %REC	RPD	QC LIMITS RPD	QC LIMITS %REC
Phenol	F0218/F0219	64	64	0	23	15-97
2-Chlorophenol		63	63	0	21	17-89
4-Chloro-3-methylphenol		72	71	1	36	08-101
4-Nitrophenol		70	68	3	34	13-99
Pentachlorophenol		32	32	0	42	13-96

* = Diluted Out

ENSECO-WADSWORTH/ALERT LABORATORIES
SAMPLE SHIPPER EVALUATION AND RECEIPT FORM

Client: ABB Project Name/Number: NAS Key West

Samples Received By: [signature] Date Received: 6/8/93
(Signature)

Sample Evaluation Form By: [signature] LAB No: 7111/3F0809
(Signature)

Type of shipping container samples received in? WAL Cooler ~~X~~

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

Cooler # ~~X~~ Temp 6 °C Cooler # _____ Temp _____ °C

Cooler # _____ Temp _____ °C Cooler # _____ Temp _____ °C

Comments: _____

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NAS Key West	2

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Tampa, FL 33610

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Fax (813) 623-6021

Chain of Custody Record

Record _____ of _____

07319

Client: ABB

Project Name / Location: NAS KEY WEST / ~~BLDG A~~

Sampler(s): R Durham, C Tucker

Project #: BLDG A-322

Item #	Date	Time	MATRIX	Sample Location	No. Of CON-TAINERS	Parameter: VOC-	625	METALS-	TRPH-	EDB-	TDS					Remarks
1	6/7/93	1115	H_2O	EQUIPMENT BLANK	2		2									
2	6/7/93	1116	H_2O	MW 12	2		2									
3	6/7/93	1136	H_2O	MW 7	2		2									
4	6/7/93	1212	H_2O	MW 13	2		2									
5	6/7/93	1218	H_2O	MW 14	2		2									
6	6/7/93	—	H_2O	DUPLICATE	2		2									
7	6/7/93	1225	H_2O	MW 10	3		2				1					TDS+ Total dissolved solids
8																
9																
10																
11							14				1					

Total Containers: 15

Number of Coolers in Shipment: 2

Bailers:

Report To: Roger Durham

Additional Comments:

No Preservative

Transfer Number	Item Number(s)	Relinquished By / Company	Accepted By / Company	Date	Time
1	2	Ryan Durham / ABB			
2					
3					
4					
5					
6					

Original Accompanies Shipment

CONTAMINATION ASSESSMENT REPORT ADDENDUM

BUILDING 352, PHMRON MAINTENANCE RAMP
TRUMAN ANNEX
NAVAL AIR STATION KEY WEST
KEY WEST, FLORIDA

UIC: N00213

Contract No. 62467-89-D-0317

Prepared by:

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

Authors:

Pamela J. Wagner
Roger Durham

Prepared for:

Department of the Navy, Southern Division
Naval Facilities Engineering Command
2155 Eagle Drive
Charleston, South Carolina 29411-0068

Luis Vazquez, Code 1843, Engineer-in-Charge

June 1993

FOREWORD

Subtitle I of the Hazardous and Solid Waste Amendments of 1984 to the Solid Waste Disposal Act (SWDA) of 1965 established a national regulatory program for managing underground storage tanks (USTs) containing hazardous materials, especially petroleum products. Hazardous wastes stored in USTs were already regulated under the Resource Conservation and Recovery Act of 1976, which was also an amendment to SWDA. Subtitle I requires that the U.S. Environmental Protection Agency (USEPA) promulgate UST regulations. The program was designed to be administered by the individual States, who were allowed to develop more stringent standards, but not less stringent standards. Local governments were permitted to establish regulatory programs and standards that are more stringent, but not less stringent than either State or Federal regulations. The USEPA UST regulations are found in the Code of Federal Regulations (CFR), Title 40, Part 280 (40 CFR 280) (*Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks*) and Title 40, Part 281 (*Approval of State Underground Storage Tank Programs*). Title 40, Part 280 was revised and published on September 23, 1988, and became effective December 22, 1988.

The Navy's UST program policy is to comply with all Federal, State, and local regulations pertaining to USTs. This report was prepared to satisfy the requirements of the Florida Department of Environmental Regulation (FDER) Chapter 17-770, Florida Administrative Code (FAC) (*State Underground Petroleum Environmental Response*) regulations on petroleum contamination in Florida's environment as a result of spills or leaking tanks or piping.

Questions regarding this report should be addressed to the Environmental Coordinator, Naval Air Station, Key West, Florida, at 305-293-2194, or to Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOM), Code 1843, at DSN 563-0613 or 803-743-0613.

ACKNOWLEDGMENTS

In preparing this report, the Underground Storage Tank Section of the Comprehensive Long-Term Environmental Action, Navy (CLEAN) Group at ABB Environmental Services, Inc. (ABB-ES), commends the support, assistance, and cooperation provided by the personnel of the Naval Air Station (NAS) Key West, Key West, Florida, and Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOM). In particular, ABB-ES acknowledges the efforts provided by the following people during the investigation and preparation of this report.

Name	Title	Position	Location
Luis Vazquez	Environmental Engineer	Engineer-in-Charge	SOUTHNAVFACENGCOM
Diane Lancaster	Environmental Coordinator	Environmental Coordinator	NAS Key West

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GLOSSARY

ABB-ES	ABB Environmental Services, Inc.
bls	below land surface
CA	Contamination Assessment
CAP	Contamination Assessment Plan
CAR	Contamination Assessment Report
CFR	Code of Federal Regulations
CompQAPP	Comprehensive Quality Assurance Program Plan
CTO	Contract Task Order
FAC	Florida Administrative Code
FDER	Florida Department of Environmental Regulation
FID	flame ionization detector
HSWA	Hazardous and Solid Waste Amendments of 1984
msl	mean sea level
MTBE	methyl tert-butyl ether
NAS	Naval Air Station
NFAP	No Further Action Proposal
OVA	organic vapor analyzer
PAH	polynuclear aromatic hydrocarbons
POA	Plan of Action
ppb	parts per billion
ppm	parts per million
PVC	polyvinyl chloride
SOUTHNAV-FACENGCOM	Southern Division, Naval Facilities Engineering Command
SWDA	Solid Waste Disposal Act of 1965
TRPH	total recoverable petroleum hydrocarbons
UIC	uniform identification code
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey
UST	underground storage tank
VOA	volatile organic aromatics
VOC	volatile organic compound

