NOV 13 1990

DEPARTMENT OF PARKS AND RECREATION

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

RECEIVED
OFFICE OF THE DIRECTOR
DEPT. OF HEALTH

'90 NOV -9 P2:33

FRANK F. FASI
MAYOR

WALTER M. OZAWA
DIRECTOR

ALVIN K.C. AU
DEPUTY DIRECTOR

RECEIVED

'90 NOV 16 P3:51

OFC. OF ENVIRONMENTAL
QUALITY CONTROL

November 2, 1990

Dr. Bruce Anderson, Acting Interim Director
Office of Environmental Quality Control
State of Hawaii
465 South King Street
Honolulu, Hawaii 96813

Dear Dr. Anderson:

Subject: Safety Hazard Removal, Fort Barrette, Oahu, Hawaii

We are forwarding for publication in the OEQC Bulletin a Finding of No Significant Impact, a Negative Declaration and four copies of the Environmental Assessment for correction of various safety hazards at the former site of Fort Barrette.

The action proposed by the U. S. Army Corps of Engineers includes filling of all underground septic tanks and concrete boxes, removal of two underground fuel tanks, and permanent sealing of openings to an underground generator shed and underground water reservoir.

Sincerely,

ALVIN K. C. AU, Acting Director

AKCA:jf

Attach.

25b

1990-11-23-0AFEA -

ENVIRONMENTAL ASSESSMENT
FOR
SAFETY HAZARD REMOVAL
FORT BARRETTE, OAHU, HAWAII

October 1990

Prepared by: M & E Pacific, Inc.
Pauahi Tower, Suite 500
1001 Bishop Street
Honolulu, HI 96813

Prepared for: U.S. Army Engineer Division
Pacific Ocean
Fort Shafter, Hawaii 96858

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1.0 PURPOSE AND NEED

1.1 SITE DESCRIPTION:

Fort Barrette is located approximately 0.5 mile south of the community of Makakilo on the Island of Oahu, in an area known as the Ewa Plain (see Exhibit A, Project Location), north of Barbers Point Naval Air Station. The site covers an area of approximately 28 acres and is comprised of three separately owned parcels (see Exhibit B, Project Site). The parcels are identified by the following Tax Map Key (TMK) numbers:

Lot Number	TMK	Areas	Owner
5	9-1-16:21	12.232 acres	A.B. Lau Estate
6	9-1-16:22	0.274 acres	U.S. Army
7	9-1-16:2	15.792 acres	C&C Honolulu

The following land use policies govern the project:

State Land Use:	Agricultural
General Plan:	Parks and Recreation
Zoning:	P2 - General Preservation

The site has not been maintained for many years, and is subject to vandalism and deterioration. A number of features on the site have been determined to be potential safety hazards, and are in an unsightly condition.

The following features are considered hazardous. Each feature is identified with a location number in Exhibit B, Project Site. Photographs of most features are in Exhibit C.

Septic Tanks (#30, #31, #57):

A total of three underground septic tanks were found on the site. Septic tanks #30 and #31 are located near the generator building, and septic tank #57 is located near an underground plotting room. These tanks are constructed of concrete with metal covers. They are missing their covers and are safety hazards.

Concrete Boxes (#41, #44):

These concrete boxes appear to be electrical manholes. They were abandoned with some metal and wood debris left inside. Concrete box #41 is about 2" above ground and the metal cover missing. Concrete box #44 has a metal cover and is almost buried with top soil and vegetation.

Underground Fuel Tanks and Vaults (#28, #32):

There are two underground fuel tanks located just outside of the generator shed. Each of these tanks is situated within an underground vault that is accessible by a ladder. The tanks are cylindrical, approximately six feet

in diameter and about twenty five feet in length. Each tank has an estimated capacity of over 5,000 gallons. The concrete vaults are approximately 13 feet wide by 9 feet deep by 35 feet long.

Field sampling was conducted to determine the content of the diesel fuel tanks, and possible soil contaminations under the tanks. The study conducted on June 6, 1990 indicated that tank #28 (referred as Tank Site no. 1) has approximately 240 gallons of diesel and water mixture. Tank #32 (referred as Tank Site no. 2) is empty and dry. The soil under both of the tanks is clean and not contaminated. (see Appendix A) The soil material immediately outside of the vaults will be tested for contamination during removal. Soil contamination is not anticipated since the soil under the tanks has tested clean indicating that there has been no fuel leakage from the tanks.

Generator Shed (#29):

An underground generator building is located on the eastern side of the site, near the fuel tank vault. Most of the electrical equipment has been removed and the building appears to be in good structural condition. Access to the building is through a 4' by 8' double swing 1/4" thick metal door.

Reservoir (#46):

A large underground water reservoir was found near the middle of the site. The reservoir is about twenty to thirty feet deep. The capacity of this reservoir is estimated to be 50,000 gallons. Along the outside of the wall of the reservoir is another underground chamber which houses the piping manifold system for the reservoir. Metal covers are in place and are temporarily sealed.

1.2 PROPOSED ACTION:

The U.S. Army Corps of Engineers, Pacific Ocean Division, proposes to restore the site by remedying the present unsafe conditions, securing several structures, and removing the underground fuel storage tanks, under the Defense Environmental Restoration Program (DERP). This site is being developed by the City and County of Honolulu (C&C Honolulu) for Kapolei Park.

The proposed action is to :

a. Fill underground septic tanks (30, 31, 57) and concrete boxes (41, 44).

As required, stormwater run-off will be removed from the tanks prior to backfilling, and disposed of in an appropriate manner.

b. Remove underground fuel tanks (28, 32).

The waste oil (mixture of approximately 240 gallons of diesel and water) will be collected by and transported to an approved recycling facility. This facility must have a valid permit issued in accordance with the Solid Waste Disposal Act

(SWDA), and must handle the waste in a manner that will protect human health and the environment. Recoverable oil could be reclaimed for beneficial purposes; unrecyclable waste must be disposed of in accordance with the SWDA.

In compliance with the U.S. Environmental Protection Agency (EPA) Federal Register 40 CFR Parts 280 and 281, Subpart F & G (Appendix B), the following procedures are required to close the underground storage tanks:

1. Tank #28 must be emptied and cleaned, with all waste oil removed. No oil removal remedy will be required at tank #32 since there is no presence of waste oil.

2. The tanks must be removed from the ground.

Since no soil contaminants were discovered under the diesel fuel tanks, no corrective measures to clean up the soil is anticipated before permanent closure.

c. Permanently seal openings of the generator shed (29) and the reservoir (46).

Since generator shed #29 was not a storage facility and is still in good condition, it can be secured in place by welding the metal entrance doors shut permanently. The water reservoir #46's cover plates were already temporarily sealed. However, the plates should be permanently sealed and painted to prevent any safety hazards.

1.3 PURPOSE AND NEED FOR THE PROPOSED ACTION:

Under the Defense Environmental Restoration Program (DERP), Public Law 99-190, the Department of Defense (DoD) is required to determine whether any structures and/or activities generated at formerly used DoD sites require clean-up action because of the presence of hazardous/toxic wastes, unexploded ordnances, and/or unsafe debris. As part of the DERP, the COE conducted an initial site inventory survey of Fort Barrette, formerly known as Kapolei Military Reservation.

Fort Barrette initially served as an Army Signal Corps communications base; subsequently, it was selected as one of four sites for the installation of a battery of 16-inch naval guns. Construction was completed about 1933. In 1941, improvements were made to the installation to provide better protection against aerial bombardment. During this time, and later during World War II, additional improvements were made to the installation. In 1956, the installation was declared excess to the needs of the Army and it was turned over to the U.S. Navy, which in turn declared the property excess.

As a result of the site inventory report, a number of features on the site have been determined to be potential safety hazards. Since these features were the result of past DoD activities, under the DERP policies, the site was deemed eligible for remediation.

2.0 AFFECTED ENVIRONMENT

2.1 GEOGRAPHICAL CHARACTERISTICS:

Fort Barrette is shaped roughly like a truncated cone with the highest promontory rising to an elevation of 160 feet on the makai side and falling to an elevation of 115 feet at the front gate of Barbers Point Naval Air Station. The average slope is about 7 percent.

