M00263.AR.000016
MCRD PARRIS ISLAND
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REMEDIAL INVESTIGATION VERIFICATION STEP REPORT WITH TRANSMITTAL LETTER AND REPORT DOCUMENTATION PAGE MCRD PARRIS ISLAND SC
5/25/1990
MCCLELLAND ENGINEERS

NTIS 01.02.00.0004

SECURITY CLASSIFICATION OF THIS PAGE

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1a. REPORT SECURITY CLASSIFICATION Unclassified	1b. RESTRICTIVE MARKINGS N/A
2a. SECURITY CLASSIFICATION AUTHORITY N/A	3. DISTRIBUTION/AVAILABILITY OF REPORT N/A
2b. DECLASSIFICATION/DOWNGRADING SCHEDULE N/A	
4. PERFORMING ORGANIZATION REPORT NUMBER(S) 0501-7007	5. MONITORING ORGANIZATION REPORT NUMBER(S) N/A
6a. NAME OF PERFORMING ORGANIZATION McClelland Consultants 6b OFFICE SYMBOL (If applicable) N/A	7a. NAME OF MONITORING ORGANIZATION Marine Corps Recruit Depot
6c. ADDRESS (City, State, and ZIP Code) P.O. Box 740010 Houston, Texas 77274	7b. ADDRESS (City, State, and ZIP Code) Parris Island, SC 29905
8a. NAME OF FUNDING/SPONSORING ORGANIZATION SOUTHNAVFACENGCOM 8b OFFICE SYMBOL (If applicable) N/A	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER N62467-86-C-0661
8c. ADDRESS (City, State, and ZIP Code) 2155 Eagle Drive P.O. Box 10068 Charleston, SC 29411-0068	10 SOURCE OF FUNDING NUMBERS PROGRAM ELEMENT NO. / PROJECT NO / TASK NO / WORK UNIT ACCESSION NO

11. TITLE (Include Security Classification)
Remedial Investigation, Verification Step, Marine Corps Recruit Depot, Parris Island, SC UIC: M00263

12. PERSONAL AUTHOR(S)
Harry C. Day, Jr.

13a. TYPE OF REPORT	13b TIME COVERED	14. DATE OF REPORT (Year, Month, Day)	15 PAGE COUNT
Final	FROM N/A TO	90 May 25	

16 SUPPLEMENTARY NOTATION
N/A

17. COSATI CODES			18 SUBJECT TERMS (Continue on reverse if necessary and identify by block number)
FIELD	GROUP	SUB-GROUP	
N/A	N/A	N/A	

19 ABSTRACT (Continue on reverse if necessary and identify by block number)

McClelland Consultants performed verification step investigations at nine hazardous or potentially hazardous sites at the Marine Corps Recruit Depot (MCRD), Parris, Island, South Carolina. Six sites were identified by the Navy Energy and Environmental Support Activities in their Initial Assessment Study. Three additional sites were added to this investigation following negotiations between Southern Division, U.S. EPA, and SCDHEC. This project was authorized under contract to Southern Division Naval Facilities Engineering Command, under contract number N62467-86-C-0661. The purpose of this investigation was to perform limited sampling and investigations at sites identified by the Navy for evaluation of potential environmental contamination.

20 DISTRIBUTION/AVAILABILITY OF ABSTRACT ☐ UNCLASSIFIED/UNLIMITED ☒ SAME AS RPT. ☐ DTIC USERS	21. ABSTRACT SECURITY CLASSIFICATION N/A
22a. NAME OF RESPONSIBLE INDIVIDUAL Glenn C. Bradley	22b. TELEPHONE (Include Area Code) (803) 743-0582 22c. OFFICE SYMBOL 115

DD Form 1473, JUN 86 *Previous editions are obsolete.* SECURITY CLASSIFICATION OF THIS PAGE

S/N 0102-LF-014-6603

McClelland consultants

Job No. 0501-7007
May 25, 1990

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Attention: Ms. Cacky Barefoot, Code 11517

McClelland Consultants is pleased to submit this Remedial Investigation, Verification Step, Marine Corps Recruit Depot, Parris Island, South Carolina.

Sincerely,

McCLELLAND CONSULTANTS
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REMEDIAL INVESTIGATION
VERIFICATION STEP
MARINE CORPS RECRUIT DEPOT,
PARRIS ISLAND, SOUTH CAROLINA
UIC: M00263

* * *

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May 1990

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SUMMARY

McClelland Consultants performed verification step investigations at nine hazardous or potentially hazardous sites at the Marine Corps Recruit Depot (MCRD), Parris Island, South Carolina. Six sites were identified by the Navy Energy and Environmental Support Activity in their Initial Assessment Study. Three additional sites were added to this investigation following negotiations between Southern Division, U.S. EPA, and SCDHEC. This project was authorized under contract to Southern Division Naval Facilities Engineering Command, under contract number N62467-86-C-0661. The purpose of this investigation was to perform limited sampling and investigations at sites identified by the Navy for evaluation of potential environmental contamination.

During the conduct of this investigation, McClelland Consultants advanced 17 soil borings, installed 9 wells and 3 wellpoints, and collected 56 total samples of surface water, groundwater, surface soils, and subsurface soils for chemical analysis. These samples were evaluated for environmental contamination, and McClelland Consultants made recommendations to Southern Division based on the results of these investigations.

Based on the results of investigations performed for this study, McClelland Consultants recommends three sites for remedial investigation activities (Sites 1, 2 and 16). One site is recommended for no further action or additional investigations (Site 4). One site requires additional verification step investigations prior to recommendations to drop from subsequent investigations or to perform remedial investigation activities (Site 3). Four sites are scheduled to be transferred from Southern Division's Installation Restoration program to their Underground Storage Tank program (Sites 6, 17, 18 and 19). MCRD will fund the removal of the tanks at Sites 6 and 17, and coordinate the removal with SCDHEC. Southern Division will provide project review for these sites. No additional investigations of these sites are recommended under this Installation Restoration program.

1.0 PROJECT AND SITE SUMMARIES

1.1 Project Overview

The purpose of this project was to conduct verification investigation activities at nine hazardous or potentially hazardous sites at the Marine Corps Recruit Depot (MCRD), Parris Island, South Carolina. Six of the sites identified for this verification phase were selected, and initial recommendations made for the conduct of this verification phase by the Naval Energy and Environmental Support Activity, in their "Initial Assessment Study of the Marine Corps Recruit Depot, Parris Island, South Carolina" (IAS, September 1986). Three sites were subsequently added for investigation. Of the nine sites evaluated in this study, McClelland Consultants modified the recommended investigative approach at two of the sites; Site 4 - Dredge Spoils Area Fire Training Pit, and Site 6 - Former Automotive Hobby Shop Spill Area. These modifications included changing drilling locations or changing the number or type of samples. All modifications to the verification activities were approved by the Navy and by the applicable regulatory agencies before work commenced.

As part of this investigation, McClelland Consultants advanced 17 soil borings for a total footage of 343 ft, installed nine groundwater monitoring wells for a total well footage of 197 ft, and installed three wellpoints for a total footage of 32 ft. Vadose zone vapor (soil vapor-unsaturated zone) analyses were conducted at three of the sites. Wells and wellpoints were developed by approved procedures. McClelland submitted a total of 56 samples to the laboratory for chemical analytical testing, which consisted of 11 soil boring samples, 13 shallow soil/sediment samples, 10 surface water samples, and 22 groundwater monitoring well or wellpoint samples (these numbers include quality assurance/quality control laboratory samples). The laboratory analyzed the samples in accordance with EPA-approved analytical methods, within EPA-approved sample holding times.

The results of these data indicate that the following site may be recommended for no further or subsequent investigations:

Site 4 - Dredge Spoils Area Fire Training Pit,

The following sites are recommended for detailed remedial investigation. These recommendations are based upon the presence of identifiable and quantifiable concentrations of

known hazardous constituents or priority pollutants present in the sample submitted to the laboratory for analyses. Although risk to human health and the environment has not been established, these sites may prove to pose some level of environmental risk or liability. These sites include:

Site 1 - Incinerator Landfill,

Site 2 - Borrow Pit Landfill,

Site 16 - Pesticide Rinsate Disposal Area.

Based on the results of this verification step, the following site is recommended for advanced sampling and assessment activities. Additional data are needed before a decision can be made regarding deletion of this site from remedial investigation, or the addition of this site to those sites requiring remedial investigation activities. This site is:

Site 3 - Causeway Landfill.

Based on negotiations between Southern Division, MCRD, McClelland Consultants, South Carolina Department of Health and Environmental Control (SCDHEC), and U.S. Environmental Protection Agency (EPA), tank removal and assessment is recommended at one site. This will be funded and coordinated by MCRD. Southern Division will track the project status. This site is:

Site 6 - Former Automotive Hobby Shop Spill Area.

Based on negotiations between Southern Division, McClelland Consultants, U.S. EPA, and SCDHEC, three sites will be transferred to the Underground Storage Tank program of Southern Division. MCRD will fund and coordinate site remediation activities at Site 17. These three sites will therefore be exempt from further evaluation from the Installation Restoration program. These three sites include:

Site 17 - Page Field Tanks (AS-16),

Site 18 - Page Field Tanks (AS-18), and

Site 19 - MCX Service Station.

In order to maintain consistency with the chemical analytical results, all chemical analysis presented in this text maintain the same analytical reporting units as those presented by the laboratory. Usually, all inorganic analyses are presented as ppm (excluding mercury which is reported in ppb). Priority pollutant volatile organic compounds, acid and base/neutral extractable organic compounds, pesticides, and polychlorinated biphenyls (PCBs) are reported in

ppb. The indicator parameter pH is presented in standard units (S.U.), specific electrical conductivity in umho/cm, and total organic carbon (TOC) is reported in ppm.

General Engineering Laboratories, Charleston, South Carolina performed all laboratory analyses on the samples. The results of field and laboratory analyses are presented in Appendix E of this report.

1.2 Site Summaries

1.2.1 Site 1 - Incinerator Landfill. This site was active from 1921 to 1959 and continued to be used by the activity (MCRD) until 1965. The site reportedly received incinerator residues and ash, as well as liquid and solid wastes. This site is located directly at or built onto the marsh with marsh contacting the present-day site along three sides. At this site, one soil boring was advanced, one groundwater monitoring well and three wellpoints were installed. Samples were collected from shallow surface sediments, marsh edge surface water, and from the wells and wellpoints.

No priority pollutants were identified in the water samples collected at this site. Chloroform, chromium, and lead were identified in soil samples collected around the perimeter of this site. No chloroform was identified in any of the groundwater samples collected from the wells. Additional studies are needed to confirm the presence of chloroform, lead, and chromium at the site, as well as determine the depth and extent of contamination in the vicinity of this site. Because of the potential for public access to this site, it is recommended that access to this site be restricted by the installation of a fence or other barrier between Site 1 and the adjacent roadway.

1.2.2 Site 2 - Borrow Pit Landfill. This landfill was active from 1966 to 1968. Solid waste and construction debris reportedly comprised the majority of wastes at this site. According to the IAS, this site also reportedly contains solid paint wastes, paint thinners, and paint strippers. The Borrow Pit Landfill is located within 250 to 600 ft from the salt marsh. At the landfill, three groundwater monitoring wells were installed and sampled. Additionally, one surface sediment and one surface water sample was collected from the adjacent channel that appears to be the closest and topographically downgradient surficial feature between the landfill and the adjacent marsh.

Surface water samples show contamination with cadmium and chromium, while groundwater samples have quantifiable concentrations of chloroform and 1,2-dichloroethane. Chloroform was also identified in one shallow soil sample. Additional studies are needed to determine the depth and extent of organics and heavy metal contamination in the vicinity of this site.

1.2.3 Site 3 - Causeway Landfill. The Causeway Landfill was constructed from solid waste and fill dirt across a tidal marsh. The landfill is approximately 0.8 mi long and was constructed to an elevation of about 10 ft above the high tide water line. This site was constructed between 1960 and 1972, unlined, built directly on the salt marsh, and is in direct contact with marsh water and sediments along its entire length. Underground utilities such as telephone lines are conducted through the causeway. Eight surface water and eight shallow sediment samples were collected along the water line, four of each taken from each side of the causeway.

No priority pollutant contamination was identified in any samples collected at the Causeway Landfill. Additional verification step sampling activities are recommended of nearby shellfish species however, to assure no impact to these biota prior to changing the investigative status of this site.

1.2.4 Site 4 - Dredge Spoils Area Fire Training Pit. This site was used for fire training activities between the 1940s and mid-1960s. Fuels used for fire training included waste fuels and oils, and possibly petroleum-based solvents. Five boreholes were advanced and soil samples collected for headspace vapor screening and chemical analysis. No volatile organic compounds or EP toxic concentrations of heavy metals were identified in the samples screened in the field or collected and submitted to the laboratory for chemical analyses. This site is not recommended for additional studies or evaluation.

1.2.5 Site 6 - Former Automotive Hobby Shop Spill Area. This site was contaminated by surface spills of waste lube oils in the vicinity of the waste oil underground storage tank fill pipe from 1969 to 1982. A 500 gal, underground waste oil tank is buried at this location. McClelland Consultants advanced one soil boring, and completed the boring as a groundwater monitoring well. A water sample was collected from the well and two shallow soil samples collected from the soil boring and submitted to the laboratory for analysis.

No contamination of the soil or groundwater was identified in the samples submitted to the laboratory for chemical analysis. This site is not recommended for additional evaluation

under the Installation Restoration program. MCRD will fund the removal of this tank and coordinate the removal with SCDHEC. Southern Division will track the status of Site 6.

1.2.6 Site 16 - Pesticide Rinsate Disposal Area. At this site, rinsewaters from pesticide operations were discharged onto the ground in an approximately 150 sq ft area. This site was active between 1950 and 1978, with an estimated 8,000 gal of pesticide rinsate disposed during this time period. This site is located approximately 700 ft from the nearest marsh. Three soil borings were advanced and samples were submitted to the laboratory.

The pesticide DDT and degradation products DDE and DDD were identified in one of the soil borings. Additional investigation at this site may be indicated to determine the depth and extent of contamination, as well as evaluate the impact to groundwater at this location.

1.2.7 Site 17 - Page Field Tanks (AS-16). This site consists of four 25,000 gal, steel underground storage tanks. Small volumes of fuel are contained in two of the tanks, all tanks are full of fluid that is suspected to be primarily rainwater, or water which was used to displace the fuels into tank trucks. The contents of these tanks have been evaluated under a separate contract. The results of the studies are not reproduced in this report.

A soil vapor survey was conducted at this site and the results of the survey were unremarkable. One groundwater monitoring well had been installed previously by another contractor but was never sampled for groundwater quality. McClelland Consultants installed two additional wells and sampled all three wells for contaminants.

No contamination was identified in the soil vapor survey or from the chemical analyses of the groundwater samples. This site is not recommended for additional evaluation under the Installation Restoration program. This site will be transferred to Southern Division's Underground Storage Tank program for remediation. MCRD will fund and coordinate this project with SCDHEC.

1.2.8 Site 18 - Page Field Tanks (AS-18). This site consists of four, 50,000-gal underground concrete tanks. These tanks are located within 500 ft of a salt marsh. Approximately 6,200 gal of fuel is present in the first tank west of the easternmost tank, and three of the tanks are filled with fluid suspected to be rainwater or water which was used to displace the fuels into tank trucks. The contents of these tanks have been evaluated under a separate contract. The results of these studies are not reproduced in this report.

A soil vapor survey was conducted at this site, and the results of the survey indicate fuel-type vapors are present at two locations (central and west areas of the site). One groundwater monitoring well was installed previously by another contractor, but was never sampled for groundwater quality. McClelland Consultants installed two additional wells and sampled all three wells for the presence of contaminants.

Contamination of the groundwater by benzene, ethylbenzene, and xylenes was identified in one groundwater monitoring well location.

Based on negotiations between Southern Division, SCDHEC, and U.S. EPA, this site will be transferred to the Underground Storage Tank division for funding, closure, and remediation. No additional verifications step activities, and no remedial investigation activities are recommended for this site under the Installation Restoration program.

1.2.9 Site 19 - MCX Service Station. Four 5,000-gal underground storage tanks and one 500-gal underground waste lube oil tank reportedly exist at this site. At least one of the storage tanks has a history of a leak or release. Three wells are present at this site, previously installed by another contractor, but reportedly have never been sampled for groundwater quality. McClelland Consultants conducted a soil gas vapor survey at the site, sampled the three existing groundwater monitoring wells, and submitted the samples for chemical analyses.

Fuel components are present in the subsurface vapor in the vicinity of the underground storage tanks. These organic vapors appear to be localized and do not show significant signs of migration from the tank area. No groundwater contamination was identified in any monitoring wells present at this site.

Based on negotiations between Southern Division, SCDHEC, and U.S. EPA, this site will be transferred to the Underground Storage Tank division for funding, closure, and remediation. No additional verification step activities, and no remedial investigation activities are recommended for this site under the Installation Restoration program.

1.3 Site Recordation

Many of the sites evaluated during this study have a potential to threaten the public health or the environment if disturbed by site entry, construction, site grading, or other surface disturbance or activities. This risk may be most pronounced at sites where bulk quantities of

waste and waste material have been discarded and/or buried (e.g., landfill sites). It is recommended that a notice on the land plat and deed be prepared that shows the location, size, and types of material present for each of the sites evaluated during this investigation. It is further recommended that all sites that are not presently within fenced and secured areas have fences constructed around their perimeter. This should significantly reduce risk of unknowing site entry, site disturbance, or personnel exposure.

2.0 INTRODUCTION

2.1 Naval Installation Restoration Program

The Naval Installation Restoration Program (NIRP) uses a six-phase approach to manage past disposal sites at Navy and Marine facilities. Phase I, the Preliminary Assessment (PA), consists of the collection and review of all available information about the source and nature of hazardous substances at a site. Phase II, the Site Inspection (SI), involves a field inspection and sampling to verify contamination. Phase III, Remedial Investigation (RI), is a field effort to collect sufficient information to characterize sites for development and evaluation of remedial responses. Phase IV, the Feasibility Study (FS), involves the selection of remedial alternatives based on cost, environmental effects, and engineering feasibility. Phase V, Remedial Design (RD), includes the design of remedial technologies selected in the FS state. Phase VI, Remedial Action (RA), includes implementation of the selected Remedial Design.

2.2 Project History

Phase I has been completed for 16 sites at the Marine Corps Recruit Depot (MCRD) Parris Island, South Carolina. This work corresponds to the Initial Assessment Study (IAS) undertaken as part of the Naval Assessment and Control of Installation Pollutants (NACIP) program. Of the 16 sites identified in the IAS, six were identified as requiring additional investigations. Subsequent to this recommendation, three additional sites were added to the list of recommended sites, bringing the total number of sites investigated in this Phase II study to nine.

As part of Contract No. N62467-86-C-0661, McClelland Consultants was directed by Southern Division Naval Facilities Engineering Command (Southern Division) to prepare work plans for the evaluation and investigation of the nine potential sites as part of the site verification phase of a Remedial Investigation at the activity. This work was originally contracted under the NACIP program, but the sites were subsequently transferred under the Naval Installation Restoration Program (NIRP).

In September 1987, McClelland Consultants and Southern Division contracted to implement the work plans for the preliminary verification phase of the remedial investigation activities. Work plans were finalized, field activities began in February 1988 and lasted through

March 1988. This report is based on the samples collected and the chemical analyses of the samples collected during this investigation.

Further investigations are needed to answer unresolved questions concerning some of the sites evaluated in this investigation. These additional studies may be needed to provide a more complete assessment of the actual environmental risk from the sites to human health and the environment. These investigations may include additional sampling and analyses: (1) to rank the site as requiring remedial investigation activities, (2) have the site dropped from further investigations, or (3) these actions may shift the site directly into the remedial investigation process. These investigations may delineate and confirm the presence and magnitude of a contaminant plume, as well as possibly provide a more detailed or better understanding of the hydrogeology of the activity and surrounding area.

2.3 Site Descriptions

Of the nine sites evaluated in this study, three are landfills (Sites 1, 2, and 3) which reportedly contain mixtures of domestic trash and garbage, empty pesticide containers, mercury amalgam waste, contaminated fuels, waste motor and lube oils, hydraulic fluids, solvents, paint strippers and thinners, and other similar compounds and materials. Three of the sites (Sites 4, 6, and 16) received only liquid wastes. The Dredge Spoils Area Fire Training Pit (Site 4) was used for fire training purposes. The Former Automotive Hobby Shop Spill Area (Sites 6) received only waste lube oils. The Pesticide Rinsate Disposal Area (Site 16) is where excess and waste pesticides were discharged to the ground surface.

Four of the sites (Sites 6, 17, 18, and 19) contain underground storage tanks that are no longer in active service. These tanks were used for waste lube oils (Site 6 and 19), aircraft refueling (Sites 17 and 18) and for automobile fuel dispensation (Site 19). A total of fourteen underground storage tanks are present at these four sites.

2.4 Field Activities

The remedial investigation verification step activities presented herein have been designed to provide data of adequate technical content and quality necessary to support the development and evaluation of recommendations for either elimination or further investigation of each site.

This report represents a preliminary verification step of the remedial investigation. This step is not intended to completely characterize a site, but rather to perform initial sampling and analyses at sites to determine whether a detailed investigation is needed, or if a site can be eliminated from further evaluation. The criteria for elimination or further investigation of a site is based on the results from the sampling, analyses, and evaluation of the data collected during this preliminary remedial investigation verification step.

Soil gas sampling was performed to provide information concerning subsurface contamination with volatile organic compounds. In general, McClelland Consultants uses this technique to reduce or focus the fieldwork activities. Results are generally confirmed, if needed, by completion of soil borings, and installation and sampling of monitoring wells or wellpoints. Wellpoints at some sites were installed rather than wells, as they can be installed usually without a drilling rig, and no drill cuttings are produced. In some instances, a rig was used to hydraulically push the wellpoints into location. Sediments and surface water samples were collected at sites near marsh areas and in those areas where there is a potential for surface migration from the site via runoff.

2.5 Report Organization

This document presents the procedures used in the remedial investigation verification step to evaluate whether specific toxic and hazardous materials are present at the nine sites at MCRD Parris Island in concentrations considered to be hazardous. Specifically, it describes those investigative procedures necessary to characterize the site (environmental setting), define the source (source of contamination), and determine the degree and extent of hazardous constituent releases (contamination characterization). The collection of these data will further enable characterization of individual sites for development and evaluation of remedial responses or will lead to a recommendation that a site be dropped from further evaluation.

This report is presented in six sections. Section 3 provides the discussion of site history, field activities, results of chemical analyses and data, and provides recommendations for further study or removal of the site from additional investigation. This section is presented on a site by site basis rather than by field activity. Section 4 discusses the field investigative methods and activities that McClelland Consultants used during this investigation. It includes details on

drilling, sampling, decontamination, sample screening, and well or wellpoint installation. Section 5 presents a summary of recommendations by site and Section 6 provides a list of references cited in this report.

Much of the supporting documentation for the sites is presented in the appendices to this report. These include the location and elevation survey of wells and surveyor's original field notes (Appendix A), boring logs (Appendix B), well construction and well development data (Appendix C), South Carolina well installation reports (Appendix D), field and laboratory chemical analytical data (Appendix E), and completed chain-of-custody records for samples submitted for laboratory analyses (Appendix F).

3.0 SITE SPECIFIC INVESTIGATIONS AND RECOMMENDATIONS

3.1 Approach

This section provides a brief discussion of the investigation on a site-by-site basis. A summary of the site history and site background, as described in the Initial Assessment Study, is presented along with a summary of the site activities performed during this investigation. This section includes the type of field activities completed, the types and number of samples collected and submitted to the laboratory for chemical analyses, an evaluation of the analytical results, and recommendations for further investigations, if warranted. Applicable figures, soil vapor data, gas chromatographs, or other site specific data collected during the investigation are provided in this section. Soil boring logs, well construction details, well data reports, surveyed well locations and elevations, field and laboratory analytical results, and completed chain-of-custody records are presented in the appendices of this report.

Based on an evaluation of the data, each site is either recommended for further evaluation and study, or it is recommended to be dropped from further investigation. The criteria for recommending a site for further evaluation is based on a number of factors. McClelland Consultants considered the location of the site relative to adjacent marsh and wetlands, potential exposure to the site by human or animal contact, type and concentration of the contaminant(s) identified, and the site history as provided in the Initial Assessment Study.

3.2 Site Recordation/Site Security

Sites evaluated during this investigation may be potentially hazardous if disturbed or exposed even though no apparent migration or contamination were identified at the site vicinity during this investigation. A recordation of the locations of all solid and hazardous waste sites at the activity should be performed by a registered surveyor. The purpose of this recordation is to provide a record of the site locations to prevent the sites from being disturbed in the future.

In addition to recordation of the sites, many of the sites should be marked with signs or protected with fences such that the sites are secured from uncontrolled or unknowing entry. Many of the outlying sites are within open areas that military personnel access for field or training operations. Some means of security or site control is needed to prevent unknowing entry into these potentially hazardous site locations.

3.3 Activity Description

The Marine Corps Recruit Depot (MCRD) Parris Island is located approximately five miles south of the town of Beaufort, South Carolina (Figure 3.3-1). MCRD is located on an island north of the Port Royal Sound, between the Broad River and the Beaufort River.

According to the IAS, MCRD Parris Island is located on 30 to 40 ft of unconsolidated sands, silts, and clays of Pleistocene age that are considered a shallow or surficial aquifer. This unit is hydraulically and physically separated in this area from the underlying limestone aquifer of Tertiary age by the Hawthorn Formation. The IAS report states that the limestone aquifer, although used within the county as a local water source, is not used in the vicinity of MCRD Parris Island because of local intrusion and contamination by salt water. The geology and hydrogeology at the activity are described in more detail in the IAS report.

Based on preliminary site information provided in the IAS, potential migration pathways that should be assessed during the verification step include:

- lateral movement of contaminants in high permeability surficial sands,
- discharge of shallow groundwater into adjacent marshland, with contaminant movement accelerated by flushing action produced by tidal fluctuations in the water table, and
- migration of contaminants from the surficial aquifer to the deep limestone aquifer which would be enhanced by vertical hydraulic gradients in natural recharge zones or zones influenced by water supply pumping.

Locations of six sites recommended for contaminant verification, as well as the three sites subsequently added for investigation, are shown on Figure 3.3-2 and are described below.

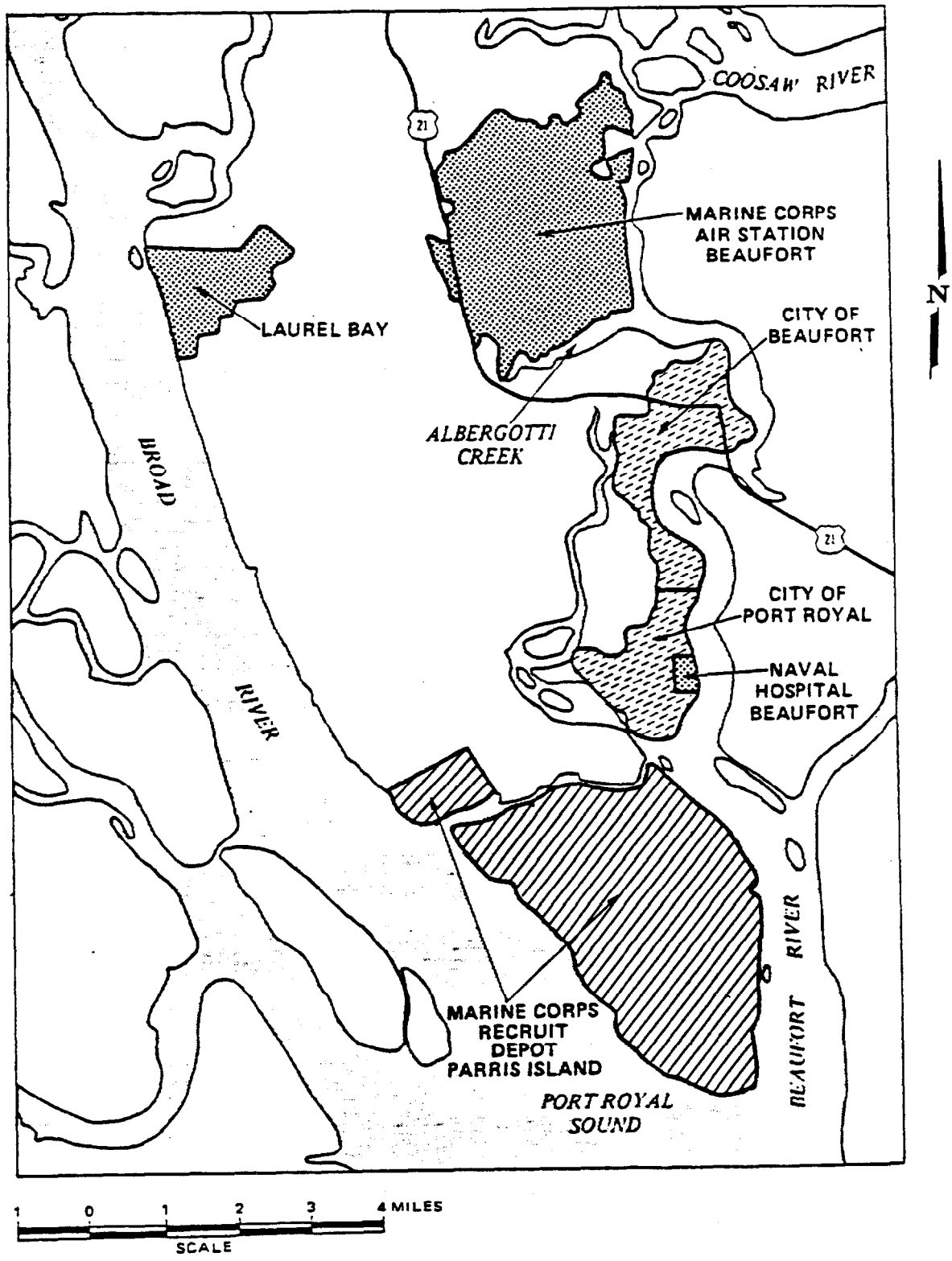
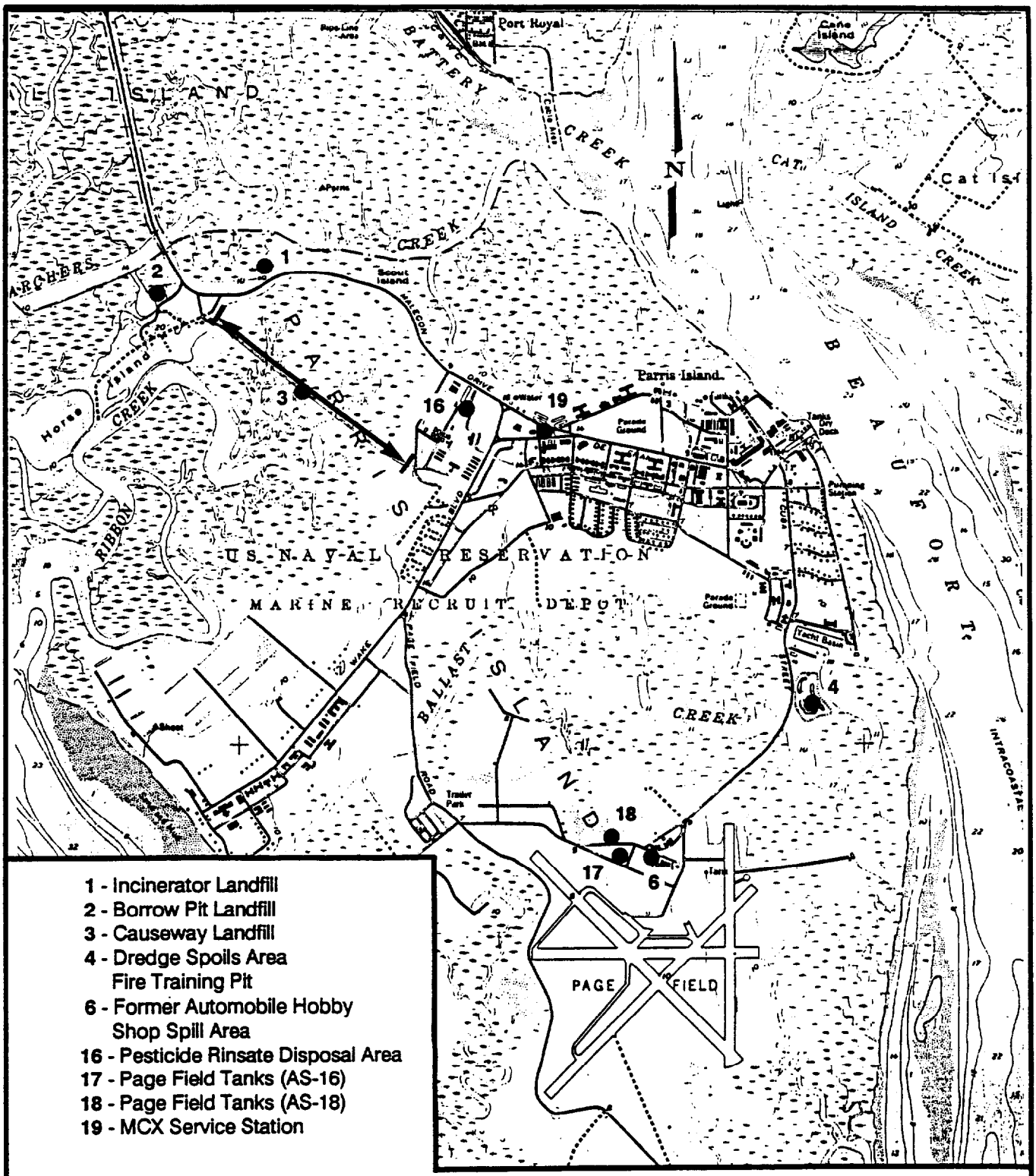


FIGURE 3.3-1 VICINITY MAP



EXPLANATION:

● Location of verification step sites as identified in IAS.

FIGURE 3.3-2
SHOWING LOCATIONS OF WASTE MANAGEMENT UNITS

0 3000 6000 feet

3.4 Site 1 - Incinerator Landfill

3.4.1 Site Description. As stated in the IAS report, this site is about 4 acres in plan view and activities included operation of an incinerator. This site was the primary disposal area at MCRD Parris Island from 1921 to 1959, and continued to be used until 1965. Combustion residues, noncombustible and combustible wastes were disposed of in the Incinerator Landfill. After the incinerator at this site was finally closed in 1965, much of the combustible wastes were reportedly open-burned in the landfill without auxiliary fuel. The majority of wastes disposed of in this landfill were reportedly nonhazardous domestic wastes, ash residues, and construction debris. With the exception of paint thinners and strippers which were burned in the landfill, the majority of hazardous wastes were burned in the incinerator during the period from 1921 to 1959. This site is located directly on preexisting marsh sediments with the present-day marsh boundary present on three sides, and a roadway present on the south boundary.

According to the IAS, migration of contaminants into the marsh is likely, but vertical contaminant migration is reportedly limited due to surficial clays and confining beds above the Tertiary limestone aquifer. The continuity of these surficial clays or confining beds at this site has not been determined. Potential contaminant receptors would include the surrounding marsh areas, fish and shellfish within the marshes and predatory species including humans which feed on fish and shellfish species.

3.4.2 Field Activities. Work at Site 1 included the installation of one monitoring well just south of the landfill near the edge of the fill area, the installation of three wellpoints just outside the landfill boundary at the land-tidal marsh interface, the collection of four groundwater samples from the well and wellpoints, and the collection of three sediment samples from the marsh surrounding the landfill. The locations are shown on Figure 3.4-1. Soil samples from the monitoring well borehole were collected continuously from the surface to the depth of the boring (15 ft). Soil samples were collected for visual inspection, classification, and headspace readings.

The monitoring well and wellpoints were installed to collect groundwater samples for chemical analyses. The top of the well screens was set for 2 ft above the existing water table which ranged from 9 to 12 ft below ground. Shallow sediment samples were collected by hand at three locations in the marsh around the landfill. The sediment samples were collected from 0 to 2-ft depth. All three soil samples were submitted for chemical analyses.

Soil samples were screened in the field for the presence of volatile organic compounds using a Foxboro Organic Vapor Analyzer (OVA). The screening procedure consisted of sampling the headspace from a soil sample to detect possible organic contamination in the subsurface.

3.4.3 Laboratory Analyses. Groundwater samples collected from the well and wellpoints were analyzed by the laboratory for priority pollutant volatile organic compounds, acid and base/neutral extractable organics including pesticides and PCBs, dissolved metals arsenic (As), barium (Ba), beryllium (Be), cadmium (Cd), chromium (Cr), lead (Pb), mercury (Hg), selenium (Se), and silver (Ag), for the indicator parameters pH, specific conductance, and total organic carbon (TOC). Shallow sediment samples were analyzed for priority pollutant volatile organic compounds, acid and base/neutral extractable organics, total metals As, Ba, Be, Cd, Cr, Pb, Hg, Se, Ag, and for EP toxic metals As, Cd, Cr, Pb, and Hg.

3.4.4 Results. No priority pollutant organic compounds were identified in the groundwater samples collected from the well and wellpoints at this location. Total organic carbon content varies in the groundwater samples from as low as 2.5 ppm in the background well, to as great as 481 ppm in well PAI1-GW2. Total organic carbon content does not correlate to the presence of priority pollutant organic compounds.

PAI1-GW4 is the only sample where a dissolved lead concentration of 0.101 ppm exceeds the EPA Interim Primary Drinking Water Standard of 0.050 ppm. The recommended EPA ambient saltwater quality criteria (acute toxicity) is 0.14 ppm, which is greater than the lead content identified in the water sample.

Although not identified in the groundwater samples collected at this site, chloroform was identified at concentrations of 351 ppb and 215 ppb in sediment samples collected at PAI1-SS1 and PAI1-SS2, respectively. No other organic priority pollutants were identified at concentrations exceeding the lower limit of determination for the analysis.

Total chromium and lead were identified in the shallow sediment samples. No EP toxic concentrations of these metals were identified in the samples analyzed in the laboratory.

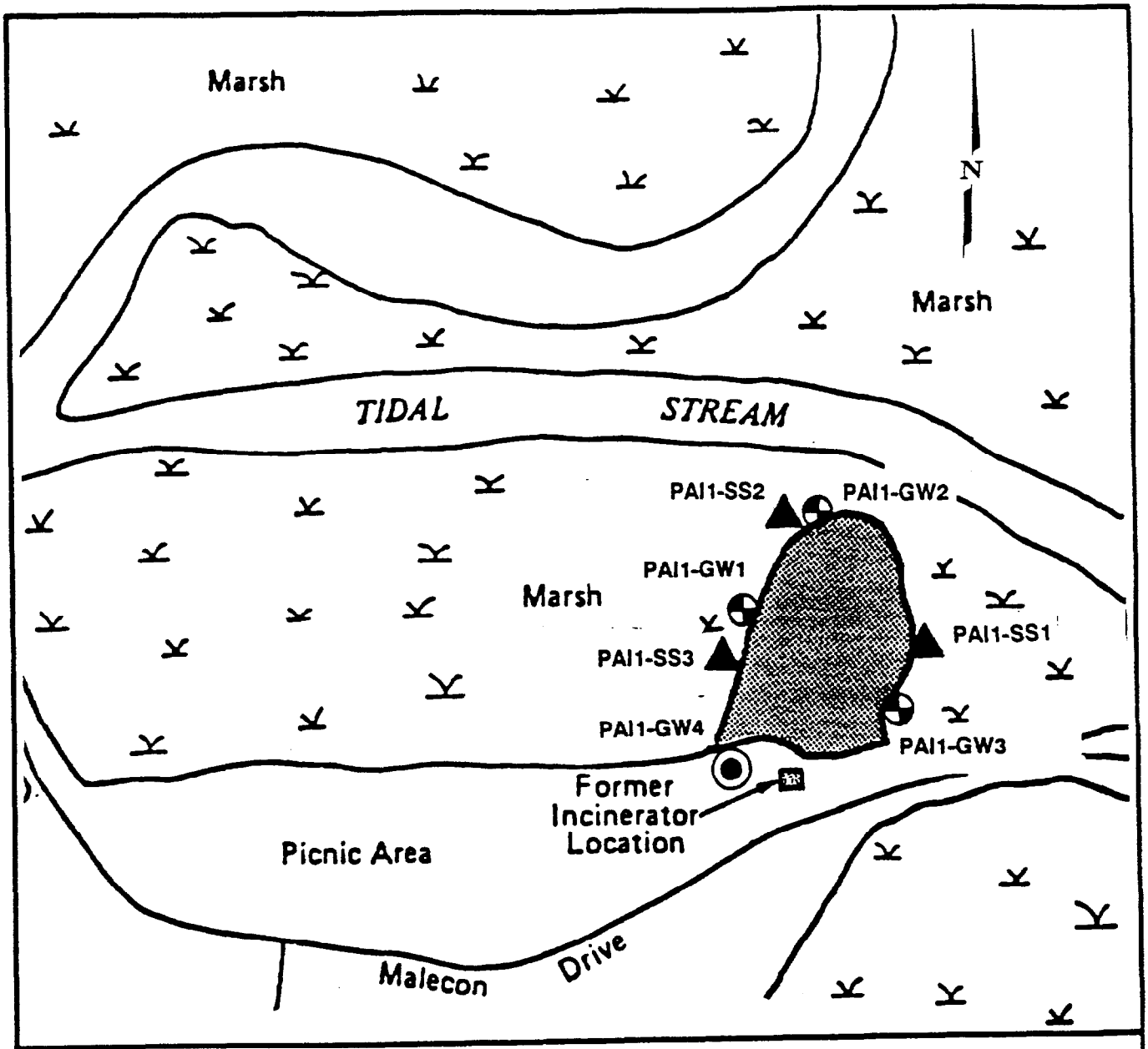
McClelland constructed a shallow water table map (Figure 3.4-2) using water level data collected during sampling activities. Well points PAI1-GW1, PAI1-GW2, and PAI1-GW3 were

installed in the tidal flats, and were only accessible during periods of low tide. Measurements of these well points show water levels at these locations were below mean sea level at the time of sampling.

The groundwater in monitoring well (PAI1-GW4) measured approximately 4 ft above mean sea level at the time of sampling. This well was completed as an expected upgradient well to the Incinerator Landfill. As expected, the water table measurements clearly show Well PAI1-GW4 as an upgradient well, however, the lead concentration in samples from this well indicate either an upgradient source of lead in the groundwater, or that this well is influenced by the landfill material.

3.4.5 Recommendations. Additional evaluation for chloroform at greater depths may be indicated because of the density and possible mobility of this compound. Additional evaluation at this site is recommended to determine the depth and lateral extent of chloroform present in the subsurface soils, and also to determine whether chloroform is present in the groundwater at deeper horizons around the Incinerator Landfill.

Any additional investigations should include evaluation of the heavy metals identified in samples analyzed as part of this investigation.



EXPLANATION:

PAI1-GW4 ◉ Monitoring well/groundwater sample

PAI1-GW3 ◔ Temporary piezometer/groundwater sample

PAI1-SS3 ▲ Surface sediment samples

Site

Structure

(modified from surveyor's notes)

FIGURE 3.4-1
SAMPLING LOCATIONS AT SITE 1

0 400 800

Scale In Feet

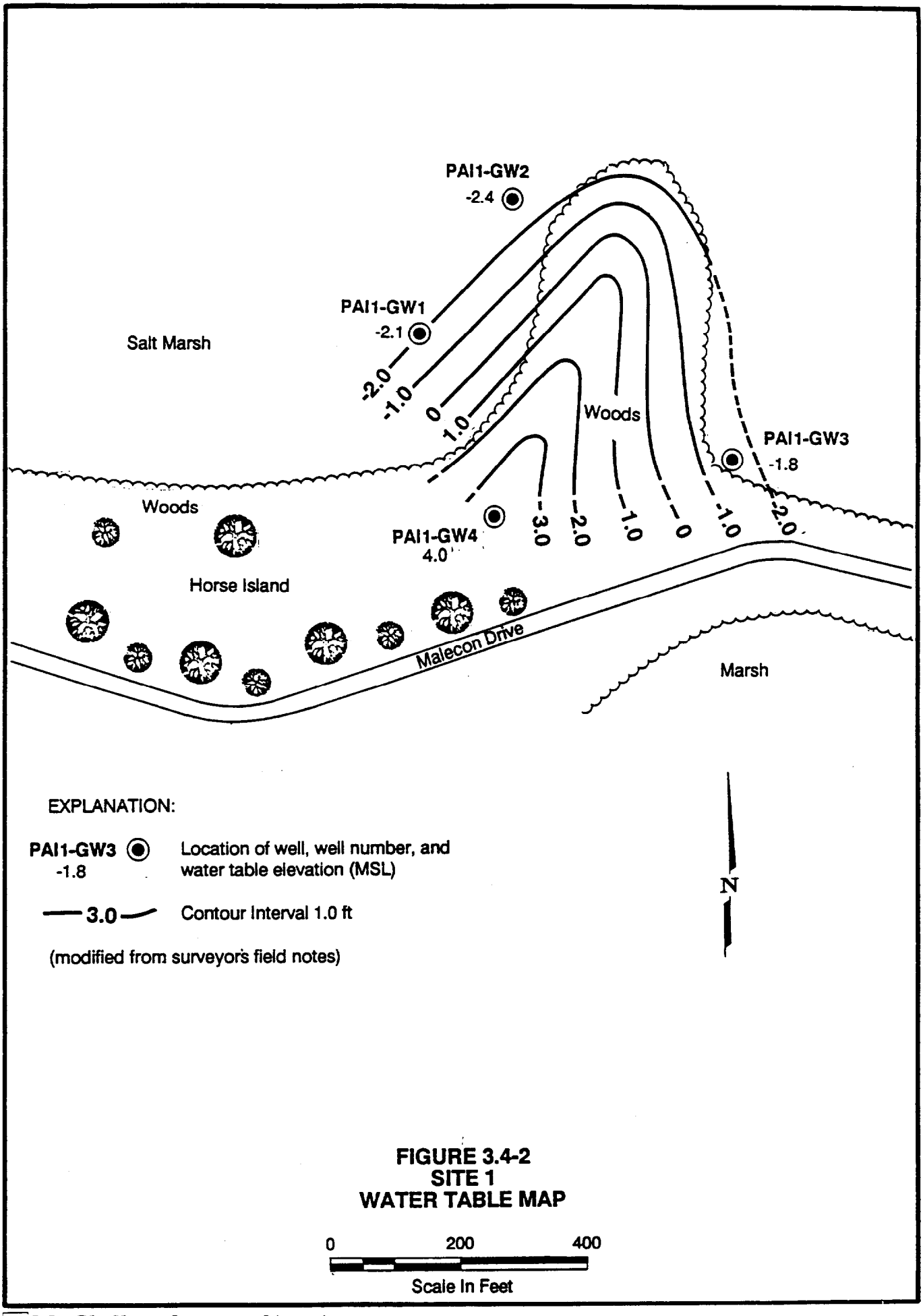


FIGURE 3.4-2
SITE 1
WATER TABLE MAP

3.5 Site 2 - Borrow Pit Landfill

3.5.1 Site Description. The IAS reports that this site was used as the primary disposal area for MCRD Parris Island wastes during the period from 1966 to 1968. This site is reportedly about 250 ft by 400 ft in plan view with a depth as deep as 10 ft below ground. Wastes disposed at this site are similar to those discarded into Site 1 - Incinerator Landfill, and consist of solid waste and construction debris, as well as solid paint wastes, paint thinners such as mineral spirits, kerosene and diesel fuel, and paint strippers (methylene chloride).

Horizontal migration of contaminants to the marsh is reported in the IAS as likely due to the underlying unconfined, highly permeable, sands. Vertical contaminant migration is limited due to the low permeability confining layers above the Tertiary limestone aquifer. The continuity of these confining beds at this site has not been established. Potential contaminant receptors would include the surrounding marsh areas, fish and shellfish within the marshes, and predatory species, including humans which feed on fish species.

3.5.2 Field Activities. The work at Site 2 includes advancing three soil borings and installing three monitoring wells around the landfill. One surface water/sediment sample was collected in the basin just west of the landfill. This sample location was selected because it represents the closest point of surface water runoff from the fill area into the marsh. Figure 3.5-1 shows the wells and sampling locations. During drilling, soil samples were collected continuously for visual inspection, soil classification, and headspace readings. A headspace gas chromatograph from this location is presented in Figure 3.5-2 and shows that no nonmethane peaks were identified. The wells were completed such that the screen extends from the base of the well to about 2 ft above the water table. Water table depths ranged from 15 ft to 17 ft below ground surface.

Soil samples from the borings were screened for total volatile organic compounds using an OVA. Groundwater samples were collected from the monitoring wells and submitted for chemical analyses. The sediment sample was collected from 0 to 2-ft depth. A surface water sample was collected at the same location as the sediment sample.

3.5.3 Laboratory Analyses. The groundwater samples and the surface water sample were analyzed for priority pollutant volatile organic compounds, acid and base/neutral extractable organics including pesticides and PCBs, for the dissolved metals As, Ba, Be, Cd, Cr, Pb, Hg, Se, Ag, and for the indicator parameters total organic carbon (TOC), pH, and specific

conductance. The sediment sample collected at this site was analyzed for priority pollutant volatile organic compounds, acid and base/neutral extractable organics including pesticides and PCBs, total metals As, Ba, Cd, Cr, Pb, Hg, Se, Ag, and for EP toxic metals As, Cd, Cr, Pb, and Hg.

3.5.4 Results. McClelland constructed a shallow water table map using data collected during field investigation activities (Figure 3.5-3). This map shows a water table gradient towards the west, but the gradient is essentially flat (less than 0.01 ft/ft).

Chloroform was identified at a concentration of 12 ppb in the groundwater sample collected from Well PAI2-GW3, and 1,2-dichloroethane was identified at a concentration of 20 ppb in the groundwater sample collected from Well PAI2-GW1. No other organic priority pollutants were identified in the groundwater samples collected from the groundwater monitoring wells at this site.

Chromium at 0.10 ppm exceeds the EPA Interim Primary Drinking Water Standard of 0.050 ppm at Well PAI2-GW3, and lead at a concentration of 0.073 exceeds the same EPA standard of 0.050 ppm in Well PAI2-GW1. No other heavy metals exceed these standards, or they were below the lower limit of determination for the samples.

The surface water sample (PAI2-SW1) exceeds the EPA Interim Primary Drinking Water Standards for cadmium and chromium. Cadmium in the sample was quantitated at 0.083 ppm and the chromium value for the sample is 0.14 ppm. The EPA Interim Primary Drinking Water Standards for these metals are 0.010 ppm and 0.050 ppm, respectively. In saltwater, the EPA ambient water quality criteria (acute toxicity) for cadmium and chromium are 0.043 ppm and 1.1 ppm, respectively. The ambient saltwater quality criteria are not enforceable limits.

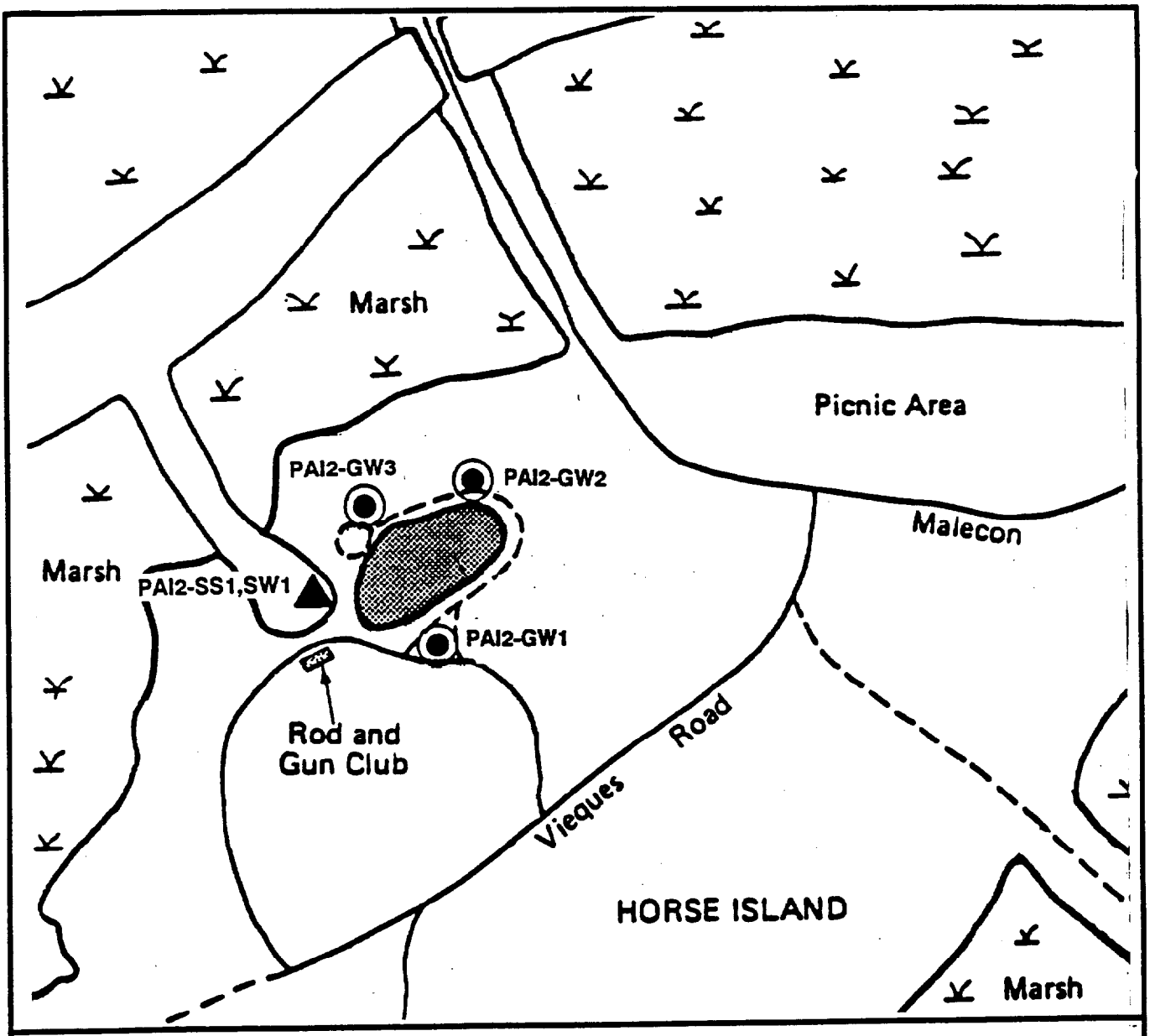
No organic priority pollutant compounds were identified in the surface water sample submitted to the laboratory for analysis.

The shallow sediment sample collected at PAI2-SS1 identified chloroform at a concentration of 81 ppb. No Federal standard exists for chloroform in sediment. No heavy metals exceeding the EP toxicity Maximum Contaminant Levels (MCLs) were identified in the sediment sample that was submitted to the laboratory for chemical analyses. No other priority

pollutant compounds or metals were identified that exceeded the EP toxicity MCLs (heavy metals) or lower limits of analytical determination (priority pollutant organic compounds) in this sample.

3.5.5 Recommendations. Because chloroform and 1,2-dichloroethane have been identified in the groundwater, and chloroform is identified in the sediment in the marsh east of the site, additional evaluation may be indicated to determine the source, depth and extent of these compounds. Both of these volatile organic compounds are more dense than fresh or saltwater, and may be present at this site at greater depth.

Additional work at this site should include the evaluation of lead, chromium, and cadmium present in the ground and surface water.



EXPLANATION:

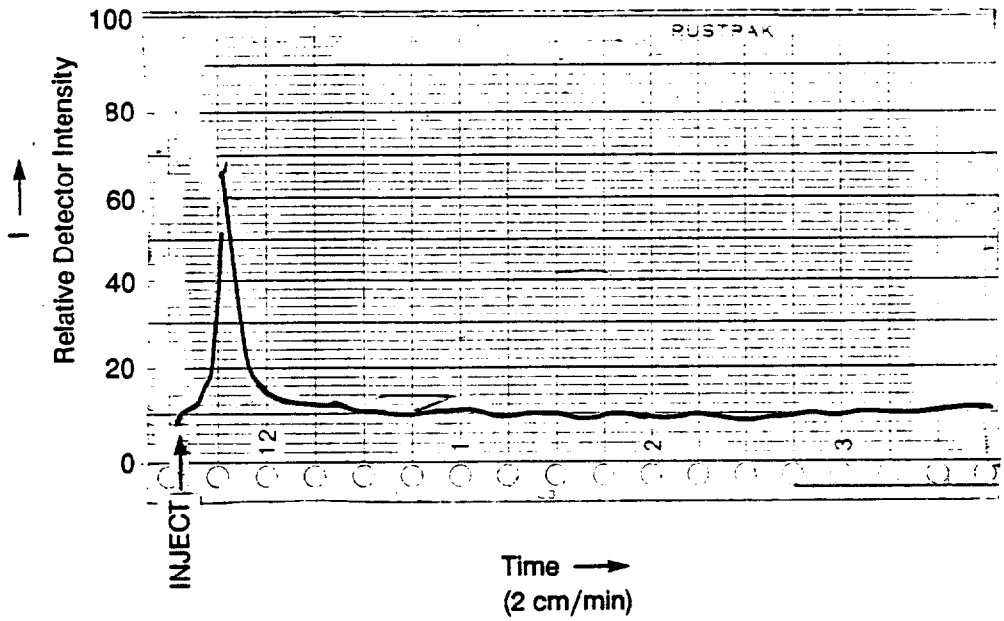
- Monitoring well/groundwater sample
- Surface water and sediment samples
- Site
- Structure
- Dirt Road

(modified from IAS reports)

N

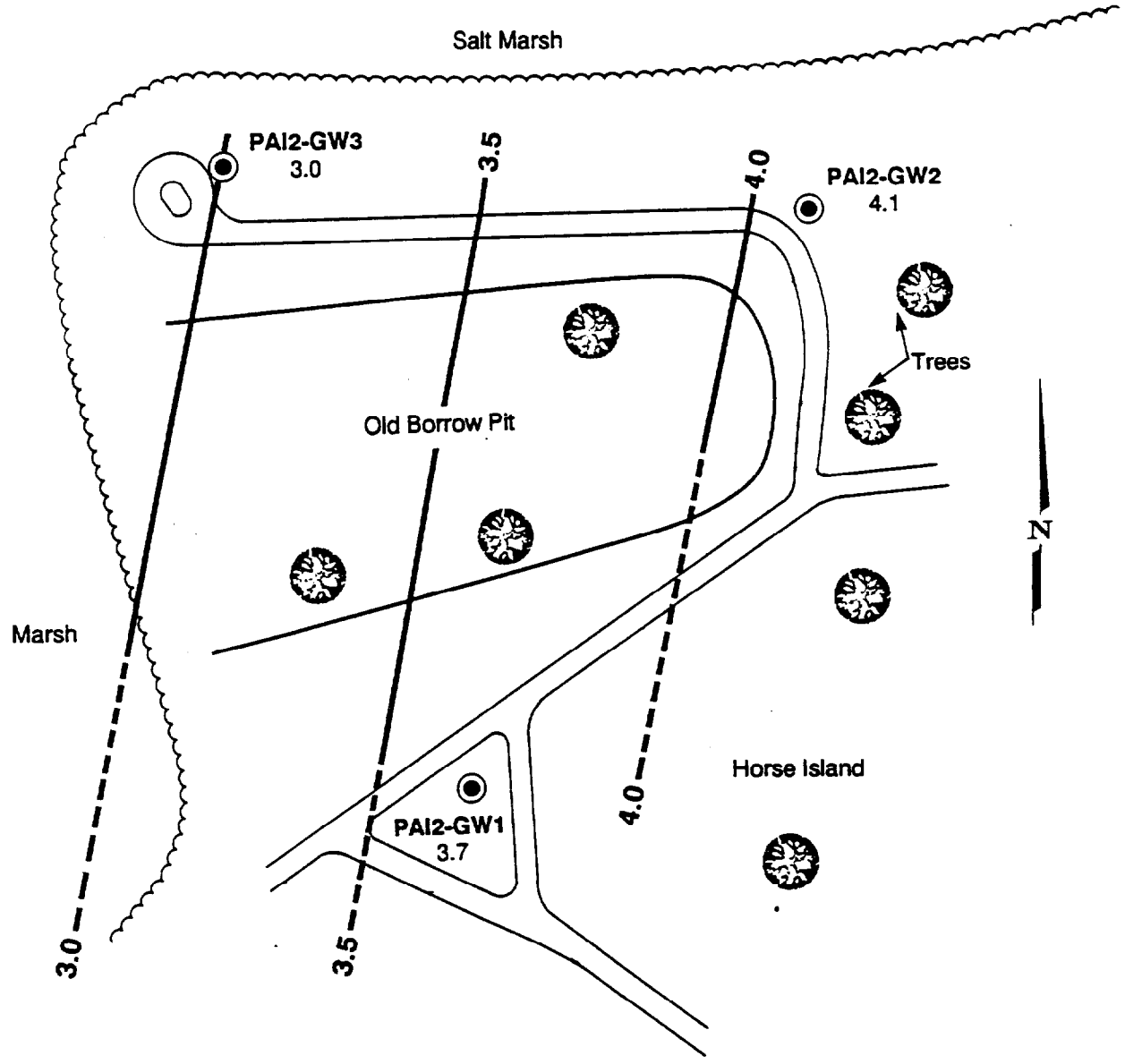
FIGURE 3.5-1
SAMPLING LOCATIONS AT SITE 2

0 400 800 feet



PAI2-GW2
14 ft

FIGURE 3.5-2
SITE 2 FIELD GAS CHROMATOGRAPH



EXPLANATION:

PAI2-GW1 ◉ 3.7 — Location of well, well number, and water table elevation (MSL)

—4.0— Contour interval 0.5 ft

(modified from surveyor's field notes)

FIGURE 3.5-3
SITE 2
WATER TABLE MAP

0 100 200

Scale In Feet

3.6 Site 3 - Causeway Landfill

3.6.1 Site Description. As stated in the IAS report, this site was constructed from solid waste and fill dirt across a tidal marsh of the Broad River (across Archer's Creek). This site was reported to be the major MCRD Parris Island disposal area during most of the period between 1960 and 1972, but was inactive between 1966 and 1968. Materials disposed of at this site reportedly include trash, solid and hazardous waste. The causeway is an approximately 10-acre area in plan view, is about 10 ft above water line, and wide enough for two-way vehicle traffic.

Contaminant migration into the marsh and nearby ponds is reported as likely, according to the IAS report, due to tidal flushing of contaminants. Vertical migration is reportedly limited due to the low permeability soils and confining beds above the Tertiary limestone aquifer. Potential contaminant receptors would include the surrounding marsh area, fish and shellfish within the marshes and the predatory species including humans which feed on fish species.

3.6.2 Field Activities. The work at Site 3 consisted of collecting eight shallow soil/sediment samples and eight surface water samples along the flanks of the causeway. Figure 3.6-1 shows the approximate (locations not surveyed) sampling locations. These locations were determined using odometer readings in the sampling vehicle. The soil sampling locations were selected off the edge of the landfill at the water is edge during low tide, since potential contaminants from the site are likely to move toward the marsh from this portion of the site. Soil or sediment, and surface water samples were collected on each side of the causeway. The soil or sediment samples were collected from the surface to a maximum depth of about 2 ft. Samples of soil or sediment were screened with the OVA for headspace readings of total organic vapor content.

