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Naval Weapons Station Earle
Colts Neck, New Jersey

Health/Safety Plan and POAM

Confirmation Study to Determine Existence and Possible Migration of Specific Chemicals In Situ

April 1985

DRAFT

WESTON
DESIGNERS CONSULTANTS

HEALTH/SAFETY PLAN AND POA&M FOR CONFIRMATION STUDY BEING CONDUCTED AT THE NAVAL WEAPONS STATION EARLE IN COLT'S NECK, NEW JERSEY

29 April 1985

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EMERGENCY SUMMARY

ES 1.0 Emergency Contacts

Phone Number	Contact
462-9500 (ext. 321)	Bill Matthaey
462-9500	Security
462-9500	Safety/First Aid
741-2700	Riverview Medical Center

E.S 2.0 Emergency Notification Procedure

In case of any emergency the WESTON project team leader will be responsible to notify Earle personnel listed above in order to coordinate any additional aid required. If medical attention beyond the capability of station first aid is needed, the injured person will be taken to Riverview Medical Center. A route to the center is shown in figure 1.

ES 3.0 General Site Requirements

In order to comply with Naval Weapons Station Earle Security Standard Operating Procedures, everyone connected with this project shall comply with the following general regulations:

1. No smoking, matches or sparking devices will be permitted on Earle property.

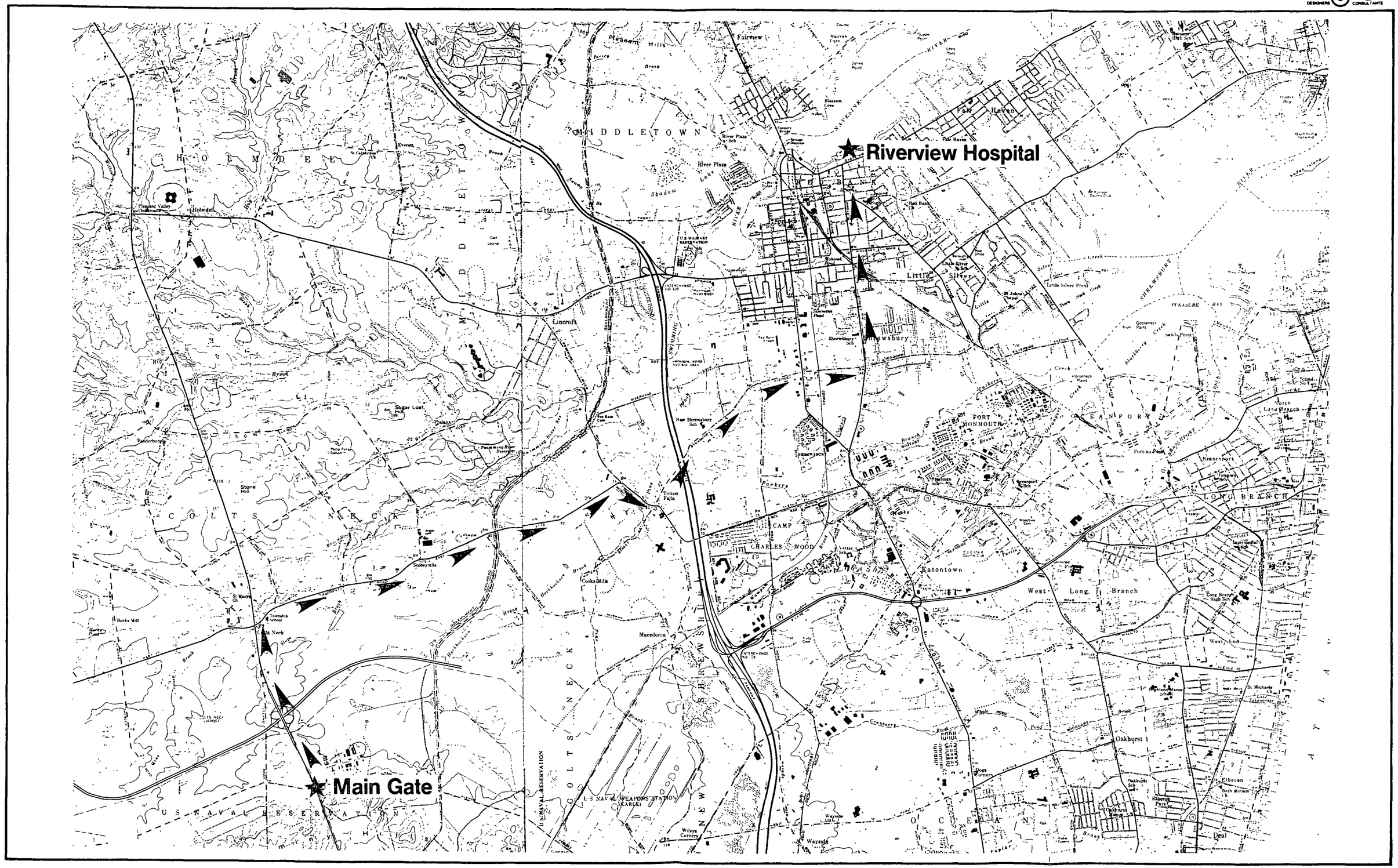

FIGURE 1 HOSPITAL ROUTE

2. No two way communication devices will be permitted on Earle property.

3. No cameras will be permitted on Earle property.

4. All personnel will obtain badges from station security prior to entering the station.

5. All personnel are prohibited from entering any building on the station unless prior approval is obtained

6. Fire extinguishers will be carried in all vehicles at all times when on station property.

7. All project participants are required to comply with the "Safety Requirements for Construction and Contractor Operations" as described in Appendix A, and any safety directions given by Earle personnel.

8. Any station vehicle with flashing lights shall be yielded to, by pulling the edge of the road and stopping completely.

SECTION 1

SAFETY PLAN

1.0 CONTINGENCY PLANNING

The purpose of this Safety Plan is to protect members of the WESTON team during drilling, sampling, and analytical work relative to the study at the Naval Weapons Station Earle, located in Colts Neck, New Jersey.

This Safety Plan applies to all prime and subcontracted personnel working on this assignment and to visitors at the project work sites. There are no exceptions. The program is based on present operating conditions, past operating practices, and the effects of past disposal practices at the facility.

This Safety Plan describes specific procedures for minimizing hazards, and will be implemented in accordance with all applicable standards and codes -- Federal, state and local. In addition, the plan will be revised, if needed, based on additional site information and changes in field conditions/ activities.

Although WESTON is not responsible for existing conditions at Earle, we will not permit our personnel to work in any area where the work can not be performed safely. We will immediately stop any work in progress which we discover to be unsafe and will not resume that work until personnel safety has been assured.

Responsible Individuals- WESTON's Corporate Safety Officer is Mr. Martin Mathemal, [telephone: (215) 692-3030]. Mr. Mathemal has responsibility for overall contract safety policy, planning, execution, and auditing. He has authority to halt project activities for safety reasons.

The Field Safety Coordinator (David Epps or designated senior WESTON person on-site) will plan and supervise specific safety activities at the work site. The Field Safety Coordinator will work closely with the Safety Officer and the WESTON Corporate Station Safety Officer to assure the smooth progress of the project.

Duties of the Field Safety Coordinator include:

(a) Supervision of field execution of this Health and Safety Plan.

(b) Establishment and maintenance of liaison with Earle Safety Personnel.

(c) Monitoring to assure proper decontamination.

(d) Make regular inspections of survey work and work areas.

(e) Indoctrinate employees.

(f) Maintain records of field operations.

(g) Investigate accidents.

(h) Issue safety instructions.

Applicability - This Safety Plan applies to all prime and subcontracted personnel working on this assignment and to visitors to project work sites. There are no exceptions.

1.1 Health and Safety Procedures and Elements

This Safety Plan describes specific procedures for minimizing hazards. In particular, this plan addresses two major areas:

(a) Field safety procedures.

(b) Emergency response.

The plan also addresses training requirements, personnel responsibilities, and site-specific precautions.

This Health and Safety Plan will be implemented in accordance with all applicable standards and codes -- Federal, state, local and Base Station requirements. In addition, the plan will be revised, if needed, based on additional site information and changes in field conditions/activities.

1.1.1 Major Incident

A major incident is that situation that may require rescue, police, fire, or security support from Earle. In case of a major incident the senior WESTON representative will be responsible to notify the proper individuals from Earle.

The notification list is shown in Section 1.0 of the Emergency Summary.

1.1.2 Minor Incident

A minor incident is that situation that can be handled without direct support of outside services.

1.2 PROTECTIVE EQUIPMENT AND CLOTHING

WESTON will furnish all WESTON personnel with protective equipment required to perform work tasks at Naval Weapons Station Earle.

All personnel must wear appropriate protective equipment during the field investigations. Protective clothing, i.e., Tyvek and chemical-resistant gloves, shield the skin from contact with hazardous chemicals. Respirators are used to protect the lungs (and eyes, when full face respirators are worn), and prevents ingestion of foreign materials.

Levels of protection for specific field activities will be established throughout this project. The levels of protection herein are to be considered guidelines; all personnel must realize that protection requirements can change frequently in the field.

Equipment to protect the body against contact with known or anticipate chemical hazards has been divided into four categories according to the degree of protection afforded:

- Level A: Should be worn when the highest level of respiratory, skin, and eye protection is needed.

- Level B: Should be selected when the highest level of respiratory protection is needed, but a lesser level of skin protection. Level B protection is the minimum level recommended on initial site entries until the hazards have been further defined by on-site studies and appropriate personnel protection utilized.

- Level C: Should be selected when the types of airborne substances are known, the concentrations measured, and the criteria for using air-purifying respirators are met.

- Level D: Should not be worn on any site with respiratory or skin hazards. It is primarily a work uniform providing minimal protection.

The Level of Protection selected should be based primarily on:

- Types and measured concentrations of chemical substances in the ambient atmosphere and their toxicity.

- Potential or measured exposure to substances in air, splashes of liquids, or other direct contact with material due to work being performed.

Every effort should be made to identify the individual constituents (and the presence of particulates) contributing to the total vapor readings of a few parts per million. Respiratory protective equipment can then be selected accordingly. It is exceedingly difficult, however, to provide constant, real-time identification of all components in a vapor cloud with concentrations of a few parts per million at a site where ambient concentrations are constantly changing. If highly toxic substances have been ruled out, but ambient levels of a few parts per million persist, it is unreasonable to assume only self-contained breathing apparatus should be worn. The continuous use of air-purifying masks in vapor/gas concentrations of a few parts per million gives a reasonable assurance that the respiratory tract is protected, provided that the absence of highly toxic substances has been confirmed.

Full-face, air-purifying devices provide respiratory protection against most vapors at greater than 5 ppm; however, until more definitive qualitative information is available, concentrations greater than 5 ppm indicates that a higher level of respiratory protection should be used. Also, unanticipated transient excursions may increase the concentrations in the environment above the limits of air-purifying devices. The increased probability of exposure due to the work being done may require Level B protection, even though ambient levels are low.

1.3 Site Specific Safety Plan

A safety survey of all sites was completed using an HNu photoionizer, it was determined that Level D will be the initial level of protection. This level is subject to change during field activities as warranted by continuous air monitoring. Level D protection shall consist of:

- Coveralls (Tyvek)
- Gloves
- Boots/shoes, leather or chemical-resistant, steel toe and shank
- Boots (outer), chemical-resistant (disposable)
- Safety glasses or chemical splash goggles
- Hard hat (face shield)
- Escape mask

1.3.1 Special Provisions

Site 2 - Ordnance Demilitarization Area. Before any work commences at the ordnance disposal areas the project team will meet with ordnance disposal personnel to determine if any unexploded ordnance materials are present at the site. A schedule must be submitted to E.O.D. at least one week prior to the start of any work to be completed in the area.

Site 5 - Landfill West of Army Barricades. The project team will submit a schedule to E.O.D. at least one week prior to the start of any work to be completed in the area.

Site 26 - Explosive "D" Washout area - GB-1. The station fire department personnel and equipment will be required to be present at this site due to the explosive nature of ammonium picrate and its degradation products. Specific drilling and sampling procedures are outlined in Sections 4.0 and 5.0 respectively.

1.3.2 ON-SITE AIR MONITORING

A program must be established for periodic monitoring of the air during site operations. Without an air monitoring program, any changes could go undetected and jeopardize response personnel. Monitoring can be done with various types of air pumps and filtering devices followed by analysis of filtering media, portable real-time monitoring instruments located strategically on-site, personal dosimeters, and periodic walk-throughs by personnel carrying survey instruments.

A key aspect in providing on-site safety monitoring will be the continuous use of the HNu photoionizer as a means of determining the Level of Protection through a numerical criterion, and the MSA combustible gas/oxygen deficiency meter to determine levels of protection as well as a safe working environment. The HNu will be used in situations where the presence of vapors or gases is not known, or if present, the individual components are unknown. Such a scenario could

occur when field personnel enter previously uninvestigated areas of a hazardous waste site or areas of recent disturbance, as when deteriorated drums are uncovered. Another situation in which the HNu has and will be used is during drilling for the installation of monitoring wells due to the possibility of encountering and releasing toxic vapors or gases to the working area from unknown sources below the ground surface.

Although total vapor/gas concentration measurements are useful to a qualified professional for the selection of protection equipment, caution should be exercised in interpretation. An instrument does not respond with the same sensitivity to several vapor/gas contaminants as it does to a single contaminant. Also since total vapor/gas field instrument see all contaminants in relation to a specific calibration gas, the concentration of unknown gases or vapors may be over or underestimated.

Suspected carcinogens, particulates, highly hazardous substances, or other substances that do not elicit an instrument response may be known or believed to be present. Therefore, the protection level should not be based solely on the total vapor/gas criterion. Rather, the level should be selected case by case, with special emphasis on potential exposure and chemical and toxicological characteristics of the known or suspected material.

<u>Factors for Consideration</u> - In utilizing total atmospheric vapor/gas concentrations as a guide for selecting a Level of

Protection, a number of other factors should also be considered:

- The uses, limitations, and operating characteristics of the monitoring instrument must be recognized and understood. Instruments such as the HNu Photoionizer, and others do not respond identically to the same concentration of a substance or respond to all substances. Therefore, experience, knowledge, and good judgement must be used to complement the data obtained with instruments.

- Other hazards may exist such as gases not detected by the HNu (i.e., phosgene, cyanides, arsenic, chlorine), explosives, flammable materials, oxygen deficiency, liquid/solid particles, and liquid or solid chemicals.

- Vapors/gases with very low toxicities could be present.

- The risk to personnel entering or working in an area must be weighted against the need for being there. Although this assessment is largely a value judgement, it requires a conscientious balancing of the variables involved and the risk to personnel against the need to enter or work in an unknown environment.

- The knowledge that suspected carcinogens or substances extremely toxic or destructive to skin are present or suspected to be present (which may not be

reflected in total vapor/gas concentration) requires an evaluation of factors such as the potential for exposure, chemical characteristics of the material, limitation of instruments, and other considerations specific to the site.

- What needs to be done on-site must be evaluated. Based upon total atmospheric vapor concentrations, Level C protection may be judged adequate; however, tasks such as drilling, moving drums, opening containers, and bulking of materials, which increase the probability of liquid splashes or generation of vapors, gases, or particulates, may require a higher Level of Protection.