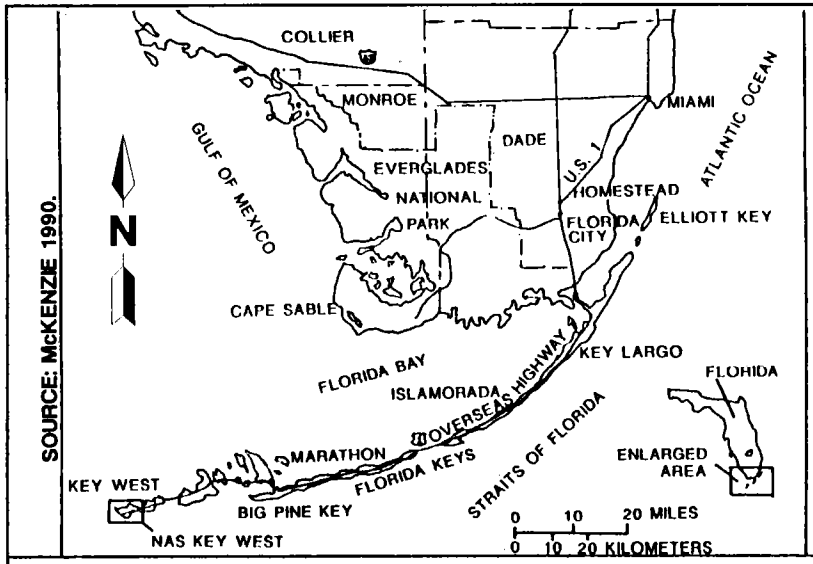
1.0 INTRODUCTION

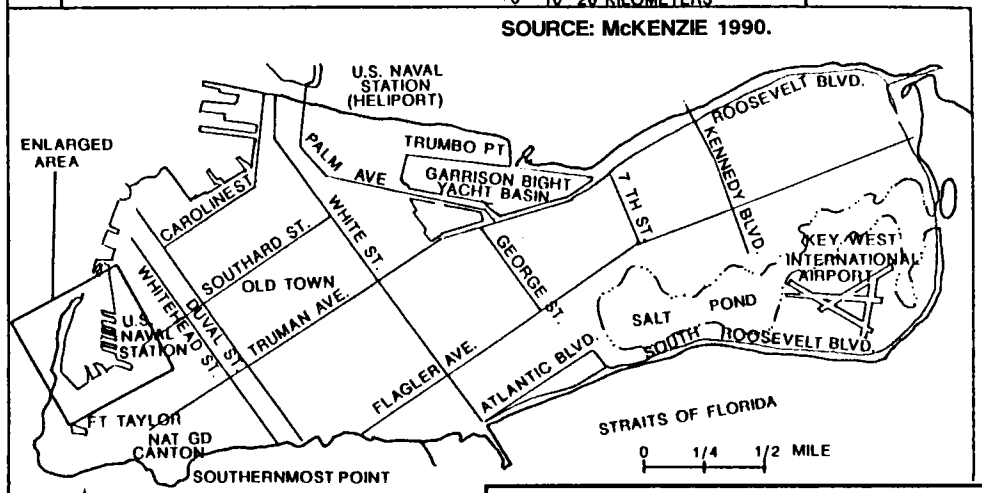
The Naval Air Station Key West (NAS Key West) is located approximately 150 miles southwest of Miami in Monroe County, Florida (Figure 1-1). NAS Key West, a complex of activities located in numerous areas of the Lower Florida Keys, encompasses approximately 5,000 acres. The majority of these activities are concentrated on Boca Chica Key and Key West. The mission of NAS Key West is to maintain and operate facilities and provide services and materials to support operations of aviation activities and units designated by the Chief of Naval Operations.

ABB Environmental Services, Inc. (ABB-ES), was contracted by Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOM) to perform a contamination assessment (CA) and submit a contamination assessment report (CAR) for the reported leakage of a 500-gallon, diesel underground storage tank (UST) at the PHMRON maintenance ramp (Building 352) at Truman Annex, NAS Key West. The scope of services is described in Contract Task Order (CTO) No. 007, the Plan of Action (POA), and the Contamination Assessment Plan (CAP) and included the following:

- drilling soil borings and analyzing site soil samples to assess the extent of soil contamination,
- installing and sampling groundwater monitoring wells to assess the 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 to estimate aquifer characteristics, and
- reducing and analyzing pertinent data gathered during the contamination assessment to complete a CAR.

The contamination assessment at Building 352 was conducted during July and August 1991. A CAR was submitted to FDER in February 1992. At the request of FDER, a supplemental field investigation was performed, which was conducted during March 1993. This report is an addendum to the original CAR, and presents the findings and conclusions of the supplemental field investigation.