2.2 SOIL TYPE:

The soil is classified by the United States Department of Agricultural Soil Conservation Service as Lahaina silty clay (LaC3). The surface layer consists of approximately 18 inches thick of dark reddish-brown silty clay loam. The subsoil which is approximately 42 inches thick, consists of dark reddish-brown and dark red silty clay loam that has a subangular blocky structure. The substratum is coral limestone, sand or gravelly alluvium. The soil's acidic level varies from low to moderate (ph value is from 5.6 to 6.5).

The Lahaina soil series consist of well-drained soils. Permeability is moderate. Run-off is medium. The erosion hazard is sever, and most of the surface layer and parts of the subsoil have been eroded. The proposed action does not include grubbing or grading; therefore, it is not anticipated that erosion will be exacerbated.

Entrance to
Ft. Barrette

2.3 COASTAL ZONE STANDARDS:

This project is not subject to Shoreline Protection Ordinance No. 4529; however, it is subject to stipulations of the National CZM (Coastal Zone Management) Act of 1972 (amended 16 U.S.C. 1451 et. seq.). Under this Act, Federal agencies are required to conduct their planning, management, development and regulatory activities in a manner consistent with State CZM programs. The Federal regulations for "Federal Consistency with Approved Coastal Management Programs" (15 Code of Federal Regulations [CFR], Part 930) establish the informational and procedural requirements which are binding on all Federal agencies.

2.4 FLOOD/TSUNAMI HAZARDS:

The site is located on a promontory; there are no perennial streams and the site is not located in a tsunami inundation area. According to the Flood Insurance Study, the area is classified D: Area of undetermined, but possible flood hazard.

2.5 FLORA AND FAUNA:

The U.S. Fish and Wildlife Service, and the Hawaii State Division of Forestry and Wildlife verify that no threatened or endangered species have been found on the site. Vegetation at the site is heavy and mostly of the dryland shrubbery variety. Various species of animals inhabit the area. Flora and fauna found at the site are identified in Appendix C, "Negative Declaration for Land Acquisition for Improvements at Kapolei Park".

Typical off-road vegetation

2.6 WATER QUALITY:

There are no groundwater resources suitable for domestic use in the project area, and there are no perennial streams in the vicinity.

2.7 AIR QUALITY:

The project is surrounded by agricultural lands currently used for the cultivation of sugar cane. There are no continual or point sources of air emissions at the site and aside from intermittent burning of the sugar cane fields, there are no other sources of air pollutants in the near vicinity.

There are several potential sources of air pollution located some distance from the site which might have some impact, depending on the prevailing wind conditions. They are: Kahe Generating Station, H-Power, refineries and other industrial activities in Campbell Industrial Park, Waipahu Incinerator and Naval Air Station (NAS), Barbers Point. The tradewinds normally keep air pollutions from these sources from becoming a problem in the area; however, air quality can be compromised by lack of trades or by the presence of Kona winds.

2.8 NOISE QUALITY:

The noise quality at the site on any given day consists of aircraft operations at NAS, Barbers Point, air traffic into Honolulu and Hickam Air Force Base, Coast Guard air operations, private aircraft, and surface transportation.

In regards to aircraft operations, the most common criteria for determining the acceptability of noise in a residential community is an outdoor level of 65 Ldn. Areas outside of the NAS do not exceed this.

2.9 HISTORIC PRESERVATION:

The Kuoloa Archaeological Research staff conducted a reconnaissance survey (see Appendix C) at the site in May 1977. No surface artifacts, midden, or prehistoric structures were seen. At that time, at least twenty (20) abandoned, or partially abandoned, late historic military structures, including bunkers, barracks, and a chapel, were identified. On January 10, 1990 (see Appendix D), members of PEMCO staff verified the presence of these structures. Further coordination with the Corps of Engineers' Senior Archaeologist (Mr. C.F. Streck) was conducted in August 1990. The COE initiated coordination of a determination of no effect to historic properties with the Hawaii Preservation Office on August 20, 1990, in fulfillment of Section 106 of the National Historic Preservation Act of 1966, as amended under implementing regulations 36 CRF 800.

2.10 ACCESSIBILITY AND UTILITIES:

Access to the site is readily available via Farrington Highway and Barbers Point Access Road.

Electrical, water, and sewage facilities can be made available.

3.0 ALTERNATIVES

Three alternatives have been evaluated: the proposed action (project remediation), remediation with underground storage tanks abandoned in place, and no action. The proposed action includes removal of the USTs and sealing shut hazardous features to protect human health and the environment.

The U.S. Environmental Protection Agency has developed UST regulations to prevent leaks and spills, to detect releases and to remediate problems created by them. At present, the USTs are not in use and are subject to failure. As USTs age, the likelihood of failure increases and therefore, the possibility of environmental degradation increases. According to federal regulations, tanks installed prior to 1965 must have leak detection by December of 1989; therefore, the site is presently in non-compliance. The permanent closure of these USTs will put the site in compliance.

Two methods of closure are permitted, removal and abandonment in place. The abandonment in place alternative requires the removal of the product, dangerous vapors, sludge, appurtenance piping and devices, and filling the tank with inert material, such as sand or concrete.

When a tank is decommissioned in place, a permanent record of the tank location, date of disposal in place, and the method of conditioning the tank for disposal must be kept. Moreover, property owners and potential buyers must be informed of the presence of an abandon tank; implication is that liability does not necessarily end with the decommissioning of the tank. While abandonment is allowed when difficult terrain and expensive cost prevail, the preferred method of closure is removal.

The no action alternative would keep the project site "as is" and therefore, would be in violation of federal requirements.

4.0 ENVIRONMENTAL CONSEQUENCES

4.1 CORROSION:

Corrosion could be a problem in the future since the sealed openings (generator buildings, reservoirs, etc.) are exposed to the elements. This problem can be resolved by painting all exposed surfaces. The paint should be routinely maintained by the park personnel (C&C of Honolulu).

4.2 AIR QUALITY:

During the construction period, airborne emissions will consist of fugitive dust and construction vehicle and equipment emissions. Dust will be minimized by periodic sprinkling of water over the affected area. State laws regarding air pollution will govern the use of fuel burning equipment and internal combustion engines.

4.3 NOISE QUALITY:

Since the site is located in an open area with the nearest residential subdivision located approximately one-half mile away, noise during construction will not have a detrimental impact on the nearby residents.

4.4 HISTORIC PRESERVATION:

The proposed project shall have no effect to potentially significant cultural resources. Periodic monitoring of the construction project shall be performed by qualified archaeologists from the Corps of Engineers in order to insure that no adverse effects to unanticipated cultural resources occur.

5.0 SUMMARY and CONCLUSIONS

A number of features on the site have been determined to be a potential hazard to human health and the environment. The impacts of removal and/or modification of these features are both short term and long term. The long term impacts are beneficial in nature. The City and County of Honolulu is presently developing part of the site for a parkland. The proposed action will enhance the recreational attributes of this property. The removal of the UST's will also eliminate the possibility of an undetected release to the environment and put the project in compliance with federal requirements.

There are several potential short term impacts which will require mitigative measures:

1. A small area of vegetation will have to be cleared in order to facilitate removal of the USTs; however, it is anticipated that the vegetation will grow back. Noise, fugitive dust and construction equipment exhaust may have a temporary effect on the wildlife population, but the impacts will be minor. All Department of Health rules and regulations will be adhered to in order to mitigate these impacts.

2. It is possible to have an accidental release of tank contents, either during removal of the contents or during the removal of the tank. The contractor shall observe all safety requirements, follow procedures dictated by good engineering principles, and comply with Federal and State laws and regulations. The contractor shall provide an Accident Prevention Plan (APP) and an Activities Hazard Analysis (AHA) for situations anticipated to be encountered during the project.

In the event that a spill does occur, the contractor shall attempt to control, divert, and/or absorb the product in order to prevent further spread; and to secure the source in order to prevent additional releases. The contractor shall report all spills to the proper authorities and in a manner as required by State and Federal Law.

While the proposed action is not without adverse short term impacts, they are outweighed by the long term benefits both to human health and to the environment.