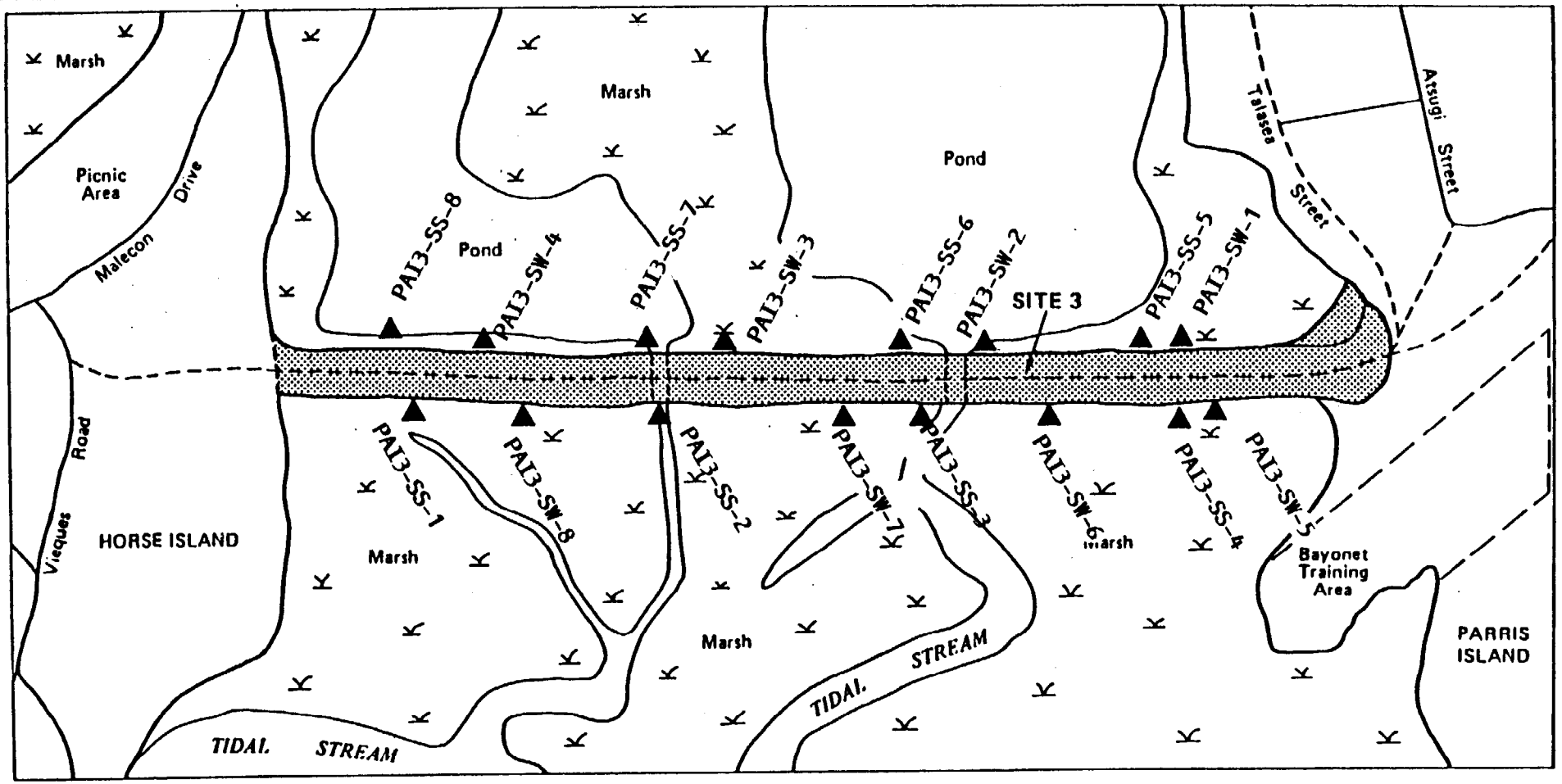
3.6.3 Laboratory Analyses. Soil or sediment samples were submitted to the laboratory for analyses of priority pollutant volatile organic compounds, acid and base/neutral extractable organics including PCBs and pesticides, total metals As, Ba, Be, Cd, Cr, Pb, Hg, Se, Ag, and EP toxicity metals As, Cd, Cr, Pb, and Hg. Hexavalant chromium [Cr(VI)] was analyzed in five of the soil samples as the total chromium concentrations exceeded the lower limit of determination for total chromium.

Surface water samples were collected and submitted to the laboratory for the analyses of priority pollutant volatile organic compounds, acid and base/neutral extractable organic com-

pounds including PCBs and pesticides, total metals As, Ba, Be, Cd, Cr, Pb, Hg, Se, Ag, and the indicator parameters total organic carbon, pH, and specific conductance.

3.6.4 Results. The results of these data indicate that no priority pollutant organic compounds were identified in the sediment and water samples. In addition, no heavy metals were identified that exceeded allowable limits set forth in the EPA Interim Primary Drinking Water Standards or the EPA Ambient Saltwater Quality Criteria. Concentrations of chromium exceeded the lower limit of determination for five sediment samples. However, none of these five samples exhibited hexavalant chromium at concentrations above the lower limit of determination for this constituent at 0.010 mg/l.

3.6.5 Recommendations. Based on these data, no significant priority pollutant chemical compounds or constituents were identified in the samples collected and submitted to the laboratory for analyses. However, this site remains a potential concern as harvesting of shellfish and fish species in the vicinity of the Causeway Landfill is ongoing. Additional verification step activities in the form of biota sampling and analyses of food chain species are needed before this site can be recommended for remedial investigations activities or dropped from subsequent investigations.



EXPLANATION:

▲ Seep/surface water and causeway sediment sample

Site

Dirt Road

Note: These are approximate locations.

N

0 500 1000 feet

FIGURE 3.6-1
SAMPLING LOCATIONS AT SITE 3

McClelland consultants

3.7 Site 4 - Dredge Spoils Area Fire Training Pit

3.7.1 Site Description. Based on information provided in the IAS, this site was used for fire fighter training during an approximate 20-year period between the 1940s and mid-1960s. Information regarding the size and construction of this pit is limited, as the training pit was covered with dredge spoils from the construction of the marina in 1981. At present, only the approximate location of the pit area located within the dredge spoils area is known. An estimated 12,000 gal of waste fuels and oils, including waste motor oils and small quantities of petroleum-based solvents, were reportedly introduced to the soils during training.

Contaminant migration within the surficial aquifer is likely according to the IAS report. Vertical contaminant migration would be limited by the low permeability soils overlying the Tertiary limestone aquifer. Potential contaminant receptors would include the surrounding marsh areas, fish and shellfish within the river and predatory species including humans which feed on fish and shellfish species.

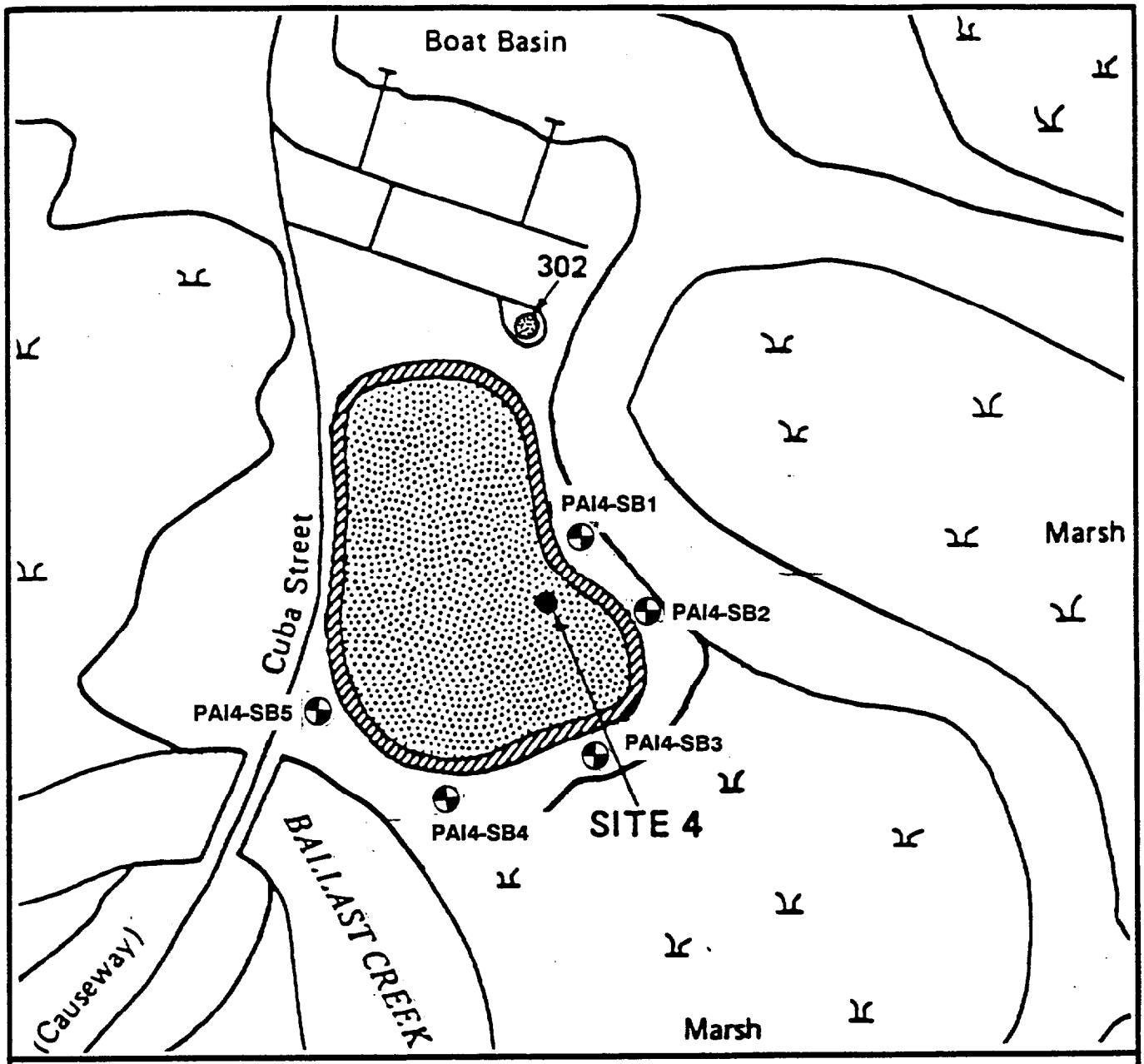
3.7.2 Field Activities. At Site 4, five shallow soil borings were drilled and continuously sampled (Figure 3.7-1). The borings were advanced at locations adjacent to or on the spoils area berm, near the suspected area of the fire training pit. The borings were drilled to total depths of 20 ft below natural ground surface (exclusive of containment berm elevation). The purpose of these borings was to collect soil samples for headspace screening and chemical analyses.

During the advancement of the boreholes, no nonmethane peaks were identified on the chromatographs from the samples collected and screened in the field (chromatographs not retained). In accordance with the approved work plan, no wells were installed. The boreholes were backfilled to the ground surface with a cement/bentonite grout.

3.7.3 Laboratory Analyses. Soil samples (one from each borehole) were collected and submitted to the laboratory for analysis of total and EP toxicity metals Cd, Cr, and Pb.

3.7.4 Results. One soil boring (PAI4-SB2) showed a total lead concentration of 13.9 ppm at the 1-ft depth interval. Sample PAI4-SB5 had a total chromium content of 7.69 ppm at a depth of 7.5 ft. The chemical analytical results indicate that no EP toxicity concentrations of Cd, Cr, or Pb were present in the samples submitted to the laboratory.

3.7.5 Recommendations. We recommend that Site 4 - Dredge Spoils Area Fire Training Pit be dropped from further investigations or studies. No volatile organic compounds were identified in headspace readings, and no toxic concentrations of the heavy metals Cd, Cr, or Pb were present in the samples analyzed.



EXPLANATION:

- Soil boring
- Dredge Spoils Area
- Spoils Area Berm
- Structure
- Site

N

FIGURE 3.7-1
SAMPLING LOCATIONS AT SITE 4

0 400 800 feet

Scale In Feet

3.8 Site 6 - Former Automotive Hobby Shop Spill Area

3.8.1 Site Description. As reported in the IAS, this site was contaminated by surface spills of waste lube oil between the period of 1969 to 1982. Spills occurred while disposing of waste lube oils into a 500-gal underground storage tank. It was estimated in the IAS that more than 2,000 gal of waste oil were spilled during this time period. However, stained surficial soils suggest a much smaller volume (less than 25 sq ft visible staining).

The IAS reports that horizontal migration of contaminants is likely, due to the shallow water table (approximately 7 ft below ground) and highly permeable soils near the ground surface. Vertical contaminant migration is reportedly limited due to the low permeability soils overlying the Tertiary limestone aquifer. The continuity of the confining layers at this location has not been determined. Potential contaminant receptors would include marsh areas (800 ft north), fish and shellfish, and predatory species including humans which feed on fish and shellfish species.

3.8.2 Field Activities. The work at Site 6 consisted of drilling one soil boring near the buried tank to a total depth of 12 ft (see Figure 3.8-1). Continuous soil samples were collected and screened with the OVA/GC. A groundwater monitoring well was installed in this borehole.

3.8.3 Laboratory Activities. One sediment sample was collected at 4 ft and submitted to the laboratory for the analysis of priority pollutant volatile organic compounds, base/neutral extractable organic compounds, oil and grease, and total metals Cd, Cr, and Pb. A groundwater sample was collected from the well and submitted for analyses of priority pollutant volatile organic compounds, base/neutral extractable organic compounds, the indicator parameters total organic carbon, pH, and specific conductivity, and for dissolved metals Cd, Cr, and Pb.

3.8.4 Results. The soil sample indicates that the total oil and grease in the sample collected ranges from 310 ppm to 462 ppm (duplicate sample set). However, no priority pollutant organic chemical compounds were identified in the chemical analyses of this sample. Total chromium and lead levels in the soil sample were as high as 5.5 ppm and 12.7 ppm, respectively. In accordance with the approved work plan for this investigation, no EP toxicity analyses were performed on samples collected from this site. It is not anticipated that EP toxicity lead and chromium will be identified by EP toxicity analysis because of the low concentrations of these constituents when analyzed by total digestion techniques.

No dissolved metals were identified in the groundwater sample that exceeded the EPA Interim Primary Drinking Water Standards. No priority pollutant organic chemical compounds were identified in the analysis of the groundwater sample.

3.8.5 Recommendations. We recommend that Site 6 be dropped from further investigations under the Installation Restoration program. Tank removal and assessment will be funded by MCRD and coordinated with SCDHEC. Southern Division will track the status of this project.

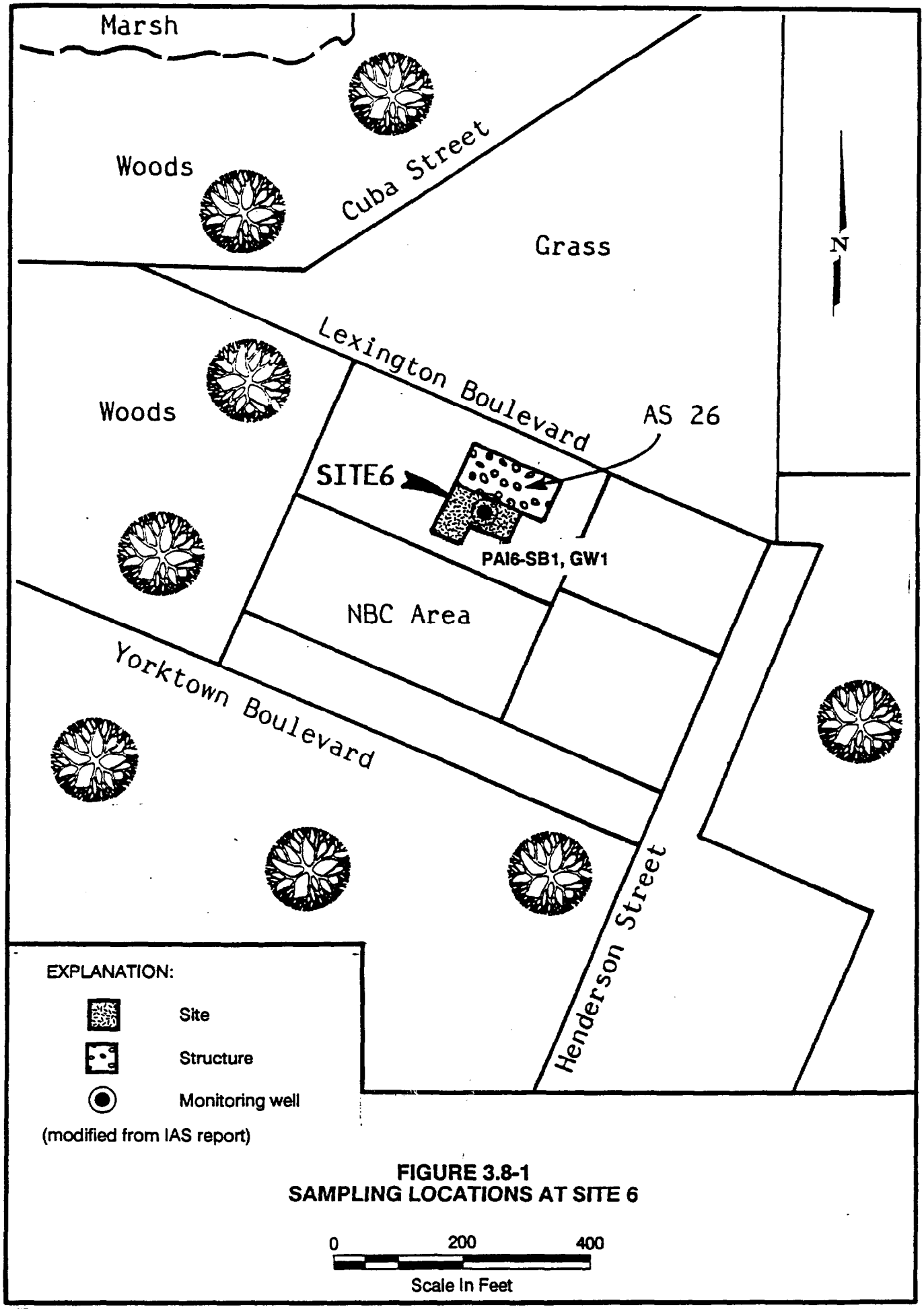


FIGURE 3.8-1
SAMPLING LOCATIONS AT SITE 6

McClelland consultants

3.9 Site 16 - Pesticide Rinsate Disposal Area

3.9.1 Site Description. As stated in the IAS report, this site was used for the disposal of rinsewaters from pesticide spray containers. The site was used between 1950 and 1978, and covers an area of approximately 150 sq ft. Pesticides used at the activity during this period reportedly included Aldrin, Baygon, Chlordane, Dursban, Malathion, Naled, and DDT. Approximately 8,000 gal of pesticide rinsate were reportedly disposed of at this site.

According to the IAS, tidal action, highly permeable sandy soil, and the shallow water table (depth not determined) would allow contaminant migration from the site. Potential contaminant receptors would include the surrounding marsh areas, fish and shellfish within the marshes, and predatory species including humans which feed on fish and shellfish species.

3.9.2 Field Activities. At Site 16, three soil borings were advanced at the locations shown on Figure 3.9-1. The soil borings were sampled continuously and each drilled to less than 10 ft deep where a tight clay confining layer was encountered. In accordance with the approved work plan, no groundwater monitoring wells were installed and no groundwater samples were collected at this site.

3.9.3 Laboratory Analyses. Soil samples were collected from each boring and submitted to the laboratory for analyses of priority pollutant pesticides, and for total metals As, Cd, Cr, and Pb. All soil samples submitted to the laboratory were collected from a depth of 3 ft below ground.

3.9.4 Results. The results of the chemical analyses indicate that a total lead concentration of 8.4 ppm is present in the sample submitted from Boring PAI16-SB1. In accordance with the approved work plan, an EP toxicity lead analysis was not performed on the sample. In this same soil sample, the pesticide 4,4'-DDT, along with its degradation products 4,4'-DDE and 4,4'-DDD were identified at concentrations of 1,380 ppb, 421 ppb, and 486 ppb, respectively. No other priority pollutant pesticides or total metals As, Cd, Cr, and Pb were present in any of the other samples at concentrations greater than the lower limits of determination (pesticides), or exceeding EP toxicity Maximum Contaminant Levels (metals As, Cd, Cr, and Pb).

3.9.5 Recommendations. Based on these data, this site is recommended for further evaluation to determine the depth and extent of the DDT and DDT degradation products present in the subsurface soils at this site. Additionally, an evaluation of the groundwater is warranted to determine whether the groundwater quality has been affected in the vicinity of this site.

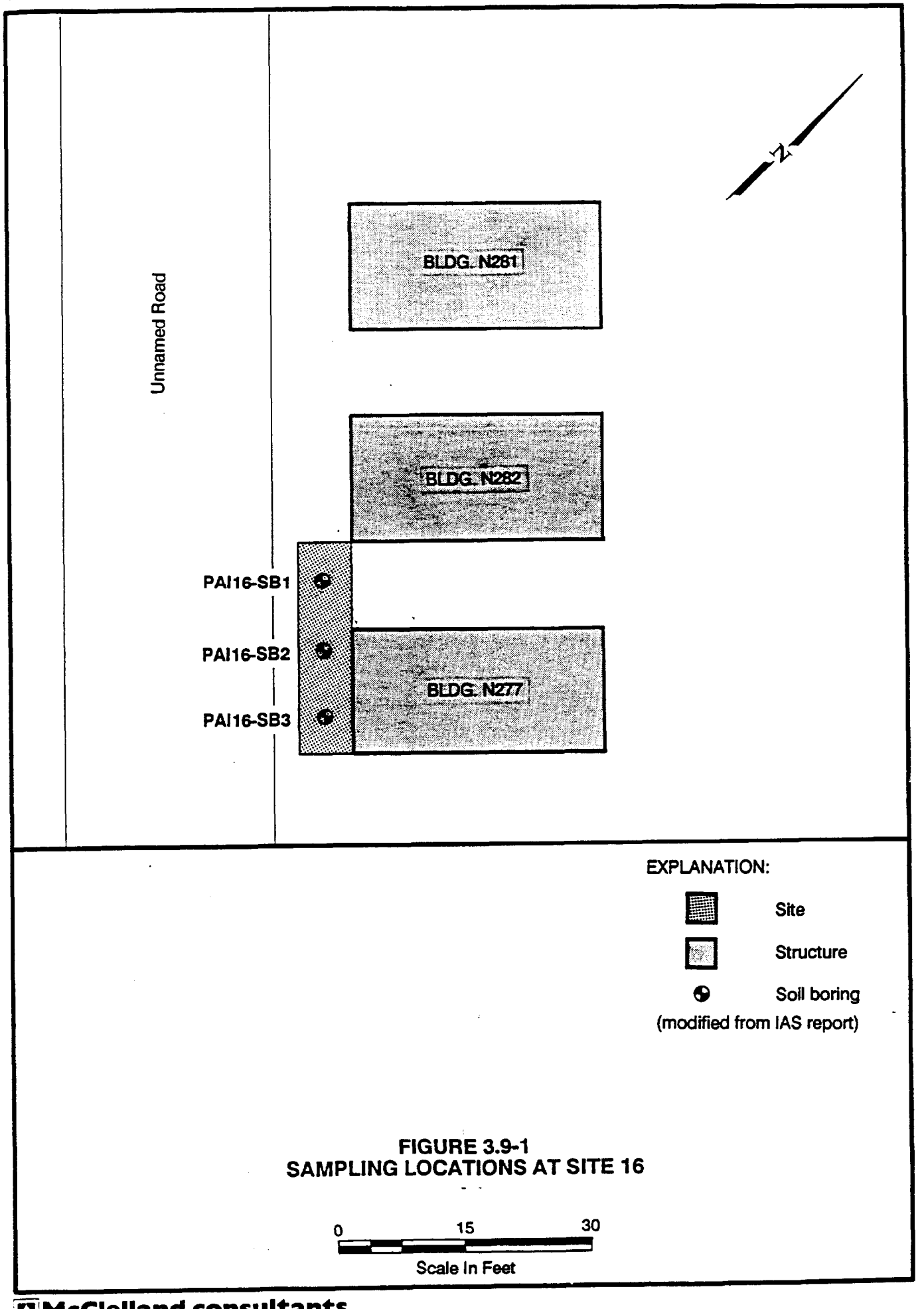


FIGURE 3.9-1
SAMPLING LOCATIONS AT SITE 16

3.10 Site 17 - Page Field Tanks (AS-16)

3.10.1 Site Description. Site 17 consists of four 25,000 gal steel tanks which are 10 ft in diameter, 40 ft long and installed as horizontal cylinders. They were installed at grade and then mounded with soil. The final plans indicate the top of the tanks are approximately 4 ft below grade. These tanks presently hold water, two contain small quantities of fuel, however, the site is presently not in use. It is not known when these tanks were taken out of active operation. According to the MCRD Parris Island Public Works Department, four borings were previously completed at the site (two to 15 ft and two to 25 ft) and one well installed (groundwater 17 ft below ground). The well reportedly was never sampled. The tanks contain liquids (a combination of fuel and/or water, as fuel use at this locations was reportedly operated with a water drive or displacement process). Under a separate contract for Southern Division, McClelland Consultants evaluated the tank contents at AS 16.

3.10.2 Field Activity. A VZV Probe^{R} survey was conducted to identify potential volatile organic subsurface contamination. Figure 3.10-1 shows the VZV Probe^{R} survey locations. Results presented on Table 3.10-1 indicate no organic vapor readings were identified at this site. McClelland installed two groundwater monitoring wells due east and west of the tanks at the locations indicated on Figure 3.10-1. These wells were installed to a total depth of approximately 20 ft.

Following installation of the wells, all three wells (one previous and two McClelland wells) were developed and sampled.

3.10.3 Laboratory Analyses. Groundwater samples were submitted to the laboratory for analyses of benzene, toluene, xylenes, ethylbenzene, dissolved metals Cd, Cr, and Pb, and the indicator parameters pH, total organic carbon, and specific conductance.

3.10.4 Results. Figure 3.10-2 shows a water table gradient map for Site 17 - Page Field Tanks (AS-16). Even though this site is proximate to Site 18, these two sites were not combined into one water table map because of their: 1) horizontal separation, 2) topographic divide by Lexington Boulevard, and 3) probable manmade surface topography disturbances including tank area fill and cover. Figure 3.10-2 shows the shallow water table gradient at this site is to the west-northwest or toward Monitoring Well PAI17-GW1.

No benzene, ethylbenzene, toluene, or xylenes were identified in the groundwater samples that exceeded the lower limit of determination for these constituents in water. No dissolved lead was identified that exceeded the EPA Interim Primary Drinking Water Standards (maximum contaminant level 0.050 mg/l). Cd and Cr were both below the lower limit of determination for all of the water samples submitted.

3.10.5 Recommendations. Verification of clean closure is to be performed at the time that these tanks are removed from this site and the site is closed from additional operations.

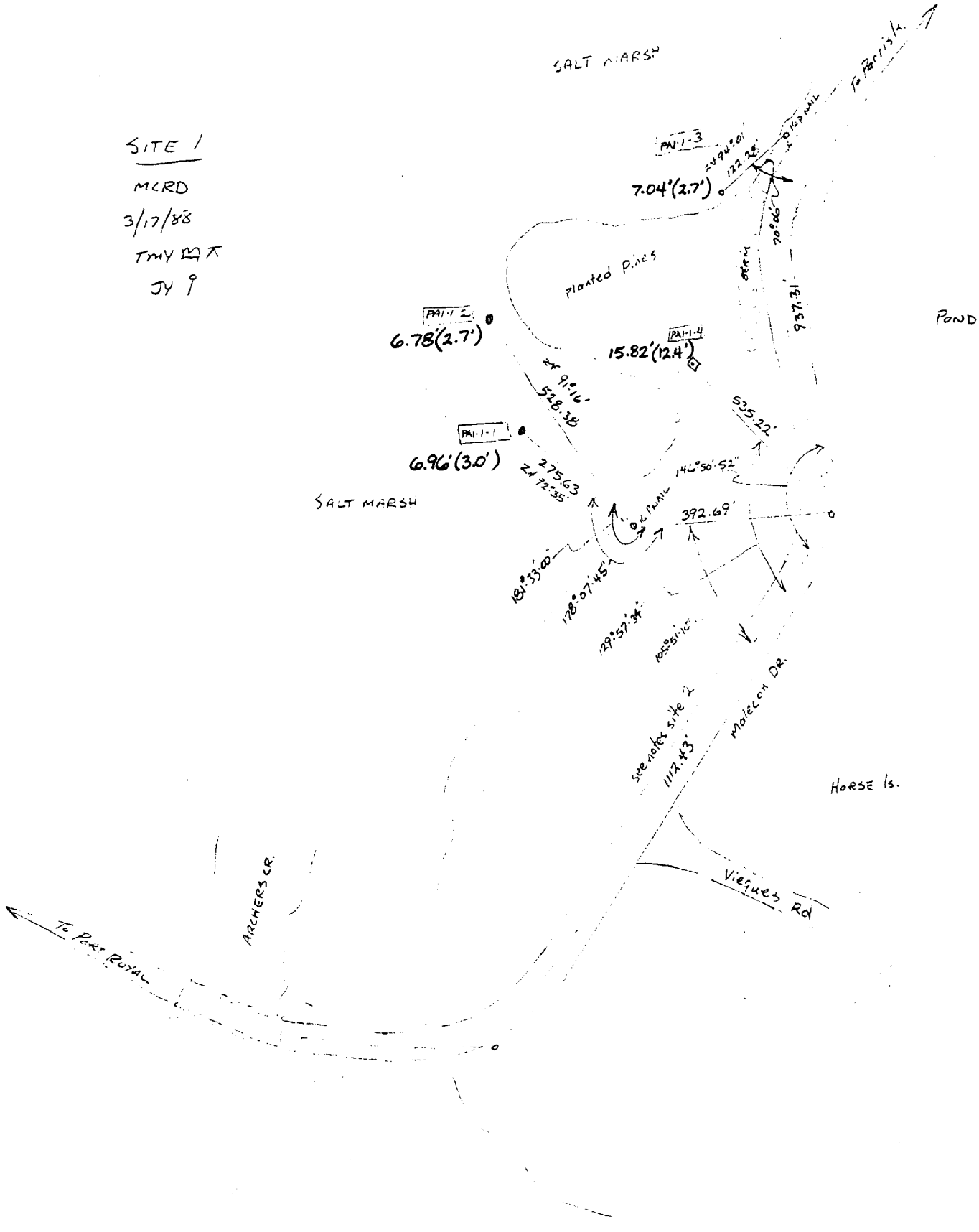
Based on negotiations between Southern Division, EPA, and SCDHEC, this site is not recommended for additional Installation Restoration activities. The MCRD will fund the closure and coordinate the project with SCDHEC. Southern Division will track the status of the project.

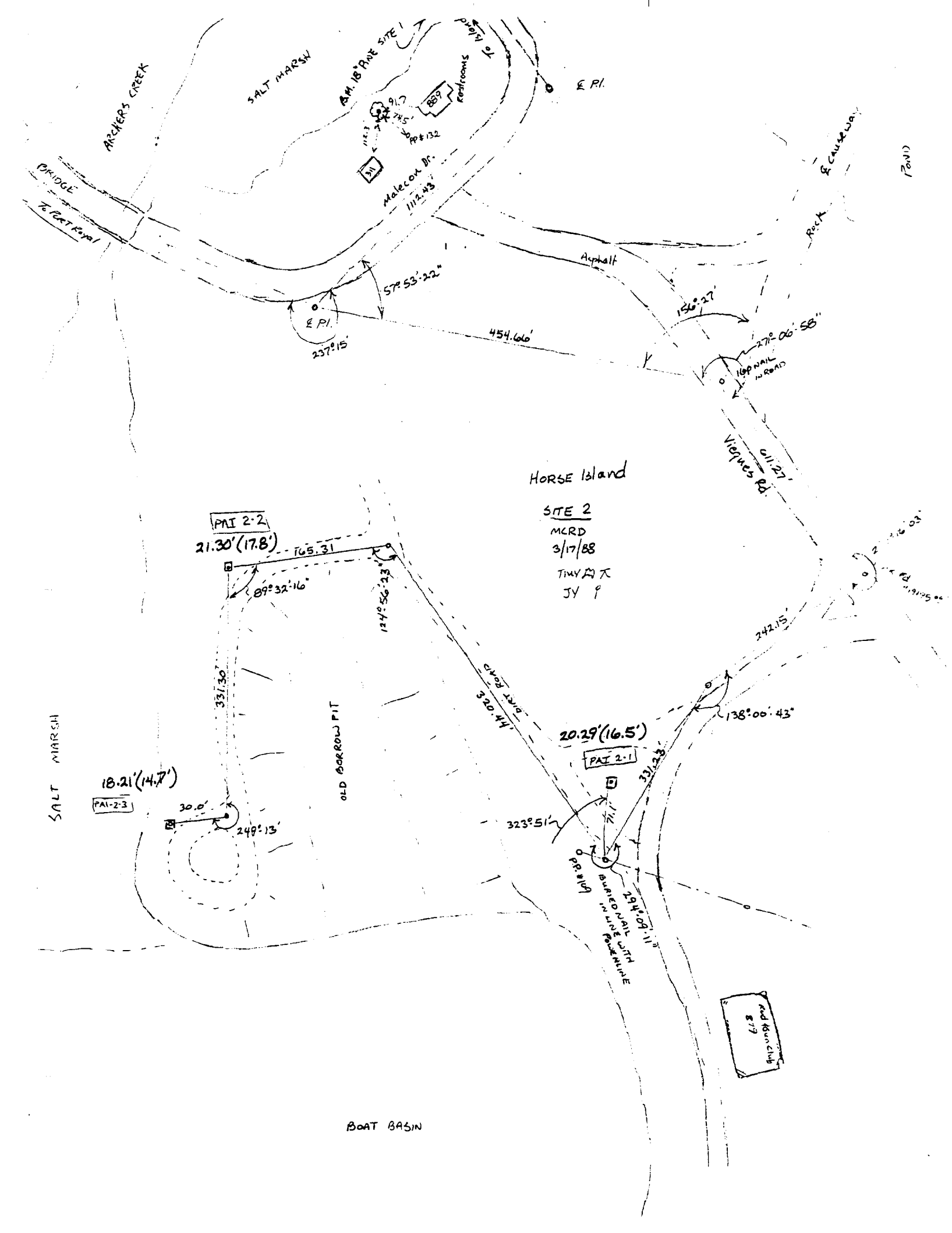
TABLE 3.10-1
SITE 17 - PAGE FIELD TANKS AS-16
SUMMARY OF VZV Probe® RESULTS

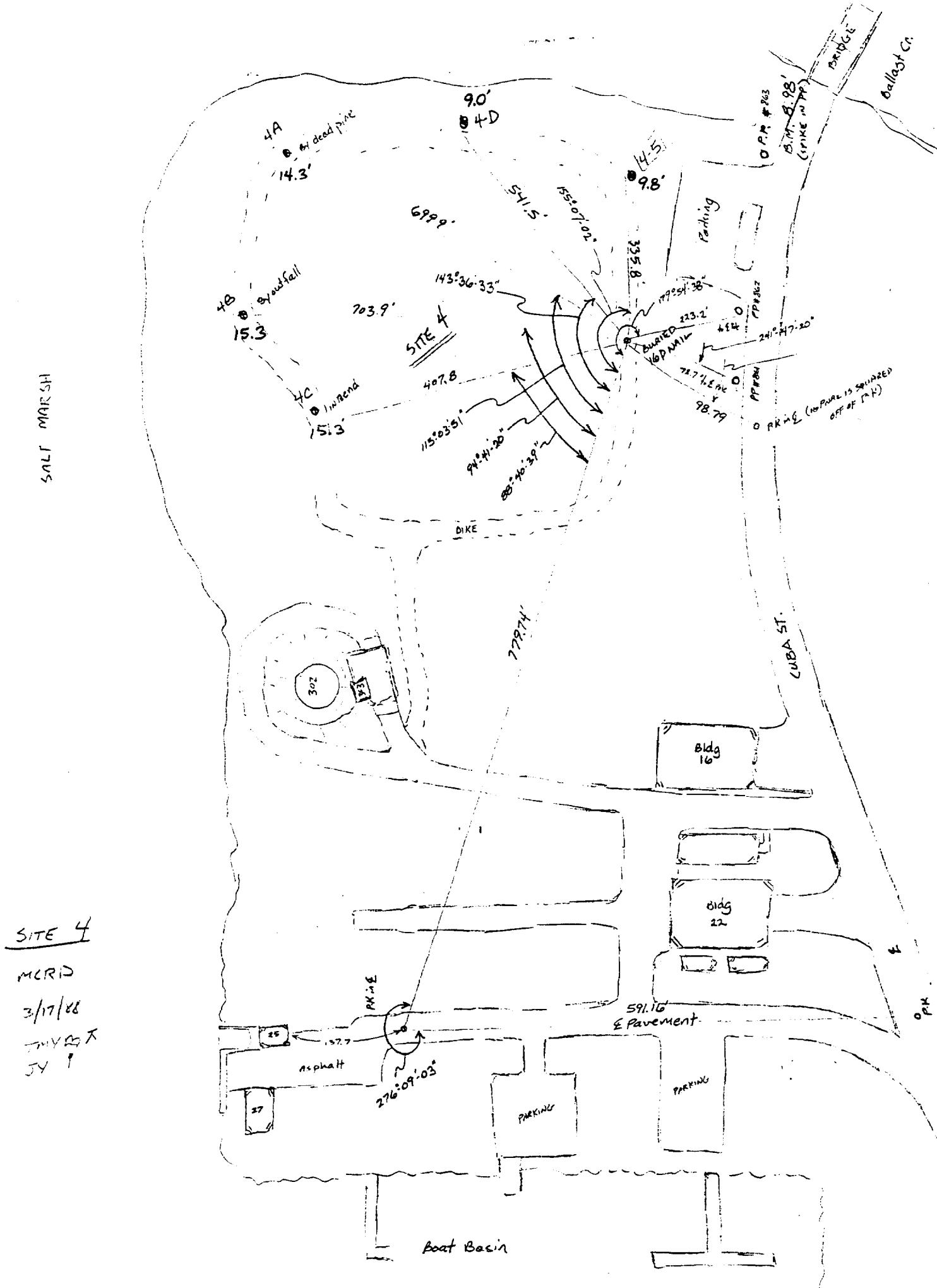
Location	Depth (ft)	OVA (ppm)
1	8	0
2	10	0
3	6	0
4	10	0
5	8	0
6	10	0
7	10	0
8	10	0
9	8.5	0
10	8	0
11	8	0
12	8	0

Summary of Surveyed Well Elevations
Marine Corps Recruit Depot
Parris Island, South Carolina

Well Number	Ground Elevation (ft.)	Well Casing Elevation (ft.)
PAI-1-1	3.0	6.96
PAI-1-2	2.7	6.78
PAI-1-3	2.7	7.04
PAI-1-4	12.4	15.82
PAI-2-1	16.5	20.29
PAI-2-2	17.8	21.30
PAI-2-3	14.7	18.21
PAI-6-1	9.1	12.55
PAI-17-1	18.1	21.40
PAI-17-2	18.3	21.87
PAI-18-1	15.9	18.85
PAI-18-2	16.1	18.25


SITE 1
MCRD
3/17/88
TMY
JY
SALT MARSH
PN-1-3
7.04'(2.7')
PN-1-2
6.78'(2.7')
PN-1-4
15.82'(12.4')
PN-1-1
6.96'(3.0')
Planted Pines
POND
SALT MARSH
937.31'
548.38'
275.63'
392.69'
535.22'
146°50'52"
181°33'00"
128°07'45"
129°57'34"
105°51'16"
112.43'
See note site 2
Molecca DR.
Horse Is.
Vieques Rd
ARCHERS CR.
To Port Royal
To Parris I.


ARCHERS CREEK
SALT MARSH
AM. 18' PAVE SITE 1
to Island
RESTROOMS
889
91.7
745'
App # 132
311
Malecon Dr.
1112.43'
BRIDGE
To PORT Royal
E P.I.
57°53'22"
237°15'
454.66'
Asphalt
136°27'
27°06'58"
16P NAIL IN ROAD
Rock & Causeway
POND
Viejues Rd.
0°11'27"
HORSE Island
SITE 2
MCRD
3/17/88
TINY
JY
PAI 2-2
21.30'(17.8')
165.31'
89°32'16"
124°56'23"
331.30'
SALT MARSH
OLD BORROW PIT
PORT ROAD
320.44'
242.15'
138°00'43"
20.29'(16.5')
PAI 2-1
331.23'
323°51'
18.21'(14.7')
PAI-2-3
30.0'
249°13'
PP #109
BURIED NAIL WITH WASHER IN LINE POWERLINE
294°04'11"
Mud Hen Club
BOAT BASIN

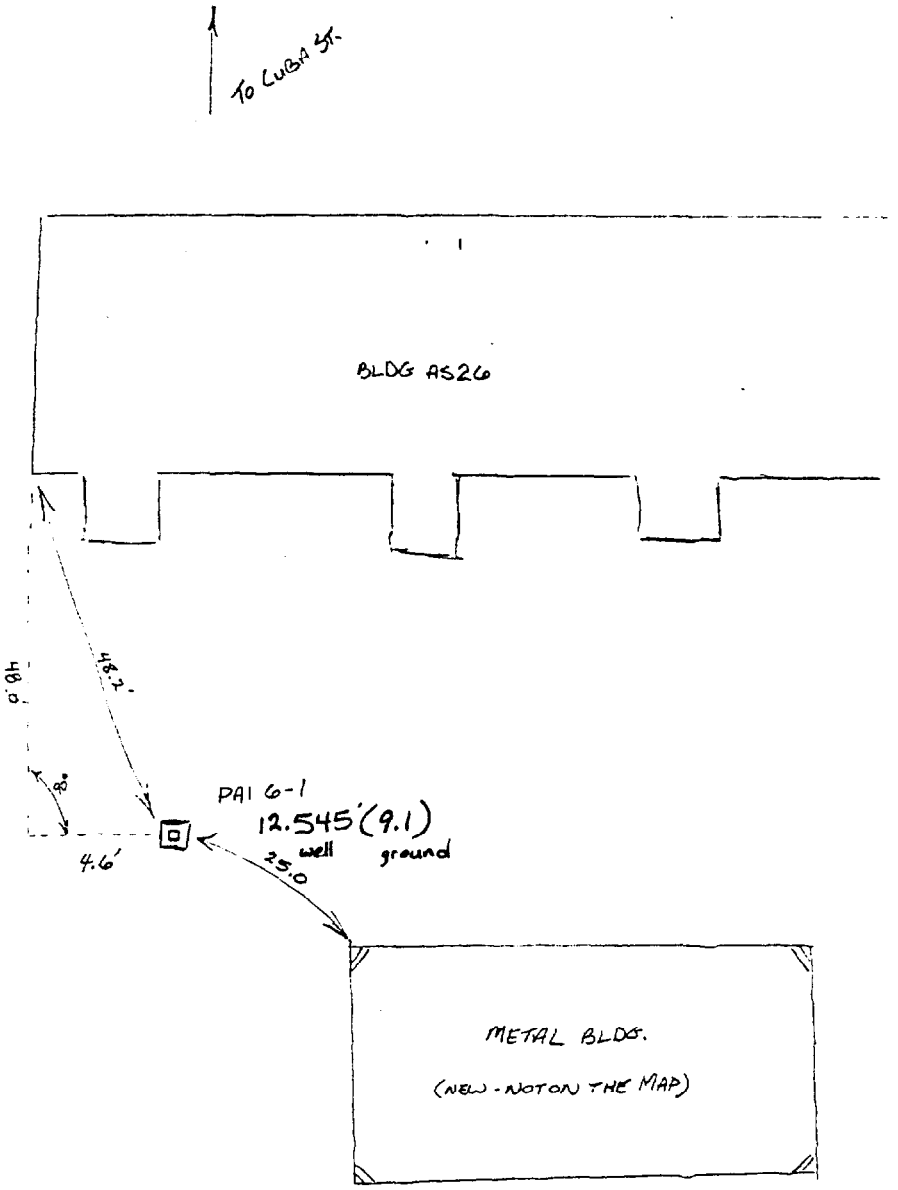


SITE 4

MCRD

3/17/88

JY

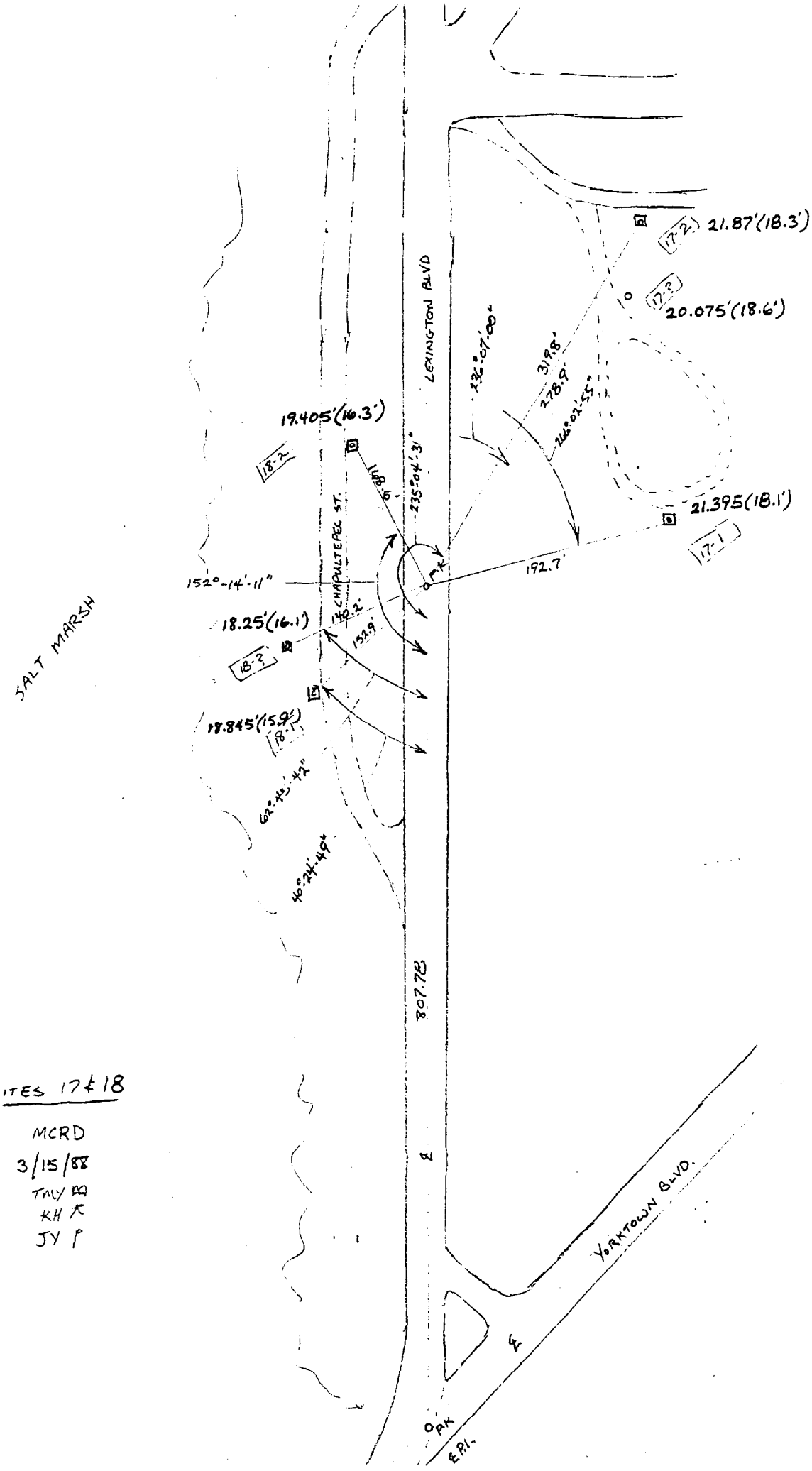


SITE 6

IMCRD

3/11/88

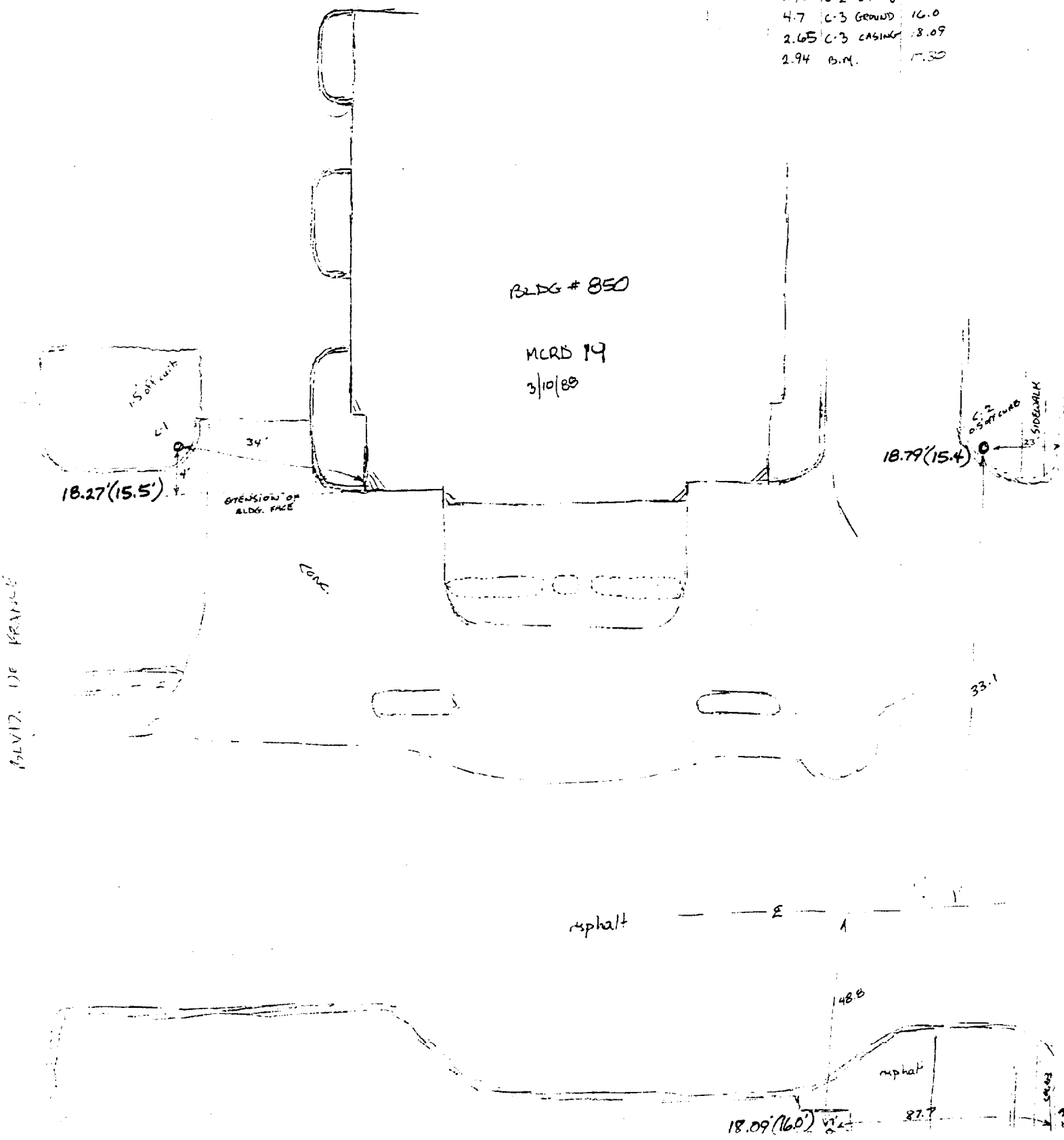
TMY
JV

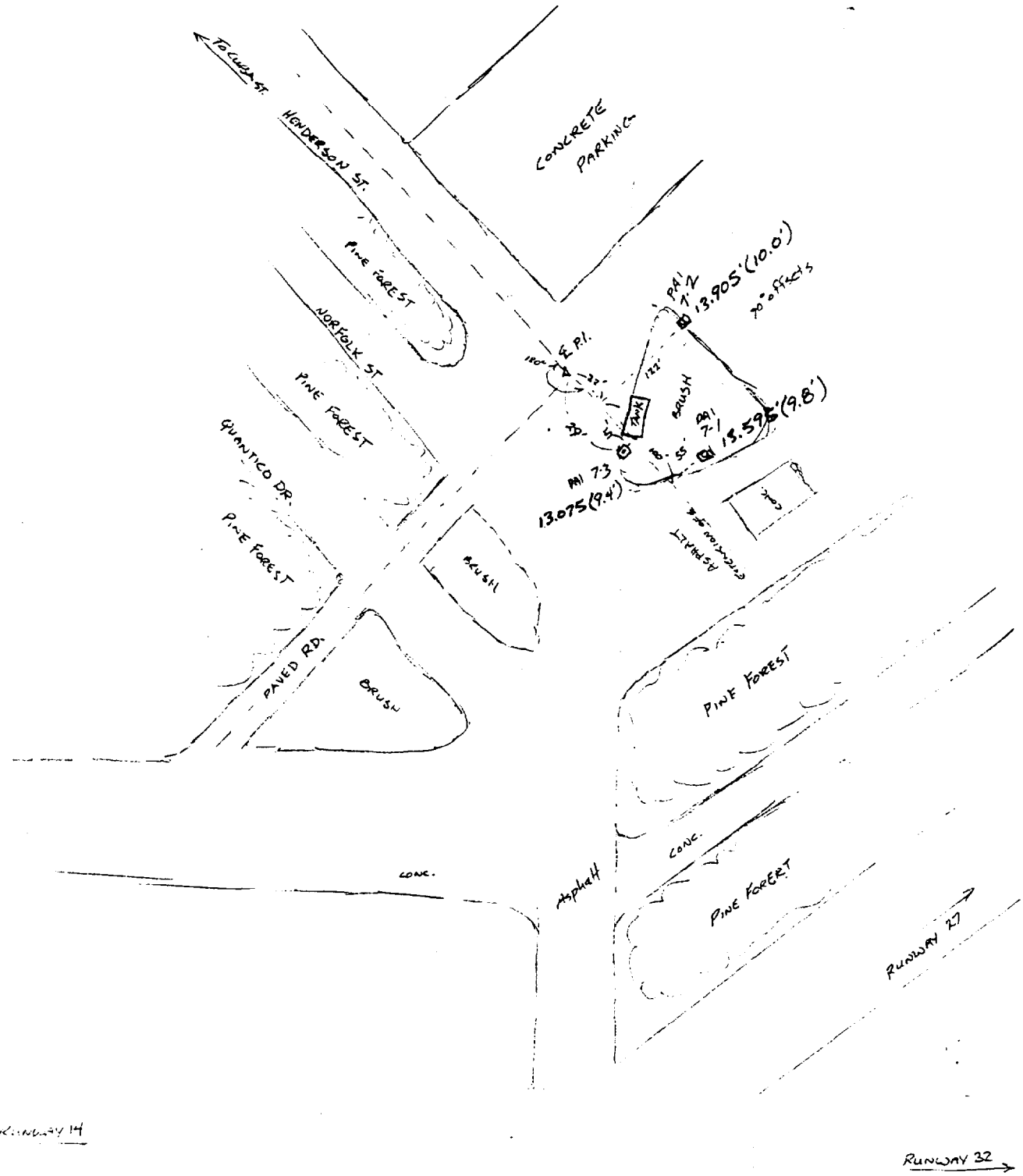


SITES 17 & 18

MCRD
3/15/88
TMY
KH
JY

+	H.I.	-	STA	ELEV
2.94	20.74		T-104 BM	17.80
		5.2	C-1 GROUND	15.5
		2.47	C-1 CASING	18.27
		5.3	C-2 GROUND	15.4
		1.95	C-2 CASING	18.79
		4.7	C-3 GROUND	16.0
		2.65	C-3 CASING	18.09
		2.94	B.M.	17.80



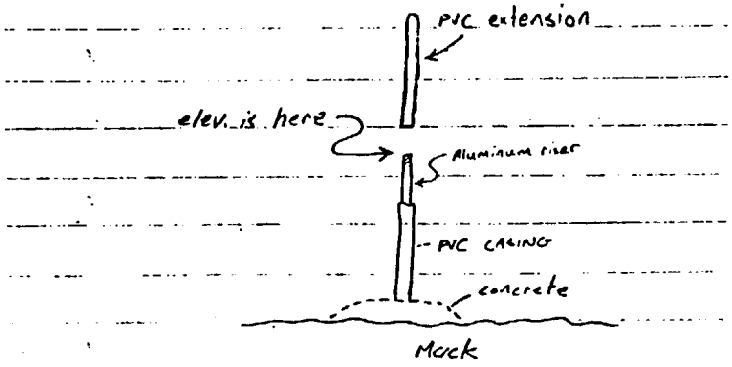


SITE 7
MCRD
3/11/88

SITE 1
MCRD
3/17/58

(+)	H.I.	(-)	STA.	ELEV
0.33	27.27		R104	26.94
		9.77	TBM NAIL IN PINE (SEE SITE 2 NOTES)	17.50
9.75	27.52			
		0.31	R104 tie	26.94
1.28	18.78		TBM NAIL IN PINE (see notes site 2)	17.50
		15.8	PAI-1-1 GROUND	3.0
		11.82	PAI-1-1 CASING	6.96
		16.1	PAI-1-2 GROUND	2.7
		12.00	PAI-1-2 CASING	6.78
		6.4	PAI-1-4 GROUND	12.4
		2.96	PAI-1-4 T.P. CASING	15.82
3.85	19.67			
		2.17	TBM TIE	17.50
4.32	20.14		PAI-1-4 T.P. CASING	15.82
		6.94	T.P.	13.20
3.10	16.3			
		13.6	PAI 1-3 GROUND	2.7
		9.26	PAI 1-3 T.P. CASING	7.04
9.12	16.16			
		2.95	T.P.	13.21

+	HI	(-)	STA	elev
6.95	20.16		T.P.	13.21
		4.33	PAI 1-4 TIE CASING	15.83
			DIF	.01



MCRD
3/13/88
SITE 2

(−)	H.I.	(+)	STA.	ELEV.
5.05	22.55		B.M. NAIL IN PAVE DRAKE ISLAND	17.50
		5.05	T.P. ①	17.50
5.39	22.89			
		4.45	T.P. ② PK FL.	18.44
5.79	24.23			
		5.72	T.P. ③	18.51
4.10	22.61			
		6.0	PAI·2·1 GROUND	16.5
		2.32	PAI·2·1 CASING	20.29
		4.75	T.P. ④ TOP NAIL BETWEEN 2·1 & 2·2	17.86
5.07	22.93		-	
		5.1	PAI·2·2 GROUND	17.8
		1.63	PAI·2·2 CASING	21.30
		7.64	T.P. ⑤	15.29
3.78	19.07			
		4.4	PAI·2·3 GROUND	14.7
		0.86	PAI·2·3 CASING T.P. ⑥	18.21
0.77	18.98	3.67	3.67 T.P. ⑦	15.31
7.65	22.38	4.52	T.P. ⑧	17.86
4.84	22.70	4.17	T.P. ⑨	13.53
5.96	24.49	6.05	T.P. ⑩	13.44
4.11	22.55	5.06	T.P. ⑪	17.49
5.17	22.68	5.15	B.M.	17.50/0.00

LEVEL LINE TO SITE 4

MCRD 3/13/88

1 of 7

(+)	H.I.	(−)	STA.	ELEV
3.41	12.75		B.M. STAMPED "NGS 1973"	9.34
		3.67	T.P.	9.08
4.51	13.59			
		5.63	T.P.	7.96
3.75	11.71			
		5.57	T.P.	6.14
5.56	11.70			
		4.93	T.P.	6.77
4.18	10.95			
		4.63	T.P.	6.32
5.60	11.92			
		5.04	T.P.	6.88
3.89	10.77			
		3.69	T.P.	7.08
6.32	13.40			
		4.21	T.P.	9.19
5.52	14.71			
		5.73	B.M. SET 16D NAIL IN PP PP8859 NEAR BRIDGE	8.98
5.66	14.54			
		5.66	T.P.	8.88
4.22	13.39			
		6.32	T.P.	7.07

Site 4

MCRD
3/10/88
2 of 7

(+)	HI	(−)	STA	ELEV
3.85	10.92		T.P.	7.07
		4.06	T.P.	6.86
5.17	12.03			
		5.73	T.P.	6.30
5.24	11.54			
		4.81	T.P.	6.73
4.87	11.60			
		5.45	T.P.	6.15
5.76	11.91			
		3.93	T.P.	7.98
5.61	13.59			
		4.50	T.P.	9.09
3.53	12.62			
		3.27	B.M. TIE (WES #673)	9.35
			ACTUAL	9.34
			OUT	0.01
			11,000'± level loop	
			Very Windy	

LEVEL LOOP TO SITE 6 BLDG. AS-260

MCRD
3/10/88
3 of 7

(+)	H.I.	(−)	STA	ELEV
			B.M. PP# B59	8.98
7.59	16.57			
		7.32	T.P. ①	9.25
4.69	13.94			
		5.83	T.P. ②	8.11
4.90	13.01			
		4.85	T.P. ③	8.16
4.99	13.15			
		4.28	T.P. ④	8.87
4.92	13.79			
		5.22	T.P. ⑤	8.57
6.22	14.79			
		6.03	T.P. ⑥	8.76
5.84	14.60			
		5.5	PAI 6-1 GROUND T.P	9.1
		2.055	PAI 6-1 CASING	12.545
2.135	14.680			
		5.91	T.P. ⑥	8.77
6.21	14.98			
		6.41	T.P. ⑤	8.57
5.34	13.91			
		5.03	T.P. ④	8.88
4.20	13.08			
		4.92	T.P. ③	8.16

SITE 6

MCRD
3/10/88
4 of 7

+	HI	−	STA.	ELEV
4.96	13.12		T.P.	8.16
		4.91	T.P. T.P. ⑤	8.21
			WIND TOO STRONG	
5.63	14.04			
		4.68	T.P. T.P. ①	9.36
7.32	16.68	7.58	B.M. PP#859 TIE	9.10
			ACTUAL	8.98
			OUT	0.12
			3/11/88	
7.16	16.14		B.M. PP#859	8.98
		6.83	T.P. ① {CHECKS 1ST RUN}	9.26
4.70	13.96			
		5.83	T.P. ② {CHECKS 1ST RUN}	8.13

BAD SHOT WAS ON LOOP BACK AT T.P. ②
ELEVATION OF WELLIS CORRECT. ACTUAL ERROR IS 0.02', SHOT MISREAD BY 0.10 @ T.P. ②

SITE 7

MCRD
3/11/88
5 of 7

(+)	HI	(−)	STA	ELEV
0.25	13.395		PAI-G-1 CASING	12.545
		0.32	PAI 7-3 T.P. CASING	12.075
0.53	13.605			
		1.070	PAI G-1 TIE CASING	12.535
			OUT	0.01
2.26	15.335		PAI 7-3 CASING	13.075
		5.9	PAI 7-3 GROUND	9.4
		5.3	PAI 7-2 GROUND	10.0
		1.43	PAI 7-2 CASING	13.905
		5.5	PAI 7-1 GROUND	9.8
		1.84	PAI 7-1 CASING	13.495
0.24	14.145		PAI 7-2 CASING	13.905
		4.810	T.P.	9.335
5.355	14.690			
		5.48	T.P.	9.21
5.69	14.90			
		5.00	T.P.	9.90
5.27	15.17			
		5.86	TBM IGP MAG NAIL IN BASE OF INFILTRATION COLLAR	9.31
5.92	15.23			
		5.35	T.P.	9.88

Site 7

MCRD 3/11/93 6 of 7

+	H.I.	−	STA	ELEV
4.785	14.605		T.P.	9.88
		5.455	T.P.	9.210
5.48	14.69			
		5.36	T.P.	9.33
4.735	14.065			
		0.170	PAI 7-2 CASING TIE	13.895
			ACTUAL	13.905
			OUT	0.010
5.62	14.93		B.M. INFILTRATION CORRECTION	9.31
		6.04	T.P.	8.89
3.53	12.42			
		4.82	T.P.	7.60
5.03	12.63			
		6.03	T.P.	6.60
4.52	11.12			
		5.3	PAI-INF 1 GROUND	5.8
		1.93	PAI-INF 1 CASING	9.19
		5.0	PAI-INF 2 GROUND	6.1
		1.43	PAI-INF 2 CASING T.P.	9.69
3.09	12.78			
	↓	5.0	PAI-INF 3 GROUND	7.8
	V	1.35	PAI-INF 3 CASING	11.43

Site 7

MCRD 3/11/93 7 of 7

(+)	HI	(−)	STA	ELEV
	12.78			
		5.13	T.P.	7.65
5.19	12.84	3.76	T.P.	9.08
6.09	15.17	5.86	B.M. TIE	9.31
			ACTUAL	9.31
			OUT	0.00

SITES 17 & 18

MCRD 3/15/88 1 of 2

(+)	H.I.	(-)	STA	ELEV
1.32	13.865		PAI 6-1 CASING	12.545
		5.33	T.P.	8.535
12.76	21.295			
		5.0	PAI 18-2 GROUND	16.3
		1.89	PAI 18-2 T.P. CASING	19.405
2.47	21.875			
		5.8	PAI 18-3 GROUND (CONCRETE)	16.1
		3.625	PAI 18-3 CASING	18.250
		6.0	PAI 18-1 GROUND	15.9
		3.030	PAI 18-1 CASING	18.545
		11.13	T.P. TOP FIRE HYDRANT	10.745
12.75	23.495			
		5.4	PAI 17-1 GROUND	18.1
		2.100	PAI 17-1 CASING	21.395
		4.9	PAI 17-3 GROUND	18.6
		3.42	PAI 17-3 CASING	20.075
		5.2	PAI 17-2 GROUND	18.3
		1.625	PAI 17-2 CASING	21.870
		12.750	T.P.	10.745
2.94	13.685			
		5.50	T.P.	8.185
5.43	13.615			
		1.10	PAI 6-1 CASING TIE	12.515 c.03

SITE 4

MCRD 3/15/88 2 of 2

(+)	H.I.	(-)	STA	ELEV
11.01	19.99		B.M. POH B59	8.98
		5.7	PAI 4A	14.3
		4.7	PAI 4B	15.3
		4.7	PAI 4C	15.3
		10.2	PAI 4-5	9.8
		11.0	PAI 4D	9.0

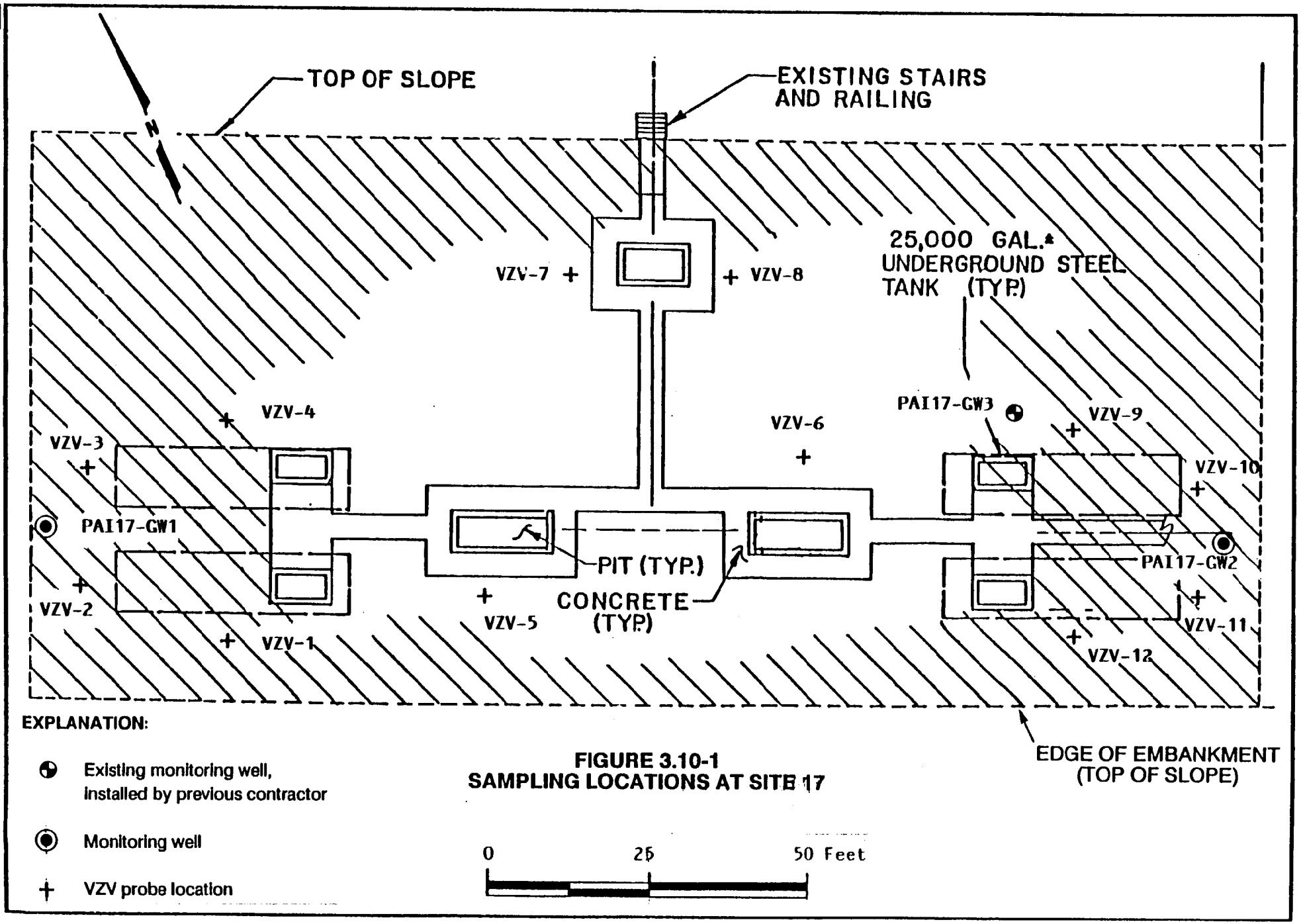
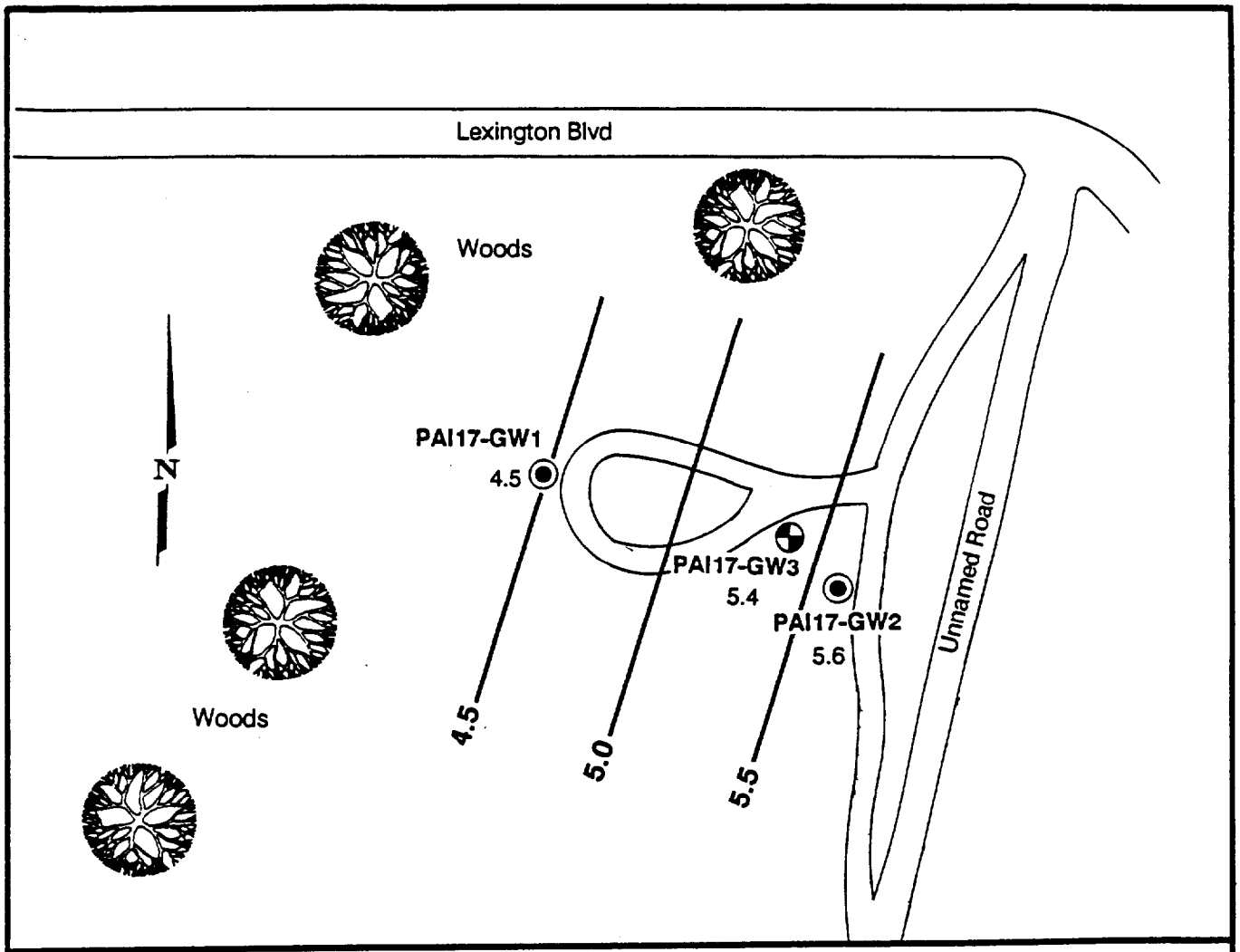


FIGURE 3.10-1
SAMPLING LOCATIONS AT SITE 17

0501-7007



EXPLANATION:

PAI17-GW1 ◉ 4.5 — Monitoring well, showing water table elevation (MSL)

◓ — Well installed by previous contractor, showing water table elevation (MSL)

— 4.5 — — Contour interval 0.5 ft

(modified from surveyors notes)

FIGURE 3.10-2
Site 17
WATER TABLE MAP

0 100 200

Scale in Feet

McClelland consultants

3.11 Site 18 - Page Field Tanks (AS-18)

3.11.1 Site Description. The AS-18 tanks consist of four 50,000-gal precast concrete tanks. The tanks have a diameter of 35 ft and a height of 8.5 ft and are installed as vertical cylinders. The tanks were installed at grade and then mounded with approximately 5 ft of soil. All four tanks presently contain rain or other water. One tank, located second from east contains 1 ft of fuel. This site is presently not in active use, however, the date these tanks became inactive is unknown. Eight borings were previously completed at the site, four to 15 ft and four to 25 ft. One well was installed by a previous contractor and had reportedly never been sampled. Under a separate contract for Southern Division, McClelland Consultants evaluated the tank contents at AS-18.