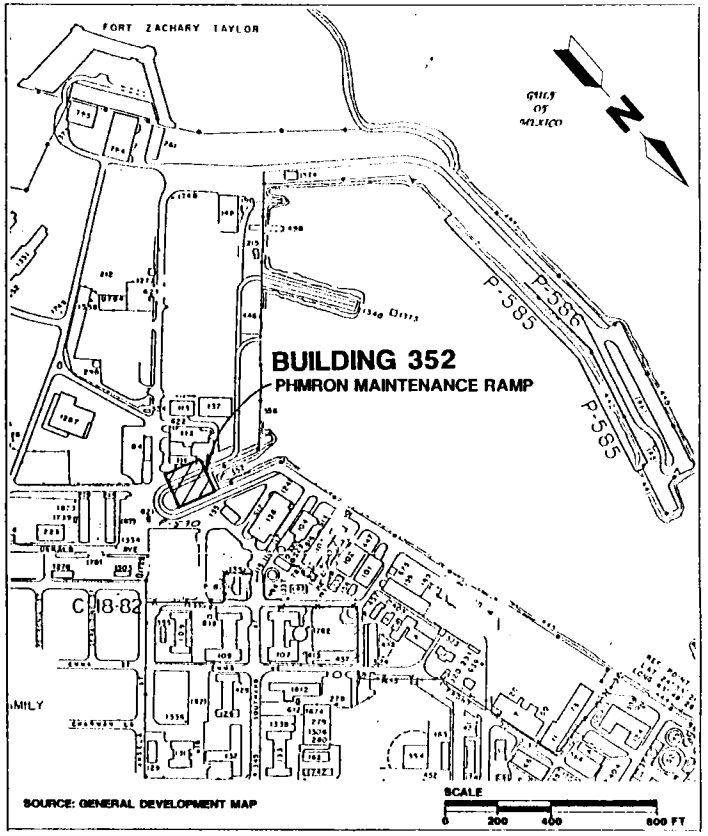


FIGURE 1-1
FACILITY LOCATION MAP

CONTAMINATION ASSESSMENT REPORT ADDENDUM, BUILDING 352

TRUMAN ANNEX
NAVAL AIR STATION
KEY WEST, FLORIDA

2.0 SITE BACKGROUND

2.1 SITE DESCRIPTION AND HISTORY. Building 352 is located on Key West at the PHMRON maintenance ramp south of Building 136 in Truman Annex (Figure 2-1). The PHMRON maintenance ramp was used to service large seagoing vessels. During reconstruction of the PHMRON maintenance ramp in 1989, a 500-gallon diesel fuel UST was discovered under the ramp approach (Figure 2-1). The UST supplied fuel for a winch that conveyed the vessels along the ramp. Workers observed corrosion of the UST that resulted in the discharge of diesel fuel. Contaminated soils and the UST were removed from the site during ramp reconstruction activities, and the area above the former UST location was resurfaced with concrete. According to facility personnel, the concrete in the ramp vicinity is reinforced and its thickness is in excess of 30 feet. The area surrounding the ramp is covered with asphalt.

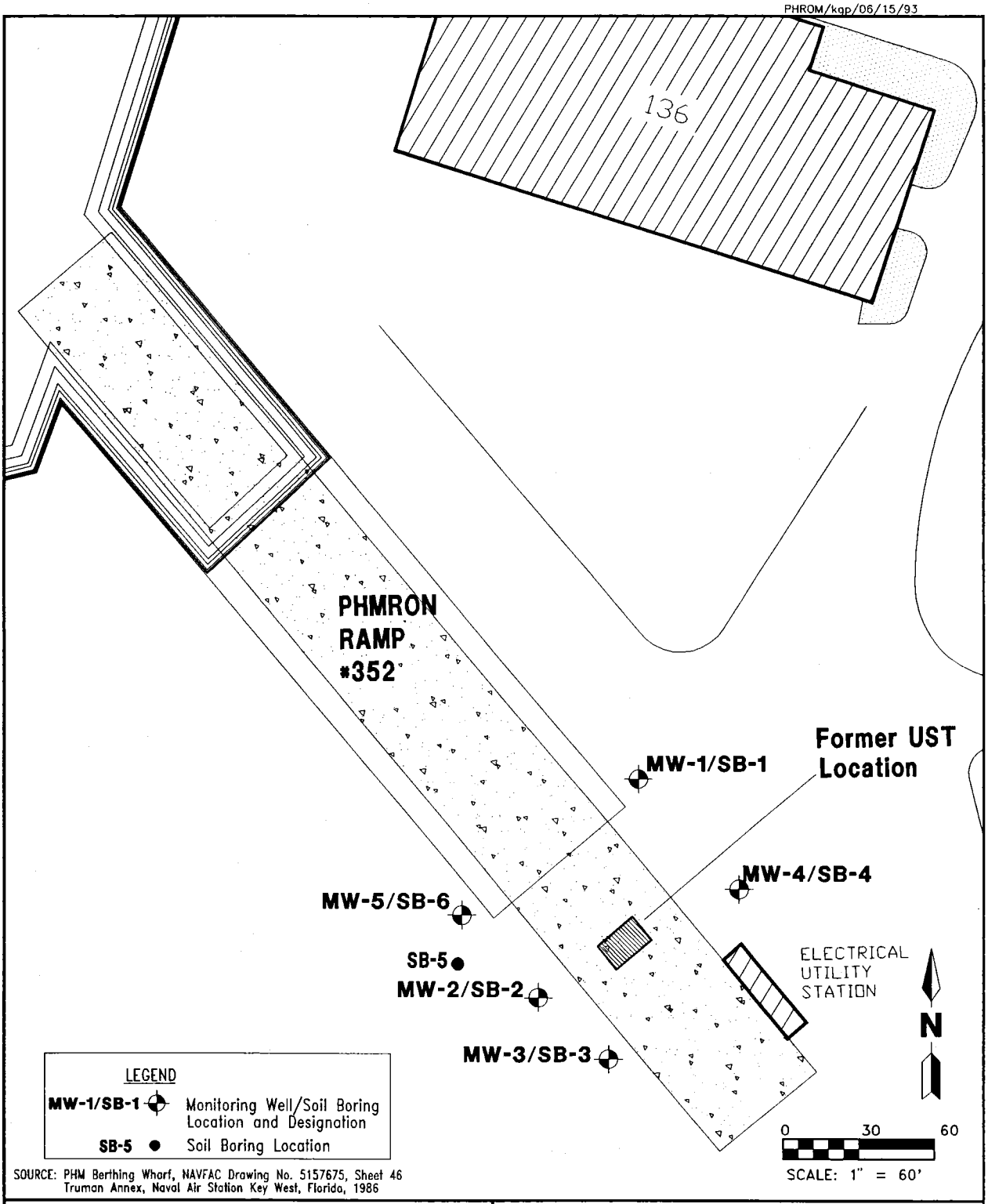
2.2 PREVIOUS SITE INVESTIGATION. A CA was performed by ABB-ES in July and August 1991. The objectives of the CA were to identify petroleum contaminants at the site, to assess the degree and extent of petroleum contamination in soils and groundwater. This CA included the advancement of four soil borings (KYW-352-SB1 through KYW-352-SB4) and the installation of three monitoring wells (KYW-352-MW1 through KYW-352-MW3). The excessive thickness of concrete in the ramp vicinity prevented placement of borings and wells at the former UST location. Soil boring and monitoring well locations are shown in Figure 2-1. For convenience, the prefix (KYW-352-) is not shown in the tables and figures in this report.

Soil samples were collected from each boring and analyzed for volatile organic compounds (VOC) by organic vapor analyzer (OVA) headspace analysis. Groundwater samples were collected from wells KYW-352-MW1 through KYW-352-MW3 and were analyzed for constituents of the kerosene analytical group as defined in Chapter 17-770, Florida Administrative Code (FAC). A CAR was submitted to the Navy and Florida Department of Environmental Regulation (FDER) in February 1992.

The findings of the CAR are summarized below.