EXHIBIT A

Project Location

PROJECT LOCATION

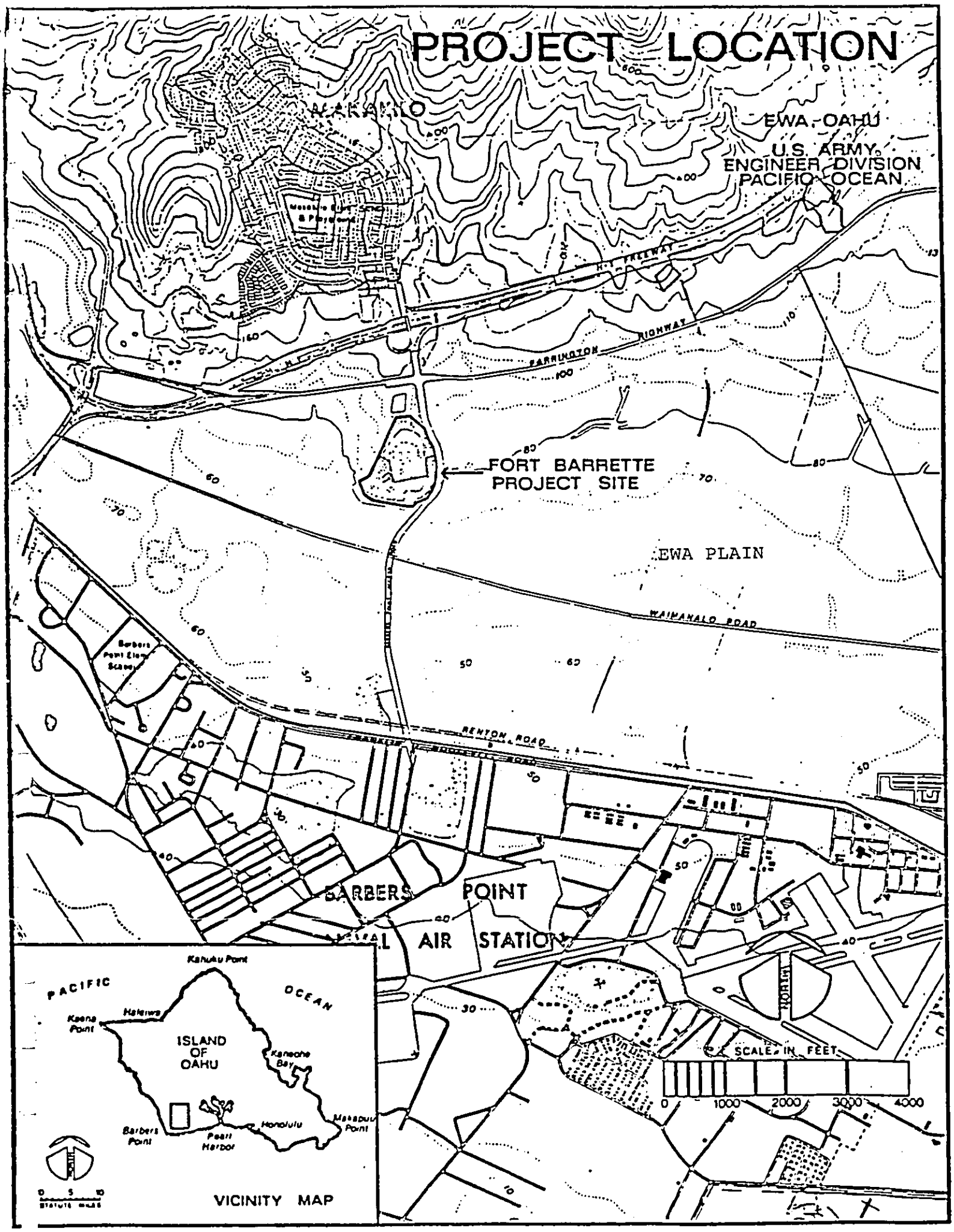


EXHIBIT B

Project Site

PROJECT SITE

EWA, OAHU
U.S. ARMY
ENGINEER DIVISION
PACIFIC OCEAN

TMK 9-1-16:6

TMK 9-1-16:9

TMK 9-1-16:7

BARBER'S POINT ACCESS ROAD

U.S. ARMY

AB LAU ESTATE

CITY & COUNTY OF HONOLULU

NORTH

SCALE IN FEET

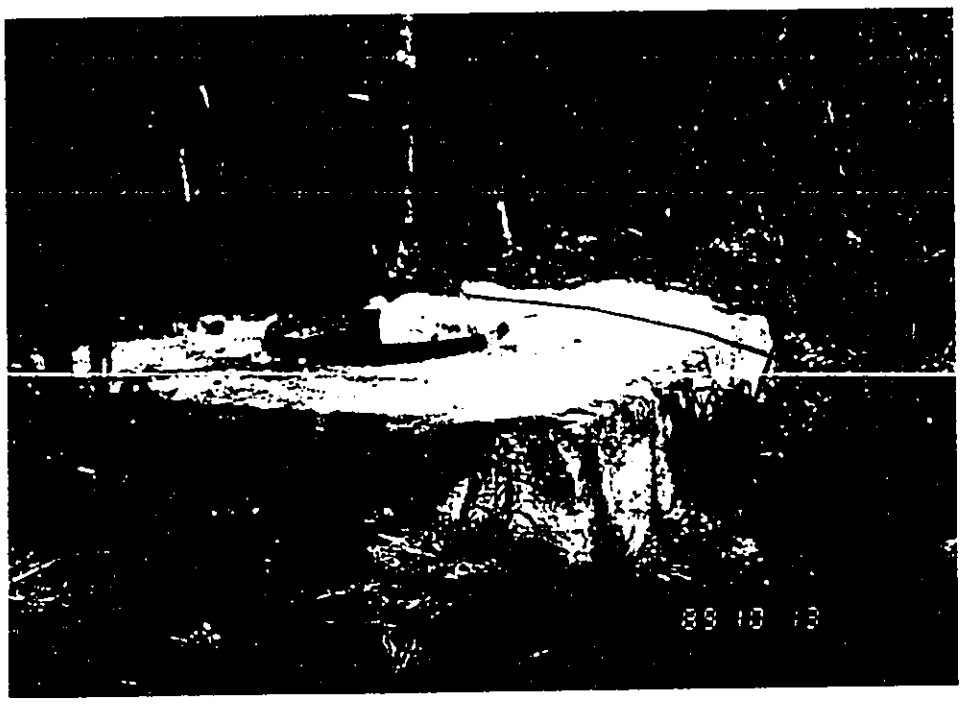
0 80 160 240 320