- Before any respiratory protective apparatus is issued, a respiratory protection program must be developed and implemented according to recognized standards (ANSI Z88.2, 1980).

1.4 EXCEEDANCE DEFINITIONS AND PROCEDURES

1.4.1 HNu Photoionizer

Level A Protection (500 to 1,000 ppm Above Background) - Level A protection provides the highest degree of respiratory tract, skin, and eye protection if the inherent limitations of the personal protective equipment are not exceeded. The range of 500 to 1,000 ppm total vapors/gases concentration in air was selected based on the following criteria:

Although Level A provides protection against air concentrations greater than 1,000 ppm for most substances, an operational restriction of 1,000 ppm is established as a warning flag to:

- Evaluate the need to enter environments with unknown concentrations greater than 1,000 ppm.

- Identify the specific constituents contributing to the total concentration and their associated toxic properties.

- Determine more precisely concentrations of constituents.

- Evaluate the calibration and/or sensitivity error associated with the instrument(s).

- Evaluate instrument sensitivity to wind velocity, humidity temperature, etc.

- A lower limit of 500 ppm total vapors/gases in air was selected as the value to consider upgrading from Level B to Level A. This concentration was selected to fully protect the skin until the constituents can be identified and measured and substances affecting the skin excluded.

- The range of 500 to 1,000 ppm is sufficiently conservative to provide a safe margin of protection if

readings are low due to the instrument error, calibration, and sensitivity; if higher than anticipated concentrations occur; and if substances highly toxic to the skin are present.

With properly operating portable field equipment, ambient air concentrations approaching 500 ppm have not routinely been encountered on hazardous waste sites only. High concentrations have been encountered in closed buildings, when containers were being opened, when personnel were working in the spilled contaminants, or when organic vapors/gases were released in transportation accidents. A decision to require Level A protection should also consider the negative aspects: higher probability of accidents due to cumbersome equipment, and most importantly, the physical stress caused by heat buildup in fully encapsulating suits.

Level B Protection (5 to 500 Above Background - Level B protection is the minimum Level of Protection recommended for initially entering an open site where the types, concentrations, and presence of airborne vapors are unknown. This Level of Protection provides a high degree of respiratory protection. Skin and eyes are also protected, although a small portion of the body (neck and sides of head) may be exposed. The use of a separate hood or hooded, chemical-resistance jacket would further reduce the potential for exposure to this area of the body. Level B impermeable protective clothing also increases the probability of heat stress.

A limit of 500 ppm total atmospheric vapor/gas concentration on portable field instruments has been selected as the upper restriction on the use of Level B. Although Level B personnel protection should be adequate for most commonly encountered substances at air concentrations higher than 500 ppm, this limit has been selected as a decision point for a careful evaluation of the risks associated with higher concentrations. These factors should be considered:

- The necessity for entering unknown concentrations higher than 500 ppm wearing Level B protection.

- The probability that substance(s) present are severe skin hazards.

- The work to be done and the increased probability of exposure.

- The need for qualitative and quantitative identification of the specific components.

- Inherent limitations of the instruments used for air monitoring.

- Instruments sensitivity to winds, humidity, temperature, and other factors.

<u>Level C Protection (Background to 5 ppm Above Background</u> - Level C provides skin protection identical to Level B, assuming the same type of chemical protective clothing is worn, but lesser protection against inhalation hazards. A

range of background to 5 ppm above ambient background concentrations of vapors/gases in the atmospheres has been established as guidance for selecting Level C protection. Concentrations in the air of unidentified vapors/gases approaching or exceeding 5 ppm would warrant upgrading respiratory protection to self-contained breathing apparatus.

A full-face, air-purifying mask equipped with an organic vapor canister (or a combined organic vapor/particulate canister) provides protection against low concentrations of most common organic vapors/gases. There are some substances against which full-face, canister-equipped masks do not protect, or substances that have very low Threshold Limit Values or Immediately Dangerous to Life or Health.

1.4.2 Explosimeter

Oxygen levels are expressed in percent (%) oxygen and the combustible gases are expressed in percent of the Lower Explosive Limit (LEL) of Pentane. The following levels will be used as exceedance definitions and procedures.

1. Oxygen

Less than 19.5%	Level B
19.5 - 25%	Routine operations as applicable monitor other parameters.
Greater than 25%	Evacuate site, atmosphere may be explosive.

2. Combustible gases

0 - 10% (LEL)	Routine operations, monitor other parameters.
10 - 20% (LEL)	Proceed with caution, continuous monitoring.
Greater than 20% (LEL)	Evacuate site until concentrations return to safe level.

Due to the possible explosive environment the maximum exceedance level for combustible gases has been lowered with respect to the corporate WESTON Safety Plan.

1.5 Instrument Sensitivity

Although the measurement of total vapor/gas concentrations can be a useful adjunct to professional judgement in the selection of an appropriate Level of Protection, caution should be issued in the interpretation of the measuring instrument's readout. The response of an instrument to a gas or vapor cloud containing two or more substances does not provide the same sensitivity as measurements involving the individual pure constituents. Hence, the instrument readout may overestimate or underestimate the concentration of an unknown composite cloud. This same type of inaccuracy could also occur in measuring a single unknown substance with the instrument calibrated to a different substance.

The idiosyncrasies of each instrument must be considered in conjunction with the other parameters in selecting the protection equipment needed.

Using the total vapor/gas concentration as a criterion used to determine levels of protection should provide protection against concentrations greater than the instrument's read-out. However, when the upper limits of Level C and B are approached, serious consideration should be given to selecting a higher Level of Protection. Cloud constituents must be identified as rapidly as possible and levels of protection based on the toxic properties of the specific substances identified.

1.6 COMMUNICATIONS AND REPORTING

A daily safety log (figure 2) will be filled out at the end of each working day. In the event of personal injury or exposure an incident report (figure 3) will be filled out by the senior WESTON representative at the site. In case of an emergency in the field the senior WESTON representative will contact the proper individuals at Earle.

1.7 VISITORS AND OBSERVERS

Visitors and observers will not be permitted at the site on going; i.e., drilling, sampling. Any requests shall be routed to station security.

DAILY SAFETY LOG

Project Name: _____

Date: _____

Location: _____

WESTON staff present: _____

Other personnel present: _____

Area of work: _____

Equipment used: _____

_____

Summary of work performed: _____

_____

Protective clothing worn: _____

Conditions encountered: _____

_____

Safety violations: _____

Accidents/exposure incidents (itemize below; give detailed account of incident on separate form): _____

_____

Emergency Procedures initiated: _____

_____

Prepared by: _____

Title: _____

figure 2

WESTON INCIDENT REPORT

Project _____ Health & Safety Mgr. _____

Site Location _____ Project Mgr. _____

Incident Summary _____

_____

_____

Date and Time of Incident _____

Exposed Individuals _____

_____

_____

Exposed to _____

_____

Actions Taken:

First Aid Administered

Doctor Examination

Other _____

_____

figure 3

1.8 Registration

Each member of WESTON's project team, on the first day that he/she reports to Earle for work, shall be processed at the Security Office. Identification badges shall be issued to all individuals working on-site for more than one day. At the time of initial processing, WESTON personnel will provide the Security Branch with a list of all general purpose vehicles, by type and license number, to be operated at Earle. A numbered vehicle pass will be issued for each such vehicle with regard to the area in which it will be used.

SECTION 2

CONFIRMATION STUDY

2.0 Introduction

The confirmation study utilizes a sequentially phased program to determine the existence, extent, and rate of migration of possible contaminants located at the Naval Weapons Station Earle in Colts Neck, New Jersey. This study focuses on the first phase of the program, which consists of step I(A) Verification and step I(B) Characterization. The objective of the verification step is to determine whether the specific contaminants identified in the IAS, and possibly other toxic materials are present in concentrations considered to be hazardous. The characterization step is designed to determine the levels and distribution of contamination vertically as well as horizontally. This step will also provide the geohydrology and characteristics of ground water movement throughout the site.

2.1 SCOPE OF WORK

The objective of this confirmation study is to determine whether significant contamination and sufficient contamination pathways exist at the Naval Weapons Station Earle in Colts Neck, New Jersey. After a detailed reconnaissance of the ten sites to be investigated was performed, it was determined that the following work will be completed in

order to identify and quantify the contaminants and their potential for migration:

1. Drill and install twenty-six (26) ground water monitoring wells throughout the Station property.

2. Complete twelve (12) soil borings throughout the Station property.

3. Collect soil surface water, and sediment samples from streams and marshes present adjacent to any site.

4. Collect ground water samples from the monitor wells at regular intervals.

2.2 Data Review

2.2.1 Sites not investigated

It was concluded after visiting and reviewing the data on the following sites that they would not be included in Phase IA of the Confirmation Study being conducted at the Naval Weapons Station Earle in Colts Neck, New Jersey:

Site No.	Site Title
1	Ordnance Demilitarization Site, Secured
6	LandFill West of Normandy Road
7	LandFill South of "P" Barricades
8	LandFill East of S-186
9	LandFill Southeast of "P" Barricades
12	Battery Acid Spill Site
13	Defense Property Disposal Office Yard
14	Defense Property Disposal Office Warehouse
15	Sludge Disposal Site Near Waterfront South Gate
16	Fuel Line Connecting Building C-19 and C-50
17	Disposal Site Behind Training Barge, Waterfront
18	Demilitarization Furnace
21	Baqhouse and Cyclone Dust Storage Area
23	Paint Chip Disposal Site Near Building D-5
24	Closed Pistol Range
25	Closed Pistol Range
27	Projectiles Refurbishing Area
28	Waste Oil Tank
29	PCB Spill Site, Building C-16

2.2.2 Sites to be investigated

The sites to be investigated in Phase IA of the Confirmation Study being conducted at Naval Weapons Station Earle in Colts Neck, New Jersey are listed below and shown in Figure 4.

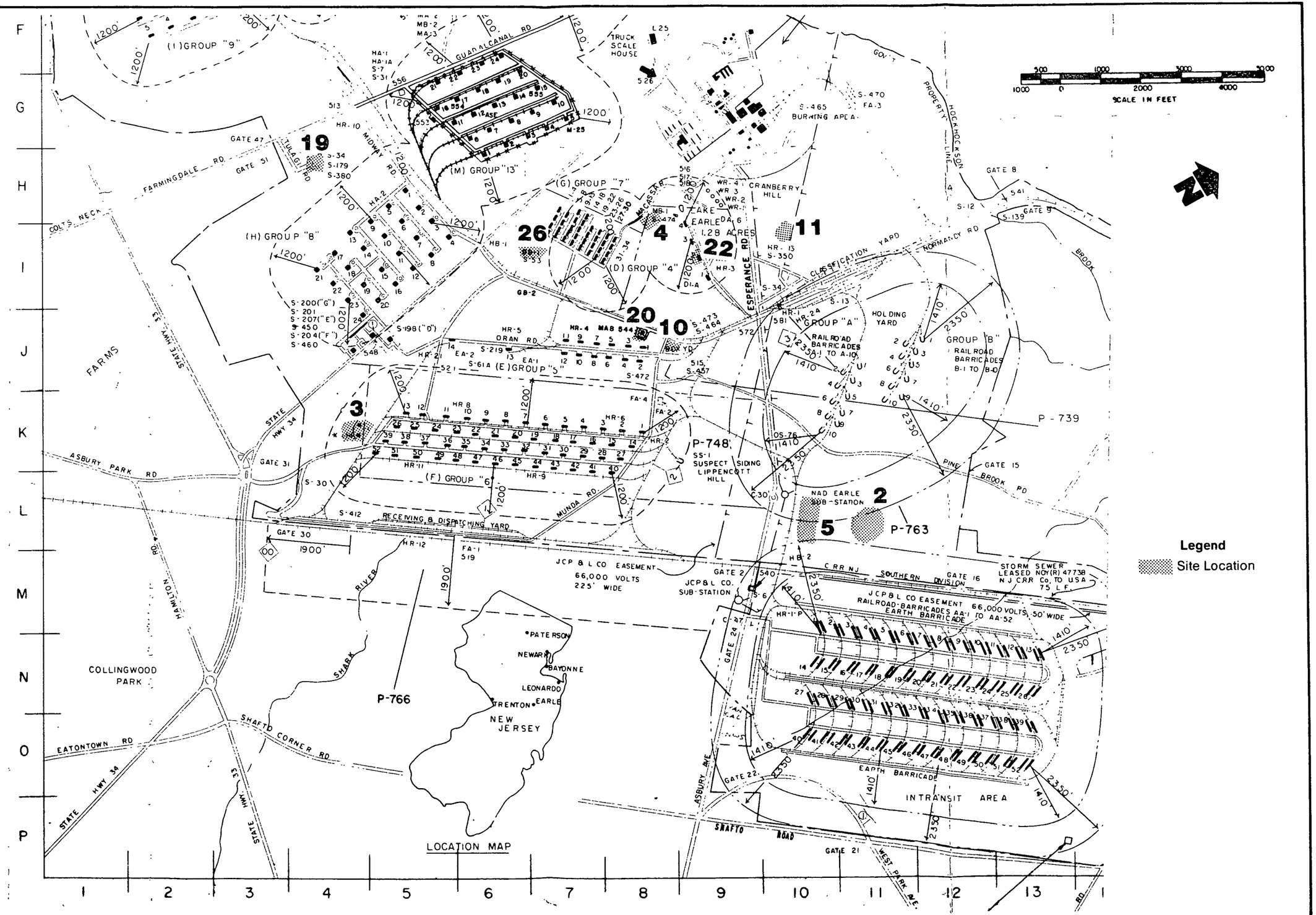

FIGURE 4 SITE LOCATIONS

Site No.	Site Title
2	Ordance Demilitarization Site
3	LandFill Southwest of "F" Group
4	LandFill West of "D" Group
5	LandFill West of Army Barricades
10	Scrap Metal LandFill near building 589
11	Contract Ordnance Disposal Area
19	Piant Chip and Sludge Disposal area adjacent to building S-34
20	Grit Blasting Disposal area, Bldg. 544.
22	Paint Chip Disposal area adjacent to Building D-2
26	Explosive "D" Washout area, building GB-1

2.3 PLAN OF ACTION

A plan of action for the investigation of the ten sites is outlined in the following sections. The EIC shall be informed at regular intervals of work accomplished to date, and any adjustments in the work schedule. To accomplish the milestones proposed in the project schedule (Section 6.0) the following tasks will be performed:

2.3.1 Pre-Site Activities

The following subsections described tasks that have been or will be completed as part of the Confirmation Study being conducted.

2.3.1.1 Initial POA & M Development

A meeting between the EIC, Earle representatives and WESTON was held to POA&M discuss general responsibilities. A draft of the POA&M shall be submitted to the EIC for review (see Section 6.0).

2.3.1.2 Site Reconnaissance

An assessment of each site identified in the I.A.S. was performed to determine their potential for environmental contamination resulting from past waste disposal practices, and the potential for contaminant migration from these sites.

2.3.1.3 Safety Program

A site specific health, safety, and contingency plan will be submitted to the EIC for review and comments. This plan will contain procedures for all field work activities, safety, responsibilities of all contractor personnel, acquisition of all safety permits and emergency response procedures pertaining to the site. (The Safety Program is included in this document.)