- No petroleum-contaminated soils were identified by OVA headspace analysis.
- No free product was detected in any monitoring well.
- Methyl tert-butyl ether (MTBE) was the only contaminant detected in the groundwater. MTBE concentrations were 55 parts per billion (ppb) and 115 ppb in samples collected from wells KYW-352-MW2 and KYW-352-MW3, respectively. MTBE was not detected in well KYW-352-MW1. MTBE is not a constituent of diesel fuel and its source was not identified.
- Groundwater flow direction at the site is tidally influenced. Groundwater flow varies from southwest at high water table elevations to northeast at low water table elevations.
- No potable wells were identified within a 0.25-mile radius of the site.

PHROM/kqp/06/15/93



SOURCE: PHM Berthing Wharf, NAVFAC Drawing No. 5157675, Sheet 46 Truman Annex, Naval Air Station Key West, Florida, 1986

FIGURE 2-1
SITE PLAN SHOWING
MONITORING WELL AND SOIL BORING LOCATIONS

CONTAMINATION ASSESSMENT REPORT ADDENDUM, BUILDING 352

TRUMAN ANNEX
NAVAL AIR STATION
KEY WEST, FLORIDA

A *No Further Action Plan (NFAP)* was submitted in the CAR. Upon completion of review, FDER requested that an additional monitoring well be installed downgradient of the former UST location and that an additional round of groundwater sampling be performed. A copy of the correspondence from FDER is presented in Appendix A.

2.3 SCOPE. The scope of services developed to perform the March 1993 supplemental field work included the following.

- Two monitoring wells (KYW-352-MW4 and KYW-352-MW5) were installed to a depth of 13 feet below land surface (bls). Because groundwater flow direction is tidally influenced, two wells were installed to ensure that a well was located downgradient of the UST during both high and low tidal periods. The newly installed wells are located along the periphery of the ramp. The excessive thickness of concrete near the former UST location precluded the installation of a monitoring well in that area.

- Groundwater samples were collected from each well and analyzed for U.S. Environmental Protection Agency (USEPA) Methods 601, 602 (including MTBE), and 610.

- All data gathered during the field investigation were reduced and analyzed to prepare this CAR addendum.

3.0 SUPPLEMENTAL ASSESSMENT RESULTS

3.1 METHODOLOGIES AND EQUIPMENT. All methodologies and equipment used during the March 1993 field investigation were in conformance with the ABB-ES, FDER-approved, Comprehensive Quality Assurance Program Plan (CompQAPP).

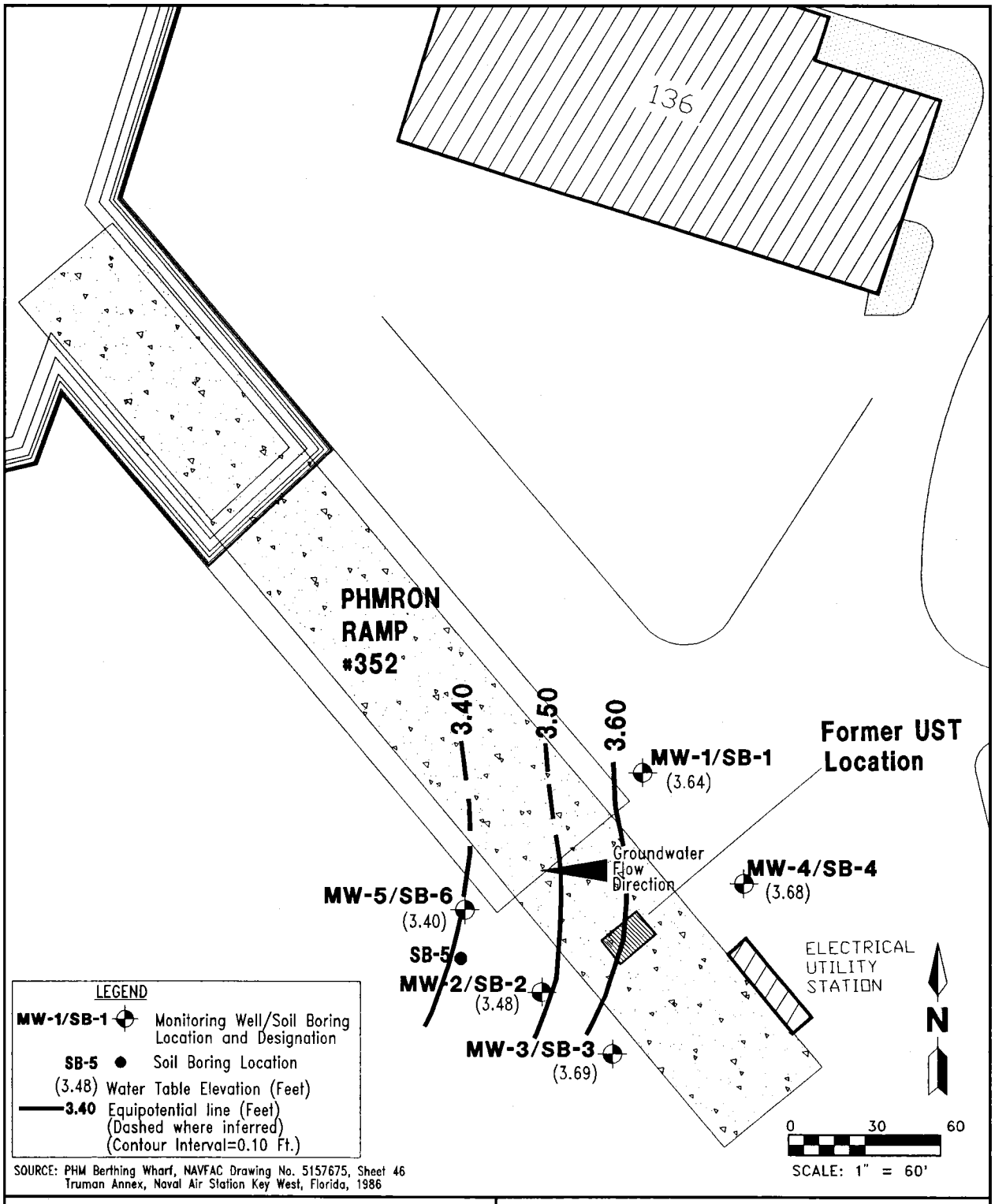
3.1.1 Soil Boring Advancement and Soil Sampling Soil borings were advanced into the water table using rotary drilling and hollow-stem augers. For each boring, a soil sample was collected from the following intervals: 0 to 1 foot bls, 1 to 3 feet bls, and from 3 to 5 feet bls. Groundwater was encountered at a depth of approximately 6 feet bls. Soil samples collected above the water table were placed in 16-ounce glass jars, and analyzed with an OVA equipped with a flame ionization detector (FID). Borings were advanced to a depth of 13 feet bls. Soil boring logs are attached in Appendix B.