Structures considered hazardous

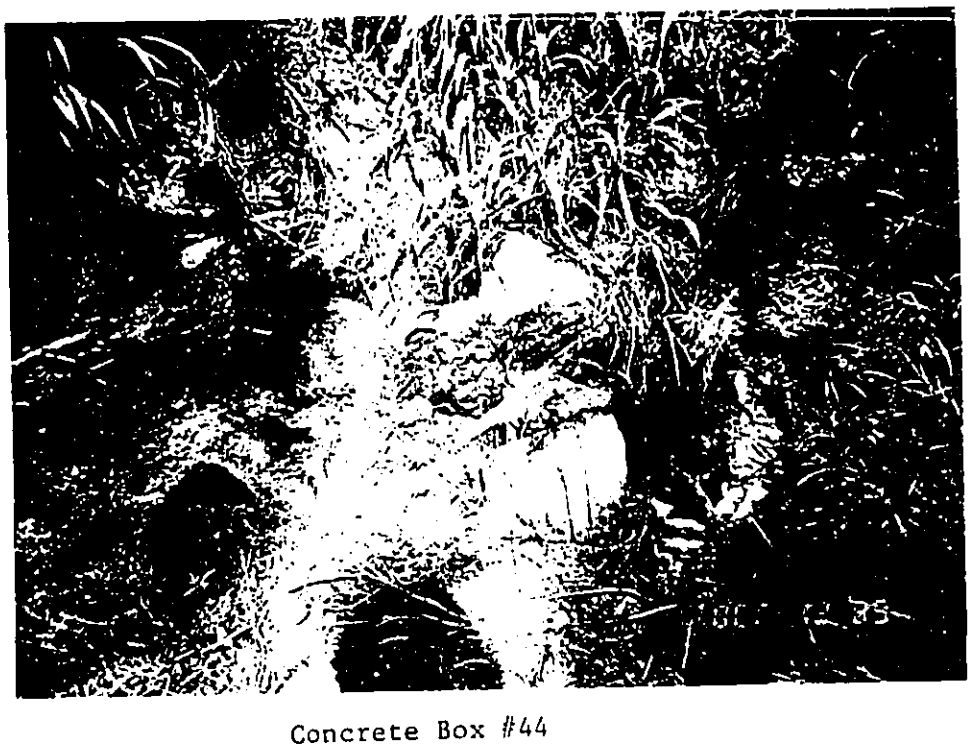
EXHIBIT C

Photographs

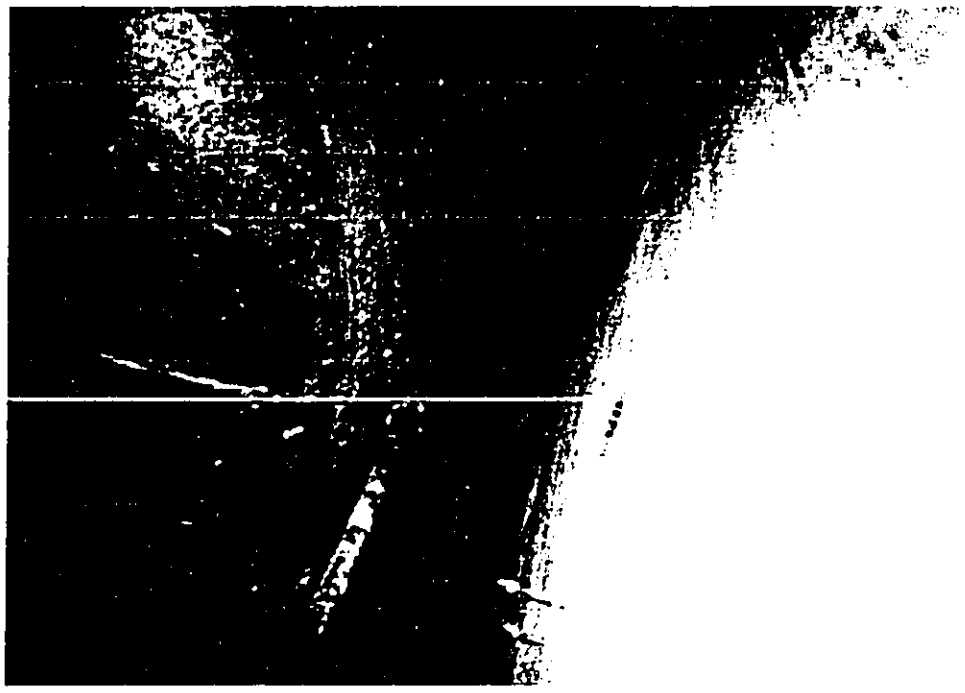
Septic Tank #30



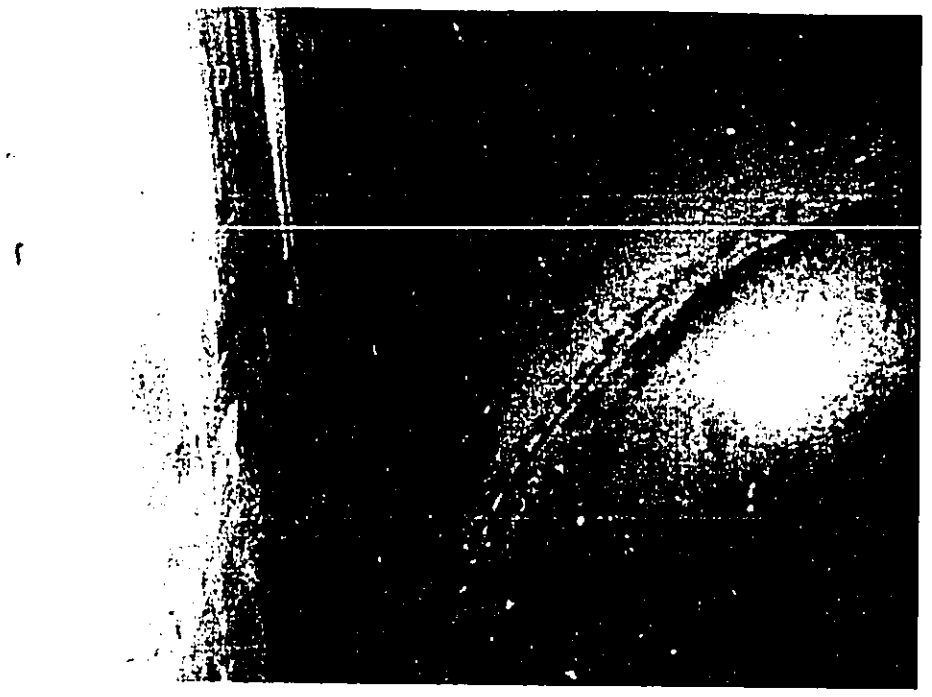
Concrete Box #41



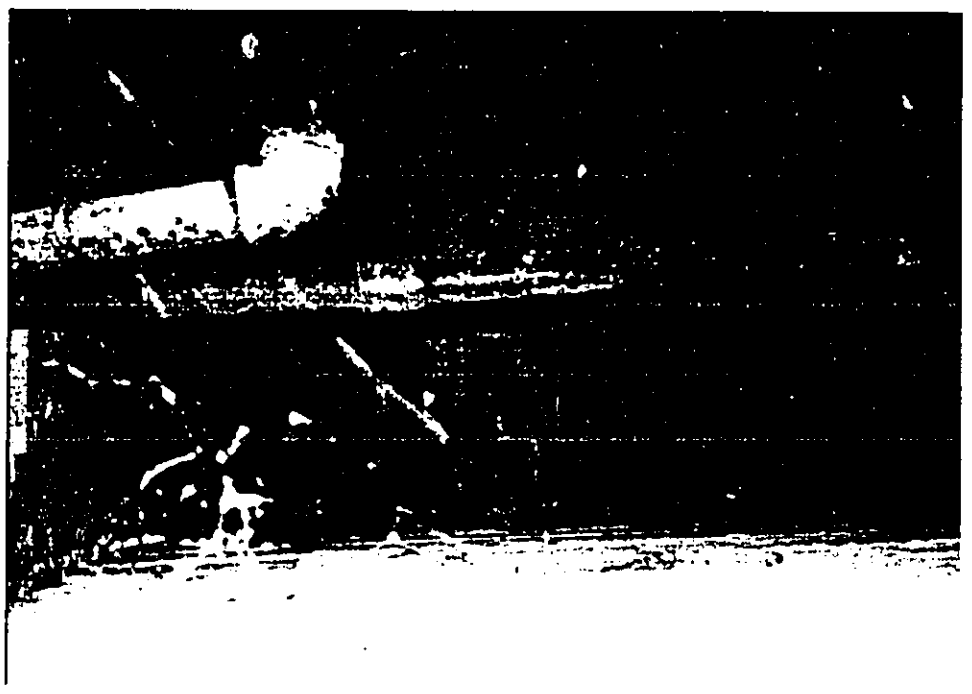
Concrete Box #44



Fuel Tank Vault #28

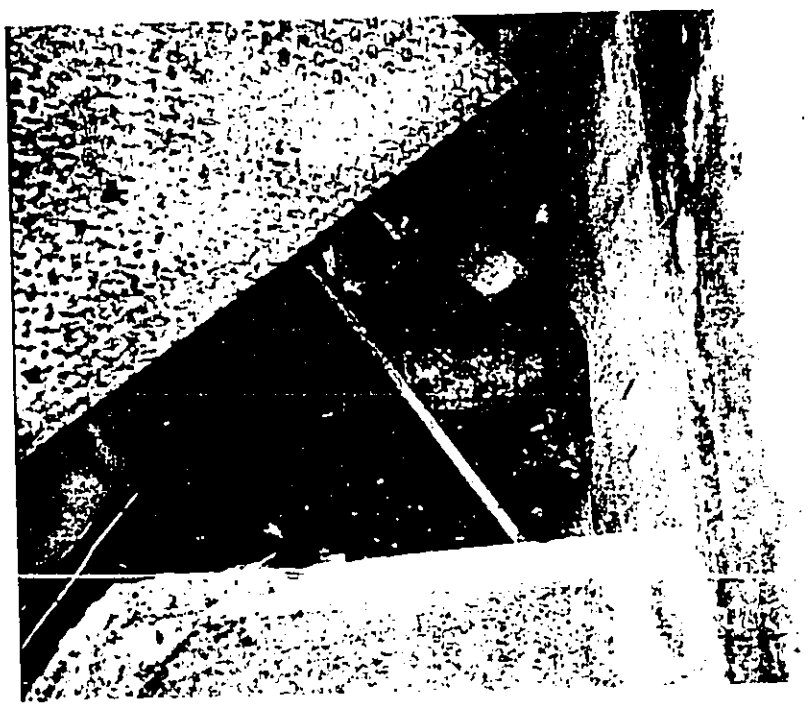


Fuel Tank Vault #28
(Tank within vault)



