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SITE ASSESSMENT WORK PLAN BUILDING 8 CCAD NAS CORPUS CHRISTI TX
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ENSAFE

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SITE ASSESSMENT WORK PLAN
BUILDING 8, CCAD
NAVAL AIR STATION
CORPUS CHRISTI, TEXAS

Prepared by:
EnSafe/Allen & Hoshall

October 1991

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SECTION 1
SITE ASSESSMENT WORK PLAN

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1.0 INTRODUCTION

The Naval Facilities Engineering Command has retained EnSafe/Allen & Hoshall to conduct a preliminary site assessment (PSA) at Building 8 on the Naval Air Station (NAS), Corpus Christi, Texas. This investigation will include the collection and analysis of 15 groundwater samples and a pre-sampling site visit to verify sampling locations.

1.1 Site Description

The Naval Air Station is located in South Texas on the Gulf of Mexico near the city of Corpus Christi, Texas. The facility is located on a peninsula surrounded by Laguna Madre to the east, Corpus Christi Bay to the north, and Cayo del Oso Bay to the west. The air station was commissioned in 1941 and is primarily used for Naval air training operations.

Building 8 at NAS Corpus Christi is leased by the Corpus Christi Army Depot (CCAD) which serves under the U.S. Army Material Development and Readiness Command. CCAD's primary operations include performing depot level maintenance of Army aircraft and aeronautical equipment, training military personnel in depot level maintenance, and preparing aircraft for overseas shipment. Various industrial activities are conducted within the Building 8 complex including plating operations, parts cleaning and degreasing, bulk fuel storage, and painting.

1.2 Objective

The purpose of this assessment is to confirm or deny the presence of possible groundwater contamination at the site.

2.0 GROUNDWATER SAMPLING

During this investigation, a total of 15 groundwater samples will be collected. A hydraulically actuated hydropunch will be used to collect 14 of these samples and one (1) sample will be collected from an existing groundwater monitoring well. Three (3) of the hydropunch samples will be collected in an area presumed to be free of contamination. These samples will represent background concentrations for comparison with samples

collected near Building 8. Locations for background samples are shown on Figure 1. Background samples will be collected first in order to prevent possible cross contamination from other samples or sampling equipment. The remaining 12 samples will be collected around the periphery of Building 8 at the locations shown in Figure 2 and described below.

The sampling points are located:

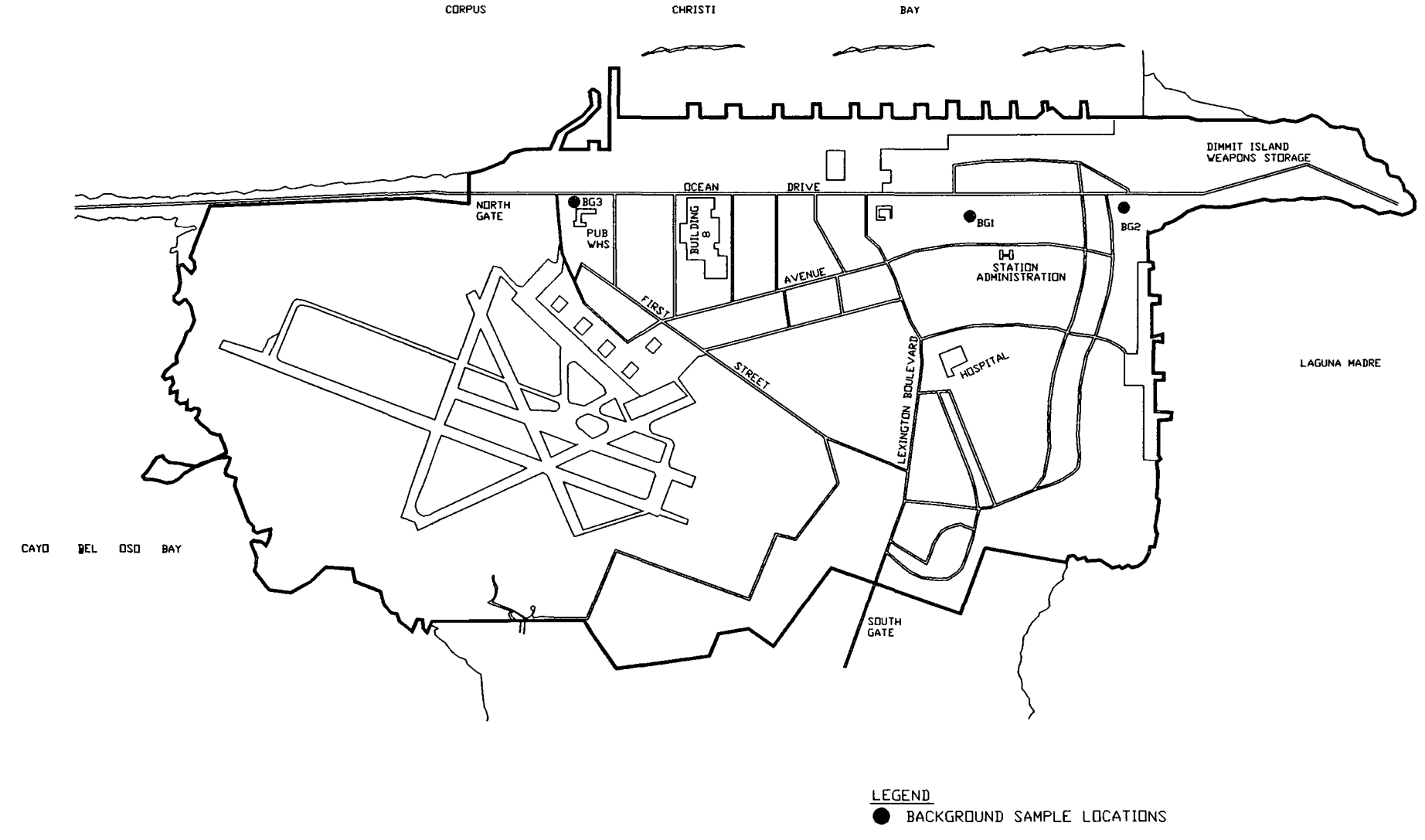
#1 - between fenced areas, ten (10) feet north of Avenue D, and east of the steam rack.
#2 - 15 feet south of the fenced storage area.
#3 - adjacent to the east side of the Pretreatment Plant.
#4 - adjacent to the LP gas storage tank.
#5 - in the north entrance of Building 8, 75 feet west of Forth Street.
#6 - west of the sidewalk, 20 feet south of the building.
#7 - south of the sidewalk, 35 feet west of the building.
#8 - adjacent to the intersection of the Ocean Drive sidewalk and the pedestrian crossing sidewalk across from hangar 43.
#9 - in the parking lot on the yellow striping between the spaces marked 59 and 60.
#10 - as one of the monitoring wells at Building 1804.
#11 - adjacent to the corner of the building.
#12- six (6) feet west of the fence adjacent to the "TWC Site 21" sign.

2.1 Hydropunch Methodology

Groundwater samples will be collected using a hydropunch. The hydropunch is essentially a stainless steel tube that is hydraulically forced through soil to the water table. When the tube is fully submerged, one (1) to three (3) feet below the water table, the point is opened and the tube fills with groundwater. The sample is collected by extracting the tube from the ground, opening it, and pouring the contents into sample containers.