2.3.1.4 Drilling Specifications

A contract will be prepared for the drilling subcontractor that contains drilling procedures and specifications.

2.3.2 ON SITE INVESTIGATION

The following text describes the tasks to be completed at the Station as part of the Confirmation Study. Sampling methodology and site specific analytes are described in Section 5.0.

2.3.2.1 Drilling

A total of twenty-six (26) ground water monitoring wells will be installed throughout the station. Drilling will require approximately eight (8) weeks to complete, a more specific schedule is being submitted to the EIC with this document (Section 6.0). Drilling methods to be used for this project are presented in Section 4.

2.3.2.2 Ground Water

Ground Water samples will be collected from the monitor wells located throughout the station. A full round of ground water sampling will require approximately ten (10) full working days to complete. One complete round of ground water sampling is presently scheduled. The need for subsequent rounds of sampling will be determined after the interim report is submitted and reviewed by North Division.

2.3.2.3 Surface water and Sediment Sampling

Samples will be collected from any stream or marsh area which may have been affected through past disposal operations. Six (6) composite surface water and sediment samples will be collected at three of the ten sites (2, 10, 19). This work will be performed concurrently with the ground water sampling, and will require approximately three (3) days to complete.

2.3.2.4 Soil Sampling

Surface soil sampling and soil borings (0-5ft) will be completed at several sites throughout station. Soil borings will be completed during installation of the ground water monitor wells. Surface soil sampling will be conducted during ground water sampling, and will require approximately two (2) days to complete.

2.3.2.5 Surveying

Upon completion of drilling the monitor wells, an elevation and location survey of each well will be completed and tied to any existing Base datum. A base map of the site will be produced having the locations and elevations of all monitoring wells located at the station. Well elevations will be measured from a permanent mark on the protective casing.

2.3.2.6 Progress Reviews

A brief outline of the progress to date will be sent to the EIC by the fifteenth (15th) day of each calendar month.

2.3.3 EVALUATION AND REPORT

An evaluation of all laboratory analysis and geohydraulic data will be performed, and a draft report submitted to the EIC within 45 days of completion of the site investigation. If the characterization step is not implemented, the draft report shall be finalized and submitted for review and comments.

2.3.4 PROJECT ORGANIZATION

Roy F. Weston, Inc. (WESTON) - WESTON shall be responsible for providing all personnel, material, and equipment necessary to complete the study. Recognizing that the safe containment or mitigation of hazardous waste that may be contained in the soil and ground water is a highly specialized area, the persons in responsible charge of the study shall be experts in their area(s) of involvement. WESTON shall be responsible for development of and adherence to an appropriate work and safety plan to protect contractor personnel as well as Government personnel and property.

Name	Title	Telephone
Peter J. Marks	Program Manager Vice President	(215) 692-3030 Extension 340
Katherine A. Sheedy	Project Manager	(215) 692-3030 Extension 410
David E. Epps	Project Geologist	(215) 692-3030 Extension 518

Northern Division Personnel

David Smith	Environmental Engineer (Engineer in Charge, EIC)	(215) 894-6280

Earle Contacts

CMMD Pylant	Public Work Commander	(201) 462-9500
William Matthaey	Energy/Environmental Engineer	(201) 462-9500

SECTION 3

SITE INVESTIGATION

3.0 Site Specific Investigations

The following subsections describe the tasks to be completed at each site investigated as part of the Confirmation Study being conducted at the Naval Weapons Station Earle. At several sites where monitor wells are to be installed, the lateral boundaries of the site are not clearly marked. To prevent drilling through any waste and creating a direct contaminant pathway to ground water, it will be necessary to delineate these boundaries with the use of non-destructive subsurface investigative equipment. Some of the equipment to be used will include: Ground Penetrating Radar, Electromagnetic Conductivity Meter, and a Vertical Flux Gate mangetometer. Surveys employing this equipment will be conducted along the perimeter of each site (2, 3, 4, 5, 10, 11,) where a monitor well is to be installed. Site specific analytes are listed in Table 3-1.

3.1 SITE 2: Ordnance Demilitraization Site

This site is currently being used for the demilitarition of ordnance materials from on and off base. Demilitarization operations are presently employing thermal destruction methods. Some explosive and propellants disposed of at this

TABLE 3-1

SAMPLING PLAN

Site I.D.	No. of Wells	Sample Type	No. of Samples	Parameters
2	4	GW	4	pH, specific conductance, chloride, TOH, nitrite/nitrate, acid extractable, base/neutral compounds, priority pollutant soluble metals, RDX, HMX, NG, TNT, picric acid.
		SW	2	Same as ground water
		So	Composite 3	Nitrite,nitrate, NG, TNT, RDX, HMX
		SED	2	Same as soil.
3	3	GW	3	pH, specific conductance, VOA, TOC, TOH, chloride, pesticides, acid extractable/base/neutral compounds, nitrite/nitrate, priority pollutant, soluble metals, oil and grease (method 418).
4	3	GW	3	Same as Site 3.
5	4	GW	4	Same as Site 3.
10	3	GW	3	pH, specific conductance, nitrite/nitrate, TOH, VOA, and extractable, base/neutral compounds, priority pollutant soluble metals, total xylene, oil and grease (method 418)
		SW	2	Same as ground water
		SED	2	Priority pollutant total metals, TOH, total xylene, oil and grease (418).

TABLE 3-1

SAMPLING PLAN

(Continued)

Site I.D.	No. of Wells	Sample Type	No. of Samples	Parameters
19	3	GW	3	Same as Site 10.
		SW	2	Same as Site 10.
		SED.	2	Same as Site 10.
		So	8	Same as Site 10, sediment
11	3	GW	3	Same as Site 2, plus oil and grease (418).
		So	8	Oil and grease (418).
20		So	8	Ep Toxicity for Zn, Cr, Pb, Ti, oil and grease (418).
22		So	8	Same as Site 20.
26	3	GW	3	Picric acid, acid extractables.

So = Soil GW = Groundwater
SED = Sediment SW = Surface water

site include the following: Ammonium Picrate, Trinitrotoluene C-4 (waxed RDX), Black Powder, and Double Base Propellants (nitrogylcerin). Due to the high solubility and toxic nature of the wastes disposed of, and the permeable formations present at the site it will be necessary to install four (4) ground water monitoring wells and the perimeter of the site, approximately thirty 30 feet below ground surface. These wells will provide water quality data and ground water flow direction data for the shallow sandy aquifer in the area to determine if contaminants, resulting from the demilitarization operations, have migrated into the ground water. Three (3) composite surface soil samples will be collected throughout the interior of the site to assess soil quality and the potential for additional leaching of contaminants into the ground water. Two(2) surface water and sediment samples will be collected over time (1 and 6 hours) from a stream adjacent to the site, and a marsh located in the northeast section of the site. These samples will determine if runoff crossing the detonation area is impacting the adjacent surface waters. Sampling locations are shown in Figure 5.

3.2 SITE 3: LandFill SouthWest of "F" Group)

This five (5) acre landfill received approximately 4,800 tons of refuse over its nine (9) year period of operation. Wastes disposed of here typically included municipal and industrial wastes, such as: glass, paper, plastics, solvents, Acids, alcohols, caustics, pestcide containers, paint thinner, and paint. Typical components of paint used at Earle consist of the following chemical compounds:

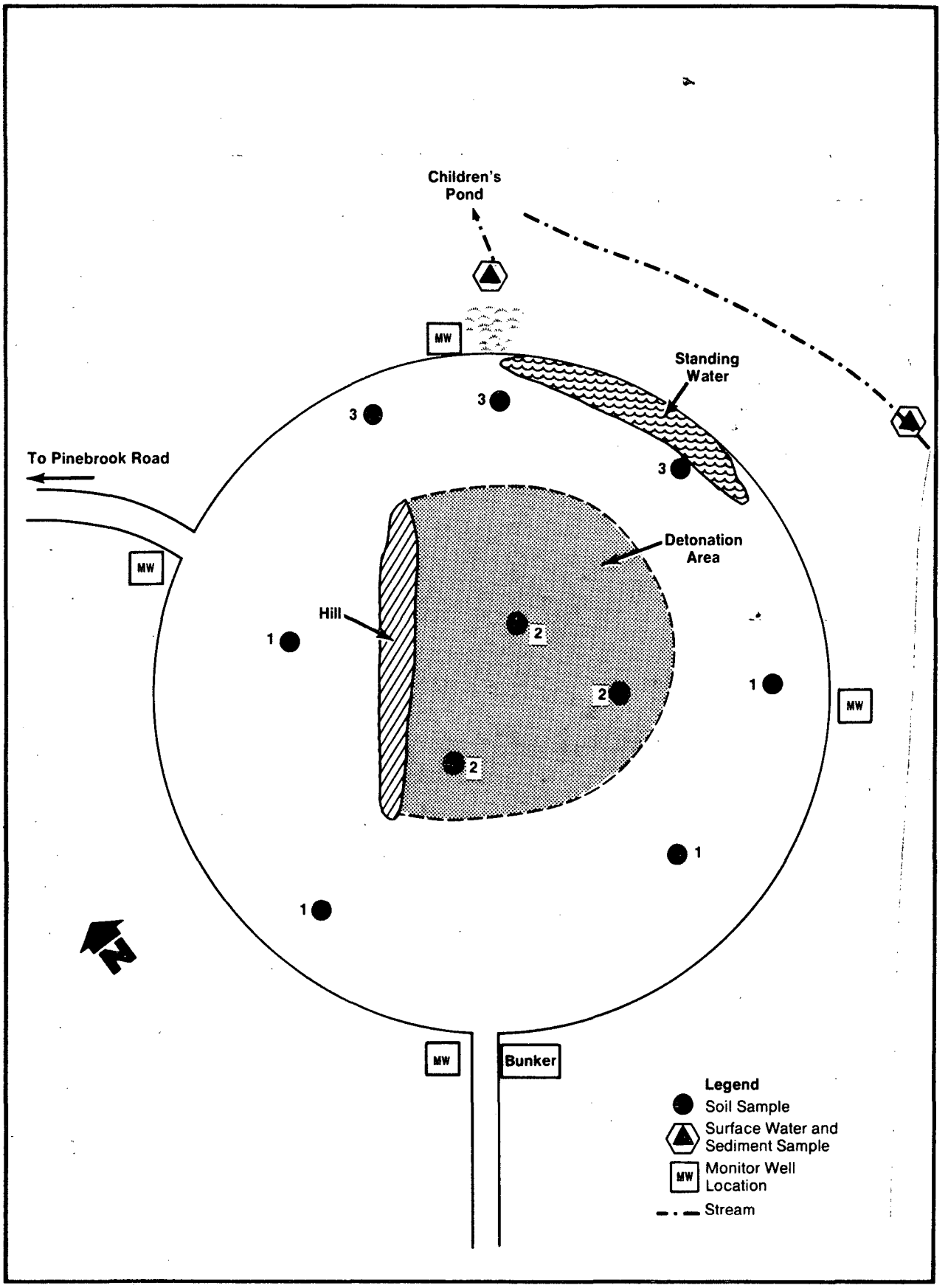

FIGURE 5 SITE 2 - ORDNANCE DEMILITARIZATION SITE

Titanium dioxide, Zinc oxides, Magnesium silicate, Alkyd resin solution, Petroleum Spirits, Lead Napthenate, Cobalt Napthenate, Manganese Naphthenate, and Xylene. Due to the possible breakdown of the materials disposed of and the high potential for migration of contaminants into the underlying soil and ground water, three (3) ground water monitoring wells will be installed approximately fourty (40) feet below surface (Figure 6). These wells will provide data on water quality, and ground water flow direction for the shallow aquifer to determine if contaminants leached from either the municipal or industrial wastes disposed of have migrated into the ground water.

3.3 SITE 4: LandFill West of "D" Group

This five (5) acre site received approximately 10,200 tons of municipal and industrial wastes, similar to those disposed of at site 3, over a period of seventeen (17) years. Disposal methods used at this site included open trench burning of some wastes before burial. Since the depth of these trenches could not be determined from the initial assessment study (I.A.S.) it is assumed that the bottom of these trenches are very close to the water table, thus posing a high potential for contaminants to migrate into the ground water. Field activities will include the installation of three (3) ground water monitoring wells, approximately 30 feet deep, (Figure 7) that will provide data on ground water flow direction, and water quality to determine if any contaminants have migrated into the ground water. The springs located along the fire road will be sampled at one