Fuel Tank Vault #28
(Piping)

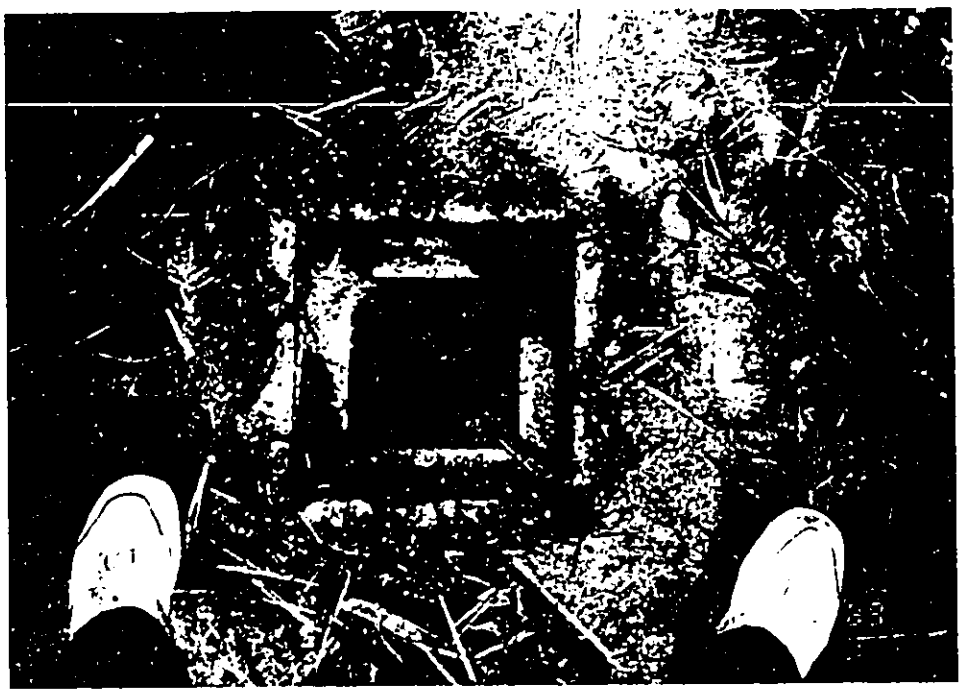
Fuel Tank Vault #32



Fuel Tank Vault #32
(Piping)

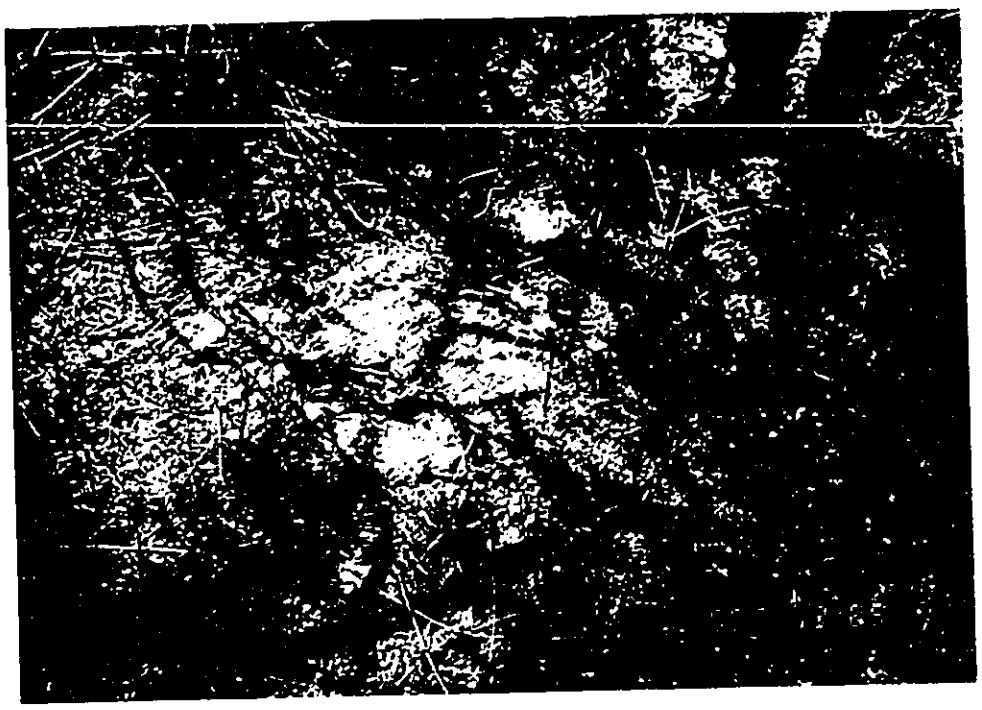
Generator Shed #29

Reservoir #46



Fuel Tank Vault #32
(Filling Port)

Fuel Tank Vault #32
(Vent)



Reservoir #46

Reservoir #46

EXHIBIT D

Master Phasing Plan
Kapolei Park/Fort Barrette

I HASING
MASTER PLAN
I'APOLEI PARK/FORT BARRETTE

DEPARTMENT OF PARKS & RECREATION • CITY & COUNTY OF HONOLULU
PREPARED BY: PHILLIPS BRAHOT REDDICK FEBRUARY 28, 1986

APPENDIX A

Memorandum from M&E Pacific, Inc. of 6/12/90
and
Chemical Analysis Report

M&E Pacific, Inc.

MEMORANDUM

June 12, 1990

TO: Files

FROM: BS

SUBJECT: Ft. Barrette - Field Sampling

Field sampling of two (2) fuel oil storage tanks on the project site was conducted on June 6, 1990 by Kay Town and Michelle Medeiros of AECOS, Inc., and Bert Saito and Tony Lau of M&E Pacific, Inc.

The project site is situated on the Ewa Plains just south of Makakilo City. Located on site is Ft. Barrette which is an abandoned Army fort acquired by the City and County of Honolulu for park development.

M&E was contracted to provide cost estimates, specifications and sketches for the removal of safety hazards at Fort Barrette. The removal of safety hazards includes the demolition and backfilling of eight (8) underground structures, sealing entries to three (3) hazardous structures and removal and disposal of two (2) diesel fuel tanks and its contents. (See Memorandum to Files dated October 13, 1989 for description of safety hazards on site)

Since the content of the diesel fuel tanks and the extent of soil contamination were unknown, a fair and equitable specification for tank closure could not be written. For this reason, M&E, together with U.S. Army Corps of Engineers, sub-contracted AECOS to sample and analyze the tanks' content and the soil within tanks' vaults.

After results are received from AECOS, M&E will complete contract specifications and sketches for tank closure at Fort Barrette.

SAMPLING METHODS AND DESCRIPTION

The diesel fuel tanks involved in the sampling are located Site No. 1 and Site No. 5 (see attached figures and photographs).

Sampling of each tank was accomplished through an uncapped vent pipe via a weighted glass vial which was lowered with nylon string.