3.1.2 Monitoring Well Construction Monitoring wells KYW-352-MW4 and KYW-352-MW5 were installed in soil borings KYW-352-SB4 and KYW-352-SB6, respectively. An obstruction was encountered in KYW-352-SB5, at a depth of 4 feet bls, and the boring was abandoned. Monitoring wells were installed to a depth of 13 feet bls and constructed of 2-inch inside diameter, schedule 40, polyvinyl chloride (PVC) casing with flush-threaded joints and 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 screen. A 6- to 12-inch thick bentonite seal was placed on top of the filter pack. The remaining annular space was grouted to the surface with a neat cement grout. A protective traffic-bearing vault was installed to complete the well location. Monitoring wells are equipped with a locking well cap and a padlock.

3.1.3 Water Table Elevation Measurements Water level measurements were recorded from each monitoring well prior to groundwater sampling on March 27, 1993. Groundwater levels were measured using an electronic water level indicator. Water level elevations were calculated by subtracting the measured depth to groundwater from the elevation at the top of the well casing. A water level elevation contour map was constructed using this information (Figure 3-1).

3.1.4 Groundwater Sampling and Analyses Groundwater samples were collected from all five monitoring wells at the site on March 27, 1993. Before sampling, the monitoring wells were purged with a Teflon™ bailer. Purging continued until five well volumes had been removed. Groundwater samples were collected using an extruded Teflon™ bailer. The samples were placed into appropriate containers, properly preserved, placed on ice, and shipped to Wadsworth/ALERT Laboratories, Inc., in Tampa, Florida. Groundwater samples collected from the monitoring wells underwent analyses for USEPA Methods 601, 602 (including MTBE), and 610. A duplicate sample, trip blank, and equipment blank were also analyzed.

PHROM/kgp/06/04/93



SOURCE: PHM Berthing Wharf, NAVFAC Drawing No. 5157675, Sheet 46 Truman Annex, Naval Air Station Key West, Florida, 1986

FIGURE 3-1
WATER TABLE ELEVATION CONTOUR MAP
SURFICIAL ZONE
MARCH 27, 1993

CONTAMINATION ASSESSMENT REPORT ADDENDUM, BUILDING 352

TRUMAN ANNEX
NAVAL AIR STATION
KEY WEST, FLORIDA

3.2 SOIL ASSESSMENT RESULTS. Table 3-1 summarizes the results of the OVA headspace analyses for soil samples. No VOCs were detected in any soil samples.

Table 3-1
Summary of Organic Vapor Analyzer (OVA) Soil Sample Results, March 23, 1993

Contamination Assessment Report Addendum
Building 352, Naval Air Station Key West
Key West, Florida

Soil Boring Number	Depth Below Land Surface (feet)	OVA Headspace Reading (ppm)
KYW-352-SB4	0.3 to 1.0	<1
	1.0 to 3.0	<1
KYW-352-SB5	0.3 to 1.0	<1
	1.0 to 4.0	<1
KYW-352-SB6	0.0 to 1.0	<1
	1.0 to 3.0	<1
	3.0 to 5.0	<1

Note: ppm = parts per million.

3.3 GROUNDWATER ASSESSMENT RESULTS.

3.3.1 Groundwater Flow Direction In 1991, A tidal influence study indicated that groundwater flow direction at Site 352 varies from west to southwestly flow direction at high water table elevations to a north to northeasterly groundwater flow direction at low water table elevations (ABB-ES, 1992). Water level data collected on March 27, 1993 indicate a westerly flow direction consistent with the previous measurements recorded during high water table elevations (ABB-ES, 1992) (Figure 3-1).

3.3.2 Groundwater Contamination Groundwater analytical results from the March 27, 1993, sampling event are presented in Appendix C, and are summarized in Table 3-2 and Figure 3-2. MTBE was the only contaminant detected in groundwater samples. MTBE was detected in samples from each of the five monitoring wells and the equipment blank. MTBE concentrations ranged from 2 ppb to 10 ppb in samples collected from monitoring wells. The MTBE concentration in the equipment blank was 3 ppb. The occurrence of MTBE in the equipment blank may have been the result of contamination during sampling activities.

MTBE concentrations decreased significantly in the samples collected from wells KYW-352-MW2 and KYW-352-MW3 since the previous sampling event of August 1991. MTBE concentrations in samples collected from monitoring wells KYW-352-MW2 and KYW-352-MW3 decreased from 55 ppb to 10 ppb, and 115 ppb to 9 ppb, respectively.

There are no State target levels for MTBE for Class G-III groundwater; however, MTBE concentrations from the most recent sampling event are much less than the State target level of 50 ppb for G-II groundwater.