3.11.2 Field Activities. McClelland Consultants conducted a VZV Probe^{R} survey at the site. Access conditions were such that the northern side of the tanks (marsh side) were inaccessible to the probe equipment. Probe sampling locations are shown on Figure 3.11-1, and were selected to provide information regarding well placement. The VZV Probe^{R} survey identified two locations where organic vapors in the soils exceeded background levels. OVA readings are presented on Table 3.11-1 and chromatograph results are presented on Figure 3.11-2. Groundwater monitoring wells were installed near the two locations where organic vapors were identified.

McClelland Consultants installed two groundwater monitoring wells at the locations shown on Figure 3.11-1. Surveyed locations are presented in Appendix A. The water table in these wells ranged from 13.5 to 14.5 ft below ground. Following well installation, all three wells were developed, evacuated, and sampled.

3.11.3 Laboratory Analyses. The groundwater samples were analyzed for benzene, toluene, ethylbenzene, and xylenes, dissolved metals Cd, Cr, and Pb, and the indicator parameters total organic carbon, pH, and specific conductivity.

3.11.4 Results. Figure 3.11-3 shows a water table gradient map for Site 18 - Page Field Tanks (AS-18). Even though this site is proximate to Site 17, these two sites were not combined into one water table map because of their: 1) horizontal separation, 2) topographic divide by Lexington Boulevard, and 3) probable manmade surface topography disturbances including tank area fill and cover. Figure 3.11-3 shows a shallow water table gradient directly towards the marsh to the immediate north.

Benzene, ethylbenzene, and xylenes were identified in the groundwater sample collected from Well PAI18-GW1 at concentrations of 250 ppb, 735 ppb, and 220 ppb, respectively. No other constituents were identified in any of the samples collected and submitted to the laboratory for analyses at this site. No cadmium, chromium or lead was identified in the water samples that exceeded the EPA Interim Primary Drinking Water Standards, or the concentrations were below the lower limit of determination for these constituents in water.

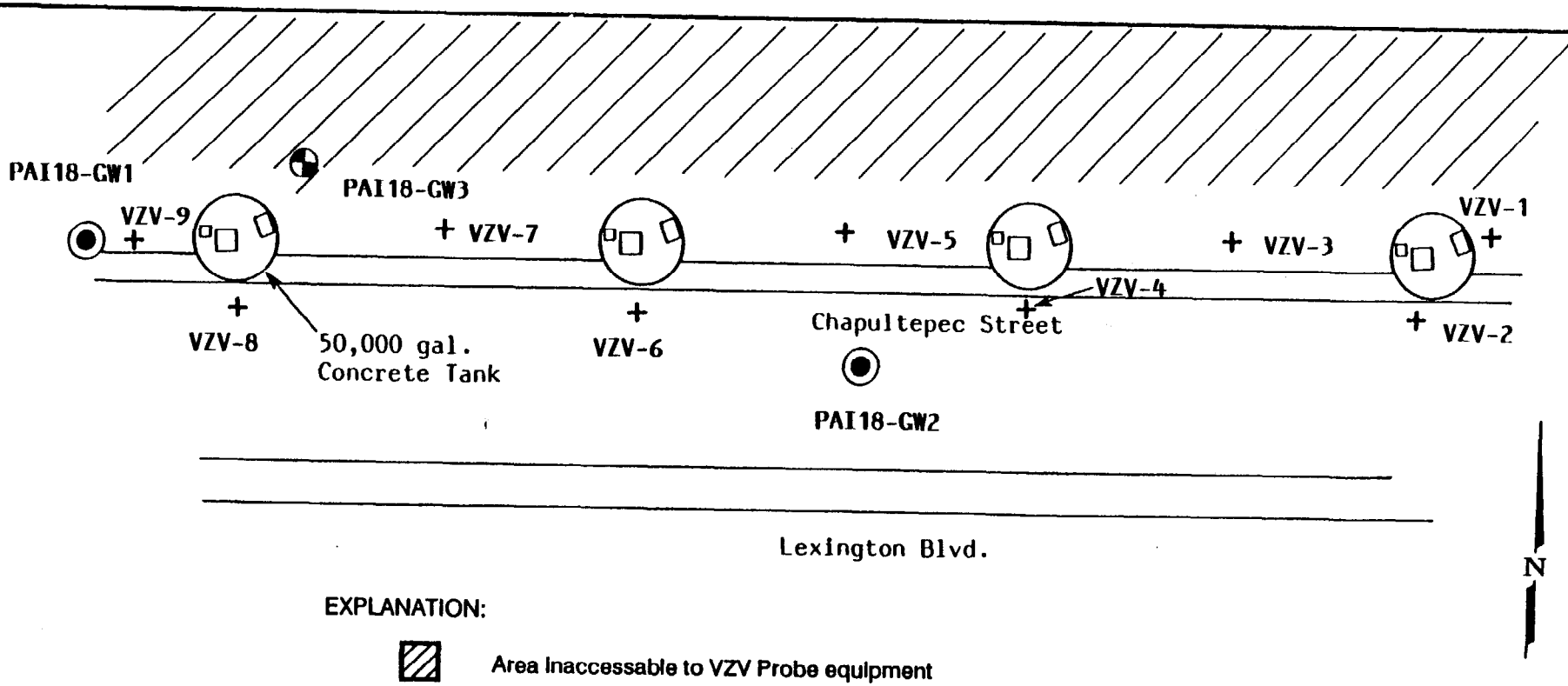
Fuel vapors were present in the subsurface at the south and west sides of Site 18. In addition, fuel components were identified in the groundwater along the western edge of the site. At present it has not been determined whether any of the tanks are leaking, or if the fuel components in the groundwater are a results of piping leaks, or from uncontrolled fuel spills at the site.

3.11.5 Recommendations. This site is not recommended for additional Installation Restoration activities. Based on negotiations between Southern Division, EPA, and SCDHEC, this site is being transferred to Southern Division's Underground Storage Tank program for management and tank closure. Site assessment and remediation may be performed concurrent with tank closure activities.

TABLE 3.11-1
SITE 18 - PAGE FIELD TANKS AS-18
SUMMARY OF VZV Probe[R] RESULTS

Location	Depth (ft)	OVA (ppm)	GC
1	8	0	
2	8	2.5	
3	8	0	
4	8	0	
5	8	>100	Y
6	8	0	
7	8	0	
8	8	0	
9	8	30	Y

> indicates "greater than"



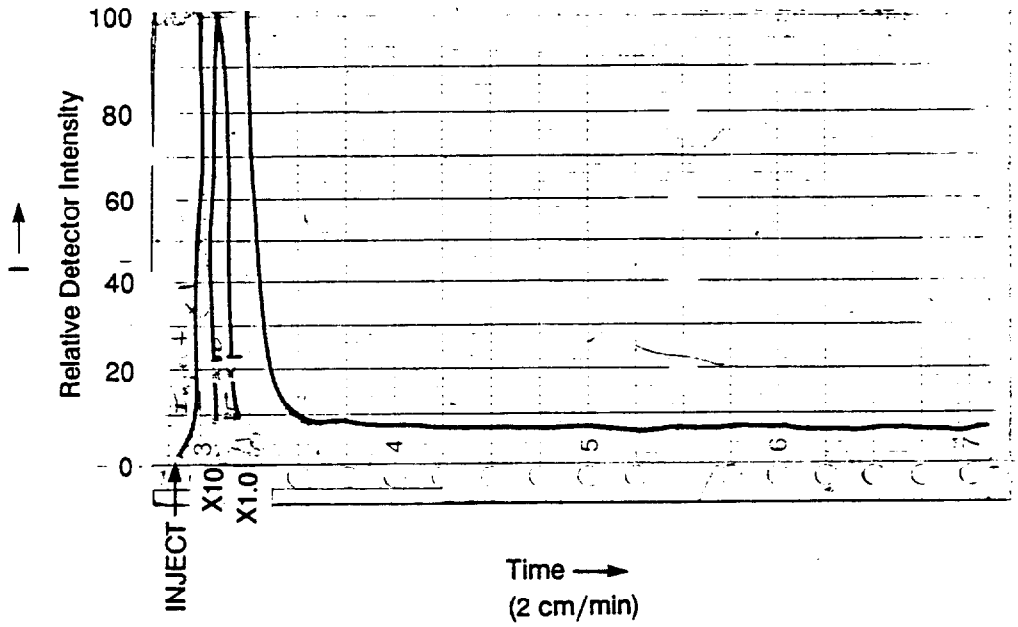
EXPLANATION:

- Area inaccessable to VZV Probe equipment
- PAI18-GW3 — Existing monitoring well, installed by previous contractor
- PAI18-GW1 — Monitoring well
- VZV-6 — VZV Probe location

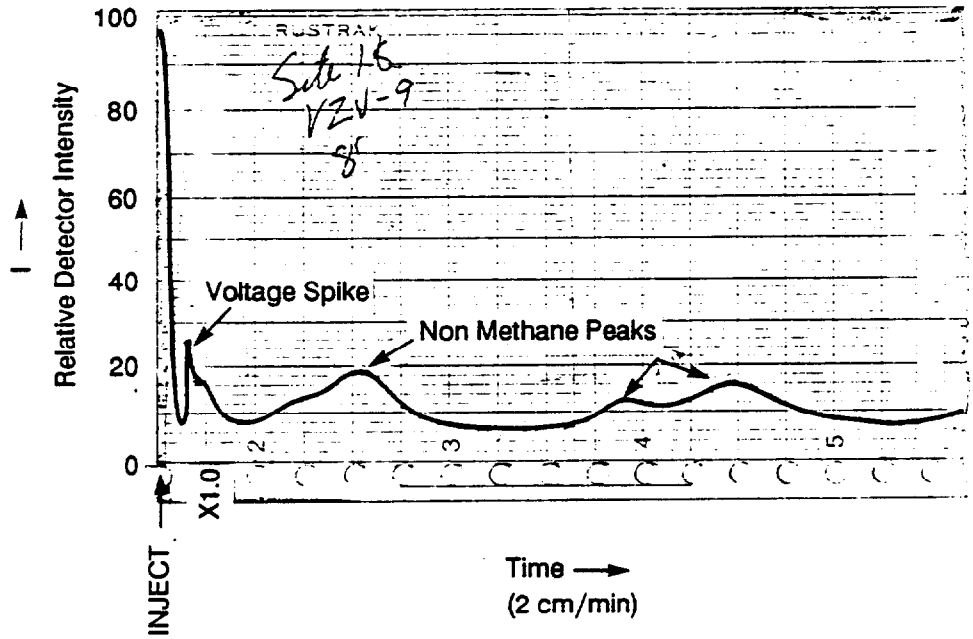
(modified from MCRD engineering drawings)

FIGURE 3.11-1
SAMPLING LOCATIONS AT SITE 18

0 75 150 Feet

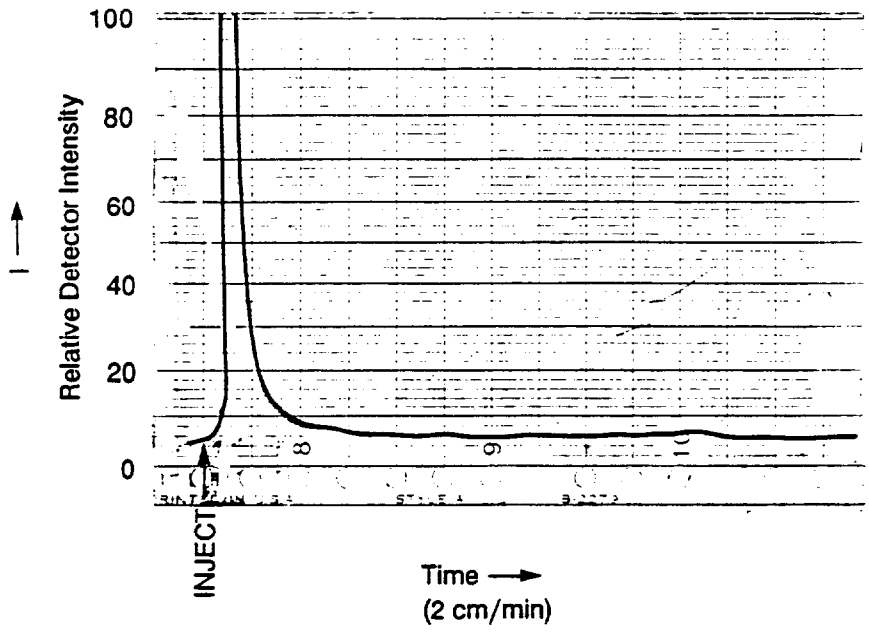


VZV 5-8'
>100 ppm

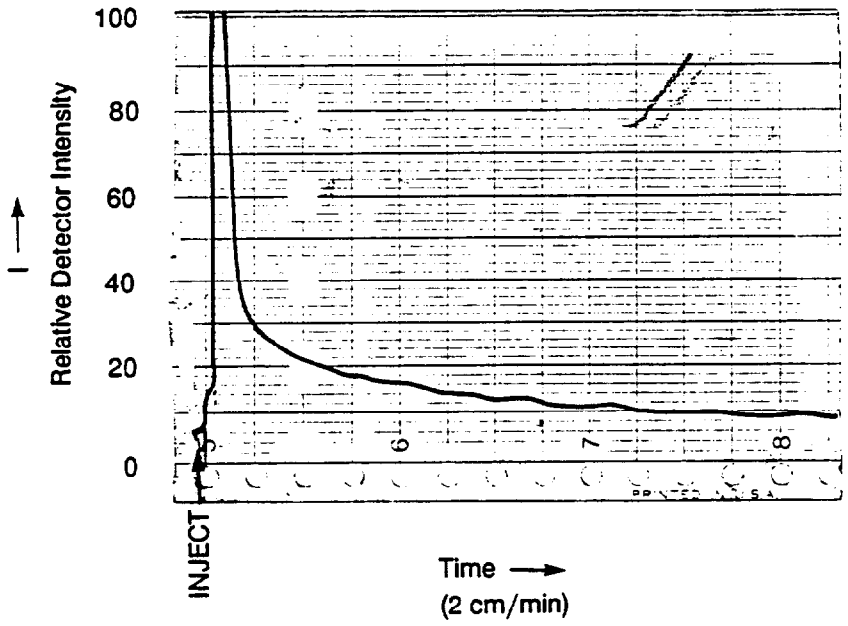


VZV 9-8'
30 ppm

FIGURE 3.11-2
SITE 18
FIELD GAS CHROMATOGRAPHS

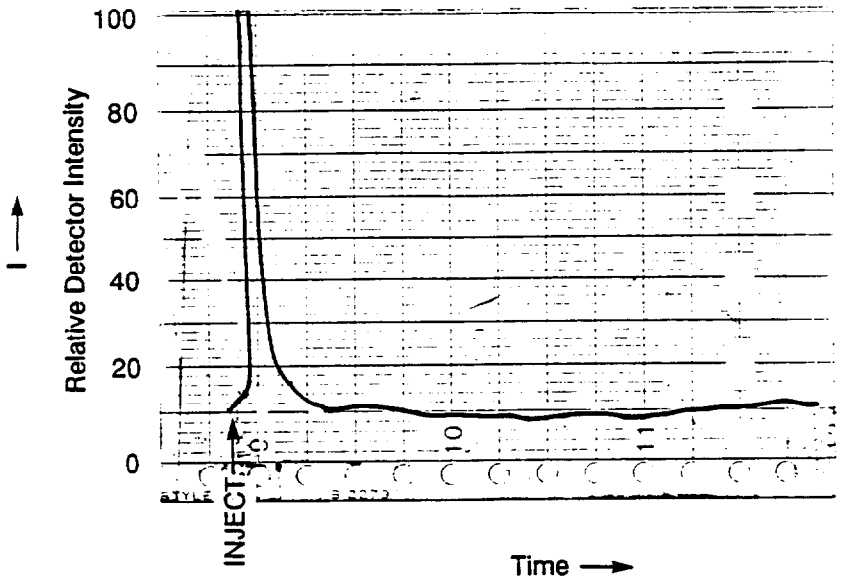


PAI18-GW1
15 ft

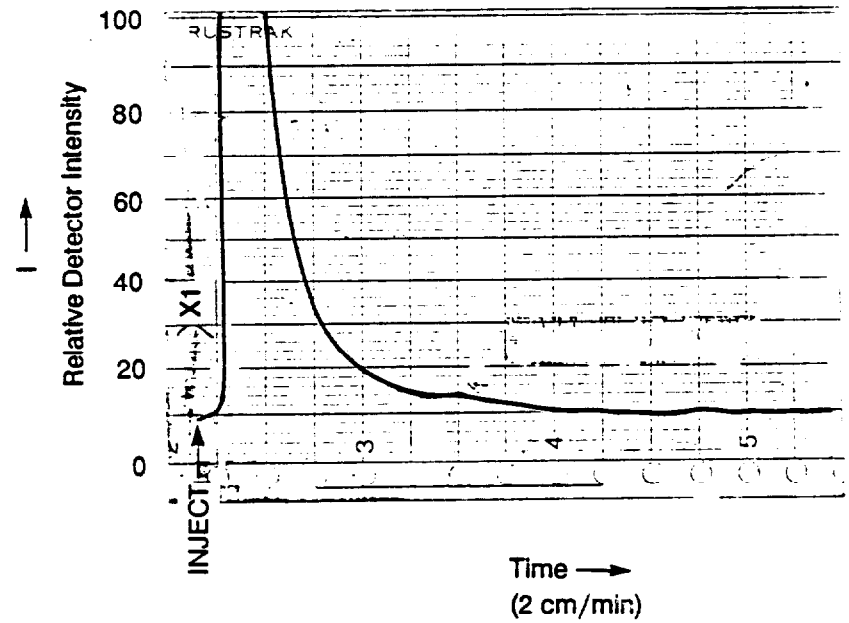


PAI18-GW1
20 ft

FIGURE 3.11-2
SITE 18
FIELD GAS CHROMATOGRAPHS(Cont')

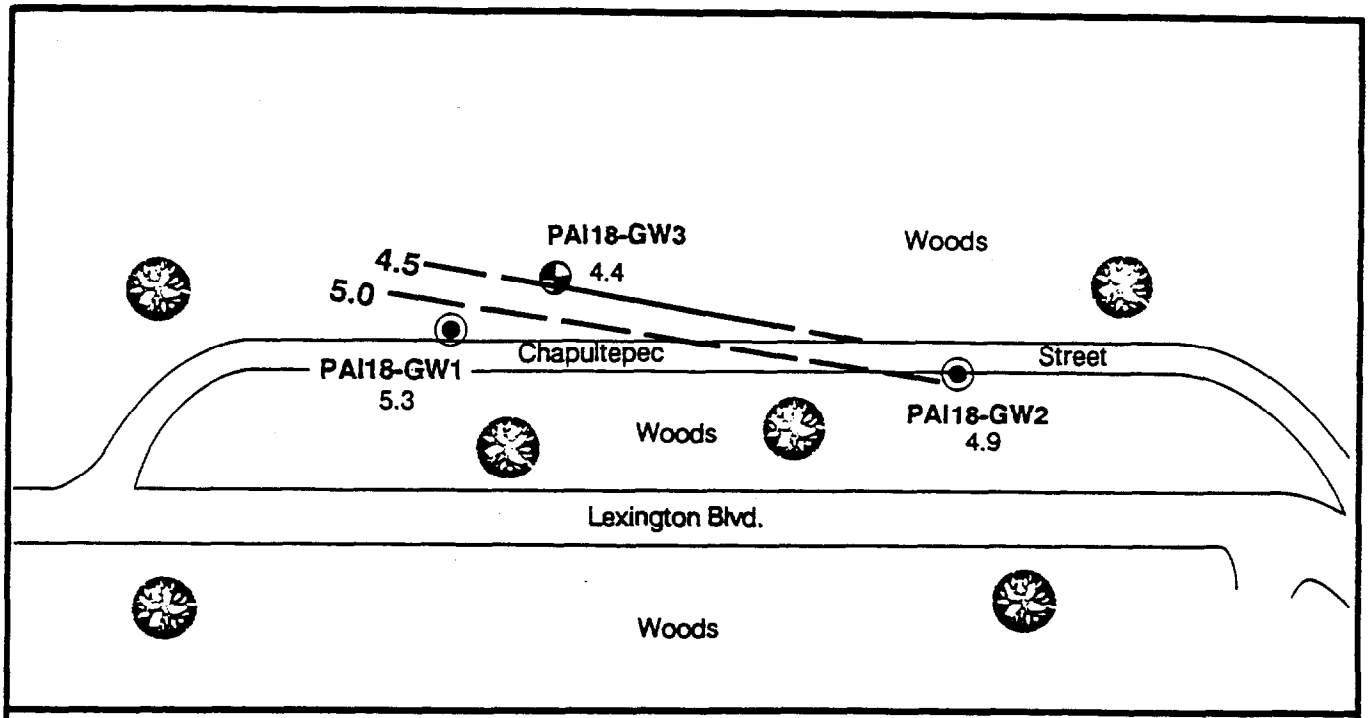


PAI18-GW1
4 ft



PAI18-GW1
11.5 ft

FIGURE 3.11-2
SITE 18
FIELD GAS CHROMATOGRAPHS(Cont')



EXPLANATION:

Well installed by previous contractor

PAI18-GW1 5.3 — Monitoring well, well number, water table elevation (MSL)

4.5 — Contour interval 0.5 ft

(modified from surveyor's notes)

N

FIGURE 3.11-3
SITE 18
WATER TABLE MAP

0 100 200

Scale In Feet

3.12 Site 19 - MCX Service Station

3.12.1 Site Description. The MCX Service Station (Bldg. 850) was taken out of active service in approximately 1985. The building was used for storage until 1989, when the building was demolished by the activity. According to correspondence provided to McClelland Consultants from the activity, a project that was being undertaken to demolish underground storage tanks at this location identified environmental contamination at the site. Prior to 1985, automobile gasoline was stored in underground tanks (4 tanks/5,000 gal each) at this location. The gasoline pumps have been removed from the pump islands.

Seven borings were previously advanced at this site to at least 20 ft below ground. Three wells were installed, but none had been sampled prior to our field activities in March 1988. McClelland included this site in this investigation after the wells had been completed. In addition to four 5,000-gal underground storage tanks, it is reported by activity personnel that a 500-gal waste oil tank is also present below ground at the site, however, McClelland field personnel could not verify its location.

3.12.2 Field Activities. A VZV Probe^{R} survey was conducted around Site 19 to evaluate the lateral extent of potential fuel contamination. Site 19 and the VZV Probe^{R} sampling locations are shown on Figures 3.12-1 with field gas chromatograms presented on Figure 3.12-2. McClelland personnel evacuated and sampled all three existing groundwater monitoring wells.

3.12.3 Laboratory Analyses. McClelland Consultants sampled the existing groundwater monitoring wells at this site. The samples were collected and analyzed for the presence of benzene, toluene, xylenes, ethylbenzene, dissolved metals Cd, Cr, and Pb, and for the indicator parameters total organic carbon, pH, and specific conductivity.

3.12.4 Results. The VZV Probe^{R} data (Table 3.12-1) indicates that organic vapors are present in the subsurface at this site, but that the vapors appear localized in the area of the 5,000-gal underground storage tanks. Little or no organic vapors were identified in the vicinity of the building, or other areas away from the underground tanks.

A shallow groundwater table map (Figure 3.12-3) was constructed from static water levels measured during the sampling of the three wells at this site. The data show that the shallow groundwater gradient in these wells was 0.01 ft/ft to the east-southeast.

The results of the chemical data indicate that no benzene, ethylbenzene, toluene, or xylenes were identified above the lower limit of determination for these constituents in the

groundwater samples. Cadmium and chromium levels were below the lower limit of determination, and lead is below the EPA Interim Primary Drinking Water Standard of 0.05 mg/l for all wells. Total organic carbon concentrations in the wells were unremarkable.

Based on the VZV Probe^{R} survey data, it appears that a release of fuel may have previously occurred from one or more of the underground storage tanks. The contamination is localized, and may be contained within the excavation pit that holds the tanks.

3.12.5 Recommendations. This site is not recommended for additional Installation Restoration activities. Based on negotiations between Southern Division, EPA, and SCDHEC, this site is being transferred to Southern Division's Underground Storage Tank program for management and tank closure. Site assessment and remediation may be performed concurrent with tank closure activities.

TABLE 3.12-1
SITE 10-MCX SERVICE STATION
SUMMARY OF VZV Probe® RESULTS

Location	Depth (ft)	OVA (ppm)	GC
1	5	3	
2	6	>1,000	Y
3	1.5	>1,000	Y
4	6	4.5	
5	6	1.7	
6	6	1.0	
7	7	2.9	
8	6	0	
9	6	0	
10	6	0	
11	6	0	
12	6	0	
13	5	0	
14	6	0	
15	6	0	
16	6	0	
17	6	0	
18	6	0	
19	6	1.2	
20	6	0	

> indicates "greater than"

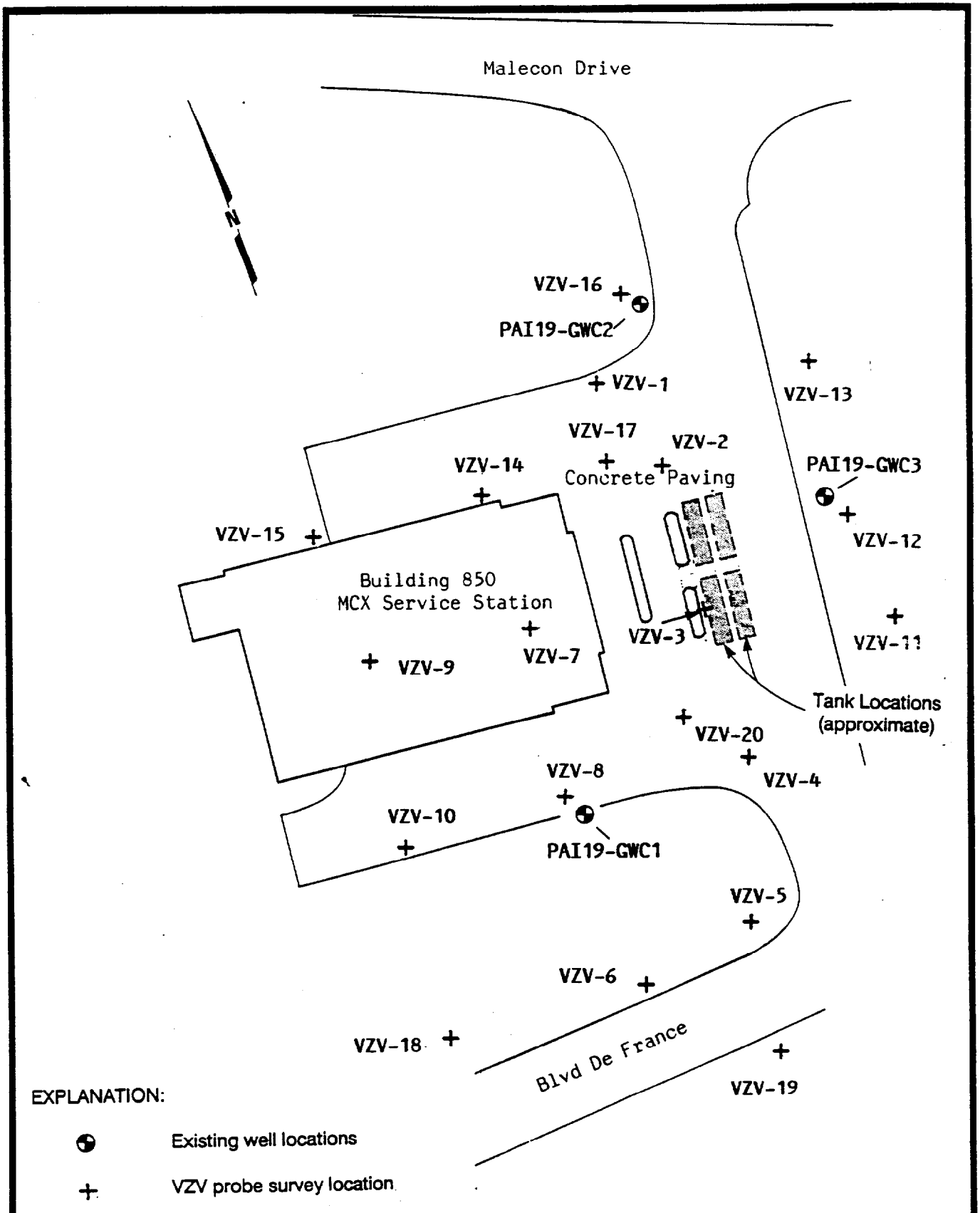
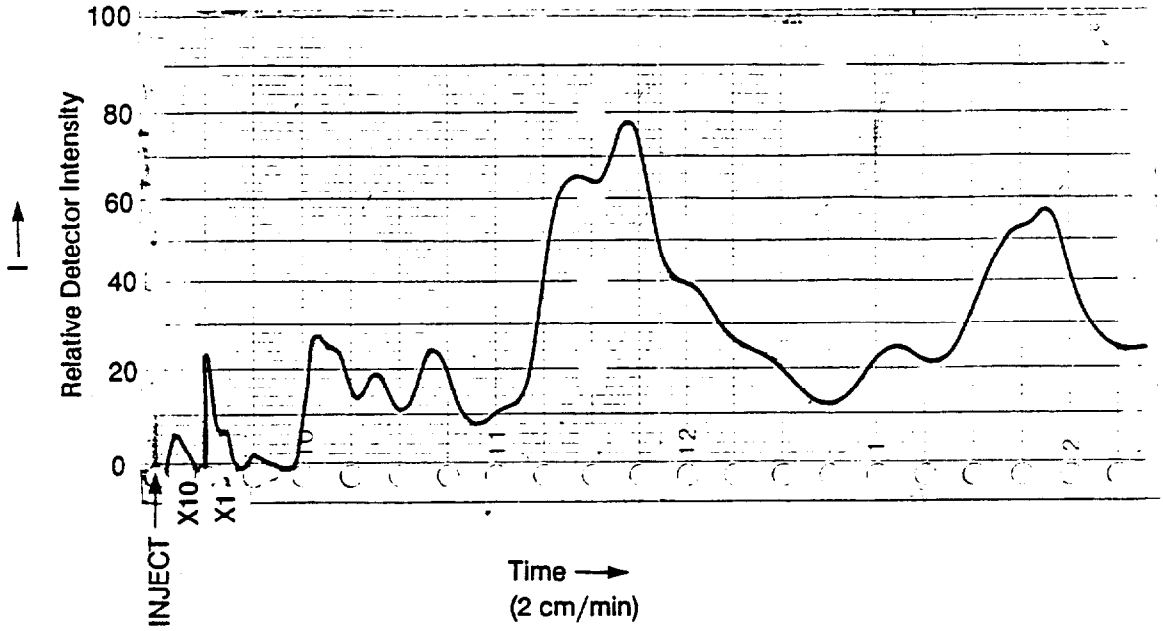


FIGURE 3.12-1
SAMPLING LOCATIONS AT SITE 19

Drafted : ____ Date : ____ Checked : ____ Date : ____ Appr'd : ____ Date : ____ Job No. : ____ Form DFT-1.00 (12/81)



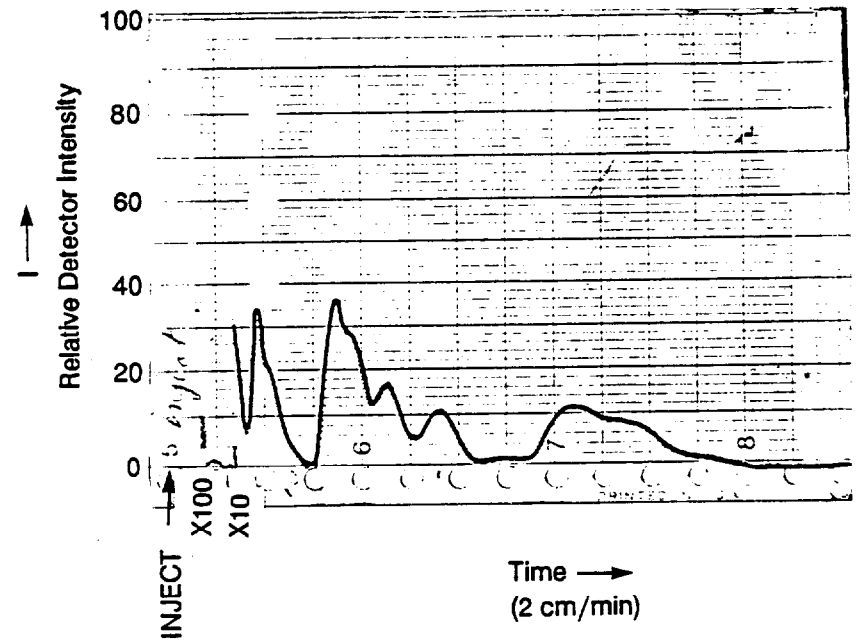
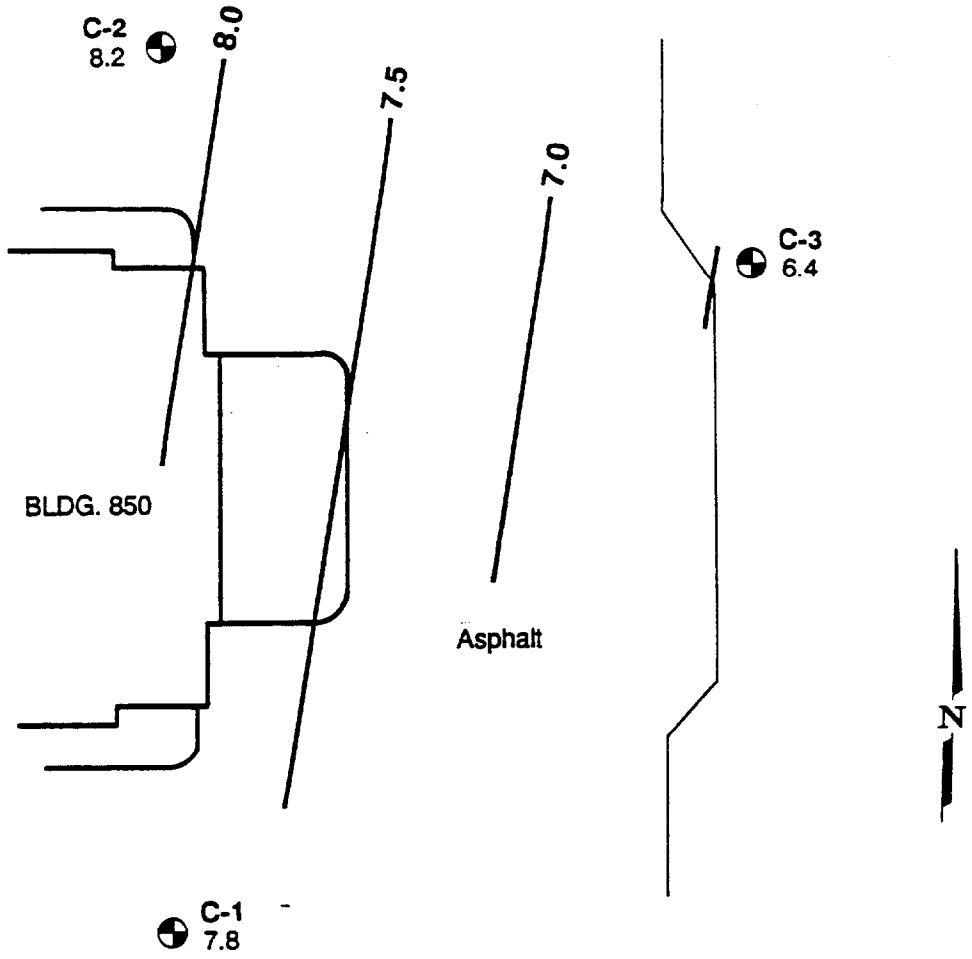


FIGURE 3.12-2
SITE 19
FIELD GAS CHROMATOGRAPHS



EXPLANATION:

C-3 6.4 — Well installed by previous contractor, well number, water table elevation (MSL)

8.0 — Contour interval 0.5 ft

(modified from surveyor's notes)

FIGURE 3.12-3
SITE 19
WATER TABLE MAP

0 20 40
Scale In Feet

4.0 FIELD INVESTIGATION PROCEDURES

This section describes procedures used to perform drilling, installation of monitoring wells and wellpoints, sample collection, sample handling, Quality Assurance/Quality Control (QA/QC), and decontamination. Procedures for evaluating the unsaturated zone soil gas with the Vadose Zone Vapor Probe (VZV Probe^{R}) are included in this section.

4.1 Borehole Completion

Borehole advancement or drilling, whether for the collection of samples or for the installation of groundwater monitoring wells, followed the same procedure. All borings were advanced using dry-auger methods when possible. The borings were advanced following collection of relatively undisturbed soils by the use of either 3-in. thin-walled tube samplers (for clays and more consolidated materials), or 2-in. split-barrel samplers (for sands and unconsolidated materials). The samplers were hydraulically pushed or driven into the undisturbed soil by the drilling rig. If samples could not be collected by the thin-walled tube sampling method because of resistance encountered, a 2-in. split-barrel sampler was driven by a controlled driving method that consists of dropping a 140-lb hammer 30 inches. If the split-barrel sampler was driven, blow counts were recorded for the sampling intervals.

During drilling, soil samples were collected, labeled, logged, and typical field tests on the samples were performed (Appendix B). The field tests included visual classification according to the Unified Soils Classification System and field screening at some locations for organic vapor content. Boring logs constructed during drilling record the sampling depth, soil type, color, and soil consistency, depths of the boring and the first occurrence of water, if noted; method of sampling and drilling; dates of well completion and development; and any water losses, if applicable.

Borings were completed to the depths specified in the work plan. Cuttings generated during drilling of the boreholes were contained in drums and held onsite.

Following collection of the samples, the borehole was reamed to a larger diameter. Rotary techniques were used when drilling difficulties were encountered while drilling with dry-auger techniques. This drilling procedure was continued until the boring was advanced to its total depth, and drilling was terminated.

4.2 Monitoring Well Installation

Monitoring well installations were supervised by a driller registered in the State of South Carolina, and completed in accordance with state regulations. The monitoring wells were installed using dry-auger techniques when possible. When this was not possible, wet-rotary methods were used. Drilling fluids were restricted to fresh, potable water obtained from an approved source (e.g., the activity water supply). Portable recirculation tanks were used during the wet-rotary drilling operation. When drilling mud was necessary, additives were restricted to Envirogel^{R} or other pure bentonite. No organic drilling fluid additives were used.

All down-hole equipment was decontaminated between holes. Drill rod joints were kept free of grease and oil. For the installation of 2-in.-ID well casings, boreholes with a minimum diameter of 6 in. were drilled. The wells were installed as soon as possible, no later than 24 hours following borehole completion.

Well construction diagrams are presented in Appendix C. Well casings were constructed of 2-in.-ID Schedule 40 PVC. Pipe lengths are threaded, flush jointed. Well screens were constructed of factory slotted, 2-in.-ID Schedule 40 PVC, with flush joints and screen slot openings of 0.010 inch. Screen lengths varied depending on the site and the potential types of contaminants.

A sand pack was installed in the annulus between the borehole and the screen. The pack consisted of clean, inert 16-30 grade sand, filled from the bottom of the borehole to at least 1 ft above the top of the screen. Bentonite pellets were used to form a minimum seal 1 ft thick above the sand pack. After the bentonite had been allowed to hydrate, a cement-bentonite grout was placed from the top of the bentonite seal to the ground surface. The well was completed at the surface with a concrete pad in accordance with the state requirements.

A vented PVC cap was provided for each well, and in addition, a protective steel security casing was installed in the concrete pad. The 4-in.-diameter steel casing rises approximately 3 ft above ground level and closes with a cover and padlock.

4.3 Wellpoint Installation

The 1-1/4-in.-ID, stainless steel wellpoints were hydraulically pushed or driven into the ground in 5-ft threaded, flush jointed sections. The bottom section consists of stainless steel,

wire-wound well screen (0.010 in. slots) with a solid, stainless steel point. No lead or solder was used in the manufacture or installation of these wellpoints.

Surface completions consisted of a 2 to 3-ft stainless steel riser or stick up, vented cap, and concrete pad. A 3-in.-ID PVC outside casing was installed in the concrete pad at each wellpoint, the casing was capped to limit infiltration. At the Incinerator Landfill (Site 1), additional casing was added above ground to assure that the tops of these wellpoints remained above tidal influences. The additional casing can be removed for wellpoint elevation surveying, water level measurements, and groundwater sampling.

The wellpoints were developed and sampled in the same manner as the monitoring wells (see Section 4.5).

4.4 Well and Wellpoint Documentation

Completion details and well data reports for each monitoring well and wellpoint are recorded on the appropriate Southern Division forms and diagrams and presented in Appendix C. The well detail diagrams include the following:

- bottom of the borehole,
- screened interval and slot size,
- sand pack interval,
- thickness of bentonite seal,
- depth to base of grout backfill,
- height of riser,
- design of joints, and
- well installation dates.

The well data report includes the following information and supplements the well construction detail report:

- well hole data (driller, drilling method, mud type),
- water level data (level and date),
- development data (method, time), and
- well driller identification (name and registration number).

In addition to the well construction and well data reports, records of drilling and installation of all monitoring wells and wellpoints are registered with SCDHEC. These registrations

are provided in Appendix D of this report, and identify standard well drilling, completion, formation, location, and owner/operator information for the well.

Monitoring well and wellpoint locations for each site are identified in Section 3.0. Coordinates and elevations were surveyed for each of the wells following installation and are presented in Appendix A. Coordinates were measured by a surveyor registered with the State of South Carolina. Ground surface elevation to the closest tenth of a foot and elevation of the top of casing to the closest hundredth of a foot were surveyed at each well. The coordinates and elevations of the wells are plotted on a map and tabulated. Copies of the field diagrams and survey field notes are also provided in this appendix.

4.5 Well and Wellpoint Development

Development of the wells and wellpoints began a minimum of 24 hours after installation of the well and placement of the grout in the borehole. Development was performed using either a bottom-filling bailer or hand pump. A minimum of three times the volume of water standing in the well casing plus three times the volume of any water lost during well installation was removed during development. For wells set in low permeable material, when it was not possible to remove these quantities of water, the well was evacuated completely and allowed to recover before sampling. Well development included the following procedures.

- measuring of water levels and total well depths,
- recording the total volume of water removed and rate or removal and,
- continuing development until the water appears relatively clear, the sediment thickness in the well is less than 5 percent of the screen length, and the required volume has been removed.

The wellpoint installation precluded the installation of a sand pack around the screened interval. Because of this, combined with the fine-grained nature of sediments in this area, the water collected from the wellpoints remained slightly turbid following development. This is not anticipated to adversely affect the analytical chemistry results, as samples collected for metals were subject to field filtration, and organic analyses required an extraction step prior to analyses.

4.6 Borehole Grouting

Each borehole where a monitoring well was not installed, was grouted with a cement/bentonite grout from the bottom up to prevent cross-contamination. Because the grout mix is more dense than the drilling fluid, it displaces the drilling fluids (if any) in the borehole. The drill pipe is withdrawn while filling the borehole with grout pumped through the drill pipe or through a tremie pipe.

The grout consisted of 5 to 10 gal of water per sack (94 lb) of Portland Type I cement, and up to 5 lbs of bentonite per sack of cement.

Wellpoints did not require grout above the screen because: (1) wellpoints were installed to very shallow depths, and (2) there is no annular space between the outside of the casing and the formation. At these locations, the prevention of infiltration from the ground surface (surface water) is accomplished with the use of the concrete pad placed around each wellpoint at ground surface.

Due to their small diameter (1/2 in.), holes made while pushing the Vadose Zone Vapor Probe (VZV Probe^{R}) and cone penetrometer were not grouted. Additionally, the probe was used only at shallow depths (e.g., less than 20 ft). The VZV Probe^{R} was not pushed below the water table as no vapor samples can be recovered from the saturated zone with this equipment.

4.7 Sample Collection

Six different types of samples were collected: surface soil, surface water and sediment, subsurface soil, subsurface vapor, and groundwater.

4.7.1 Surficial Soils. Surface soil samples include those collected from the surface to a depth of approximately 2.0 ft. In general, any grass or vegetation in the top few inches of soil was removed from the sample location. The sample was collected with a small hand held auger or trowel and placed in a one-pint glass jar. A sheet of aluminum foil, placed between the jar and lid, provided a seal.

A split sample was collected of all soil samples where screening for organic vapors was needed. The sampling utensil was decontaminated between sampling locations.

4.7.2 Surface Water and Sediments. Surface water and sediment samples were collected from the tidally influenced drainage ditches and marsh areas during low-tide periods, when possible. Surface water samples were collected by carefully filling sample containers using

a second container as a filling device, if needed. The sample containers containing the appropriate preservatives were filled directly from the collection device. Sediment samples were collected using a scoop or shovel. All sampling equipment was decontaminated between sampling locations.

4.7.3 Subsurface Soils. Subsurface soils collected with thin-walled tubes were hydraulically extruded in the field. The soil sample was then shaved with a knife to remove any portion of the sample that contacted the tube. Following the removal of the outer portion of the sample, the soil was collected in the containers provided by the laboratory for analyses. Samples collected for headspace readings were collected in a separate, clean-glass jar with aluminum foil cover and lid. No samples collected for chemical analyses were used for headspace samples.

Samples collected by split-barrel sampler were handled in a similar fashion, by shaving the outer surface of the sample prior to placing the sample in the sample container.

Both types of sampling devices were decontaminated between sampling intervals. All shavings generated from the sample collection activities were placed in drums with the drill cuttings collected from the borehole.

4.7.4 Soil Gases. Subsurface vapor samples were obtained by hydraulically advancing a probe designed to collect vapor samples (VZV Probe^{R}). Soil vapor samples were collected at varying intervals (dependant on soil conditions and depth to water table) to a completion depth near the water table. The total volatile organic content (in ppm, calibrated as methane) in the soil vapor was determined using a Foxboro Model 128 Organic Vapor Analyzer (OVA). In general, a field gas chromatograph (GC) was run on vapor samples with OVA readings that exceed 10 ppm to "fingerprint" the contaminants present. The field GC is used to determine whether the organic vapors in the soil are attributed to nonmethane compounds such as fuel or solvent components, or to methane, a naturally occurring constituent common to organic-rich or decaying organic matter that is present in many soils. If nonmethane peaks are identified, the field GC can provide a characteristic fingerprint of the volatile contaminants present in the subsurface. Comparison of the soil vapor fingerprint to an expected and/or potential source of contamination can provide information regarding the source of the contamination, and sometimes the relative age of the contamination. Typically chromatograms of soils associated with recent releases generally show a fingerprint that is similar to that of the source of the material, while

chromatograms of old releases generally show an observable loss of the more volatile components relative to the source material. Following each sample, the GC column was back-flushed to clear any residual organic vapors.

4.7.5 Groundwater. Following development, wells and wellpoints were sampled by standard techniques. If the wells were sampled immediately following development, no additional evacuation of the water in the well casing was performed. If the well could not be sampled with 24 hours following development, the well was evacuated by removal of a minimum of three additional casing volumes of the water standing in the well or to dryness. Evacuation was performed using either a bottom-filling PVC or acrylic bailer, or a hand pump. Water sampling was performed using a stainless steel or PVC bottom filling bailer only.

During sampling, water was poured directly from the sampler into either the filtering device (for dissolved metals analyses) or directly into the sampling container. If samples were collected for dissolved metals, the water was immediately field filtered using a pressurized acrylic sampling device and 0.45 micron geomembrane filter, followed by nitric acid preservation and cooling.

4.8 Decontamination

There are two phases of decontamination, equipment and personnel. The equipment decontamination is necessary to reduce the risk of cross contamination during the site investigation and migration of contaminants offsite. Personnel decontamination is necessary to protect the workers' health and safety, and is described in detail in the approved Health and Safety Plan (submitted as part of the Work Plan for this investigation).

4.8.1 Equipment Decontamination. The basic format for decontaminating drill pipe, samplers, and tools including washing and rinsing with detergent and potable water. This procedure was used during drilling and sampling, before drilling into an uncontaminated strata, and before moving to the next boring location. This decontamination procedure was performed using a 5 percent trisodiumphosphate (TSP) solution in potable water with a potable water rinse.

Decontamination of the drill rig, drill bits, samplers, drill pipe, and tools was completed at each drilling location. Well screens and casings were decontaminated if visible contamination was identified prior to installation using a wash of 5 percent TSP in potable water and a potable

water rinse. All well casings and screens were stored in the original shipping containers until their use. Wash solutions were transferred to drums and handled in the same manner as the well development and evacuation water.

4.8.2 Personnel Decontamination. Prior to leaving the working area and when needed, personnel were decontaminated using the following techniques.

If drilling and sampling activities were performed using a Level D personnel protection, latex sampling gloves and other contaminated or dirty disposable items were disposed of following the completion of sampling and drilling activities at a site. If a Level C personal protection was needed, boots were washed down to prevent tracking of potentially contaminated soils to other locations. All disposable personal protective equipment including Tyvek coveralls, gloves, respirator cartridges, and other similar material were placed in plastic bags for subsequent disposal.

4.9 Sampling Handling

The sample handling procedures are determined by the types of chemical analyses assigned to each sample.

4.9.1 Soil and Sediment. All soil and sediment samples were placed in clean, one-pint jars, covered with foil, sealed with the lid, labeled, and recorded in the field log book. Soil samples collected for organic chemical analyses were immediately placed in an ice chest and kept at less than $4^{o}C$ for shipment to the laboratory.

Screening of soil samples consisted primarily of sampling the head space with an organic vapor analyzer (OVA). The sample to be screened was placed in a one-pint jar, covered with aluminum foil and a lid, and allowed to stand for a period of at least two minutes. The lid was then removed, and the foil pierced with the OVA probe to obtain a measurement of the organic vapor concentration in the headspace above the sample. Samples used for vapor screening were duplicate samples or splits of those submitted for chemical analyses.

4.9.2 Groundwater and Surface Water. Figure 4.9-1 summarizes the sample containers, number of containers, and preservatives required for groundwater and surface water samples. The type of containers, number of containers per sample, and appropriate preservative were dictated by the analytical laboratory for this project and are in accordance with EPA-approved methods and procedures.

4.9.3 Chain of Custody. The purpose of the chain-of-custody (COC) procedures are to provide documentation of the handling of each sample from collection through laboratory analytical report. This ensures the integrity of the samples for both technical and legal purposes.

The COC record was initiated at the site by McClelland personnel. As the samples are collected, the following activities are performed:

- o assign a unique sample identification number to the sample,
- o complete the sample label and affix it to the sample container,
- o take any required field measurements and add preservative (if needed),
- o seal the container with the COC seal (samples for chemical testing only),
- o record the information in a bound field notebook, and
- o place the sample in an ice chest containing sufficient ice to maintain the samples at $<4^{o}C$ until receipt by laboratory.

Prior to shipment, the COC form was completed for all the samples being transported. As an alternative to a COC seal on each container, the entire cooler was sealed using a COC seal on the cooler lid sealing the lid to the body of the cooler. This was done after all samples, COC record, and ice were placed in the cooler.

4.9.4 Sample Identification. Sample identification numbers were assigned by McClelland personnel. The numbers are unique to each sample and descriptive. Each identification number included the identification of the activity, site number, type of sample (groundwater, surface water, soil boring, shallow sediment, etc.), sample number, depth, and an identifier for quality control duplicates or blanks. An explanation of the sample numbering system used for this project is provided below:

AAABB-CCD-EEF, where

AAA = PAI for MCRD Parris Island.

BB = 1, Incinerator Landfill
2, Borrow Pit Landfill
3, Causeway Landfill
4, Dredge Spoils Area Fire Training Pit
6, Former Automotive Hobby Shop Spill Area
16, Pesticide Rinsate Disposal Area

17, Page Field Tanks (AS-16)
18, Page Field Tanks (AS-18)
19, MCX Service Station

CC = SW, Surface Water,
GW, Groundwater
SS, Shallow Sediment, and
SB, Soil Boring.

D = Sample, Soil Boring, or Well Location Number.

EE = Depth of the sample collected. For groundwater and surface water samples the depth was not specified (00), for sediment and soil boring samples this two digit number corresponds to depth below ground.

F = D, for Duplicate Sample
B, for Field Blank.

After the sample identification number had been assigned, the site personnel completed the sample label that was affixed to the sample container by the laboratory. Example labeling is shown in Figure 4.9-2. The labels were self-adhesive and were completed using a black, waterproof marker.

All samples obtained for chemical testing were logged into a field notebook by the Team Leader. The field notebook was bound and documents the collection of the samples. The field personnel were responsible for the field notebook.

Completed COC records are provided in Appendix F of this report. This form was completed by the field personnel prior to securing the samples in an ice chest for transport to the laboratory. After the samples were received by the laboratory and inspected, the COC form was signed by a laboratory representative. The completed COC record was returned to McClelland Consultants when laboratory analytical results returned from the laboratory.

The Team Leader placed the COC forms in plastic bags in the ice chests containing the samples. The samples were packed with ice and packing material, if required, to prevent breakage and each ice chest secured with tape. Ice Chests containing samples for chemical testing were transported by overnight carrier (Federal Express or by bus) or by McClelland personnel to the laboratory within 24 hours of being collected.

General Engineering Laboratories, Charleston, South Carolina, conducted the laboratory analyses of the samples collected as part of the investigations at this activity.

4.10 Quality Assurance/Quality Control

The purpose of the Quality Assurance/Quality Control (QA/QC) Program is to assess and document the precision and accuracy of the data obtained during the field investigation. The specific objective is to collect data which are of a known quality with respect to:

- o precision,
- o accuracy,
- o completeness,
- o representativeness, and
- o comparability.

Successful fulfillment of these objectives requires that sound QA/QC practices are observed throughout all phases of the field investigation. The program consists of two parts: (1) the internal (laboratory) quality control, and (2) the external quality assurance. The internal program is documented in "Quality Control in Environmental Testing and Hazardous Waste," prepared by General Engineering Laboratories, Charleston, South Carolina. This program was presented in the approved work plan for this investigation and is not repeated in this report. In this section, the external quality control measures are described. In addition to proper sample collection, handling, and documentation which have been described previously, the Quality Assurance (QA) program includes the submission of QA samples to the laboratory.

QA samples were submitted to the laboratory as a check on their internal quality control. QA samples include field blanks and duplicates. In accordance with the work plan for this project, McClelland submitted sample blanks and duplicates to the laboratory with a frequency of one QA sample per twenty field samples. Sample blanks were collected for volatile organic analyses only.

Sample duplicates were collected for groundwater samples at Sites 1 and 2, and for a surface water sample at Site 3. Soil boring duplicates were collected from Sites 6 and 16, while a shallow soil duplicate was collected from Site 3. Sample blanks were submitted from groundwater sampling locations at Sites 1 (two locations), 2, 6, and 18. The field personnel were responsible for preparing the QA samples and assigned each with a number similar to those used for the field samples.

McClelland Consultants reviewed the results of the QA sample analyses and the documented QC results. Laboratory analytical reports for all duplicate and sample blanks are presented in Appendix E - Lab and Field Data. The duplicate and blank analytical results are presented in numerical order by site where they were collected. No obvious or significant inconsistencies were noted in the QA/QC program.

SAMPLE TYPE	ANALYSES	BOTTLE TYPE / SIZE	# BOTTLES / SAMPLE	PRESERVATIVE
Sediments/ Soils	Volatiles	Vial / 40 mL (collect with no headspace)	2	--
	Acid and Base/ Neutral Extractables	Teflon Lined Jar / 500 mL	1	--
	Pesticides*	Teflon Lined Jar / 500 mL	1	--
	PCB's*	Teflon Lined Jar / 500 mL	1	--
	Oil and Grease	Glass Jar / 500 mL	1	--
	GC Scan (JP-4, JP-5)	Vial / 40 mL	2	--
	GC Scan (AVGAS)	Vial / 40 mL	2	--
	Metals (Total & EP Toxicity)	Square Nalgene / 500 mL	1	--
Groundwater/ Surface Water	Gross Alpha / Beta	Square Nalgene / 500 mL	1	HNO3 to pH < 2
	pH, Specific Cond.	Nalgene / 125 mL	1	--
	T.O.C.	Vial / 40 mL	1	H2SO4 to pH < 2
	EPA Method 602	Vial / 40 mL (collect with no headspace)	4	Na2S2O3
	Volatiles	Vial / 40 mL (collect with no headspace)	4	Na2S2O3
	Acid and Base / Neutral Extractables**	Glass Amber / 1 Liter	2	--
	Pesticides*	Glass Amber / 1 Liter	2	--
	GC Scan (AVGAS)	Vial / 40 mL	2	H2SO4 to pH < 2
	Dissolved Metals	Square Nalgene / 500 mL	1	HNO3 to pH < 2

* Collect samples for Pesticide and PCB Analyses ONLY if no sample is collected for Base/Neutral Analyses.
**If only Base/Neutral Extractable Analyses are requested for a sample, continue to collect 2 Liters.