2.2 Monitoring Well Sampling

One (1) groundwater sample will be collected from one (1) of the existing monitoring wells located near Building 1804 in the following manner:



LEGEND

● BACKGROUND SAMPLE LOCATIONS

N

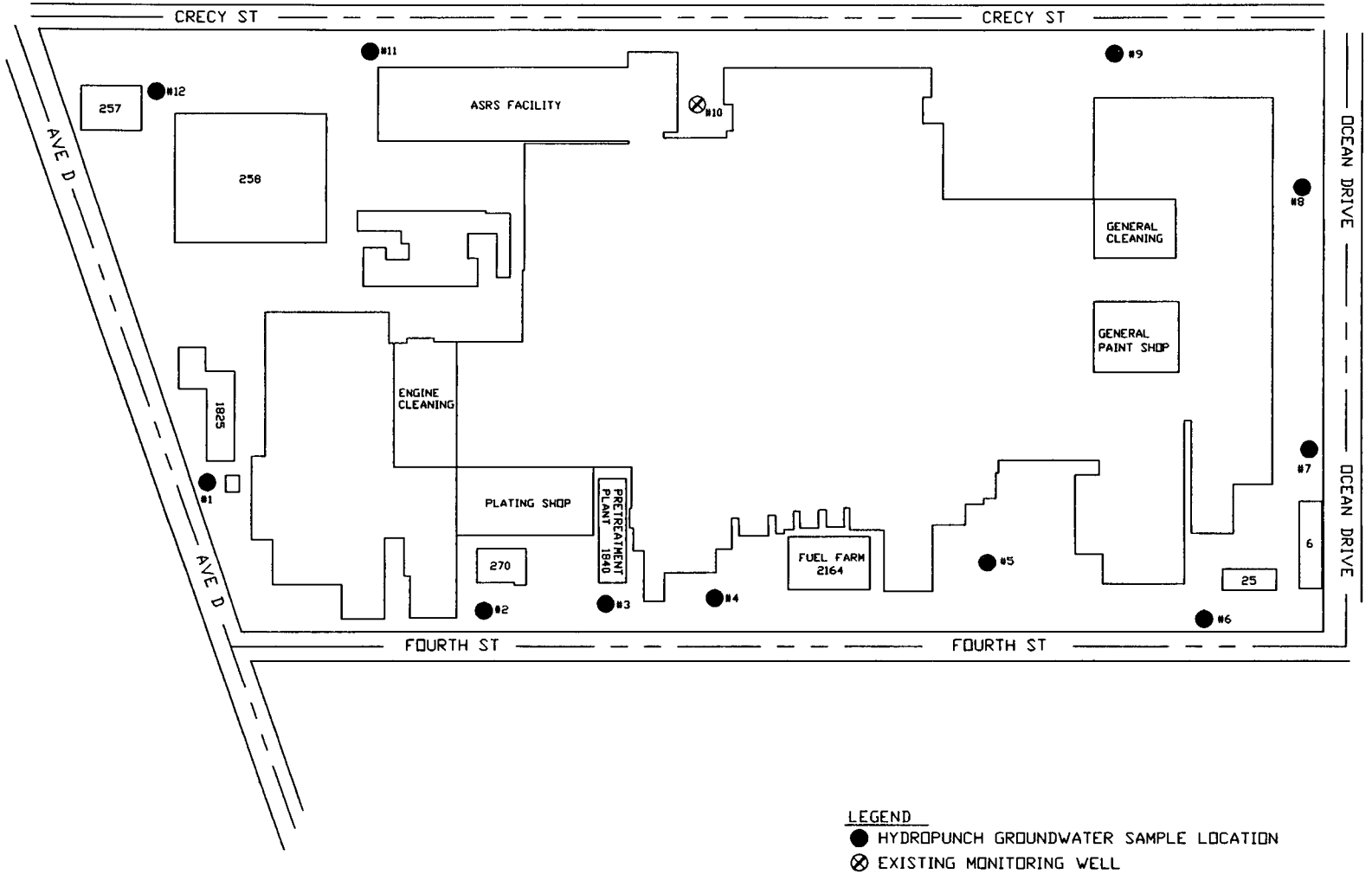
NOT TO SCALE

NAVAL AIR STATION
CORPUS CHRISTI, TEXAS

FIGURE 1
BACKGROUND SAMPLE LOCATIONS
CORPUS CHRISTI, TEXAS

DATE 10/17/91

DWG NAME CLNBSL1



LEGEND

● HYDROPUNCH GROUNDWATER SAMPLE LOCATION

⊗ EXISTING MONITORING WELL

NOT TO SCALE

NAVAL AIR STATION
CORPUS CHRISTI, TEXAS

FIGURE 2
BUILDING 8, CCAD
GROUNDWATER SAMPLING LOCATIONS
CORPUS CHRISTI, TEXAS

DATE: 10/17/91

DWG NAME SDSCC-EFF

2.2.1 Purging

Prior to sampling, a minimum of three (3) casing volumes will be removed from the well. This will remove any stagnant water and ensure that the water being sampled is representative of the aquifer immediately surrounding the well. If the well is evacuated dry, it will not be sampled until the following day to allow for sufficient recharge.

Groundwater level and total well depth will be measured with an electronic water level indicator to determine the evacuation volume. The depth to water measurement subtracted from the total well depth equals the thickness of the water column in the well. This value multiplied by a conversion factor (0.174 gallons/ft. for a 2-inch well) will establish the volume of water within the casing. Three times the casing volume will serves as the minimum evacuation required for sampling.

2.2.2 Sample Collection

The groundwater sample from the monitoring well will be collected with a clean teflon bailer attached to clean nylon rope. This sample will be handled, preserved, and shipped in the same manner as the hydropunch samples.

2.3 Sample Preservation, Handling, and Shipping

Immediately after collection, samples will be appropriately preserved and placed in a 4°C cooler filled with blue ice. Samples will be handled as infrequently as possible and care will be taken to ensure that samples are not contaminated. All samples will be shipped to the laboratory the day of collection via an overnight express air courier.

To assure that the samples are maintained in a safe and reliable manner, a strict chain-of-custody (COC) procedure will be followed. This will be implemented in the field and carried throughout the entire analytical process. All parties handling the samples will sign the COC form which will become a part of the permanent records. Sample security seals will be employed either for individual sample bottles or shipping containers. Completed

COC forms will form part of the laboratory reporting package for data validation. An example of a COC form and security seal are shown in Figure 3 and Figure 4 respectively.

2.4 Analytical Parameters and Specifications

All samples will be analyzed for TPH, volatiles, and the metals listed in Appendix IX of 40 CFR Part 264. The metals in Appendix IX include antimony, arsenic, barium, beryllium, cadmium, chromium (total), cobalt, copper, lead, mercury, nickel, selenium, silver, thallium, vanadium, and zinc. Table 1 lists these parameters and associated collection and preservation methods.

Table 1. Analytical Parameters and Specifications.

Parameter	Method	Container	Volume	Preserva-tive	Holding Time
Volatiles	EPA 8240	(3) VOA vials amber glass	40 mL each	4°C	7 days
Metals	EPA 6010 &/or 7000 Series	(1) plastic	500 mL	4°C HNO_3 pH<2	6 months
Mercury	EPA 7470	(1) plastic	250 mL	4°C HNO_3 pH<2	28 days
TPH	EPA 418.1	(1) amber glass	1L	4°C HCl pH<2	28 days