Table 3-2
Summary of Groundwater Sample Laboratory Analyses, March 27, 1993

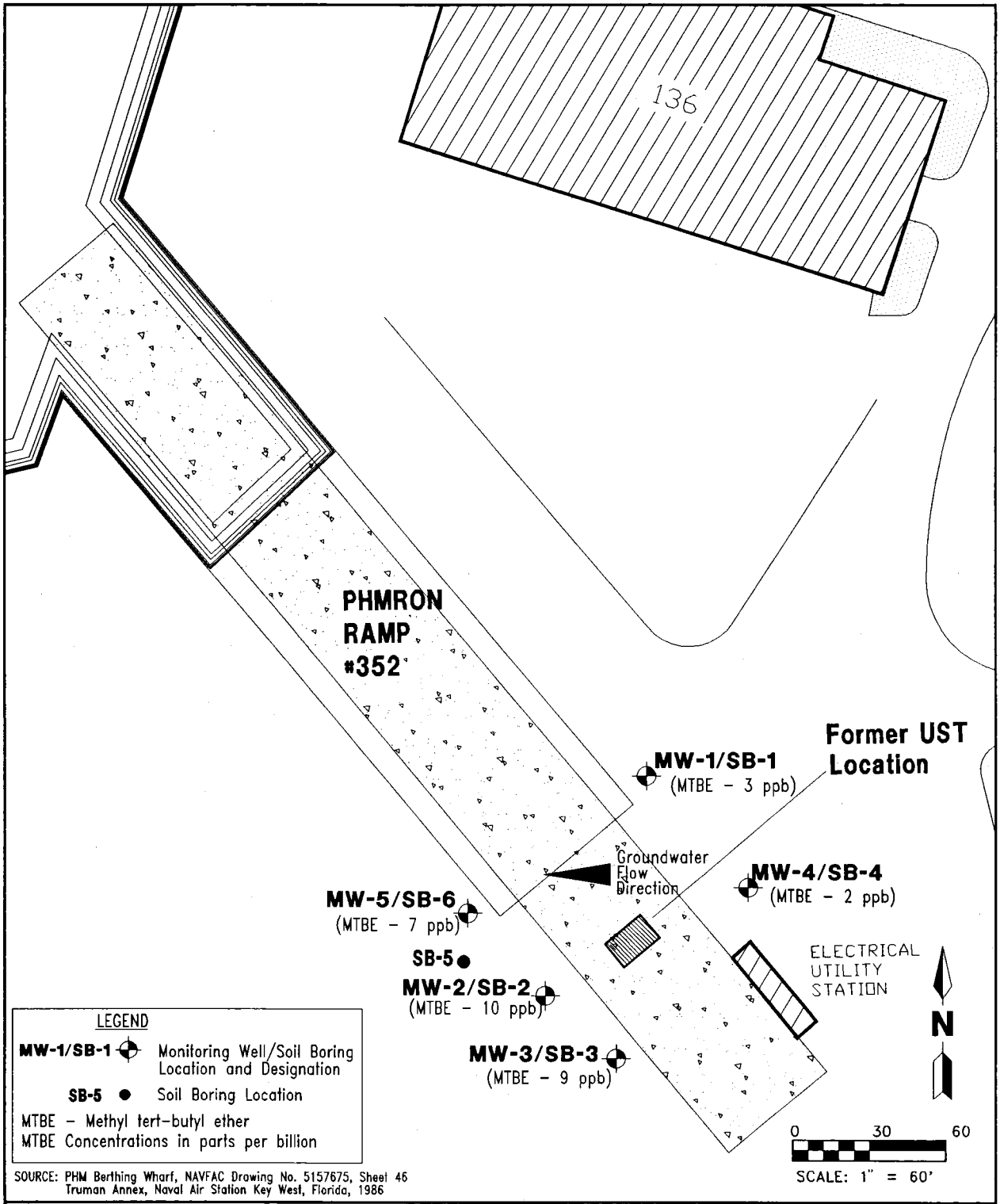
Contamination Assessment Report Addendum
Building 352, Naval Air Station Key West
Key West, Florida

Compound	State Target Level[1]	MW1	MW2	MW3	MW4	MW5	DUP[2]	Equip Blank	Trip Blank	Lab Blank
MTBE	50	3	10	9	2	7	2	3	ND	ND

[1]State target level for G-II groundwater (Chapter 17-770, Florida Administrative Code [FAC]).
[2]Duplicate sample taken from KYW-352-MW4.

Notes: All concentrations are in parts per billion.
Equip Blank = equipment blank.
Lab Blank = laboratory blank.
MTBE = methyl tert-butyl ether.
ND = not detected.

PHROM/kgp/06/15/93



SOURCE: PHM Berthing Wharf, NAVFAC Drawing No. 5157675, Sheet 46 Truman Annex, Naval Air Station Key West, Florida, 1986

FIGURE 3-2
GROUNDWATER CONTAMINATION DISTRIBUTION MAP
MARCH 27, 1993

CONTAMINATION ASSESSMENT REPORT ADDENDUM, BUILDING 352

TRUMAN ANNEX
NAVAL AIR STATION
KEY WEST, FLORIDA

4.0 SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

4.1 SUMMARY.

Based upon results of the previous investigation and the additional field investigation, the following is a summary of the conditions observed at Site 352.

- The surficial aquifer in the Key West area is classified as a Class G-III groundwater source. There are no official potable wells in the Key West area (McKenzie, 1990).

- The UST and petroleum-contaminated soils were removed during reconstruction activities at the ramp. No diesel fuel constituents were found in groundwater samples collected during this investigation. Therefore, the reported source of diesel fuel contamination was apparently abated by the removal action.

- No petroleum contaminated soil was identified by OVA headspace analysis.

- No free product was found at the site.

- MTBE was detected in samples collected from all five monitoring wells at concentrations ranging from 2 to 10 ppb, and in the equipment blank at a concentration of 3 ppb. There is no State target level for MTBE in G-III groundwater; however, MTBE concentrations from the most recent sampling event are much less than the State target level of 50 ppb for G-II groundwater.

4.2 CONCLUSIONS

- MTBE, the only contaminant identified during the investigation, is not a constituent of diesel fuel. The source of MTBE contamination is not known and was not identified in this assessment.

- MTBE is a constituent of unleaded gasoline. No other gasoline constituents were detected in groundwater samples collected at the site during this investigation. It is possible that the presence of MTBE in groundwater at the site resulted from a small gasoline spill that occurred during ramp reconstruction activities.

- Between April 1991 and March 1993, significant decreases were observed in MTBE concentrations in the samples collected from monitoring wells KYW-352-MW2 and KYW-252-MW3. MTBE concentrations in the groundwater are expected to continue to decrease through time.

4.3 RECOMMENDATIONS. Based on the findings and conclusions of the CAR and CAR addendum, a *No Further Action Proposal (NFAP)* is recommended.

5.0 PROFESSIONAL REVIEW CERTIFICATION

The contamination assessment contained in this report was prepared using sound, hydrogeologic principles and judgment. This assessment is based on the geologic investigation and associated information detailed in the text and appended to this report. If conditions are determined to exist that differ from those described, the undersigned geologist should be notified to evaluate the effects of any additional information on the assessment described in this report. This Contamination Assessment Report Addendum was developed for the UST located at Building 352 at Truman Annex, Naval Air Station, Key West, Florida, and should not be construed to apply to any other site.

Roger Durham
Professional Geologist
P.G. No. 001127

Date

REFERENCES

ABB Environmental Services, Inc., 1992, Contamination Assessment Report, Site 352, Truman Annex, Naval Air Station, Key West, Florida: prepared for Southern Division, Naval Facilities Engineering Command, Charleston, South Carolina.

Florida Department of Environmental Regulation, Division of Waste Management, May 1992: Guidelines for assessment and remediation of petroleum contaminated soils.

McKenzie, D.J., 1990, Water resources potential of the freshwater lens at Key West, Florida: U.S. Geological Survey Water-Resources Investigations Report 90-4115, 24 p.