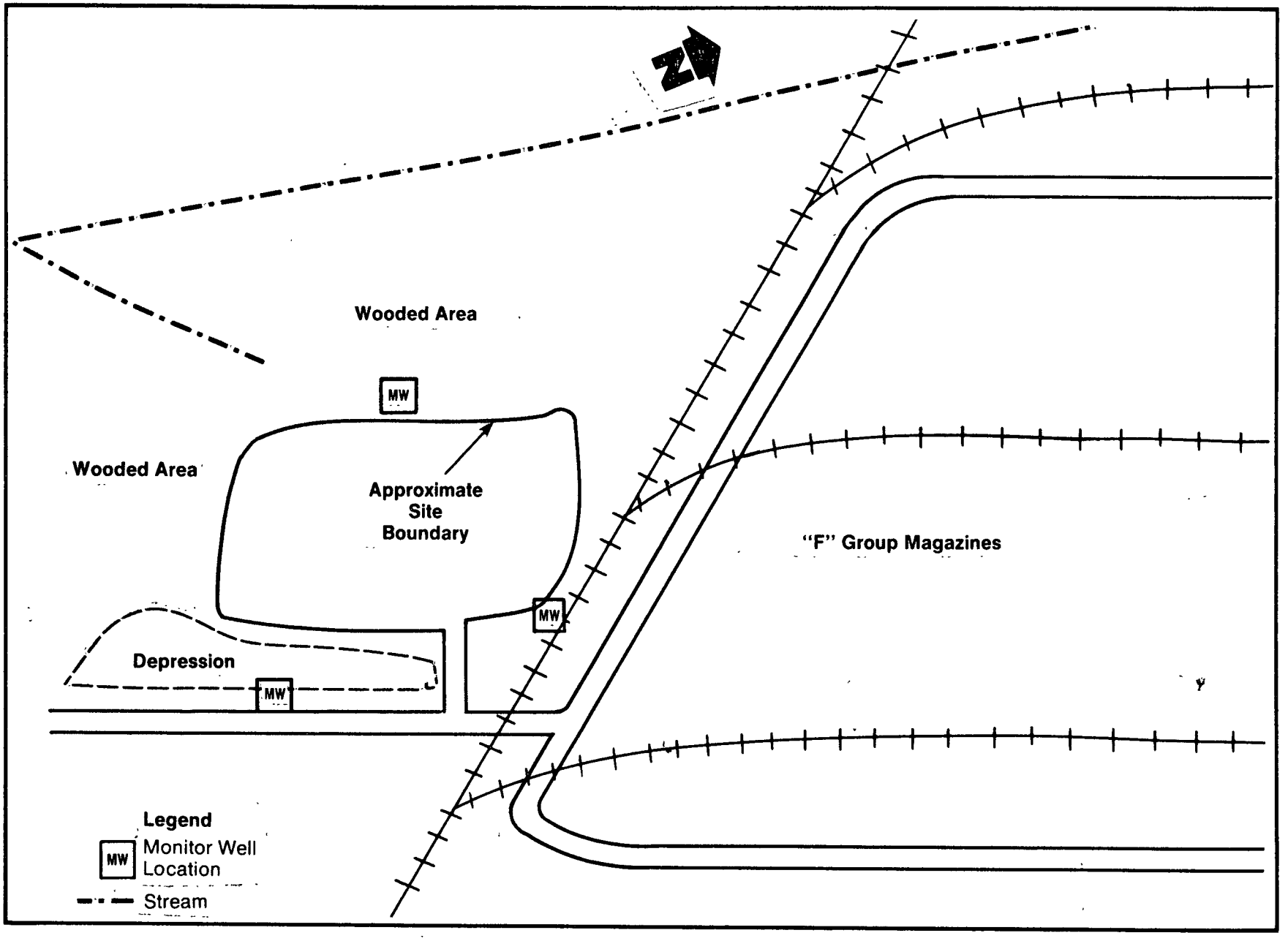

FIGURE 6 SITE 3 - LANDFILL SOUTHWEST OF "F" GROUP

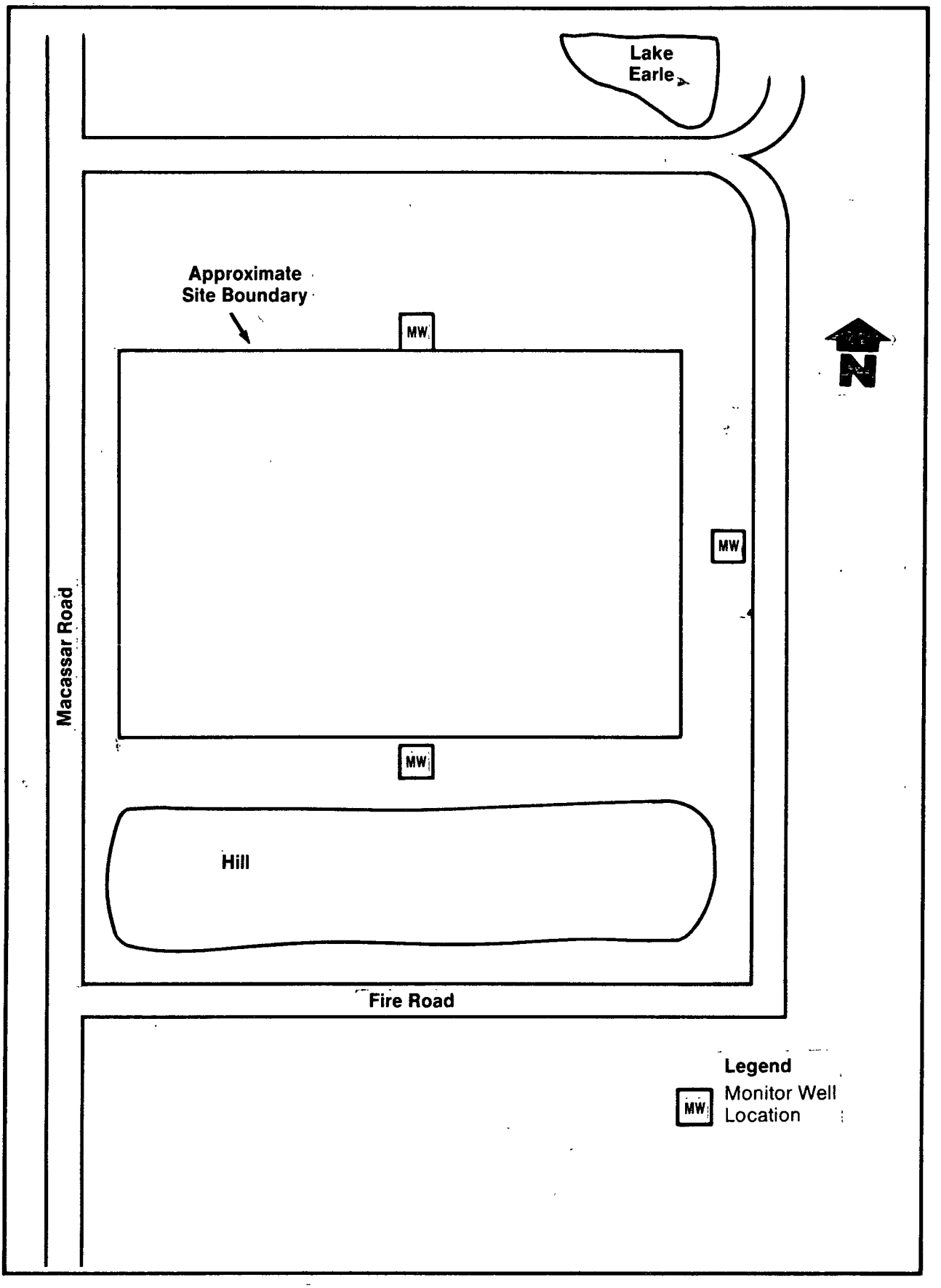

FIGURE 7 SITE 4 LANDFILL

(1) and six (6) hour intervals if they are flowing at the time of ground water sampling.

3.4 SITE 5: LandFill West of Army Barricades

The 6,600 tons of waste disposed of at this thirteen (13) acre site over its ten year period of operation, are very similar to that described in site 3. Due to the nature of the wastes disposed of here and the permeability of the soils underlying the site, four (4) ground water monitoring wells (Figure 8) will be installed approximately 40 feet below ground surface around the perimeter of the site. These wells will provide data on ground water flow direction and water quality for the shallow aquifer, to determine if any contaminants have entered the ground water.

3.5 SITE 10: Scrap Metal LandFill near Building S-589

This, two (2) acre site was used to dispose of aluminum and steel containers along with spent shell cases. Paint chips and spent blasting grit from maintenance operations were also disposed of at this site. Due to the possible breakdown of the paint chips and the migration of the degration products into the ground water, three (3) ground water monitoring wells (Figure 9) will be installed around the perimeter of the landfill. These wells will provide data on ground water flow direction and water quality in the shallow aquifer. Wells will be completed approximately thirty (30) feet below ground surface. Two (2) surface water and sediment samples will be collected from a stream that flows along the perimeter of the site as shown in Figure 9.

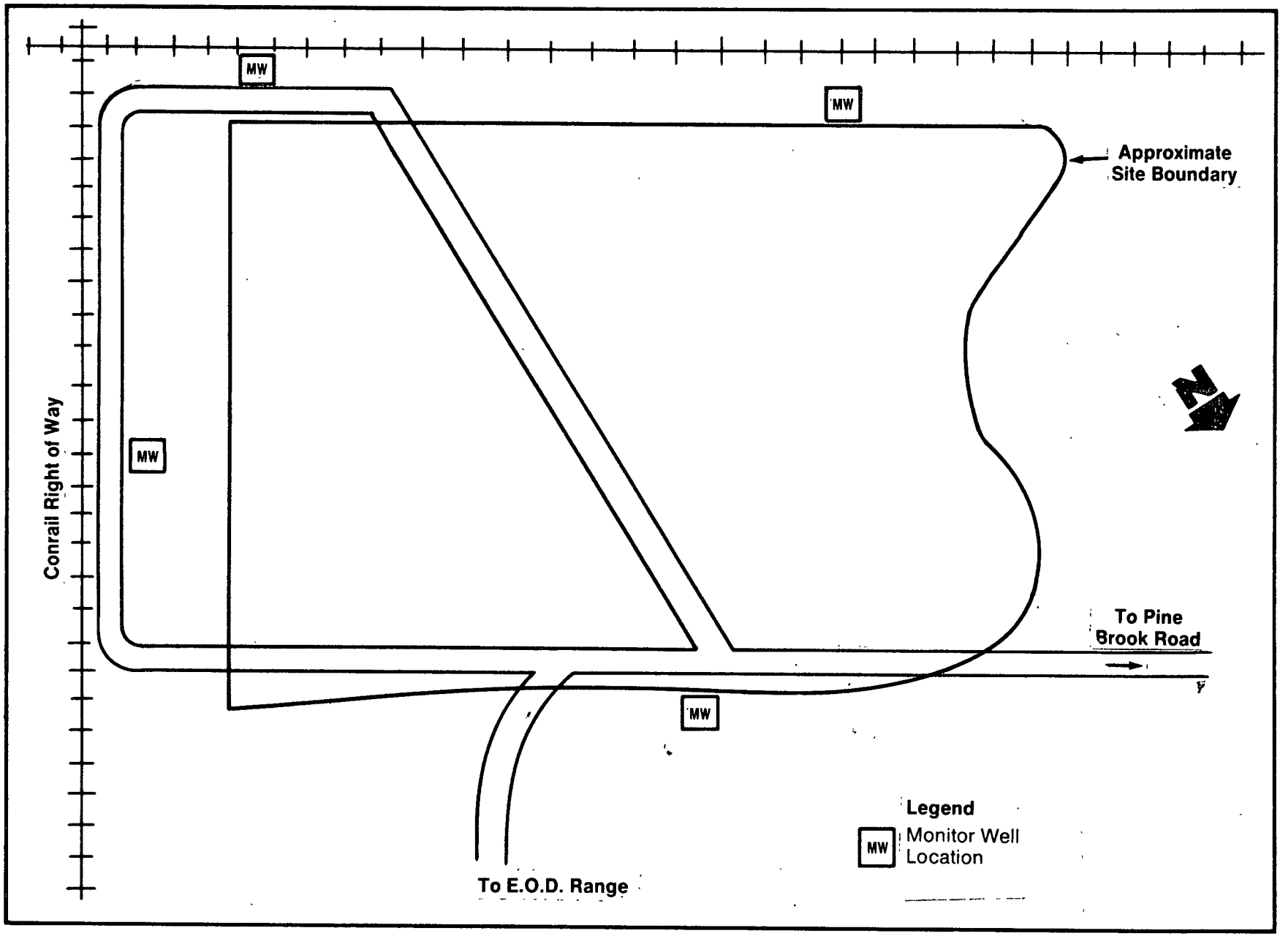

FIGURE 8 SITE 5 - LANDFILL WEST OF ARMY BARRICADES

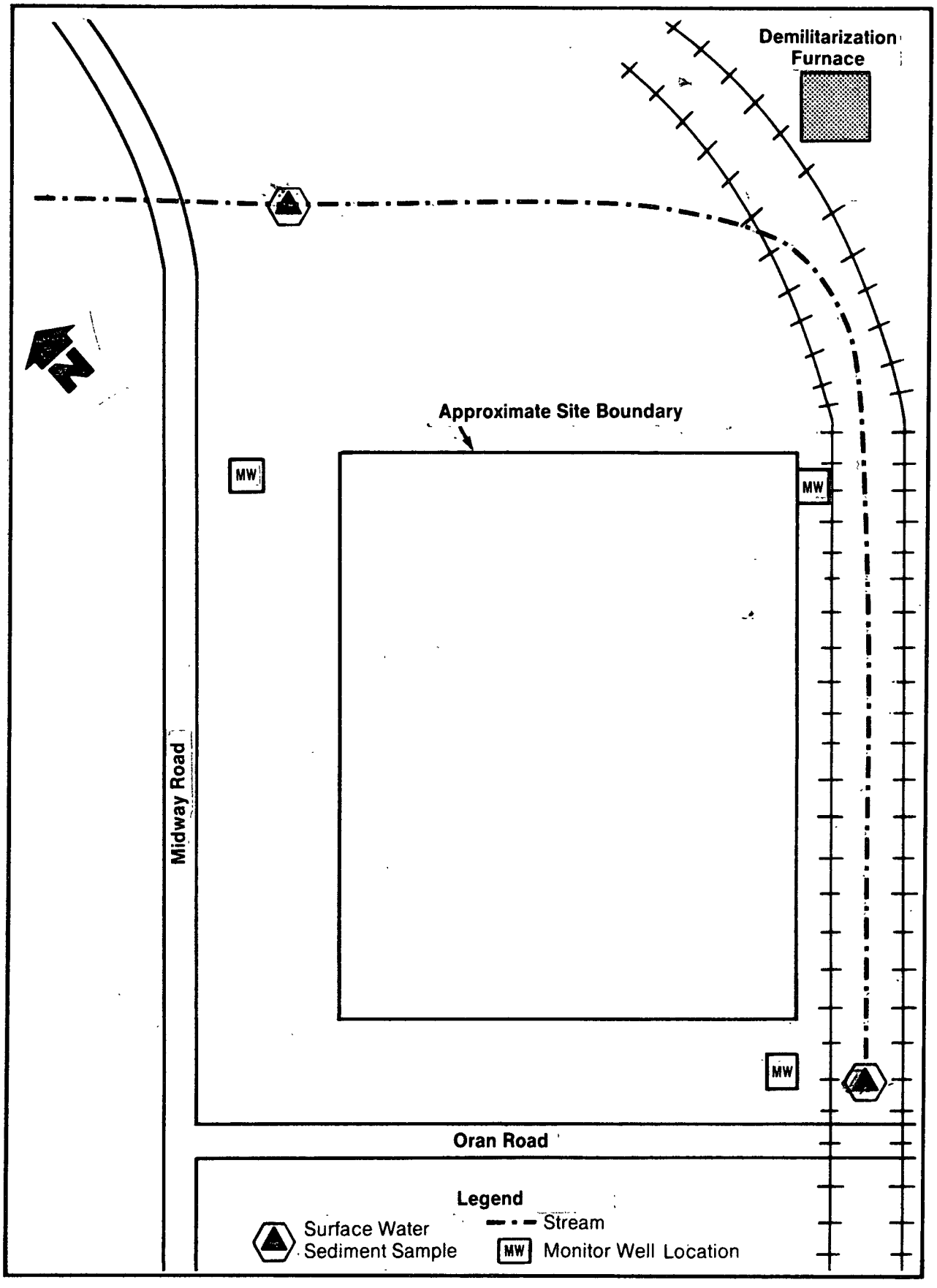

FIGURE 9 SITE 10 - SCRAP METAL LANDFILL

3.6 SITE 11: Contract Ordnance Disposal Area

This two (2) acre site was used by an outside contractor, to dispose of obsolete ordnance material using some thermal destruction techniques. It was also utilized as a training area for fire fighting exercises over approximately three (3) years. The exercises were conducted in two unlined pits measuring roughly thirty feet in diameter and two feet deep using oil soaked reject airplanes and vehicles. Any remaining unburned oil was left in the pit and soaked into the soil. The area was secured at some later date (after 1977) by removing the soil and regrading the area. Due to the possibility of the residue wastes, resulting from the demilitarization of ordnance materials and the fire-fighting exercises migrating into the ground water, three (3) ground water monitoring wells (Figure 10) will be installed to determine ground water quality and flow direction in the shallow aquifer underlying the site. Depth of the wells will be approximately thirty (30) feet.