FIGURE 3
CHAIN OF CUSTODY FORM

CHAIN OF CUSTODY RECORD

NAVAL AIR STATION
CORPUS CHRISTI, TEXAS

PAGE___ of____

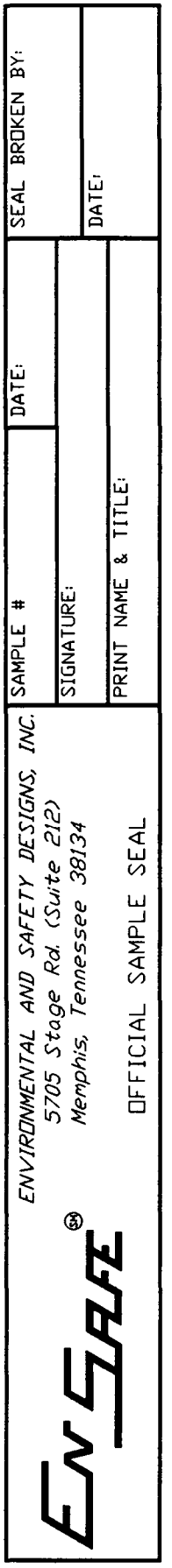
CLIENT NAME							#of containers	MEDIA (X)				SAMPLE ANALYSIS (X)									PRESERVATION
COLLECTED BY																					
SAMPLE ID	DATE	TIME	comp	grab	well	SAMPLE LOCATION		SOIL	WATER	SEDIMENT	GROUNDWATER										

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:

RELINQUISHED BY:	DATE	TIME	RECEIVED AT LAB BY:	DATE	TIME	REMARKS

CLENCUSI

FIGURE 4
SAMPLE SECURITY SEAL



2.5 Decontamination

All equipment that comes in contact with soil will be steam cleaned before use and after each sample is collected. This will minimize potential cross contamination between samples. Decontamination will consist of the following steps:

1) High pressure, hot tap water and Alconox wash
2) Tap water rinse
3) Two rinses with isopropyl alcohol
4) Two rinses with deionized water

Additional scrubbing may be required to remove encrusted materials.

3.0 QUALITY ASSURANCE AND SAFETY

The following measures will be taken or planned to assure that the quality of data obtained in this sampling program match the intended or required end use of the data.

3.1 Field Team Organization

All field work will be completed under the direct supervision of an EnSafe geologist or project manager. Samplers will be fully trained in proper sampling protocol, and the Plans prepared for this project.

3.1.1 Sampling Protocol

- Following the procedures outlined in Section 2.5, all sampling equipment will be decontaminated before each sample is collected.
- Samplers will put on a clean pair of surgical gloves before each sample is collected.
- Descriptions of hydropunch and monitoring well sampling methodology are presented in Sections 2.1 and 2.2 respectively.
- When the full hydropunch or bailer is extracted, samples will be collected in the appropriate pre-cleaned containers mentioned in Table 1.
- Samples will be immediately preserved with the chemicals outlined in Table 1 and placed in coolers with blue ice.

3.2 Document and Sample Control

Field personnel will use bound logbooks for the maintenance of all field records pertaining to all field activities. These records will be maintained in the EnSafe/Allen & Hoshall project file and will document all visual observations, calculations and equipment adjustments. Every entry will be dated, and the time for each entry will be noted. The logbooks are accountable documents that will be properly maintained and retained as part of the project files.

Custody Procedures

To assure that the samples are maintained in a safe and reliable manner, a strict chain-of-custody (COC) procedure will be followed. This will be implemented in the field and carried throughout the entire analytical process. All parties handling the samples will sign the COC form and this form will become a part of the permanent records. Completed COC forms will form part of the laboratory reporting package and part of the data validation criteria. A copy of a COC form is presented in Figure 3.

3.3 Quality Control Samples

To assess analytical precision, a field duplicate will be obtained at one of the sample locations near Building 8. This duplicate will be handled and analyzed along with all other samples.

Further evaluation of precision and accuracy will be obtained by analyzing matrix spike samples from the same location mentioned above. An extra volume of sample will be collected for TPH and volatile matrix spike/matrix spike duplicate analysis. Two (2) extra liters will be collected for TPH and four (4) extra VOA vials will be filled for volatiles.

To evaluate the adequacy of decontamination procedures, one rinsate blank will be collected during the investigation. The blank will be obtained by passing organic-free water through the hydropunch mechanism and collecting it. This sample will be analyzed with the other samples.

To ensure that extraneous sources have not contaminated the samples, one (1) trip blank will be handled and shipped with those being collected. The trip blank will consist of a 40 mL VOA sample container filled with organic-free water by the laboratory. It will be analyzed for volatile organics only and will be handled and shipped in the same manner as the other samples.

One field blank will be collected during this assessment to check for contamination imparted to the samples by the sample containers or other extraneous sources. The field blank will be obtained by filling sample jars from the deionized water source used for decontamination. This blank will be handled, shipped, and analyzed with the rest of the samples.

3.4 Health and Safety

A formal plan for the protection of sampling team and third party health and safety has been prepared for this work as a separate deliverable.

4.0 REPORTING

After the samples have been analyzed, a Site Assessment Report will be prepared for SOUTHDIV that documents the sampling and analytical results. This report will include a summary of site activities, analytical results, conclusions, and recommendations for future activities.

SECTION 2
HEALTH AND SAFETY PLAN

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1.0 INTRODUCTION

The following Health and Safety Plan is written in conjunction with the Site Assessment (SA) Work Plan for the Naval Air Station, Corpus Christi, Texas. The project contract number is N62467-89-D-0318. This project is being conducted to confirm or deny the presence of groundwater contamination at the site.

Applicability

The provisions of the plan are mandatory for all onsite personnel engaged in the Environmental Assessment who will be exposed or have the potential to be exposed to onsite hazardous substances. All personnel will operate in accordance with the most current requirements of 29 CFR 1910.120, Standards for Hazardous Waste Workers and Emergency Responders. These regulations include the following provisions for employees exposed to hazardous substances, health hazards or safety hazards: training as described in 120(e), medical surveillance as described in 120(f), and personal protective equipment described in 120(g). Health and Safety training certificates for all EnSafe/Allen & Hoshall employees who may visit the site are provided in Appendix III. Up-to-date OSHA refresher training certificates will be available on-site for all employees involved in field activities whose refresher course requirements come up for renewal prior to project initiation.