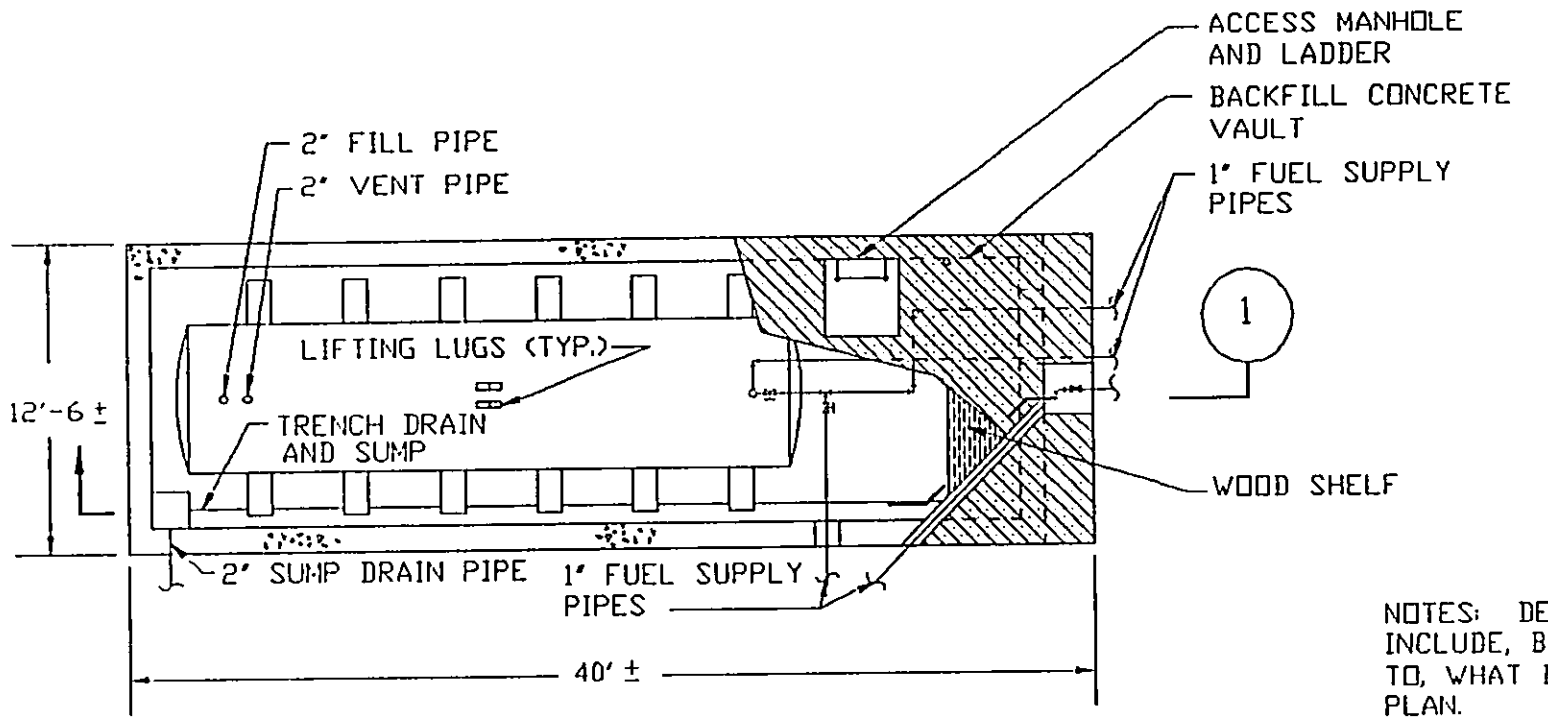
Each tank lies in a concrete vault approximately 12.5' wide by 8.5' deep by 33' long (40' long for vault at Site No. 5). Each tank is approximately 6' in diameter and 25' long and its fuel capacity is approximately 5,300 gallons. Along one side of the fuel tank is a 6" wide by 30' long by 6" deep trench drain running along one side of the vault. The downstream end of the trench runs into a 1.5' by 1.5' by 1' deep sump drain with a 2" drain pipe.

The trench and sump of each vault contained soil which was subsequently sampled for fuel oil.

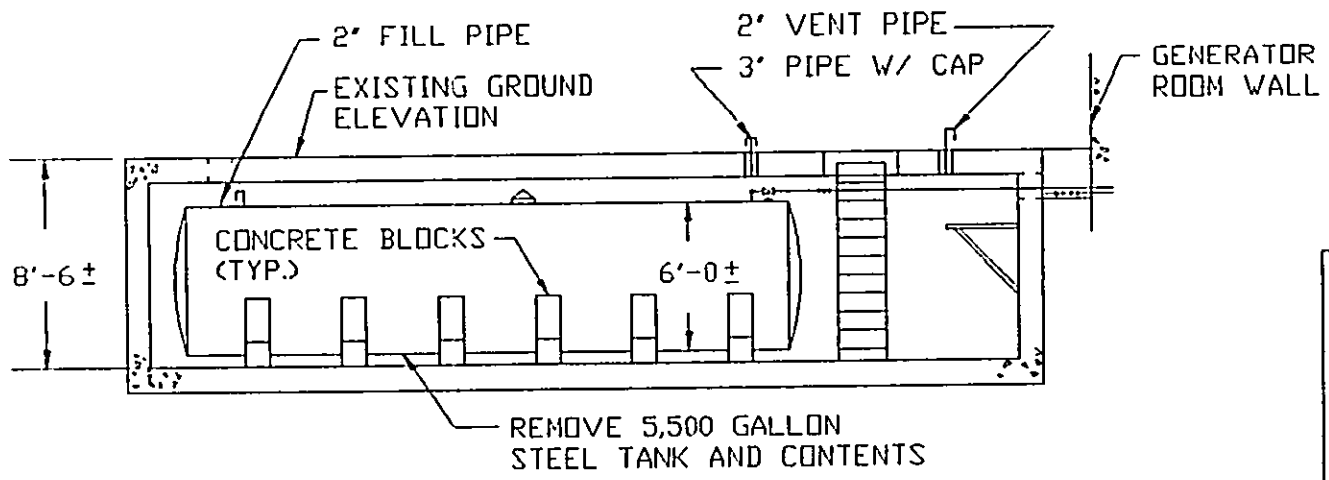
The tank at Site No. 1 had approximately 6.5 inches of liquid (240 gallons mixture of fuel and water) and the tank at Site No. 5 had no indication of liquid. The sampling bottle came up dry on the outside and, furthermore, the bottle had no smudges of oil residue (Note that the sampling was done at one end of the tank only. The tank may still contain oil residue).

MISCELLANEOUS ITEMS

AECOS indicated that the analyses of soil and liquid samples will be completed 30 days after the sampling date of June 6.



DEMOLITION PLAN OF STRUCTURE #5 (FUEL TANK)
SCALE: 1/8" = 1'-0



SECTION 1
SCALE: 1/8" = 1'-0

NOTES: DEMOLITION SHALL INCLUDE, BUT IS NOT LIMITED TO, WHAT IS SHOWN ON THIS PLAN.

CONTRACTOR SHALL VERIFY SIZE AND LOCATION OF EXISTING PIPE AND MISCELLANEOUS PIPING APPURTENANCES.

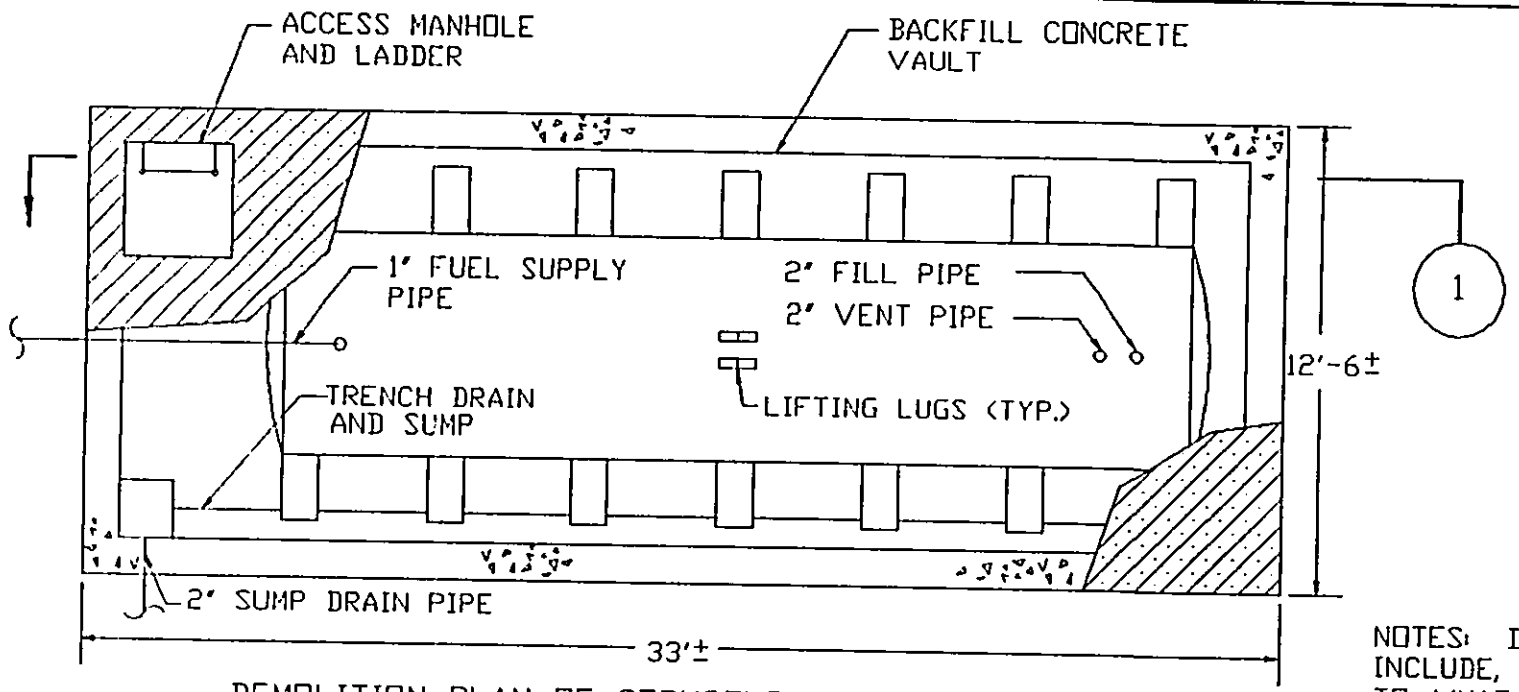
REMOVE AND CAP EXISTING PIPING AND MISCELLANEOUS PIPING APPURTENANCES.