FIGURE 4.9-1
CONTAINERS AND PRESERVATIVES FOR SAMPLES COLLECTED FOR LABORATORY ANALYSIS

GENERAL ENGINEERING LABORATORIES
2040 Savage Road - Charleston, SC 29414
(803) 556-8171

VOLATILES (GROUNDWATER) 4 VIALS PER SAMPLE
PRES W/ NA2S2O3 1 of 4

SAMPLE ID BFT1-GW1-00

DATE 3/8/88 TIME COLLECTED 1130

GENERAL ENGINEERING LABORATORIES
2040 Savage Road - Charleston, SC 29414
(803) 556-8171

VOLATILES (GROUNDWATER) 4 VIALS PER SAMPLE
PRES W/ NA2S2O3 2 of 4

SAMPLE ID BFT1-GW1-00

DATE 3/8/88 TIME COLLECTED 1130

GENERAL ENGINEERING LABORATORIES
2040 Savage Road - Charleston, SC 29414
(803) 556-8171

VOLATILES (GROUNDWATER) 4 VIALS PER SAMPLE
PRES W/ NA2S2O3 3 of 4

SAMPLE ID BFT1-GW1-00

DATE 3/8/88 TIME COLLECTED 1130

GENERAL ENGINEERING LABORATORIES
2040 Savage Road - Charleston, SC 29414
(803) 556-8171

VOLATILES (GROUNDWATER) 4 VIALS PER SAMPLE
PRES W/ NA2S2O3 4 of 4

SAMPLE ID BFT1-GW1-00

DATE 3/8/88 TIME COLLECTED 1130

FIGURE 4.9-2
EXAMPLE OF SAMPLE LABELING

5.0 SUMMARY OF RECOMMENDATIONS

Our recommendations for each of the sites investigated during this verification step of the Installation Restoration program are presented below:

- Site 1 - Incinerator Landfill: We recommend additional evaluation of this site to confirm the presence of chloroform, lead, and chromium, determine the depth and extent of contamination in the soils and groundwater, as well as determine whether these contaminants are present in groundwater at greater depth. Additionally, a fence or barrier is needed at this site to limit site access.

- Site 2 - Borrow Pit Landfill: Additional study is needed to assess the presence of lead, cadmium, and chromium in the surface and/or groundwater as well as to assess the presence of chloroform and 1,2-dichloroethane in the groundwater. This evaluation should be extended in both lateral and vertical directions from the site.

- Site 3 - Causeway Landfill: We recommend further investigation of nearby shellfish species at this site under a detailed site inspection prior to recommending a change in status of this site.

- Site 4 - Dredge Spoils Area Fire Training Pit: We recommend that this site be dropped from further evaluation under this Installation Restoration program.

- Site 6 - Former Automotive Hobby Shop Spill Area: We recommend no further Installation Restoration activities at this site. MCRD will fund and coordinate tank removal with SCDHEC. Southern Division will track project status.

- Site 16 - Pesticide Rinsate Disposal Area: Additional study is needed at this site to determine the depth and extent of subsurface soil contamination by DDT, DDE, and DDD. Evaluation of the groundwater is needed to determine whether contamination is also present in the groundwater at this site.

- Site 17 - Page Field Tanks (AS-16): We recommend no further Installation Restoration activities at this site. MCRD will fund and coordinate tank removal with SCDHEC. Southern Division will track project status.

- Site 18 - Page Field Tanks (AS-18): We recommend no further Installation Restoration activities at this site. This site is to be transferred to Southern Division's Underground Storage Tank program. Additional investigations under the UST program should include assessment and remediation of contamination identified during the conduct of the verification step activities.

- Site 19 - MCX Service Station: We recommend no further Installation Restoration activities at this site. This site is to be transferred to Southern Division's Underground Storage Tank program. Additional investigations under the UST program should include assessment and remediations of contamination identified during the conduct of the verification step activities.

6.0 REFERENCES CITED

Dames & Moore, 1986, Initial assessment study of Marine Corps Recruit Depot, Parris Island, South Carolina, UIC: M00263, prepared for Environmental Restoration Department, Navy Energy and Environmental Support Activity, Port Hueneme, California, Contract No. N62474-84-C-3385.

McClelland Engineers, Inc., 1988, Final work plan remedial investigation, Marine Corps Recruit Depot, verification step, Beaufort, South Carolina, UIC: M00263, prepared for Southern Division Naval Facilities Engineering Command, Charleston, South Carolina, Contract No. N62467-86-C-0661.

Map of
Marine Corps Recruit Depot
Parris Island, So. Car.

SHOWING CONDITIONS AS OF
1 JAN 1988

APPENDIX A
LOCATION OF WELLS OR WELL POINTS
INSTALLED FOR THIS INVESTIGATION
McCLELLAND ENGINEERS, INC ,HOUSTON, TEXAS 1988

0 300 600 1200 Feet

LEGEND

- BUILDING AND STRUCTURES
- SURFACED ROADS AND PAVED AREAS
- UNSURFACED ROADS AND PAVED AREAS
- RAILROADS
- FENCE
- NAVY PROPERTY BOUNDARY
- MAIN STATION ENTRANCE
- WELL INSTALLED PRIOR TO THIS INVESTIGATION BY SEPARATE CONTRACTOR
- GROUNDWATER MONITORING WELL OR WELL POINT

Well survey by R.D. Troedahl Jr. Surveyor Inc. March 1988

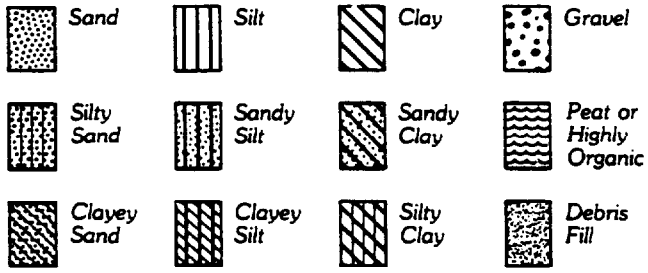
Note: 100 Yr out of scope to plot from notes.

Note: Information course is drawn incorrectly - verified position by aerial photo.

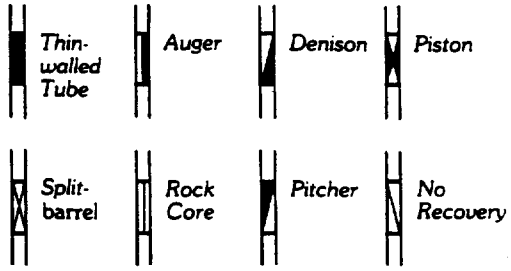
Form STD-1.11 (3/84)

TERMS AND SYMBOLS USED ON BORING LOGS

SOIL TYPES

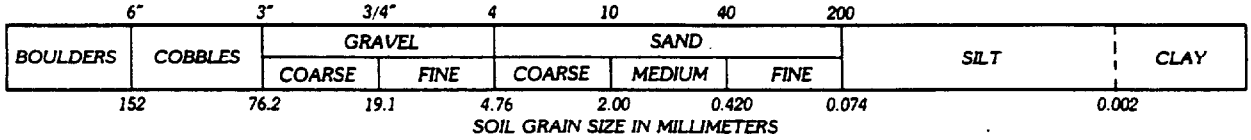


SAMPLER TYPES



SOIL GRAIN SIZE

U.S. STANDARD SIEVE



SOIL GRAIN SIZE IN MILLIMETERS

STRENGTH OF COHESIVE SOILS [1]

Consistency	Undrained Shear Strength, Kips Per Sq Ft
Very Soft	less than 0.25
Soft	0.25 to 0.50
Firm	0.50 to 1.00
Stiff	1.00 to 2.00
Very Stiff	2.00 to 4.00
Hard	greater than 4.00

DENSITY OF GRANULAR SOILS [2,3]

Descriptive Term	*Relative Density, %
Very Loose	less than 15
Loose	15 to 35
Medium Dense	35 to 65
Dense	65 to 85
Very Dense	greater than 85

*Estimated from sampler driving record

SPLIT-BARREL SAMPLER DRIVING RECORD

Blows Per Foot	Description
25	25 blows drove sampler 12 inches, after initial 6 inches of seating.
50/7"	50 blows drove sampler 7 inches, after initial 6 inches of seating.
Ref/3"	50 blows drove sampler 3 inches during initial 6-inch seating interval.

Note : To avoid damage to sampling tools, driving is limited to 50 blows during or after seating interval.

SOIL STRUCTURE [1]

Slickensided	Having planes of weakness that appear slick and glossy. The degree of slickensidedness depends upon the spacing of slickensides and the ease of breaking along these planes.
Fissured	Containing shrinkage or relief cracks, often filled with fine sand or silt; usually more or less vertical.
Pocket	Inclusion of material of different texture that is smaller than the diameter of the sample.
Parting	Inclusion less than 1/8 inch thick extending through the sample.
Seam	Inclusion 1/8 inch to 3 inches thick extending through the sample.
Layer	Inclusion greater than 3 inches thick extending through the sample.
Laminated	Soil sample composed of alternating partings or seams of different soil type.
Interlayered	Soil sample composed of alternating layers of different soil type.
Intermixed	Soil sample composed of pockets of different soil type and layered or laminated structure is not evident.
Calcareous	Having appreciable quantities of carbonate.

REFERENCES :

(1) ASTM D 2488
(2) ASCE Manual 56 (1976)
(3) ASTM D 2049

Information on each boring log is a compilation of subsurface conditions and soil or rock classifications obtained from the field as well as from laboratory testing of samples. Strata have been interpreted by commonly accepted procedures. The stratum lines on the logs may be transitional and approximate in nature. Water level measurements refer only to those observed at the times and places indicated, and may vary with time, geologic condition or construction activity.

LOG OF BORING NO. PAI 1-4

Site 1 - Incinerator Landfill
Marine Corps Recruit Depot
Beaufort County, South Carolina

Location: See Plate >

Surface Elevation: 12.4'

Depth, Ft	Samples	Penetration Resistance, Blows/Ft	MATERIAL DESCRIPTION	Shear Strength, ksf: Penetrometer (P) Torvane (T)	Shear Strength, ksf: Unconfined Compression	Shear Strength, ksf: Triaxial Compression	Confining Pressure, ksf	Unit Dry Weight pcf	Water Content, %	Liquid Limit	Plastic Limit	Percent Passing No. 200 Sieve
			FILL: SILTY SAND, dark brown - with gravel and rubble (3.5')									
5			SILTY SAND, light brown - wet at 8.0'									
10												
15			(15.0')									
20												
25												
30												
35												
40												
45												
50												
55												

See Key for Terms and Symbols.

Completion Depth: 15.0'
Water First Noticed: --
Date: February 23, 1987
Depth to Water: --
Caved: --
Date: --

Job No.: 1387-3606
Drilled By: A. Clark
Logged By: J. Byars
Dry Auger: 0' to 15'
Wet Rotary:
Boring Sealed: Well Installed

McCLELLAND ENGINEERS

PLATE >

LOG OF BORING NO. PAI 2-1

Site 2 - Borrow Pit Landfill
Marine Corps Recruit Depot
Beaufort County, South Carolina

Location: See Plate >

Surface Elevation: 16.5'

Depth, Ft	Samples	Penetration Resistance, Blows/Ft	MATERIAL DESCRIPTION	Shear Strength, ksf: Penetrometer (P) Torvane (T)	Shear Strength, ksf: Unconfined Compression	Shear Strength, ksf: Triaxial Compression	Confining Pressure, ksf	Unit Dry Weight pcf	Water Content, %	Liquid Limit	Plastic Limit	Percent Passing No. 200 Sieve
0			SILTY SAND, brown - with roots to 4.0'									
5			- light brown below 4.0'									
10												
15			- gray at 17.0'									
20			- with a few 1/2" thick clay seams, 20.0' to 21.0'									
25			- sand, medium to coarse below 24.0' (25.5')									
			CLAY, soft, gray - with some plant debris (26.0')									
30												
35												
40												
45												
50												
55												

See Key for Terms and Symbols.

Completion Depth: 26.0'
Water First Noticed: 14.0'
Date: February 24, 1988
Depth to Water: --
Caved: --
Date: --

Job No.: 1387-3606
Drilled By: A. Clark
Logged By: J. Byars
Dry Auger: 0' to 16'
Wet Rotary: 16' to 26'
Boring Sealed: Well Installed

McCLELLAND ENGINEERS

PLATE >

LOG OF BORING NO. PAI 2-2

Site 2 - Borrow Pit Landfill
Marine Corps Recruit Depot
Beaufort County, South Carolina

Location: See Plate >

Surface Elevation: 17.8'

Depth, Ft	Samples	Penetration Resistance, Blows/Ft	MATERIAL DESCRIPTION	Shear Strength, ksf: Penetrometer (P) Torvane (T)	Shear Strength, ksf: Unconfined Compression	Shear Strength, ksf: Triaxial Compression	Confining Pressure, ksf	Unit Dry Weight pcf	Water Content, %	Liquid Limit	Plastic Limit	Percent Passing No. 200 Sieve
			SILTY SAND, brown									
			- with roots to 2.0'									
5			- light brown below 4.0'									
10			- wet at 13.0'									
15												
20			- gray at 23.0'									
25			- with a few clay pockets below 25.0'									
30			(30.0')									
35												
40												
45												
50												
55												

See Key for Terms and Symbols.

Completion Depth: 30.0'
Water First Noticed: --
Date: February 22, 1988
Depth to Water: --
Caved: --
Date: --

Job No.: 1387-3606
Drilled By: A. Clark
Logged By: J. Byars
Dry Auger: 0' to 14'
Wet Rotary: 14' to 30'?
Boring Sealed: Well Installed

McCLELLAND ENGINEERS

PLATE >

LOG OF BORING NO. PAI 2-3

Site 2 - Borrow Pit Landfill
Marine Corps Recruit Depot
Beaufort County, South Carolina

Location: See Plate >

Surface Elevation: 14.7'

Depth, Ft	Samples	Penetration Resistance, Blows/Ft	MATERIAL DESCRIPTION	Shear Strength, ksf: Penetrometer (P) Torvane (T)	Shear Strength, ksf: Unconfined Compression	Shear Strength, ksf: Triaxial Compression	Confining Pressure, ksf	Unit Dry Weight pcf	Water Content, %	Liquid Limit	Plastic Limit	Percent Passing No. 200 Sieve
0			SILTY SAND, dark brown - with roots									
5			- light brown below 5.0'									
10			- wet below 11.0'									
15			- gray below 14.0'									
20			- with a few clay seams at 18.0'									
25			- with clayey sand seam at 24.0' (26.0') SANDY CLAY, gray (28.0')									
30												
35												
40												
45												
50												
55												

See Key for Terms and Symbols.

Completion Depth: 28.0'
Water First Noticed: --
Date: February 22, 1988
Depth to Water: --
Caved: --
Date: --

Job No.: 1387-3606
Drilled By: A. Clark
Logged By: J. Byars
Dry Auger: 0' to 12'
Wet Rotary: 12' to 28'
Boring Sealed: Well Installed

McCLELLAND ENGINEERS

PLATE >

LOG OF BORING NO. PAI 4-1

Site 4 - Dredge Spoils Fire Training Area
Marine Corps Recruit Depot
Beaufort County, South Carolina

Location: See Plate >

Surface Elevation: 15.3'

Depth, Ft	Samples	Penetration Resistance, Blows/Ft	MATERIAL DESCRIPTION	Shear Strength, ksf: Penetrometer (P) Torvane (T)	Shear Strength, ksf: Unconfined Compression	Shear Strength, ksf: Triaxial Compression	Confining Pressure, ksf	Unit Dry Weight pcf	Water Content, %	Liquid Limit	Plastic Limit	Percent Passing No. 200 Sieve
			SILTY CLAY, gray									
			- with sand pockets and shell fragments (1.0')									
			SILTY SAND, brown									
5			- with a few ferrous nodules at 3.0'									
			- gray at 6.0'									
10												
			- with a 2" clay seam at 14.0'									
15												
			- with gray, clay seams, 0.1" to 0.2" thick at 17.5'									
20			(20.0')									
25												
30												
35												
40												
45												
50												
55												

See Key for Terms and Symbols.

Completion Depth: 20.0'
Water First Noticed: --
Date: February 25, 1988
Depth to Water: --
Caved: --
Date: --

Job No.: 1387-3606
Drilled By: A. Clark
Logged By: J. Byars
Dry Auger: --
Wet Rotary: 0' to 20'
Boring Sealed: Grouted

McCLELLAND ENGINEERS

PLATE >

LOG OF BORING NO. PAI 4-2

Site 4 - Dredge Spoils Fire Training Area
Marine Corps Recruit Depot
Beaufort County, South Carolina

Location: See Plate >

Surface Elevation: 15.3'

Depth, Ft	Samples	Penetration Resistance, Blows/Ft	MATERIAL DESCRIPTION	Shear Strength, ksf: Penetrometer (P) Torvane (T)	Shear Strength, ksf: Unconfined Compression	Shear Strength, ksf: Triaxial Compression	Confining Pressure, ksf	Unit Dry Weight pcf	Water Content, %	Liquid Limit	Plastic Limit	Percent Passing No. 200 Sieve
			SILTY SAND, dark gray - with clay pockets to 2.0' - brown, 2.0' to 5.0'									
5			- gray below 5.0'									
			- with few clay pockets, 8.0' to 12.0'									
10			- with few clay seams, 12.0' to 14.0'									
			- with many clay seams, 14.0' to 16.0'									
15			- with some clay seams below 16.0'									
20			(20.0')									
25												
30												
35												
40												
45												
50												
55												

See Key for Terms and Symbols.

Completion Depth: 20.0'
Water First Noticed: --
Date: February 25, 1988
Depth to Water: --
Caved: --
Date: --

Job No.: 1387-3606
Drilled By: A. Clark
Logged By: J,. Byars
Dry Auger: --
Wet Rotary: 0' to 20'
Boring Sealed: Grouted

McCLELLAND ENGINEERS

PLATE >

LOG OF BORING NO. PAI 4-3

Site 4 – Dredge Spoils Fire Training Area
Marine Corps Recruit Depot
Beaufort County, South Carolina

Location: See Plate >

Surface Elevation: 14.3'

Depth, Ft	Samples	Penetration Resistance, Blows/Ft	MATERIAL DESCRIPTION	Shear Strength, ksf: Penetrometer (P) Torvane (T)	Shear Strength, ksf: Unconfined Compression	Shear Strength, ksf: Triaxial Compression	Confining Pressure, ksf	Unit Dry Weight pcf	Water Content, %	Liquid Limit	Plastic Limit	Percent Passing No. 200 Sieve
0			SILTY SAND, brown									
5			- gray below 6.0'									
10			- with some clay pockets, 12.0' to 14.0' and at 16.0'									
15												
20			(20.0')									
25												
30												
35												
40												
45												
50												
55												

See Key for Terms and Symbols.

Completion Depth: 20.0'
Water First Noticed: --
Date: February 26, 1988
Depth to Water: --
Caved: --
Date: --

Job No.: 1387-3606
Drilled By: A. Clark
Logged By: J. Byars
Dry Auger: --
Wet Rotary: 0' to 20'
Boring Sealed: Grouted

McCLELLAND ENGINEERS

PLATE >

LOG OF BORING NO. PAI 4-4

Site 4 – Dredge Spoils Fire Training Area
Marine Corps Recruit Depot
Beaufort County, South Carolina

Location: See Plate >

Surface Elevation: 9.0'

Depth, Ft	Samples	Penetration Resistance, Blows/Ft	MATERIAL DESCRIPTION	Shear Strength, ksf: Penetrometer (P) Torvane (T)	Shear Strength, ksf: Unconfined Compression	Shear Strength, ksf: Triaxial Compression	Confining Pressure, ksf	Unit Dry Weight pcf	Water Content, %	Liquid Limit	Plastic Limit	Percent Passing No. 200 Sieve
			FILL: SILTY SAND,									
			- with clay pockets (1.5')									
			SILTY SAND, brown									
5			- brown and gray, 6.0' to 8.0'									
			- gray at 8.0'									
10												
15			- with some clay seams at 16.0'									
			(20.0')									
20												
25												
30												
35												
40												
45												
50												
55												

See Key for Terms and Symbols.

Completion Depth: 20.0'
Water First Noticed: --
Date: February 26, 1988
Depth to Water: --
Caved: --
Date: --

Job No.: 1387-3606
Drilled By: A. Clark
Logged By: J. Byars
Dry Auger: --
Wet Rotary: 0' to 20'
Boring Sealed: Grouted

McCLELLAND ENGINEERS

PLATE >

LOG OF BORING NO. PAI 4-5

Site 4- Dredge Spoils Fire Training Area
Marine Corps Recruit Depot
Beaufort County, South Carolina

Location: See Plate >

Surface Elevation: 4.5'

Depth, Ft	Samples	Penetration Resistance, Blows/Ft	MATERIAL DESCRIPTION	Shear Strength, ksf: Penetrometer (P) Torvane (T)	Shear Strength, ksf: Unconfined Compression	Shear Strength, ksf: Triaxial Compression	Confining Pressure, ksf	Unit Dry Weight pcf	Water Content, %	Liquid Limit	Plastic Limit	Percent Passing No. 200 Sieve
			SILTY SAND, brown (2.0')									
			SILTY CLAY, gray (3.5')									
5			SILTY SAND, brown, wet (6.0')									
			CLAYEY SAND, gray and brown (12.0')									
10												
			SILTY SAND, gray - with a few 1/2" clay seams to 15.0' - some clayey sand pockets, 15.0' to 17.0' (20.0')									
15												
20												
25												
30												
35												
40												
45												
50												
55												

See Key for Terms and Symbols.

Completion Depth: 20.0'
Water First Noticed: --
Date: February 25, 1988
Depth to Water: --
Caved: --
Date: --

Job No.: 1387-3606
Drilled By: A. Clark
Logged By: J. Byars
Dry Auger: 0' to 20'
Wet Rotary: --
Boring Sealed: Grouted

McCLELLAND ENGINEERS

PLATE >

LOG OF BORING NO. PAI 6-1

Site 6 - Hobby Shop
Marine Corps Recruit Depot
Beaufort County, South Carolina

Location: See Plate >

Surface Elevation: 9.1'

Depth, Ft	Samples	Penetration Resistance, Blows/Ft	MATERIAL DESCRIPTION	Shear Strength, ksf: Penetrometer (P) Torvane (T)	Shear Strength, ksf: Unconfined Compression	Shear Strength, ksf: Triaxial Compression	Confining Pressure, ksf	Unit Dry Weight pcf	Water Content, %	Liquid Limit	Plastic Limit	Percent Passing No. 200 Sieve
			FILL: SILTY SAND AND SANDY CLAY, brown (1.5')									
5			SILTY SAND, light brown - light gray at 4.0'									
10			- brown below 10.0' (12.0')									
15												
20												
25												
30												
35												
40												
45												
50												
55												

See Key for Terms and Symbols.

Completion Depth: 12.0'
Water First Noticed: --
Date: February 21, 1988
Depth to Water: --
Caved: --
Date: --

Job No.: 1387-3606
Drilled By: A. Clark
Logged By: J. Byars
Dry Auger: 0' to 12'
Wet Rotary: --
Boring Sealed: Well Installed

McCLELLAND ENGINEERS

PLATE >

LOG OF BORING NO. PAI 16-1

Site 16 – Pesticide Rinsate Desposal Area
Marine Corps Recruit Depot
Beaufort County, South Carolina

Location: See Plate >

Surface Elevation: --

Depth, Ft	Samples	Penetration Resistance, Blows/Ft	MATERIAL DESCRIPTION	Shear Strength, ksf: Penetrometer (P) Torvane (T)	Shear Strength, ksf: Unconfined Compression	Shear Strength, ksf: Triaxial Compression	Confining Pressure, ksf	Unit Dry Weight pcf	Water Content, %	Liquid Limit	Plastic Limit	Percent Passing No. 200 Sieve
			FILL: ASPHALT AND GRAVEL (0.5')									
			SILTY SAND, light brown - with clay seams, 3.5' to 4.0' (6.5')									
			CLAY, light gray, and brown (7.5')									

See Key for Terms and Symbols.

Completion Depth: 15.0'
Water First Noticed: --
Date: February 23, 1988
Depth to Water: --
Caved: --
Date: --

Job No.: 1387-3606
Drilled By: A. Clark
Logged By: J. Byars
Dry Auger: 0' to 7.5'
Wet Rotary: --
Boring Sealed: Grouted

McCLELLAND ENGINEERS

PLATE >

LOG OF BORING NO. PAI 16-2

Site 16 - Pesticide Rinsate Desposal Area
Marine Corps Recruit Depot
Beaufort County, South Carolina

Location: See Plate >

Surface Elevation: --

Depth, Ft	Samples	Penetration Resistance, Blows/Ft	MATERIAL DESCRIPTION	Shear Strength, ksf: Penetrometer (P) Torvane (T)	Shear Strength, ksf: Unconfined Compression	Shear Strength, ksf: Triaxial Compression	Confining Pressure, ksf	Unit Dry Weight pcf	Water Content, %	Liquid Limit	Plastic Limit	Percent Passing No. 200 Sieve
			FILL: SAND AND RUBBLE (0.5')									
			SILTY SAND, light brown									
5			- with clayey sand seam, 4.5' to 5.0'									
			- with clayey sand seam, 7.3' to 7.5' (7.5')									
			SANDY CLAY with sand pockets (8.5')									
10												
15												
20												
25												
30												
35												
40												
45												
50												
55												

See Key for Terms and Symbols.

Completion Depth: 8.5'
Water First Noticed: 3.0'
Date: February 23, 1988
Depth to Water: --
Caved: --
Date: --

Job No.: 1387-3606
Drilled By: A. Clark
Logged By: J. Byars
Dry Auger: 0' to 8.5'
Wet Rotary: --
Boring Sealed: Grouted

McCLELLAND ENGINEERS

PLATE >

LOG OF BORING NO. PAI 16-3

Site 16 - Pesticide Rinsate Desposal Area
Marine Corps Recruit Depot
Beaufort County, South Carolina

Location: See Plate >

Surface Elevation: --

Depth, Ft	Samples	Penetration Resistance, Blows/Ft	MATERIAL DESCRIPTION	Shear Strength, ksf: Penetrometer (P) Torvane (T)	Shear Strength, ksf: Unconfined Compression	Shear Strength, ksf: Triaxial Compression	Confining Pressure, ksf	Unit Dry Weight pcf	Water Content, %	Liquid Limit	Plastic Limit	Percent Passing No. 200 Sieve
			FILL: GRAVEL AND ASPHALT (0.5')									
5			SILTY SAND, light brown (7.5')									
10			CLAY, gray, with a few sand pockets (8.0')									
15												
20												
25												
30												
35												
40												
45												
50												
55												

See Key for Terms and Symbols.

Completion Depth: 8.0'
Water First Noticed: --
Date: February 23, 1988
Depth to Water: --
Caved: --
Date: --

Job No.: 1387-3606
Drilled By: A. Clark
Logged By: J. Byars
Dry Auger: 0' to 8'
Wet Rotary: --
Boring Sealed: Grouted

McCLELLAND ENGINEERS

PLATE >

LOG OF BORING NO. PAI 17-1

Site 17 (AS-16) Page Field AVGAS
Marine Corps Recruit Depot
Beaufort County, South Carolina

Location: See Plate >

Surface Elevation: 18.1'

Depth, Ft	Samples	Penetration Resistance, Blows/Ft	MATERIAL DESCRIPTION	Shear Strength, ksf: Penetrometer (P) Torvane (T)	Shear Strength, ksf: Unconfined Compression	Shear Strength, ksf: Triaxial Compression	Confining Pressure, ksf	Unit Dry Weight pcf	Water Content, %	Liquid Limit	Plastic Limit	Percent Passing No. 200 Sieve
			FILL: SILTY SAND, dark brown - with clay pockets and seams at 2.0'									
5			(7.0')									
			SILTY SAND, light brown with some clay pockets									
10			(10.5')									
			CLAYEY SAND, light brown									
			(13.0')									
15			SILTY SAND, dark brown, wet - gray at 15.5'									
20			(20.0')									
25												
30												
35												
40												
45												
50												
55												

See Key for Terms and Symbols.

Completion Depth: 20.0'
Water First Noticed: --
Date: February 26, 1988
Depth to Water: --
Caved: --
Date: --

Job No.: 1387-3606
Drilled By: A. Clark
Logged By: J. Byars
Dry Auger: 0' to 20'
Wet Rotary: --
Boring Sealed: Well Installed

McCLELLAND ENGINEERS

PLATE >

LOG OF BORING NO. PAI 17-2

Site 17 (AS-16) Page Field AVGAS
Marine Corps Recruit Depot
Beaufort County, South Carolina

Location: See Plate >

Surface Elevation: 18.3'

Depth, Ft	Samples	Penetration Resistance, Blows/Ft	MATERIAL DESCRIPTION	Shear Strength, ksf: Penetrometer (P) Torvane (T)	Shear Strength, ksf: Unconfined Compression	Shear Strength, ksf: Triaxial Compression	Confining Pressure, ksf	Unit Dry Weight pcf	Water Content, %	Liquid Limit	Plastic Limit	Percent Passing No. 200 Sieve
0			FILL: SILTY SAND, dark brown									
5			(7.5')									
10			CLAYEY SAND, gray and brown									
15			- gray below 16.0' - wet below 17.0'									
20			(20.0')									
25												
30												
35												
40												
45												
50												
55												

See Key for Terms and Symbols.

Completion Depth: 20.0'
Water First Noticed: --
Date: February 26, 1988
Depth to Water: --
Caved: --
Date: --

Job No.: 1387-3606
Drilled By: A. Clark
Logged By: J. Byars
Dry Auger: 0' to 20'
Wet Rotary: --
Boring Sealed: Well Installed

McCLELLAND ENGINEERS

PLATE >

LOG OF BORING NO. PAI 18-1

Site 18 (AS-18) Page Field AVGAS
Marine Corps Recruit Depot
Beaufort County, South Carolina

Location: See Plate >

Surface Elevation: 15.9'

Depth, Ft	Samples	Penetration Resistance, Blows/Ft	MATERIAL DESCRIPTION	Shear Strength, ksf: Penetrometer (P) Torvane (T)	Shear Strength, ksf: Unconfined Compression	Shear Strength, ksf: Triaxial Compression	Confining Pressure, ksf	Unit Dry Weight pcf	Water Content, %	Liquid Limit	Plastic Limit	Percent Passing No. 200 Sieve
0			FILL: SILTY SAND, light brown - with roots to 2.0' - with clay pockets below 2.0'									
5			(10.0')									
10			SILTY SAND, dark brown, - with avgas odors (12.0')									
			CLAYEY SAND, light gray and brown - with fuel odors (15.0')									
15			SILTY SAND, light brown									
20			(20.0')									
25												
30												
35												
40												
45												
50												
55												

See Key for Terms and Symbols.

Completion Depth: 20.0'
Water First Noticed: --
Date: February 23, 1988
Depth to Water: --
Caved: --
Date: --

Job No.: 0187-3606
Drilled By: A. Clark
Logged By: J. Byars
Dry Auger: 0' to 20'
Wet Rotary: --
Boring Sealed: Well Installed

McCLELLAND ENGINEERS

PLATE >

LOG OF BORING NO. PAI 18-2

Site 18 (AS-18) Page Field AVGAS
Marine Corps Recruit Depot
Beaufort County, South Carolina

Location: See Plate >

Surface Elevation: 16.1'

Depth, Ft	Samples	Penetration Resistance, Blows/Ft	MATERIAL DESCRIPTION	Shear Strength, ksf: Penetrometer (P) Torvane (T)	Shear Strength, ksf: Unconfined Compression	Shear Strength, ksf: Triaxial Compression	Confining Pressure, ksf	Unit Dry Weight pcf	Water Content, %	Liquid Limit	Plastic Limit	Percent Passing No. 200 Sieve
			FILL: SILTY SAND AND SANDY CLAY - with roots to 3.0'									
			(4.5')									
5			SILTY SAND, dark brown									
			(7.5')									
			CLAYEY SAND, gray and brown									
			- wet at 10.0' (10.0')									
10			SILTY SAND, dark brown									
			- light brown at 12.5' - with sandy clay pockets at 13.0'									
15			- gray below 15.5'									
			(20.0')									
20												
25												
30												
35												
40												
45												
50												
55												

See Key for Terms and Symbols.

Completion Depth: 20.0'
Water First Noticed: 10.0'
Date: February 24, 1988
Depth to Water: --
Caved: --
Date: --

Job No.: 1387-3606
Drilled By: A. Clark
Logged By: J. Byars
Dry Auger: 0' to 20'
Wet Rotary: --
Boring Sealed: Well Installed

McCLELLAND ENGINEERS

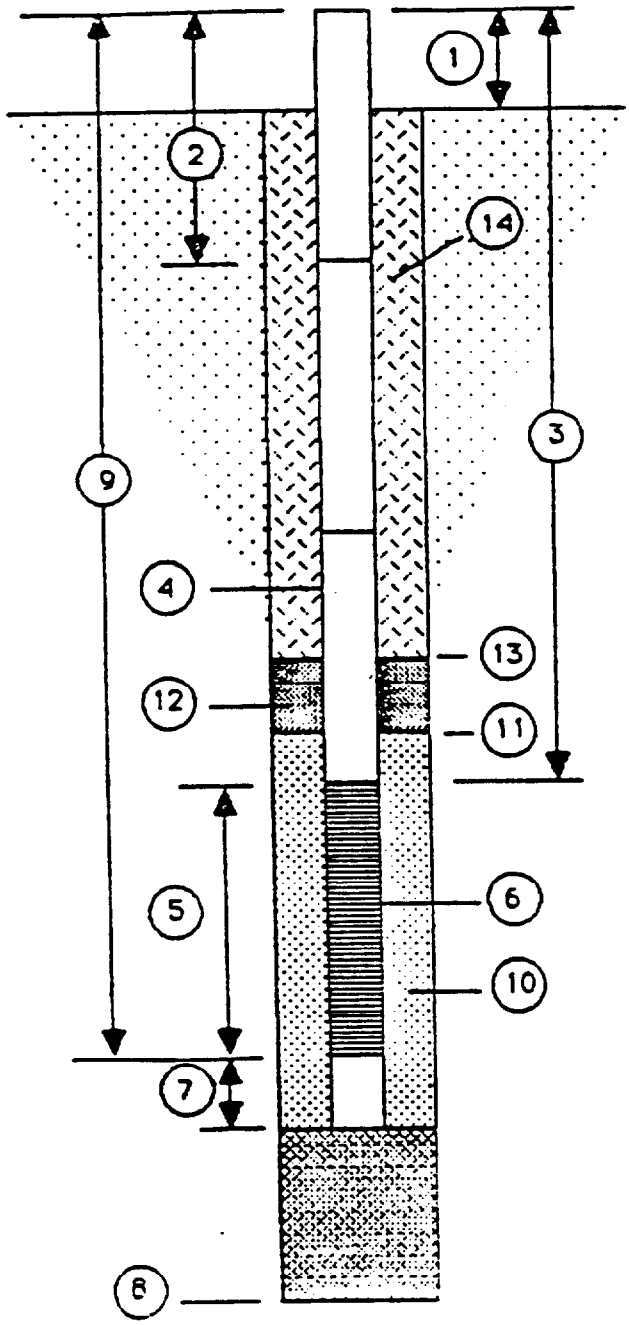
PLATE >

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR., P.O BOX 10068
CHARLESTON S C 29411-0068

WELL CONSTRUCTION DETAILS

WELL NUMBER PA1-1-1

DATE OF INSTALLATION 3-1-88



1. Height of Casing above ground 9.0'
2. Depth to first Coupling +4.0'

   Coupling Interval Depths 5.0'
3. Total Length of Blank Pipe 10.0'
4. Type of Blank Pipe 1 1/4" SCH 40 PVC THREADED
5. Length of Screen 5.0'
6. Type of Screen 1 1/4" S.S.
7. Length of Sump —
8. Total Depth of Boring 6.0 Hole Diameter 1 1/4"
9. Depth To Bottom of Screen 6.0'
10. Type of Screen Filter NATURAL

    Quantity Used — Size — U/C —
11. Depth To Top of Filter —
12. Type of Seal WELL POINT

    Quantity Used —
13. Depth To Top of Seal —
14. Type of Grout SURFACE SLAB ONLY

    Grout Mixture —

    Method of Placement —

COMMENTS ON INSTALLATION

WELL POINT

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR P O BOX 10068
CHARLESTON S C 29411-0068

WELL DATA REPORT

WELL NUMBER PAI-1-1 AREA PAI SITE 1

DATE OF INSTALLATION 3-1-88 ~~2-28-88~~

WELL HOLE DATA

Drill Date 3-1-88 Well Driller J. A. BYARS

Depth of Boring 6.0' Purpose of Boring PIEZOMETER

Drilling Method DRIVEN Mud Type —

WATER LEVEL DATA (All measurements from top of casing)

Water Level 9.1 Date of Measurement 3-16-88

DEVELOPMENT DATA

Development Method HAND PUMP

Length of Time Developed 1 HOUR

LOCATION OF BOREHOLE INFORMATION

Drillers Log — Geophysical Log —

Physical Core — Cutting Samples —

Water Level Observations

DRILLED BY J. A. BYARS SCCWD# 588

DEVELOPED BY J. A. BYARS SCCWD# 588

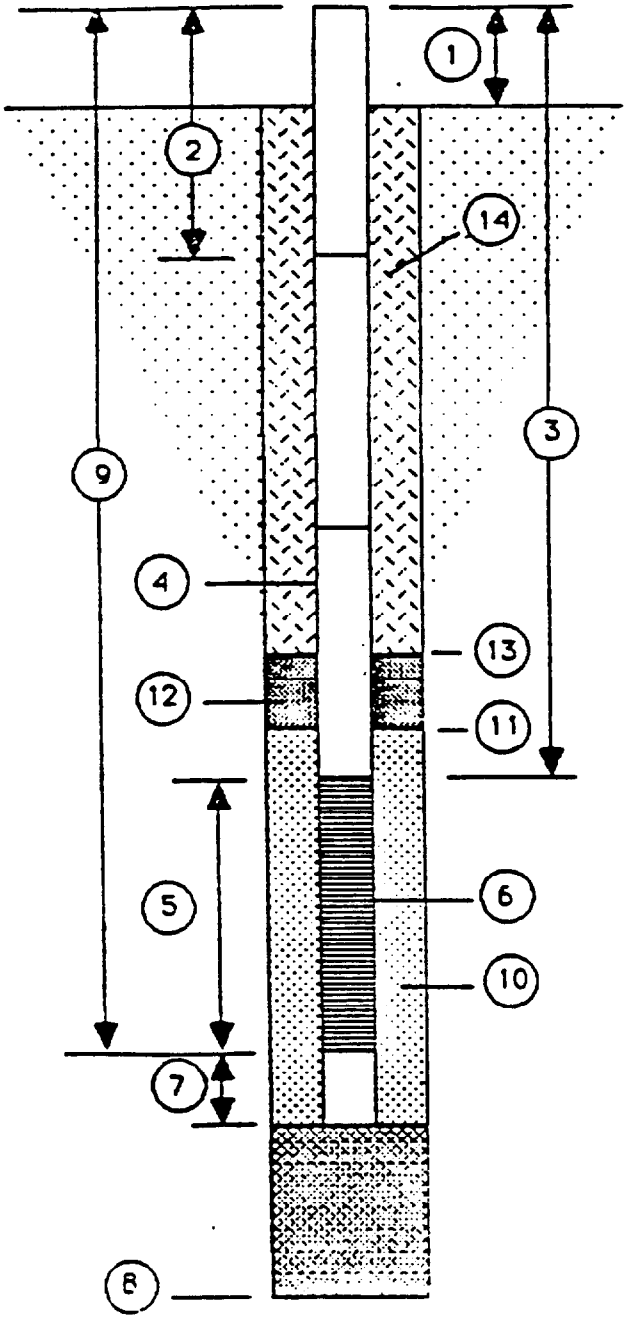
TECHNICAL OVERSIGHT BY

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR., P.O. BOX 10068
CHARLESTON S.C. 29411-0068

WELL CONSTRUCTION DETAILS

WELL NUMBER PA1-1-2

DATE OF INSTALLATION 3-1-88



1. Height of Casing above ground 9.0'
2. Depth to first Coupling +4.0'
   Coupling Interval Depths 5'
3. Total Length of Blank Pipe 10.0'
4. Type of Blank Pipe 1 1/4" SCH 40 PVC THREADED
5. Length of Screen 5.0'
6. Type of Screen 1 1/4" S.S. WIRE WRAP
7. Length of Sump —
8. Total Depth of Boring 6.0' Hole Diameter 1 1/4"
9. Depth To Bottom of Screen 6.0'
10. Type of Screen Filter NATURAL
    Quantity Used — Size — U/C —
11. Depth To Top of Filter —
12. Type of Seal WELL POINT
    Quantity Used —
13. Depth To Top of Seal —
14. Type of Grout SURFACE SLAB ONLY
    Grout Mixture —
    Method of Placement —

COMMENTS ON INSTALLATION.

WELL POINT

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR P O BOX 10068
CHARLESTON S C 29411-0068

WELL DATA REPORT

WELL NUMBER PA1-1-2 AREA PA1 SITE 1

DATE OF INSTALLATION 3-1-88

WELL HOLE DATA

Drill Date 3-1-88 Well Driller J.A. BYARS

Depth of Boring 6.0' Purpose of Boring PIEZOMETER

Drilling Method DRIVEN Mud Type —

WATER LEVEL DATA (All measurements from top of casing)

Water Level 9.2' Date of Measurement 3-16-88

DEVELOPMENT DATA

Development Method HAND PUMP

Length of Time Developed 1 HOUR

LOCATION OF BOREHOLE INFORMATION

Drillers Log — Geophysical Log —

Physical Core — Cutting Samples —

Water Level Observations

DRILLED BY J.A. BYARS SCCWD# 588

DEVELOPED BY J.A. BYARS SCCWD# 588

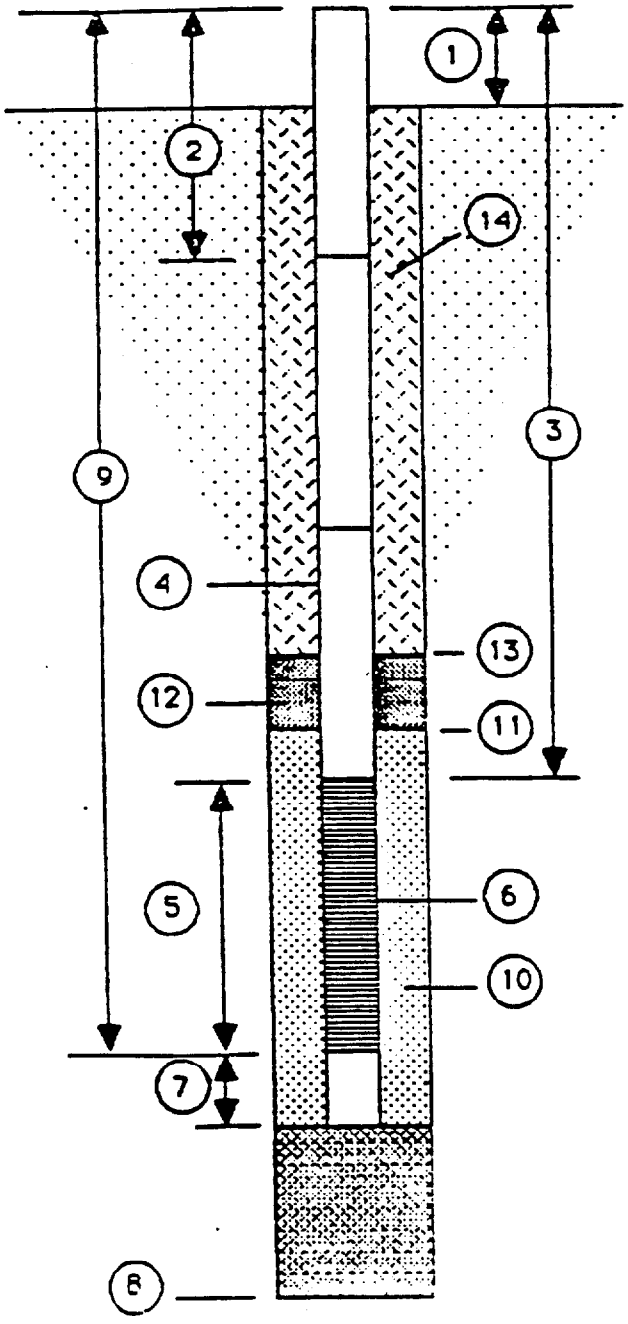
TECHNICAL OVERSIGHT BY

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR., P.O. BOX 10068
CHARLESTON S.C. 29411-0068

WELL CONSTRUCTION DETAILS

WELL NUMBER PAI-1-3

DATE OF INSTALLATION 3-1-88



1. Height of Casing above ground 9.0'
2. Depth to first Coupling +4.0'
   Coupling Interval Depths 5'
3. Total Length of Blank Pipe 10.0'
4. Type of Blank Pipe 1¼" SCH 40 PVC THREADED
5. Length of Screen 5.0'
6. Type of Screen 1¼" S.S. WIRE WRAP
7. Length of Sump —
8. Total Depth of Boring 6.0' Hole Diameter 1¼"
9. Depth To Bottom of Screen 6.0'
10. Type of Screen Filter NATURAL
    Quantity Used — Size — U/C —
11. Depth To Top of Filter —
12. Type of Seal WELL POINT
    Quantity Used —
13. Depth To Top of Seal —
14. Type of Grout SURFACE SLAB ONLY
    Grout Mixture
    Method of Placement

COMMENTS ON INSTALLATION

WELL POINT

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR P O BOX 10068
CHARLESTON S C 29411-0068

WELL DATA REPORT

WELL NUMBER PAI-1-3 AREA PAI SITE 1

DATE OF INSTALLATION 3-1-88

WELL HOLE DATA

Drill Date 3-1-88 Well Driller J.A. BYARS

Depth of Boring 6.0' Purpose of Boring PIEZOMETER

Drilling Method DRIVEN Mud Type —

WATER LEVEL DATA (All measurements from top of casing)

Water Level 8.8' Date of Measurement 3-16-88

DEVELOPMENT DATA

Development Method HAND PUMP

Length of Time Developed 1 HOUR

LOCATION OF BOREHOLE INFORMATION

Drillers Log — Geophysical Log —

Physical Core — Cutting Samples —

Water Level Observations

DRILLED BY J.A. BYARS SCCWD# 588

DEVELOPED BY J.A. BYARS SCCWD# 588

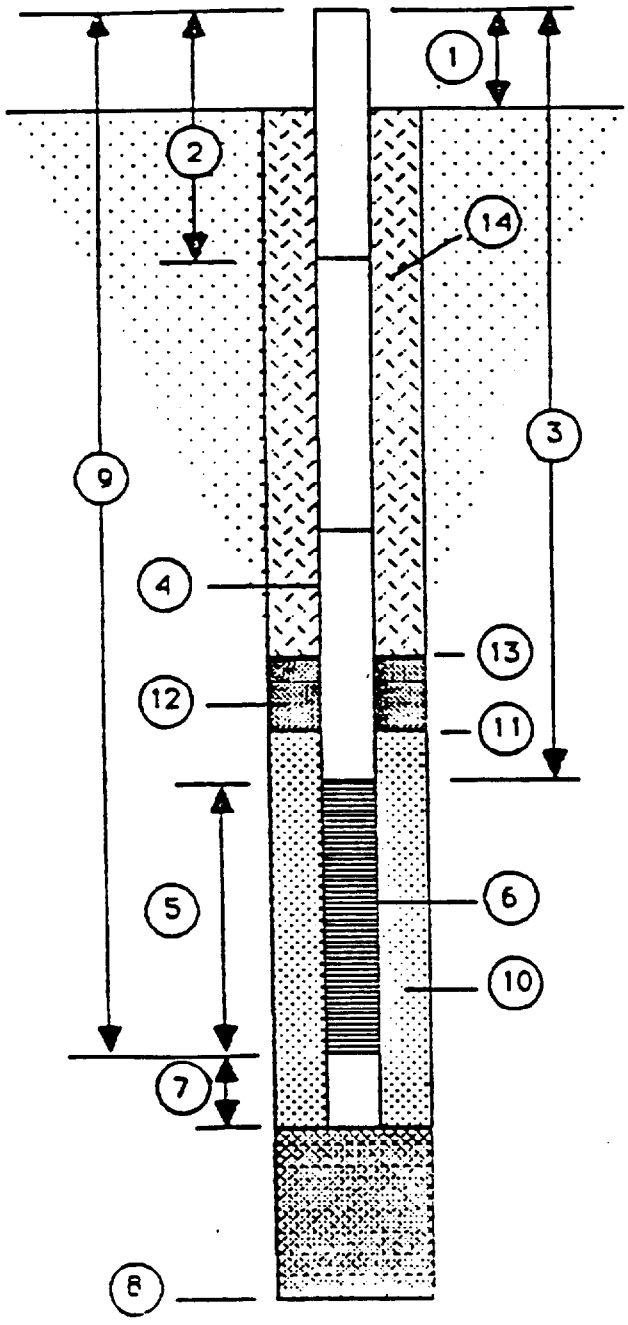
TECHNICAL OVERSIGHT BY

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR., P.O. BOX 10068
CHARLESTON S.C. 29411-0068

WELL CONSTRUCTION DETAILS

WELL NUMBER PA1-1-4

DATE OF INSTALLATION 2-23-88



1. Height of Casing above ground 3.5'
2. Depth to first Coupling 8.5'
   Coupling Interval Depths —
3. Total Length of Blank Pipe 8.5'
4. Type of Blank Pipe 2" SCH 40 THREADED PVC
5. Length of Screen 10.0'
6. Type of Screen 2" SCH 40 PVC THREADED 0.010" SLOT
7. Length of Sump —
8. Total Depth of Boring 15.0' Hole Diameter 6.0"
9. Depth To Bottom of Screen 15.0'
10. Type of Screen Filter FRAC SAND
    Quantity Used 200 LBS Size 16/30 U/C —
11. Depth To Top of Filter 3.5'
12. Type of Seal BENTONITE PELLETS
    Quantity Used 25 LBS.
13. Depth To Top of Seal 2.0'
14. Type of Grout CEMENT/BENTONITE
    Grout Mixture 94/5
    Method of Placement POUR IN DRY HOLE

COMMENTS ON INSTALLATION:

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR P O BOX 10068
CHARLESTON S C 29411-0068

WELL DATA REPORT

WELL NUMBER PAI-1-4 AREA PAI SITE 1

DATE OF INSTALLATION 2-23-88

WELL HOLE DATA

Drill Date 2-23-88 Well Driller J.A. BYARS

Depth of Boring 15.0' Purpose of Boring MONITOR

Drilling Method DRY AUGER Mud Type —

WATER LEVEL DATA (All measurements from top of casing)

Water Level 11.8' Date of Measurement 3-17-88

DEVELOPMENT DATA

Development Method HAND PUMP

Length of Time Developed 2 HOURS

LOCATION OF BOREHOLE INFORMATION

Drillers Log ✓ Geophysical Log —

Physical Core ✓ Cutting Samples —

Water Level Observations

DRILLED BY J.A. BYARS SCCWD# 588

DEVELOPED BY J.A. BYARS SCCWD# 588

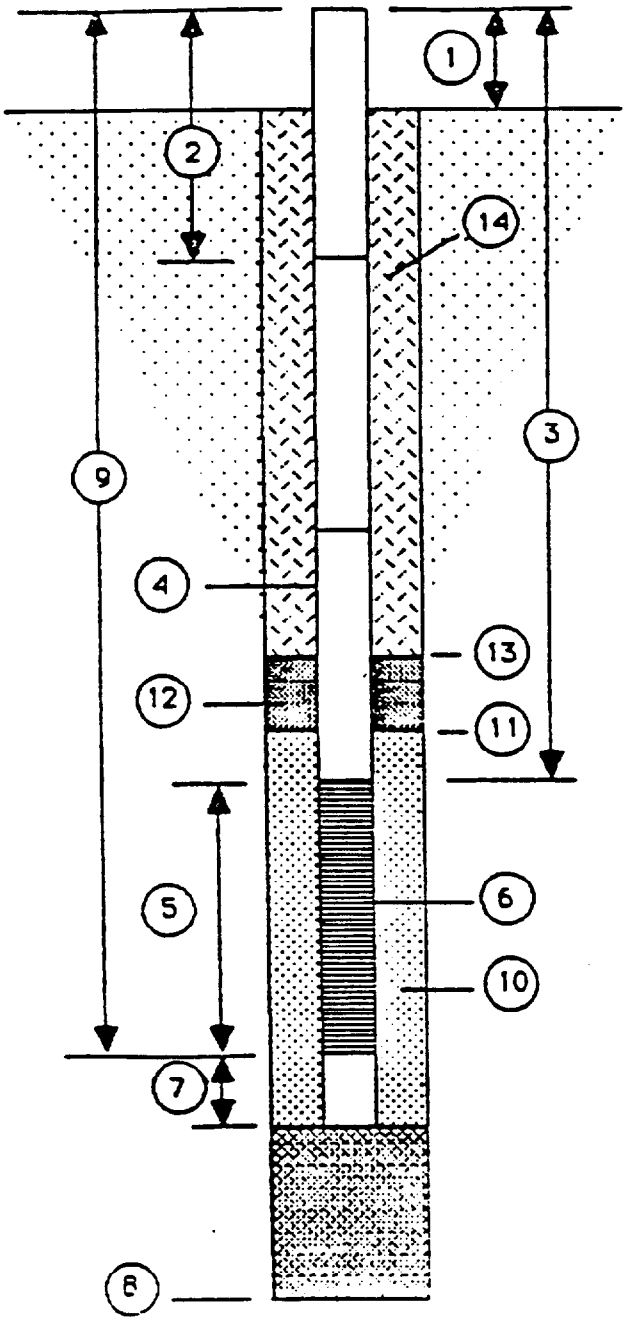
TECHNICAL OVERSIGHT BY

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR. P.O BOX 10068
CHARLESTON S C 29411-0068

WELL CONSTRUCTION DETAILS

WELL NUMBER PA1-2-1

DATE OF INSTALLATION 2-21-88



1. Height of Casing above ground 3.5'
2. Depth to first Coupling 9.5'
   Coupling Interval Depths 10.0'
3. Total Length of Blank Pipe 9.5'
4. Type of Blank Pipe 2" SCH 40 PVC THREADED
5. Length of Screen 20.0'
6. Type of Screen 2" SCH 40 PVC THREADED 0.010"
7. Length of Sump —
8. Total Depth of Boring 26.0' Hole Diameter 6.0"
9. Depth To Bottom of Screen 26.0'
10. Type of Screen Filter FRAC SAND
    Quantity Used 300 LBS Size 16/30 U/C
11. Depth To Top of Filter 4.0'
12. Type of Seal BENTONITE PELLETS
    Quantity Used 25 LBS
13. Depth To Top of Seal 2.5'
14. Type of Grout CEMENT/BENTONITE
    Grout Mixture 94/5
    Method of Placement POUR IN DRY HOLE

COMMENTS ON INSTALLATION

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR P O BOX 10068
CHARLESTON S C 29411-0068

WELL DATA REPORT

WELL NUMBER PAI-2-1 AREA PAI SITE 2

DATE OF INSTALLATION 2-21-88

WELL HOLE DATA

Drill Date 2-21-88 Well Driller J.A. BYARS

Depth of Boring 26.0' Purpose of Boring MONITOR

Drilling Method ~~DRY AUGER~~ WET ROTARY Mud Type —

WATER LEVEL DATA (All measurements from top of casing)

Water Level 16.6' Date of Measurement 3-16-88

DEVELOPMENT DATA

Development Method HAND PUMP

Length of Time Developed 2 HOURS

LOCATION OF BOREHOLE INFORMATION

Drillers Log ✓ Geophysical Log —

Physical Core ✓ Cutting Samples —

Water Level Observations

DRILLED BY J.A. BYARS SCCWD# 588

DEVELOPED BY J.A. BYARS SCCWD# 588

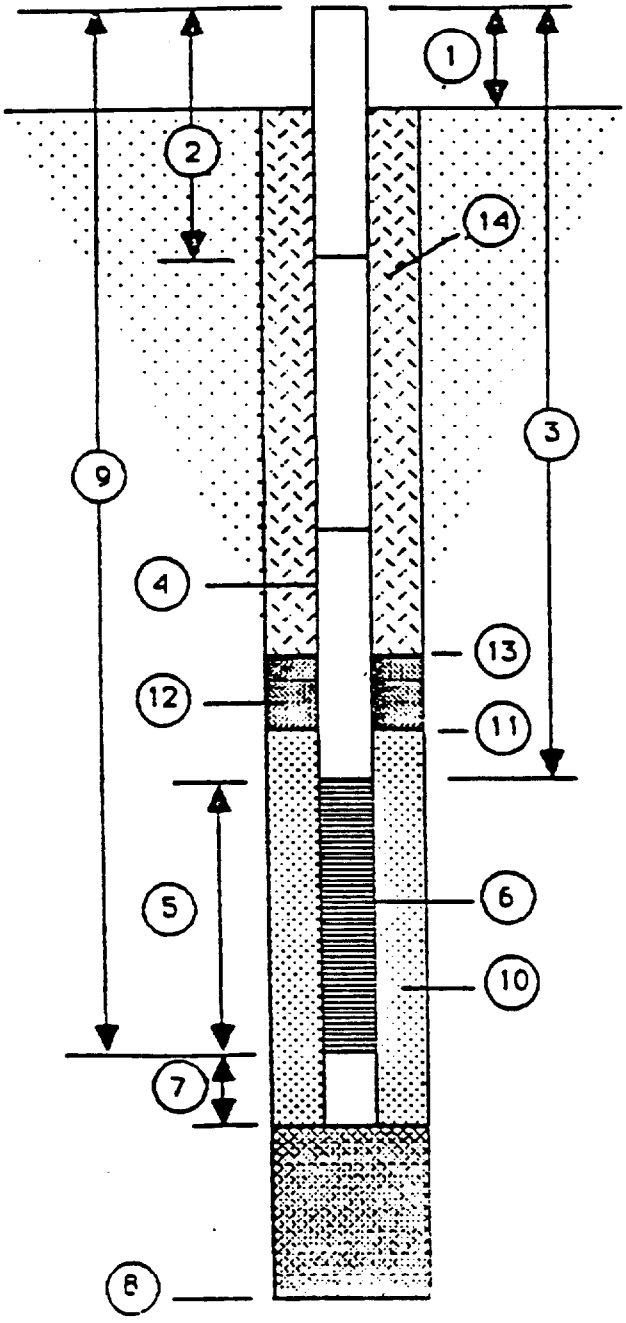
TECHNICAL OVERSIGHT BY

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR., P.O. BOX 10068
CHARLESTON S C 29411-0068

WELL CONSTRUCTION DETAILS

WELL NUMBER PA1-2-2

DATE OF INSTALLATION 2-22-88



1. Height of Casing above ground 3.5'
2. Depth to first Coupling 8.5'

   Coupling Interval Depths 8.5, 18.5, 28.5, 33.5
3. Total Length of Blank Pipe 8.5'
4. Type of Blank Pipe 2" SCH 40 THREADED PVC
5. Length of Screen 25.0'
6. Type of Screen 2" SCH 40 PVC THREADED 0.010" SLOT
7. Length of Sump —
8. Total Depth of Boring 30.0' Hole Diameter 6.0"
9. Depth To Bottom of Screen 30.0'
10. Type of Screen Filter FRAC SAND

    Quantity Used 450 LBS Size 10/30 U/C —
11. Depth To Top of Filter 3.9'
12. Type of Seal BENTONITE PELLET

    Quantity Used 25 LBS
13. Depth To Top of Seal 2.0'
14. Type of Grout CEMENT/BENTONITE

    Grout Mixture 94/5

    Method of Placement POUR IN DRY HOLE

COMMENTS ON INSTALLATION.