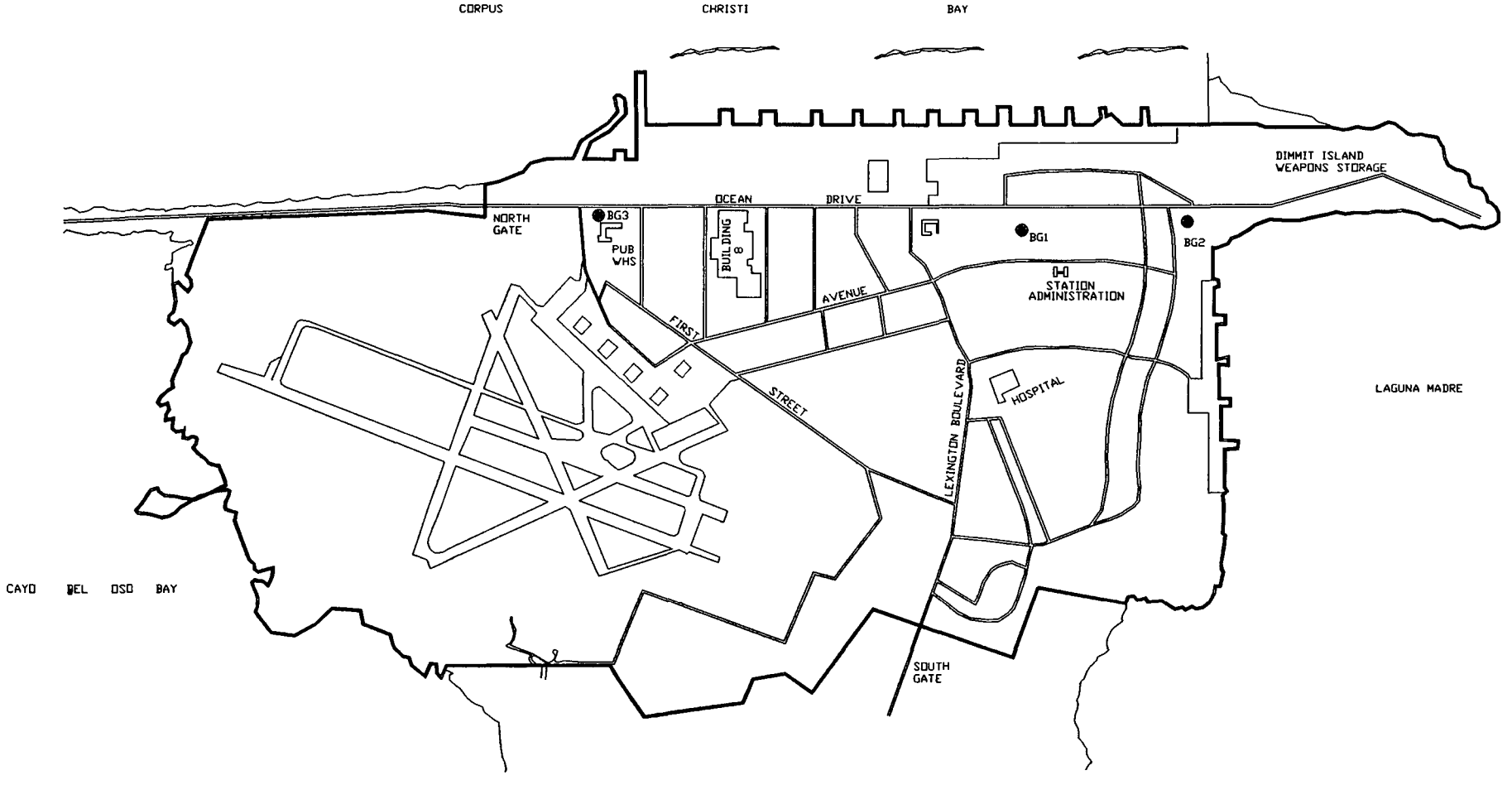
1.1 SITE CHARACTERIZATION

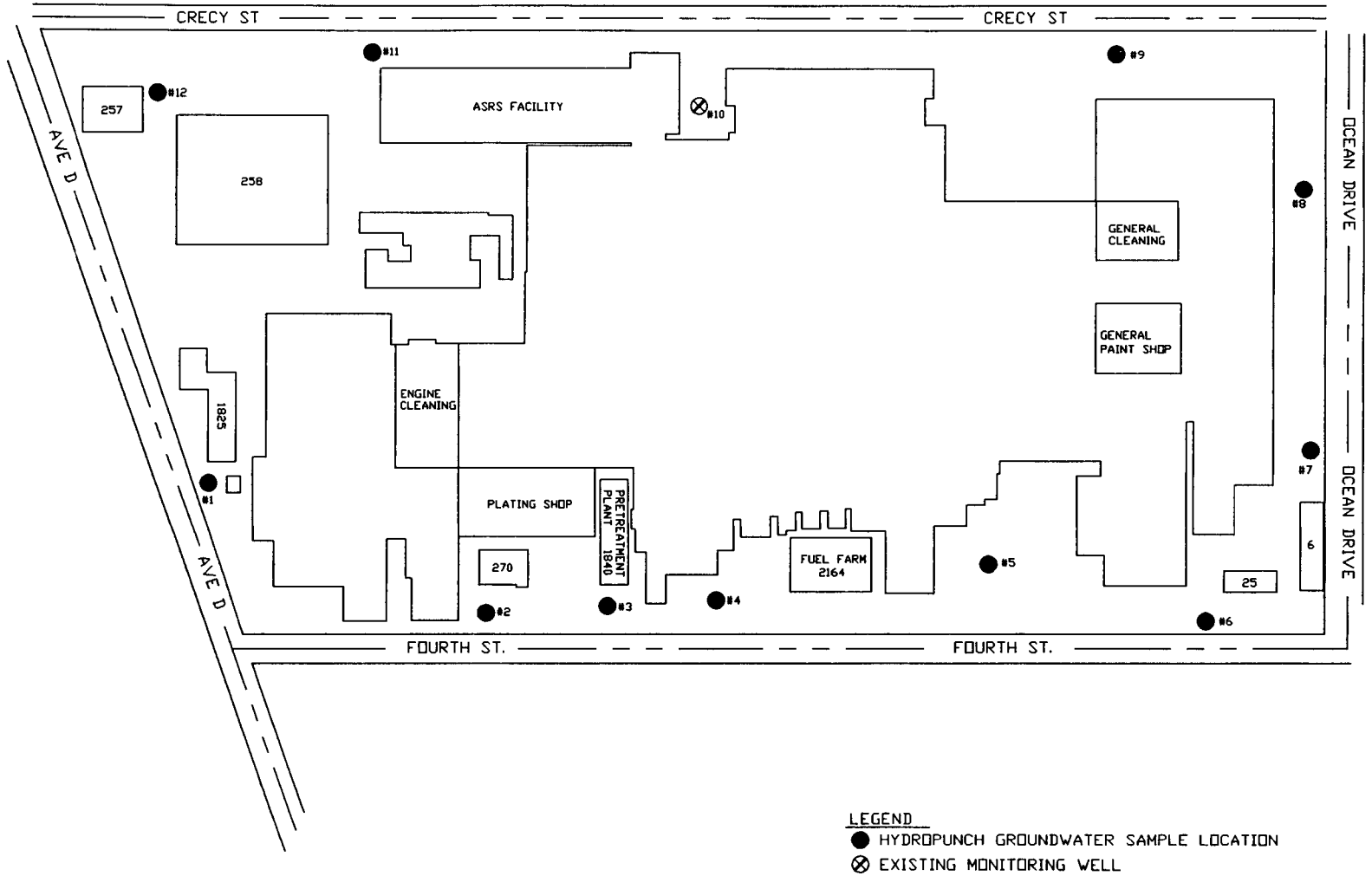
1.1.1 Site Control

A twenty foot perimeter will be established around each work zone and marked with hazard tape if the likelihood exists for unauthorized personnel to enter the work zone. Only authorized personnel with 40 hours health and safety training meeting the requirements of OSHA 29 CFR 1910.120 are permitted within the marked area.

1.1.2 Work Zones

Site activities will be conducted in the areas depicted in Figures 1 and 2. Work will be restricted to the twenty foot perimeter around each sampling location as described above.


CORPUS
CHRISTI
BAY
DIMMIT ISLAND
WEAPONS STORAGE
OCEAN
DRIVE
NORTH
GATE
BG3
PUB
WHS
BUILDING
8
BG1
BG2
STATION
ADMINISTRATION
AVENUE
FIRST
STREET
LEXINGTON BOULEVARD
HOSPITAL
LAGUNA MADRE
CAYO
BEL
OSO
BAY
SOUTH
GATE
LEGEND
BACKGROUND SAMPLE LOCATIONS
N
NOT TO SCALE
NAVAL AIR STATION
CORPUS CHRISTI, TEXAS
FIGURE 1
BACKGROUND SAMPLE LOCATIONS
CORPUS CHRISTI, TEXAS
DATE 10/17/91
DWG NAME CLNBSL1



LEGEND

● HYDROPUNCH GROUNDWATER SAMPLE LOCATION

⊗ EXISTING MONITORING WELL

NOT TO SCALE

NAVAL AIR STATION
CORPUS CHRISTI, TEXAS

FIGURE 2
BUILDING 8, CCAD
GROUNDWATER SAMPLING LOCATIONS
CORPUS CHRISTI, TEXAS

DATE: 10/17/91

DWG NAME. SDSCC-EFF

1.2 SITE ACTIVITIES

The only activity conducted during this investigation will be the collection of groundwater samples from 15 different locations near Building 8. Samples will be collected using a hydraulically actuated hydropunch. A full description of sampling techniques is provided in the SA Work Plan.