3.7 SITE 19: Paint Chip and Sludge Disposal area adjacent to Building S-34.

This site was used for the disposal of paint chip and paint chip sludge resulting from depth charge maintenance operations (i.e. repainting). Paint stripping procedures included wire brushing and solvent dipping followed by a wash down with water. The waste scrapings and sludge were discharged onto the ground surface and to an open drainage swale located south of building S-34. The drainage swale

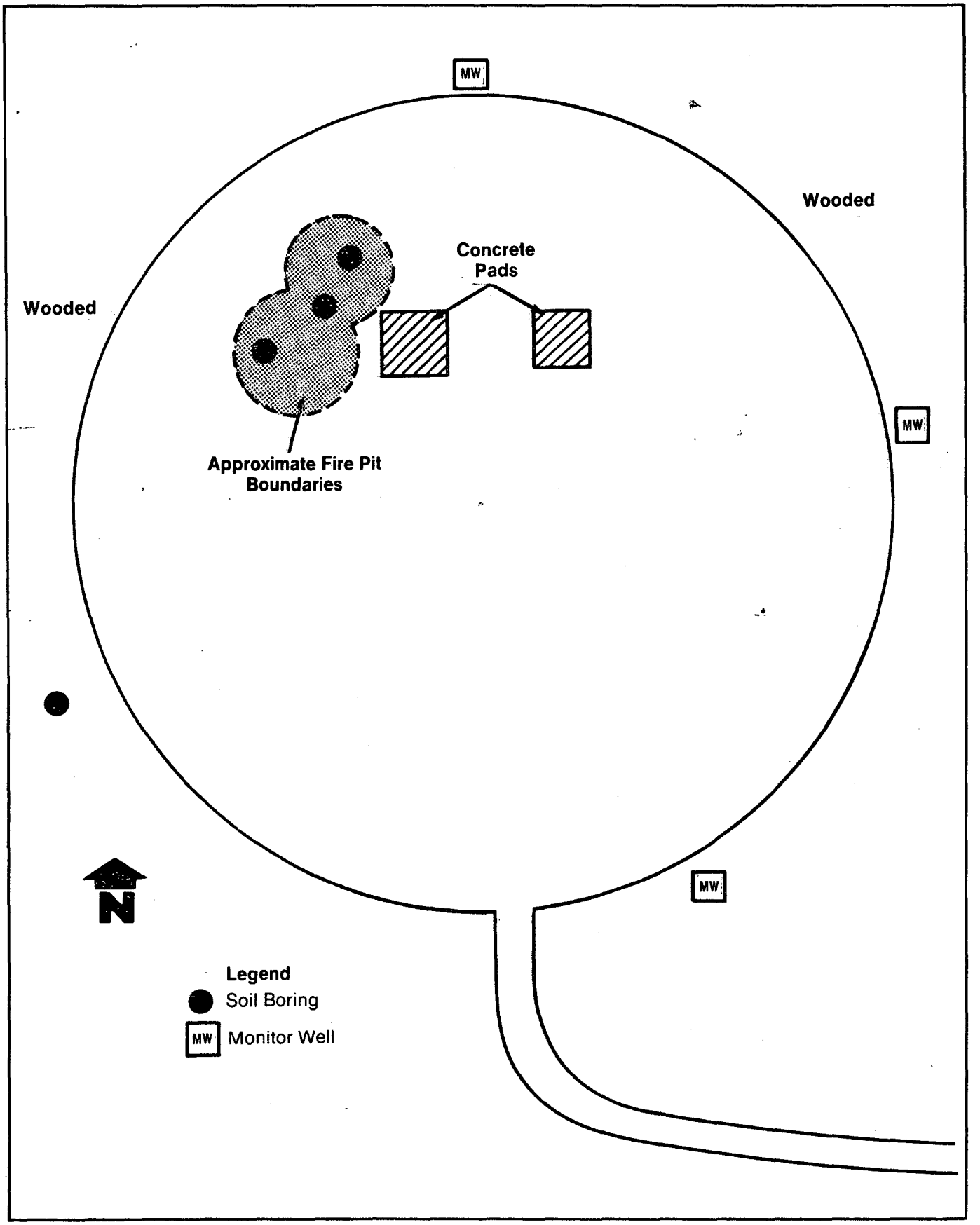

FIGURE 10 SITE 11 CONTRACT ORDINANCE DISPOSAL AREA

carried the remaining waste that had not settled, into a stream flowing parallel to the site (Figure 11). It is possible that the solvent used in the stripping operations, (Keolite) and the degredation products of the paint scrapings has migrated into the ground water and surface water environments. Three (3) ground water monitoring wells approximately 30 feet deep will be installed around the perimeter of the site to determine ground water flow and ground water quality. Four (4) composite soil borings will be completed in the drainage swale at various distances from the site. Samples will be collected from 0 feet to 0.5 feet and 1.5 to 2.0 feet below ground surface at each boring location. Two (2) surface water and sediment samples will be collected in the stream flowing parallel to the site at one (1) and six (6) hour intervals during each round of ground water sampling to determine if the surface water is being effected from past disposal operations conducted at the site. Sampling locations are illustrated in Figure 11.

3.8 SITE 20: GRIT BLASTING AREA, BLDG. 544

Building 544 houses blasting operations for the removal of paint from mines. The paint chips and blasting grit are disposed of in an area behind the building. Due to the possible decomposition of the paint chips and the migration of contaminants into the surrounding soil, four (4) soil borings will be completed at the site. Samples will be collected at 0 feet to 0.5 feet and 1.5 feet to 2.0 feet below ground surface. Figure 12 shows the locations of these borings and areas where paint chips were observed. A drainage ditch traverses the site and is a possible pathway

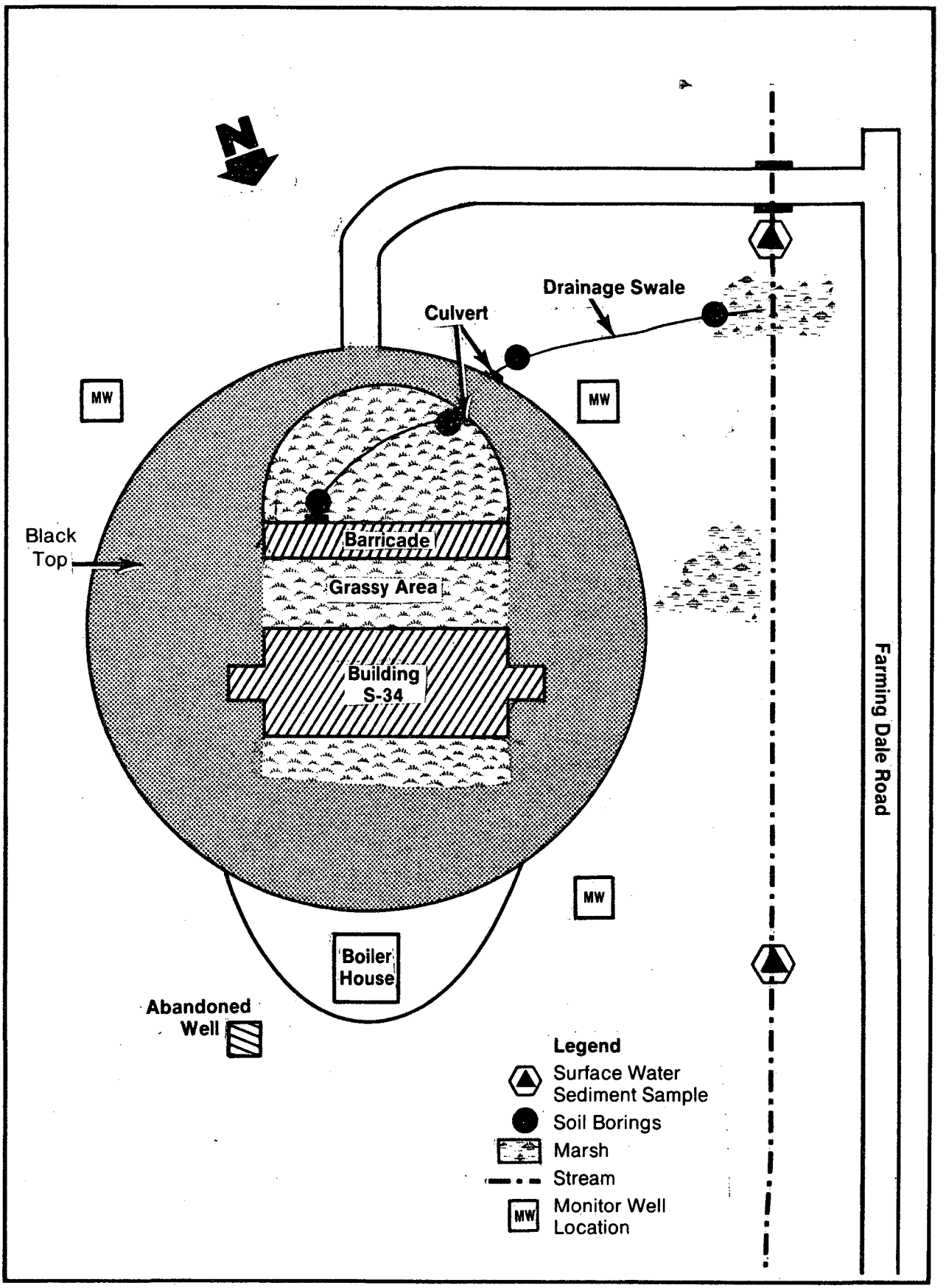

FIGURE 11 SITE 19 - PAINT CHIP AND SLUDGE DISPOSAL AREA

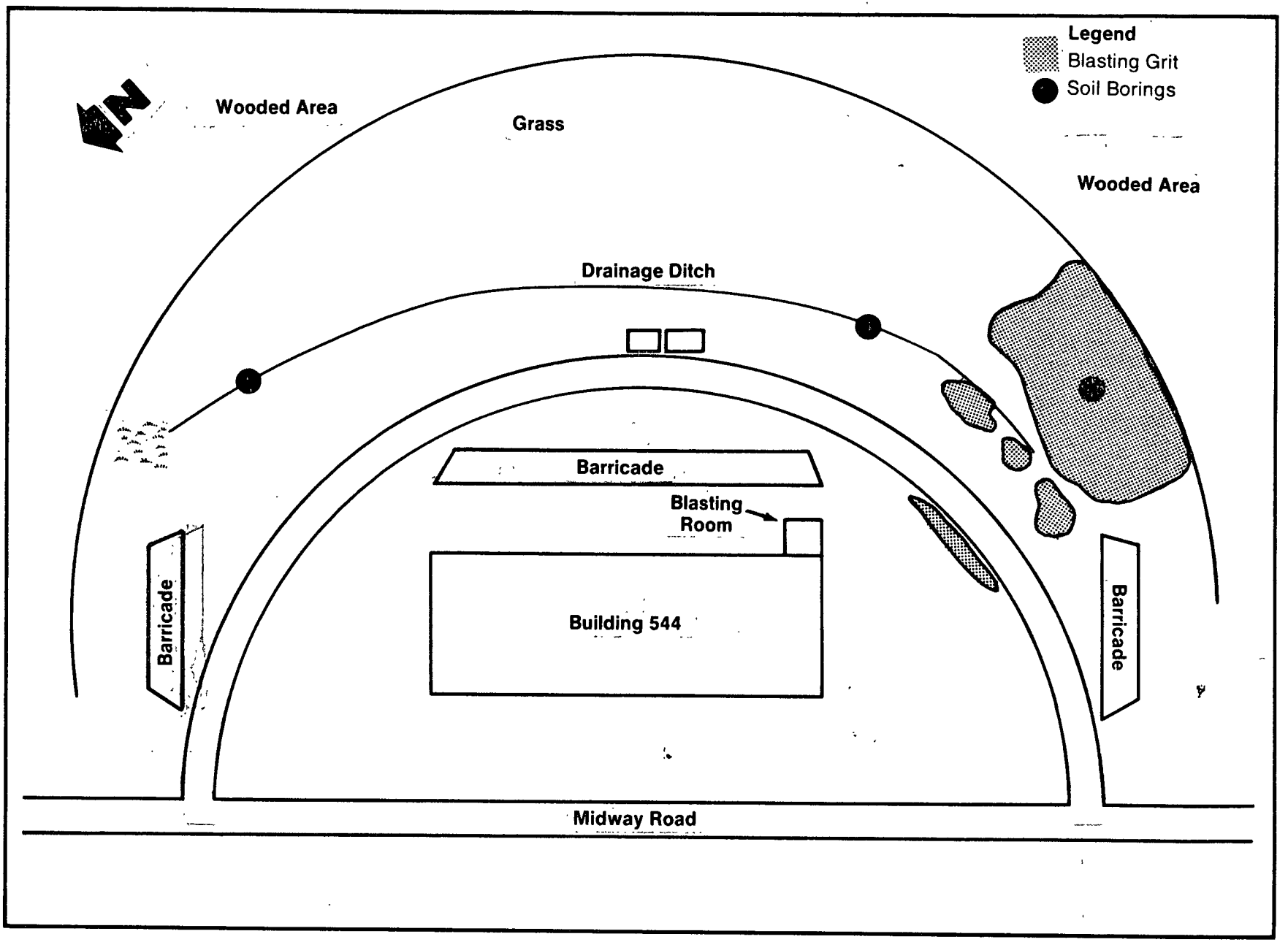

FIGURE 12 SITE 20 - GRIT BLASTING AREA AT BUILDING 544

for surface contamination migration. An E.P. Toxicity test will be performed on the soil for those analytes listed in Table 3-1 so as to assess the leachability of the paint chips into the environment.

3.9 SITE 22: Paint Chip Disposal Area Adjacent to Building D-2

An area behind building D-2 was used for the disposal of paint from past painting operations. Due to the posssible of the decomposition of the paint and migration into the surrounding soils, four (4) soil borings will be completed at the site (Figure 13). Sample will be collected from 0 feet to 0.5 feet and 1.5 feet to 2.0 feet below ground surface. An E.P. Toxicity Test will be performed on the soil for the analytes listed in Table 3-1. This analysis will assess the leachability of the paint into the environment.