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR P O BOX 10068
CHARLESTON S C 29411-0068

WELL DATA REPORT

WELL NUMBER PA1-2-2 AREA PA1 SITE 2

DATE OF INSTALLATION 2-22-88

WELL HOLE DATA

Drill Date 2-22-88 Well Driller J.A. BYARS

Depth of Boring 30.0' Purpose of Boring MONITOR

Drilling Method WET ROTARY Mud Type NONE

WATER LEVEL DATA (All measurements from top of casing)

Water Level 17.2' Date of Measurement 3-16-88

DEVELOPMENT DATA

Development Method HAND PUMP

Length of Time Developed 2 HOURS

LOCATION OF BOREHOLE INFORMATION

Drillers Log ✓ Geophysical Log —

Physical Core ✓ Cutting Samples —

Water Level Observations

DRILLED BY J.A. BYARS SCCWD# 588

DEVELOPED BY J.A. BYARS SCCWD# 588

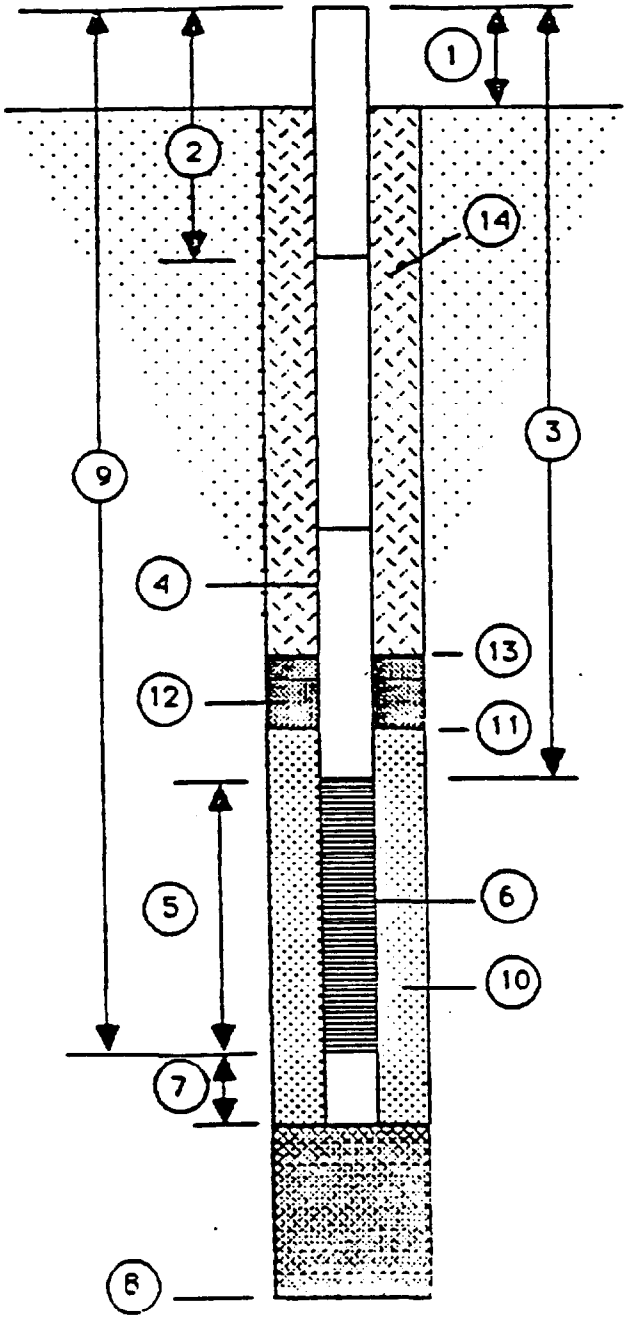
TECHNICAL OVERSIGHT BY

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR., P.O BOX 10068
CHARLESTON S C 29411-0068

WELL CONSTRUCTION DETAILS

WELL NUMBER PA1-2-3

DATE OF INSTALLATION 2-22-88



1. Height of Casing above ground 3.5'
2. Depth to first Coupling 9.5'

   Coupling Interval Depths 10.0'

3. Total Length of Blank Pipe 9.5'
4. Type of Blank Pipe 2" SCH 40 PVC THREADED
5. Length of Screen 20.0'
6. Type of Screen 2" SCH 40 PVC THREADED 0.010"SL
7. Length of Sump —
8. Total Depth of Boring 26.0' Hole Diameter 6.0"
9. Depth To Bottom of Screen 26.0'
10. Type of Screen Filter FRAC SAND

    Quantity Used 450 LBS Size 16/30 U/C —
11. Depth To Top of Filter 4.1'
12. Type of Seal BENTONITE PELLET

    Quantity Used 25 LBS.
13. Depth To Top of Seal 2.8'
14. Type of Grout CEMENT/BENTONITE

    Grout Mixture 94/5

    Method of Placement POUR IN DRY HOLE

COMMENTS ON INSTALLATION

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR P O BOX 10068
CHARLESTON S C 29411-0068

WELL DATA REPORT

WELL NUMBER PAI-2-3 AREA PAI SITE 2

DATE OF INSTALLATION 2-22-88

WELL HOLE DATA

Drill Date 2-22-88 Well Driller J. A. BYARS

Depth of Boring 26.0' Purpose of Boring MONITOR

Drilling Method ~~DRY~~ WET ROTARY Mud Type NONE

WATER LEVEL DATA (All measurements from top of casing)

Water Level 15.2 Date of Measurement 3-16-88

DEVELOPMENT DATA

Development Method HAND PUMP

Length of Time Developed 2 HOURS

LOCATION OF BOREHOLE INFORMATION

Drillers Log ✓ Geophysical Log —

Physical Core ✓ Cutting Samples —

Water Level Observations

DRILLED BY J. A BYARS SCCWD# 588

DEVELOPED BY J. A. BYARS SCCWD# 588

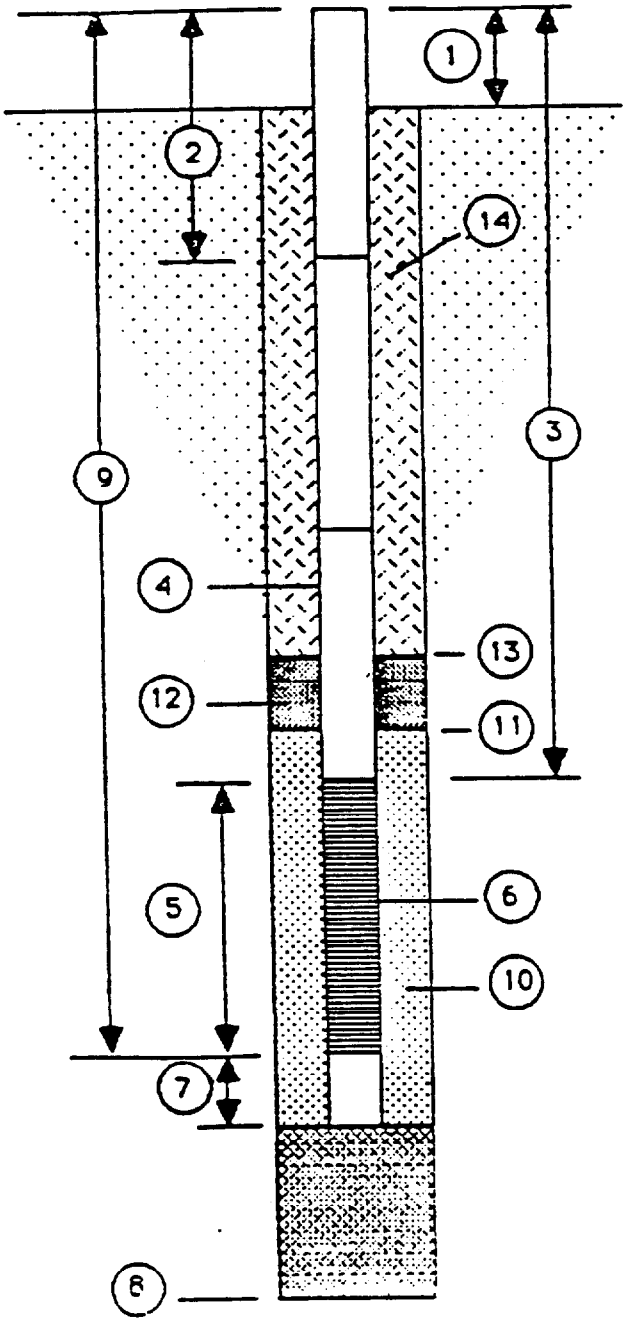
TECHNICAL OVERSIGHT BY

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR., P.O BOX 10068
CHARLESTON S C 29411-0068

WELL CONSTRUCTION DETAILS

WELL NUMBER PA1-6-1

DATE OF INSTALLATION 2-21-88



1. Height of Casing above ground 3.5'
2. Depth to first Coupling 5.5
   Coupling Interval Depths —
3. Total Length of Blank Pipe 5.5'
4. Type of Blank Pipe 2" SCH 40 THREADED PVC
5. Length of Screen 10.0'
6. Type of Screen 2" SCH 40 PVC THREADED 0.010" SLOT
7. Length of Sump —
8. Total Depth of Boring 12.5' Hole Diameter 6.0"
9. Depth To Bottom of Screen 12.0'
10. Type of Screen Filter FRAC SAND
    Quantity Used 200 LBS Size 16/30 U/C
11. Depth To Top of Filter 1.6'
12. Type of Seal BENTONITE PELLET
    Quantity Used 25 LBS
13. Depth To Top of Seal 0.5'
14. Type of Grout CEMENT/BENTONITE
    Grout Mixture 94/5
    Method of Placement POUR IN DRY HOLE

COMMENTS ON INSTALLATION

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR P O BOX 10068
CHARLESTON S C 29411-0068

WELL DATA REPORT

WELL NUMBER PAI-6-1 AREA PAI SITE 6

DATE OF INSTALLATION 2-21-88

WELL HOLE DATA

Drill Date 2-21-88 Well Driller J. A. BYARS

Depth of Boring 12.5' Purpose of Boring MONITOR

Drilling Method WET ROTARY Mud Type NONE

WATER LEVEL DATA (All measurements from top of casing)

Water Level 6.7' Date of Measurement 3-17-88

DEVELOPMENT DATA

Development Method HAND PUMP

Length of Time Developed 2 HOURS

LOCATION OF BOREHOLE INFORMATION

Drillers Log ✓ Geophysical Log —

Physical Core ✓ Cutting Samples —

Water Level Observations

DRILLED BY J.A. BYARS SCCWD# 588

DEVELOPED BY J.A. BYARS SCCWD# 588

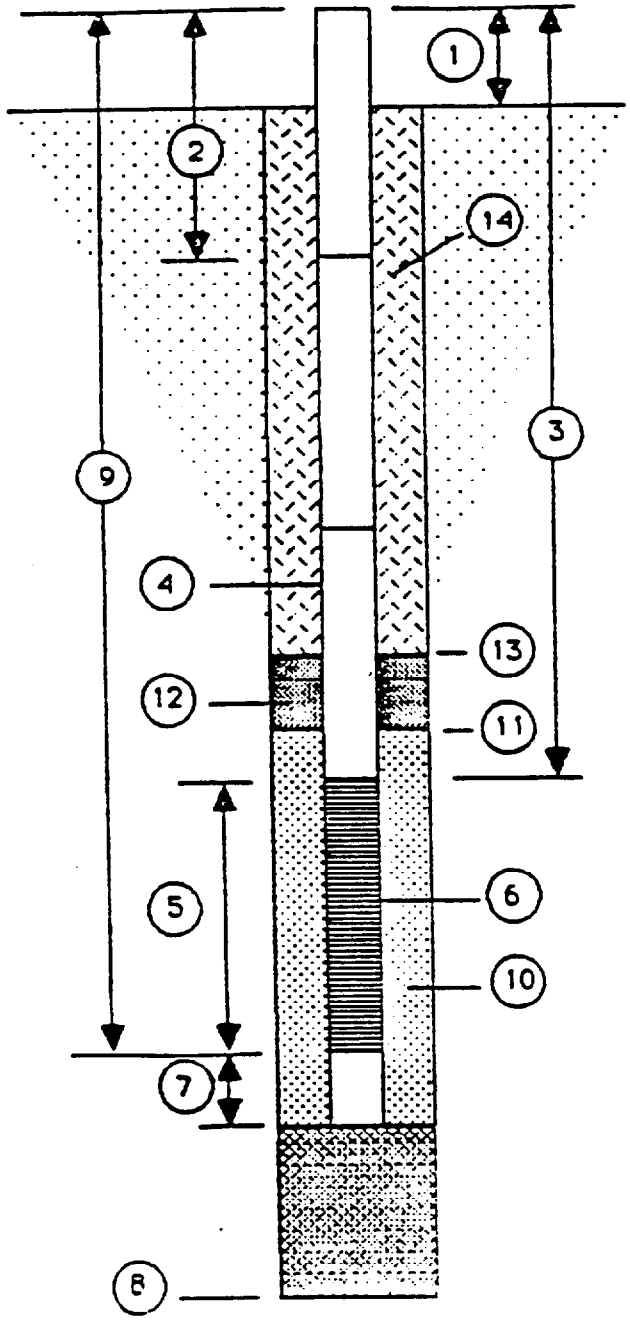
TECHNICAL OVERSIGHT BY

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR., P.O. BOX 10068
CHARLESTON S.C. 29411-0068

WELL CONSTRUCTION DETAILS

WELL NUMBER PA1-17-1

DATE OF INSTALLATION 2-26-88



1. Height of Casing above ground 3.5'
2. Depth to first Coupling 3.5'
   Coupling Interval Depths 10'
3. Total Length of Blank Pipe 13.5'
4. Type of Blank Pipe 2" SCH 40 PVC THREADED
5. Length of Screen 10.0'
6. Type of Screen 2" SCH 40 PVC THREADED 0.010"
7. Length of Sump —
8. Total Depth of Boring 20.0' Hole Diameter 6.0"
9. Depth To Bottom of Screen 20.0'
10. Type of Screen Filter FRAC SAND
    Quantity Used 200 LBS Size 16/30 U/C
11. Depth To Top of Filter 8.1'
12. Type of Seal BENTONITE PELLETS
    Quantity Used 25 LBS
13. Depth To Top of Seal 6.3'
14. Type of Grout CEMENT/BENTONITE
    Grout Mixture 94/5
    Method of Placement POUR IN DRY HOLE

COMMENTS ON INSTALLATION

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR P O BOX 10068
CHARLESTON S C 29411-0068

WELL DATA REPORT

WELL NUMBER PA1-17-1 AREA PA1 SITE 17

DATE OF INSTALLATION 2-26-88

WELL HOLE DATA

Drill Date 2-26-88 Well Driller J.A. BYARS

Depth of Boring 20.0' Purpose of Boring MONITOR

Drilling Method DRY AUGER Mud Type —

WATER LEVEL DATA (All measurements from top of casing)

Water Level 16.9' Date of Measurement 3-18-88

DEVELOPMENT DATA

Development Method HAND PUMP

Length of Time Developed 2 HOURS

LOCATION OF BOREHOLE INFORMATION

Drillers Log ✓ Geophysical Log —

Physical Core ✓ Cutting Samples —

Water Level Observations

DRILLED BY J.A. BYARS SCCWD# 588

DEVELOPED BY J.A. BYARS SCCWD# 588

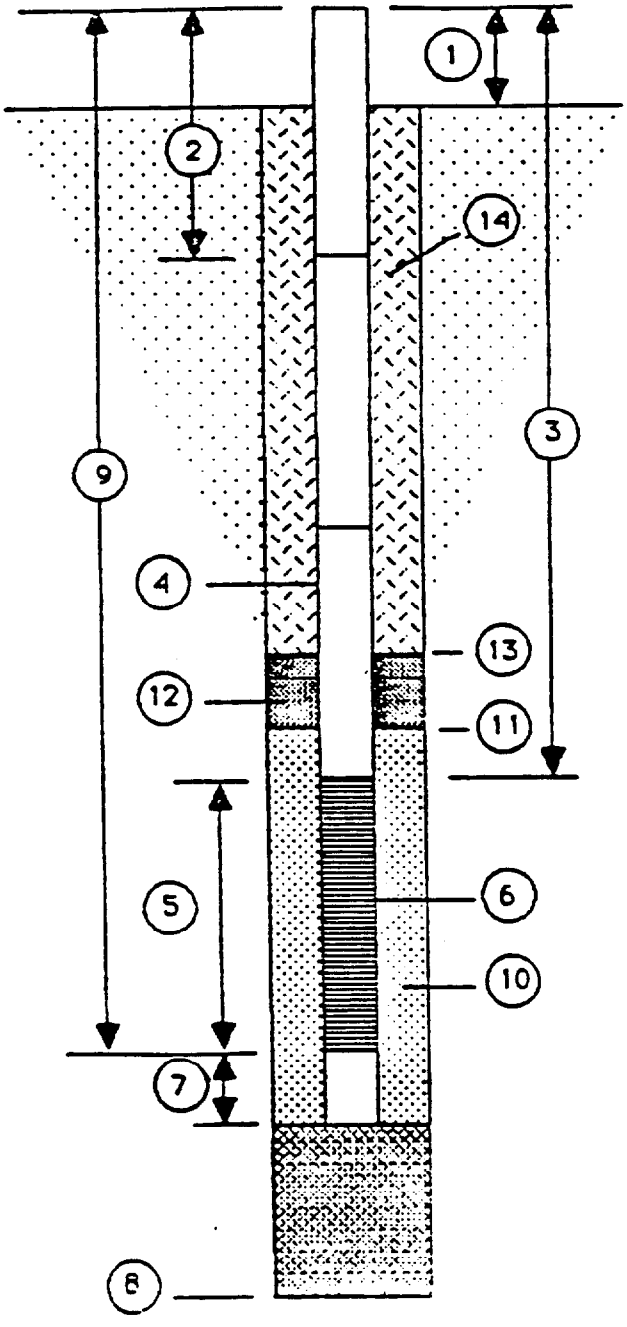
TECHNICAL OVERSIGHT BY

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR., P.O. BOX 10068
CHARLESTON S.C. 29411-0068

WELL CONSTRUCTION DETAILS

WELL NUMBER PAI-17-2

DATE OF INSTALLATION 2-26-88



1. Height of Casing above ground 3.5'
2. Depth to first Coupling 0'
   Coupling Interval Depths 10.0'
3. Total Length of Blank Pipe 13.5'
4. Type of Blank Pipe 2" Sch 40 PVC Threaded
5. Length of Screen 10.0'
6. Type of Screen 2" Sch 40 PVC Threaded 0.010
7. Length of Sump ____
8. Total Depth of Boring 20.0' Hole Diameter 6.0"
9. Depth To Bottom of Screen 20.0'
10. Type of Screen Filter Frac Sand
    Quantity Used 200 LBS Size 16/30 U/C ____
11. Depth To Top of Filter 8.2'
12. Type of Seal Bentonite Pellets
    Quantity Used 25 LBS
13. Depth To Top of Seal 6.5'
14. Type of Grout Cement / Bentonite
    Grout Mixture 94/5
    Method of Placement Pour in dry hole

COMMENTS ON INSTALLATION

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR P O BOX 10068
CHARLESTON S C 29411-0068

WELL DATA REPORT

WELL NUMBER PAI-17-2 AREA PAI Site 17

DATE OF INSTALLATION 2-26-88

WELL HOLE DATA

Drill Date 2-26-88 Well Driller J.A. Byars

Depth of Boring 20.0' Purpose of Boring Monitor

Drilling Method Dry Auger Mud Type -

WATER LEVEL DATA (All measurements from top of casing)

Water Level 16.3' Date of Measurement 3-18-88

DEVELOPMENT DATA

Development Method Hand Pump

Length of Time Developed 1 hour

LOCATION OF BOREHOLE INFORMATION

Drillers Log ✓ Geophysical Log

Physical Core ✓ Cutting Samples

Water Level Observations

DRILLED BY J.A. BYARS SCCWD# 588

DEVELOPED BY J.A. BYARS SCCWD# 588

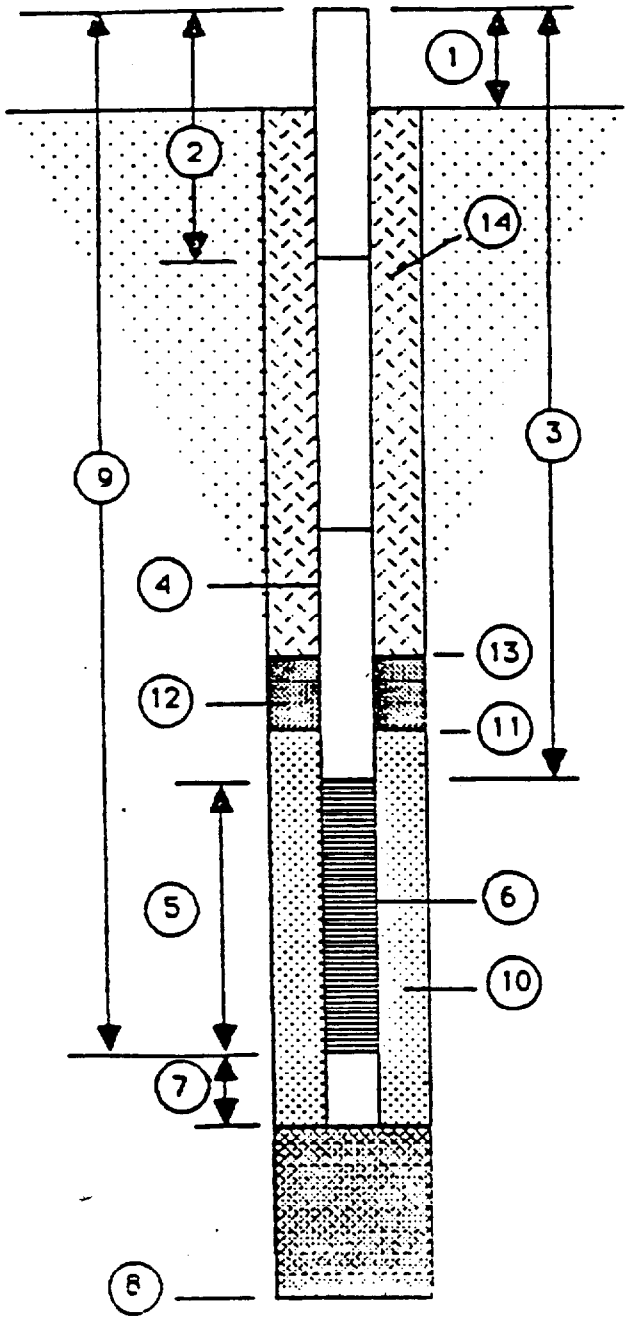
TECHNICAL OVERSIGHT BY

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR., P.O BOX 10068
CHARLESTON S C 29411-0068

WELL CONSTRUCTION DETAILS

WELL NUMBER PA1-18-1

DATE OF INSTALLATION 2-23-88



1. Height of Casing above ground 3.0'
2. Depth to first Coupling ~~2.4'~~ 2.4'

   Coupling Interval Depths 12.4

3. Total Length of Blank Pipe 12.4'
4. Type of Blank Pipe 2" SCH 40 PVC THREADED
5. Length of Screen 10.0'
6. Type of Screen 2" SCH 40 PVC THREADED 0.010"SLO
7. Length of Sump —
8. Total Depth of Boring 20.0' Hole Diameter 6.0"
9. Depth To Bottom of Screen 19.4'
10. Type of Screen Filter FRAC SAND

    Quantity Used 250 LBS Size 16/30 U/C
11. Depth To Top of Filter 8.1'
12. Type of Seal BENTONITE PELLETS

    Quantity Used 25 LBS
13. Depth To Top of Seal 6.2'
14. Type of Grout CEMENT/BENTONITE

    Grout Mixture 94/5

    Method of Placement POUR THROUGH TREMMIE PIPE

COMMENTS ON INSTALLATION

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR P O BOX 10068
CHARLESTON S C 29411-0068

WELL DATA REPORT

WELL NUMBER PA1-18-1 AREA PA1 SITE 18

DATE OF INSTALLATION 2-23-88

WELL HOLE DATA

Drill Date 2-23-88 Well Driller J.A. BYARS

Depth of Boring 20.0' Purpose of Boring MONITOR

Drilling Method DRY AUGER Mud Type —

WATER LEVEL DATA (All measurements from top of casing)

Water Level 13.5' Date of Measurement 3-18-88

DEVELOPMENT DATA

Development Method HAND PUMP

Length of Time Developed 2 HOURS

LOCATION OF BOREHOLE INFORMATION

Drillers Log ✓ Geophysical Log —

Physical Core ✓ Cutting Samples —

Water Level Observations

DRILLED BY J. A. BYARS SCCWD# 588

DEVELOPED BY J. A. BYARS SCCWD# 588

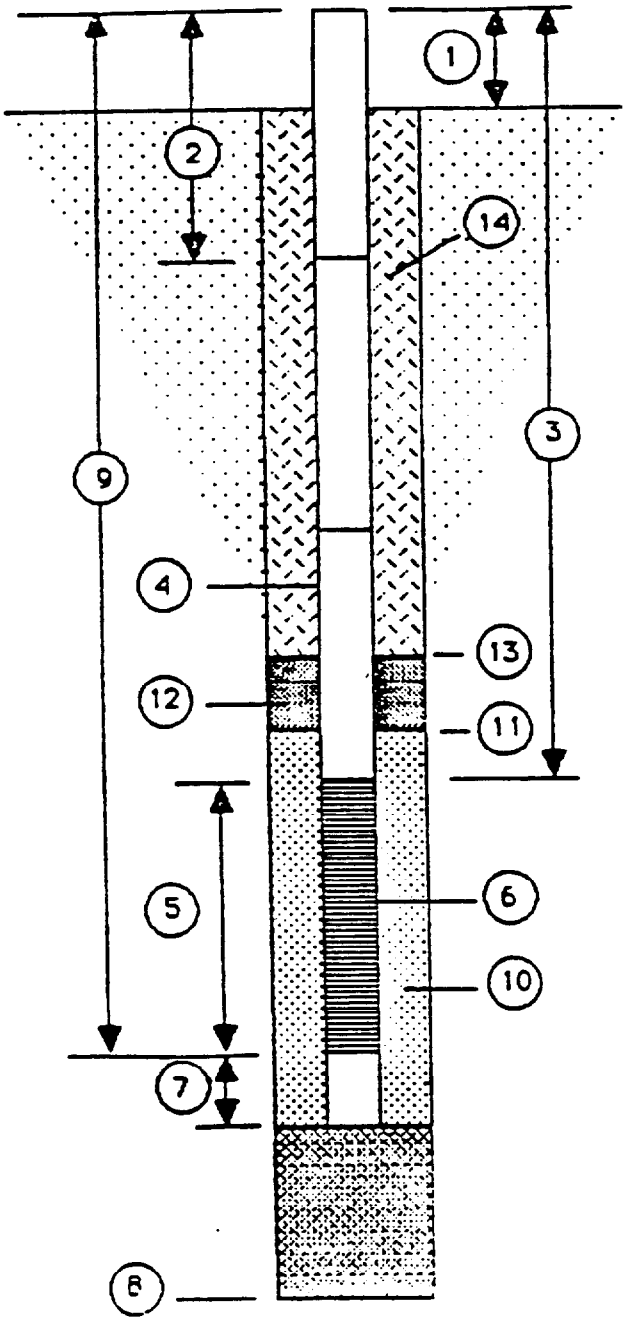
TECHNICAL OVERSIGHT BY

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR. P.O BOX 10068
CHARLESTON S C 29411-0068

WELL CONSTRUCTION DETAILS

WELL NUMBER PA1-18-2

DATE OF INSTALLATION 2-24-88



1. Height of Casing above ground 3.0'
2. Depth to first Coupling 2.5'

   Coupling Interval Depths 10'

3. Total Length of Blank Pipe 12.5
4. Type of Blank Pipe 2" SCH 40 PVC THREADED
5. Length of Screen 10.0'
6. Type of Screen 2" SCH 40 PVC THREADED 0.010"
7. Length of Sump —
8. Total Depth of Boring 20.0' Hole Diameter 6.0"
9. Depth To Bottom of Screen 19.5'
10. Type of Screen Filter FRAC SAND

    Quantity Used 200 LBS Size 16/30 U/C
11. Depth To Top of Filter 8.0'
12. Type of Seal BENTONITE PELLET

    Quantity Used 25 LBS.
13. Depth To Top of Seal 6.7'
14. Type of Grout CEMENT/BENTONITE

    Grout Mixture 94/5

    Method of Placement POUR IN DRY HOLE

COMMENTS ON INSTALLATION:

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DR P O BOX 10068
CHARLESTON S C 29411-0068

WELL DATA REPORT

WELL NUMBER PA1-18-2 AREA PA1 SITE 18

DATE OF INSTALLATION 2-24-88

WELL HOLE DATA

Drill Date 2-24-88 Well Driller J.A. BYARS

Depth of Boring 20.0' Purpose of Boring MONITOR

Drilling Method DRY AUGER Mud Type —

WATER LEVEL DATA (All measurements from top of casing)

Water Level 14.5 Date of Measurement 3-18-88

DEVELOPMENT DATA

Development Method HAND PUMP

Length of Time Developed 2 HOURS

LOCATION OF BOREHOLE INFORMATION

Drillers Log ✓ Geophysical Log —

Physical Core ✓ Cutting Samples —

Water Level Observations

DRILLED BY J. A. BYARS SCCWD# 588

DEVELOPED BY J. A. BYARS SCCWD# 588

TECHNICAL OVERSIGHT BY

SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL

Ground Water Protection Division | 2600 Bull Street | Columbia, S.C. 29201 | (803) 758-5213 | Water Well Record

SC 88-WP-34 PAI-1-1

1. LOCATION OF WELL

County: BEAUFORT System Name: MCRD

Latitude: N 32° 21' 36" Longitude: W 80° 42' 29"

Distance And Direction from Road Intersections

Street address & City of Well Location

Sketch Map: (See example on back)

2. CUTTING SAMPLES ☐ Yes ☒ No

Geophysical Logs ☐ Yes (Please enclose) ☒ No

FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
MARSH CLAY		

Indicate water bearing zones

(use a 2nd sheet if needed)

3. REMARKS

4. OWNER OF WELL:
Address U.S. GOVT
Telephone No. CAL GARNET (803) 525-2979

Engineer
Address
Telephone No.

5. WELL DEPTH (Completed) 6.0 ft. Date Started: Date Completed:

6. ☐ Mud Rotary ☐ Jetted ☐ Bored ☐ Dug ☐ Air Rotary ☒ Driven ☐ Cable tool ☐ Other

7. USE: ☐ Domestic ☐ Public Supply Permit No. ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well ☒ PIEZOMETER

8. CASING: ☒ Threaded ☐ Welded
Diam. 1¼"
Type ☐ PVC ☐ Galvanized S.S. ☒ Steel ☐ Other
1¼ in. to 1.0 ft. depth
in. to ft. depth
Height: Above/~~Below~~ Surface 9.0 ft.
Weight lbs./ft.
Drive Shoe? ☐ Yes ☐ No

9. SCREEN:
Type: S.S. WIRE WRAP Diam. 1¼"
Slot/Gauze 0.010" Length 5.0'
Set Between 1.0 ft. and 6.0 ft.
ft. and ft.
NOTE: MULTIPLE SCREENS USE SECOND SHEET
Sieve Analysis ☐ Yes (Please enclose) ☒ No

10. STATIC WATER LEVEL
0.1 ft. below land surface after 24 hours

11. PUMPING LEVEL Below Land Surface N/A
ft. after hrs. pumping G.P.M.
Pumping Test: ☐ Yes (Please enclose) ☐ No
Yield

12. WATER QUALITY
Chemical Analysis ☐ Yes ☐ No N/A Bacterial Analysis ☐ Yes ☐ No
Please Enclose Lab Results.

13. ARTIFICIAL FILTER (Gravel Pack) ☐ Yes ☒ No WELL POINT
Installed from ft. to ft.
Effective size uniformity coefficient

14. WELL GROUTED? ☐ Yes ☐ No SURFACE SLAB ONLY
Neat Cement ☐ Sand Cement ☐ Concrete ☐ Other ☐
Depth From ft. to ft.

15. NEAREST SOURCE OF POSSIBLE CONTAMINATION: Feet Direction
Type Well disinfected ☐ Yes Type
upon completion ☒ No Amount

16. PUMP: Date Installed not installed ☒
Mfr. name model no.
H.P. volts length of drop pipe ft. capacity gpm
TYPE: ☐ Submersible ☐ Jet (shallow) ☐ Turbine ☐ Jet (deep) ☐ Reciprocating ☐ Centrifugal

17. WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled under my direction and this report is true to the best of my knowledge and belief.
REGISTERED BUSINESS NAME McCLELLAND ENGRS ADDRESS P.O. Box 11609 Houston, Tx
Signed BYARS CERT. NO. 588
AUTHORIZED REPRESENTATIVE Date

DHEC # 1903 (10/86) COPY 1 MAIL TO: S.C. DEPARTMENT OF HEALTH AND ENVIRO

SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL

Ground Water Protection Division **2600 Bull Street** **Columbia, S.C. 29201** **(803) 758-5213** **Water Well Record**

SC88-WP-35 PA1-1-2

LOCATION OF WELL

County: BEAUFORT System Name: MCRD

Latitude: N 32°21'38" Longitude: W 80°42'32"

Distance And Direction from Road Intersections

Street address & City of Well Location

Sketch Map: (See example on back)

4. OWNER OF WELL
Address: U.S. GOVT.
Telephone No. CAL GARNET (803) 525-2779

Engineer
Address
Telephone No.

5. WELL DEPTH (Completed) 6.0 ft. Date Started: Date Completed:

6. ☐ Mud Rotary ☐ Jetted ☐ Bored ☐ Dug ☐ Air Rotary ☒ Driven ☐ Cable tool ☐ Other

7. USE: ☐ Domestic ☐ Public Supply-Permit No. ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well ☒ PIEZOMETER

8. CASING: ☒ Threaded ☐ Welded
Diam. 1¼"
Type ☐ PVC ☐ Galvanized S.S. ☒ Steel ☐ Other
1¼ in. to 1.0 ft. depth
in. to ft. depth
Height: Above/~~Below~~ Surface 9.0 ft.
Weight lbs./ft.
Drive Shoe? ☐ Yes ☐ No

9. SCREEN:
Type: S.S. WIRE WRAP Diam. 1¼"
Slot/Gauze 0.010" Length 5.0'
Set Between 1.0 ft. and 6.0 ft.
ft. and ft.
NOTE: MULTIPLE SCREENS USE SECOND SHEET
Sieve Analysis ☐ Yes (Please enclose) ☒ No

10. STATIC WATER LEVEL
0.2 ft. below land surface after 24 hours

11. PUMPING LEVEL Below Land Surface N/A
ft. after hrs. pumping G.P.M.
Pumping Test: ☐ Yes (Please enclose) ☐ No
Yield

12. WATER QUALITY
Chemical Analysis ☐ Yes ☐ No N/A Bacterial Analysis ☐ Yes ☐ No
Please Enclose Lab Results.

13. ARTIFICIAL FILTER (Gravel Pack) ☐ Yes ☒ No WELL POINT
Installed from ft. to ft.
Effective size uniformity coefficient

14. WELL GROUTED? ☐ Yes ☐ No SURFACE SLAB ONLY
Neat Cement ☐ Sand Cement ☐ Concrete ☐ Other ☐
Depth From ft. to ft.

15. NEAREST SOURCE OF POSSIBLE CONTAMINATION: Feet Direction
Type Well disinfected upon completion ☐ Yes Type ☒ No Amount

16. PUMP: Date Installed not installed ☒
Mfr. name model no.
H.P. volts length of drop pipe ft. capacity gpm
TYPE: ☐ Submersible ☐ Jet (shallow) ☐ Turbine ☐ Jet (deep) ☐ Reciprocating ☐ Centrifugal

FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
MARSH CLAY		
* Indicate water bearing zones (use a 2nd sheet if needed)		

3. REMARKS

17. WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled under my direction and this report is true to the best of my knowledge and belief.
REGISTERED BUSINESS NAME: McCLELLAND ENGRS ADDRESS: P.O. BOX 740010 HOUSTON, TX 77274
Signed BYARS CERT. NO. 588
AUTHORIZED REPRESENTATIVE Date

DHEC # 1903 (10/86) COPY 1 MAIL TO: S.C. DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL

SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL

Ground Water Protection Division | 2600 Bull Street | Columbia, S.C. 29201 | (803) 758-5213 | Water Well Record

SC88-WP-36 PAI-1-3

LOCATION OF WELL

County: BEAUFORT System Name: NAVAL

Latitude: N32°22'13" Longitude: W80°42'20"

Distance And Direction from Road Intersections

Street address & City of Well Location

Sketch Map: (See example on back)

2. CUTTING SAMPLES ☐ Yes ☒ No

Geophysical Logs ☐ Yes (Please enclose) ☒ No

FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
MARSH CLAY		
Indicate water bearing zones (use a 2nd sheet if needed)		

3. REMARKS

4. OWNER OF WELL
Address: U.S. GOVT
Telephone No. (803) 525-2775
Engineer
Address
Telephone No.

5. WELL DEPTH (Completed) 6.0 ft. Date Started: Date Completed:

6. ☐ Mud Rotary ☐ Jetted ☐ Bored ☐ Dug ☐ Air Rotary ☒ Driven ☐ Cable tool ☐ Other

7. USE:
☐ Domestic ☐ Public Supply-Permit No. ☐ Industry
☐ Irrigation ☐ Air Conditioning ☐ Commercial
☐ Test Well ☒ PIEZOMETER

8. CASING: ☒ Threaded ☐ Welded
Diam. 1¼"
Type ☐ PVC ☐ Galvanized S.S. ☒ Steel ☐ Other
1¼ in. to 1.0 ft. depth
in. to ft. depth
Height: Above/Below
Surface 9.0 ft.
Weight lbs./ft.
Drive Shoe? ☐ Yes ☐ No

9. SCREEN:
Type: S.S. WIRE WRAP Diam 1¼"
Slot/Gauze 0.010" Length 5.0'
Set Between ft. and ft.
ft. and ft.
NOTE: MULTIPLE SCREENS USE SECOND SHEET
Sieve Analysis ☐ Yes (Please enclose) ☒ No

10. STATIC WATER LEVEL
0.1 ft. below land surface after 24 hours

11. PUMPING LEVEL Below Land Surface N/A
ft. after hrs. pumping G.P.M.
Pumping Test: ☐ Yes (Please enclose) ☐ No
Yield

12. WATER QUALITY
Chemical Analysis ☐ Yes ☐ No N/A Bacterial Analysis ☐ Yes ☐ No
Please Enclose Lab Results.

13. ARTIFICIAL FILTER (Gravel Pack) ☐ Yes ☒ No WELLPOINT
Installed from ft. to ft.
Effective size uniformity coefficient

14. WELL GROUTED? ☐ Yes ☐ No SURFACE SLAB ONLY
Neat Cement ☐ Sand Cement ☐ Concrete ☐ Other ☐
Depth From ft. to ft.

15. NEAREST SOURCE OF POSSIBLE CONTAMINATION: Feet Direction
Type Well disinfected upon completion ☐ Yes Type ☒ No Amount

16. PUMP: Date Installed not installed ☒
Mfr. name model no.
H.P. volts length of drop pipe ft. capacity gpm
TYPE: ☐ Submersible ☐ Jet (shallow) ☐ Turbine ☐ Jet (deep) ☐ Reciprocating ☐ Centrifugal

17. WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled under my direction and this report is true to the best of my knowledge and belief.
REGISTERED BUSINESS NAME: MCCLELLAND ENGRS ADDRESS:
NAME (Please type or print) CERT. NO.
Signed BYARS Date
AUTHORIZED REPRESENTATIVE

DHEC # 1903 (10/88) COPY 1 MAIL TO: S.C. DEPARTMENT OF HEALTH AND

SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL

Ground Water Protection Division **2600 Bull Street** **Columbia, S.C. 29201** **(803) 758-5213** **Water Well Record**

Sc88-MW-13 PAI-1-4

LOCATION OF WELL

County: BEAUFORT System Name: MCAS

Latitude: N 32° 21' 34" Longitude: W80° 42' 23"

Distance And Direction from Road Intersections

Street address & City of Well Location

Sketch Map: (See example on back)

4. OWNER OF WELL
Address: U.S. Govt.
Telephone No.: Cal Garner (803) 525-2779
Engineer
Address
Telephone No.

5. WELL DEPTH (Completed) 15.0 ft. Date Started: 2-23-88 Date Completed: 2-23-88

6. ☐ Mud Rotary ☐ Jetted ☐ Bored ☐ Dug ☐ Air Rotary ☐ Driven ☐ Cable tool ☒ Other Auger

7. USE: ☐ Domestic ☐ Public Supply Permit No. ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well ☒ Monitor Well

8. CASING: ☒ Threaded ☐ Welded
Diam. 2.0"
Type ☒ PVC ☐ Galvanized ☐ Steel ☐ Other
2 in. to 5.0 ft. depth
2 in. to +3.5 ft. depth
Height: Above/Below Surface 3.5 ft.
Weight ____ lbs./ft.
Drive Shoe? ☐ Yes ☐ No

9. SCREEN:
Type: PVC threaded Diam 2.0"
Slot/Gauze 0.010" Length 10.0'
Set Between 15.0 ft. and 5.0 ft. NOTE: MULTIPLE SCREENS USE SECOND SHEET
____ ft. and ____ ft.
Sieve Analysis ☐ Yes (Please enclose) ☒ No

10. STATIC WATER LEVEL
____ ft. below land surface after 24 hours

11. PUMPING LEVEL Below Land Surface N/A
____ ft. after ____ hrs. pumping ____ G.P.M.
Pumping Test: ☐ Yes (Please enclose) ☐ No
Yield ____

12. WATER QUALITY N/A
Chemical Analysis ☐ Yes ☐ No Bacterial Analysis ☐ Yes ☐ No
Please Enclose Lab Results.

13. ARTIFICIAL FILTER (Gravel Pack) ☒ Yes ☐ No
Installed from 15.0 ft. to 3.5 ft.
Effective size ____ uniformity coefficient 16/30

14. WELL GROUTED? ☒ Yes ☐ No
Neat Cement ☒ Sand Cement ☐ Concrete ☐ Other ☐ ____
Depth From 2.0 ft. to grade ft.

15. NEAREST SOURCE OF POSSIBLE CONTAMINATION: ____ Feet ____ Direction ____ Type
Well disinfected ☐ Yes Type ____
upon completion ☒ No Amount ____

16. PUMP: Date Installed ____ not installed ☒
Mfr. name ____ model no. ____
H.P. ____ volts ____ length of drop pipe ____ ft. capacity ____ gpm
TYPE: ☐ Submersible ☐ Jet (shallow) ☐ Turbine ☐ Jet (deep) ☐ Reciprocating ☐ Centrifugal

2. CUTTING SAMPLES ☐ Yes ☒ No
Geophysical Logs ☐ Yes (Please enclose) ☒ No

FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
Silty Sand		
No Confining Layer Penetrated		
* Indicate water bearing zones		
(use a 2nd sheet if needed)		

3. REMARKS

17. WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled under my direction and this report is true to the best of my knowledge and belief.
REGISTERED BUSINESS NAME: McClelland Engrs. ADDRESS: P.O. Box 740010 Houston, TX 77274
Signed: BYARS Date ____ CERT. NO. 588
AUTHORIZED REPRESENTATIVE

DHEC # 1903 (10/86) COPY 1 MAIL TO: S.C. DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL (ADDRESS ABOVE)

SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL

Ground Water Protection Division **2600 Bull Street** **Columbia, S.C. 29201** **(803) 758-5213** **Water Well Record**

SC88-MW-10 PAI-2-1

LOCATION OF WELL

County: BEAUFORT System Name: MCRD

Latitude: N32°21'31" Longitude: W80°42'49"

Distance And Direction from Road Intersections

Street address & City of Well Location

Sketch Map: (See example on back)

2. CUTTING SAMPLES ☐ Yes ☒ No

Geophysical Logs ☐ Yes (Please enclose) ☒ No

FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
SILTY SAND		
NO CONFINING LAYER PENETRATED		
* Indicate water bearing zones (use a 2nd sheet if needed)		

3. REMARKS

4. OWNER OF WELL
Address U.S. Govt
Telephone No. Cal Garnet (803) 525-2779

Engineer
Address
Telephone No.

5. WELL DEPTH (Completed) 26.0 ft. Date Started: 2-21-88 Date Completed: 2-21-88

6. ☐ Mud Rotary ☐ Jetted ☐ Bored ☐ Dug ☐ Air Rotary ☐ Driven ☐ Cable tool ☒ Other Auger

7. USE:
☐ Domestic ☐ Public Supply-Permit No. _____ ☐ Industry
☐ Irrigation ☐ Air Conditioning ☐ Commercial
☐ Test Well ☒ Monitor Well

8. CASING: ☒ Threaded ☐ Welded
Diam. 2.0"
Type ☒ PVC ☐ Galvanized ☐ Steel ☐ Other
2 in. to 6.0 ft. depth
2 in. to +3.5 ft. depth
Height: Above/Below
Surface 3.5 ft.
Weight _____ lbs./ft.
Drive Shoe? ☐ Yes ☐ No

9. SCREEN:
Type: PVC threaded Diam 2.0"
Slot/Gauze 0.010" Length 20.0'
Set Between 26.0 ft. and 6.0 ft. NOTE: MULTIPLE SCREENS
_____ ft. and _____ ft. USE SECOND SHEET
Sieve Analysis ☐ Yes (Please enclose) ☒ No

10. STATIC WATER LEVEL
_____ ft. below land surface after 24 hours

11. PUMPING LEVEL Below Land Surface N/A
_____ ft. after _____ hrs. pumping _____ G.P.M.
Pumping Test: ☐ Yes (Please enclose) ☐ No
Yield _____

12. WATER QUALITY N/A
Chemical Analysis ☐ Yes ☐ No Bacterial Analysis ☐ Yes ☐ No
Please Enclose Lab Results.

13. ARTIFICIAL FILTER (Gravel Pack) ☒ Yes ☐ No
Installed from 26.0 ft. to 4.0 ft.
Effective size _____ uniformity coefficient _____

14. WELL GROUTED? ☒ Yes ☐ No
Neat Cement ☒ Sand Cement ☐ Concrete ☐ Other ☐ _____
Depth From 2.5 ft. to grade ft.

15. NEAREST SOURCE OF POSSIBLE CONTAMINATION: _____ Feet _____ Direction
_____ Type Well disinfected ☐ Yes Type _____
upon completion ☒ No Amount _____

16. PUMP: Date Installed _____ not installed ☒
Mfr. name _____ model no. _____
H.P. _____ volts _____ length of drop pipe _____ ft. capacity _____ gpm
TYPE: ☐ Submersible ☐ Jet (shallow) ☐ Turbine ☐ Jet (deep) ☐ Reciprocating ☐ Centrifugal

17. WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled under my direction and this report is true to the best of my knowledge and belief.
REGISTERED BUSINESS NAME McClelland Engrs. ADDRESS P.O. Box 740010 Houston, TX 77274
Signed BYARS CERT. NO. 588
AUTHORIZED REPRESENTATIVE Date

DHEC # 1903 (10/86) COPY 1 MAIL TO: S.C. DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL (ADDRESS ABOVE)

SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL

Ground Water Protection Division | 2600 Bull Street | Columbia, S.C. 29201 | (803) 758-5213 | Water Well Record

SC88-MW-11 PAI-2-2

LOCATION OF WELL

County: BEAUFORT System Name: MCRD

Latitude: N 32°21'33" Longitude: W80°42'46"

Distance And Direction from Road Intersections

Street address & City of Well Location

Sketch Map: (See example on back)

1. OWNER OF WELL
Address: U.S. Govt
Telephone No.: Cal Garnet (803) 525-2779

Engineer
Address:
Telephone No.:

5. WELL DEPTH (Completed) 30.0 ft. Date Started: Date Completed:

6. ☐ Mud Rotary ☐ Jetted ☐ Bored ☐ Dug ☐ Air Rotary ☐ Driven ☐ Cable tool ☒ Other Auger

7. USE: ☐ Domestic ☐ Public Supply-Permit No. ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well ☒ Monitor Well

8. CASING: ☒ Threaded ☐ Welded
Diam. 2.0"
Type ☒ PVC ☐ Galvanized ☐ Steel ☐ Other
2 in. to 5.0 ft. depth
2 in. to +3.5 ft. depth
Height: Above/Below
Surface 3.5 ft.
Weight ____ lbs./ft.
Drive Shoe? ☐ Yes ☐ No

9. SCREEN:
Type: PVC threaded Diam 2.0"
Slot/Gauze 0.010" Length 35.0'
Set Between 30.0 ft. and 5.0 ft. NOTE: MULTIPLE SCREENS
____ ft. and ____ ft. USE SECOND SHEET
Sieve Analysis ☐ Yes (Please enclose) ☒ No

2. CUTTING SAMPLES ☐ Yes ☒ No

Geophysical Logs ☐ Yes (Please enclose) ☒ No

FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
SILTY SAND		
NO CONFINING LAYER PENETRATED		
* Indicate water bearing zones		
(use a 2nd sheet if needed)		

10. STATIC WATER LEVEL
____ ft. below land surface after 24 hours

11. PUMPING LEVEL Below Land Surface N/A
____ ft. after ____ hrs. pumping ____ G.P.M.
Pumping Test: ☐ Yes (Please enclose) ☐ No
Yield ____

12. WATER QUALITY N/A
Chemical Analysis ☐ Yes ☐ No Bacterial Analysis ☐ Yes ☐ No
Please Enclose Lab Results.

13. ARTIFICIAL FILTER (Gravel Pack) ☒ Yes ☐ No
Installed from 30.0 ft. to 3.9 ft.
Effective size ____ uniformity coefficient ____

14. WELL GROUTED? ☒ Yes ☐ No
Neat Cement ☒ Sand Cement ☐ Concrete ☐ Other ☐ ____
Depth From 2.0 ft. to grade ft.

15. NEAREST SOURCE OF POSSIBLE CONTAMINATION: ____ Feet ____ Direction ____ Type
Well disinfected upon completion ☐ Yes ☒ No Type ____ Amount ____

16. PUMP: Date Installed ____ not installed ☒
Mfr. name ____ model no. ____
H.P. ____ volts ____ length of drop pipe ____ ft. capacity ____ gpm
TYPE: ☐ Submersible ☐ Jet (shallow) ☐ Turbine ☐ Jet (deep) ☐ Reciprocating ☐ Centrifugal

17. WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled under my direction and this report is true to the best of my knowledge and belief.
REGISTERED BUSINESS NAME: McClelland Engrs ADDRESS: P.O. Box 740010 Houston, TX 77274
Signed: BYARS Date:
AUTHORIZED REPRESENTATIVE
CERT. NO. 588

3. REMARKS

DHEC # 1903 (10/86) COPY 1 MAIL TO: S.C. DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL (ADDRESS ABOVE)

SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL

Ground Water Protection Division **2600 Bull Street** **Columbia, S.C. 29201** **(803) 758-5213** **Water Well Record**

SC88-MW-12 PAI - 2-3

LOCATION OF WELL

County: BEAUFORT System Name: MCRD

Latitude: N 32° 21' 33" Longitude: W 80° 42' 49"

Distance And Direction from Road Intersections

Street address & City of Well Location

Sketch Map: (See example on back)

2. CUTTING SAMPLES ☐ Yes ☒ No

Geophysical Logs ☐ Yes (Please enclose) ☒ No

FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
SILTY SAND		
No CONFINING LAYER PENETRATED		
* Indicate water bearing zones (use a 2nd sheet if needed)		

3. REMARKS

4. OWNER OF WELL
Address: U.S. Govt
Telephone No.: Cal Garnett (803) 525-2779
Engineer
Address
Telephone No.:

5. WELL DEPTH (Completed) 26.0 ft. Date Started: 2-21-88 Date Completed: 2-22-88

6. ☐ Mud Rotary ☐ Jetted ☐ Bored ☐ Dug ☐ Air Rotary ☐ Driven ☐ Cable tool ☒ Other Auger

7. USE:
☐ Domestic ☐ Public Supply-Permit No. ☐ Industry
☐ Irrigation ☐ Air Conditioning ☐ Commercial
☐ Test Well ☒ Monitor Well

8. CASING: ☒ Threaded ☐ Welded
Diam. 2.0"
Type ☒ PVC ☐ Galvanized ☐ Steel ☐ Other
2 in. to 6.0 ft. depth
2 in. to +3.5 ft. depth
Height: Above/Below
Surface 3.5 ft.
Weight ____ lbs./ft.
Drive Shoe? ☐ Yes ☐ No

9. SCREEN:
Type: PVC threaded Diam. 2.0"
Slot/Gauze 0.010" Length 20.0'
Set Between 26.0 ft. and 6.0 ft. NOTE: MULTIPLE SCREENS USE SECOND SHEET
____ ft. and ____ ft.
Sieve Analysis ☐ Yes (Please enclose) ☒ No

10. STATIC WATER LEVEL
____ ft. below land surface after 24 hours

11. PUMPING LEVEL Below Land Surface N/A
____ ft. after ____ hrs. pumping ____ G.P.M.
Pumping Test: ☐ Yes (Please enclose) ☐ No
Yield ____

12. WATER QUALITY N/A
Chemical Analysis ☐ Yes ☐ No Bacterial Analysis ☐ Yes ☐ No
Please Enclose Lab Results.

13. ARTIFICIAL FILTER (Gravel Pack) ☒ Yes ☐ No
Installed from 26.0 ft. to 4.1 ft.
Effective size ____ uniformity coefficient 16/30

14. WELL GROUTED? ☒ Yes ☐ No
Neat Cement ☒ Sand Cement ☐ Concrete ☐ Other ☐ ____
Depth From 2.8 ft. to grade ft.

15. NEAREST SOURCE OF POSSIBLE CONTAMINATION: ____ Feet ____ Direction ____ Type
Well disinfected upon completion ☐ Yes ☒ No Type ____ Amount ____

16. PUMP: Date Installed ____ not installed ☒
Mfr. name ____ model no. ____
H.P. ____ volts ____ length of drop pipe ____ ft. capacity ____ gpm
TYPE: ☐ Submersible ☐ Jet (shallow) ☐ Turbine ☐ Jet (deep) ☐ Reciprocating ☐ Centrifugal

17. WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled under my direction and this report is true to the best of my knowledge and belief.
REGISTERED BUSINESS NAME: McClelland Engrs. ADDRESS: P.O. Box 740010 Houston, TX 77274
Signed BVAES Date ____ CERT. NO. 588
AUTHORIZED REPRESENTATIVE

DHEC # 1903 (10/86) COPY 1 MAIL TO: S.C. DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL (ADDRESS ABOVE)

SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL

Ground Water Protection Division **2600 Bull Street** **Columbia, S.C. 29201** **(803) 758-5213** **Water Well Record**

SC88-MW-9 PAI-6-1

LOCATION OF WELL

County: BEAUFART System Name: MCRD

Latitude: N32°19'35" Longitude: W80°40'49"

Distance And Direction from Road Intersections

Street address & City of Well Location

Sketch Map: (See example on back)

2. CUTTING SAMPLES ☐ Yes ☒ No

Geophysical Logs ☐ Yes (Please enclose) ☒ No

FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
SILTY SAND		
NO CONFINING LAYER PENETRATED		
* Indicate water bearing zones (use a 2nd sheet if needed)		

3. REMARKS

4. OWNER OF WELL:
Address U.S. Govt
Telephone No. Cal Garnet (803) 525-2779

Engineer
Address
Telephone No.

5. WELL DEPTH (Completed) 12.0 ft. Date Started: 2-21-88 Date Completed: 2-21-88

6. ☐ Mud Rotary ☐ Jetted ☐ Bored ☐ Dug ☐ Air Rotary ☐ Driven ☐ Cable tool ☒ Other Auger

7. USE:
☐ Domestic ☐ Public Supply-Permit No. _____ ☐ Industry
☐ Irrigation ☐ Air Conditioning ☐ Commercial
☐ Test Well ☒ Monitor Well

8. CASING: ☒ Threaded ☐ Welded
Diam. 2.0"
Type ☒ PVC ☐ Galvanized ☐ Steel ☐ Other
2 in. to 2 ft. depth
2 in. to +3.5 ft. depth
Height: Above/Below
Surface 3.5 ft.
Weight _____ lbs./ft.
Drive Shoe? ☐ Yes ☐ No

9. SCREEN:
Type: PVC threaded Diam. 2.0"
Slot/Gauze 0.010" Length 10.0'
Set Between 12.0 ft. and 2.0 ft. NOTE: MULTIPLE SCREENS
_____ ft. and _____ ft. USE SECOND SHEET
Sieve Analysis ☐ Yes (Please enclose) ☒ No

10. STATIC WATER LEVEL
_____ ft. below land surface after 24 hours

11. PUMPING LEVEL Below Land Surface N/A
_____ ft. after _____ hrs. pumping _____ G.P.M.
Pumping Test: ☐ Yes (Please enclose) ☐ No
Yield _____

12. WATER QUALITY N/A
Chemical Analysis ☐ Yes ☐ No Bacterial Analysis ☐ Yes ☐ No
Please Enclose Lab Results.

13. ARTIFICIAL FILTER (Gravel Pack) ☒ Yes ☐ No
Installed from 12.5 ft. to 1.6 ft.
Effective size _____ uniformity coefficient 16/30

14. WELL GROUTED? ☒ Yes ☐ No
Neat Cement ☒ Sand Cement ☐ Concrete ☐ Other ☐ _____
Depth From 2.5 ft. to grade ft.

15. NEAREST SOURCE OF POSSIBLE CONTAMINATION: _____ Feet _____ Direction
_____ Type Well disinfected upon completion ☐ Yes Type _____ ☒ No Amount _____

16. PUMP: Date Installed _____ not installed ☒
Mfr. name _____ model no. _____
H.P. _____ volts _____ length of drop pipe _____ ft. capacity _____ gpm
TYPE: ☐ Submersible ☐ Jet (shallow) ☐ Turbine ☐ Jet (deep) ☐ Reciprocating ☐ Centrifugal

17. WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled under my direction and this report is true to the best of my knowledge and belief.
REGISTERED BUSINESS NAME McClelland Engrs ADDRESS P.O. Box 740010 Houston, TX 77274
Signed BYARS CERT. NO. 588
AUTHORIZED REPRESENTATIVE Date _____

DHEC # 1903 (10/86) COPY 1 MAIL TO: S.C. DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL (ADDRESS ABOVE)

SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL

Ground Water Protection Division | 2600 Bull Street | Columbia, S.C. 29201 | (803) 758-5213 | Water Well Record

SC88-MW-20 PAI - 17 - 1

LOCATION OF WELL

County: BEAUFORT System Name: MCRD

Latitude: N 32° 19' 37" Longitude: W 80° 41' 01"

Distance And Direction from Road Intersections

Street address & City of Well Location

Sketch Map: (See example on back)

4. OWNER OF WELL
Address U.S. Govt
Telephone No. Cal Garnet (803) 525-2779
Engineer
Address
Telephone No.

5. WELL DEPTH (Completed) 20 ft. Date Started: 2-26-88 Date Completed: 2-26-88

6. ☐ Mud Rotary ☐ Jetted ☐ Bored ☐ Dug ☐ Air Rotary ☐ Driven ☐ Cable tool ☒ Other Auger

7. USE:
☐ Domestic ☐ Public Supply-Permit No. ____ ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well ☒ Monitor Well

8. CASING: ☒ Threaded ☐ Welded
Diam. 2.0"
Type ☐ PVC ☐ Galvanized ☐ Steel ☐ Other
2 in. to 10.0 ft. depth
2 in. to +3.5 ft. depth
Height: Above/Below
Surface 3.5 ft.
Weight ____ lbs./ft.
Drive Shoe? ☐ Yes ☐ No

2. CUTTING SAMPLES ☐ Yes ☒ No

Geophysical Logs ☐ Yes (Please enclose) ☒ No

FORMATION DESCRIPTION	*THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
SILTY SAND		
NO CONFINING LAYER PENETRATED		

* Indicate water bearing zones

(use a 2nd sheet if needed)

9. SCREEN:
Type: PVC threaded Diam. 2.0"
Slot/Gauze 0.010" Length 10.0'
Set Between 20.0 ft. and 10.0 ft. NOTE: MULTIPLE SCREENS USE SECOND SHEET
____ ft. and ____ ft.
Sieve Analysis ☐ Yes (Please enclose) ☒ No

10. STATIC WATER LEVEL
____ ft. below land surface after 24 hours

11. PUMPING LEVEL Below Land Surface N/A
____ ft. after ____ hrs. pumping ____ G.P.M.
Pumping Test: ☐ Yes (Please enclose) ☐ No
Yield ____

12. WATER QUALITY N/A
Chemical Analysis ☐ Yes ☐ No Bacterial Analysis ☐ Yes ☐ No
Please Enclose Lab Results.

13. ARTIFICIAL FILTER (Gravel Pack) ☒ Yes ☐ No
Installed from 20.0 ft. to 8.1 ft. 16/30
Effective size ____ uniformity coefficient ____

14. WELL GROUTED? ☒ Yes ☐ No
Neat Cement ☒ Sand Cement ☐ Concrete ☐ Other ☐ ____
Depth From 6.3 ft. to grade ft.

15. NEAREST SOURCE OF POSSIBLE CONTAMINATION: ____ Feet ____ Direction ____ Type
Well disinfected ☐ Yes Type ____
upon completion ☒ No Amount ____

16. PUMP: Date Installed ____ not installed ☒
Mfr. name ____ model no. ____
H.P. ____ volts ____ length of drop pipe ____ ft. capacity ____ gpm
TYPE: ☐ Submersible ☐ Jet (shallow) ☐ Turbine ☐ Jet (deep) ☐ Reciprocating ☐ Centrifugal

17. WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled under my direction and this report is true to the best of my knowledge and belief.
REGISTERED BUSINESS NAME McClelland Engrs. ADDRESS P.O. Box 740010 Houston TX 77274
Signed BEARS AUTHORIZED REPRESENTATIVE Date ____ CERT. NO. 588

3. REMARKS

DHEC # 1903 (10/86) COPY 1 MAIL TO: S.C. DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL (ADDRESS ABOVE)

SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL

Ground Water Protection Division 2600 Bull Street Columbia, S.C. 29201 (803) 758-5213 **Water Well Record**

SC88-MW-19 PAI-17-2

LOCATION OF WELL

County: BEAUFORT System Name: MCRD

Latitude: N32°19'36" Longitude: W80°40'58"

Distance And Direction from Road Intersections

Street address & City of Well Location

Sketch Map: (See example on back)

2. CUTTING SAMPLES ☐ Yes ☒ No

Geophysical Logs ☐ Yes (Please enclose) ☒ No

FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
Silty Sand		
No Confining Layer Penetrated		

*Indicate water bearing zones

(use a 2nd sheet if needed)

3. REMARKS

4. OWNER OF WELL:
Address U.S. Govt
Telephone No. Cal Garnet (805) 525-2779

Engineer
Address
Telephone No.

5. WELL DEPTH (Completed) 20 ft.
Date Started: 2-26-88
Date Completed: 2-26-88

6. ☐ Mud Rotary ☐ Jetted ☐ Bored ☐ Dug
☐ Air Rotary ☐ Driven ☐ Cable tool ☒ Other Auger

7. USE:
☐ Domestic ☐ Public Supply-Permit No. ______ ☐ Industry
☐ Irrigation ☐ Air Conditioning ☐ Commercial
☐ Test Well ☒ Monitor Well

8. CASING: ☒ Threaded ☐ Welded
Diam. 2.0"
Type ☒ PVC ☐ Galvanized ☐ Steel ☐ Other
2 in. to 10.0 ft. depth
2 in. to +3.5 ft. depth

Height: Above/Below
Surface 3.5 ft.
Weight ______ lbs./ft.
Drive Shoe? ☐ Yes ☐ No

9. SCREEN:
Type: PVC threaded Diam. 2.0"
Slot/Gauze 0.010" Length 10.0'
Set Between 20.0 ft. and 10.0 ft. **NOTE: MULTIPLE SCREENS USE SECOND SHEET**
______ ft. and ______ ft.
Sieve Analysis ☐ Yes (Please enclose) ☐ No

10. STATIC WATER LEVEL
______ ft. below land surface after 24 hours

11. PUMPING LEVEL Below Land Surface N/A
______ ft. after ______ hrs. pumping ______ G.P.M.
Pumping Test: ☐ Yes (Please enclose) ☐ No
Yield

12. WATER QUALITY N/A
Chemical Analysis ☐ Yes ☐ No Bacterial Analysis ☐ Yes ☐ No
Please Enclose Lab Results.

13. ARTIFICIAL FILTER (Gravel Pack) ☒ Yes ☐ No
Installed from 20.0 ft. to 8.2 ft.
Effective size ______ uniformity coefficient 16/30

14. WELL GROUTED? ☒ Yes ☐ No
Neat Cement ☒ Sand Cement ☐ Concrete ☐ Other ☐
Depth From 6.5 ft. to grade ft.

15. NEAREST SOURCE OF POSSIBLE CONTAMINATION: ______ Feet ______ Direction
______ Type Well disinfected upon completion ☐ Yes ☒ No Type ______ Amount ______

16. PUMP: Date Installed ______ not installed ☒
Mfr. name ______ model no. ______
H.P. ______ volts ______ length of drop pipe ______ ft. capacity ______ gpm
TYPE: ☐ Submersible ☐ Jet (shallow) ☐ Turbine
☐ Jet (deep) ☐ Reciprocating ☐ Centrifugal

17. WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled under my direction and this report is true to the best of my knowledge and belief.
REGISTERED BUSINESS NAME: McClelland Engrs. ADDRESS P.O. Box 740010 Houston, TX 77274
CERT. NO. 588
Signed [signature] Byars Date
AUTHORIZED REPRESENTATIVE

SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL

Ground Water Protection Division **2600 Bull Street** **Columbia, S.C. 29201** **(803) 758-5213** **Water Well Record**

SC88-MW-14 PAI-18-1

LOCATION OF WELL

County: BEAUFORT System Name: MCAD

Latitude: N32°19'40" Longitude: W80°41'06"

Distance And Direction from Road Intersections

Street address & City of Well Location

Sketch Map: (See example on back)

2. CUTTING SAMPLES ☐ Yes ☒ No

Geophysical Logs ☐ Yes (Please enclose) ☒ No

FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
SILTY SAND		
NO CONFINING LAYER PENETRATED		
* Indicate water bearing zones (use a 2nd sheet if needed)		

3. REMARKS

4. OWNER OF WELL
Address U.S. Govt.
Telephone No. Cal Garnet (803) 525-2779
Engineer
Address
Telephone No.

5. WELL DEPTH (Completed) 19.4 ft. Date Started: 2-23-88 Date Completed: 2-23-88

6. ☐ Mud Rotary ☐ Jetted ☐ Bored ☐ Dug ☐ Air Rotary ☐ Driven ☐ Cable tool ☒ Other Auger

7. USE:
☐ Domestic ☐ Public Supply-Permit No. ☐ Industry
☐ Irrigation ☐ Air Conditioning ☐ Commercial
☐ Test Well ☒ Monitor Well

8. CASING: ☒ Threaded ☐ Welded
Diam. 2.0"
Type ☒ PVC ☐ Galvanized ☐ Steel ☐ Other
2 in. to 9.4 ft. depth
2 in. to +3.0 ft. depth
Height: Above/Below
Surface 3.0 ft.
Weight ____ lbs./ft.
Drive Shoe? ☐ Yes ☐ No

9. SCREEN:
Type: PVC threaded Diam 2.0"
Slot/Gauze 0.010" Length 10.0'
Set Between 19.4 ft. and 9.4 ft. NOTE: MULTIPLE SCREENS USE SECOND SHEET
____ ft. and ____ ft.
Sieve Analysis ☐ Yes (Please enclose) ☒ No

10. STATIC WATER LEVEL
____ ft. below land surface after 24 hours

11. PUMPING LEVEL Below Land Surface N/A
____ ft. after ____ hrs. pumping ____ G.P.M.
Pumping Test: ☐ Yes (Please enclose) ☐ No
Yield ____

12. WATER QUALITY N/A
Chemical Analysis ☐ Yes ☐ No Bacterial Analysis ☐ Yes ☐ No
Please Enclose Lab Results.

13. ARTIFICIAL FILTER (Gravel Pack) ☒ Yes ☐ No
Installed from 20.0 ft. to 8.1 ft.
Effective size ____ uniformity coefficient ____

14. WELL GROUTED? ☒ Yes ☐ No
Neat Cement ☒ Sand Cement ☐ Concrete ☐ Other ☐ ____
Depth From 6.2 ft. to grade ft.

15. NEAREST SOURCE OF POSSIBLE CONTAMINATION: ____ Feet ____ Direction
____ Type Well disinfected ☐ Yes Type ____
upon completion ☒ No Amount ____

16. PUMP: Date Installed ____ not installed ☒
Mfr. name ____ model no. ____
H.P. ____ volts ____ length of drop pipe ____ ft. capacity ____ gpm
TYPE: ☐ Submersible ☐ Jet (shallow) ☐ Turbine ☐ Jet (deep) ☐ Reciprocating ☐ Centrifugal

17. WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled under my direction and this report is true to the best of my knowledge and belief.
REGISTERED BUSINESS NAME: McClelland Engrs. ADDRESS: P.O. Box 740010 Houston, TX 77274
Signed B Vaes AUTHORIZED REPRESENTATIVE CERT. NO. 588 Date ____

DHEC # 1903 (10/86) COPY 1 MAIL TO: S.C. DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL (ADDRESS ABOVE)

SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL

Ground Water Protection Division **2600 Bull Street** **Columbia, S.C. 29201** **(803) 758-5213** **Water Well Record**

5C88-MW-15 PAI-18-2

1. LOCATION OF WELL

County: BEAUFORT System Name: MCRD

Latitude: N 32° 19' 41" Longitude: W 80° 41' 02"

Distance And Direction from Road Intersections

Street address & City of Well Location

Sketch Map: (See example on back)

2. CUTTING SAMPLES ☐ Yes ☒ No

Geophysical Logs ☐ Yes (Please enclose) ☒ No

FORMATION DESCRIPTION	*THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
Silty Sand		
No Confining Layer Penetrated		

* Indicate water bearing zones

(use a 2nd sheet if needed)

3. REMARKS

4. OWNER OF WELL:
Address: U.S. Govt
Telephone No.: Cal Garnet (803) 525-2779
Engineer
Address
Telephone No.

5. WELL DEPTH (Completed) 19.5' ft. Date Started: 2-24-88 Date Completed: 2-24-88

6. ☐ Mud Rotary ☐ Jetted ☐ Bored ☐ Dug ☐ Air Rotary ☐ Driven ☐ Cable tool ☒ Other Auger

7. USE: ☐ Domestic ☐ Public Supply-Permit No. ______ ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well ☒ Monitor Well

8. CASING: ☒ Threaded ☐ Welded
Diam. 2.0"
Type ☒ PVC ☐ Galvanized ☐ Steel ☐ Other
2 in. to 9.5 ft. depth
2 in. to +3.0 ft. depth
Height: Above/Below Surface 3.0 ft.
Weight ______ lbs./ft.
Drive Shoe? ☐ Yes ☐ No

9. SCREEN:
Type: PVC threaded Diam. 2.0"
Slot/Gauze 0.010" Length 10.0'
Set Between 19.5 ft. and 9.5 ft. **NOTE: MULTIPLE SCREENS USE SECOND SHEET**
______ ft. and ______ ft.
Sieve Analysis ☐ Yes (Please enclose) ☒ No

10. STATIC WATER LEVEL
______ ft. below land surface after 24 hours

11. PUMPING LEVEL Below Land Surface N/A
______ ft. after ______ hrs. pumping ______ G.P.M.
Pumping Test: ☐ Yes (Please enclose) ☐ No
Yield

12. WATER QUALITY N/A
Chemical Analysis ☐ Yes ☐ No Bacterial Analysis ☐ Yes ☐ No
Please Enclose Lab Results.

13. ARTIFICIAL FILTER (Gravel Pack) ☒ Yes ☐ No
Installed from 20.0 ft. to 8.0 ft.
Effective size ______ uniformity coefficient 16/30

14. WELL GROUTED? ☒ Yes ☐ No
Neat Cement ☒ Sand Cement ☐ Concrete ☐ Other ☐
Depth From 6.7 ft. to grade ft.

15. NEAREST SOURCE OF POSSIBLE CONTAMINATION: ______ Feet ______ Direction
______ Type Well disinfected upon completion ☐ Yes ☒ No Type ______ Amount ______

16. PUMP: Date Installed ______ not installed ☒
Mfr. name ______ model no. ______
H.P. ______ volts ______ length of drop pipe ______ ft. capacity ______ gpm
TYPE: ☐ Submersible ☐ Jet (shallow) ☐ Turbine ☐ Jet (deep) ☐ Reciprocating ☐ Centrifugal

17. WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled under my direction and this report is true to the best of my knowledge and belief.
REGISTERED BUSINESS NAME: McClelland Engrs ADDRESS: P.O. Box 740010 Houston, TX 77274
CERT. NO. 588
Signed: [signature] Byars Date
AUTHORIZED REPRESENTATIVE

SUMMARY OF FIELD ANALYTICAL DATA
MARINE CORPS RECRUIT DEPOT
PARRIS ISLAND, SOUTH CAROLINA[a]

Site	Sample Type	Sample Number	Temperature (°C)	pH	Specific Conductivity (umhos/cm)	OVA Readings (ppm)
1	Groundwater	PAI1-GW1-00	15	8.0	>10,000	NA[b]
		PAI1-GW2-00	14	7.5	>10,000	NA
		PAI1-GW3-00	16	8.0	>10,000	NA
		PAI1-GW4-00[c]	15.5/	6.5/	3,000/	NA
			15.5	6.5	2,800	NA
2	Groundwater	PAI2-GW1-00	16	6.0	780	NA
		PAI2-GW2-00	16	6.0	420	NA
		PAI2-GW3-00	16	6.0	3,300	NA
	Surface Water	PAI2-SW1-00	14	6.5	>10,000	NA
3	Shallow Soil	PAI3-SS1-01	NA	NA	NA	1
		PAI3-SS2-01	NA	NA	NA	2.1
		PAI3-SS3-01	NA	NA	NA	2.8
		PAI3-SS4-01	NA	NA	NA	50
		PAI3-SS5-01	NA	NA	NA	500
		PAI3-SS6-01	NA	NA	NA	36
		PAI3-SS7-01	NA	NA	NA	70
		PAI3-SS8-01	NA	NA	NA	200
	Surface Water	PAI3-SW1-00	18/	6.5/	>10,000/	NA
			18	6.5	>10,000	
		PAI3-SW2-00	18	7.0	10,000	NA
		PAI3-SW3-00	19	7.0	>10,000	NA
		PAI3-SW4-00	19	7.0	>10,000	NA
		PAI3-SW5-00	22	6.5	>10,000	NA
		PAI3-SW6-00	21	6.5	>10,000	NA
		PAI3-SW7-00	21	7.0	>10,000	NA
		PAI3-SW8-00	NA	NA	NA	NA
6	Groundwater	PAI6-GW1-00	17	6.0	220	NA
17	Groundwater	PAI17-GW1-00	17	5.5	440	NA
		PAI17-GW2-00	17	6.0	220	NA
		PAI17-GW3-00	18	6.0	440	NA
18	Groundwater	PAI18-GW1-00	17	6.0	3,700	NA
		PAI18-GW2-00	17	5.5	3,400	NA
		PAI18-GW3-00	17	6.0	4,800	NA

[a] Field measurements collected by McClelland Engineers.
[b] NA means not analyzed.
[c] Duplicated Readings.