U.S. Army Corps of Engineers
Debris Removal at Fort Barrette

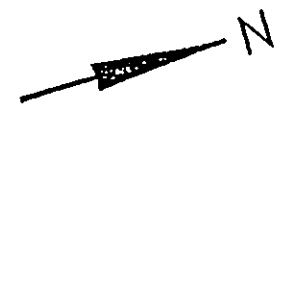
DEMOLITION PLAN OF STRUCTURE #5 (FUEL TANK)

Fort Barrette, Oahu

Prepared by:
M&E Pacific, Inc.



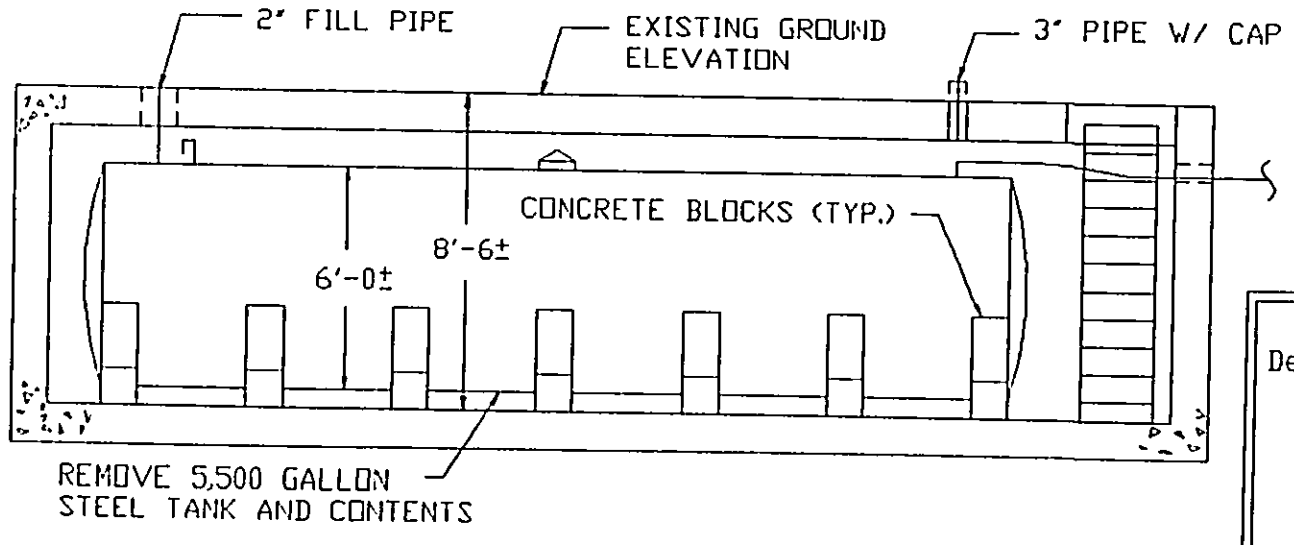
DEMOLITION PLAN OF STRUCTURE #1 (FUEL TANK)
SCALE: 3/16" = 1'-0



NOTES: DEMOLITION SHALL INCLUDE, BUT IS NOT LIMITED TO, WHAT IS SHOWN ON THIS PLAN.

CONTRACTOR SHALL VERIFY SIZE AND LOCATION OF EXISTING PIPE AND MISCELLANEOUS PIPING APPURTENANCES.

REMOVE AND CAP EXISTING PIPING AND MISCELLANEOUS PIPING APPURTENANCES.



SECTION 1
SCALE: 3/16" = 1'-0

U.S. Army Corps of Engineers
Debris Removal at Fort Barrette

DEMOLITION PLAN OF STRUCTURE #1 (FUEL TANK)

Fort Barrette, Oahu

Prepared by:
M&E Pacific, Inc.

FORT BARRETTE

PROPOSED SAFETY HAZARD REMOVAL

CHEMICAL ANALYSES

Prepared For:

M & E Pacific, Inc.
Suite 500, Pauahi Tower
1001 Bishop Street
Honolulu, Hawaii 96813-3497

Prepared By:

AECOS, Inc.
970 North Kalaheo Avenue, A300
Kailua, Hawaii 96734

July 1990

The subjects of the investigation were underground fuel storage Tank # 1 and Tank # 5 (figure 1) located at Fort Barrette, Ewa, Hawaii. Both tanks were located below ground level within concrete vaults. AECOS representatives, Michelle Medeiros and Kay Town, and M & E Pacific representatives, Bert Saito and Tony Lau, conducted the sampling event.

A laddered entry into the vault was available. Both tanks were raised above the floor of the vault by concrete supports. A drainage trench spanning the length of the tank at the edge of the vault contained soil. A total of eight (8) 40 ml vials, one vial between each concrete support, was collected from the drainage trench. The vials from each tank vault were respectively composited at AECOS to constitute a single soil for each tank. AECOS identified Tank #1 soil by log number [4455] and Tank #5 soil by log number [4456].

The contents of each tank were accessed through an uncapped vent protruding above the concrete vault at ground level. A 40 milliliter glass vial was lowered on a length of string into the tank. 1 - 500 ml glass bottle and 2 - 40 ml glass VOA vials of organic liquid were collected from Tank #1. AECOS identified Tank #1 organic liquid by log number [4454]. The vial deployed into Tank #5 was retrieved dry and unsoiled; no liquid was detected or collected from Tank #5.

AECOS submitted 2 - 40ml glass vials of soil for each Tank #1 and Tank #5 and 2 - 40 ml glass vials of organic liquid from Tank #1 to Brewer Analytical Laboratories in Hilo, Hawaii for analysis of purgeable halocarbon content using EPA method number 8010; no detectable quantities were reported. Results of purgeable halocarbon analyses are reported in Table I.

AECOS analyzed samples [4454], [4455], and [4456] for organochlorine pesticides and polychlorinated biphenyls (PCB) by EPA method number 8080. No detectable quantities were reported. Results of organochlorines pesticides and PCB analyses are reported in Table II.

The gasoline and diesel content of the organic liquid sample [4454] from Tank #1 was determined by AECOS by a modified version of EPA method number 8015 using the direct injection technique. Results of the total petroleum hydrocarbons analysis identified the organic liquid [4454] as diesel fuel. These results are summarized in Table III.

The soil samples from Tank #1 [4455] and Tank #5 [4456] were analyzed by a modified version of EPA method number 8015 using the headspace technique. Results of the total petroleum hydrocarbon analyses detected no quantifiable quantities of gasoline or diesel. Table III summarizes these results.