3.10 SITE 26: Explosive "D" Washout area, Building GB-1

This site was used for the removal and recovery of ammonium picrate (Explosive "D") from five (5) inch shells for a period of one year. High pressure hot water was used to wash out the highly soluble (1g in 78ml of H_20 at 20^oC) explosive. The discharge containing the explosive compound flowed into a chain of cascading tanks allowing the water to cool and precipitate the ammonium picrate. The discharge from these tanks flowed through an open tile pipeline into an unlined settling basin behind the building. The effluent was then allowed to evaporate from the basin or percolate

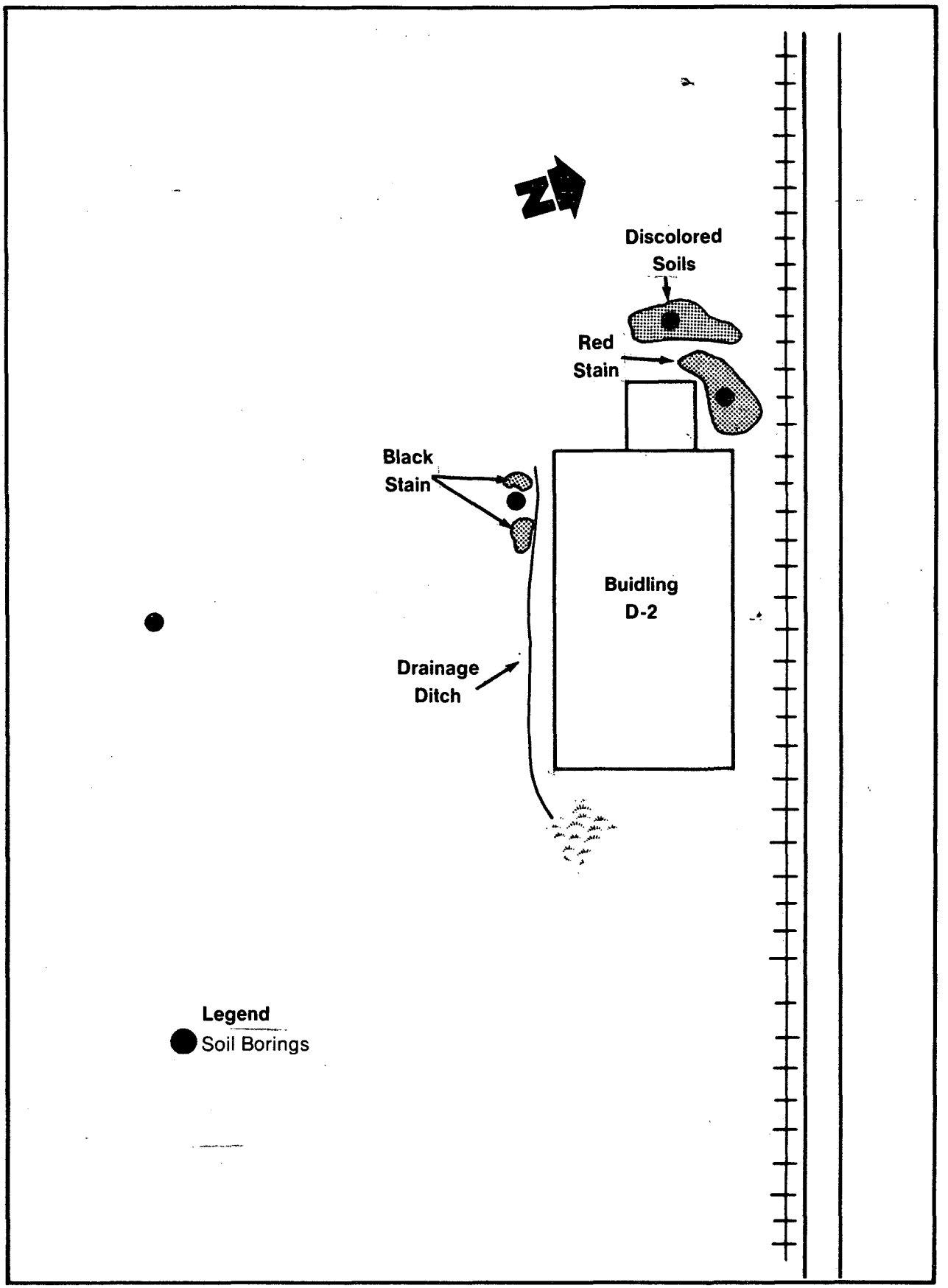

FIGURE 13 SITE 22 - PAINT CHIP DISPOSAL AREA

down into the soil. Because of the high solubility of ammonium picrate at low temperatures, the possibility exists that a dissolving/recrystallization process may have occurred in the soils underlying the settling basin. This process is the result of rainfall or excessive effluent percolating through the soils redissolving ammonium picrate crystals present in the soil, migrating them downward, until the temperature of the solution was lowered or over saturation occurred thus causing the ammonium picrate to recrystalize. The process may continue until the ammonium picrate eventually reaches the ground water. Field activities will include the installation of three (3) ground water monitoring wells around the perimeter of the settling basin to determine the ground water flow direction and the water quality in the shallow aquifer.

SECTION 4

DRILLING METHODS

4.0 Drilling Program

The drilling and installation of all ground water monitoring wells and soil borings will be in accordance with the specifications and procedures outline in the following subsections.

4.1 Drilling Specifications

Each pilot boring will be advanced with a truck mounted drill rig employing either hollow stem auger or air rotary techniques. Soils in all pilot borings will be sampled at regular intervals, with a 2-inch diameter, 18 inch long split spoon sampler using standard penetration test techniques as specified by ASTM method No. D-1586. All soil samples collected will be stored in glass jars. Samples will be described by the WESTON Field Geologist present using Munsell soil color charts and the Unified Soil Classification System. During each sampling operation, an HNu Model PI-101 Organic Vapor Photiniozation detector will be used to detect any organic vapors emanating from the boring or from the split spoon samples. Final completion depths for each boring will be determined by the WESTON field geologist.

4.2 Monitor Well Construction

Each monitor well will be constructed of four (4) inch schedule 40 polyvinylchloride (PVC) flush threaded pipe with No 10 (0.010-inch) machine slotted PVC screen. An average of fifteen (15) feet of screen will be used in each well with a minimum two feet of screen above the water table. Annular space around the well screen will be filled with a medium gained Ottawa sand from the bottom of the borehole to three (3) feet above the top of the screen. A thick bentonite slurry will then be tremied down the hole to form a seal approximately two (2) feet thick on top of the sand pack. A Portland cement-bentonite grout mixture (6:1 dry weight) will be tremied into the annular space to complete the surface seal. All monitor wells will be secured by enclosing the PVC riser pipe in a protective iron casing with a locking cap. Bumper guards constructed of three (3) inch casing filled with concrete will be placed around the well to protect it from being struck by any vehicles.

4.3 DRILLING PROCEDURES

Each drilling station will be set up in turn to collect data on the stratigraphy to the completion depth as well as determining the first occurrence of shallow groundwater. Well construction will follow State and EPA prescribed methods. Drilling procedures will be completed in the following representative manner with the field geologist completing the necessary data inputs and maintaining logs and sampling records:

1. Arrive at well with an identified group. Log in location, identifiers, and dates of operation including rig type, rod box, bits used, etc., Thoroughly wash the drill rig using the approved source water to prevent cross-contamination as outlined in section 4.4.

2. Proceed with drilling using approved drilling method. Soil samples will be collected, logged, and described from split-spoon samples collected at varied intervals and each stratigraphic change.

3. Soil sample percent recovery, penetration, depth of recovery and down-drive weight (or hammer distance) will be recorded. Sample identification will be recorded in the field notebook as well as on the sample container.

4. Well Installation will follow specifications set forth in Section 4.2.

5. All monitor wells will be developed using either a bailer, submersible or surface centrifugal pumps, for a period of time sufficient to yield clear, sand-free water (one hour per well is estimated).

6. Well security will be constructed according to Section 4.2.

7. Upon completion of well construction, a log (Figure 15) and completion form (Figure 16) will

WESTON

DRILLING LOG

WELL NUMBER: _____ OWNER: _____

LOCATION: _____ ADDRESS: _____

_____ _____

_____ TOTAL DEPTH _____

SURFACE ELEVATION: _____ WATER LEVEL: _____

DRILLING COMPANY: _____ DRILLING METHOD: _____ DATE DRILLED: _____

DRILLER: _____ HELPER: _____

LOG BY: _____

SKETCH MAP

NOTES:

DEPTH (FEET)	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS*	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)

* A.S T.M. D1586

SHEET ____ OF ____

Figure 15

Well _____

Well Construction Summary

Location or Coords: _____ Elevation: Ground Level _____

_____ Top of Casing _____

Drilling Summary:

Total Depth _____

Borehole Diameter _____

Driller _____

Rig _____

Bit(s) _____

Drilling Fluid _____

Surface Casing _____

Well Design:

Basis: Geologic Log ____ Geophysical Log ____

Casing String(s): C = Casing S = Screen

____	–	____	____	____	–	____	____
____	–	____	____	____	–	____	____
____	–	____	____	____	–	____	____
____	–	____	____	____	–	____	____
____	–	____	____	____	–	____	____
____	–	____	____	____	–	____	____
____	–	____	____	____	–	____	____
____	–	____	____	____	–	____	____

Casing: C1 _____

C2 _____

Screen: S1 _____

S2 _____

Centralizers _____

Filter Material _____

Cement _____

Other _____

Construction Time Log:

Task	Start Date	Start Time	Finish Date	Finish Time
Drilling:				
_____	____	____	____	____
_____	____	____	____	____
_____	____	____	____	____
Geophys. Logging:	____	____	____	____
Casing:				
_____	____	____	____	____
_____	____	____	____	____
_____	____	____	____	____
Filter Placement:	____	____	____	____
Cementing:	____	____	____	____
Development:	____	____	____	____
Other:				
_____	____	____	____	____
_____	____	____	____	____
_____	____	____	____	____
_____	____	____	____	____
_____	____	____	____	____

Well Development:

_____

Comments:

_____

Figure 16

WESTON DESIGNERS CONSULTANTS

be prepared for each well.) In addition the log sheets will include some of the following data:

- If pumping pressure meters are installed on the equipment used, meter pressure readings during drilling or purging operations will be recorded.

- Type and amount of bentonite drilling fluid additive used, depth at which its use started, and reason for starting to use the additive.

- Description of drill rig configuration, manufacturer, model, pump type, bit type, rod sizes, and specifications of tools used.

- Visual, odor or remote sensing (HNU) descriptions of possible contamination zones, depth to these zones and thicknesses of the zones.

- A record of the sequence of drilling operations used at each site.

- All special problems encountered at a site - lost casing, screen, tools, etc., along with hole heaving, bridging or cavern development.

- Commencement and completion dates for each boring.

- Sequential lithologic boundaries; where these are estimated, note the degree of accuracy which applies to the boundary.

- Blow counts, hammer weight, and length of fall for each drill rig configuration used.

- The length of the sampled interval and the length of sample recovered for that interval for all split-spoon, thin wall, and cored samples.

- Depth to first and subsequent water encountered, along with method of determination.

- Visual, numerical estimates of secondary soil constituents.

- Location, spacing, and nature (natural or coring induced) of all core breaks, intervals of possible sample losses, and probable reasons for the loss.

4.3.8 Special Provision Site 26

Specific drilling procedures to be followed during operations at this site include the following:

1. All boring locations and their access routes will be surveyed with a magnetometer prior to drilling in order to check for burried metal objects.

2. Should metal objects be detected, the borehole location will be moved and the new location resurveyed.

3. The borehole location will be saturated with water for at least 24 hours prior to drilling.

4. Earle fire department personel and equipment will be present during all drilling operations in case of any emergencies.

5. Upon contact with potentially contaminated water, skin will be flushed promptly with clean water; non-impermeable clothing that becomes wet will be removed.

6. Organic vapor/combustible gas/oxygen readings will be taken and recorded prior to and during drilling activities.

4.4 Decontamination Procedures for Drilling Equipment

Decontamination of equipment is undertaken to prevent cross-contamination. A decontamination area will be established for the cleaning of heavy equipment and everyday use. A steam cleaner will be used to decontaminate all drilling equipment.

4.4.1 Drill Rig

The drill rig will be decontaminated initially on the first (1st) day of drilling and between every site to be investigated, and before leaving plant property.

4.4.2 Drilling Rods and Bit

These will be decontaminated before drilling each borehole and before leaving plant property.

4.4.3 Sampling Equipment

The split spoon sampler, purge pump, and bailer, will be decontaminated between every sample and before leaving the plant property. To accommodate the full range of solubilities for the parameters listed in the sampling plan the following procedure will be followed.

1. Scrub with an Alconox solution
2. Rinse with distilled water
3. Rinse with Acetone solution
4. Rinse with hexane solution
5. Rinse with steam cleaner

SECTION 5

SAMPLING PROGRAM

5.0 Sampling Procedures

The purpose of the sampling program is to identify the location, concentration, and areal extent of contamination in the hydrogeologic environment. From this information it is possible to deduce the general direction in which the contaminants are migrating and their probable origin. To achieve these goals efficiently, specific field procedures have been developed for purging the wells, collecting the samples, and ensuring field quality control. These procedures are described in the following sections.

5.1 Sampling Plan

The analytes recommended in Table 5-1 are based upon the type of waste disposed of at each site, and the chemical and physical properties of that waste. These properties will determine which contaminants and at what rate these contaminants will be leached from the waste into the surrounding environment. The more soluble constituents will migrate into the ground water while those less soluble will remain in the soils underlying the site or at the surface.

TABLE 5-1

ANALYTICAL PARAMETER SUMMARY

Analyte	Sampled for at Site No.	Comments
Voa, chloride, pH, specific conductance, TOH, TOC, nitrite/nitrate	2, 3, 4, 5, 10, 11, 19	Typical indicator parameters used to characterize groundwater quality.
Pesticides, acid extractable, base/neutral compounds.	2, 3, 4, 5, 10, 11, 19	Includes compounds indicative of industrial waste and degradation products of paint.
RDX, HMX, NG, TNT, picric acid.	2,26, 11	Major residual contaminants of explosive compounds.
Priority pollutant metals	2, 3, 4, 5, 11, 19	Major constituents in paint, primary drinking water standard.
Total xylene	10, 19	Persistant organic constituent in paint.
Oil and grease (418)	3, 4, 5, 10, 11, 19, 20, 22	Persistant organic constituent in paint as the petroleum-based carrier.

5.2 Ground Water Sampling

Ground water samples will be collected from each monitoring well at regular intervals. Data from these samples will be used to determine if ground water contamination has occurred.

5.2.1 MONITORING WELL PURGING

All groundwater sampling will be accomplished after the installed monitoring wells have been properly developed and stabilized. Prior to collecting samples, each well will be purged by pumping or bailing to ensure that a representative sample of the aquifer is collected during the sampling process. The field procedures used for monitoring well purging will include the following guidelines:

1. Prior to placing any equipment into the well, the equipment will be scrubbed according to Section 4.4.3.

2. Before purging, the depth to water from the notched measuring point in the well casing will be measured and recorded. For initial sampling of wells, measurements will also be taken of the depth from the top of the water level to the bottom of the well.

3. Calculate the volume of water to be purged based on the amount of standing water in the well.

4. Purge the well by pumping, removing at least five times the calculated volume of standing water in the well.

5. Disconnect the pump and remove it from the well. Decontaminate the equipment as described in Section 4.4.3.

5.2.2 MONITOR WELL SAMPLE COLLECTION

All required sample containers will be prepared and supplied by WESTON Laboratories. Sampling activities will consist of the following:

1. Lay out plastic apron and arrange sampling equipment, bottles and logging information.

2. Remove and inspect sample containers and chain-of-custody forms, and check for consistency with well number.

3. Decontaminate teflon bailer with Alconox and copious amounts of distilled water. Similarly, decontaminate any additional equipment that will be used in the sampling process, i.e. filtering equipment.

4. Slowly lower the cleaned bailer into the well and allow water to fill into the bailer.

5. When the bailer is full, carefully retrieve the bailer.

6. Rinse sample bottles with appropriate sample before filling.

7. Add appropriate preservative (according to EPA prescribed methods), secure the cap on the sample containers, and label the bottle according to chain-of-custody procedures.

8. Take a grab sample for immediate field measurement of temperature, pH and conductivity, and record the results in the daily log.