1.3 EMPLOYEE PROTECTION

Employee protection for this project includes standard safe work practices, personal protective equipment, procedures and equipment for extreme weather conditions, work limitations, and exposure evaluation.

1.3.1 Standard Safe Work Practices

Standard safe work practices that will be followed include:

- Eating, drinking, chewing gum or tobacco, smoking or any activity that increases the probability of hand-to-mouth transfer and ingestion of material is prohibited in any area designated as contaminated, unless authorized by the Site Health and Safety Officer.

- Hands and face must be thoroughly washed upon leaving the work area.

- No contact lenses will be worn in work areas while invasive actions are conducted.

- Whenever decontamination procedures for outer garments are in effect, the entire body should be thoroughly washed as soon as possible after the protective garment is removed.

- Contact with contaminated or suspected contaminated surfaces should be avoided. Whenever possible, do not walk through puddles, leachate or discolored surfaces; or lean, sit, or place equipment on drums, containers, or on soil suspected of being contaminated.

- Medicine and alcohol can exacerbate the effects from exposure to toxic chemicals. Prescribed drugs should not be taken by personnel on cleanup or response operations where the potential for absorption, inhalation or ingestion of toxic substances exists unless specifically approved by a qualified physician. Consumption of alcoholic beverages shall be prohibited during operations.

- Due to the possible presence of overhead power lines, adequate side and overhead

clearance should be maintained to insure that drill rig boom(s) or hydropunch equipment do not touch or pass close to any overhead lines.

- Due to the possible presence of underground utilities (including electric, natural gas, water, sewer, telephone, etc.), the activity and local utility representatives should be contacted and requested to identify all lines at the ground surface using characteristic spray paint or labelled stakes. A three (3) yard buffer zone should be maintained during all subsurface investigations.

- Due to the flammable properties of the potential chemical hazards, all spark or ignition sources should be bonded and/or grounded or mitigated prior to commencement of hydropunch advancement.

1.3.2 Personal Protective Equipment (PPE)

Field activities which disturb soils will be initiated in Level D protection. Level D Protection consists of a work coveralls (full length sleeves and pants), hard hat, appropriate chemical resistant gloves, eye protection, and chemical resistant, steel toed and shank boots.

Worker breathing zone air monitoring will be performed throughout field procedures to constantly reassess the potential for exposure through the inhalation pathway. If field conditions indicate a higher level of contamination than anticipated, field activities will be halted, and a reassessment of the field program will be conducted. The reassessment will include the type of PPE recommended for field activities. If higher levels are necessary, they will be selected based on the contaminants and concentrations. Any readjustments in field procedures as a result of a reassessment will result in an amendment to this Health and Safety Plan. Guidelines for use, maintenance, and selection of PPE are contained in EnSafe/Allen & Hoshall's corporate Health and Safety Plan, "Health and Safety Manual, ESDM-1".

The methods to be used to assess hazard potential are discussed in Section 1.5 Monitoring Requirements.

1.3.3 Procedures and Equipment for Extreme Weather Conditions

Field activities for this investigation are scheduled to last approximately one (1) to two (2) days. The seasonal climate can be expected to be hot. Heat stress will be of concern for the health and safety personnel. Adverse weather conditions are important considerations in planning and conducting site operations. Extremes in hot weather can cause physical discomfort, loss of efficiency and personal injury.

1.3.4 Heat Stress

Heat stress can result when the protective clothing decreases natural body ventilation even when temperatures are moderate. Working under various levels of personal protection may require the wearing of low permeability disposable suits, gloves and boots. This clothing will prevent most natural body ventilation. Discomfort due to increased sweating and body temperature (heat stress) will be expected at the work site.

Heat stress is the metabolic and environmental heat to which an individual is exposed. The manifestations of heat strain are the adjustments made by an individual in response to the stress. The three most important categories of heat-induced illness are: heat exhaustion, heat cramps, and heat stroke. These disorders can occur when the normal responses to increased sweat production are not adequate to meet the needs for body heat loss or when the temperature regulating mechanisms fail to function properly.

Heat exhaustion is a state of collapse brought about by an insufficient blood supply to the cerebral cortex of the brain. The result is low blood pressure caused by inadequate heart output and widespread expansion of blood vessels.

There are three significant factors which can lead to heat exhaustion:

1. Increased expansion of blood vessels which causes a decreased capacity of circulation to meet the demands for heat loss to the environment, exercise, and digestive activities.

2. Decreased blood volume due to dehydration.

3. Reduced blood volume due to lack of physical training, infection, intoxication (from industrial contaminants as well as from drinking alcohol), or heart failure.

The symptoms include extreme weakness or fatigue, dizziness, nausea, or headache. More severe cases may also involve vomiting and possible unconsciousness. The skin becomes clammy and moist, the complexion pale, and the oral temperature stays normal or low but the rectal temperature is usually elevated (99.5°F - 101.3°F). Workers who are unacclimatized run the highest risk.

In most cases, treatment of heat exhaustion is fairly simple. The victim will be moved to a cool place. If the victim is unconscious, medical assistance must be sought. Mild cases may experience immediate recovery; however, more severe cases may require several days care. No permanent effects have ever been reported.

Heat cramps result when the working muscles go into painful spasms. This may occur in those who perspire profusely in heat and who drink large quantities of water, but who fail

to replace their bodies' salt. It is the low salt content in the blood that causes the cramping. The abdominal muscles as well as the muscles in the arms and legs may be affected. The cramps may appear during or even after work hours. Persons on a "low sodium" diet should not be given salt. A physician must be consulted on the care of people with this condition.

Heat stroke is the most serious of the health problems that arise while working in hot environments. It is caused by the breakdown of the thermo-regulatory system under stress. When this happens, perspiration stops and the body can no longer regulate its own temperature.

Heat stroke victims must be treated as a major medical emergency. A heat stroke victim may be identified by hot, dry, and usually red or spotted skin. The body core temperature can exceed 105°F. Mental confusion, irritability and chills are common. These are all early warning signs of heat stroke; if the sufferer is not removed from the hot environment at once, more severe symptoms can follow, including unconsciousness, delirium, and convulsions, possibly ending in death.

When someone is suffering from heat stroke, medical assistance must be summoned immediately. In addition:

- First aid must be administered
- Individual must be moved to a cool location
- Individual must be cooled through
  - wetting,
  - fanning, or
  - immersion

Care should be taken to avoid over-cooling and treatment for shock should be given by raising the legs. Early recognition and treatment of heat stroke are the only means of preventing permanent brain damage or death.

Recommendations to reduce heat stress are:

- Drink plenty of fluids (to replace loss through sweating).
- Wear cotton undergarments to act as a wick to absorb moisture.
- Make adequate shelter available for taking rest breaks to cool off.

In extremely warm weather, the Site Health and Safety Officer may also require these additional measures:

- Wear cooling devices to aid in ventilation (NOTE: the additional weight may affect efficiency).
- Install portable showers or hose down facilities to cool clothing and body.
- Shift working hours to early morning and early evening. Avoid the hottest time of the day.
- Frequently rotate crews wearing the protective clothing (if required).

1.3.5 Work Limitations

All site activities will be conducted during daylight hours only. All personnel scheduled for these activities will have completed initial health and safety training and actual field training as specified in 29 CFR 1910.120(e).

1.3.6 Exposure Evaluation

All personnel scheduled for site activities have had a baseline physical examination and have been declared fit for duty. An exposure history form will be completed for each worker participating in site activities. It includes onsite monitoring results. The EnSafe/Allen & Hoshall medical monitoring program is discussed below (see Section 1.4).