SUMMARY OF FIELD ANALYTICAL DATA
MARINE CORPS RECRUIT DEPOT
SITE 19
PARRIS ISLAND, SOUTH CAROLINA[a]

Sample Type	Sample Number	Temperature (°C)	pH	Specific Conductivity (umhos/cm)
Groundwater	PAI19-GWC1-00	20	6.0	120
	PAI19-GWC2-00	19	6.0	190
	PAI19-GWC3-00	20	6.0	180

[a] Field measurements collected by McClelland Engineers.

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HOUSTON , TX 77274

DATE: 05/10/88

CONTACT: MR. HARRY DAY

RELEASED BY: for: ALLAN M. CRANE

CC/FC: MCHD/MCHD5

PAGE NO.: 1

PARAMETER	SAMPLE ID	PAI1-GW1-00	PAI1-GW2-00	PAI1-GW3-00	PAI1-GW4-00
	LAB ID	88030972	88030974	88030975	88030976
	SAMPLE TYPE	11	11	11	11
	DATE RECEIVED	03/21/88	03/21/88	03/21/88	03/21/88
	COLLECTED BY	MCHD	MCHD	MCHD	MCHD
TOTAL ORGANIC CARBON		112 ppm	481. ppm	350 ppm	25.5 ppm
CADMIUM - DISSOLVED		<0.010 ppm	<0.010 ppm	<0.010 ppm	<0.010 ppm
CHROMIUM - DISSOLVED		<0.03 ppm	<0.03 ppm	<0.03 ppm	<0.03 ppm
LEAD - DISSOLVED		0.017 ppm	0.015 ppm	0.017 ppm	0.101 ppm
ACID DIGESTION		YES	YES	YES	YES
PP Volatiles by Method 8240					
ACROLEIN		<100 ppb	<100 ppb	<100 ppb	<100 ppb
ACRYLONITRILE		<100 ppb	<100 ppb	<100 ppb	<100 ppb
BENZENE		<5 ppb	<5 ppb	<5 ppb	<5 ppb
BROMOFORM		<10 ppb	<10 ppb	<10 ppb	<10 ppb
CARBON TETRACHLORIDE		<10 ppb	<10 ppb	<10 ppb	<10 ppb
CHLOROBENZENE		<10 ppb	<10 ppb	<10 ppb	<10 ppb
CHLORODIBROMOMETHANE		<10 ppb	<10 ppb	<10 ppb	<10 ppb
CHLOROETHANE		<10 ppb	<10 ppb	<10 ppb	<10 ppb
2-CHLOROETHYL VINYL ETHER		<10 ppb	<10 ppb	<10 ppb	<10 ppb
CHLOROFORM		<10 ppb	<10 ppb	<10 ppb	<10 ppb
DICHLOROBENZENE (1,2)		<10 ppb	<10 ppb	<10 ppb	<10 ppb
DICHLOROBENZENE (1,3)		<10 ppb	<10 ppb	<10 ppb	<10 ppb
DICHLOROBENZENE (1,4)		<10 ppb	<10 ppb	<10 ppb	<10 ppb
DICHLOROBROMOMETHANE		<10 ppb	<10 ppb	<10 ppb	<10 ppb
DICHLORODIFLUOROMETHANE		<10 ppb	<10 ppb	<10 ppb	<10 ppb
DICHLOROETHANE (1,1)		<10 ppb	<10 ppb	<10 ppb	<10 ppb
DICHLOROETHANE (1,2)		<10 ppb	<10 ppb	<10 ppb	<10 ppb
DICHLOROETHYLENE (1,1)		<10 ppb	<10 ppb	<10 ppb	<10 ppb
DICHLOROETHYLENE (1,2-T)		<10 ppb	<10 ppb	<10 ppb	<10 ppb
DICHLOROPROPANE (1,2)		<10 ppb	<10 ppb	<10 ppb	<10 ppb
DICHLOROPROPYLENE (1,2)		<10 ppb	<10 ppb	<10 ppb	<10 ppb
DICHLOROPROPYLENE (1,3)		<10 ppb	<10 ppb	<10 ppb	<10 ppb
ETHYLBENZENE		<10 ppb	<10 ppb	<10 ppb	<10 ppb
METHYL BROMIDE		<10 ppb	<10 ppb	<10 ppb	<10 ppb
METHYL CHLORIDE		<10 ppb	<10 ppb	<10 ppb	<10 ppb
METHYLENE CHLORIDE		<10 ppb	<10 ppb	<10 ppb	<10 ppb
TETRACHLOROETHANE (1,1,2,2)		<10 ppb	<10 ppb	<10 ppb	<10 ppb

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DATE: 05/10/88

CC/FC: MCHD/MCHD5

SAMPLE ID :	PAI1-GW1-00	PAI1-GW2-00	PAI1-GW3-00	PAI1-GW4-00
LAB ID :	88030972	88030974	88030975	88030976
DATE RECEIVED:	03/21/88	03/21/88	03/21/88	03/21/88
TETRACHLOROETHYLENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
TOLUENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
TRICHLOROETHANE (1,1,1)	<10 ppb	<10 ppb	<10 ppb	<10 ppb
TRICHLOROETHANE (1,1,2)	<10 ppb	<10 ppb	<10 ppb	<10 ppb
TRICHLOROETHYLENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
TRICHLOROFLUOROMETHANE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
VINYL CHLORIDE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
PP Acid Ext. by Method 8270				
CHLOROPHENOL (2)	<10 ppb	<10 ppb	<10 ppb	<10 ppb
DICHLOROPHENOL (2,4)	<10 ppb	<10 ppb	<10 ppb	<10 ppb
DINITROPHENOL(2-METHYL-4,6)	<30 ppb	<30 ppb	<30 ppb	<30 ppb
DIMETHYLPHENOL (2,4)	<10 ppb	<10 ppb	<10 ppb	<10 ppb
DINITROPHENOL (2,4)	<45 ppb	<45 ppb	<45 ppb	<45 ppb
NITROPHENOL (2)	<10 ppb	<10 ppb	<10 ppb	<10 ppb
NITROPHENOL (4)	<10 ppb	<10 ppb	<10 ppb	<10 ppb
P-CHLORO-M-CRESOL	<10 ppb	<10 ppb	<10 ppb	<10 ppb
PENTACHLOROPHENOL	<10 ppb	<10 ppb	<10 ppb	<10 ppb
PHENOL	<10 ppb	<10 ppb	<10 ppb	<10 ppb
TRICHLOROPHENOL (2,4,6)	<10 ppb	<10 ppb	<10 ppb	<10 ppb
PP B/N Ext. by Method 8270				
ACENAPHTHENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
BENZIDINE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
BIS (CHLOROMETHYL) ETHER	<10 ppb	<10 ppb	<10 ppb	<10 ppb
BIS (2-CHLOROETHOXY) METHANE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
BIS (2-CHLOROETHYL) ETHER	<10 ppb	<10 ppb	<10 ppb	<10 ppb
BIS (2-CHLOROISOPROPYL) ETHER	<10 ppb	<10 ppb	<10 ppb	<10 ppb
BROMOPHENYL PHENYL ETHER	<10 ppb	<10 ppb	<10 ppb	<10 ppb
CHLOROETHYL VINYL ETHER	<10 ppb	<10 ppb	<10 ppb	<10 ppb
CHLOROPHENYL PHENYL ETHER	<10 ppb	<10 ppb	<10 ppb	<10 ppb
CHLORONAPHTHALENE (2)	<10 ppb	<10 ppb	<10 ppb	<10 ppb
DICHLOROBENZIDINE (3,3')	<10 ppb	<10 ppb	<10 ppb	<10 ppb
DINITROTOLUENE (2,4)	<10 ppb	<10 ppb	<10 ppb	<10 ppb
DINITROTOLUENE (2,6)	<10 ppb	<10 ppb	<10 ppb	<10 ppb
DIPHENYLHYDRAZINE (1,2)	<10 ppb	<10 ppb	<10 ppb	<10 ppb
FLUORANTHENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb

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CONTACT: MR. HARRY DAY

DATE: 05/10/88

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SAMPLE ID :	PAI1-GW1-00	PAI1-GW2-00	PAI1-GW3-00	PAI1-GW4-00
LAB ID :	88030972	88030974	88030975	88030976
DATE RECEIVED:	03/21/88	03/21/88	03/21/88	03/21/88
HEXACHLOROBENZENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
HEXACHLOROBUTADIENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
HEXACHLOROCYCLOPENTADIENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
HEXACHLOROETHANE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
ISOPHORONE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
NAPHTHALENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
NITROBENZENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
N-NITROSODIMETHYLAMINE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
N-NITROSODIPHENYLAMINE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
N-NITROSO-DI-N-PROPYLAMINE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
TRICHLOROBENZENE (1,2,4)	<10 ppb	<10 ppb	<10 ppb	<10 ppb
BIS (2-ETHYLHEXYL) PHTHALATE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
BUTYL BENZYL PHTHALATE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
DIETHYL PHTHALATE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
DIMETHYL PHTHALATE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
DI-N-BUTYL PHTHALATE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
DI-N-OCTYL PHTHALATE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
ACENAPHTHYLENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
ANTHRACENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
BENZO (A) ANTHRACENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
BENZO (B) FLUORANTHENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
BENZO (K) FLUORANTHENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
BENZO (GHI) PERYLENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
BENZO (A) PYRENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
BENZOFLUORANTHENE (3,4)	<10 ppb	<10 ppb	<10 ppb	<10 ppb
CHRYSENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
DIBENZO (A,H) ANTHRACENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
FLUORENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
INDENO (1,2,3-CD) PYRENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
PHENANTHRENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
PYRENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
ALDRIN	<10 ppb	<10 ppb	<10 ppb	<10 ppb
DIELDRIN	<10 ppb	<10 ppb	<10 ppb	<10 ppb
CHLORDANE (TECHNICAL)	<10 ppb	<10 ppb	<10 ppb	<10 ppb
O,P'-DDE	<10 ppb	<10 ppb	<10 ppb	<10 ppb

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LAB ID :	88030972	88030974	88030975	88030976
DATE RECEIVED:	03/21/88	03/21/88	03/21/88	03/21/88
O,P'-DDD	<10 ppb	<10 ppb	<10 ppb	<10 ppb
O,P'-DDT	<10 ppb	<10 ppb	<10 ppb	<10 ppb
P,P'-DDE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
P,P'-DDD	<10 ppb	<10 ppb	<10 ppb	<10 ppb
P,P'-DDT	<10 ppb	<10 ppb	<10 ppb	<10 ppb
ENDOSULFAN I	<10 ppb	<10 ppb	<10 ppb	<10 ppb
ENDOSULFAN II	<10 ppb	<10 ppb	<10 ppb	<10 ppb
ENDOSULFAN SULFATE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
ENDRIN	<10 ppb	<10 ppb	<10 ppb	<10 ppb
ENDRIN ALDEHYDE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
HEPTACHLOR	<10 ppb	<10 ppb	<10 ppb	<10 ppb
HEPTACHLOR EPOXIDE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
A-BHC	<10 ppb	<10 ppb	<10 ppb	<10 ppb
B-BHC	<10 ppb	<10 ppb	<10 ppb	<10 ppb
LINDANE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
D-BHC	<10 ppb	<10 ppb	<10 ppb	<10 ppb
TOXAPHENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
AROCLOR 1016	<150 ppb	<150 ppb	<150 ppb	<150 ppb
AROCLOR 1221	<150 ppb	<150 ppb	<150 ppb	<150 ppb
AROCLOR 1232	<150 ppb	<150 ppb	<150 ppb	<150 ppb
AROCLOR 1242	<150 ppb	<150 ppb	<150 ppb	<150 ppb
AROCLOR 1248	<150 ppb	<150 ppb	<150 ppb	<150 ppb
AROCLOR 1254	<150 ppb	<150 ppb	<150 ppb	<150 ppb
AROCLOR 1260	<150 ppb	<150 ppb	<150 ppb	<150 ppb
AROCLOR 1262	<150 ppb	<150 ppb	<150 ppb	<150 ppb
EXTRACTION & CONCENTRATION	YES	YES	YES	YES

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SAMPLE ID : PA11-GW1-00B

LAB ID : 88030973
SAMPLE TYPE : 11
DATE RECEIVED: 03/21/88
COLLECTED BY : MCHD

PARAMETER	
PP Volatiles by Method 8240	
ACROLEIN	<100 ppb
ACRYLONITRILE	<100 ppb
BENZENE	<5 ppb
BROMOFORM	<10 ppb
CARBON TETRACHLORIDE	<10 ppb
CHLOROBENZENE	<10 ppb
CHLORODIBROMOMETHANE	<10 ppb
CHLOROETHANE	<10 ppb
2-CHLOROETHYL VINYL ETHER	<10 ppb
CHLOROFORM	<10 ppb
DICHLOROBENZENE (1,2)	<10 ppb
DICHLOROBENZENE (1,3)	<10 ppb
DICHLOROBENZENE (1,4)	<10 ppb
DICHLOROBROMOMETHANE	<10 ppb
DICHLORODIFLUOROMETHANE	<10 ppb
DICHLOROETHANE (1,1)	<10 ppb
DICHLOROETHANE (1,2)	<10 ppb
DICHLOROETHYLENE (1,1)	<10 ppb
DICHLOROETHYLENE (1,2-T)	<10 ppb
DICHLOROPROPANE (1,2)	<10 ppb
DICHLOROPROPYLENE (1,2)	<10 ppb
DICHLOROPROPYLENE (1,3)	<10 ppb
ETHYLBENZENE	<10 ppb
METHYL BROMIDE	<10 ppb
METHYL CHLORIDE	<10 ppb
METHYLENE CHLORIDE	<10 ppb
TETRACHLOROETHANE (1,1,2,2)	<10 ppb
TETRACHLOROETHYLENE	<10 ppb
TOLUENE	<10 ppb
TRICHLOROETHANE (1,1,1)	<10 ppb
TRICHLOROETHANE (1,1,2)	<10 ppb
TRICHLOROETHYLENE	<10 ppb

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DATE: 05/10/88

CC/FC: MCHD/MCHD5

SAMPLE ID : PA11-GW1-00B

LAB ID : 88030973
DATE RECEIVED: 03/21/88

TRICHLOROFLUOROMETHANE	<10 ppb
VINYL CHLORIDE	<10 ppb

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DATE: 05/10/88

CONTACT: MR. HARRY DAY

RELEASED BY: for: ALLAN M. CRANE

CC/FC: MCHD/MCHD5

SAMPLE ID : PA11-GW4-00B

LAB ID : 88030978
SAMPLE TYPE : 11
DATE RECEIVED: 03/21/88
COLLECTED BY : MCHD

PARAMETER	
PP Volatiles by Method 8240	
ACROLEIN	<100 ppb
ACRYLONITRILE	<100 ppb
BENZENE	<5 ppb
BROMOFORM	<10 ppb
CARBON TETRACHLORIDE	<10 ppb
CHLOROBENZENE	<10 ppb
CHLORODIBROMOMETHANE	<10 ppb
CHLOROETHANE	<10 ppb
2-CHLOROETHYL VINYL ETHER	<10 ppb
CHLOROFORM	<10 ppb
DICHLOROBENZENE (1,2)	<10 ppb
DICHLOROBENZENE (1,3)	<10 ppb
DICHLOROBENZENE (1,4)	<10 ppb
DICHLOROBROMOMETHANE	<10 ppb
DICHLORODIFLUOROMETHANE	<10 ppb
DICHLOROETHANE (1,1)	<10 ppb
DICHLOROETHANE (1,2)	<10 ppb
DICHLOROETHYLENE (1,1)	<10 ppb
DICHLOROETHYLENE (1,2-T)	<10 ppb
DICHLOROPROPANE (1,2)	<10 ppb
DICHLOROPROPYLENE (1,2)	<10 ppb
DICHLOROPROPYLENE (1,3)	<10 ppb
ETHYLBENZENE	<10 ppb
METHYL BROMIDE	<10 ppb
METHYL CHLORIDE	<10 ppb
METHYLENE CHLORIDE	<10 ppb
TETRACHLOROETHANE (1,1,2,2)	<10 ppb
TETRACHLOROETHYLENE	<10 ppb
TOLUENE	<10 ppb
TRICHLOROETHANE (1,1,1)	<10 ppb
TRICHLOROETHANE (1,1,2)	<10 ppb
TRICHLOROETHYLENE	<10 ppb

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CERTIFICATE OF ANALYSIS

CLIENT: McCLELLAND ENGINEERS
P.O. BOX 740010
HOUSTON , TX 77274
CONTACT: MR. HARRY DAY

DATE: 05/10/88

CC/FC: MCHD/MCHD5

SAMPLE ID : PAII-GW4-00B

LAB ID : 88030978
DATE RECEIVED: 03/21/88

TRICHLOROFLUOROMETHANE	<10 ppb
VINYL CHLORIDE	<10 ppb

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CONTACT: MR. HARRY DAY

DATE: 05/10/88

RELEASED BY: for: ALLAN M. CRANE

CC/FC: MCHD/MCHD5

PAGE NO.: 1

SAMPLE ID	: PAI1-GW4-00D
LAB ID	: 88030977
SAMPLE TYPE	: 11
DATE RECEIVED	: 03/21/88
COLLECTED BY	: MCHD

PARAMETER	
TOTAL ORGANIC CARBON	31.2 ppm
PP Volatiles by Method 8240	
ACROLEIN	<100 ppb
ACRYLONITRILE	<100 ppb
BENZENE	<5 ppb
BROMOFORM	<10 ppb
CARBON TETRACHLORIDE	<10 ppb
CHLOROBENZENE	<10 ppb
CHLORODIBROMOMETHANE	<10 ppb
CHLOROETHANE	<10 ppb
2-CHLOROETHYL VINYL ETHER	<10 ppb
CHLOROFORM	<10 ppb
DICHLOROBENZENE (1,2)	<10 ppb
DICHLOROBENZENE (1,3)	<10 ppb
DICHLOROBENZENE (1,4)	<10 ppb
DICHLOROBROMOMETHANE	<10 ppb
DICHLORODIFLUOROMETHANE	<10 ppb
DICHLOROETHANE (1,1)	<10 ppb
DICHLOROETHANE (1,2)	<10 ppb
DICHLOROETHYLENE (1,1)	<10 ppb
DICHLOROETHYLENE (1,2-T)	<10 ppb
DICHLOROPROPANE (1,2)	<10 ppb
DICHLOROPROPYLENE (1,2)	<10 ppb
DICHLOROPROPYLENE (1,3)	<10 ppb
ETHYLBENZENE	<10 ppb
METHYL BROMIDE	<10 ppb
METHYL CHLORIDE	<10 ppb
METHYLENE CHLORIDE	<10 ppb
TETRACHLOROETHANE (1,1,2,2)	<10 ppb
TETRACHLOROETHYLENE	<10 ppb
TOLUENE	<10 ppb
TRICHLOROETHANE (1,1,1)	<10 ppb
TRICHLOROETHANE (1,1,2)	<10 ppb

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SAMPLE ID : PA11-GW4-00D

LAB ID : 88030977
DATE RECEIVED: 03/21/88

TRICHLOROETHYLENE	<10 ppb
TRICHLOROFLUOROMETHANE	<10 ppb
VINYL CHLORIDE	<10 ppb
PP Acid Ext. by Method 8270	
CHLOROPHENOL (2)	<10 ppb
DICHLOROPHENOL (2,4)	<10 ppb
DINITROPHENOL(2-METHYL-4,6)	<30 ppb
DIMETHYLPHENOL (2,4)	<10 ppb
DINITROPHENOL (2,4)	<45 ppb
NITROPHENOL (2)	<10 ppb
NITROPHENOL (4)	<10 ppb
P-CHLORO-M-CRESOL	<10 ppb
PENTACHLOROPHENOL	<10 ppb
PHENOL	<10 ppb
TRICHLOROPHENOL (2,4,6)	<10 ppb
PP B/N Ext. by Method 8270	
ACENAPHTHENE	<10 ppb
BENZIDINE	<10 ppb
BIS (CHLOROMETHYL) ETHER	<10 ppb
BIS (2-CHLOROETHOXY) METHANE	<10 ppb
BIS (2-CHLOROETHYL) ETHER	<10 ppb
BIS (2-CHLOROISOPROPYL) ETHER	<10 ppb
BROMOPHENYL PHENYL ETHER	<10 ppb
CHLOROETHYL VINYL ETHER	<10 ppb
CHLOROPHENYL PHENYL ETHER	<10 ppb
CHLORONAPHTHALENE (2)	<10 ppb
DICHLOROBENZIDINE (3,3')	<10 ppb
DINITROTOLUENE (2,4)	<10 ppb
DINITROTOLUENE (2,6)	<10 ppb
DIPHENYLHYDRAZINE (1,2)	<10 ppb
FLUORANTHENE	<10 ppb
HEXACHLOROBENZENE	<10 ppb
HEXACHLOROBUTADIENE	<10 ppb
HEXACHLOROCYCLOPENTADIENE	<10 ppb
HEXACHLOROETHANE	<10 ppb

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LAB ID : 88030977
DATE RECEIVED: 03/21/88

ISOPHORONE	<10 ppb
NAPHTHALENE	<10 ppb
NITROBENZENE	<10 ppb
N-NITROSODIMETHYLAMINE	<10 ppb
N-NITROSODIPHENYLAMINE	<10 ppb
N-NITROSO-DI-N-PROPYLAMINE	<10 ppb
TRICHLOROBENZENE (1,2,4)	<10 ppb
BIS (2-ETHYLHEXYL) PHTHALATE	<10 ppb
BUTYL BENZYL PHTHALATE	<10 ppb
DIETHYL PHTHALATE	<10 ppb
DIMETHYL PHTHALATE	<10 ppb
DI-N-BUTYL PHTHALATE	<10 ppb
DI-N-OCTYL PHTHALATE	<10 ppb
ACENAPHTHYLENE	<10 ppb
ANTHRACENE	<10 ppb
BENZO (A) ANTHRACENE	<10 ppb
BENZO (B) FLUORANTHENE	<10 ppb
BENZO (K) FLUORANTHENE	<10 ppb
BENZO (GHI) PERYLENE	<10 ppb
BENZO (A) PYRENE	<10 ppb
BENZOFLUORANTHENE (3,4)	<10 ppb
CHRYSENE	<10 ppb
DIBENZO (A,H) ANTHRACENE	<10 ppb
FLUORENE	<10 ppb
INDENO (1,2,3-CD) PYRENE	<10 ppb
PHENANTHRENE	<10 ppb
PYRENE	<10 ppb
ALDRIN	<10 ppb
DIELDRIN	<10 ppb
CHLORDANE (TECHNICAL)	<10 ppb
O,P'-DDE	<10 ppb
O,P'-DDD	<10 ppb
O,P'-DDT	<10 ppb
P,P'-DDE	<10 ppb
P,P'-DDD	<10 ppb

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CC/FC: MCHD/MCHD5 PAGE NO.: 4

SAMPLE ID : PA11-GW4-00D

LAB ID : 88030977
DATE RECEIVED: 03/21/88

P,P'-DDT	<10 ppb
ENDOSULFAN I	<10 ppb
ENDOSULFAN II	<10 ppb
ENDOSULFAN SULFATE	<10 ppb
ENDRIN	<10 ppb
ENDRIN ALDEHYDE	<10 ppb
HEPTACHLOR	<10 ppb
HEPTACHLOR EPOXIDE	<10 ppb
A-BHC	<10 ppb
B-BHC	<10 ppb
LINDANE	<10 ppb
D-BHC	<10 ppb
TOXAPHENE	<10 ppb
AROCLOR 1016	<150 ppb
AROCLOR 1221	<150 ppb
AROCLOR 1232	<150 ppb
AROCLOR 1242	<150 ppb
AROCLOR 1248	<150 ppb
AROCLOR 1254	<150 ppb
AROCLOR 1260	<150 ppb
AROCLOR 1262	<150 ppb
EXTRACTION & CONCENTRATION	YES

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RELEASED BY: for ALLAN M. CRANE

CC/FC: MCHD/EPTM4

PAGE NO.: 1

PARAMETER	SAMPLE ID	PAI1-SS1-01	PAI1-SS2-01	PAI1-SS3-01
	LAB ID	88030920	88030921	88030922
	SAMPLE TYPE	15	15	15
	DATE RECEIVED	03/18/88	03/18/88	03/18/88
	COLLECTED BY	MCHD	MCHD	MCHD
ARSENIC		<1.00 ppm	<1.00 ppm	<1.00 ppm
CADMIUM		<0.50 ppm	<0.50 ppm	<0.50 ppm
CHROMIUM		<1.00 ppm	<1.00 ppm	<1.00 ppm
LEAD		<1.00 ppm	<1.00 ppm	<1.00 ppm
MERCURY		<0.20 ppm	<0.20 ppm	<0.20 ppm
EP TOX EXTRACTION-SOLID		YES	YES	YES
DIGESTION FOR MERCURY ANALYSIS		YES	YES	YES

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CONTACT: MR. HARRY DAY

RELEASED BY: for ALLAN M. CRANE

CC/FC: MCHD/MCHD2

PARAMETER	SAMPLE ID	PAI1-SS1-01	PAI1-SS2-01	PAI1-SS3-01
	LAB ID	88030916	88030917	88030918
	SAMPLE TYPE	15	15	15
	DATE RECEIVED	03/18/88	03/18/88	03/18/88
	COLLECTED BY	MCHD	MCHD	MCHD
ARSENIC		1.52 ppm	0.36 ppm	1.46 ppm
BARIUM		16.8 ppm	3.50 ppm	45.3 ppm
BERYLLIUM		<0.20 ppm	<0.20 ppm	<0.20 ppm
CADMIUM		<0.10 ppm	0.10 ppm	0.14 ppm
CHROMIUM		5.30 ppm	2.52 ppm	4.82 ppm
CHROMIUM - HEXAVALENT		0.01 ppm	0.01 ppm	<0.01 ppm
LEAD		204 ppm	13.6 ppm	97.8 ppm
MERCURY		<0.2 ppm	<0.2 ppm	<0.2 ppm
SELENIUM		<0.20 ppm	<0.20 ppm	<0.20 ppm
SILVER		<1.00 ppm	<1.00 ppm	<1.00 ppm
HEX. CHROMIUM EXTRACTION		YES	YES	YES
DIGESTION FOR MERCURY ANALYSIS		YES	YES	YES
ACID DIGESTION		YES	YES	YES
PP Volatiles by Method 8240				
ACROLEIN		<100 ppb	<100 ppb	<100 ppb
ACRYLONITRILE		<100 ppb	<100 ppb	<100 ppb
BENZENE		<5 ppb	16 ppb	<5 ppb
BROMOFORM		<10 ppb	<10 ppb	<10 ppb
CARBON TETRACHLORIDE		<10 ppb	<10 ppb	<10 ppb
CHLOROBENZENE		<10 ppb	<10 ppb	<10 ppb
CHLORODIBROMOMETHANE		<10 ppb	<10 ppb	<10 ppb
CHLOROETHANE		<10 ppb	<10 ppb	<10 ppb
2-CHLOROETHYL VINYL ETHER		<10 ppb	<10 ppb	<10 ppb
CHLOROFORM		352 ppb	215 ppb	<10 ppb
DICHLOROBENZENE (1,2)		<10 ppb	<10 ppb	<10 ppb
DICHLOROBENZENE (1,3)		<10 ppb	<10 ppb	<10 ppb
DICHLOROBENZENE (1,4)		<10 ppb	<10 ppb	<10 ppb
DICHLOROBROMOMETHANE		<10 ppb	<10 ppb	<10 ppb
DICHLORODIFLUOROMETHANE		<10 ppb	<10 ppb	<10 ppb
DICHLOROETHANE (1,1)		<10 ppb	<10 ppb	<10 ppb
DICHLOROETHANE (1,2)		<10 ppb	<10 ppb	<10 ppb
DICHLOROETHYLENE (1,1)		<10 ppb	<10 ppb	<10 ppb
DICHLOROETHYLENE (1,2-T)		<10 ppb	<10 ppb	<10 ppb

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DATE: 05/10/88

CC/FC: MCHD/MCHD2

SAMPLE ID :	PAI1-SS1-01	PAI1-SS2-01	PAI1-SS3-01
LAB ID :	88030916	88030917	88030918
DATE RECEIVED:	03/18/88	03/18/88	03/18/88
DICHLOROPROPANE (1,2)	<10 ppb	<10 ppb	<10 ppb
DICHLOROPROPYLENE (1,2)	<10 ppb	<10 ppb	<10 ppb
DICHLOROPROPYLENE (1,3)	<10 ppb	<10 ppb	<10 ppb
ETHYLBENZENE	<10 ppb	<10 ppb	<10 ppb
METHYL BROMIDE	<10 ppb	<10 ppb	<10 ppb
METHYL CHLORIDE	<10 ppb	<10 ppb	<10 ppb
METHYLENE CHLORIDE	<10 ppb	<10 ppb	<10 ppb
TETRACHLOROETHANE (1,1,2,2)	<10 ppb	<10 ppb	<10 ppb
TETRACHLOROETHYLENE	<10 ppb	<10 ppb	<10 ppb
TOLUENE	<10 ppb	<10 ppb	<10 ppb
TRICHLOROETHANE (1,1,1)	<10 ppb	<10 ppb	<10 ppb
TRICHLOROETHANE (1,1,2)	<10 ppb	<10 ppb	<10 ppb
TRICHLOROETHYLENE	<10 ppb	<10 ppb	<10 ppb
TRICHLOROFLUOROMETHANE	<10 ppb	<10 ppb	<10 ppb
VINYL CHLORIDE	<10 ppb	<10 ppb	<10 ppb
PP Acid Ext. by Method 8270			
CHLOROPHENOL (2)	<330 ppb	<330 ppb	<330 ppb
DICHLOROPHENOL (2,4)	<330 ppb	<330 ppb	<330 ppb
DINITROPHENOL(2-METHYL-4,6)	<990 ppb	<990 ppb	<990 ppb
DIMETHYLPHENOL (2,4)	<330 ppb	<330 ppb	<330 ppb
DINITROPHENOL (2,4)	<1490 ppb	<1490 ppb	<1490 ppb
NITROPHENOL (2)	<330 ppb	<330 ppb	<330 ppb
NITROPHENOL (4)	<330 ppb	<330 ppb	<330 ppb
P-CHLORO-M-CRESOL	<330 ppb	<330 ppb	<330 ppb
PENTACHLOROPHENOL	<330 ppb	<330 ppb	<330 ppb
PHENOL	<330 ppb	<330 ppb	<330 ppb
TRICHLOROPHENOL (2,4,6)	<330 ppb	<330 ppb	<330 ppb
PP B/N Ext. by Method 8270			
ACENAPHTHENE	<330 ppb	<330 ppb	<330 ppb
BENZIDINE	<330 ppb	<330 ppb	<330 ppb
BIS (CHLOROMETHYL) ETHER	<330 ppb	<330 ppb	<330 ppb
BIS (2-CHLOROETHOXY) METHANE	<330 ppb	<330 ppb	<330 ppb
BIS (2-CHLOROETHYL) ETHER	<330 ppb	<330 ppb	<330 ppb
BIS (2-CHLOROISOPROPYL) ETHER	<330 ppb	<330 ppb	<330 ppb
BROMOPHENYL PHENYL ETHER	<330 ppb	<330 ppb	<330 ppb

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SAMPLE ID	PAI1-SS1-01	PAI1-SS2-01	PAI1-SS3-01
LAB ID	88030916	88030917	88030918
DATE RECEIVED:	03/18/88	03/18/88	03/18/88
CHLOROETHYL VINYL ETHER	<330 ppb	<330 ppb	<330 ppb
CHLOROPHENYL PHENYL ETHER	<330 ppb	<330 ppb	<330 ppb
CHLORONAPHTHALENE (2)	<330 ppb	<330 ppb	<330 ppb
DICHLOROBENZIDINE (3,3')	<330 ppb	<330 ppb	<330 ppb
DINITROTOLUENE (2,4)	<330 ppb	<330 ppb	<330 ppb
DINITROTOLUENE (2,6)	<330 ppb	<330 ppb	<330 ppb
DIPHENYLHYDRAZINE (1,2)	<330 ppb	<330 ppb	<330 ppb
FLUORANTHENE	<330 ppb	<330 ppb	<330 ppb
HEXACHLOROBENZENE	<330 ppb	<330 ppb	<330 ppb
HEXACHLOROBUTADIENE	<330 ppb	<330 ppb	<330 ppb
HEXACHLOROCYCLOPENTADIENE	<330 ppb	<330 ppb	<330 ppb
HEXACHLOROETHANE	<330 ppb	<330 ppb	<330 ppb
ISOPHORONE	<330 ppb	<330 ppb	<330 ppb
NAPHTHALENE	<330 ppb	<330 ppb	<330 ppb
NITROBENZENE	<330 ppb	<330 ppb	<330 ppb
N-NITROSODIMETHYLAMINE	<330 ppb	<330 ppb	<330 ppb
N-NITROSODIPHENYLAMINE	<330 ppb	<330 ppb	<330 ppb
N-NITROSO-DI-N-PROPYLAMINE	<330 ppb	<330 ppb	<330 ppb
TRICHLOROBENZENE (1,2,4)	<330 ppb	<330 ppb	<330 ppb
BIS (2-ETHYLHEXYL) PHTHALATE	<330 ppb	<330 ppb	<330 ppb
BUTYL BENZYL PHTHALATE	<330 ppb	<330 ppb	<330 ppb
DIETHYL PHTHALATE	<330 ppb	<330 ppb	<330 ppb
DIMETHYL PHTHALATE	<330 ppb	<330 ppb	<330 ppb
DI-N-BUTYL PHTHALATE	<330 ppb	<330 ppb	<330 ppb
DI-N-OCTYL PHTHALATE	<330 ppb	<330 ppb	<330 ppb
ACENAPHTHYLENE	<330 ppb	<330 ppb	<330 ppb
ANTHRACENE	<330 ppb	<330 ppb	<330 ppb
BENZO (A) ANTHRACENE	<330 ppb	<330 ppb	<330 ppb
BENZO (B) FLUORANTHENE	<330 ppb	<330 ppb	<330 ppb
BENZO (K) FLUORANTHENE	<330 ppb	<330 ppb	<330 ppb
BENZO (GHI) PERYLENE	<330 ppb	<330 ppb	<330 ppb
BENZO (A) PYRENE	<330 ppb	<330 ppb	<330 ppb
BENZOFLUORANTHENE (3,4)	<330 ppb	<330 ppb	<330 ppb
CHRYSENE	<330 ppb	<330 ppb	<330 ppb
DIBENZO (A,H) ANTHRACENE	<330 ppb	<330 ppb	<330 ppb

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SAMPLE ID :	PAI1-SS1-01	PAI1-SS2-01	PAI1-SS3-01
LAB ID :	88030916	88030917	88030918
DATE RECEIVED:	03/18/88	03/18/88	03/18/88
FLUORENE	<330 ppb	<330 ppb	<330 ppb
INDENO (1,2,3-CD) PYRENE	<330 ppb	<330 ppb	<330 ppb
PHENANTHRENE	<330 ppb	<330 ppb	<330 ppb
PYRENE	<330 ppb	<330 ppb	<330 ppb
ALDRIN	<330 ppb	<330 ppb	<330 ppb
DIELDRIN	<330 ppb	<330 ppb	<330 ppb
CHLORDANE (TECHNICAL)	<330 ppb	<330 ppb	<330 ppb
O,P'-DDE	<330 ppb	<330 ppb	<330 ppb
O,P'-DDD	<330 ppb	<330 ppb	<330 ppb
O,P'-DDT	<330 ppb	<330 ppb	<330 ppb
P,P'-DDE	<330 ppb	<330 ppb	<330 ppb
P,P'-DDD	<330 ppb	<330 ppb	<330 ppb
P,P'-DDT	<330 ppb	<330 ppb	<330 ppb
ENDOSULFAN I	<330 ppb	<330 ppb	<330 ppb
ENDOSULFAN II	<330 ppb	<330 ppb	<330 ppb
ENDOSULFAN SULFATE	<330 ppb	<330 ppb	<330 ppb
ENDRIN	<330 ppb	<330 ppb	<330 ppb
ENDRIN ALDEHYDE	<330 ppb	<330 ppb	<330 ppb
HEPTACHLOR	<330 ppb	<330 ppb	<330 ppb
HEPTACHLOR EPOXIDE	<330 ppb	<330 ppb	<330 ppb
A-BHC	<330 ppb	<330 ppb	<330 ppb
B-BHC	<330 ppb	<330 ppb	<330 ppb
LINDANE	<330 ppb	<330 ppb	<330 ppb
D-BHC	<330 ppb	<330 ppb	<330 ppb
TOXAPHENE	<330 ppb	<330 ppb	<330 ppb
AROCLOR 1016	<450 ppb	<450 ppb	<450 ppb
AROCLOR 1221	<450 ppb	<450 ppb	<450 ppb
AROCLOR 1232	<450 ppb	<450 ppb	<450 ppb
AROCLOR 1242	<450 ppb	<450 ppb	<450 ppb
AROCLOR 1248	<450 ppb	<450 ppb	<450 ppb
AROCLOR 1254	<450 ppb	<450 ppb	<450 ppb
AROCLOR 1260	<450 ppb	<450 ppb	<450 ppb
AROCLOR 1262	<450 ppb	<450 ppb	<450 ppb
% WATER (KARL-FISCHER TIT.)	63.3 wt%	50.0 wt%	51.5 wt%
EXTRACTION & CONCENTRATION	YES	YES	YES

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Laboratory Certifications:

FL	E87156/87294
NC	233
SC	10120
VA	00151
NACIP	Approved

CERTIFICATE OF ANALYSIS

CLIENT: McCLELLAND ENGINEERS
P.O. BOX 740010
HOUSTON , TX 77274

DATE: 05/10/88

CONTACT: MR. HARRY DAY

RELEASED BY: for ALLAN M. CRANE

CC/FC: MCHD/MCHD3

PARAMETER	SAMPLE ID	PAI2-GW1-00	PAI2-GW2-00	PAI2-GW3-00
	LAB ID	88030925	88030926	88030928
	SAMPLE TYPE	11	11	11
	DATE RECEIVED	03/18/88	03/18/88	03/18/88
	COLLECTED BY	MCHD	MCHD	MCHD
TOTAL ORGANIC CARBON		23.4 ppm	56.4 ppm	9.91 ppm
ARSENIC - DISSOLVED		0.007 ppm	0.007 ppm	<0.005 ppm
BARIUM - DISSOLVED		0.11 ppm	0.10 ppm	0.14 ppm
CADMIUM - DISSOLVED		<0.010 ppm	<0.010 ppm	<0.010 ppm
CHROMIUM - DISSOLVED		<0.03 ppm	<0.03 ppm	0.10 ppm
LEAD - DISSOLVED		0.073 ppm	0.015 ppm	0.011 ppm
MERCURY - DISSOLVED		<0.5 ppb	<0.5 ppb	0.0010 ppm
SELENIUM - DISSOLVED		<0.005 ppm	<0.005 ppm	<0.005 ppm
SILVER - DISSOLVED		<0.05 ppm	<0.05 ppm	<0.05 ppm
BERYLLIUM - DISSOLVED		<0.010 ppm	<0.010 ppm	<0.010 ppm
HEX. CHROMIUM - DISSOLVED		<0.01 ppm	<0.01 ppm	<0.01 ppm
HEX. CHROMIUM EXTRACTION		YES	YES	YES
DIGESTION FOR MERCURY ANALYSIS		YES	YES	YES
ACID DIGESTION		YES	YES	YES
PP Volatiles by Method 8240				
ACROLEIN		<100 ppb	<100 ppb	<100 ppb
ACRYLONITRILE		<100 ppb	<100 ppb	<100 ppb
BENZENE		<5 ppb	<5 ppb	<5 ppb
BROMOFORM		<10 ppb	<10 ppb	<10 ppb
CARBON TETRACHLORIDE		<10 ppb	<10 ppb	<10 ppb
CHLOROBENZENE		<10 ppb	<10 ppb	<10 ppb
CHLORODIBROMOMETHANE		<10 ppb	<10 ppb	<10 ppb
CHLOROETHANE		<10 ppb	<10 ppb	<10 ppb
2-CHLOROETHYL VINYL ETHER		<10 ppb	<10 ppb	<10 ppb
CHLOROFORM		<10 ppb	<10 ppb	12 ppb
DICHLOROBENZENE (1,2)		<10 ppb	<10 ppb	<10 ppb
DICHLOROBENZENE (1,3)		<10 ppb	<10 ppb	<10 ppb
DICHLOROBENZENE (1,4)		<10 ppb	<10 ppb	<10 ppb
DICHLOROBROMOMETHANE		<10 ppb	<10 ppb	<10 ppb
DICHLORODIFLUOROMETHANE		<10 ppb	<10 ppb	<10 ppb
DICHLOROETHANE (1,1)		<10 ppb	<10 ppb	<10 ppb
DICHLOROETHANE (1,2)		20 ppb	<10 ppb	<10 ppb
DICHLOROETHYLENE (1,1)		<10 ppb	<10 ppb	<10 ppb

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CONTACT: MR. HARRY DAY

DATE: 05/10/88

CC/FC: MCHD/MCHD3

SAMPLE ID :	PAI2-GW1-00	PAI2-GW2-00	PAI2-GW3-00
LAB ID :	88030925	88030926	88030928
DATE RECEIVED:	03/18/88	03/18/88	03/18/88
DICHLOROETHYLENE (1,2-T)	<10 ppb	<10 ppb	<10 ppb
DICHLOROPROPANE (1,2)	<10 ppb	<10 ppb	<10 ppb
DICHLOROPROPYLENE (1,2)	<10 ppb	<10 ppb	<10 ppb
DICHLOROPROPYLENE (1,3)	<10 ppb	<10 ppb	<10 ppb
ETHYLBENZENE	<10 ppb	<10 ppb	<10 ppb
METHYL BROMIDE	<10 ppb	<10 ppb	<10 ppb
METHYL CHLORIDE	<10 ppb	<10 ppb	<10 ppb
METHYLENE CHLORIDE	<10 ppb	<10 ppb	<10 ppb
TETRACHLOROETHANE (1,1,2,2)	<10 ppb	<10 ppb	<10 ppb
TETRACHLOROETHYLENE	<10 ppb	<10 ppb	<10 ppb
TOLUENE	<10 ppb	<10 ppb	<10 ppb
TRICHLOROETHANE (1,1,1)	<10 ppb	<10 ppb	<10 ppb
TRICHLOROETHANE (1,1,2)	<10 ppb	<10 ppb	<10 ppb
TRICHLOROETHYLENE	<10 ppb	<10 ppb	<10 ppb
TRICHLOROFLUOROMETHANE	<10 ppb	<10 ppb	<10 ppb
VINYL CHLORIDE	<10 ppb	<10 ppb	<10 ppb
PP Acid Ext. by Method 8270			
CHLOROPHENOL (2)	<10 ppb	<10 ppb	<10 ppb
DICHLOROPHENOL (2,4)	<10 ppb	<10 ppb	<10 ppb
DINITROPHENOL(2-METHYL-4,6)	<30 ppb	<30 ppb	<30 ppb
DIMETHYLPHENOL (2,4)	<10 ppb	<10 ppb	<10 ppb
DINITROPHENOL (2,4)	<45 ppb	<45 ppb	<45 ppb
NITROPHENOL (2)	<10 ppb	<10 ppb	<10 ppb
NITROPHENOL (4)	<10 ppb	<10 ppb	<10 ppb
P-CHLORO-M-CRESOL	<10 ppb	<10 ppb	<10 ppb
PENTACHLOROPHENOL	<10 ppb	<10 ppb	<10 ppb
PHENOL	<10 ppb	<10 ppb	<10 ppb
TRICHLOROPHENOL (2,4,6)	<10 ppb	<10 ppb	<10 ppb
PP B/N Ext. by Method 8270			
ACENAPHTHENE	<10 ppb	<10 ppb	<10 ppb
BENZIDINE	<10 ppb	<10 ppb	<10 ppb
BIS (CHLOROMETHYL) ETHER	<10 ppb	<10 ppb	<10 ppb
BIS (2-CHLOROETHOXY) METHANE	<10 ppb	<10 ppb	<10 ppb
BIS (2-CHLOROETHYL) ETHER	<10 ppb	<10 ppb	<10 ppb
BIS (2-CHLOROISOPROPYL) ETHER	<10 ppb	<10 ppb	<10 ppb

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DATE: 05/10/88

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SAMPLE ID :	PAI2-GW1-00	PAI2-GW2-00	PAI2-GW3-00
LAB ID :	88030925	88030926	88030928
DATE RECEIVED:	03/18/88	03/18/88	03/18/88
BROMOPHENYL PHENYL ETHER	<10 ppb	<10 ppb	<10 ppb
CHLOROETHYL VINYL ETHER	<10 ppb	<10 ppb	<10 ppb
CHLOROPHENYL PHENYL ETHER	<10 ppb	<10 ppb	<10 ppb
CHLORONAPHTHALENE (2)	<10 ppb	<10 ppb	<10 ppb
DICHLOROBENZIDINE (3,3')	<10 ppb	<10 ppb	<10 ppb
DINITROTOLUENE (2,4)	<10 ppb	<10 ppb	<10 ppb
DINITROTOLUENE (2,6)	<10 ppb	<10 ppb	<10 ppb
DIPHENYLHYDRAZINE (1,2)	<10 ppb	<10 ppb	<10 ppb
FLUORANTHENE	<10 ppb	<10 ppb	<10 ppb
HEXACHLOROBENZENE	<10 ppb	<10 ppb	<10 ppb
HEXACHLOROBUTADIENE	<10 ppb	<10 ppb	<10 ppb
HEXACHLOROCYCLOPENTADIENE	<10 ppb	<10 ppb	<10 ppb
HEXACHLOROETHANE	<10 ppb	<10 ppb	<10 ppb
ISOPHORONE	<10 ppb	<10 ppb	<10 ppb
NAPHTHALENE	<10 ppb	<10 ppb	<10 ppb
NITROBENZENE	<10 ppb	<10 ppb	<10 ppb
N-NITROSODIMETHYLAMINE	<10 ppb	<10 ppb	<10 ppb
N-NITROSODIPHENYLAMINE	<10 ppb	<10 ppb	<10 ppb
N-NITROSO-DI-N-PROPYLAMINE	<10 ppb	<10 ppb	<10 ppb
TRICHLOROBENZENE (1,2,4)	<10 ppb	<10 ppb	<10 ppb
BIS (2-ETHYLHEXYL) PHTHALATE	<10 ppb	<10 ppb	<10 ppb
BUTYL BENZYL PHTHALATE	<10 ppb	<10 ppb	<10 ppb
DIETHYL PHTHALATE	<10 ppb	<10 ppb	<10 ppb
DIMETHYL PHTHALATE	<10 ppb	<10 ppb	<10 ppb
DI-N-BUTYL PHTHALATE	<10 ppb	<10 ppb	<10 ppb
DI-N-OCTYL PHTHALATE	<10 ppb	<10 ppb	<10 ppb
ACENAPHTHYLENE	<10 ppb	<10 ppb	<10 ppb
ANTHRACENE	<10 ppb	<10 ppb	<10 ppb
BENZO (A) ANTHRACENE	<10 ppb	<10 ppb	<10 ppb
BENZO (B) FLUORANTHENE	<10 ppb	<10 ppb	<10 ppb
BENZO (K) FLUORANTHENE	<10 ppb	<10 ppb	<10 ppb
BENZO (GHI) PERYLENE	<10 ppb	<10 ppb	<10 ppb
BENZO (A) PYRENE	<10 ppb	<10 ppb	<10 ppb
BENZOFLUORANTHENE (3,4)	<10 ppb	<10 ppb	<10 ppb
CHRYSENE	<10 ppb	<10 ppb	<10 ppb

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DATE: 05/10/88

CC/FC: MCHD/MCHD3

SAMPLE ID :	PAI2-GW1-00	PAI2-GW2-00	PAI2-GW3-00
LAB ID :	88030925	88030926	88030928
DATE RECEIVED:	03/18/88	03/18/88	03/18/88
DIBENZO (A,H) ANTHRACENE	<10 ppb	<10 ppb	<10 ppb
FLUORENE	<10 ppb	<10 ppb	<10 ppb
INDENO (1,2,3-CD) PYRENE	<10 ppb	<10 ppb	<10 ppb
PHENANTHRENE	<10 ppb	<10 ppb	<10 ppb
PYRENE	<10 ppb	<10 ppb	<10 ppb
ALDRIN	<10 ppb	<10 ppb	<10 ppb
DIELDRIN	<10 ppb	<10 ppb	<10 ppb
CHLORDANE (TECHNICAL)	<10 ppb	<10 ppb	<10 ppb
O,P'-DDE	<10 ppb	<10 ppb	<10 ppb
O,P'-DDD	<10 ppb	<10 ppb	<10 ppb
O,P'-DDT	<10 ppb	<10 ppb	<10 ppb
P,P'-DDE	<10 ppb	<10 ppb	<10 ppb
P,P'-DDD	<10 ppb	<10 ppb	<10 ppb
P,P'-DDT	<10 ppb	<10 ppb	<10 ppb
ENDOSULFAN I	<10 ppb	<10 ppb	<10 ppb
ENDOSULFAN II	<10 ppb	<10 ppb	<10 ppb
ENDOSULFAN SULFATE	<10 ppb	<10 ppb	<10 ppb
ENDRIN	<10 ppb	<10 ppb	<10 ppb
ENDRIN ALDEHYDE	<10 ppb	<10 ppb	<10 ppb
HEPTACHLOR	<10 ppb	<10 ppb	<10 ppb
HEPTACHLOR EPOXIDE	<10 ppb	<10 ppb	<10 ppb
A-BHC	<10 ppb	<10 ppb	<10 ppb
B-BHC	<10 ppb	<10 ppb	<10 ppb
LINDANE	<10 ppb	<10 ppb	<10 ppb
D-BHC	<10 ppb	<10 ppb	<10 ppb
TOXAPHENE	<10 ppb	<10 ppb	<10 ppb
AROCLOR 1016	<150 ppb	<150 ppb	<150 ppb
AROCLOR 1221	<150 ppb	<150 ppb	<150 ppb
AROCLOR 1232	<150 ppb	<150 ppb	<150 ppb
AROCLOR 1242	<150 ppb	<150 ppb	<150 ppb
AROCLOR 1248	<150 ppb	<150 ppb	<150 ppb
AROCLOR 1254	<150 ppb	<150 ppb	<150 ppb
AROCLOR 1260	<150 ppb	<150 ppb	<150 ppb
AROCLOR 1262	<150 ppb	<150 ppb	<150 ppb
EXTRACTION & CONCENTRATION	YES	YES	YES

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CERTIFICATE OF ANALYSIS

CLIENT: McCLELLAND ENGINEERS
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HOUSTON , TX 77274
CONTACT: MR. HARRY DAY

DATE: 05/10/88

RELEASED BY: for ALLAN M. CRANE

CC/FC: MCHD/MCHD3

PAGE NO.: 1

SAMPLE ID	PAI2-GW3-00D
LAB ID	88030927
SAMPLE TYPE	11
DATE RECEIVED	03/18/88
COLLECTED BY	MCHD

PARAMETER	
PP Volatiles by Method 8240	
ACROLEIN	<100 ppb
ACRYLONITRILE	<100 ppb
BENZENE	<5 ppb
BROMOFORM	<10 ppb
CARBON TETRACHLORIDE	<10 ppb
CHLOROBENZENE	<10 ppb
CHLORODIBROMOMETHANE	<10 ppb
CHLOROETHANE	<10 ppb
2-CHLOROETHYL VINYL ETHER	<10 ppb
CHLOROFORM	12 ppb
DICHLOROBENZENE (1,2)	<10 ppb
DICHLOROBENZENE (1,3)	<10 ppb
DICHLOROBENZENE (1,4)	<10 ppb
DICHLOROBROMOMETHANE	<10 ppb
DICHLORODIFLUOROMETHANE	<10 ppb
DICHLOROETHANE (1,1)	<10 ppb
DICHLOROETHANE (1,2)	<10 ppb
DICHLOROETHYLENE (1,1)	<10 ppb
DICHLOROETHYLENE (1,2-T)	<10 ppb
DICHLOROPROPANE (1,2)	<10 ppb
DICHLOROPROPYLENE (1,2)	<10 ppb
DICHLOROPROPYLENE (1,3)	<10 ppb
ETHYLBENZENE	<10 ppb
METHYL BROMIDE	<10 ppb
METHYL CHLORIDE	<10 ppb
METHYLENE CHLORIDE	<10 ppb
TETRACHLOROETHANE (1,1,2,2)	<10 ppb
TETRACHLOROETHYLENE	<10 ppb
TOLUENE	<10 ppb
TRICHLOROETHANE (1,1,1)	<10 ppb
TRICHLOROETHANE (1,1,2)	<10 ppb
TRICHLOROETHYLENE	<10 ppb

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CLIENT: McCLELLAND ENGINEERS
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CONTACT: MR. HARRY DAY

DATE: 05/10/88

CC/FC: MCHD/MCHD3

SAMPLE ID : PA12-GW3-00D

LAB ID : 88030927
DATE RECEIVED: 03/18/88

TRICHLOROFLUOROMETHANE	<10 ppb
VINYL CHLORIDE	<10 ppb

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CLIENT: McCLELLAND ENGINEERS
P.O. BOX 740010
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CONTACT: MR. HARRY DAY

DATE: 05/10/88

RELEASED BY: for ALLAN M. CRANE

CC/FC: MCHD/MCHD3

SAMPLE ID : PAI2-GW3-00B

LAB ID : 88030929
SAMPLE TYPE : 11
DATE RECEIVED: 03/18/88
COLLECTED BY : MCHD

PARAMETER	
PP Volatiles by Method 8240	
ACROLEIN	<100 ppb
ACRYLONITRILE	<100 ppb
BENZENE	<5 ppb
BROMOFORM	<10 ppb
CARBON TETRACHLORIDE	<10 ppb
CHLOROBENZENE	<10 ppb
CHLORODIBROMOMETHANE	<10 ppb
CHLOROETHANE	<10 ppb
2-CHLOROETHYL VINYL ETHER	<10 ppb
CHLOROFORM	<10 ppb
DICHLOROBENZENE (1,2)	<10 ppb
DICHLOROBENZENE (1,3)	<10 ppb
DICHLOROBENZENE (1,4)	<10 ppb
DICHLOROBROMOMETHANE	<10 ppb
DICHLORODIFLUOROMETHANE	<10 ppb
DICHLOROETHANE (1,1)	<10 ppb
DICHLOROETHANE (1,2)	<10 ppb
DICHLOROETHYLENE (1,1)	<10 ppb
DICHLOROETHYLENE (1,2-T)	<10 ppb
DICHLOROPROPANE (1,2)	<10 ppb
DICHLOROPROPYLENE (1,2)	<10 ppb
DICHLOROPROPYLENE (1,3)	<10 ppb
ETHYLBENZENE	<10 ppb
METHYL BROMIDE	<10 ppb
METHYL CHLORIDE	<10 ppb
METHYLENE CHLORIDE	<10 ppb
TETRACHLOROETHANE (1,1,2,2)	<10 ppb
TETRACHLOROETHYLENE	<10 ppb
TOLUENE	<10 ppb
TRICHLOROETHANE (1,1,1)	<10 ppb
TRICHLOROETHANE (1,1,2)	<10 ppb
TRICHLOROETHYLENE	<10 ppb

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CONTACT: MR. HARRY DAY

DATE: 05/10/88

CC/FC: MCHD/MCHD3

SAMPLE ID : PAI2-GW3-00B

LAB ID : 88030929
DATE RECEIVED: 03/18/88

TRICHLOROFLUOROMETHANE	<10 ppb
VINYL CHLORIDE	<10 ppb

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CLIENT: McCLELLAND ENGINEERS
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CONTACT: MR. HARRY DAY

RELEASED BY: for: ALLAN M. CRANE

CC/FC: MCHD/MCHD3

PAGE NO.: 1

SAMPLE ID : PAI2-SW1-00

LAB ID : 88030924
SAMPLE TYPE : 11
DATE RECEIVED: 03/18/88
COLLECTED BY : MCHD

PARAMETER	
TOTAL ORGANIC CARBON	5.39 ppm
ARSENIC - DISSOLVED	<0.005 ppm
BARIUM - DISSOLVED	<0.03 ppm
CADMIUM - DISSOLVED	0.083 ppm
CHROMIUM - DISSOLVED	0.14 ppm
LEAD - DISSOLVED	0.025 ppm
MERCURY - DISSOLVED	<0.5 ppb
SELENIUM - DISSOLVED	<0.005 ppm
SILVER - DISSOLVED	<0.05 ppm
BERYLLIUM - DISSOLVED	<0.010 ppm
HEX. CHROMIUM - DISSOLVED	<0.01 ppm
HEX. CHROMIUM EXTRACTION	YES
DIGESTION FOR MERCURY ANALYSIS	YES
ACID DIGESTION	YES
PP Volatiles by Method 8240	
ACROLEIN	<100 ppb
ACRYLONITRILE	<100 ppb
BENZENE	<5 ppb
BROMOFORM	<10 ppb
CARBON TETRACHLORIDE	<10 ppb
CHLOROBENZENE	<10 ppb
CHLORODIBROMOMETHANE	<10 ppb
CHLOROETHANE	<10 ppb
2-CHLOROETHYL VINYL ETHER	<10 ppb
CHLOROFORM	<10 ppb
DICHLOROBENZENE (1,2)	<10 ppb
DICHLOROBENZENE (1,3)	<10 ppb
DICHLOROBENZENE (1,4)	<10 ppb
DICHLOROBROMOMETHANE	<10 ppb
DICHLORODIFLUOROMETHANE	<10 ppb
DICHLOROETHANE (1,1)	<10 ppb
DICHLOROETHANE (1,2)	<10 ppb
DICHLOROETHYLENE (1,1)	<10 ppb

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CONTACT: MR. HARRY DAY

DATE: 05/10/88

CC/FC: MCHD/MCHD3

SAMPLE ID : PA12-SW1-00

LAB ID : 88030924
DATE RECEIVED: 03/18/88

DICHLOROETHYLENE (1,2-T)	<10 ppb
DICHLOROPROPANE (1,2)	<10 ppb
DICHLOROPROPYLENE (1,2)	<10 ppb
DICHLOROPROPYLENE (1,3)	<10 ppb
ETHYLBENZENE	<10 ppb
METHYL BROMIDE	<10 ppb
METHYL CHLORIDE	<10 ppb
METHYLENE CHLORIDE	<10 ppb
TETRACHLOROETHANE (1,1,2,2)	<10 ppb
TETRACHLOROETHYLENE	<10 ppb
TOLUENE	<10 ppb
TRICHLOROETHANE (1,1,1)	<10 ppb
TRICHLOROETHANE (1,1,2)	<10 ppb
TRICHLOROETHYLENE	<10 ppb
TRICHLOROFLUOROMETHANE	<10 ppb
VINYL CHLORIDE	<10 ppb
PP Acid Ext. by Method 8270	
CHLOROPHENOL (2)	<10 ppb
DICHLOROPHENOL (2,4)	<10 ppb
DINITROPHENOL(2-METHYL-4,6)	<30 ppb
DIMETHYLPHENOL (2,4)	<10 ppb
DINITROPHENOL (2,4)	<45 ppb
NITROPHENOL (2)	<10 ppb
NITROPHENOL (4)	<10 ppb
P-CHLORO-M-CRESOL	<10 ppb
PENTACHLOROPHENOL	<10 ppb
PHENOL	<10 ppb
TRICHLOROPHENOL (2,4,6)	<10 ppb
PP B/N Ext. by Method 8270	
ACENAPHTHENE	<10 ppb
BENZIDINE	<10 ppb
BIS (CHLOROMETHYL) ETHER	<10 ppb
BIS (2-CHLOROETHOXY) METHANE	<10 ppb
BIS (2-CHLOROETHYL) ETHER	<10 ppb
BIS (2-CHLOROISOPROPYL) ETHER	<10 ppb