9. Wrap the sample containers in packaging material and, if necessary, place in the thermal chest pack with sufficient "Blue Ice" to ensure cooling to less than 4°C and secure packaged samples.

10. Wash and rinse the bailer (according to Section 4.4.3) and fill with deionized water; pour into rinse blank container for future analyses.

11. Fill out the chain-of-custody form and proceed to the next sampling location.

5.3 SOIL AND SEDIMENT SAMPLING

All soil and sediment samples will be collected during the first round of groundwater sampling. All required sample

containers will be prepared and supplied by WESTON Laboratories. Sampling activities consist of the following procedures:

1. Lay out plastic apron and arrange sampling equipment, bottles and logging information.

2. Remove and inspect sample containers and chain-of-custody forms, and check consistency with well numbers.

3. Decontaminate sampler according to Section 4.4.3.

4. Retrieve sample and place it in the appropriate bottle. Sample containers will consist of pre-weighed 30 milliliter serum vials with teflon^{R} lined crimp-top caps.

5. After placing the sample into the vial clean any particles off the lip and crimp the cap firmly in place, with the teflon liner towards the soil.

6. Samples will be stored in separate compartments.

7. Chain-of-custody forms will be filled out for each sample.

5.4 SAMPLE HANDLING

All samples will be handled and preserved following state and Federal EPA prescribed methods to ensure their integrity.

5.4.1 CHAIN-OF-CUSTODY PROCEDURES

All WESTON field personnel will follow the U.S. EPA chain-of-custody procedures to ensure preservation of the integrity of all samples. The chain-of-custody record will be initiated at the time of sample bottle preparation and will follow each bottle and lot through the sequence from bottle preparation through completion of chemical analyses. A copy of this form is included as Figure 17.

Collected samples will be under lock and key, or under visual control at all times until their shipment to the analytical lab. WESTON field samplers will act as sample custodians and document control officers to monitor the location of collected samples and to record vital sample information in the field log books.

5.5 Quality Assurance

WESTON field samplers will implement the following quality assurance procedures to ensure that the collection of representative samples and production of highest quality analytical data:

FIGURE 17

CHAIN OF CUSTODY RECORD

SAMPLERS: *(Signature)* _____

Phone. _____

SHIP TO:

_____

_____

_____

_____

ATTENTION: _____

Phone No. _____

SHIPPING INFORMATION

Location _____

Shipper _____

Address _____

_____

Date Shipped _____

Shipment Service _____

Airbill No. _____

Cooler No. _____

Relinquished by: *(Signature)*	Received by: *(Signature)*	Date/Time
Relinquished by: *(Signature)*	Received by: *(Signature)*	Date/Time
Relinquished by: *(Signature)*	Received by: *(Signature)*	Date/Time
Relinquished by: *(Signature)*	Received for laboratory by: *(Signature)*	Date/Time

Analysis laboratory should complete "sample cond upon receipt" section below, sign and return copy to Shipper

Sample Number	No. Of Cont.	Site Identification	Date Sampled	Analysis Requested	Sample Cond. Upon Receipt

Remarks:

1. Field blanks will be prepared and labelled. A set of sample containers will be filled with deionized water that has been poured from the cleaned sample bailer at the sampling site. The containers will be carried with all other sample containers during that date and will be processed with the sample group lot.

2. All equipment used in the sampling process will be cleaned thoroughly before and after sampling to minimize possible off-site transport of site contaminants.

5.6 Packaging and shipment

Individual sample container caps will be sealed with teflon tape. Samples will be sorted in thermal chests containing "Blue Ice" to ensure the preservation of sampling integrity during shipment. The thermal chests will be secured and transported to the WESTON Laboratory after a final inspection by Earle Security. Analytical lab personnel will acknowledge receipt of the shipped samples at the time of their arrival and enter them onto that sample group chain-of-custody form.

6.0 Project Schedule

Table 6-1 summarizes the project schedule for the Confirmation Study at the Naval Weapons Station Earle in Colts Neck, New Jersey. A flow chart of events for the verification phase of the Confirmation Study is illlustrated in Figure 18.

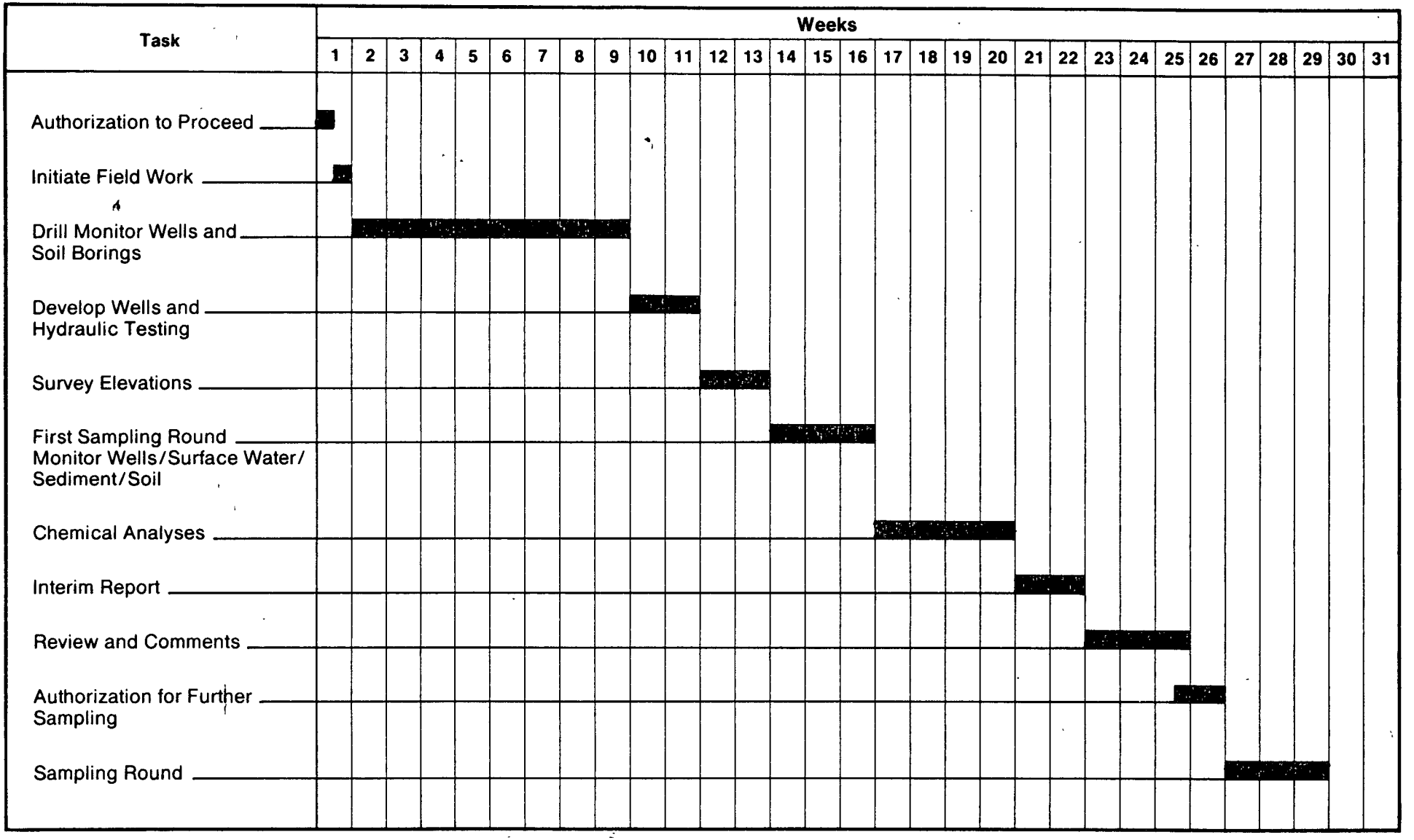

TABLE 6-1 SCHEDULE OF ACTIVITIES

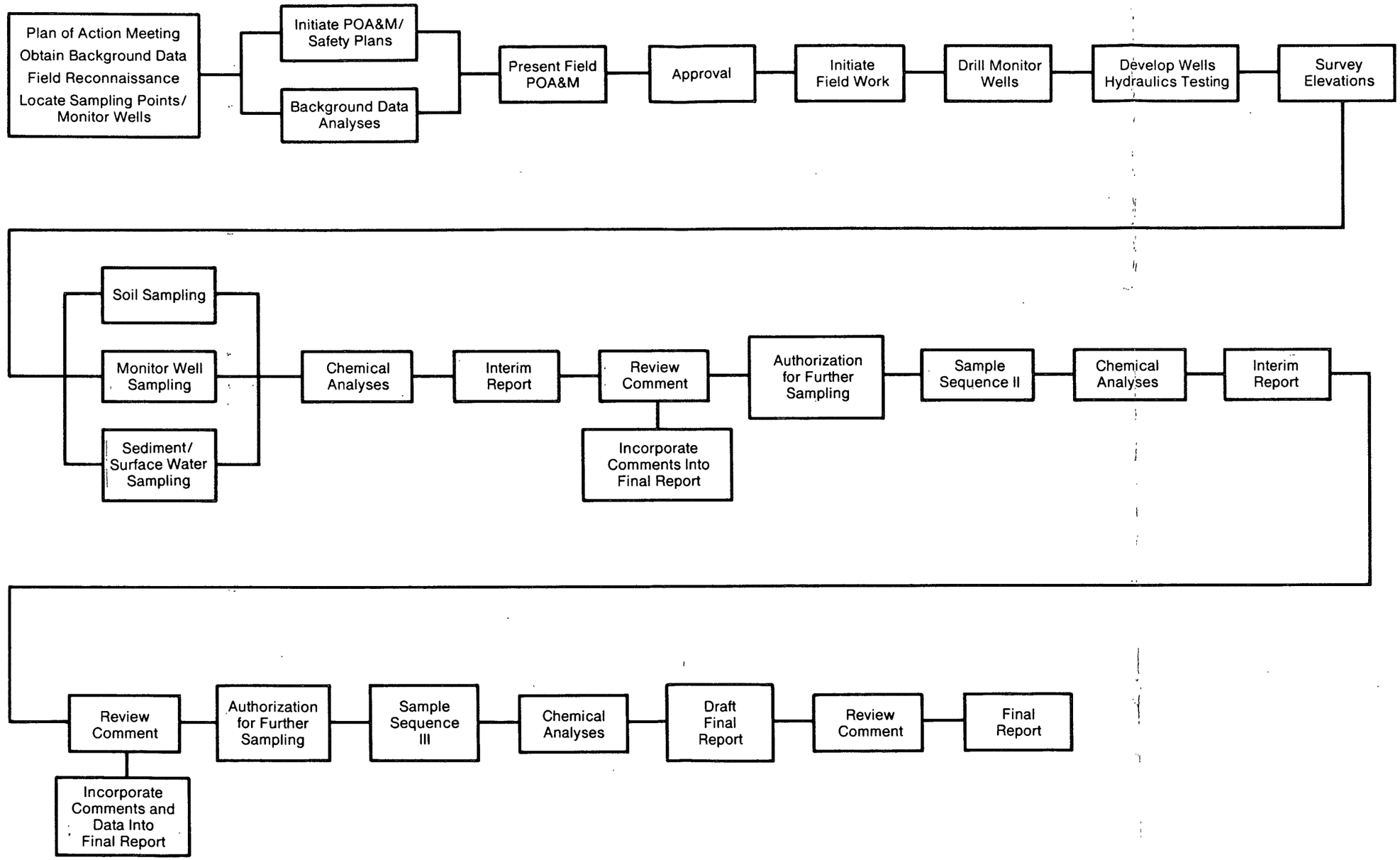

FIGURE 18 FLOW CHART VERIFICATION PHASE EARLE

APPENDIX A

CHAPTER 8

SAFETY REQUIREMENTS FOR CONSTRUCTION AND CONTRACTOR OPERATIONS

0801. POLICY. Private contractors performing construction work, maintenance and repair, and utilities services on board the Station shall comply with all applicable safety regulations, OSHA standards, and the regulations contained herein. Additional safety requirements will be outlined by the Contracting Officer during the preconstruction conference.

a. The Occupational Safety and Health Act of 1970 (OSHA), Public Law 91-596, requires contractors to comply with safety standards promulgated by the Occupational Safety and Health (OSH) Administration. The OSH Administration has the authority and responsibility for enforcing the safety standards. Personnel involved in the administration, management or inspection of Naval Facilities Engineering Command (NAVFAC) contracts do not have any authority or responsibility for enforcing contractor compliance with OSHA standards.

b. Under authority of the OSH Act, OSHA officials (commonly referred to as OSHA compliance officers), whether they be Federal (i.e., Department of Labor) or State, inspect and conduct investigations at contractor workplaces for the purpose of enforcing compliance with OSHA standards. Subject to allowing access by the Station Commanding Officer, these officials may visit without prior notice, work sites where the Navy has contract administration responsibility for safe working conditions. Such visits may be the result of a random selection of locations, in direct response to a complaint of a hazardous condition by a worker, or a serious accident.

c. This chapter will be issued to contractors at time of contract award.

0802. CONTRACTS AND FEDERALLY-AIDED PROGRAMS AND PROJECTS. In accordance with the provisions of Public Law 91-596 and the rules set by the Secretary of Labor in 29 CFR, employers are responsible for the safety of their employees. Therefore, in accordance with those rules, each contractor, grantee, or other entity conducting programs or projects which are funded in whole or in part by the Navy, bears the responsibility to provide safe and healthful places and conditions of employment for its employees as a condition under the terms of the contract or agreement. Under the standard safety clauses in each Federal contract or agreement, the Navy shall take action to ensure contractor compliance with those clauses whenever non-compliance is recognized by the contracting officer or his representative. The following paragraphs outline procedures to be followed in providing the control necessary to ensure the safe prosecution of contracts or Federally funded programs.

0803. STOP ORDERS FOR IMMINENT DANGER. Safety Manager, Contracting Officer or their representatives, shall issue a "Stop Order" when in

their opinion a condition exists, during the term of the contract, which could reasonably be expected to cause death, serious physical harm, or substantial property damage immediately, or before such danger can be eliminated through corrective procedures. When such an order is issued, the contracting officer shall be notified by the most expedient means of such issuance. Examples of conditions which may warrant stop order action are (but are not limited to):

a. Personnel working in hazardous atmospheres without proper respiratory protection.

b. Personnel working in deep trenches, the sides of which are crumbling and unprotected by shoring or other means.

c. Work being conducted over an unprotected passageway, walkway, or workplace.

d. Unauthorized welding or cutting or working on unpurged containers (hot work permits must be approved by the Fire Department).

e. Personnel working under suspended loads.

f. Improper use or safeguarding of explosives.

g. Improper guarding of excavations.

h. Personnel working over or near water without USCG approved life jacket or buoyant work vests.