1.4 MONITORING REQUIREMENTS

Air monitoring will be accomplished using an HNu (or similar) photoionization detector (PID). The PID will be calibrated to measure volatile organic compounds relative to benzene using an isobutylene standard gas. Background (ambient) PID readings in the breathing zone will be collected prior to commencement of each day's field activities. This value will be recorded in the field log book. If volatile organic compounds concentrations (in the breathing zone) exceed background (ambient) readings by five ppm or more, field activities will immediately cease. Upon cessation of site activities, the field project manager must contact the Health and Safety Officer. The Health and Safety Officer will have responsibility for reassessing the hazards and prescribing revised health and safety requirements as necessary including (but not limited to): upgraded Personal Protective Equipment requirements, revised work schedules, and revised decontamination procedures.

Field technicians will be made aware that they must report any unusual odors or soil discolorations. Each instrument shall be calibrated daily before site activities commence and at the termination of each days work. At the end of each work day and prior to calibration, each instrument shall be checked to ensure that it is free from surface contamination.

1.4.1 Medical Monitoring Program

All Joint Venture (EnSafe/Allen & Hoshall) personnel who enter hazardous waste/spill sites or have the potential for exposure to hazardous materials from these sites must participate in EnSafe/Allen & Hoshall's Monitoring Program. The program is conducted by EnSafe/Allen & Hoshall's Company doctor in liaison with the Company Health and Safety Officer. The purpose of the program is to identify any preexisting illnesses or problems that would put an employee at unusual risk from certain exposures or respirators, and to monitor and evaluate exposure-related events where workers are involved in the handling of hazardous materials. Project managers should consult with the Health and Safety Officer and/or the Company doctor concerning the scope of work and known or anticipated chemical hazards associated with each project.

The Joint Venture maintains the right to exclude certain individuals from particular jobs based on reports from the Company doctor. The program will be reviewed on an annual basis to determine its effectiveness.

The Company doctor has been employed as an independent contractor to provide medical monitoring for The Joint Venture. The doctor is responsible for the following aspects of the medical monitoring program:

- Selection and quality assurance of medical and laboratory services involved in carrying out the monitoring program.
- Development of a uniform medical record.
- Record retention.
- Employee notification of examination results.
- Determination of content of the medical and biological monitoring programs.
- Record review and correlation between potential exposure and effect.
- Monitoring job related illness and injury for each employee.

1.4.1.1 Preplacement Examinations

Each employee will be given a preplacement examination to identify any preexisting illness or problem that would put the employee at an unusual risk from certain exposures; to assure that each employee can safely use negative pressure respirators; and to develop a data base to assess any exposure related events detected during periodic medical monitoring. Data accumulation will include variables such as age, sex, race, smoking, prior employment history, and other conditions that might bear upon the occurrence of subsequent events once employment begins.

The preplacement examination includes:

- Occupational history including previous chemical and carcinogenic exposures.
- Medical history including demographic data, family history, personal habits, past medical history and a current symptomatic review of systems.
- Fertility history.
- Physical examination, stressing examination of the neurologic, cardio-pulmonary, musculoskeletal and dermatological systems.
- Physiological parameters including blood pressure and visual acuity testing.
- Pulmonary function testing including FVC, FEVI and FEV 25-75.
- Electrocardiogram.
- PA and lateral chest X-ray.
- A multi-chemistry panel including tests of kidney and liver function.
- Red blood cell cholinesterase.
- Audiogram.

The history, physiological parameters, X-ray, screening tests and laboratory studies will be done prior to the physical examination. After the physical examination the medical examiner will review the results of the examination and special studies with each employee and facilitate referral for further evaluation of abnormalities detected during this examination. OHS will provide each employee a written summary and detailed results of the examination along with treatment of any job restrictions. Additional medical testing procedures (e.g. ophthalmology/optometric assessment, specialized audiometric testing, etc.)

may be required at the discretion of EnSafe/Allen & Hoshall's attending physician.

1.4.1.2 Periodic and Exit Examinations

An examination and updated occupational history will be repeated on an annual basis. The content of the annual examination includes:

- Updated occupational and medical history
- Physical examination, stressing examination of the neurologic, cardio-pulmonary, musculoskeletal and dermatological systems
- Pulmonary function testing including FVC, FEVI and FEV 25-75
- Multi-chemistry panel including tests of kidney and liver function
- Urinalysis

The Company doctor will review the results of annual examination and exposure data, and request further tests or issue medical clearances as appropriate.

An examination will also be done when an employee terminates. The Company doctor will be consulted for the contents of the exam. The exception to this is when the terminating employee has had an exam within 6 months or when there has been no site work since the time of the last examination.

1.4.1.3 Return-to-Work Examinations

After any job-related injury or illness, a medical examination is required to determine fitness for duty or to identify any job restrictions. The medical examiner will review the results of this back-to-work examination with Company doctor prior to releasing the employee for work. A similar examination will be performed if an employee has missed at least 3 days of work due to a non-job-related injury requiring medical attention.

1.4.1.4 Confidentiality

Medical records will be maintained in a confidential manner so that only authorized persons will have access to the records. These will include medical staff of EnSafe/Allen & Hoshall or contracted medical personnel, the individual, the individual's personal physician or the individual's designated representative. Upon request, the individual may obtain a copy of the medical file. This will be provided within 15 days of the receipt of the

written request. Information used for research, testing, statistical, or epidemiologic purposes will have all identifying data removed, including the identity of the individual. Any medical information or findings obtained which do not affect the individual's job performance will not be made available to EnSafe/Allen & Hoshall. This is to maintain the patient-physician confidentiality. Upon death, retirement, resignation, or other termination of services, the records will be retained by EnSafe/Allen & Hoshall or contracting physician.

1.5 DECONTAMINATION

A decontamination zone will be established and will include one area for sampling equipment and one area for personnel decontamination (if necessary).

1.5.1 Personnel Decontamination

The decontamination procedures, based on Level D protection, will consist of brushing heavily soiled overboots, and rinsing gloves and overboots with soap and water. Hard hats and eye protection should also be washed thoroughly at the end of each work day with a soap and water solution. All field personnel are to be instructed to shower as soon as possible after leaving the site.

Decontamination procedures will be conducted at the end of each work day.
If higher levels of personal protection equipment are needed, adjustments will be made to these procedures and an amendment will be made to this health and safety plan.

1.5.2 Closure of the Personnel Decontamination Station

Decontamination and rinse solutions (soap and water solutions) from sampling tool decontamination will be placed in a 55 gallon drum and characterized for proper disposal. Reusable clothing will be dried and prepared for future use. All washtubs, pails, buckets, etc. will be washed, rinsed and dried at the end of each workday.

1.6 AUTHORIZED PERSONNEL

Personnel anticipated to be onsite at various times during site activities include:

- EnSafe/Allen & Hoshall Principle-In-Charge - Dr. James Speakman
- EnSafe/Allen & Hoshall Task Order Manager - Mr. Jeff Bennett

- EnSafe/Allen & Hoshall Field Project Manager - Mr. Paul Stoddard
- EnSafe/Allen & Hoshall Field Geologist - Mr. Bart Douglas
- EnSafe/Allen & Hoshall Safety Officer - Mr. Rick Barlow
- EnSafe/Allen & Hoshall Representatives - Mr. Mark Bowers
- SOUTHDIV, Engineer-in-Charge - Mr. Ed Lohr
- Naval Air Station Corpus Christi, TX. Site Contact - Mr. Jim Boatman
- Hydropunch Contractor - To be determined

1.6.1 Responsibilities of the Project Manager

The Project Manager will direct the site assessment and operation. The Project Manager has the primary responsibility for:

- Assuring that all personnel are aware of:

  a. Names of personnel and alternates responsible for site safety and health;
  b. Safety, health and other hazards present on the site;
  c. Use of personal protection equipment and assuring that the equipment is available;
  d. Work practices by which the employee can minimize risks from hazards;
  e. Safe use of engineering controls and equipment on the site;
  f. Medical surveillance requirements including recognition of symptoms and signs which might indicate over exposure to hazards; and
  g. Site control measures, decontamination procedures, site standard operating procedures and the contingency plan and responses to emergencies including the necessary PPE.