APPENDIX A

FDER CORRESPONDENCE

State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

Interoffice Memorandum

TO: Eric S. Nuzie, Federal Facilities Coordinator
Bureau of Waste Cleanup

THROUGH: Dr. James J. Crane, PGIII/Administrator JJC
Technical Review Section

FROM: Jorge R. Caspary P.G., Base Coordinator J.R.C.
Technical Review Section

DATE: April 22, 1992

SUBJECT: Meeting with ABB Environmental Services, Inc. on Contamination Assessment Reports for Base Exchange Station Bldg. A-322, PHMRON Maintenance Ramp Bldg. 352, Public Works Motor Pool Bldg. A-317, and Berthing Wharf Bldg. 189. Key West Naval Air Station

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As agreed during an April 17th meeting with an ABB Environmental Services, Inc. representative, and followed by a confirmatory telephone conversation on April 21st, the following comments are issued on a site specific basis.

Base Exchange Service Station Bldg. A-322

As accorded with the ABB project manager, comments 1 and 2 of the March 30th interoffice memorandum are left as optional. However, it must be noted that if significant contaminant concentrations are detected at wells KYWA322- 9, 10, and 11, the previously asked water table monitoring wells will be required.

Comment 3 is rescinded. Only wells number 9, 10, and 12 will be required to be sampled and analyzed. Said wells should be analyzed for EPA Methods 624 and 625 for listed compounds. Non Priority Pollutants with peaks larger than 10 ppb should also be identified. In addition, a confirmatory analysis for Sulfur in groundwater should be implemented.

PHMRON Maintenance Ramp Bldg. 352

An additional well is needed downgradient of the underground storage tank. Well KYW352-1 is lateral to the groundwater flow.

APPENDIX B

LITHOLOGIC LOGS

TITLE: NAS Key West, Truman Annex	LOG of WELL: KYW-352-MW4		BORING NO. SB4
CLIENT: SOUTHNAVFACENGCOM			PROJECT NO: 7519-30
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 3/23/93	COMPLTD: 3/23/93
METHOD: 4.25" HSA	CASE SIZE: 2 inch	SCREEN INT.: 3 - 13 FT.	PROTECTION LEVEL: D
TOC ELEV.: 9.64 FT.	MONITOR INST.: OVA	TOT DPTH: 13FT.	DPTH TO ▽ 5.96 FT.
LOGGED BY: R. Durham	WELL DEVELOPMENT DATE: 3/23/93		SITE: Bldg. 352, PHMRON Ramp

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
				<1	ASPHALT				
				<1					
5					LIME FILL: light tan to gray, silty, loose				▽
10									
15									
20									

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE: NAS Key West, Truman Annex	LOG of WELL:	BORING NO. SB5
CLIENT: SOUTHNAVFACENGCOM		PROJECT NO: 7519-30
CONTRACTOR: Groundwater Protection Inc.	DATE STARTED: 3/23/93	COMPLTD: 3/23/93
METHOD: 4.25" HSA	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: FT.	MONITOR INST.: OVA	TOT DPTH: 4FT.	DPTH TO ▽ FT.
LOGGED BY: R. Durham	WELL DEVELOPMENT DATE:	SITE: Bldg. 352, PHMRON Ramp

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
				<1	ASPHALT				
				<1	SANDY FILL: gray-brown, silty, mixed with limerock				
					MET REFUSAL				
5									
10									
15									
20									

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE: NAS Key West, Truman Annex	LOG of WELL: KYW-352-MW5		BORING NO. SB6
CLIENT: SOUTHNAVFACENGCOM			PROJECT NO: 7519-30
CONTRACTOR: Groundwater Protection Inc.		DATE STARTED: 3/23/93	COMPLTD: 3/23/93
METHOD: 4.25" HSA	CASE SIZE: 2 inch	SCREEN INT.: 3 - 13 FT.	PROTECTION LEVEL: D
TOC ELEV.: 9.59 FT.	MONITOR INST.: OVA	TOT DPTH: 13FT.	DPTH TO ▽ 6.19 FT.
LOGGED BY: R. Durham	WELL DEVELOPMENT DATE: 3/23/93		SITE: Bldg. 352, PHMRON Ramp

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
				<1	ASPHALT				
				<1					
				<1					
5					CLAYEY SAND: light brown, mixed with limerock				▽
10									
15									
20									

APPENDIX C

GROUNDWATER ANALYTICAL DATA
MARCH 27, 1993, SAMPLING EVENT

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: 0019

TRUMAN ANNEX-BLDG 352

Presented to:

ROGER DURHAM

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 20, 1993

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
Polynuclear Aromatic Hydrocarbons	** EPA Method 625

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 Drinking Waters USEPA, 600/4-88/039, December, 1988.
Std. Methods	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.
SW846 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.

ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3C3005-1
MATRIX: WATER

DATE RECEIVED: 3/30/93
DATE EXTRACTED: 3/31/93
DATE ANALYZED: 4/14/93

SAMPLE ID: KYW-352-MW1 TRUMAN ANNEX-BLDG 352

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
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	104	(22-135)	(10-155)
Fluorobiphenyl	78	(34-140)	(12-153)
Terphenyl-d14	42	(10-132)	(13-140)

ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3C3005-2
MATRIX: WATER

DATE RECEIVED: 3/30/93
DATE EXTRACTED: 3/31/93
DATE ANALYZED: 4/14/93

SAMPLE ID: KYW-352-MW2 TRUMAN ANNEX-BLDG 352

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
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 = 6 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	77	(34-140)	(12-153)
Terphenyl-d14	40	(10-132)	(13-140)

ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3C3005-3
MATRIX: WATER

DATE RECEIVED: 3/30/93
DATE EXTRACTED: 3/31/93
DATE ANALYZED: 4/14/93

SAMPLE ID: KYW-352-MW3 TRUMAN ANNEX-BLDG 352

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
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	109	(22-135)	(10-155)
Fluorobiphenyl	78	(34-140)	(12-153)
Terphenyl-d14	41	(10-132)	(13-140)

ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3C3005-4
MATRIX: WATER

DATE RECEIVED: 3/30/93
DATE EXTRACTED: 3/31/93
DATE ANALYZED: 4/15/93

SAMPLE ID: KYW-352-MW4 TRUMAN ANNEX-BLDG 352

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
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	114	(22-135)	(10-155)
Fluorobiphenyl	97	(34-140)	(12-153)
Terphenyl-d14	48	(10-132)	(13-140)

ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3C3005-5
MATRIX: WATER

DATE RECEIVED: 3/30/93
DATE EXTRACTED: 3/31/93
DATE ANALYZED: 4/15/93

SAMPLE ID: KYW-352-MW5 TRUMAN ANNEX-BLDG 352

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
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	90	(22-135)	(10-155)
Fluorobiphenyl	80	(34-140)	(12-153)
Terphenyl-d14	28	(10-132)	(13-140)

ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3C3005-6
MATRIX: WATER

DATE RECEIVED: 3/30/93
DATE EXTRACTED: 3/31/93
DATE ANALYZED: 4/15/93

SAMPLE ID: KYW-352-DUP TRUMAN ANNEX-BLDG 352

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
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	100	(22-135)	(10-155)
Fluorobiphenyl	96	(34-140)	(12-153)
Terphenyl-d14	53	(10-132)	(13-140)

ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3C3005-7
MATRIX: WATER

DATE RECEIVED: 3/30/93
DATE EXTRACTED: 3/31/93
DATE ANALYZED: 4/15/93

SAMPLE ID: KYW-352-EB TRUMAN ANNEX-BLDG 352

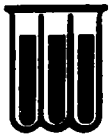
CERTIFICATION #: E84059
HRS84297

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	94	(22-135)	(10-155)
Fluorobiphenyl	86	(34-140)	(12-153)
Terphenyl-d14	82	(10-132)	(13-140)



ENSECO-WADSWORTH/ALERT
Laboratories

QUALITY CONTROL SECTION

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

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	QC LIMITS 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 # 3C3005-BK
MATRIX: WATER

DATE RECEIVED: 3/30/93
DATE EXTRACTED: NA
DATE ANALYZED: 4/ 5/93

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 = ug/L) as rec'd
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS
Bromochloromethane (HECD)	116	(78-122)
Trifluorotoluene (PID)	102	(73-131)

ENSECO-WADSWORTH/ALERT
Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 3C3005-BK
MATRIX: WATER

DATE RECEIVED: 3/30/93
DATE EXTRACTED: 3/31/93
DATE ANALYZED: 4/14/93

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
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	89	(34-140)	(12-153)
Terphenyl-d14	88	(10-132)	(13-140)

ENSECO-WADSWORTH/ALERT
Laboratories

LAB ID : LCS
MATRIX : WATER
METHOD : 601/2
RUN ID : MA/MB01021

DATE EXTRACTED: N/A
DATE ANALYZED : 04/05/93

LABORATORY CONTROL SAMPLE RESULTS

COMPOUND	ANALYTICAL RUN ID #	LCS %REC	QC LIMITS RPD	QC LIMITS %REC
Benzene	MA/MB01021	106	15	70-117
Toluene		108	16	70-117
Chlorobenzene		101	24	58-133
1,1-Dichloroethene		122	28	43-131
Trichloroethene		125	30	69-129
Dichlorobromomethane		92	22	61-133

ENSECO-WADSWORTH/ALERT
Laboratories

LAB ID : LCS
MATRIX : WATER
METHOD : 625
RUN ID : D0275

DATE EXTRACTED: 03/31/93
DATE ANALYZED : 04/14/93

LABORATORY CONTROL SAMPLE RESULTS

COMPOUND	ANALYTICAL RUN ID #	LCS %REC	QC LIMITS RPD	QC LIMITS %REC
Naphthalene	D0275	89	43	10-139
1-Methylnaphthalene		84	48	10-150
Acenaphthene		88	29	45-130
Fluorene		91	24	37-133
Pyrene		109	41	20-144
Chrysene		86	45	15-152

ENSECO-WADSWORTH/ALERT
Laboratories

LAB ID : 3C3005-5
MATRIX : WATER
METHOD : 625
RUN ID : D0304/D0305

DATE RECEIVED : 03/30/93
DATE PREPARED : 03/31/93
DATE ANALYZED : 04/15/93

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

COMPOUND	ANALYTICAL RUN ID #	MS %REC	MSD %REC	RPD	QC LIMITS RPD	QC LIMITS %REC
Naphthalene	D0304/D0305	90	84	7	23	25-97
1-Methylnaphthalene		81	76	6	24	48-101
Acenaphthene		81	77	5	24	57-104
Fluorene		90	83	8	28	34-118
Pyrene		79	71	11	30	58-148
Chrysene		63	59	7	36	48-118

* = Diluted Out

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 1 of 1

10557

Client: ABB-ES

Project Name / Location: Truman Annex - Bldg 352

Sampler(s): R. Durham P. Wagner

Project #: Keywest-CTO 7

Item #	Date	Time	MATRIX	Sample Location	No. Of CONTAINERS	Parameter: VOC - 601/602	PAH - 610	METALS -	TRPH -	EDB -						Remarks
1	3-22-93	13:10	H_2O	KYW-352-MW5	5	3	2									
2	↑	13:20		KYW-352-MW4	5	3	2									
3		13:30		KYW-352-MW2	5	3	2									
4		13:45		KYW-352-MW3	5	3	2									
5		14:05		KYW-352-MW1	5	3	2									
6	↓	12:55		KYW-352-EB	5	3	2									
7	3-23-93		↓	KYW-352-DUP	5	3	2									
8																
9																
10																
11																

Total Containers: 35

Number of Coolers in Shipment:

Bailers:

Report To:

Additional Comments:

No VOA's
Enclosed
will ship tomorrow

Transfer Number	Item Number(s)	Relinquished By / Company	Accepted By / Company	Date	Time
1		ABB-ES	Paul McNulty	3/23/93	1700
2					
3					
4					
5					
6					

Original Accompanies Shipment

ENSECO-WADSWORTH/ALERT LABORATORIES
SAMPLE SHIPPER EVALUATION AND RECEIPT FORM

.: ABB Project Name/Number: Key West CTC7

es Received By: [signature] Date Received: 3-31-93
(Signature)

3C3005 } received vials for
3C3010 } projects received 3
3C3011 }

le Evaluation Form By: [signature] LAB No: 3C3109/10/11
(Signature)

e of shipping container samples received in? WAL Cooler ✓

Client Cooler ____ WAL Shipper ____ Box ____ Other ____

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

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

Cooler # — Temp 4 °C Cooler # — Temp 5 °C

Cooler # — Temp 4 °C Cooler # — Temp 4 °C

Comments: Approximately half the vials have headspace
Received VOAs only on 3-31-93, 3 VOAs
each sample for 601/2