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CONTACT: MR. HARRY DAY

DATE: 05/10/88

CC/FC: MCHD/MCHD3

SAMPLE ID : PAI2-SW1-00

LAB ID : 88030924
DATE RECEIVED: 03/18/88

BROMOPHENYL PHENYL ETHER	<10 ppb
CHLOROETHYL VINYL ETHER	<10 ppb
CHLOROPHENYL PHENYL ETHER	<10 ppb
CHLORONAPHTHALENE (2)	<10 ppb
DICHLOROBENZIDINE (3,3')	<10 ppb
DINITROTOLUENE (2,4)	<10 ppb
DINITROTOLUENE (2,6)	<10 ppb
DIPHENYLHYDRAZINE (1,2)	<10 ppb
FLUORANTHENE	<10 ppb
HEXACHLOROBENZENE	<10 ppb
HEXACHLOROBUTADIENE	<10 ppb
HEXACHLOROCYCLOPENTADIENE	<10 ppb
HEXACHLOROETHANE	<10 ppb
ISOPHORONE	<10 ppb
NAPHTHALENE	<10 ppb
NITROBENZENE	<10 ppb
N-NITROSODIMETHYLAMINE	<10 ppb
N-NITROSODIPHENYLAMINE	<10 ppb
N-NITROSO-DI-N-PROPYLAMINE	<10 ppb
TRICHLOROBENZENE (1,2,4)	<10 ppb
BIS (2-ETHYLHEXYL) PHTHALATE	<10 ppb
BUTYL BENZYL PHTHALATE	<10 ppb
DIETHYL PHTHALATE	<10 ppb
DIMETHYL PHTHALATE	<10 ppb
DI-N-BUTYL PHTHALATE	<10 ppb
DI-N-OCTYL PHTHALATE	<10 ppb
ACENAPHTHYLENE	<10 ppb
ANTHRACENE	<10 ppb
BENZO (A) ANTHRACENE	<10 ppb
BENZO (B) FLUORANTHENE	<10 ppb
BENZO (K) FLUORANTHENE	<10 ppb
BENZO (GHI) PERYLENE	<10 ppb
BENZO (A) PYRENE	<10 ppb
BENZOFLUORANTHENE (3,4)	<10 ppb
CHRYSENE	<10 ppb

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CC/FC: MCHD/MCHD3

SAMPLE ID : PAI2-SW1-00

LAB ID : 88030924
DATE RECEIVED: 03/18/88

DIBENZO (A,H) ANTHRACENE	<10 ppb
FLUORENE	<10 ppb
INDENO (1,2,3-CD) PYRENE	<10 ppb
PHENANTHRENE	<10 ppb
PYRENE	<10 ppb
ALDRIN	<10 ppb
DIELDRIN	<10 ppb
CHLORDANE (TECHNICAL)	<10 ppb
O,P'-DDE	<10 ppb
O,P'-DDD	<10 ppb
O,P'-DDT	<10 ppb
P,P'-DDE	<10 ppb
P,P'-DDD	<10 ppb
P,P'-DDT	<10 ppb
ENDOSULFAN I	<10 ppb
ENDOSULFAN II	<10 ppb
ENDOSULFAN SULFATE	<10 ppb
ENDRIN	<10 ppb
ENDRIN ALDEHYDE	<10 ppb
HEPTACHLOR	<10 ppb
HEPTACHLOR EPOXIDE	<10 ppb
A-BHC	<10 ppb
B-BHC	<10 ppb
LINDANE	<10 ppb
D-BHC	<10 ppb
TOXAPHENE	<10 ppb
AROCLOR 1016	<150 ppb
AROCLOR 1221	<150 ppb
AROCLOR 1232	<150 ppb
AROCLOR 1242	<150 ppb
AROCLOR 1248	<150 ppb
AROCLOR 1254	<150 ppb
AROCLOR 1260	<150 ppb
AROCLOR 1262	<150 ppb
EXTRACTION & CONCENTRATION	YES

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DATE: 05/10/88

CONTACT: MR. HARRY DAY

RELEASED BY: for: ALLAN M. CRANE

CC/FC: MCHD/EPTM4

PAGE NO.: 1

	SAMPLE ID :	PAI2-SS1-01
	LAB ID :	88030923
	SAMPLE TYPE :	15
	DATE RECEIVED:	03/18/88
PARAMETER	COLLECTED BY :	MCHD
ARSENIC		<1.00 ppm
CADMIUM		<0.50 ppm
CHROMIUM		<1.00 ppm
LEAD		<1.00 ppm
MERCURY		<0.20 ppm
EP TOX EXTRACTION-SOLID		YES
DIGESTION FOR MERCURY ANALYSIS		YES

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CONTACT: MR. HARRY DAY

DATE: 05/10/88

RELEASED BY: for ALLAN M. CRANE

CC/FC: MCHD/MCHD2

PAGE NO.: 1

PARAMETER	SAMPLE ID : PAI2-SS1-01
LAB ID	: 88030919
SAMPLE TYPE	: 15
DATE RECEIVED	: 03/18/88
COLLECTED BY	: MCHD
ARSENIC	9.59 ppm
BARIUM	3.00 ppm
BERYLLIUM	<0.20 ppm
CADMIUM	<0.10 ppm
CHROMIUM	3.11 ppm
CHROMIUM - HEXAVALENT	<0.01 ppm
LEAD	4.81 ppm
MERCURY	<0.2 ppm
SELENIUM	<0.20 ppm
SILVER	<1.00 ppm
HEX. CHROMIUM EXTRACTION	YES
DIGESTION FOR MERCURY ANALYSIS	YES
ACID DIGESTION	YES
PP Volatiles by Method 8240	
ACROLEIN	<100 ppb
ACRYLONITRILE	<100 ppb
BENZENE	<5 ppb
BROMOFORM	<10 ppb
CARBON TETRACHLORIDE	<10 ppb
CHLOROBENZENE	<10 ppb
CHLORODIBROMOMETHANE	<10 ppb
CHLOROETHANE	<10 ppb
2-CHLOROETHYL VINYL ETHER	<10 ppb
CHLOROFORM	81 ppb
DICHLOROBENZENE (1,2)	<10 ppb
DICHLOROBENZENE (1,3)	<10 ppb
DICHLOROBENZENE (1,4)	<10 ppb
DICHLOROBROMOMETHANE	<10 ppb
DICHLORODIFLUOROMETHANE	<10 ppb
DICHLOROETHANE (1,1)	<10 ppb
DICHLOROETHANE (1,2)	<10 ppb
DICHLOROETHYLENE (1,1)	<10 ppb
DICHLOROETHYLENE (1,2-T)	<10 ppb

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CONTACT: MR. HARRY DAY

DATE: 05/10/88

CC/FC: MCHD/MCHD2

SAMPLE ID : PA12-SS1-01

LAB ID : 88030919
DATE RECEIVED: 03/18/88

DICHLOROPROPANE (1,2)	<10 ppb
DICHLOROPROPYLENE (1,2)	<10 ppb
DICHLOROPROPYLENE (1,3)	<10 ppb
ETHYLBENZENE	<10 ppb
METHYL BROMIDE	<10 ppb
METHYL CHLORIDE	<10 ppb
METHYLENE CHLORIDE	<10 ppb
TETRACHLOROETHANE (1,1,2,2)	<10 ppb
TETRACHLOROETHYLENE	<10 ppb
TOLUENE	<10 ppb
TRICHLOROETHANE (1,1,1)	<10 ppb
TRICHLOROETHANE (1,1,2)	<10 ppb
TRICHLOROETHYLENE	<10 ppb
TRICHLOROFLUOROMETHANE	<10 ppb
VINYL CHLORIDE	<10 ppb
PP Acid Ext. by Method 8270	
CHLOROPHENOL (2)	<330 ppb
DICHLOROPHENOL (2,4)	<330 ppb
DINITROPHENOL(2-METHYL-4,6)	<990 ppb
DIMETHYLPHENOL (2,4)	<330 ppb
DINITROPHENOL (2,4)	<1490 ppb
NITROPHENOL (2)	<330 ppb
NITROPHENOL (4)	<330 ppb
P-CHLORO-M-CRESOL	<330 ppb
PENTACHLOROPHENOL	<330 ppb
PHENOL	<330 ppb
TRICHLOROPHENOL (2,4,6)	<330 ppb
PP B/N Ext. by Method 8270	
ACENAPHTHENE	<330 ppb
BENZIDINE	<330 ppb
BIS (CHLOROMETHYL) ETHER	<330 ppb
BIS (2-CHLOROETHOXY) METHANE	<330 ppb
BIS (2-CHLOROETHYL) ETHER	<330 ppb
BIS (2-CHLOROISOPROPYL) ETHER	<330 ppb
BROMOPHENYL PHENYL ETHER	<330 ppb

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CONTACT: MR. HARRY DAY

DATE: 05/10/88

CC/FC: MCHD/MCHD2

SAMPLE ID : PAI2-SS1-01

LAB ID : 88030919
DATE RECEIVED: 03/18/88

CHLOROETHYL VINYL ETHER	<330 ppb
CHLOROPHENYL PHENYL ETHER	<330 ppb
CHLORONAPHTHALENE (2)	<330 ppb
DICHLOROBENZIDINE (3,3')	<330 ppb
DINITROTOLUENE (2,4)	<330 ppb
DINITROTOLUENE (2,6)	<330 ppb
DIPHENYLHYDRAZINE (1,2)	<330 ppb
FLUORANTHENE	<330 ppb
HEXACHLOROBENZENE	<330 ppb
HEXACHLOROBUTADIENE	<330 ppb
HEXACHLOROCYCLOPENTADIENE	<330 ppb
HEXACHLOROETHANE	<330 ppb
ISOPHORONE	<330 ppb
NAPHTHALENE	<330 ppb
NITROBENZENE	<330 ppb
N-NITROSODIMETHYLAMINE	<330 ppb
N-NITROSODIPHENYLAMINE	<330 ppb
N-NITROSO-DI-N-PROPYLAMINE	<330 ppb
TRICHLOROBENZENE (1,2,4)	<330 ppb
BIS (2-ETHYLHEXYL) PHTHALATE	<330 ppb
BUTYL BENZYL PHTHALATE	<330 ppb
DIETHYL PHTHALATE	<330 ppb
DIMETHYL PHTHALATE	<330 ppb
DI-N-BUTYL PHTHALATE	<330 ppb
DI-N-OCTYL PHTHALATE	<330 ppb
ACENAPHTHYLENE	<330 ppb
ANTHRACENE	<330 ppb
BENZO (A) ANTHRACENE	<330 ppb
BENZO (B) FLUORANTHENE	<330 ppb
BENZO (K) FLUORANTHENE	<330 ppb
BENZO (GHI) PERYLENE	<330 ppb
BENZO (A) PYRENE	<330 ppb
BENZOFLUORANTHENE (3,4)	<330 ppb
CHRYSENE	<330 ppb
DIBENZO (A,H) ANTHRACENE	<330 ppb

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DATE: 05/10/88

CC/FC: MCHD/MCHD2

SAMPLE ID : PAI2-SS1-01

LAB ID : 88030919
DATE RECEIVED: 03/18/88

FLUORENE	<330 ppb
INDENO (1,2,3-CD) PYRENE	<330 ppb
PHENANTHRENE	<330 ppb
PYRENE	<330 ppb
ALDRIN	<330 ppb
DIELDRIN	<330 ppb
CHLORDANE (TECHNICAL)	<330 ppb
O,P'-DDE	<330 ppb
O,P'-DDD	<330 ppb
O,P'-DDT	<330 ppb
P,P'-DDE	<330 ppb
P,P'-DDD	<330 ppb
P,P'-DDT	<330 ppb
ENDOSULFAN I	<330 ppb
ENDOSULFAN II	<330 ppb
ENDOSULFAN SULFATE	<330 ppb
ENDRIN	<330 ppb
ENDRIN ALDEHYDE	<330 ppb
HEPTACHLOR	<330 ppb
HEPTACHLOR EPOXIDE	<330 ppb
A-BHC	<330 ppb
B-BHC	<330 ppb
LINDANE	<330 ppb
D-BHC	<330 ppb
TOXAPHENE	<330 ppb
AROCLOR 1016	<450 ppb
AROCLOR 1221	<450 ppb
AROCLOR 1232	<450 ppb
AROCLOR 1242	<450 ppb
AROCLOR 1248	<450 ppb
AROCLOR 1254	<450 ppb
AROCLOR 1260	<450 ppb
AROCLOR 1262	<450 ppb
% WATER (KARL-FISCHER TIT.)	27.2 wt%
EXTRACTION & CONCENTRATION	YES

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DATE: 04/20/88

CONTACT: MR. HARRY DAY

RELEASED BY: A.M. Crane
ALLAN M. CRANE

CC/FC: MCHD/MCHD3

PARAMETER	SAMPLE ID	PAI3-SW1-00	PAI3-SW2-00	PAI3-SW3-00	PAI3-SW4-00
	LAB ID	88030792	88030794	88030795	88030796
	SAMPLE TYPE	11	11	11	11
	DATE RECEIVED	03/16/88	03/16/88	03/16/88	03/16/88
	COLLECTED BY	MCHD	MCHD	MCHD	MCHD
TOTAL ORGANIC CARBON		11.0 ppm	10.7 ppm	11.5 ppm	8.28 ppm
ARSENIC - DISSOLVED		<0.005 ppm	<0.005 ppm	<0.005 ppm	<0.005 ppm
BARIUM - DISSOLVED		<0.03 ppm	<0.03 ppm	<0.03 ppm	<0.03 ppm
CADMIUM - DISSOLVED		0.010 ppm	<0.010 ppm	<0.010 ppm	<0.010 ppm
CHROMIUM - DISSOLVED		<0.03 ppm	<0.03 ppm	<0.03 ppm	<0.03 ppm
LEAD - DISSOLVED		0.022 ppm	0.012 ppm	0.009 ppm	0.013 ppm
MERCURY - DISSOLVED		0.0016 ppm	0.0005 ppm	<0.5 ppb	<0.5 ppb
SELENIUM - DISSOLVED		<0.010 ppm	<0.010 ppm	<0.010 ppm	<0.010 ppm
SILVER - DISSOLVED		<0.05 ppm	<0.05 ppm	<0.05 ppm	<0.05 ppm
BERYLLIUM - DISSOLVED		<0.010 ppm	<0.010 ppm	<0.010 ppm	<0.010 ppm
DIGESTION FOR MERCURY ANALYSIS		YES	YES	YES	YES
ACID DIGESTION		YES	YES	YES	YES
PP Volatiles by Method 8240					
ACROLEIN		<100 ppb	<100 ppb	<100 ppb	<100 ppb
ACRYLONITRILE		<100 ppb	<100 ppb	<100 ppb	<100 ppb
BENZENE		<5 ppb	<5 ppb	<5 ppb	<5 ppb
BROMOFORM		<10 ppb	<10 ppb	<10 ppb	<10 ppb
CARBON TETRACHLORIDE		<10 ppb	<10 ppb	<10 ppb	<10 ppb
CHLOROBENZENE		<10 ppb	<10 ppb	<10 ppb	<10 ppb
CHLORODIBROMOMETHANE		<10 ppb	<10 ppb	<10 ppb	<10 ppb
CHLOROETHANE		<10 ppb	<10 ppb	<10 ppb	<10 ppb
2-CHLOROETHYL VINYL ETHER		<10 ppb	<10 ppb	<10 ppb	<10 ppb
CHLOROFORM		<10 ppb	<10 ppb	<10 ppb	<10 ppb
DICHLOROBENZENE (1,2)		<10 ppb	<10 ppb	<10 ppb	<10 ppb
DICHLOROBENZENE (1,3)		<10 ppb	<10 ppb	<10 ppb	<10 ppb
DICHLOROBENZENE (1,4)		<10 ppb	<10 ppb	<10 ppb	<10 ppb
DICHLOROBROMOMETHANE		<10 ppb	<10 ppb	<10 ppb	<10 ppb
DICHLORODIFLUOROMETHANE		<10 ppb	<10 ppb	<10 ppb	<10 ppb
DICHLOROETHANE (1,1)		<10 ppb	<10 ppb	<10 ppb	<10 ppb
DICHLOROETHANE (1,2)		<10 ppb	<10 ppb	<10 ppb	<10 ppb
DICHLOROETHYLENE (1,1)		<10 ppb	<10 ppb	<10 ppb	<10 ppb
DICHLOROETHYLENE (1,2-T)		<10 ppb	<10 ppb	<10 ppb	<10 ppb
DICHLOROPROPANE (1,2)		<10 ppb	<10 ppb	<10 ppb	<10 ppb

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CONTACT: MR. HARRY DAY

DATE: 04/20/88

CC/FC: MCHD/MCHD3

SAMPLE ID :	PAI3-SW1-00	PAI3-SW2-00	PAI3-SW3-00	PAI3-SW4-00
LAB ID :	88030792	88030794	88030795	88030796
DATE RECEIVED:	03/16/88	03/16/88	03/16/88	03/16/88
DICHLOROPROPYLENE (1,2)	<10 ppb	<10 ppb	<10 ppb	<10 ppb
DICHLOROPROPYLENE (1,3)	<10 ppb	<10 ppb	<10 ppb	<10 ppb
ETHYLBENZENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
METHYL BROMIDE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
METHYL CHLORIDE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
METHYLENE CHLORIDE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
TETRACHLOROETHANE (1,1,2,2)	<10 ppb	<10 ppb	<10 ppb	<10 ppb
TETRACHLOROETHYLENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
TOLUENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
TRICHLOROETHANE (1,1,1)	<10 ppb	<10 ppb	<10 ppb	<10 ppb
TRICHLOROETHANE (1,1,2)	<10 ppb	<10 ppb	<10 ppb	<10 ppb
TRICHLOROETHYLENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
TRICHLOROFLUOROMETHANE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
VINYL CHLORIDE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
PP Acid Ext. by Method 8270				
CHLOROPHENOL (2)	<10 ppb	<10 ppb	<10 ppb	<10 ppb
DICHLOROPHENOL (2,4)	<10 ppb	<10 ppb	<10 ppb	<10 ppb
DINITROPHENOL(2-METHYL-4,6)	<30 ppb	<30 ppb	<30 ppb	<30 ppb
DIMETHYLPHENOL (2,4)	<10 ppb	<10 ppb	<10 ppb	<10 ppb
DINITROPHENOL (2,4)	<45 ppb	<45 ppb	<45 ppb	<45 ppb
NITROPHENOL (2)	<10 ppb	<10 ppb	<10 ppb	<10 ppb
NITROPHENOL (4)	<10 ppb	<10 ppb	<10 ppb	<10 ppb
P-CHLORO-M-CRESOL	<10 ppb	<10 ppb	<10 ppb	<10 ppb
PENTACHLOROPHENOL	<10 ppb	<10 ppb	<10 ppb	<10 ppb
PHENOL	<10 ppb	<10 ppb	<10 ppb	<10 ppb
TRICHLOROPHENOL (2,4,6)	<10 ppb	<10 ppb	<10 ppb	<10 ppb
PP B/N Ext. by Method 8270				
ACENAPHTHENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
BENZIDINE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
BIS (CHLOROMETHYL) ETHER	<10 ppb	<10 ppb	<10 ppb	<10 ppb
BIS (2-CHLOROETHOXY) METHANE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
BIS (2-CHLOROETHYL) ETHER	<10 ppb	<10 ppb	<10 ppb	<10 ppb
BIS (2-CHLOROISOPROPYL) ETHER	<10 ppb	<10 ppb	<10 ppb	<10 ppb
BROMOPHENYL PHENYL ETHER	<10 ppb	<10 ppb	<10 ppb	<10 ppb
CHLOROETHYL VINYL ETHER	<10 ppb	<10 ppb	<10 ppb	<10 ppb

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FL	E87156/87294
NC	233
SC	10120
VA	00151
NACIP	Approved

CERTIFICATE OF ANALYSIS

CLIENT: McCLELLAND ENGINEERS
P.O. BOX 740010
HOUSTON , TX 77274
CONTACT: MR. HARRY DAY

DATE: 04/20/88

CC/FC: MCHD/MCHD3

SAMPLE ID :	PAI3-SW1-00	PAI3-SW2-00	PAI3-SW3-00	PAI3-SW4-00
LAB ID :	88030792	88030794	88030795	88030796
DATE RECEIVED:	03/16/88	03/16/88	03/16/88	03/16/88
CHLOROPHENYL PHENYL ETHER	<10 ppb	<10 ppb	<10 ppb	<10 ppb
CHLORONAPHTHALENE (2)	<10 ppb	<10 ppb	<10 ppb	<10 ppb
DICHLOROBENZIDINE (3,3')	<10 ppb	<10 ppb	<10 ppb	<10 ppb
DINITROTOLUENE (2,4)	<10 ppb	<10 ppb	<10 ppb	<10 ppb
DINITROTOLUENE (2,6)	<10 ppb	<10 ppb	<10 ppb	<10 ppb
DIPHENYLHYDRAZINE (1,2)	<10 ppb	<10 ppb	<10 ppb	<10 ppb
FLUORANTHENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
HEXACHLOROBENZENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
HEXACHLOROBUTADIENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
HEXACHLOROCYCLOPENTADIENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
HEXACHLOROETHANE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
ISOPHORONE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
NAPHTHALENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
NITROBENZENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
N-NITROSODIMETHYLAMINE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
N-NITROSODIPHENYLAMINE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
N-NITROSO-DI-N-PROPYLAMINE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
TRICHLOROBENZENE (1,2,4)	<10 ppb	<10 ppb	<10 ppb	<10 ppb
BIS (2-ETHYLHEXYL) PHTHALATE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
BUTYL BENZYL PHTHALATE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
DIETHYL PHTHALATE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
DIMETHYL PHTHALATE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
DI-N-BUTYL PHTHALATE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
DI-N-OCTYL PHTHALATE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
ACENAPHTHYLENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
ANTHRACENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
BENZO (A) ANTHRACENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
BENZO (B) FLUORANTHENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
BENZO (K) FLUORANTHENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
BENZO (GHI) PERYLENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
BENZO (A) PYRENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
BENZOFLUORANTHENE (3,4)	<10 ppb	<10 ppb	<10 ppb	<10 ppb
CHRYSENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
DIBENZO (A,H) ANTHRACENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
FLUORENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb

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CONTACT: MR. HARRY DAY

DATE: 04/20/88

CC/FC: MCHD/MCHD3

	SAMPLE ID :	PAI3-SW1-00	PAI3-SW2-00	PAI3-SW3-00	PAI3-SW4-00
	LAB ID :	88030792	88030794	88030795	88030796
	DATE RECEIVED:	03/16/88	03/16/88	03/16/88	03/16/88
INDENO (1,2,3-CD) PYRENE		<10 ppb	<10 ppb	<10 ppb	<10 ppb
PHENANTHRENE		<10 ppb	<10 ppb	<10 ppb	<10 ppb
PYRENE		<10 ppb	<10 ppb	<10 ppb	<10 ppb
ALDRIN		<10 ppb	<10 ppb	<10 ppb	<10 ppb
DIELDRIN		<10 ppb	<10 ppb	<10 ppb	<10 ppb
CHLORDANE (TECHNICAL)		<10 ppb	<10 ppb	<10 ppb	<10 ppb
O,P'-DDE		<10 ppb	<10 ppb	<10 ppb	<10 ppb
O,P'-DDD		<10 ppb	<10 ppb	<10 ppb	<10 ppb
O,P'-DDT		<10 ppb	<10 ppb	<10 ppb	<10 ppb
P,P'-DDE		<10 ppb	<10 ppb	<10 ppb	<10 ppb
P,P'-DDD		<10 ppb	<10 ppb	<10 ppb	<10 ppb
P,P'-DDT		<10 ppb	<10 ppb	<10 ppb	<10 ppb
ENDOSULFAN I		<10 ppb	<10 ppb	<10 ppb	<10 ppb
ENDOSULFAN II		<10 ppb	<10 ppb	<10 ppb	<10 ppb
ENDOSULFAN SULFATE		<10 ppb	<10 ppb	<10 ppb	<10 ppb
ENDRIN		<10 ppb	<10 ppb	<10 ppb	<10 ppb
ENDRIN ALDEHYDE		<10 ppb	<10 ppb	<10 ppb	<10 ppb
HEPTACHLOR		<10 ppb	<10 ppb	<10 ppb	<10 ppb
HEPTACHLOR EPOXIDE		<10 ppb	<10 ppb	<10 ppb	<10 ppb
A-BHC		<10 ppb	<10 ppb	<10 ppb	<10 ppb
B-BHC		<10 ppb	<10 ppb	<10 ppb	<10 ppb
LINDANE		<10 ppb	<10 ppb	<10 ppb	<10 ppb
D-BHC		<10 ppb	<10 ppb	<10 ppb	<10 ppb
TOXAPHENE		<10 ppb	<10 ppb	<10 ppb	<10 ppb
AROCLOR 1016		<150 ppb	<150 ppb	<150 ppb	<150 ppb
AROCLOR 1221		<150 ppb	<150 ppb	<150 ppb	<150 ppb
AROCLOR 1232		<150 ppb	<150 ppb	<150 ppb	<150 ppb
AROCLOR 1242		<150 ppb	<150 ppb	<150 ppb	<150 ppb
AROCLOR 1248		<150 ppb	<150 ppb	<150 ppb	<150 ppb
AROCLOR 1254		<150 ppb	<150 ppb	<150 ppb	<150 ppb
AROCLOR 1260		<150 ppb	<150 ppb	<150 ppb	<150 ppb
AROCLOR 1262		<150 ppb	<150 ppb	<150 ppb	<150 ppb
EXTRACTION & CONCENTRATION		YES	YES	YES	YES

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HOUSTON , TX 77274

DATE: 04/20/88

CONTACT: MR. HARRY DAY

RELEASED BY: ALLAN M. CRANE

CC/FC: MCHD/MCHD3

SAMPLE ID : PAI3-SW1-00D

LAB ID : 88030793
SAMPLE TYPE : 11
DATE RECEIVED: 03/16/88
COLLECTED BY : MCHD

PARAMETER	
TOTAL ORGANIC CARBON	10.1 ppm
ARSENIC - DISSOLVED	<0.005 ppm
BARIUM - DISSOLVED	<0.03 ppm
CADMIUM - DISSOLVED	0.010 ppm
CHROMIUM - DISSOLVED	<0.03 ppm
LEAD - DISSOLVED	0.011 ppm
MERCURY - DISSOLVED	<0.5 ppb
SELENIUM - DISSOLVED	<0.010 ppm
SILVER - DISSOLVED	<0.05 ppm
BERYLLIUM - DISSOLVED	<0.010 ppm
DIGESTION FOR MERCURY ANALYSIS	YES
ACID DIGESTION	YES

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HOUSTON , TX 77274

DATE: 04/20/88

CONTACT: MR. HARRY DAY

RELEASED BY: ALLAN M. CRANE

CC/FC: MCHD/MCHD3

PARAMETER	SAMPLE ID	PAI3-SW5-00	PAI3-SW6-00	PAI3-SW7-00	PAI3-SW8-00
	LAB ID	88030797	88030798	88030799	88030800
	SAMPLE TYPE	11	11	11	11
	DATE RECEIVED	03/16/88	03/16/88	03/16/88	03/16/88
	COLLECTED BY	MCHD	MCHD	MCHD	MCHD
TOTAL ORGANIC CARBON		8.88 ppm	5.86 ppm	5.10 ppm	6.41 ppm
ARSENIC - DISSOLVED		<0.005 ppm	<0.005 ppm	<0.005 ppm	<0.005 ppm
BARIUM - DISSOLVED		<0.03 ppm	<0.03 ppm	<0.03 ppm	<0.03 ppm
CADMIUM - DISSOLVED		<0.010 ppm	0.013 ppm	<0.010 ppm	<0.010 ppm
CHROMIUM - DISSOLVED		<0.03 ppm	<0.03 ppm	<0.03 ppm	<0.03 ppm
LEAD - DISSOLVED		0.006 ppm	0.011 ppm	0.006 ppm	0.007 ppm
MERCURY - DISSOLVED		<0.5 ppb	<0.5 ppb	<0.5 ppb	<0.5 ppb
SELENIUM - DISSOLVED		<0.010 ppm	<0.010 ppm	<0.010 ppm	<0.010 ppm
SILVER - DISSOLVED		<0.05 ppm	<0.05 ppm	<0.05 ppm	<0.05 ppm
BERYLLIUM - DISSOLVED		<0.010 ppm	<0.010 ppm	<0.010 ppm	<0.010 ppm
DIGESTION FOR MERCURY ANALYSIS		YES	YES	YES	YES
ACID DIGESTION		YES	YES	YES	YES
PP Volatiles by Method 8240					
ACROLEIN		<100 ppb	<100 ppb	<100 ppb	<100 ppb
ACRYLONITRILE		<100 ppb	<100 ppb	<100 ppb	<100 ppb
BENZENE		<5 ppb	<5 ppb	<5 ppb	<5 ppb
BROMOFORM		<10 ppb	<10 ppb	<10 ppb	<10 ppb
CARBON TETRACHLORIDE		<10 ppb	<10 ppb	<10 ppb	<10 ppb
CHLOROBENZENE		<10 ppb	<10 ppb	<10 ppb	<10 ppb
CHLORODIBROMOMETHANE		<10 ppb	<10 ppb	<10 ppb	<10 ppb
CHLOROETHANE		<10 ppb	<10 ppb	<10 ppb	<10 ppb
2-CHLOROETHYL VINYL ETHER		<10 ppb	<10 ppb	<10 ppb	<10 ppb
CHLOROFORM		<10 ppb	<10 ppb	<10 ppb	<10 ppb
DICHLOROBENZENE (1,2)		<10 ppb	<10 ppb	<10 ppb	<10 ppb
DICHLOROBENZENE (1,3)		<10 ppb	<10 ppb	<10 ppb	<10 ppb
DICHLOROBENZENE (1,4)		<10 ppb	<10 ppb	<10 ppb	<10 ppb
DICHLOROBROMOMETHANE		<10 ppb	<10 ppb	<10 ppb	<10 ppb
DICHLORODIFLUOROMETHANE		<10 ppb	<10 ppb	<10 ppb	<10 ppb
DICHLOROETHANE (1,1)		<10 ppb	<10 ppb	<10 ppb	<10 ppb
DICHLOROETHANE (1,2)		<10 ppb	<10 ppb	<10 ppb	<10 ppb
DICHLOROETHYLENE (1,1)		<10 ppb	<10 ppb	<10 ppb	<10 ppb
DICHLOROETHYLENE (1,2-T)		<10 ppb	<10 ppb	<10 ppb	<10 ppb
DICHLOROPROPANE (1,2)		<10 ppb	<10 ppb	<10 ppb	<10 ppb

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DATE: 04/20/88

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SAMPLE ID :	PAI3-SW5-00	PAI3-SW6-00	PAI3-SW7-00	PAI3-SW8-00
LAB ID :	88030797	88030798	88030799	88030800
DATE RECEIVED:	03/16/88	03/16/88	03/16/88	03/16/88
DICHLOROPROPYLENE (1,2)	<10 ppb	<10 ppb	<10 ppb	<10 ppb
DICHLOROPROPYLENE (1,3)	<10 ppb	<10 ppb	<10 ppb	<10 ppb
ETHYLBENZENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
METHYL BROMIDE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
METHYL CHLORIDE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
METHYLENE CHLORIDE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
TETRACHLOROETHANE (1,1,2,2)	<10 ppb	<10 ppb	<10 ppb	<10 ppb
TETRACHLOROETHYLENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
TOLUENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
TRICHLOROETHANE (1,1,1)	<10 ppb	<10 ppb	<10 ppb	<10 ppb
TRICHLOROETHANE (1,1,2)	<10 ppb	<10 ppb	<10 ppb	<10 ppb
TRICHLOROETHYLENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
TRICHLOROFLUOROMETHANE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
VINYL CHLORIDE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
PP Acid Ext. by Method 8270				
CHLOROPHENOL (2)	<10 ppb	<10 ppb	<10 ppb	<10 ppb
DICHLOROPHENOL (2,4)	<10 ppb	<10 ppb	<10 ppb	<10 ppb
DINITROPHENOL(2-METHYL-4,6)	<30 ppb	<30 ppb	<30 ppb	<30 ppb
DIMETHYLPHENOL (2,4)	<10 ppb	<10 ppb	<10 ppb	<10 ppb
DINITROPHENOL (2,4)	<45 ppb	<45 ppb	<45 ppb	<45 ppb
NITROPHENOL (2)	<10 ppb	<10 ppb	<10 ppb	<10 ppb
NITROPHENOL (4)	<10 ppb	<10 ppb	<10 ppb	<10 ppb
P-CHLORO-M-CRESOL	<10 ppb	<10 ppb	<10 ppb	<10 ppb
PENTACHLOROPHENOL	<10 ppb	<10 ppb	<10 ppb	<10 ppb
PHENOL	<10 ppb	<10 ppb	<10 ppb	<10 ppb
TRICHLOROPHENOL (2,4,6)	<10 ppb	<10 ppb	<10 ppb	<10 ppb
PP B/N Ext. by Method 8270				
ACENAPHTHENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
BENZIDINE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
BIS (CHLOROMETHYL) ETHER	<10 ppb	<10 ppb	<10 ppb	<10 ppb
BIS (2-CHLOROETHOXY) METHANE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
BIS (2-CHLOROETHYL) ETHER	<10 ppb	<10 ppb	<10 ppb	<10 ppb
BIS (2-CHLOROISOPROPYL) ETHER	<10 ppb	<10 ppb	<10 ppb	<10 ppb
BROMOPHENYL PHENYL ETHER	<10 ppb	<10 ppb	<10 ppb	<10 ppb
CHLOROETHYL VINYL ETHER	<10 ppb	<10 ppb	<10 ppb	<10 ppb

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LAB ID :	88030797	88030798	88030799	88030800
DATE RECEIVED:	03/16/88	03/16/88	03/16/88	03/16/88
CHLOROPHENYL PHENYL ETHER	<10 ppb	<10 ppb	<10 ppb	<10 ppb
CHLORONAPHTHALENE (2)	<10 ppb	<10 ppb	<10 ppb	<10 ppb
DICHLOROBENZIDINE (3,3')	<10 ppb	<10 ppb	<10 ppb	<10 ppb
DINITROTOLUENE (2,4)	<10 ppb	<10 ppb	<10 ppb	<10 ppb
DINITROTOLUENE (2,6)	<10 ppb	<10 ppb	<10 ppb	<10 ppb
DIPHENYLHYDRAZINE (1,2)	<10 ppb	<10 ppb	<10 ppb	<10 ppb
FLUORANTHENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
HEXACHLOROBENZENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
HEXACHLOROBUTADIENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
HEXACHLOROCYCLOPENTADIENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
HEXACHLOROETHANE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
ISOPHORONE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
NAPHTHALENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
NITROBENZENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
N-NITROSODIMETHYLAMINE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
N-NITROSODIPHENYLAMINE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
N-NITROSO-DI-N-PROPYLAMINE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
TRICHLOROBENZENE (1,2,4)	<10 ppb	<10 ppb	<10 ppb	<10 ppb
BIS (2-ETHYLHEXYL) PHTHALATE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
BUTYL BENZYL PHTHALATE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
DIETHYL PHTHALATE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
DIMETHYL PHTHALATE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
DI-N-BUTYL PHTHALATE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
DI-N-OCTYL PHTHALATE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
ACENAPHTHYLENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
ANTHRACENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
BENZO (A) ANTHRACENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
BENZO (B) FLUORANTHENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
BENZO (K) FLUORANTHENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
BENZO (GHI) PERYLENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
BENZO (A) PYRENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
BENZOFLUORANTHENE (3,4)	<10 ppb	<10 ppb	<10 ppb	<10 ppb
CHRYSENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
DIBENZO (A,H) ANTHRACENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
FLUORENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb

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INDENO (1,2,3-CD) PYRENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
PHENANTHRENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
PYRENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
ALDRIN	<10 ppb	<10 ppb	<10 ppb	<10 ppb
DIELDRIN	<10 ppb	<10 ppb	<10 ppb	<10 ppb
CHLORDANE (TECHNICAL)	<10 ppb	<10 ppb	<10 ppb	<10 ppb
O,P'-DDE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
O,P'-DDD	<10 ppb	<10 ppb	<10 ppb	<10 ppb
O,P'-DDT	<10 ppb	<10 ppb	<10 ppb	<10 ppb
P,P'-DDE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
P,P'-DDD	<10 ppb	<10 ppb	<10 ppb	<10 ppb
P,P'-DDT	<10 ppb	<10 ppb	<10 ppb	<10 ppb
ENDOSULFAN I	<10 ppb	<10 ppb	<10 ppb	<10 ppb
ENDOSULFAN II	<10 ppb	<10 ppb	<10 ppb	<10 ppb
ENDOSULFAN SULFATE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
ENDRIN	<10 ppb	<10 ppb	<10 ppb	<10 ppb
ENDRIN ALDEHYDE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
HEPTACHLOR	<10 ppb	<10 ppb	<10 ppb	<10 ppb
HEPTACHLOR EPOXIDE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
A-BHC	<10 ppb	<10 ppb	<10 ppb	<10 ppb
B-BHC	<10 ppb	<10 ppb	<10 ppb	<10 ppb
LINDANE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
D-BHC	<10 ppb	<10 ppb	<10 ppb	<10 ppb
TOXAPHENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
AROCLOR 1016	<150 ppb	<150 ppb	<150 ppb	<150 ppb
AROCLOR 1221	<150 ppb	<150 ppb	<150 ppb	<150 ppb
AROCLOR 1232	<150 ppb	<150 ppb	<150 ppb	<150 ppb
AROCLOR 1242	<150 ppb	<150 ppb	<150 ppb	<150 ppb
AROCLOR 1248	<150 ppb	<150 ppb	<150 ppb	<150 ppb
AROCLOR 1254	<150 ppb	<150 ppb	<150 ppb	<150 ppb
AROCLOR 1260	<150 ppb	<150 ppb	<150 ppb	<150 ppb
AROCLOR 1262	<150 ppb	<150 ppb	<150 ppb	<150 ppb
EXTRACTION & CONCENTRATION	YES	YES	YES	YES

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CLIENT: McCLELLAND ENGINEERS
P.O. BOX 740010
HOUSTON , TX 77274

DATE: 04/12/88

CONTACT: MR. HARRY DAY

RELEASED BY: ALLAN M. CRANE

CC/FC: MCHD/EPTM4

PARAMETER					
	SAMPLE ID :	PAI3-SS1-01	PAI3-SS2-01	PAI3-SS3-01	PAI3-SS4-01
	LAB ID :	88030715	88030716	88030717	88030718
	SAMPLE TYPE :	15	15	15	15
	DATE RECEIVED:	03/14/88	03/14/88	03/14/88	03/14/88
	COLLECTED BY :	MCHD	MCHD	MCHD	MCHD
ARSENIC		<1.00 ppm	<1.00 ppm	<1.00 ppm	<1.00 ppm
CADMIUM		<0.50 ppm	<0.50 ppm	<0.50 ppm	<0.50 ppm
CHROMIUM		<1.00 ppm	<1.00 ppm	<1.00 ppm	<1.00 ppm
LEAD		<1.00 ppm	<1.00 ppm	<1.00 ppm	<1.00 ppm
MERCURY		<0.20 ppm	<0.20 ppm	<0.20 ppm	<0.20 ppm
EP TOX EXTRACTION-SOLID		YES	YES	YES	YES
DIGESTION FOR MERCURY ANALYSIS		YES	YES	YES	YES

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DATE: 04/13/88

CONTACT: MR. HARRY DAY

RELEASED BY: ALLAN M. CRANE

CC/FC: MCHD/MCHD2

PARAMETER	SAMPLE ID	PAI3-SS1-01	PAI3-SS2-01	PAI3-SS3-01	PAI3-SS4-01
	LAB ID	88030706	88030707	88030708	88030709
	SAMPLE TYPE	15	15	15	15
	DATE RECEIVED	03/14/88	03/14/88	03/14/88	03/14/88
	COLLECTED BY	MCHD	MCHD	MCHD	MCHD
ARSENIC		<0.10 ppm	<0.10 ppm	<0.10 ppm	<0.10 ppm
BARIUM		1.45 ppm	2.53 ppm	5.88 ppm	2.71 ppm
BERYLLIUM		<0.20 ppm	<0.20 ppm	<0.20 ppm	<0.20 ppm
CADMIUM		<1.00 ppm	<0.20 ppm	<0.20 ppm	<0.20 ppm
CHROMIUM		<1.00 ppm	<1.00 ppm	2.58 ppm	2.21 ppm
LEAD		0.48 ppm	0.98 ppm	8.08 ppm	6.80 ppm
MERCURY		0.45 ppm	0.60 ppm	0.40 ppm	0.30 ppm
SELENIUM		<0.10 ppm	<0.10 ppm	<0.10 ppm	<0.10 ppm
SILVER		<1.00 ppm	<1.00 ppm	<1.00 ppm	<1.00 ppm
DIGESTION FOR MERCURY ANALYSIS		YES	YES	YES	YES
ACID DIGESTION		YES	YES	YES	YES
PP Volatiles by Method 8240					
ACROLEIN		<100 ppb	<100 ppb	<100 ppb	<100 ppb
ACRYLONITRILE		<100 ppb	<100 ppb	<100 ppb	<100 ppb
BENZENE		<5 ppb	<5 ppb	<5 ppb	<5 ppb
BROMOFORM		<10 ppb	<10 ppb	<10 ppb	<10 ppb
CARBON TETRACHLORIDE		<10 ppb	<10 ppb	<10 ppb	<10 ppb
CHLOROBENZENE		<10 ppb	<10 ppb	<10 ppb	<10 ppb
CHLORODIBROMOMETHANE		<10 ppb	<10 ppb	<10 ppb	<10 ppb
CHLOROETHANE		<10 ppb	<10 ppb	<10 ppb	<10 ppb
2-CHLOROETHYL VINYL ETHER		<10 ppb	<10 ppb	<10 ppb	<10 ppb
CHLOROFORM		<10 ppb	<10 ppb	<10 ppb	<10 ppb
DICHLOROBENZENE (1,2)		<10 ppb	<10 ppb	<10 ppb	<10 ppb
DICHLOROBENZENE (1,3)		<10 ppb	<10 ppb	<10 ppb	<10 ppb
DICHLOROBENZENE (1,4)		<10 ppb	<10 ppb	<10 ppb	<10 ppb
DICHLOROBROMOMETHANE		<10 ppb	<10 ppb	<10 ppb	<10 ppb
DICHLORODIFLUOROMETHANE		<10 ppb	<10 ppb	<10 ppb	<10 ppb
DICHLOROETHANE (1,1)		<10 ppb	<10 ppb	<10 ppb	<10 ppb
DICHLOROETHANE (1,2)		<10 ppb	<10 ppb	<10 ppb	<10 ppb
DICHLOROETHYLENE (1,1)		<10 ppb	<10 ppb	<10 ppb	<10 ppb
DICHLOROETHYLENE (1,2-T)		<10 ppb	<10 ppb	<10 ppb	<10 ppb
DICHLOROPROPANE (1,2)		<10 ppb	<10 ppb	<10 ppb	<10 ppb
DICHLOROPROPYLENE (1,2)		<10 ppb	<10 ppb	<10 ppb	<10 ppb

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CC/FC: MCHD/MCHD2

SAMPLE ID :	PAI3-SS1-01	PAI3-SS2-01	PAI3-SS3-01	PAI3-SS4-01
LAB ID :	88030706	88030707	88030708	88030709
DATE RECEIVED:	03/14/88	03/14/88	03/14/88	03/14/88
DICHLOROPROPYLENE (1,3)	<10 ppb	<10 ppb	<10 ppb	<10 ppb
ETHYLBENZENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
METHYL BROMIDE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
METHYL CHLORIDE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
METHYLENE CHLORIDE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
TETRACHLOROETHANE (1,1,2,2)	<10 ppb	<10 ppb	<10 ppb	<10 ppb
TETRACHLOROETHYLENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
TOLUENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
TRICHLOROETHANE (1,1,1)	<10 ppb	<10 ppb	<10 ppb	<10 ppb
TRICHLOROETHANE (1,1,2)	<10 ppb	<10 ppb	<10 ppb	<10 ppb
TRICHLOROETHYLENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
TRICHLOROFLUOROMETHANE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
VINYL CHLORIDE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
PP Acid Ext. by Method 8270				
CHLOROPHENOL (2)	<330 ppb	<330 ppb	<330 ppb	<330 ppb
DICHLOROPHENOL (2,4)	<330 ppb	<330 ppb	<330 ppb	<330 ppb
DINITROPHENOL(2-METHYL-4,6)	<990 ppb	<990 ppb	<990 ppb	<990 ppb
DIMETHYLPHENOL (2,4)	<330 ppb	<330 ppb	<330 ppb	<330 ppb
DINITROPHENOL (2,4)	<1490 ppb	<1490 ppb	<1490 ppb	<1490 ppb
NITROPHENOL (2)	<330 ppb	<330 ppb	<330 ppb	<330 ppb
NITROPHENOL (4)	<330 ppb	<330 ppb	<330 ppb	<330 ppb
P-CHLORO-M-CRESOL	<330 ppb	<330 ppb	<330 ppb	<330 ppb
PENTACHLOROPHENOL	<330 ppb	<330 ppb	<330 ppb	<330 ppb
PHENOL	<330 ppb	<330 ppb	<330 ppb	<330 ppb
TRICHLOROPHENOL (2,4,6)	<330 ppb	<330 ppb	<330 ppb	<330 ppb
PP B/N Ext. by Method 8270				
ACENAPHTHENE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
BENZIDINE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
BIS (CHLOROMETHYL) ETHER	<330 ppb	<330 ppb	<330 ppb	<330 ppb
BIS (2-CHLOROETHOXY) METHANE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
BIS (2-CHLOROETHYL) ETHER	<330 ppb	<330 ppb	<330 ppb	<330 ppb
BIS (2-CHLOROISOPROPYL) ETHER	<330 ppb	<330 ppb	<330 ppb	<330 ppb
BROMOPHENYL PHENYL ETHER	<330 ppb	<330 ppb	<330 ppb	<330 ppb
CHLOROETHYL VINYL ETHER	<330 ppb	<330 ppb	<330 ppb	<330 ppb
CHLOROPHENYL PHENYL ETHER	<330 ppb	<330 ppb	<330 ppb	<330 ppb

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CONTACT: MR. HARRY DAY

DATE: 04/13/88

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SAMPLE ID :	PAI3-SS1-01	PAI3-SS2-01	PAI3-SS3-01	PAI3-SS4-01
LAB ID :	88030706	88030707	88030708	88030709
DATE RECEIVED:	03/14/88	03/14/88	03/14/88	03/14/88
CHLORONAPHTHALENE (2)	<330 ppb	<330 ppb	<330 ppb	<330 ppb
DICHLOROBENZIDINE (3,3')	<330 ppb	<330 ppb	<330 ppb	<330 ppb
DINITROTOLUENE (2,4)	<330 ppb	<330 ppb	<330 ppb	<330 ppb
DINITROTOLUENE (2,6)	<330 ppb	<330 ppb	<330 ppb	<330 ppb
DIPHENYLHYDRAZINE (1,2)	<330 ppb	<330 ppb	<330 ppb	<330 ppb
FLUORANTHENE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
HEXACHLOROBENZENE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
HEXACHLOROBUTADIENE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
HEXACHLOROCYCLOPENTADIENE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
HEXACHLOROETHANE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
ISOPHORONE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
NAPHTHALENE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
NITROBENZENE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
N-NITROSODIMETHYLAMINE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
N-NITROSODIPHENYLAMINE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
N-NITROSO-DI-N-PROPYLAMINE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
TRICHLOROBENZENE (1,2,4)	<330 ppb	<330 ppb	<330 ppb	<330 ppb
BIS (2-ETHYLHEXYL) PHTHALATE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
BUTYL BENZYL PHTHALATE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
DIETHYL PHTHALATE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
DIMETHYL PHTHALATE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
DI-N-BUTYL PHTHALATE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
DI-N-OCTYL PHTHALATE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
ACENAPHTHYLENE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
ANTHRACENE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
BENZO (A) ANTHRACENE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
BENZO (B) FLUORANTHENE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
BENZO (K) FLUORANTHENE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
BENZO (GHI) PERYLENE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
BENZO (A) PYRENE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
BENZOFLUORANTHENE (3,4)	<330 ppb	<330 ppb	<330 ppb	<330 ppb
CHRYSENE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
DIBENZO (A,H) ANTHRACENE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
FLUORENE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
INDENO (1,2,3-CD) PYRENE	<330 ppb	<330 ppb	<330 ppb	<330 ppb

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CONTACT: MR. HARRY DAY

DATE: 04/13/88

CC/FC: MCHD/MCHD2

SAMPLE ID :	PAI3-SS1-01	PAI3-SS2-01	PAI3-SS3-01	PAI3-SS4-01
LAB ID :	88030706	88030707	88030708	88030709
DATE RECEIVED:	03/14/88	03/14/88	03/14/88	03/14/88
PHENANTHRENE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
PYRENE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
ALDRIN	<330 ppb	<330 ppb	<330 ppb	<330 ppb
DIELDRIN	<330 ppb	<330 ppb	<330 ppb	<330 ppb
CHLORDANE (TECHNICAL)	<330 ppb	<330 ppb	<330 ppb	<330 ppb
O,P'-DDE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
O,P'-DDD	<330 ppb	<330 ppb	<330 ppb	<330 ppb
O,P'-DDT	<330 ppb	<330 ppb	<330 ppb	<330 ppb
P,P'-DDE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
P,P'-DDD	<330 ppb	<330 ppb	<330 ppb	<330 ppb
P,P'-DDT	<330 ppb	<330 ppb	<330 ppb	<330 ppb
ENDOSULFAN I	<330 ppb	<330 ppb	<330 ppb	<330 ppb
ENDOSULFAN II	<330 ppb	<330 ppb	<330 ppb	<330 ppb
ENDOSULFAN SULFATE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
ENDRIN	<330 ppb	<330 ppb	<330 ppb	<330 ppb
ENDRIN ALDEHYDE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
HEPTACHLOR	<330 ppb	<330 ppb	<330 ppb	<330 ppb
HEPTACHLOR EPOXIDE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
A-BHC	<330 ppb	<330 ppb	<330 ppb	<330 ppb
B-BHC	<330 ppb	<330 ppb	<330 ppb	<330 ppb
LINDANE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
D-BHC	<330 ppb	<330 ppb	<330 ppb	<330 ppb
TOXAPHENE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
AROCLOR 1016	<450 ppb	<450 ppb	<450 ppb	<450 ppb
AROCLOR 1221	<450 ppb	<450 ppb	<450 ppb	<450 ppb
AROCLOR 1232	<450 ppb	<450 ppb	<450 ppb	<450 ppb
AROCLOR 1242	<450 ppb	<450 ppb	<450 ppb	<450 ppb
AROCLOR 1248	<450 ppb	<450 ppb	<450 ppb	<450 ppb
AROCLOR 1254	<450 ppb	<450 ppb	<450 ppb	<450 ppb
AROCLOR 1260	<450 ppb	<450 ppb	<450 ppb	<450 ppb
AROCLOR 1262	<450 ppb	<450 ppb	<450 ppb	<450 ppb
% WATER (KARL-FISCHER TIT.)	27.2 wt%	31.3 wt%	30.3 wt%	34.3 wt%
EXTRACTION & CONCENTRATION	YES	YES	YES	YES

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CLIENT: McCLELLAND ENGINEERS
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DATE: 04/12/88

CONTACT: MR. HARRY DAY

RELEASED BY: A.M. Crane
ALLAN M. CRANE

CC/FC: MCHD/EPTM4

PARAMETER					
	SAMPLE ID :	PAI3-SS5-01	PAI3-SS6-01	PAI3-SS7-01	PAI3-SS8-01
	LAB ID :	88030719	88030720	88030721	88030723
	SAMPLE TYPE :	15	15	15	15
	DATE RECEIVED:	03/14/88	03/14/88	03/14/88	03/14/88
	COLLECTED BY :	MCHD	MCHD	MCHD	MCHD
ARSENIC		<1.00 ppm	<1.00 ppm	<1.00 ppm	<1.00 ppm
CADMIUM		<0.50 ppm	<0.50 ppm	<0.50 ppm	<0.50 ppm
CHROMIUM		<1.00 ppm	<1.00 ppm	<1.00 ppm	<1.00 ppm
LEAD		<1.00 ppm	<1.00 ppm	<1.00 ppm	<1.00 ppm
MERCURY		<0.20 ppm	<0.20 ppm	<0.20 ppm	<0.20 ppm
EP TOX EXTRACTION-SOLID		YES	YES	YES	YES
DIGESTION FOR MERCURY ANALYSIS		YES	YES	YES	YES

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CONTACT: MR. HARRY DAY

RELEASED BY: ALLAN M. CRANE

CC/FC: MCHD/MCHD2

PAGE NO.: 1

PARAMETER	SAMPLE ID	PAI3-SS5-01	PAI3-SS6-01	PAI3-SS7-01	PAI3-SS8-01
	LAB ID	88030710	88030711	88030712	88030714
	SAMPLE TYPE	15	15	15	15
	DATE RECEIVED	03/14/88	03/14/88	03/14/88	03/14/88
	COLLECTED BY	MCHD	MCHD	MCHD	MCHD
ARSENIC		<0.10 ppm	<0.10 ppm	<0.10 ppm	<0.10 ppm
BARIUM		3.74 ppm	2.38 ppm	1.86 ppm	3.45 ppm
BERYLLIUM		<0.20 ppm	<0.20 ppm	<0.20 ppm	<0.20 ppm
CADMIUM		<0.20 ppm	<0.20 ppm	<0.20 ppm	<0.20 ppm
CHROMIUM		2.43 ppm	<1.00 ppm	1.76 ppm	1.80 ppm
LEAD		18.8 ppm	0.52 ppm	4.32 ppm	23.9 ppm
MERCURY		0.55 ppm	0.35 ppm	0.35 ppm	0.45 ppm
SELENIUM		0.16 ppm	<0.10 ppm	0.15 ppm	<0.10 ppm
SILVER		<1.00 ppm	<1.00 ppm	<1.00 ppm	<1.00 ppm
DIGESTION FOR MERCURY ANALYSIS		YES	YES	YES	YES
ACID DIGESTION		YES	YES	YES	YES
PP Volatiles by Method 8240					
ACROLEIN		<100 ppb	<100 ppb	<100 ppb	<100 ppb
ACRYLONITRILE		<100 ppb	<100 ppb	<100 ppb	<100 ppb
BENZENE		<5 ppb	<5 ppb	<5 ppb	<5 ppb
BROMOFORM		<10 ppb	<10 ppb	<10 ppb	<10 ppb
CARBON TETRACHLORIDE		<10 ppb	<10 ppb	<10 ppb	<10 ppb
CHLOROBENZENE		<10 ppb	<10 ppb	<10 ppb	<10 ppb
CHLORODIBROMOMETHANE		<10 ppb	<10 ppb	<10 ppb	<10 ppb
CHLOROETHANE		<10 ppb	<10 ppb	<10 ppb	<10 ppb
2-CHLOROETHYL VINYL ETHER		<10 ppb	<10 ppb	<10 ppb	<10 ppb
CHLOROFORM		<10 ppb	<10 ppb	<10 ppb	<10 ppb
DICHLOROBENZENE (1,2)		<10 ppb	<10 ppb	<10 ppb	<10 ppb
DICHLOROBENZENE (1,3)		<10 ppb	<10 ppb	<10 ppb	<10 ppb
DICHLOROBENZENE (1,4)		<10 ppb	<10 ppb	<10 ppb	<10 ppb
DICHLOROBROMOMETHANE		<10 ppb	<10 ppb	<10 ppb	<10 ppb
DICHLORODIFLUOROMETHANE		<10 ppb	<10 ppb	<10 ppb	<10 ppb
DICHLOROETHANE (1,1)		<10 ppb	<10 ppb	<10 ppb	<10 ppb
DICHLOROETHANE (1,2)		<10 ppb	<10 ppb	<10 ppb	<10 ppb
DICHLOROETHYLENE (1,1)		<10 ppb	<10 ppb	<10 ppb	<10 ppb
DICHLOROETHYLENE (1,2-T)		<10 ppb	<10 ppb	<10 ppb	<10 ppb
DICHLOROPROPANE (1,2)		<10 ppb	<10 ppb	<10 ppb	<10 ppb
DICHLOROPROPYLENE (1,2)		<10 ppb	<10 ppb	<10 ppb	<10 ppb

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CONTACT: MR. HARRY DAY

CC/FC: MCHD/MCHD2

SAMPLE ID :	PAI3-SS5-01	PAI3-SS6-01	PAI3-SS7-01	PAI3-SS8-01
LAB ID :	88030710	88030711	88030712	88030714
DATE RECEIVED:	03/14/88	03/14/88	03/14/88	03/14/88
DICHLOROPROPYLENE (1,3)	<10 ppb	<10 ppb	<10 ppb	<10 ppb
ETHYLBENZENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
METHYL BROMIDE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
METHYL CHLORIDE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
METHYLENE CHLORIDE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
TETRACHLOROETHANE (1,1,2,2)	<10 ppb	<10 ppb	<10 ppb	<10 ppb
TETRACHLOROETHYLENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
TOLUENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
TRICHLOROETHANE (1,1,1)	<10 ppb	<10 ppb	<10 ppb	<10 ppb
TRICHLOROETHANE (1,1,2)	<10 ppb	<10 ppb	<10 ppb	<10 ppb
TRICHLOROETHYLENE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
TRICHLOROFLUOROMETHANE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
VINYL CHLORIDE	<10 ppb	<10 ppb	<10 ppb	<10 ppb
PP Acid Ext. by Method 8270				
CHLOROPHENOL (2)	<330 ppb	<330 ppb	<330 ppb	<330 ppb
DICHLOROPHENOL (2,4)	<330 ppb	<330 ppb	<330 ppb	<330 ppb
DINITROPHENOL(2-METHYL-4,6)	<990 ppb	<990 ppb	<990 ppb	<990 ppb
DIMETHYLPHENOL (2,4)	<330 ppb	<330 ppb	<330 ppb	<330 ppb
DINITROPHENOL (2,4)	<1490 ppb	<1490 ppb	<1490 ppb	<1490 ppb
NITROPHENOL (2)	<330 ppb	<330 ppb	<330 ppb	<330 ppb
NITROPHENOL (4)	<330 ppb	<330 ppb	<330 ppb	<330 ppb
P-CHLORO-M-CRESOL	<330 ppb	<330 ppb	<330 ppb	<330 ppb
PENTACHLOROPHENOL	<330 ppb	<330 ppb	<330 ppb	<330 ppb
PHENOL	<330 ppb	<330 ppb	<330 ppb	<330 ppb
TRICHLOROPHENOL (2,4,6)	<330 ppb	<330 ppb	<330 ppb	<330 ppb
PP B/N Ext. by Method 8270				
ACENAPHTHENE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
BENZIDINE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
BIS (CHLOROMETHYL) ETHER	<330 ppb	<330 ppb	<330 ppb	<330 ppb
BIS (2-CHLOROETHOXY) METHANE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
BIS (2-CHLOROETHYL) ETHER	<330 ppb	<330 ppb	<330 ppb	<330 ppb
BIS (2-CHLOROISOPROPYL) ETHER	<330 ppb	<330 ppb	<330 ppb	<330 ppb
BROMOPHENYL PHENYL ETHER	<330 ppb	<330 ppb	<330 ppb	<330 ppb
CHLOROETHYL VINYL ETHER	<330 ppb	<330 ppb	<330 ppb	<330 ppb
CHLOROPHENYL PHENYL ETHER	<330 ppb	<330 ppb	<330 ppb	<330 ppb

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VA	00151
NACIP	Approved

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CLIENT: McCLELLAND ENGINEERS
P.O. BOX 740010
HOUSTON , TX 77274
CONTACT: MR. HARRY DAY

DATE: 04/19/88

CC/FC: MCHD/MCHD2

SAMPLE ID :	PAI3-SS5-01	PAI3-SS6-01	PAI3-SS7-01	PAI3-SS8-01
LAB ID :	88030710	88030711	88030712	88030714
DATE RECEIVED:	03/14/88	03/14/88	03/14/88	03/14/88
CHLORONAPHTHALENE (2)	<330 ppb	<330 ppb	<330 ppb	<330 ppb
DICHLOROBENZIDINE (3,3')	<330 ppb	<330 ppb	<330 ppb	<330 ppb
DINITROTOLUENE (2,4)	<330 ppb	<330 ppb	<330 ppb	<330 ppb
DINITROTOLUENE (2,6)	<330 ppb	<330 ppb	<330 ppb	<330 ppb
DIPHENYLHYDRAZINE (1,2)	<330 ppb	<330 ppb	<330 ppb	<330 ppb
FLUORANTHENE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
HEXACHLOROBENZENE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
HEXACHLOROBUTADIENE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
HEXACHLOROCYCLOPENTADIENE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
HEXACHLOROETHANE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
ISOPHORONE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
NAPHTHALENE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
NITROBENZENE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
N-NITROSODIMETHYLAMINE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
N-NITROSODIPHENYLAMINE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
N-NITROSO-DI-N-PROPYLAMINE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
TRICHLOROBENZENE (1,2,4)	<330 ppb	<330 ppb	<330 ppb	<330 ppb
BIS (2-ETHYLHEXYL) PHTHALATE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
BUTYL BENZYL PHTHALATE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
DIETHYL PHTHALATE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
DIMETHYL PHTHALATE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
DI-N-BUTYL PHTHALATE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
DI-N-OCTYL PHTHALATE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
ACENAPHTHYLENE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
ANTHRACENE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
BENZO (A) ANTHRACENE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
BENZO (B) FLUORANTHENE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
BENZO (K) FLUORANTHENE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
BENZO (GHI) PERYLENE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
BENZO (A) PYRENE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
BENZOFLUORANTHENE (3,4)	<330 ppb	<330 ppb	<330 ppb	<330 ppb
CHRYSENE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
DIBENZO (A,H) ANTHRACENE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
FLUORENE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
INDENO (1,2,3-CD) PYRENE	<330 ppb	<330 ppb	<330 ppb	<330 ppb

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P.O. BOX 740010
HOUSTON , TX 77274
CONTACT: MR. HARRY DAY

DATE: 04/19/88

CC/FC: MCHD/MCHD2

SAMPLE ID :	PAI3-SS5-01	PAI3-SS6-01	PAI3-SS7-01	PAI3-SS8-01
LAB ID :	88030710	88030711	88030712	88030714
DATE RECEIVED:	03/14/88	03/14/88	03/14/88	03/14/88
PHENANTHRENE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
PYRENE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
ALDRIN	<330 ppb	<330 ppb	<330 ppb	<330 ppb
DIELDRIN	<330 ppb	<330 ppb	<330 ppb	<330 ppb
CHLORDANE (TECHNICAL)	<330 ppb	<330 ppb	<330 ppb	<330 ppb
O,P'-DDE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
O,P'-DDD	<330 ppb	<330 ppb	<330 ppb	<330 ppb
O,P'-DDT	<330 ppb	<330 ppb	<330 ppb	<330 ppb
P,P'-DDE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
P,P'-DDD	<330 ppb	<330 ppb	<330 ppb	<330 ppb
P,P'-DDT	<330 ppb	<330 ppb	<330 ppb	<330 ppb
ENDOSULFAN I	<330 ppb	<330 ppb	<330 ppb	<330 ppb
ENDOSULFAN II	<330 ppb	<330 ppb	<330 ppb	<330 ppb
ENDOSULFAN SULFATE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
ENDRIN	<330 ppb	<330 ppb	<330 ppb	<330 ppb
ENDRIN ALDEHYDE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
HEPTACHLOR	<330 ppb	<330 ppb	<330 ppb	<330 ppb
HEPTACHLOR EPOXIDE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
A-BHC	<330 ppb	<330 ppb	<330 ppb	<330 ppb
B-BHC	<330 ppb	<330 ppb	<330 ppb	<330 ppb
LINDANE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
D-BHC	<330 ppb	<330 ppb	<330 ppb	<330 ppb
TOXAPHENE	<330 ppb	<330 ppb	<330 ppb	<330 ppb
AROCLOR 1016	<450 ppb	<450 ppb	<450 ppb	<450 ppb
AROCLOR 1221	<450 ppb	<450 ppb	<450 ppb	<450 ppb
AROCLOR 1232	<450 ppb	<450 ppb	<450 ppb	<450 ppb
AROCLOR 1242	<450 ppb	<450 ppb	<450 ppb	<450 ppb
AROCLOR 1248	<450 ppb	<450 ppb	<450 ppb	<450 ppb
AROCLOR 1254	<450 ppb	<450 ppb	<450 ppb	<450 ppb
AROCLOR 1260	<450 ppb	<450 ppb	<450 ppb	<450 ppb
AROCLOR 1262	<450 ppb	<450 ppb	<450 ppb	<450 ppb
% WATER (KARL-FISCHER TIT.)	27.1 wt%	28.1 wt%	28.2 wt%	29.9 wt%
EXTRACTION & CONCENTRATION	YES	YES	YES	YES