- Assuring that all employees have received a minimum of 40 hours of health and safety instruction, off the site, and actual field experience under the direct supervision of a trained experienced supervisor. Workers who may be exposed to unique or special hazards shall be provided additional training.

- Monitoring the performance of personnel to ensure that mandatory health and safety procedures are being performed and correcting any performances that do not comply with the Health and Safety Plan. (Copies of health and safety training certificates must be available for review by the EnSafe/Allen & Hoshall Project Manager and Site Safety Officer.)

- Ensuring that all field personnel employed on the site are covered by a medical surveillance program as required by 29 CFR 1910.120(f)

- Consulting with the Health and Safety Officer and/or other personnel.

- Preparation and submittal of any and all project reports - includes progress, accident, incident, contractual, etc.

1.6.2 Responsibilities of the Site Health and Safety Officer

The EnSafe/Allen & Hoshall Health and Safety Officer has the primary responsibility for:

- Assuring that a copy of the Health and Safety Plan is maintained onsite during all field activities.

- Advising the Project Manager on all health and safety related matters involved at the site.

- Directing and ensuring that the safety program is being correctly followed in the field, including the proper use of personal protective and site monitoring equipment.

- Ensuring that the field personnel observe the appropriate work zones and decontamination procedures.

- Reporting any safety violations to the Project Manager.

- Conducting safety briefings during field activities.

The Site Health and Safety Officer will be a person trained in safety and industrial hygiene.

1.6.3 Responsibilities of Onsite Field Personnel

All onsite field personnel will be responsible for the following:

- All personnel going on site must be thoroughly briefed on anticipated hazards and trained on equipment to be worn, safety procedures to be followed, emergency procedures and communications.

- Required respiratory protective devices and clothing must be worn by all personnel going into areas designated for wearing protective equipment.

- Personnel must be fit-tested prior to use of respirators.

- No facial hair which intrudes on the sealing surface of the respirator is allowed on personnel.

- Personnel on site must use the buddy system when wearing respiratory protective equipment. As a minimum, a third person, suitably equipped as a safety backup, is required during initial entries.

- Visual contact must be maintained between pairs onsite and site safety personnel. Field personnel should remain close together to assist each other during emergencies.

- All field personnel should make use of their senses to alert themselves to potentially dangerous situations which they should avoid, e.g., presence of strong and irritating or nauseating odors.

- Personnel should practice unfamiliar operations prior to doing the actual procedure in the field.

- Field personnel shall be familiar with the physical characteristics of the site, including:

  - wind direction in relation to contamination zones;
  - accessibility to associates, equipment and vehicles;
  - communications;
  - operation zones;
  - site access; and
  - nearest water sources.

- Personnel and equipment in the contaminated area must be kept to a minimum, consistent with effective site operations.

- Procedures for leaving a contaminated area must be planned and implemented prior to going onsite in accordance with the Site Health and Safety Plan.

- All visitors to the job site must comply with the Health and Safety Plan procedures. Personal protection equipment may be modified for visitors depending on the situation. Any modifications must be approved by the Site Health and Safety Officer.

1.7 EMERGENCY INFORMATION

All hazardous waste site activities present a potential risk to onsite personnel. During routine operations, risk is minimized by establishing good work practices, staying alert and using proper personal protective equipment. Unpredictable events such as physical injury, chemical exposure or fire may occur and must be anticipated.

If any situation or unplanned occurrence requires outside or support service, Robert Stender, the Naval Air Station Corpus Christi Site Contact, will be informed and the appropriate contact from the following list will be made:

Contact	Person or Agency	Telephone
Jim Boatman	Naval Air Station, Corpus Christi, TX.	(512) 939 3776
Ed Lohr	SOUTHDIV Engineer-in-Charge	(803) 743-0355
Law Enforcement	NAS Corpus Christi Security	(512) 939 3776
Fire Department	City of Corpus Christi	911
Ambulance Service	City of Corpus Christi	911
Texas State Poison Center	University of Texas Medical Branch Galveston, TX	(800) 392-8548
Jeff Bennett	EnSafe/Allen & Hoshall 5724 Summer Trees Drive Memphis, TN. 38184	(901) 372-7962

Ed Lohr, SOUTHDIV Engineer-in-Charge will be contacted after appropriate emergency measures have been initiated on-site.

1.7.1 Site Resources

Telephones for emergency use are located in Building 8 adjacent to the work area. Restroom facilities and water supply will be available near the work zone.

1.8 EMERGENCY PROCEDURES

In the event that an emergency develops onsite, the procedures delineated herein are to be immediately followed. Emergency conditions are considered to exist if:

- Any member of the field crew is involved in an accident or experiences any adverse effects or symptoms of exposure while on site; or

- A condition is discovered that suggests the existence of a situation more hazardous than anticipated.

The following emergency procedures should be followed:

- Site work area entrance and exit routes will be planned and emergency escape routes delineated by the Site Safety Officer.

- The first respondent aware of an emergency will verbally notify all other onsite personnel of the emergency or make three short blasts on the horn of the nearest site vehicle.

- In the event that any member of the field team experiences any effects or symptoms of exposure while on the scene, the entire field crew will immediately halt work and act according to the instructions provided by the Site Safety Officer.

- For applicable site activities, wind indicators visible to all onsite personnel will be provided by the Site Safety Officer to indicate possible routes for upwind escape.

- The discovery of any conditions that would suggest the existence of a situation more hazardous than anticipated will result in the suspension of work until the Safety Officer has evaluated the situation and provided the appropriate instructions to the field team.

- In the event that an accident occurs, the Project Manager is to complete an accident report form for submittal to the managing principal-in-charge of the project.

- In the event that a member of the field crew suffers a personal injury, the Site Health and Safety Officer will call 911 (serious injury) to alert appropriate emergency response agencies or administer on-site first aid (minor injury) as the situation dictates. An Accident Report Form will be completed for any such incident.

- In the event that a member of the field crew suffers a chemical exposure, the affected areas should be flushed immediately with copious amounts of clean water, and if the situation dictates, the Site Health and Safety Officer should alert appropriate emergency response agencies, or personally ensure that the exposed individual is transported to the nearest medical treatment facility for prompt treatment. An Accident Report Form will be completed

for any such incident.

Additional information on appropriate chemical exposure treatment methods is provided in MSDSs in Appendix IV. Directions to the nearest emergency medical facility capable of providing general emergency medical assistance and treating chemical burns are provided in Appendix II.

1.9 FORMS

The following forms will be used in implementing this Health and Safety Plan:

Plan Acceptance Form
Plan Feedback Form
Accident Report Form
Exposure History Form

The Plan Acceptance Form will be filled out by all employees working on the site prior to commencement of site activities. The Plan Feedback Form will be filled out by the Site Safety Officer and any other onsite employee who wishes to fill one out. The Accident Report Form will be filled out by the Project Manager in the event that an accident occurs. The Exposure History Form will be completed by both the Project Manager and the individual(s) for whom the form is intended. Examples of each form are provided in Appendix I.

All completed forms must be returned to the Task Order Manager at EnSafe/Allen & Hoshall, Memphis, Tennessee.

APPENDIX I

HEALTH AND SAFETY PLAN FORMS

PLAN ACCEPTANCE FORM

PROJECT HEALTH AND SAFETY PLAN

INSTRUCTIONS: This form is to be completed by each person working on the project work site and returned to, EnSafe, Memphis, Tennessee.