0804. ADDITIONAL DETAIL FOR CONTRACT ADMINISTRATION

a. Specifications developed for contract projects shall be reviewed by the office of prime responsibility to ensure that specifications are not in conflict with applicable safety and occupational health standards published in 29 CFR and that specifications are included as necessary to provide protection as required by this Article.

b. Contracting officers shall ensure, by requiring certification or by other mechanism, that the review required above has been made prior to taking solicitation action.

c. Prior to the commencement of work and as part of the responsibility determination, the contracting officer shall review the contractor's written safety and occupational health plan to ensure that it is adequate. If, in the opinion of the contracting officer or the Station safety and health manager, a meeting with the contractor is necessary, the contracting officer, his field representative, the safety and health manager, and the contractor shall meet to review the contractor's written safety and occupational health plan. They shall modify and add to the plan all necessary details to ensure the safe prosecution of the work and to ensure that the rules are understood by all parties concerned.

d. Accident reports and statistical data on contractor accidents will be made available to properly identified OSHA (Federal or state) representatives upon request. However, accident report requirements levied on the contractor, as a provision of the contract, in no way change the reporting requirements of OSHA.

e. When work will impinge on the living or working conditions of Station employees, military personnel, their dependents, or the public, the contracting officer shall so advise the commanding officer and shall assist as requested in ensuring that affected personnel are aware of the project, potential unsafe conditions, and the personnel to contact should they feel potentially dangerous conditions exist during the course of the contract.

0805. DUTIES AND RESPONSIBILITIES

a. Commanding Officer, Naval Weapons Station Earle, is responsible for the safety and health of Station personnel under all conditions and circumstances and shall take timely action to safeguard all personnel and property under his command.

b. Contracting officers and their representatives shall take action to assure compliance with fire, safety and occupational health contract specifications.

c. Safety and health management personnel shall advise the command with regard to contract safety and occupational health matters and advise and assist contracting officers and their representatives in obtaining compliance with safety and occupational health specifications.

0806. OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) RESPONSIBILITIES. The Department of Labor has the responsibility for enforcing standards promulgated in 29 CFR. OSHA compliance personnel have a legal right to enter upon any Navy facility or vessel to observe contractor operations, consistent with security regulations. If considered necessary to assist the Navy in ensuring full contractor compliance with the safety and occupational health specifications of a contract, commanding officers should not hesitate to ask OSHA representatives to inspect the contractor's worksite.

0807. OSHA COMPLIANCE. Permission may be granted by the Commanding Officer or his designated representative for OSHA officials to enter the Station for the sole purpose of conducting safety and health inspections involving contractor workplaces. As a matter of interim guidance, a "contractor workplace" shall be considered to be any place where work is currently being, recently has been, or will be performed by contractor employees under a Department of Defense contract, including a reasonable access route to and from the workplace. The term "contractor workplace" does not include any area, structure, machine, apparatus, device equipment, or material therein, with which a contractor is not required or reasonably expected to have contact, nor does it include any work environment with respect to which OSHACT jurisdiction has been preempted.

0808. OSHA INSPECTION PROCEDURES

a. Upon presenting appropriate credentials and security clearance, the OSHA official, acting under the inspections and investigations' provisions of 29 CFR Section 657, will be provided with an escort to the contractor workplace, as defined herein, for inspection purposes and to conduct investigation of contractor workplaces based upon specific complaints from, or accidents involving contractor employees.

b. If photographs are required, they shall be taken by a Station official photographer and will be tentatively classified CONFIDENTIAL. Photographs will not be delivered to OSHA officials until all film, negatives, and photographs have been sent to the Deputy Chief of Naval Material for Sea Systems (SEA 09G2) and fully screened and censored, as appropriate, in the interest of national security. Any other documented data or design information, e.g., recordings of noise sound level profiles, etc., shall be forwarded to the Deputy Chief of Naval Material for Sea Systems (SEA 09G2) for screening as above prior to release.

c. Public Law 91-596 prohibits giving advance notice to employers of pending OSHA inspections under penalty of a fine up to $1,000 and/or imprisonment up to 1 year. It is therefore incumbent upon Station personnel to abide by this requirement and not notify a contractor of an impending inspection.

0809. OSHA INSPECTION RESPONSIBILITIES

a. Director, Administration/Security Department. When an OSHA official request to visit a contractor workplace aboard this activity, the following procedure shall be followed:

(1) Upon presentation of appropriate credentials prepare a one-visit escort required pass. Security clearances will be mailed ahead of the initial visit and the clearance will be renewed annually. A hand-carried copy of a security clearance will not be accepted as proof of a security clearance status. Certification of security clearance must be on file with the cognizant DOD Regional Security Office and with the Station's Administration/Security Department. OSHA officials normally have no operational "need to know" and they should not be given access to classified information beyond what is necessary.

(2) Notify Head, Safety Department to provide an escort, and upon arrival of the escort, issue the Escort Required Pass to the OSHA visitor.

b. Director, Safety Department. When an OSHA official requests permission to visit a contractor workplace, as defined in this instruction, the following procedure shall be followed:

(1) When notified by the Administration/Security Department, provide an escort for the OSHA official for the purpose of conducting an inspection or investigation as defined herein.

(2) Notify the Commanding Officer of the OSHA official's findings following the visit.

0810. CONTRACTS INVOLVING AMMUNITION AND EXPLOSIVES

a. The primary mission of this activity is centered around unique military ammunition, explosives and weaponry. Therefore, special guidance is necessary. Accordingly, contractors are required to comply with the provisions of DOD 4145.26M, NAVSEA OP-5, and all other applicable DOD/DON safety regulations regarding work in ammunition and explosives areas and facilities.

b. Contracting Officer Responsibilities:

(1) Provide safety clauses and technical safety data in contracts for work in connectin with ammunition and explosive areas and facilities.

(2) Consult with the Station Safety Director and Fire Chief to insure that adequate safety and fire criteria are included in the contract.

(3) Require pre-award safety surveys be conducted to determine that the contractor can meet at least the minimum requirements of applicable explosives safety regulations.

c. Contractor Responsibility. Provide a safety program to assure the safety of its employees, Station personnel and the general public and property. Designate a responsible individual as point of contact for safety matters.

d. Safety Office Responsibility. Review for safety implications and specifications, including plans for modifying or changing, in any way, facilities or equipment.

e. Waivers and Exemptions.

(1) When compliance with mandatory safety requirements cannot be effected, a request for waiver or exemption will be forwarded by the Contracting Officer to the Station Safety Director.

(2) The Safety Director will evaluate the request and, if valid, forward recommendations to CNO/NAVSEA, as appropriate, in accordance with the procedures established in Chapter 11 of this manual.

f. Use of Lasers. Every system using a laser must have prior approval of the Station Commanding Officer. Laser safety encompasses hazards to personnel, ordnance, fuel and all other material that can be irradiated by a laser. Laser safety and health standards are contained in NAVSEAINST 5101.1 (NAVSEA Laser Safety Program) and BUMEDINST 6470.14 (Laser Health Standards).

g. Use of Explosives and Explosive Devices.

(1) Permission shall be obtained from the Commanding Officer before explosives are brought on the Station. Plans for the use of explosives or explosive devices shall be reviewed by the ROICC in consultation with the Station Safety Director prior to use of such explosives or explosive devices on the Station.

(2) Blasting materials or other explosives shall be stored in approved magazine storage when such materials must remain on the Station beyond regular working hours.

(3) Powder-actuated tools shall not be used in explosive facilities unless authorized by the Station Safety Director and the Ordnance Officer.

h. Portable Power Tools. Sparking portable electric tools shall not be introduced or used in magazines or in locations where exposed explosives are present.

0811. CONSTRUCTION SITES

a. Walkways and Sidewalks.

(1) All walkways and sidewalks bordering on or running through any construction site shall be provided with substantial guardrails or board fences. In addition, temporary footwalks beyond the curb shall be substantially constructed and provided with protection on both sides.

(2) Sidewalks and walkways shall be kept clean of excavated materials or other obstructions and no sidewalks shall be undermined unless shored to carry a live load of 125 pounds per square foot.

(3) If planks are used for a sidewalk they shall be butt ended and cleated underneath to prevent displacement. Planks shall be uniform in thickness and all exposed ends shall be beveled to prevent tripping.

(4) Raised walkways shall be provided with plank steps on strong stringers. Ramps used in place of steps shall be provided with cleats to insure safe walking.

b. Illumination. During the hours between sunset and sunrise, all sidewalks and walkways shall be adequately illuminated, and warning lights shall be placed about the property.

c. Overhead Protection. Pedestrian and vehicle traffic shall not be required or permitted to travel under loads handled by power shovels, derricks, or hoists, unless ample side barricades and overhead protection are provided.

0812. STREET AND ROAD WORK PROJECTS

a. Traffic flow must be maintained safe and with minimum of delay on Station street and roadway systems. Contractors performing any type of work on or near Station thoroughfares, or whose vehicle is disabled shall place adequate traffic warning devices (signs, flashers, barricades, etc.) on roadways at least 300 feet prior to work sites or vehicle on straightaways and 500 feet on curves (in both directions). Traffic controls and placement of traffic warning devices shall comply with Federal Standards for Uniform Traffic Control Devices for Streets and Roadways (ANSI Standard D6.1).

b. When signs, signals, and barricades do not provide necessary protection on or adjacent to a roadway or street, flagmen or other appropriate traffic controls shall be provided.

(1) Flagmen shall be provided with and shall wear a red or orange warning garment while flagging. Warning garments worn at night shall be reflectorized material. Danger or warning signs shall be posted at all truck entrances and exits.

c. Open trenches, manholes, overhead work on wires or trees, or other potential hazards to pedestrians or motor vehicles shall be adequately marked with warning devices and barricades.

0813. MOTOR VEHICLE REGULATIONS

a. Motor vehicle operations on the Station must comply with New Jersey Traffic Laws (NJSA Title 39) and Station Security Regulations (WPNSTAEINST 5510.1 series).

b. Only personnel holding a valid driver's license issued by a state or government authority may operate a motor vehicle aboard this Station. Operation of a government vehicle requires a current government vehicle operator's license.

c. On entering or leaving the Station, a motor vehicle must be brought to a complete stop until the sentry directs it to proceed. At night, lights will be dimmed when approaching gates.

d. The following vehicles are classified as emergency vehicles at this Station: fire apparatus, ambulances, security (police) vehicles, and vehicles marked "ammunition" or "explosives." "Ammunition" or "explosive" vehicles in operation are placarded on all four sides, and have their head lights on and flashers in operation.

e. When approached by an emergency vehicle from any direction, a motor vehicle shall pull to the side of the road and stop until the emergency vehicle has passed.

f. A motor vehicle overtaking an emergency vehicle shall remain a safe distance behind and not pass the emergency vehicle.

g. Troops marching on the highway shall have the right of way, but may be passed at a safe clearance at no more than 5 mph.

h. No unauthorized vehicles are permitted in restricted areas of the Station.

i. Only one lane traffic is permitted on overpasses or underpasses on Normandy Road. Southbound (toward Main Base area) traffic shall, in constricted areas, yield right of way to northbound (toward Waterfront Area) traffic, except that emergency vehicles displaying their lights shall have right of way over all other vehicles.

j. All vehicles will be operated with due regard for the possibility of the sudden appearance of wildlife on the roadway.

k. Motor vehicles with catalytic converters shall not be operated within 100 feet of fuel storage areas and transfer operations, where low-lying accumulations of flammable vapors or hazardous ignition-combustible material sources are present. In addition, such vehicles will not be parked over any grassy area or unpaved surfaces which could be considered to be oil soaked.

l. All motor vehicle accidents must be reported to the Security Officer without delay.

m. Except for Station vehicles, CB radio transmission is not authorized on the Station because of the radio frequency (rf) interference of certain sensitive testing facilities and also because rf signals present potential dangerous situations when near certain buildings with rf activated explosive devices. All such equipment must be registered in accordance with WPNSTAEINST 2302.1 series and the Security Manual, WPNSTAEINST 5510.1. Any unauthorized radio transmission is cause for denying entry on the Station.

n. Smoking in vehicles is strictly prohibited while on the Station.

0814. BROKEN ARROW ACCIDENTS/INCIDENTS

a. A "Broken Arrow" Accident/Incident alert signifies that an emergency of grave significance exists. The Station signal for this condition is repeated blasts (10 or more) of the fire whistles.

b. When this signal is sounded, all personnel will take the following actions:

(1) All windows, doors, vents and air conditioners of offices and shops are to be secured.

(2) Personnel walking or working outdoors will take cover in the nearest building. (Contractor/utility supervisors will be respon-

sible for knowing the location of an open building nearest this work site.)

(3) Vehicles are to be driven to the side of the road and parked. Occupants will remain inside. All windows, doors, air vents and air conditioners will be secured.

(4) Telephone and radio communications will be terminated leaving the telephone system and the airways clear for emergency requirements.

(5) There shall be no eating, drinking or smoking during the alert.

c. The all clear signal is two (2) blasts on the fire whistle at which time personnel may continue their normal activities.

0815. GENERAL SAFETY REQUIREMENTS. The following Navy safety standards must be adhered to. They are general in nature and do not include all conceivable operations and functions involved in the many Station activities. However, the lack of pertinent precautions is not to be interpreted as an indication of their non-existence or unimportance.

a. Industrial Housekeeping.

(1) Areas within 50 feet of Station buildings shall not be used for storage of combustible materials. Combustible scrap and debris shall be removed at regular intervals. Containers shall be provided for collection and separation of all refuse. Rubbish and trash shall be cleared from buildings at the end of each workday.

(2) Harmful substances, including flammable liquids, shall not be poured into sewers or drains, or on the ground. They shall be collected in steel drums or other designated covered containers and disposed of as directed by the Contracting Officer.

b. Fire Prevention.

(1) Fire is an extremely serious threat to the Station. Since fire is one of the greatest and most frequent hazards met in almost any area, fire prevention measures applicable to the occupations and operations involved are mandatory. A fire-fighting program is to be followed throughout all phases of the work involved. It shall provide for effective fire-fighting equipment to be available without delay, and designed to effectively meet all fire hazards as they occur.

(2) The introduction and use of any type of flame or heat producing device on the Station must be approved by the Station Fire Chief. Authorized fires and other heat producing devices must be secured prior to the end of the shift or workday.

(3) Carbon tetrachloride and/or other toxic vaporizing liquid fire extinguishers are prohibited on the Station.

(4) Station smoking rules are prescribed in the Station Fire Bill and Fire Regulations (WPNSTAEINST 11320.3). The provisions of these regulations must be strictly adhered to.

(5) Strike any-where matches are not permitted on the Station.

(6) Matches or lighters of any kind are not permitted in buildings or areas containing explosives or other dangerous materials.

(7) Station fire-fighting equipment or apparatus must not be used for any purpose other than fire fighting.

(8) Fire hydrants, hose houses, hose boxes or racks, or fire telegraph boxes must not be obstructed. An open passage should be maintained at all times so fire equipment can be brought into instant use.

(9) All spray painting operations shall be conducted in spray booths or spray rooms designed for that operation.

(10) There shall be no open flame or spark-producing equipment in any spraying areas nor within 20 feet thereof, unless the paint spraying operation is separated by a partition. Conspicuous "No Smoking" signs shall be posted at all flammable materials spraying areas and storage areas.

(11) Electrical wiring and equipment located within 20 feet of any spraying area shall be approved for a Class I, Group D location as defined in the current edition of the National Electrical Code (NEC).

(12) The quantity of flammable or combustible liquid kept in the vicinity of spraying operations shall be the minimum required for operations and shall not exceed a supply for one day or one night.