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HOUSTON , TX 77274

DATE: 04/12/88

CONTACT: MR. HARRY DAY

RELEASED BY: ALLAN M. CRANE

CC/FC: MCHD/EPTM4

	SAMPLE ID :	PAI3-SS7-01D
	LAB ID :	88030722
	SAMPLE TYPE :	15
	DATE RECEIVED:	03/14/88
PARAMETER	COLLECTED BY :	MCHD
ARSENIC		<1.00 ppm
CADMIUM		<0.50 ppm
CHROMIUM		<1.00 ppm
LEAD		<1.00 ppm
MERCURY		<0.20 ppm
EP TOX EXTRACTION-SOLID		YES
DIGESTION FOR MERCURY ANALYSIS		YES

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CLIENT: McCLELLAND ENGINEERS
P.O. BOX 740010
HOUSTON , TX 77274

DATE: 04/19/88

CONTACT: MR. HARRY DAY

RELEASED BY: ALLAN M. CRANE

CC/FC: MCHD/MCHD2

PAGE NO.: 1

SAMPLE ID : PAI3-SS7-01D

LAB ID : 88030713
SAMPLE TYPE : 15
DATE RECEIVED: 03/14/88
COLLECTED BY : MCHD

PARAMETER	
ARSENIC	<0.10 ppm
BARIUM	1.84 ppm
BERYLLIUM	<0.20 ppm
CADMIUM	<0.20 ppm
CHROMIUM	1.45 ppm
LEAD	4.65 ppm
MERCURY	0.40 ppm
SELENIUM	0.11 ppm
SILVER	<1.00 ppm
DIGESTION FOR MERCURY ANALYSIS	YES
ACID DIGESTION	YES
PP Volatiles by Method 8240	
ACROLEIN	<100 ppb
ACRYLONITRILE	<100 ppb
BENZENE	<5 ppb
BROMOFORM	<10 ppb
CARBON TETRACHLORIDE	<10 ppb
CHLOROBENZENE	<10 ppb
CHLORODIBROMOMETHANE	<10 ppb
CHLOROETHANE	<10 ppb
2-CHLOROETHYL VINYL ETHER	<10 ppb
CHLOROFORM	<10 ppb
DICHLOROBENZENE (1,2)	<10 ppb
DICHLOROBENZENE (1,3)	<10 ppb
DICHLOROBENZENE (1,4)	<10 ppb
DICHLOROBROMOMETHANE	<10 ppb
DICHLORODIFLUOROMETHANE	<10 ppb
DICHLOROETHANE (1,1)	<10 ppb
DICHLOROETHANE (1,2)	<10 ppb
DICHLOROETHYLENE (1,1)	<10 ppb
DICHLOROETHYLENE (1,2-T)	<10 ppb
DICHLOROPROPANE (1,2)	<10 ppb
DICHLOROPROPYLENE (1,2)	<10 ppb

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CONTACT: MR. HARRY DAY

DATE: 04/19/88

CC/FC: MCHD/MCHD2

SAMPLE ID : PAI3-SS7-01D

LAB ID : 88030713
DATE RECEIVED: 03/14/88

DICHLOROPROPYLENE (1,3)	<10 ppb
ETHYLBENZENE	<10 ppb
METHYL BROMIDE	<10 ppb
METHYL CHLORIDE	<10 ppb
METHYLENE CHLORIDE	<10 ppb
TETRACHLOROETHANE (1,1,2,2)	<10 ppb
TETRACHLOROETHYLENE	<10 ppb
TOLUENE	<10 ppb
TRICHLOROETHANE (1,1,1)	<10 ppb
TRICHLOROETHANE (1,1,2)	<10 ppb
TRICHLOROETHYLENE	<10 ppb
TRICHLOROFLUOROMETHANE	<10 ppb
VINYL CHLORIDE	<10 ppb
PP Acid Ext. by Method 8270	
CHLOROPHENOL (2)	<10 ppb
DICHLOROPHENOL (2,4)	<330 ppb
DINITROPHENOL(2-METHYL-4,6)	<990 ppb
DIMETHYLPHENOL (2,4)	<330 ppb
DINITROPHENOL (2,4)	<1490 ppb
NITROPHENOL (2)	<330 ppb
NITROPHENOL (4)	<330 ppb
P-CHLORO-M-CRESOL	<330 ppb
PENTACHLOROPHENOL	<330 ppb
PHENOL	<330 ppb
TRICHLOROPHENOL (2,4,6)	<330 ppb
PP B/N Ext. by Method 8270	
ACENAPHTHENE	<330 ppb
BENZIDINE	<330 ppb
BIS (CHLOROMETHYL) ETHER	<330 ppb
BIS (2-CHLOROETHOXY) METHANE	<330 ppb
BIS (2-CHLOROETHYL) ETHER	<330 ppb
BIS (2-CHLOROISOPROPYL) ETHER	<330 ppb
BROMOPHENYL PHENYL ETHER	<330 ppb
CHLOROETHYL VINYL ETHER	<330 ppb
CHLOROPHENYL PHENYL ETHER	<330 ppb

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HOUSTON , TX 77274
CONTACT: MR. HARRY DAY

DATE: 04/19/88

CC/FC: MCHD/MCHD2

SAMPLE ID : PAI3-SS7-01D

LAB ID : 88030713
DATE RECEIVED: 03/14/88

CHLORONAPHTHALENE (2)	<330 ppb
DICHLOROBENZIDINE (3,3')	<330 ppb
DINITROTOLUENE (2,4)	<330 ppb
DINITROTOLUENE (2,6)	<330 ppb
DIPHENYLHYDRAZINE (1,2)	<330 ppb
FLUORANTHENE	<330 ppb
HEXACHLOROBENZENE	<330 ppb
HEXACHLOROBUTADIENE	<330 ppb
HEXACHLOROCYCLOPENTADIENE	<330 ppb
HEXACHLOROETHANE	<330 ppb
ISOPHORONE	<330 ppb
NAPHTHALENE	<330 ppb
NITROBENZENE	<330 ppb
N-NITROSODIMETHYLAMINE	<330 ppb
N-NITROSODIPHENYLAMINE	<330 ppb
N-NITROSO-DI-N-PROPYLAMINE	<330 ppb
TRICHLOROBENZENE (1,2,4)	<330 ppb
BIS (2-ETHYLHEXYL) PHTHALATE	<330 ppb
BUTYL BENZYL PHTHALATE	<330 ppb
DIETHYL PHTHALATE	<330 ppb
DIMETHYL PHTHALATE	<330 ppb
DI-N-BUTYL PHTHALATE	<330 ppb
DI-N-OCTYL PHTHALATE	<330 ppb
ACENAPHTHYLENE	<330 ppb
ANTHRACENE	<330 ppb
BENZO (A) ANTHRACENE	<330 ppb
BENZO (B) FLUORANTHENE	<330 ppb
BENZO (K) FLUORANTHENE	<330 ppb
BENZO (GHI) PERYLENE	<330 ppb
BENZO (A) PYRENE	<330 ppb
BENZOFLUORANTHENE (3,4)	<330 ppb
CHRYSENE	<330 ppb
DIBENZO (A,H) ANTHRACENE	<330 ppb
FLUORENE	<330 ppb
INDENO (1,2,3-CD) PYRENE	<330 ppb

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DATE: 04/19/88

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SAMPLE ID : PAI3-SS7-01D

LAB ID : 88030713
DATE RECEIVED: 03/14/88

PHENANTHRENE	<330 ppb
PYRENE	<330 ppb
ALDRIN	<330 ppb
DIELDRIN	<330 ppb
CHLORDANE (TECHNICAL)	<330 ppb
O,P'-DDE	<330 ppb
O,P'-DDD	<330 ppb
O,P'-DDT	<330 ppb
P,P'-DDE	<330 ppb
P,P'-DDD	<330 ppb
P,P'-DDT	<330 ppb
ENDOSULFAN I	<330 ppb
ENDOSULFAN II	<330 ppb
ENDOSULFAN SULFATE	<330 ppb
ENDRIN	<330 ppb
ENDRIN ALDEHYDE	<330 ppb
HEPTACHLOR	<330 ppb
HEPTACHLOR EPOXIDE	<330 ppb
A-BHC	<330 ppb
B-BHC	<330 ppb
LINDANE	<330 ppb
D-BHC	<330 ppb
TOXAPHENE	<330 ppb
AROCLOR 1016	<450 ppb
AROCLOR 1221	<450 ppb
AROCLOR 1232	<450 ppb
AROCLOR 1242	<450 ppb
AROCLOR 1248	<450 ppb
AROCLOR 1254	<450 ppb
AROCLOR 1260	<450 ppb
AROCLOR 1262	<450 ppb
% WATER (KARL-FISCHER TIT.)	25.1 wt%
EXTRACTION & CONCENTRATION	YES

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P.O. BOX 740010
HOUSTON , TX 77274

DATE: 04/20/88

CONTACT: MR. HARRY DAY

RELEASED BY: ALLAN M. CRANE

CC/FC: MCHD/CR+61

PARAMETER			
	SAMPLE ID :	PAI3-SS3-01	PAI3-SS4-01
	LAB ID :	88040541	88040542
	SAMPLE TYPE :	15	15
	DATE RECEIVED:	04/15/88	04/15/88
	COLLECTED BY :	MCHD	MCHD
CHROMIUM - HEXAVALENT		<0.01 ppm	0.01 ppm
HEX. CHROMIUM EXTRACTION		YES	YES

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DATE: 04/20/88

CONTACT: MR. HARRY DAY

RELEASED BY: A.M. Crane
ALLAN M. CRANE

CC/FC: MCHD/CR+61

PAGE NO.: 1

PARAMETER	SAMPLE ID	PAI3-SS5-01	PAI3-SS7-01	PAI3-SS8-01
	LAB ID	88040543	88040544	88040546
	SAMPLE TYPE	15	15	15
	DATE RECEIVED	04/15/88	04/15/88	04/15/88
	COLLECTED BY	MCHD	MCHD	MCHD
CHROMIUM - HEXAVALENT		<0.01 ppm	0.01 ppm	<0.01 ppm
HEX. CHROMIUM EXTRACTION		YES	YES	YES

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DATE: 04/20/88

CONTACT: MR. HARRY DAY

RELEASED BY: G.M. Crane
ALLAN M. CRANE

CC/FC: MCHD/CR+61

PAGE NO.: 1

PARAMETER		
	SAMPLE ID :	PAI3-SS7-01D
	LAB ID :	88040545
	SAMPLE TYPE :	15
	DATE RECEIVED:	04/15/88
	COLLECTED BY :	MCHD
CHROMIUM - HEXAVALENT		0.01 ppm
HEX. CHROMIUM EXTRACTION		YES

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SC	10120
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CERTIFICATE OF ANALYSIS

CLIENT: McCLELLAND ENGINEERS
P.O. BOX 740010
HOUSTON , TX 77274

DATE: 03/23/88

CONTACT: MR. HARRY DAY

RELEASED BY: A.M. Crane
ALLAN M. CRANE

CC/FC: MCHD/TOTM2

PAGE NO.: 1

PARAMETER	SAMPLE ID	PAI4-SB1-10	PAI4-SB2-1	PAI4-SB3-6	PAI4-SB4-4
	LAB ID	88030044	88030045	88030046	88030047
	SAMPLE TYPE	15	15	15	15
	DATE RECEIVED	03/01/88	03/01/88	03/01/88	03/01/88
	COLLECTED BY	MCHD	MCHD	MCHD	MCHD
CADMIUM		<0.20 ppm	<0.20 ppm	<0.20 ppm	<0.20 ppm
CHROMIUM		4.90 ppm	4.50 ppm	3.79 ppm	<1.00 ppm
LEAD		3.73 ppm	13.9 ppm	1.10 ppm	1.19 ppm
ACID DIGESTION		YES	YES	YES	YES

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DATE: 03/23/88

CONTACT: MR. HARRY DAY

RELEASED BY: ALLAN M. CRANE

CC/FC: MCHD/EPTM4

PARAMETER					
	SAMPLE ID :	PAI4-SB2-1	PAI4-SB2-1	PAI4-SB3-6	PAI4-SB4-4
	LAB ID :	88030049	88030050	88030051	88030052
	SAMPLE TYPE :	15	15	15	15
	DATE RECEIVED:	03/01/88	03/01/88	03/01/88	03/01/88
	COLLECTED BY :	MCHD	MCHD	MCHD	MCHD
CADMIUM		<0.50 ppm	<0.50 ppm	<0.50 ppm	<0.50 ppm
CHROMIUM		<1.00 ppm	<1.00 ppm	<1.00 ppm	<1.00 ppm
LEAD		<1.00 ppm	<1.00 ppm	<1.00 ppm	<1.00 ppm
EP TOX EXTRACTION-SOLID		YES	YES	YES	YES

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RELEASED BY: A.M. Crane
ALLAN M. CRANE

CC/FC: MCHD/TOTM2

PAGE NO.: 1

PARAMETER		
	SAMPLE ID :	PAI4-SB5-7.5
	LAB ID :	88030048
	SAMPLE TYPE :	15
	DATE RECEIVED:	03/01/88
	COLLECTED BY :	MCHD
CADMIUM		<0.20 ppm
CHROMIUM		7.69 ppm
LEAD		1.25 ppm
ACID DIGESTION		YES

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RELEASED BY: ALLAN M. CRANE

CC/FC: MCHD/EPTM4

PARAMETER		
	SAMPLE ID :	PAI4-SB5-7.5
	LAB ID :	88030053
	SAMPLE TYPE :	15
	DATE RECEIVED:	03/01/88
	COLLECTED BY :	MCHD
CADMIUM		<0.50 ppm
CHROMIUM		<1.00 ppm
LEAD		<1.00 ppm
EP TOX EXTRACTION-SOLID		YES

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DATE: 05/10/88

RELEASED BY: for ALLAN M. CRANE

CC/FC: MCHD/MCHD5

SAMPLE ID : PAI6-GW1-00

LAB ID : 88030979
SAMPLE TYPE : 11
DATE RECEIVED: 03/21/88
COLLECTED BY : MCHD

PARAMETER	
TOTAL ORGANIC CARBON	20.3 ppm
CADMIUM - DISSOLVED	<0.010 ppm
CHROMIUM - DISSOLVED	<0.03 ppm
LEAD - DISSOLVED	0.033 ppm
ACID DIGESTION	YES
PP Volatiles by Method 8240	
ACROLEIN	<100 ppb
ACRYLONITRILE	<100 ppb
BENZENE	<5 ppb
BROMOFORM	<10 ppb
CARBON TETRACHLORIDE	<10 ppb
CHLOROBENZENE	<10 ppb
CHLORODIBROMOMETHANE	<10 ppb
CHLOROETHANE	<10 ppb
2-CHLOROETHYL VINYL ETHER	<10 ppb
CHLOROFORM	<10 ppb
DICHLOROBENZENE (1,2)	<10 ppb
DICHLOROBENZENE (1,3)	<10 ppb
DICHLOROBENZENE (1,4)	<10 ppb
DICHLOROBROMOMETHANE	<10 ppb
DICHLORODIFLUOROMETHANE	<10 ppb
DICHLOROETHANE (1,1)	<10 ppb
DICHLOROETHANE (1,2)	<10 ppb
DICHLOROETHYLENE (1,1)	<10 ppb
DICHLOROETHYLENE (1,2-T)	<10 ppb
DICHLOROPROPANE (1,2)	<10 ppb
DICHLOROPROPYLENE (1,2)	<10 ppb
DICHLOROPROPYLENE (1,3)	<10 ppb
ETHYLBENZENE	<10 ppb
METHYL BROMIDE	<10 ppb
METHYL CHLORIDE	<10 ppb
METHYLENE CHLORIDE	<10 ppb
TETRACHLOROETHANE (1,1,2,2)	<10 ppb

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DATE: 05/10/88

CC/FC: MCHD/MCHD5

SAMPLE ID : PAI6-GW1-00

LAB ID : 88030979
DATE RECEIVED: 03/21/88

TETRACHLOROETHYLENE	<10 ppb
TOLUENE	<10 ppb
TRICHLOROETHANE (1,1,1)	<10 ppb
TRICHLOROETHANE (1,1,2)	<10 ppb
TRICHLOROETHYLENE	<10 ppb
TRICHLOROFLUOROMETHANE	<10 ppb
VINYL CHLORIDE	<10 ppb
PP B/N Ext. by Method 8270	
ACENAPHTHENE	<10 ppb
BENZIDINE	<10 ppb
BIS (CHLOROMETHYL) ETHER	<10 ppb
BIS (2-CHLOROETHOXY) METHANE	<10 ppb
BIS (2-CHLOROETHYL) ETHER	<10 ppb
BIS (2-CHLOROISOPROPYL) ETHER	<10 ppb
BROMOPHENYL PHENYL ETHER	<10 ppb
CHLOROETHYL VINYL ETHER	<10 ppb
CHLOROPHENYL PHENYL ETHER	<10 ppb
CHLORONAPHTHALENE (2)	<10 ppb
DICHLOROBENZIDINE (3,3')	<10 ppb
DINITROTOLUENE (2,4)	<10 ppb
DINITROTOLUENE (2,6)	<10 ppb
DIPHENYLHYDRAZINE (1,2)	<10 ppb
FLUORANTHENE	<10 ppb
HEXACHLOROBENZENE	<10 ppb
HEXACHLOROBUTADIENE	<10 ppb
HEXACHLOROCYCLOPENTADIENE	<10 ppb
HEXACHLOROETHANE	<10 ppb
ISOPHORONE	<10 ppb
NAPHTHALENE	<10 ppb
NITROBENZENE	<10 ppb
N-NITROSODIMETHYLAMINE	<10 ppb
N-NITROSODIPHENYLAMINE	<10 ppb
N-NITROSO-DI-N-PROPYLAMINE	<10 ppb
TRICHLOROBENZENE (1,2,4)	<10 ppb
BIS (2-ETHYLHEXYL) PHTHALATE	<10 ppb

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DATE: 05/10/88

CC/FC: MCHD/MCHD5

SAMPLE ID : PAI6-GW1-00

LAB ID : 88030979
DATE RECEIVED: 03/21/88

BUTYL BENZYL PHTHALATE	<10 ppb
DIETHYL PHTHALATE	<10 ppb
DIMETHYL PHTHALATE	<10 ppb
DI-N-BUTYL PHTHALATE	<10 ppb
DI-N-OCTYL PHTHALATE	<10 ppb
ACENAPHTHYLENE	<10 ppb
ANTHRACENE	<10 ppb
BENZO (A) ANTHRACENE	<10 ppb
BENZO (B) FLUORANTHENE	<10 ppb
BENZO (K) FLUORANTHENE	<10 ppb
BENZO (GHI) PERYLENE	<10 ppb
BENZO (A) PYRENE	<10 ppb
BENZOFLUORANTHENE (3,4)	<10 ppb
CHRYSENE	<10 ppb
DIBENZO (A,H) ANTHRACENE	<10 ppb
FLUORENE	<10 ppb
INDENO (1,2,3-CD) PYRENE	<10 ppb
PHENANTHRENE	<10 ppb
PYRENE	<10 ppb
ALDRIN	<10 ppb
DIELDRIN	<10 ppb
CHLORDANE (TECHNICAL)	<10 ppb
O,P'-DDE	<10 ppb
O,P'-DDD	<10 ppb
O,P'-DDT	<10 ppb
P,P'-DDE	<10 ppb
P,P'-DDD	<10 ppb
P,P'-DDT	<10 ppb
ENDOSULFAN I	<10 ppb
ENDOSULFAN II	<10 ppb
ENDOSULFAN SULFATE	<10 ppb
ENDRIN	<10 ppb
ENDRIN ALDEHYDE	<10 ppb
HEPTACHLOR	<10 ppb
HEPTACHLOR EPOXIDE	<10 ppb

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CLIENT: McCLELLAND ENGINEERS
P.O. BOX 740010 DATE: 05/10/88
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CONTACT: MR. HARRY DAY

CC/FC: MCHD/MCHD5 PAGE NO.: 4

SAMPLE ID : PA16-GW1-00

LAB ID : 88030979
DATE RECEIVED: 03/21/88

A-BHC	<10 ppb
B-BHC	<10 ppb
LINDANE	<10 ppb
D-BHC	<10 ppb
TOXAPHENE	<10 ppb
AROCLOR 1016	<150 ppb
AROCLOR 1221	<150 ppb
AROCLOR 1232	<150 ppb
AROCLOR 1242	<150 ppb
AROCLOR 1248	<150 ppb
AROCLOR 1254	<150 ppb
AROCLOR 1260	<150 ppb
AROCLOR 1262	<150 ppb
EXTRACTION & CONCENTRATION	YES

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CONTACT: MR. HARRY DAY

DATE: 05/10/88

RELEASED BY: for: ALLAN M. CRANE

CC/FC: MCHD/MCHD5

SAMPLE ID : PAI6-GW1-00B

LAB ID : 88030980
SAMPLE TYPE : 11
DATE RECEIVED: 03/21/88
COLLECTED BY : MCHD

PARAMETER	
PP Volatiles by Method 8240	
ACROLEIN	<100 ppb
ACRYLONITRILE	<100 ppb
BENZENE	<5 ppb
BROMOFORM	<10 ppb
CARBON TETRACHLORIDE	<10 ppb
CHLOROBENZENE	<10 ppb
CHLORODIBROMOMETHANE	<10 ppb
CHLOROETHANE	<10 ppb
2-CHLOROETHYL VINYL ETHER	<10 ppb
CHLOROFORM	<10 ppb
DICHLOROBENZENE (1,2)	<10 ppb
DICHLOROBENZENE (1,3)	<10 ppb
DICHLOROBENZENE (1,4)	<10 ppb
DICHLOROBROMOMETHANE	<10 ppb
DICHLORODIFLUOROMETHANE	<10 ppb
DICHLOROETHANE (1,1)	<10 ppb
DICHLOROETHANE (1,2)	<10 ppb
DICHLOROETHYLENE (1,1)	<10 ppb
DICHLOROETHYLENE (1,2-T)	<10 ppb
DICHLOROPROPANE (1,2)	<10 ppb
DICHLOROPROPYLENE (1,2)	<10 ppb
DICHLOROPROPYLENE (1,3)	<10 ppb
ETHYLBENZENE	<10 ppb
METHYL BROMIDE	<10 ppb
METHYL CHLORIDE	<10 ppb
METHYLENE CHLORIDE	<10 ppb
TETRACHLOROETHANE (1,1,2,2)	<10 ppb
TETRACHLOROETHYLENE	<10 ppb
TOLUENE	<10 ppb
TRICHLOROETHANE (1,1,1)	<10 ppb
TRICHLOROETHANE (1,1,2)	<10 ppb
TRICHLOROETHYLENE	<10 ppb

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DATE: 05/10/88

CC/FC: MCHD/MCHD5

SAMPLE ID : PA16-GW1-00B

LAB ID : 88030980
DATE RECEIVED: 03/21/88

TRICHLOROFLUOROMETHANE	<10 ppb
VINYL CHLORIDE	<10 ppb

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CONTACT: MR. HARRY DAY

RELEASED BY: ALLAN M. CRANE

CC/FC: MCHD/MCHD2

PAGE NO.: 1

PARAMETER	SAMPLE ID	PAI6-SB1-4	PAI6-SB1-4D
	LAB ID	88021076	88021077
	SAMPLE TYPE	15	15
	DATE RECEIVED	02/25/88	02/25/88
	COLLECTED BY	MCHD	MCHD
OIL & GREASE - SOXHLET EXT.		462 ppm	310 ppm
CADMIUM		<0.20 ppm	<0.20 ppm
CHROMIUM		5.31 ppm	5.52 ppm
LEAD		12.7 ppm	9.40 ppm
ACID DIGESTION		YES	YES
PP Volatiles by Method 8240			
ACROLEIN		<100 ppb	<100 ppb
ACRYLONITRILE		<100 ppb	<100 ppb
BENZENE		<5 ppb	<5 ppb
BROMOFORM		<10 ppb	<10 ppb
CARBON TETRACHLORIDE		<10 ppb	<10 ppb
CHLOROBENZENE		<10 ppb	<10 ppb
CHLORODIBROMOMETHANE		<10 ppb	<10 ppb
CHLOROETHANE		<10 ppb	<10 ppb
2-CHLOROETHYL VINYL ETHER		<10 ppb	<10 ppb
CHLOROFORM		<10 ppb	<10 ppb
DICHLOROBENZENE (1,2)		<10 ppb	<10 ppb
DICHLOROBENZENE (1,3)		<10 ppb	<10 ppb
DICHLOROBENZENE (1,4)		<10 ppb	<10 ppb
DICHLOROBROMOMETHANE		<10 ppb	<10 ppb
DICHLORODIFLUOROMETHANE		<10 ppb	<10 ppb
DICHLOROETHANE (1,1)		<10 ppb	<10 ppb
DICHLOROETHANE (1,2)		<10 ppb	<10 ppb
DICHLOROETHYLENE (1,1)		<10 ppb	<10 ppb
DICHLOROETHYLENE (1,2-T)		<10 ppb	<10 ppb
DICHLOROPROPANE (1,2)		<10 ppb	<10 ppb
DICHLOROPROPYLENE (1,2)		<10 ppb	<10 ppb
DICHLOROPROPYLENE (1,3)		<10 ppb	<10 ppb
ETHYLBENZENE		<10 ppb	<10 ppb
METHYL BROMIDE		<10 ppb	<10 ppb
METHYL CHLORIDE		<10 ppb	<10 ppb
METHYLENE CHLORIDE		<10 ppb	<10 ppb
TETRACHLOROETHANE (1,1,2,2)		<10 ppb	<10 ppb

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CONTACT: MR. HARRY DAY

CC/FC: MCHD/MCHD2

SAMPLE ID	PAI6-SB1-4	PAI6-SB1-4D
LAB ID	88021076	88021077
DATE RECEIVED:	02/25/88	02/25/88
TETRACHLOROETHYLENE	<10 ppb	<10 ppb
TOLUENE	<10 ppb	<10 ppb
TRICHLOROETHANE (1,1,1)	<10 ppb	<10 ppb
TRICHLOROETHANE (1,1,2)	<10 ppb	<10 ppb
TRICHLOROETHYLENE	<10 ppb	<10 ppb
TRICHLOROFLUOROMETHANE	<10 ppb	<10 ppb
VINYL CHLORIDE	<10 ppb	<10 ppb
PP B/N Ext. by Method 8270		
ACENAPHTHENE	<330 ppb	<330 ppb
BENZIDINE	<330 ppb	<330 ppb
BIS (CHLOROMETHYL) ETHER	<330 ppb	<330 ppb
BIS (2-CHLOROETHOXY) METHANE	<330 ppb	<330 ppb
BIS (2-CHLOROETHYL) ETHER	<330 ppb	<330 ppb
BIS (2-CHLOROISOPROPYL) ETHER	<330 ppb	<330 ppb
BROMOPHENYL PHENYL ETHER	<330 ppb	<330 ppb
CHLOROETHYL VINYL ETHER	<330 ppb	<330 ppb
CHLOROPHENYL PHENYL ETHER	<330 ppb	<330 ppb
CHLORONAPHTHALENE (2)	<330 ppb	<330 ppb
DICHLOROBENZIDINE (3,3')	<330 ppb	<330 ppb
DINITROTOLUENE (2,4)	<330 ppb	<330 ppb
DINITROTOLUENE (2,6)	<330 ppb	<330 ppb
DIPHENYLHYDRAZINE (1,2)	<330 ppb	<330 ppb
FLUORANTHENE	<330 ppb	<330 ppb
HEXACHLOROBENZENE	<330 ppb	<330 ppb
HEXACHLOROBUTADIENE	<330 ppb	<330 ppb
HEXACHLOROCYCLOPENTADIENE	<330 ppb	<330 ppb
HEXACHLOROETHANE	<330 ppb	<330 ppb
ISOPHORONE	<330 ppb	<330 ppb
NAPHTHALENE	<330 ppb	<330 ppb
NITROBENZENE	<330 ppb	<330 ppb
N-NITROSODIMETHYLAMINE	<330 ppb	<330 ppb
N-NITROSODIPHENYLAMINE	<330 ppb	<330 ppb
N-NITROSO-DI-N-PROPYLAMINE	<330 ppb	<330 ppb
TRICHLOROBENZENE (1,2,4)	<330 ppb	<330 ppb
BIS (2-ETHYLHEXYL) PHTHALATE	<330 ppb	<330 ppb

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DATE: 03/23/88

CONTACT: MR. HARRY DAY

CC/FC: MCHD/MCHD2

SAMPLE ID	PAI6-SB1-4	PAI6-SB1-4D
LAB ID	88021076	88021077
DATE RECEIVED:	02/25/88	02/25/88
BUTYL BENZYL PHTHALATE	<330 ppb	<330 ppb
DIETHYL PHTHALATE	<330 ppb	<330 ppb
DIMETHYL PHTHALATE	<330 ppb	<330 ppb
DI-N-BUTYL PHTHALATE	<330 ppb	<330 ppb
DI-N-OCTYL PHTHALATE	<330 ppb	<330 ppb
ACENAPHTHYLENE	<330 ppb	<330 ppb
ANTHRACENE	<330 ppb	<330 ppb
BENZO (A) ANTHRACENE	<330 ppb	<330 ppb
BENZO (B) FLUORANTHENE	<330 ppb	<330 ppb
BENZO (K) FLUORANTHENE	<330 ppb	<330 ppb
BENZO (GHI) PERYLENE	<330 ppb	<330 ppb
BENZO (A) PYRENE	<330 ppb	<330 ppb
BENZOFLUORANTHENE (3,4)	<330 ppb	<330 ppb
CHRYSENE	<330 ppb	<330 ppb
DIBENZO (A,H) ANTHRACENE	<330 ppb	<330 ppb
FLUORENE	<330 ppb	<330 ppb
INDENO (1,2,3-CD) PYRENE	<330 ppb	<330 ppb
PHENANTHRENE	<330 ppb	<330 ppb
PYRENE	<330 ppb	<330 ppb
ALDRIN	<330 ppb	<330 ppb
DIELDRIN	<330 ppb	<330 ppb
CHLORDANE (TECHNICAL)	<330 ppb	<330 ppb
O,P'-DDE	<330 ppb	<330 ppb
O,P'-DDD	<330 ppb	<330 ppb
O,P'-DDT	<330 ppb	<330 ppb
P,P'-DDE	<330 ppb	<330 ppb
P,P'-DDD	<330 ppb	<330 ppb
P,P'-DDT	<330 ppb	<330 ppb
ENDOSULFAN I	<330 ppb	<330 ppb
ENDOSULFAN II	<330 ppb	<330 ppb
ENDOSULFAN SULFATE	<330 ppb	<330 ppb
ENDRIN	<330 ppb	<330 ppb
ENDRIN ALDEHYDE	<330 ppb	<330 ppb
HEPTACHLOR	<330 ppb	<330 ppb
HEPTACHLOR EPOXIDE	<330 ppb	<330 ppb

GENERAL ENGINEERING LABORATORIES

Environmental Engineering and Analytical Services

Molly F. Greene
'resident

George C. Greene, P.E., Ph.D.
Vice President
SC Registration No. 9103

Laboratory Certifications:

FL	E87156/87294
NC	233
SC	10120
VA	00151
NACIP	Approved

CERTIFICATE OF ANALYSIS

CLIENT: McCLELLAND ENGINEERS
P.O. BOX 740010
HOUSTON , TX 77274
CONTACT: MR. HARRY DAY

DATE: 03/23/88

CC/FC: MCHD/MCHD2

	SAMPLE ID :	PAI6-SB1-4	PAI6-SB1-4D
	LAB ID :	88021076	88021077
	DATE RECEIVED:	02/25/88	02/25/88
A-BHC		<330 ppb	<330 ppb
B-BHC		<330 ppb	<330 ppb
LINDANE		<330 ppb	<330 ppb
D-BHC		<330 ppb	<330 ppb
TOXAPHENE		<330 ppb	<330 ppb
AROCLOR 1016		<450 ppb	<450 ppb
AROCLOR 1221		<450 ppb	<450 ppb
AROCLOR 1232		<450 ppb	<450 ppb
AROCLOR 1242		<450 ppb	<450 ppb
AROCLOR 1248		<450 ppb	<450 ppb
AROCLOR 1254		<450 ppb	<450 ppb
AROCLOR 1260		<450 ppb	<450 ppb
AROCLOR 1262		<450 ppb	<450 ppb
% WATER (KARL-FISCHER TIT.)		27.9 wt%	20.8 wt%
EXTRACTION & CONCENTRATION		YES	YES

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NC	233
SC	10120
VA	00151
NACIP	Approved

CERTIFICATE OF ANALYSIS

CLIENT: McCLELLAND ENGINEERS
P.O. BOX 740010
HOUSTON , TX 77274

DATE: 03/23/88

CONTACT: MR. HARRY DAY

RELEASED BY: ALLAN M. CRANE

CC/FC: MCHD/MCHD2

PARAMETER	SAMPLE ID	PAI16-SB1-3	PAI16-SB2-3	PAI16-SB2-3D	PAI16-SB3-3
	LAB ID	88021072	88021073	88021074	88021075
	SAMPLE TYPE	15	15	15	15
	DATE RECEIVED	02/25/88	02/25/88	02/25/88	02/25/88
	COLLECTED BY	MCHD	MCHD	MCHD	MCHD
ARSENIC		0.800 ppm	0.148 ppm	0.235 ppm	<0.005 ppm
CADMIUM		<0.20 ppm	<0.20 ppm	<0.20 ppm	<0.20 ppm
CHROMIUM		1.88 ppm	2.19 ppm	1.86 ppm	2.41 ppm
LEAD		8.40 ppm	1.57 ppm	1.84 ppm	2.22 ppm
ACID DIGESTION		YES	YES	YES	YES
Pesticides by Method 8080					
ALDRIN		<330 ppb	<330 ppb	<330 ppb	<330 ppb
ALPHA - BHC		<330 ppb	<330 ppb	<330 ppb	<330 ppb
BETA - BHC		<330 ppb	<330 ppb	<330 ppb	<330 ppb
DELTA - BHC		<330 ppb	<330 ppb	<330 ppb	<330 ppb
GAMMA - BHC (LINDANE)		<330 ppb	<330 ppb	<330 ppb	<330 ppb
CHLORDANE		<330 ppb	<330 ppb	<330 ppb	<330 ppb
4,4'-DDD		486 ppb	<330 ppb	<330 ppb	<330 ppb
4,4'-DDE		421 ppb	<330 ppb	<330 ppb	<330 ppb
4,4'-DDT		1380 ppb	<330 ppb	<330 ppb	<330 ppb
DIELDRIN		<330 ppb	<330 ppb	<330 ppb	<330 ppb
ENDOSULFAN I		<330 ppb	<330 ppb	<330 ppb	<330 ppb
ENDOSULFAN II		<330 ppb	<330 ppb	<330 ppb	<330 ppb
ENDOSULFAN SULFATE		<330 ppb	<330 ppb	<330 ppb	<330 ppb
ENDRIN		<330 ppb	<330 ppb	<330 ppb	<330 ppb
ENDRIN ALDEHYDE		<330 ppb	<330 ppb	<330 ppb	<330 ppb
HEPTACHLOR		<330 ppb	<330 ppb	<330 ppb	<330 ppb
HEPTACHLOR EPOXIDE		<330 ppb	<330 ppb	<330 ppb	<330 ppb
TOXAPHENE		<330 ppb	<330 ppb	<330 ppb	<330 ppb
% WATER (KARL-FISCHER TIT.)		7.04 wt%	14.9 wt%	10.9 wt%	16.2 wt%
EXTRACTION & CONCENTRATION		YES	YES	YES	YES

GENERAL ENGINEERING LABORATORIES

Environmental Engineering and Analytical Services

Molly F. Greene
President

George C. Greene, P.E., Ph.D.
Vice President
SC Registration No. 9103

Laboratory Certifications:

FL	E87156/87294
NC	233
SC	10120
VA	00151
NACIP	Approved

CERTIFICATE OF ANALYSIS

CLIENT: McCLELLAND ENGINEERS
P.O. BOX 740010
HOUSTON , TX 77274

DATE: 05/10/88

CONTACT: MR. HARRY DAY

RELEASED BY: for: ALLAN M. CRANE

CC/FC: MCHD/MCHD8

PARAMETER	SAMPLE ID	PAI17-GW1-00	PAI17-GW2-00	PAI17-GW3-00
	LAB ID	88030981	88030982	88030983
	SAMPLE TYPE	11	11	11
	DATE RECEIVED	03/21/88	03/21/88	03/21/88
	COLLECTED BY	MCHD	MCHD	MCHD
TOTAL ORGANIC CARBON		22.0 ppm	7.81 ppm	40.9 ppm
CADMIUM - DISSOLVED		<0.010 ppm	<0.010 ppm	<0.010 ppm
CHROMIUM - DISSOLVED		<0.03 ppm	<0.03 ppm	<0.03 ppm
LEAD - DISSOLVED		0.015 ppm	0.014 ppm	0.015 ppm
ACID DIGESTION		YES	YES	YES
BENZENE		<5 ppb	<5 ppb	<5 ppb
ETHYLBENZENE		<10 ppb	<10 ppb	<10 ppb
TOLUENE		<10 ppb	<10 ppb	<10 ppb
XYLENE		<10 ppb	<10 ppb	<10 ppb

GENERAL ENGINEERING LABORATORIES

Environmental Engineering and Analytical Services

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SC Registration No. 9103

Laboratory Certifications:

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NC	233
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VA	00151
NACIP	Approved

CERTIFICATE OF ANALYSIS

CLIENT: McCLELLAND ENGINEERS
P.O. BOX 740010
HOUSTON , TX 77274

DATE: 05/10/88

CONTACT: MR. HARRY DAY

RELEASED BY: for ALLAN M. CRANE

CC/FC: MCHD/MCHD8

PARAMETER	SAMPLE ID	PAI18-GW1-00	PAI18-GW2-00	PAI18-GW3-00
	LAB ID	88030984	88030986	88030987
	SAMPLE TYPE	11	11	11
	DATE RECEIVED	03/21/88	03/21/88	03/21/88
	COLLECTED BY	MCHD	MCHD	MCHD
TOTAL ORGANIC CARBON		133. ppm	80.4 ppm	67.1 ppm
CADMIUM - DISSOLVED		<0.010 ppm	<0.010 ppm	<0.010 ppm
CHROMIUM - DISSOLVED		<0.03 ppm	<0.03 ppm	<0.03 ppm
LEAD - DISSOLVED		0.006 ppm	0.005 ppm	0.019 ppm
ACID DIGESTION		YES	YES	YES
BENZENE		250 ppb	<5 ppb	<5 ppb
ETHYLBENZENE		725 ppb	<10 ppb	<10 ppb
TOLUENE		<10 ppb	<10 ppb	<10 ppb
XYLENE		220 ppb	<10 ppb	<10 ppb

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CERTIFICATE OF ANALYSIS

CLIENT: McCLELLAND ENGINEERS
P.O. BOX 740010
HOUSTON , TX 77274

DATE: 05/10/88

CONTACT: MR. HARRY DAY

RELEASED BY: for: ALLAN M. CRANE

CC/FC: MCHD/MCHD8

SAMPLE ID : PAI18-GW1-00B

LAB ID : 88030985
SAMPLE TYPE : 11
DATE RECEIVED: 03/21/88
COLLECTED BY : MCHD

PARAMETER	
BENZENE	<5 ppb
ETHYLBENZENE	<10 ppb
TOLUENE	<10 ppb
XYLENE	<10 ppb

2040 Savage Road • Charleston, SC 29414 / P. O. Box 30712 • Charleston, SC 29417
Phone (803) 556-8171 • FAX (803) 766-1178

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CERTIFICATE OF ANALYSIS

CLIENT: McCLELLAND ENGINEERS
P.O. BOX 740010
HOUSTON , TX 77274

DATE: 05/10/88

CONTACT: MR. HARRY DAY

RELEASED BY: for ALLAN M. CRANE

CC/FC: MCHD/MCHD8

PARAMETER				
	SAMPLE ID :	PAI19-GWC1-00	PAI19-GWC2-00	PAI19-GWC3-00
	LAB ID :	88030988	88030989	88030990
	SAMPLE TYPE :	11	11	11
	DATE RECEIVED:	03/21/88	03/21/88	03/21/88
	COLLECTED BY :	MCHD	MCHD	MCHD
TOTAL ORGANIC CARBON		1.72 ppm	4.06 ppm	1.53 ppm
CADMIUM - DISSOLVED		<0.010 ppm	<0.010 ppm	<0.010 ppm
CHROMIUM - DISSOLVED		<0.03 ppm	<0.03 ppm	<0.03 ppm
LEAD - DISSOLVED		0.013 ppm	0.028 ppm	0.006 ppm
ACID DIGESTION		YES	YES	YES
BENZENE		<5 ppb	<5 ppb	<5 ppb
ETHYLBENZENE		<10 ppb	<10 ppb	<10 ppb
TOLUENE		<10 ppb	<10 ppb	<10 ppb
XYLENE		<10 ppb	<10 ppb	<10 ppb

CHAIN OF CUSTODY RECORD

General Engineering Laboratories
1313 Ashley River Road
Charleston, South Carolina 29407

CLIENT NAME: McCLELLAND ENGRS.

COLLECTED BY: J. A. BYARS

F - filtered P - preserved

SAMPLE ID	DATE	TIME	comp	grab	well	SAMPLE LOCATION	# of Containers	pH, Sp. Cond.	TOC F P	TOX	Cl, Fl, SO4 F	NITRATES F P	VOC	METALS F P	PESTICIDE	HERBICIDE	PHENOL P	ACID/B/N Ext	COLIFORM P	CYANIDE P	OIL & GREASE F P	BASE/NEUTRAL EXTRACTABLES F P	VOLATILES F P	REMARKS
PAI-6-SB 1-4	2/21	0945		✓										✓										
PAI-6-SB 1-4-D	2/21	0945		✓										✓										
PAI-6-SB 1-4				✓																	✓			
PAI-6-SB 1-4-D				✓																		✓		
PAI-6-SB 1-4-D				✓																	✓			
PAI-6-SB 1-4-				✓																		✓		
PAI-6-SB 1-4-D				✓																	✓			
PAI-6-SB 1-4-D				✓																			✓	
PAI-6-SB 1-4-D				✓																			✓	
PAI-6-SB 1-4				✓																			✓	
PAI-6-SB 1-4				✓																			✓	
PAI-16-SB 3-3	2/23	1245		✓										✓										

Relinquished by:	Date	Time	Received by:	Relinquished by:	Date	Time	Received by:
	3/24/88	0700	FED X				
Relinquished by:	**Date**	**Time**	**Received by lab by:**	**Date**	**Time**	**Remarks**	
				2/25/88	1130		

CHAIN OF CUSTODY RECORD

General Engineering Laboratories
1313 Ashley River Road
Charleston, South Carolina 29407

CLIENT NAME: Mc Clelland Engrs

COLLECTED BY: J. A. Byars

F - filtered P - preserved

SAMPLE ID	DATE	TIME	comp	grab	well	SAMPLE LOCATION	# of Containers	SAMPLE ANALYSIS (x)																			REMARKS
								pH, Sp. Cond.	F P TOC	TOX	F Cl, Fl, SO4	F P NITRATES	VOC	F P METALS	PESTICIDE	HERBICIDE	P PHENOL	ACID/B/N Ext	P COLIFORM	P CYANIDE	P F P F P F P						
PA1-16-SB -3-3	2/23	1245		✓											✓											
PA1-16-SB 2-3	2/23	1115 1245		✓											✓											
PA1-16-SB 2-3	"	"		✓										✓												
PA1-16-SB 3-3	"	1245		✓											✓											
PA1-16-SB 3-3	"	1245		✓										✓												
PA1-16-SB 1-3	"	1045		✓											✓											
PA1-16-SB 1-3	"	1045		✓										✓												
PA1-16-SB 1-3	"	"		✓										✓												
PA1-16-SB 1-3	"	"		✓											✓											
PA1-16-SB 2-3	"	1115		✓										✓												
PA1-16-SB 2-3	"	"		✓											✓											
PA1-16-SB 2-3-D	"	"		✓										✓												

Relinquished by:	Date	Time	Received by:	Relinquished by:	Date	Time	Received by:
[signature]	2/23	0700	FED X				
Relinquished by:	**Date**	**Time**	**Received by lab by:**	**Date**	**Time**	**Remarks**	
			[signature]	8/25/88	1130		

PAGE 3 of 3

CHAIN OF CUSTODY RECORD

General Engineering Laboratories
1313 Ashley River Road
Charleston, South Carolina 29407

CLIENT NAME: McClelland Engrs

COLLECTED BY: J.A. Byars

SAMPLE ID	DATE	TIME	comp	grab	well	SAMPLE LOCATION	# of Containers	SAMPLE ANALYSIS (x)	REMARKS
								pH, Sp. Cond. F P; TOC F P; TOX; Cl, Fl, SO4 F; NITRATES F P; VOC; METALS F P; PESTICIDE; HERBICIDE; PHENOL P; ACID/B/N Ext; COLIFORM P; CYANIDE P; F P F P F P	F - filtered P - preserved
PAI-16-SB 2-3-D	2/23	1115						✓	

Relinquished by:	Date	Time	Received by:	Relinquished by:	Date	Time	Received by:
[signature]	2/24/98	0700	FEDX				
Relinquished by:	Date	Time	Received by lab by:	Date	Time	Remarks	
			[signature]	2/25/98	1130		

CHAIN OF CUSTODY RECORD

General Engineering Laboratories
1313 Ashley River Road
Charleston, South Carolina 29407

PAGE 1 of 1

CLIENT NAME: McCLELLAND ENGRS

COLLECTED BY: J.A. BYARS

	SAMPLE ID	DATE	TIME	comp	grab	well	SAMPLE LOCATION	# of Containers	pH, Sp. Cond.	TOC F P	TOX	Cl, Fl, SO4 F	NITRATES F P	VOC	METALS F P	PESTICIDE	HERBICIDE	PHENOL P	ACID/B/N Ext	COLIFORM P	CYANIDE					REMARKS
1	44 PA1-4-SB-1-10	2/25	1200		✓		PA1	1							✓											METALS - TOTAL & EP TOX
5	48 PA1-4-SB-5-7.5	2/25	0900		✓		"	1							✓											Cd, Cr, & Pb
2	45 PA1-4-SB-2-1.0	2/25	1400		✓		"	1							✓											
3	46 PA1-4-SB-3-6	2/25	0830		✓		"	1							✓											
4	47 PA1-4-SB-4-4	2/25	1030		✓		"	1							✓											

Relinquished by:	Date	Time	Received by:	Relinquished by:	Date	Time	Received by:
	2/29	0830	FED X				
Relinquished by:	**Date**	**Time**	**Received by lab by:**	**Date**	**Time**	**Remarks**	
				3/1/02	7:35		

F - filtered P - preserved

CHAIN OF CUSTODY RECORD

General Engineering Laboratories
1313 Ashley River Road
Charleston, South Carolina 29407

PAGE 1 of 2

CLIENT NAME: McClelland Engineers

COLLECTED BY: Seifer / Millard / Day (surface sediment)

	SAMPLE ID	DATE	TIME	comp	grab	well	SAMPLE LOCATION	# of Containers	pH, Sp. Cond.	TOC F P	TOX	Cl, Fl, SO4 F	NITRATES F P	VOC	METALS F P	PESTICIDE	HERBICIDE	PHENOL P	ACID/B/N Ext	COLIFORM P	CYANIDE P	dissolved Pb F P	Total EP Tox metals F P		REMARKS
689	BFT13-GW4-00	3/12/88	0915			✓	Site 13 - BFT	8		✓				✓p					B/N			✓			
690	BFT13-GW5-00		0945			✓	"	8		✓				✓p					B/N			✓			
691	BFT13-GW3-00		1000			✓	"	8		✓				✓p					B/N			✓			
692	BFT12-GW1-00		1115			✓	Site 12 - BFT	6		✓				✓p					B/N						well went dry - waited several hrs. - still dry
693	BFT12-GW4-00		1145			✓	"	8		✓				✓p					B/N			✓			
694	BFT12-GW5-00		1230			✓	"	8		✓				✓p					B/N			✓			
705 706	PAI3-SS1-01		1545		✓		Site 3 - PAI	4						✓					✓				✓		
706 707	PAI3-SS2-01		1600		✓		"	4						✓					✓				✓		
707 708	BAI3-SS3-01		1615		✓		"	4						✓					✓				✓		
708 709	PAI3-SS4-01		1625		✓		"	4						✓					✓				✓		
709 710	PAI3-SS5-01		1645		✓		"	4						✓					✓				✓		
710 711	PAI3-SS6-01		1655		✓		"	4						✓					✓				✓		

SAMPLE ANALYSIS (x)

F - filtered P - preserved

TOTAL METALS As R Be, Cd, Cr, Pb, Hg, Se + Ag

EP Tox - As, Cd, Cr, Pb & Hg

Relinquished by:	Date	Time	Received by:	Relinquished by:	Date	Time	Received by:
[signature]	3/12/88	1900					
Relinquished by:	**Date**	**Time**	**Received by lab by:**	**Date**	**Time**	**Remarks**	
			[signature]	3/19/88	1137		

Batch #10

CHAIN OF CUSTODY RECORD

General Engineering Laboratories
1313 Ashley River Road
Charleston, South Carolina 29407

CLIENT NAME: McClelland Engineers

COLLECTED BY: Seifer / Millard / Day

SAMPLE ID	DATE	TIME	comp	grab (surface sediment)	well	SAMPLE LOCATION	# of Containers	SAMPLE ANALYSIS (x)																					F - filtered P - preserved
								pH, Sp. Cond.	F P TOC	TOX	F Cl, Fl, SO4	F P NITRATES	VOC	F P METALS	PESTICIDE	HERBICIDE	P PHENOL	ACID/B/N Ext	P COLIFORM	P CYANIDE	F P F P Total & EP Tox metals	F P	F P						REMARKS
PAI3-SS7-01	3/12/88	1700		✓		Site 3 - PAI	4						✓					✓				✓						Total Metals As, Ba, Be, Cd, Cr, Pb, Hg, Se, Ag; cP Tox As, Cd, Cr, Pb, Hg
PAI3-SS7-01D		1700		✓		"	4						✓					✓				✓						
PAI3-SS8-01	↓	1710		✓		"	4						✓					✓				✓						
						END OF RECORD																							

Relinquished by:	Date	Time	Received by:	Relinquished by:	Date	Time	Received by:
AM Seifer	3/12/88	1900					
Relinquished by:	**Date**	**Time**	**Received by lab by:**	**Date**	**Time**	**Remarks**	
			W. Byrum Jr.	3/14/88	1137		

BATCH # 10

COOLERS

CHAIN OF CUSTODY RECORD

General Engineering Laboratories
2040 Savage Road
Charleston, South Carolina 29414
PO Box 30712
Charleston, South Carolina 29417
803-556-8171

Page 1 of 1

Client Name / Facility Name: McClellan AFB

Collected By / Company: Millard / SEIforce / DAY

	SAMPLE ID	DATE	TIME	WELL	SOIL	COMP	GRAB	# of containers	pH, conductivity	TOC / DOC	TOX	Chloride, Fluoride, Sulfate	Nitrite/Nitrate	VOC - Specify Method required	METALS - specify	Pesticide	Herbicide	Total Phenol	Acid Extractables	B/N Extractables	PCB's	Cyanide	Coliform - specify type	hex cr	Remarks
792	PAI 3 SW 100	3/13/88						9		1				4	1				1	1				1	
793	PAI 3 SW 100D	"						1							1										
794	PAI 3 SW 200	"						9		1				4	1				1	1				1	
795	PAI 3 SW 300							9		1				4	DISS METALS				1	1				1	
796	PAI 3 SW 400							9		1				4	1				1	1				1	
797	PAI 3 SW 500							9		1				4	1				1	1				1	
798	PAI 3 SW 600							8		1				4					1	1				1	
799	PAI 3 SW 700							8		1				4					1	1				1	
800	PAI 3 SW 800							6		1				4										1	

SAMPLE ANALYSIS REQUIRED(s) - use remarks area to specify specific compounds or methods

Use F or P in the boxes to indicate whether ← sample was filtered and/or preserved

DISS METALS - As, Ba, Be, Cd, Cr, Pb, Hg, Se, Ag

END OF RECORD

Relinquished by:	Date	Time	Received by:	Relinquished by:	Date	Time	Received by:
	3/15/88						
Relinquished by:	Date	Time	Received by lab by:	Date	Time	Remarks	
				3/15/88	1643		

White • sample collector Yellow • file Pink • with report

RATUSH #1

Cooler # (2)

CHAIN OF CUSTODY RECORD

General Engineering Laboratories
2040 Savage Road
Charleston, South Carolina 29414
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Page 1 of 1

Client Name / Facility Name: McClellanville Envy
Collected By / Company: Seafield / Millwood

	SAMPLE ID	DATE	TIME	WELL	SOIL	COMP	GRAB	# of containers	pH, conductivity	TOC / DOC	TOX	Chloride, Fluoride, Sulfate	Nitrite/Nitrate	VOC - Specify Method required	METALS -specify	Pesticide	Herbicide	Total Phenol	Acid Extractables	B/N Extractables	PCB's	Cyanide	Coliform - specify type	TSS, Reac Cond, Soil	Oil & Grease	Remarks
									SAMPLE ANALYSIS REQUIRED(x) - use remarks area to specify specific compounds or methods																	Use F or P in the boxes to indicate whether sample was filtered and/or preserved ←
11	PAI 18 TT 4 AQ	3/14/88				X		4							IEP									1	1	PAI 3 DISSOLVED METALS As, Ba, Be, Cd, Cr, Pb, Hg, Se, Ag
10	PAI 18 TT 3 AQ	3/14/88				X		4							IEP									1	1	
8	PAI 18 TT 2 AQ	3/14/88				X		2																1	1	
	VOA TRIP BLANKS	NA				X		3						3												
9	PAI 18 TT 102 AQ	3/14/88				X		3						3												1 VIAL BROKEN PAID DISCARDED, SORRY
12	PAI 18 TT 304 AQ	11				X		4						4												
800	PAI 3 SW 800	3/13/88					X	2											1	1						
799	PAI 3 SW 700	11					X	1							1(P) DISS											
798	PAI 3 SW 600	11					X	1							1(P) DISS											
796	PAI 3 SW 400	11					X	1							1(P) DISS											
795	PAI 3 SW 300	11					X	1							1(P) DISS											
			NOTHING FOLLOWS																							

Relinquished by:	Date	Time	Received by:	Relinquished by:	Date	Time	Received by:
	3/15/88						
Relinquished by:	Date	Time	Received by lab by:	Date	Time	Remarks	
			Wilbur Jones	3/15/88	1659		

White • sample collector Yellow • file Pink • with report

BAIH $11 (2225.01) - TOTAL SAMPLES

CHAIN OF CUSTODY RECORD

General Engineering Laboratories
2040 Savage Road
Charleston, South Carolina 29414
PO Box 30712
Charleston, South Carolina 29417
803-556-8171

Page 1 of ___

Client Name / Facility Name: McClelland Engineers / Parris Island

Collected By / Company: Spiker, Millard / McClelland

SAMPLE ID	DATE	TIME	WELL	SOIL	COMP	GRAB	# of containers	pH, conductivity	TOC / DOC (P)	TOX	Chloride, Fluoride, Sulfate	Nitrite/Nitrate	VOC - Specify Method required	METALS -specify	Pesticide	Herbicide	Total Phenol	Acid Extractables	B/N Extractables	PCB's	Cyanide	Coliform - specify type		Remarks (Use F or P in the boxes to indicate whether sample was filtered and/or preserved)
																								TOTAL / DISS METALS: As, Ba, Be, Cd, Cr, Pb, Hg, Se, Ag; EP TOX (soil only): As, Cd, Cr, Pb, Hg
PAI2-SW1-00	3/15/88	1200				✓	9		✓				✓P	✓P	✓			✓	✓	✓				dissolved metals, Cr⁶ if >1 µg/l (Cr not preserved)
PAI2-SS1-01	"	1215		✓			4						✓	✓	✓			✓	✓	✓				total metals + EP toxicity
PAI2-SS1-01 (MS)	"	1100		✓			4						✓	✓	✓			✓	✓	✓				" "
PAI1-SS2-01	"	1115		✓			4						✓	✓	✓			✓	✓	✓				" "
PAI1-SS3-01	"	1030		✓			4						✓	✓	✓			✓	✓	✓				" "
PAI2-GW1-00	3/16/88	1545	✓				9		✓				✓P	✓P	✓			✓	✓	✓				dissolved metals, Cr⁶ if >1 µg/l (Cr not preserved)
PAI2-GW2-00	"	1700	✓				9		✓				✓P	✓P	✓			✓	✓	✓				" "
PAI2-GW3-00	"	1730	✓				9		✓				✓P	✓P	✓			✓	✓	✓				" "
PAI2-GW3-00D	"	1730	✓				4						✓P											
PAI2-GW3-00B	"	1730					2						✓P											
				END OF RECORD																				Note: TOC vial for PAI2 GW-3 was MIS → 2 vials total
																								PAI2-GW1-00 the one was originally changed from GW-2 & scratched out → Analyzed as PAI2-GW-2-00

Relinquished by:	Date	Time	Received by:	Relinquished by:	Date	Time	Received by:
MMSpiker	3/17/88	1830					
Relinquished by:	Date	Time	Received by lab by:	Date	Time	Remarks	
				3/17/88	1900		

White • sample collector Yellow • file Pink • with report

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CHAIN OF CUSTODY RECORD

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Client Name / Facility Name: McClelland Engineers / Parris Island

Collected By / Company: Sister Millard / McClelland

SAMPLE ID	DATE	TIME	WELL	SOIL	COMP	GRAB	# of containers	pH, conductivity	TOC / DOC	TOX	Chloride, Fluoride, Sulfate	Nitrite/Nitrate	VOC - Specify Method required	METALS -specify	Pesticide	Herbicide	Total Phenol	Acid Extractables	B/N Extractables	PCB's	Cyanide	Coliform - specify type			Remarks
								SAMPLE ANALYSIS REQUIRED(s) - use remarks area to specify specific compounds or methods																	← Use F or P in the boxes to indicate whether sample was filtered and/or preserved
PAI6-GW1-00	3/17/88	1015	✓				2												✓						
PAI1-GW4-00	3/18/88	0900	✓				2								✓			✓	✓	✓					
PAI1-GW4-00D	"	0900	✓				2								✓			✓	✓	✓					
PAI1-GW1-00	"	0945	✓				2								✓			✓	✓	✓					evacuated well again, only enough water for 1 bottle
PAI1-GW2-00	"	1000	✓				1								✓			✓	✓	✓					" " "
PAI1-GW3-00	"	1030	✓				1								✓			✓	✓	✓					" " "
							END OF RECORD																		

Relinquished by:	Date	Time	Received by:	Relinquished by:	Date	Time	Received by:
[signature]	3/21/88	930					
Relinquished by:	Date	Time	Received by lab by:	Date	Time	Remarks	
			[signature]	3/21/88	1007		

White • sample collector Yellow • file Pink • with report

CHAIN OF CUSTODY RECORD

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Charleston, South Carolina 29417
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Client Name / Facility Name: McClelland Engineers / Parris Island

Collected By / Company: B. [illegible] / McClelland

SAMPLE ID	DATE	TIME	WELL	SOIL	COMP	GRAB	# of containers	pH, conductivity	TOC / DOC	TOX	Chloride, Fluoride, Sulfate	Nitrite/Nitrate	VOC - Specify Method required	METALS -specify	Pesticide	Herbicide	Total Phenol	Acid Extractables	B/N Extractables	PCB's	Cyanide	Coliform - specify type		Remarks
							SAMPLE ANALYSIS REQUIRED(s) - use remarks area to specify specific compounds or methods																	← Use F or P in the boxes to indicate whether sample was filtered and/or preserved
1 PAI6-GW1-00	3/17/88	1015	✓				6		✓				✓	✓										dissolved metals (Cd, Cr, Pb)
2 PAI6-GW1-00B	"	1015	✓				2						✓											trip blank
PAI17-GWC1-00	"	1230	✓				6		✓				✓	✓										dissolved metals / xylene, benzene, toluene, ethylbenzene
PAI19-GWC2-00	"	1330	✓				6		✓				✓	✓										" "
PAI19-GWC3-00	"	1400	✓				6		✓				✓	✓										" / "
PAI1-GW3-00	"	1545	✓				6		✓				✓	✓										dissolved metals
PAI1-GW1-00	"	1630	✓				6		✓				✓	✓										dissolved metals
PAI1-GW1-00B	"	1630	✓				4 (2)	(HA)					✓											
PAI1-GW2-00	"	1700	✓				6		✓				✓	✓										dissolved metals
PAI1-GW4-00	3/18/88	0900	✓				6		✓				✓	✓										dissolved metals
PAI1-GW4-00D	"	0900	✓				5 (6)	(HA)	✓				✓											
PAI1-GW4-00[illegible]	"	0900	✓				4 (2)	(HA)					✓											
PAI17-GW2-00	"	1300	✓				6		✓				✓	✓										dissolved metals / benzene, toluene, ethylbenzene, xylene

PAI6 metals: Cd, Cr, Pb
PAI19
PAI17 } PAI. 17, 18, 19 - BTEX
PAI18 }

Relinquished by:	Date	Time	Received by:	Relinquished by:	Date	Time	Received by:
[illegible]	3/19/88	0930	[illegible]				
Relinquished by:	Date	Time	Received by lab:	Date	Time	Remarks	
			[illegible]	3/21/88	1007		

White • sample collector Yellow • file Pink • with report

Batch #3

PAGE 1 of 2

CHAIN OF CUSTODY RECORD

General Engineering Laboratories
1313 Ashley River Road
Charleston, South Carolina 29407

CLIENT NAME: McClellanad Engineers / Parris Island

COLLECTED BY: James Willard / McClellanad

SAMPLE ID	DATE	TIME	comp	grab	well	SAMPLE LOCATION	# of Containers	pH, Sp. Cond.	TOC F P	TOX	Cl, Fl, SO4 F	NITRATES F P	VOC (x) F P	METALS F P	PESTICIDE	HERBICIDE	PHENOL P	ACID/B/N Ext	COLIFORM P	CYANIDE P	F P	F P	F P	REMARKS
PAI17-GW1-00	3/18/88	1345			✓	Site 17, Parris Island	6		✓				✓	✓										dissolved metals / benz, toluene, ethylbenzene, xy
PAI17-GW1-00	"	1500			✓	"	6		✓				✓	✓										" / "
PAI18-GW1-00	"	1700			✓	Site 18, Parris Island	6		✓				✓	✓										" / "
PAI18-GW1-00B	"	1700				"	2						✓											trip blanks
PAI18-GW1-00	"	1715			✓	"	6		✓				✓	✓										dissolved metals / benz, toluene, xy
PAI18-GW2-00	"	1745			✓	"	6		✓				✓	✓										" / "
						END OF RECORD																		

SAMPLE ANALYSIS (x)

F - filtered P - preserved

Halob Cd, Cr, Pb

Relinquished by:	Date	Time	Received by:	Relinquished by:	Date	Time	Received by:
[illegible]	3/19/88	1730					
Relinquished by:	Date	Time	Received by lab by:	Date	Time	Remarks	
				3/24/88	1045		

BATCH #13

CHAIN OF CUSTODY RECORD

General Engineering Laboratories
2040 Savage Road
Charleston, South Carolina 29414
PO Box 30712
Charleston, South Carolina 29417
803-556-8171

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Client Name / Facility Name: McClelland Engineers / BFT & PAI

Collected By / Company: Seifer Millard / McClelland

	SAMPLE ID	DATE	TIME	WELL	SOIL	COMP	GRAB	# of containers	pH, conductivity	TOC (P) / DOC	TOX	Chloride, Fluoride, Sulfate	Nitrite/Nitrate	VOC - Specify Method required	METALS -specify (EXO)	Pesticide	Herbicide	Total Phenol	Acid Extractables	B/N Extractables	PCB's	Cyanide	Coliform - specify type	Remarks
																								Use F or P in the boxes to indicate whether ← sample was filtered and/or preserved
																								BFT8 METALS - & HENV
																								PAI7 METALS: Cd, Cr, Pb
1245	BFT3-GW2-00	3/23/88	1330	✓				5		✓				✓	O									not enough sample for complete set
1246	BFT8-GW3-00	"	1345	✓				4		✓				✓	O									TOC almost filled, only 3 VOC
1249	PAI7-GW3-00	"	1630	✓				8		✓				✓	✓				✓	✓				dissolved metals
1250	PAI7-GW3-00B	"	1630					2						✓										trip blank
1248	PAI7-GW2-00	"	1700	✓				8		✓				✓	✓				✓	✓				dissolved metals
1247	PAI7-GW1-00	"	1715	✓				9		✓				✓	✓				✓	✓				dissolved metals
	BFT8-GW2-00	3/24/88	0915	✓				1							✓									dissolved metals - 1/3 full
	BFT8-GW3-00	"	0930	✓				1							✓									dissolved metals - 1/5 full
										END OF RECORD														

Relinquished by:	Date	Time	Received by:	Relinquished by:	Date	Time	Received by:
Ali Bibi	3/24/88	1300					
Relinquished by:	Date	Time	Received by lab by:	Date	Time	Remarks	
				3/25/88	1221		

White • sample collector Yellow • file Pink • with report

BATCH #17