Job No. 2151-022

Contract No. N62467-89-D-0318

Project: SITE ASSESSMENT

I represent that I have read and understand the contents of the above plan and agree to perform my work in accordance with it.

_____
Signed

_____
Print Name

_____
Company

_____
Date

EMPLOYEE EXPOSURE HISTORY FORM

EMPLOYEE:_____

JOB NAME:_____

DATE(S) FROM/TO:_____

HOURS ON SITE:_____

CONTAMINANTS (SUSPECTED/REPORTED):

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

(SEE ATTACHED LABORATORY ANALYSIS)

PLAN FEEDBACK FORM

Problems with plan requirements

Unexpected situations encountered:

Recommendations for revisions:

APPENDIX II

DIRECTIONS TO EMERGENCY MEDICAL FACILITIES

DIRECTIONS TO THE NEAREST MEDICAL FACILITIES

HOSPITAL:
MEMORIAL HOSPITAL
2606 HOSPITAL BLVD
CORPUS CHRISTI, TEXAS
EMERGENCY NUMBER: 911

From the Naval Air Station Building 8:

Take Ocean Drive West to Morgan Avenue. Turn left onto Morgan Avenue going West. Turn right (North) onto 19th Street, and then Left onto Buford Avenue. Turn left again at Hospital Blvd. and follow the signs to the Emergency Room.

DIRECTIONS TO THE NEAREST HOSPITAL CAPABLE OF TREATING CHEMICAL EXPOSURES

HOSPITAL:
MEMORIAL HOSPITAL
2606 HOSPITAL BLVD
CORPUS CHRISTI, TEXAS
EMERGENCY NUMBER: 911

Same as above

APPENDIX III

HEALTH AND SAFETY TRAINING CERTIFICATES

GERAGHTY & MILLER, INC.
Ground-Water Services

Certificate of Completion

Presented To

Jeff Bennett

October 16~20, 1989

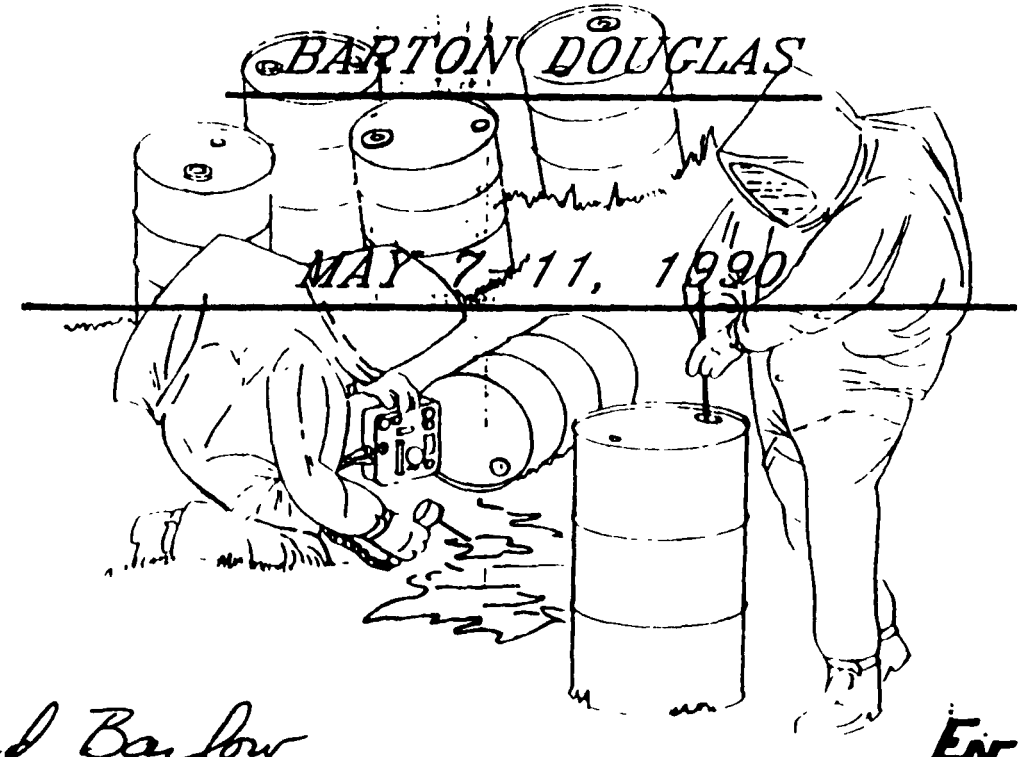
In Recognition of Having Successfully Completed
the Prescribed Course of Study for
Hazardous Waste Site Activities
40-Hour Initial
Health and Safety Training

Andrew J. Barber
Corporate Safety Manager
Geraghty & Miller, Inc.

Kevin J. Ormsby
Regional Health and Safety Manager
Geraghty & Miller, Inc.

CERTIFICATE OF ATTENDANCE

HAZARDOUS WASTE FIELD INVESTIGATION HEALTH AND SAFETY TRAINING



MAY 7-11, 1990

Richard Barlow
Instructor

Richard Barlow

ENVIRONMENTAL SAFETY
Environmental and Safety Designs, Inc.

GERAGHTY & MILLER, INC.
Environmental Services

Certificate of Completion

Presented To

David W. Fuehrer

In Recognition of Having Successfully Completed
the Prescribed Course of Study for

Hazardous Waste Site Activities
40-Hour Initial Health and Safety Training

Orlando, Florida — March 5-9, 1990

Richard Miller
President
American Ecology Services, Inc.

Course Director
Geraghty & Miller, Inc

Professional Service Industries, Inc.

This is to certify that

TODD HAVERKOST
400-76-1969

has successfully completed Educational Curriculum, the required demonstrated proficiency, and examination on the subject of

OSHA 40 HOUR SAFETY TRAINING SEMINAR
FOR DRILLING ON HAZARDOUS WASTE SITES

Presented by _____
W.K. Swartzendruber
Iministrative Coordinator

psi Annual Refresher Course
Date 05/25/90
Certificate No OH-172
Instructor _____

Given this 20th *date of* July *19* 89

Certificate #OH-172

GERAGHTY & MILLER, INC.
Environmental Services

Certificate of Completion

Presented To

Lynn S. Hurley

In Recognition of Having Successfully Completed
the Prescribed Course of Study for

Hazardous Waste Site Activities
40-Hour Initial Health and Safety Training

Orlando, Florida

February 5-9, 1990

Richard M. Miller

President
American Ecology Services, Inc.

Course Director
Geraghty & Miller, Inc

GERAGHTY
& MILLER, INC.
Ground-Water Services

Certificate of Completion

Presented To

Joseph R. Matthews

July 17-21, 1989

In Recognition of Having Successfully Completed
the Prescribed Course of Study for
Hazardous Waste Site Activities
40-Hour Initial
Health and Safety Training

Andrew J. Barker
Corporate Safety Manager
Geraghty & Miller, Inc.

Kevin J. Dooley
Regional Health and Safety Manager
Geraghty & Miller, Inc.

CERTIFICATE OF ATTENDANCE

HAZARDOUS WASTE FIELD INVESTIGATION HEALTH AND SAFETY TRAINING

PAUL V. STODDARD

JUNE 22 - 25, 1987

Instructor

EnSafe®
Environmental and Safety Designs, Inc.

GERAGHTY & MILLER, INC.
Environmental Services

Certificate of Completion

Presented To

James C. Triplett

In Recognition of Having Successfully Completed
the Prescribed Course of Study for

Hazardous Waste Site Activities
40-Hour Initial Health and Safety Training

Orlando, Florida

January 7-11, 1991

Richard M. Miller
President
American Ecology Services, Inc.

Course Director
Geraghty & Miller, Inc