TABLE I A

Fort Barrette UST
Tank #1 Organic Liquid

Purgeable Halocarbon
(ug/L)

	Tank # 1 Organic Liquid	Detection Limit
Bromobenzene	ND*	5
Bromodichloromethane	ND*	5
Bromoform	ND*	5
Bromomethane	ND*	5
Carbon tetrachloride	ND*	5
Chlorobenzene	ND*	5
Chloroethane	ND*	5
Chloroform	ND*	5
Chloromethane	ND*	5
Chlorotoluene	ND*	5
Dibromochloromethane	ND*	5
Dibromomethane	ND*	5
1,2-Dichlorobenzene	ND*	5
1,3-Dichlorobenzene	ND*	5
1,4-Dichlorobenzene	ND*	5
Dichlorodifluoromethane	ND*	5
1,1-Dichloroethane	ND*	5
1,2-Dichloroethane	ND*	5
1,1-Dichloroethylene	ND*	5
trans-1,2-Dichloroethylene	ND*	5
Dichloromethane	ND*	5
1,2-Dichloropropane	ND*	5
trans 1,3-Dichloropropylene	ND*	5
1,1,2,2-Tetrachloroethane	ND*	5
1,1,1,2 Tetrachloroethane	ND*	5
Tetrachloroethylene	ND*	5
1,1,1-Trichloroethane	ND*	5
1,1,2-Trichloroethane	ND*	5
Trichloroethylene	ND*	5
Trichlorofluoromethane	ND*	5
Trichloropropane	ND*	5
Vinyl Chloride	ND*	5

* ND = Parameter not detected

TABLE I B

Fort Barrette UST
Tank #1 Soil

Purgeable Halocarbon
(ug/L)

	Tank # 1 Soil	Detection Limit
Bromobenzene	ND*	2
Bromodichloromethane	ND*	2
Bromoform	ND*	2
Bromomethane	ND*	2
Carbon tetrachloride	ND*	2
Chlorobenzene	ND*	2
Chloroethane	ND*	2
Chloroform	ND*	2
Chloromethane	ND*	2
Chlorotoluene	ND*	2
Dibromochloromethane	ND*	2
Dibromomethane	ND*	2
1,2-Dichlorobenzene	ND*	2
1,3-Dichlorobenzene	ND*	2
1,4-Dichlorobenzene	ND*	2
Dichlorodifluoromethane	ND*	2
1,1-Dichloroethane	ND*	2
1,2-Dichloroethane	ND*	2
1,1-Dichloroethylene	ND*	2
trans-1,2-Dichloroethylene	ND*	2
Dichloromethane	ND*	2
1,2-Dichloropropane	ND*	2
trans 1,3-Dichloropropylene	ND*	2
1,1,2,2-Tetrachloroethane	ND*	2
1,1,1,2 Tetrachloroethane	ND*	2
Tetrachloroethylene	ND*	2
1,1,1-Trichloroethane	ND*	2
1,1,2-Trichloroethane	ND*	2
Trichloroethylene	ND*	2
Trichlorofluoromethane	ND*	2
Trichloropropane	ND*	2
Vinyl Chloride	ND*	2

* ND = Parameter not detected

TABLE I C

Fort Barrette UST
Tank #5 Soil

Purgeable Halocarbon
(ug/L)

	Tank # 5 Soil	Detection Limit
Bromobenzene	ND*	2
Bromodichloromethane	ND*	2
Bromoform	ND*	2
Bromomethane	ND*	2
Carbon tetrachloride	ND*	2
Chlorobenzene	ND*	2
Chloroethane	ND*	2
Chloroform	ND*	2
Chloromethane	ND*	2
Chlorotoluene	ND*	2
Dibromochloromethane	ND*	2
Dibromomethane	ND*	2
1,2-Dichlorobenzene	ND*	2
1,3-Dichlorobenzene	ND*	2
1,4-Dichlorobenzene	ND*	2
Dichlorodifluoromethane	ND*	2
1,1-Dichloroethane	ND*	2
1,2-Dichloroethane	ND*	2
1,1-Dichloroethylene	ND*	2
trans-1,2-Dichloroethylene	ND*	2
Dichloromethane	ND*	2
1,2-Dichloropropane	ND*	2
trans 1,3-Dichloropropylene	ND*	2
1,1,2,2-Tetrachloroethane	ND*	2
1,1,1,2 Tetrachloroethane	ND*	2
Tetrachloroethylene	ND*	2
1,1,1-Trichloroethane	ND*	2
1,1,2-Trichloroethane	ND*	2
Trichloroethylene	ND*	2
Trichlorofluoromethane	ND*	2
Trichloropropane	ND*	2
Vinyl Chloride	ND*	2

* ND = Parameter not detected

TABLE II A

Fort Barrette UST
Tank # 1 Organic Liquid

Organochlorine Pesticides and PCBs
(ug/L)

	Tank # 1 Organic Liquid	Detection Limit
Aldrin	ND*	0.1
Alpha-BHC	ND*	0.1
Beta-BHC	ND*	0.2
Delta-BHC	ND*	0.1
Lindane	ND*	0.1
Chlordane	ND*	10
4,4'DDD	ND*	2.5
4,4'DDE	ND*	2.5
4,4'DDT	ND*	5.0
Dieldrin	ND*	2.0
Endosulfan I	ND*	2.0
Endosulfan II	ND*	2.0
Endosulfan Sulfate	ND*	2.5
Endrin	ND*	2.5
Endrin Aldehyde	ND*	2.5
Heptachlor	ND*	0.1
Heptachlor Epoxide	ND*	2.0
Methoxychlor	ND*	8
Toxaphene	ND*	30
Arochlor 1016	ND*	3
Arochlor 1221	ND*	5
Arochlor 1232	ND*	5
Arochlor 1242	ND*	3
Arochlor 1248	ND*	2
Arochlor 1254	ND*	8
Arochlor 1260	ND*	8

TABLE II B

Fort Barrette UST
Tank # 1 Soil

Organochlorine Pesticides and PCBs
(ug/L)

	Tank # 1 Soil	Detection Limit
Aldrin	ND*	0.01
Alpha-BHC	ND*	0.01
Beta-BHC	ND*	0.01
Delta-BHC	ND*	0.01
Lindane	ND*	0.01
Chlordane	ND*	0.10
4,4'DDD	ND*	0.04
4,4'DDE	ND*	0.04
4,4'DDT	ND*	0.03
Dieldrin	ND*	0.01
Endosulfan I	ND*	0.01
Endosulfan II	ND*	0.02
Endosulfan Sulfate	ND*	0.04
Endrin	ND*	0.02
Endrin Aldehyde	ND*	0.02
Heptachlor	ND*	0.01
Heptachlor Epoxide	ND*	0.02
Methoxychlor	ND*	0.03
Toxaphene	ND*	0.15
Arochlor 1016	ND*	0.15
Arochlor 1221	ND*	0.20
Arochlor 1232	ND*	0.20
Arochlor 1242	ND*	0.10
Arochlor 1248	ND*	0.10
Arochlor 1254	ND*	0.15
Arochlor 1260	ND*	0.15

TABLE II C

Fort Barrette UST
Tank # 5 Soil

Organochlorine Pesticides and PCBs
(ug/L)

	Tank # 5 Soil	Detection Limit
Aldrin	ND*	0.01
Alpha-BHC	ND*	0.01
Beta-BHC	ND*	0.01
Delta-BHC	ND*	0.01
Lindane	ND*	0.01
Chlordane	ND*	0.10
4,4'DDD	ND*	0.04
4,4'DDE	ND*	0.04
4,4'DDT	ND*	0.03
Dieldrin	ND*	0.01
Endosulfan I	ND*	0.01
Endosulfan II	ND*	0.02
Endosulfan Sulfate	ND*	0.04
Endrin	ND*	0.02
Endrin Aldehyde	ND*	0.02
Heptachlor	ND*	0.01
Heptachlor Epoxide	ND*	0.02
Methoxychlor	ND*	0.03
Toxaphene	ND*	0.15
Arochlor 1016	ND*	0.15
Arochlor 1221	ND*	0.20
Arochlor 1232	ND*	0.20
Arochlor 1242	ND*	0.10
Arochlor 1248	ND*	0.10
Arochlor 1254	ND*	0.15
Arochlor 1260	ND*	0.15

TABLE III A

Fort Barrette UST
Tank # 1 Organic Liquid

Total Petroleum Hydrocarbons
(%)

	Tank # 1 Organic Liquid	Detection Limit
Gasoline	ND	0.5
Diesel	100	0.5

ND = Parameter not detected

TABLE III B

Fort Barrette UST
Tank # 1 Soil

Total Petroleum Hydrocarbons
(mg/kg)

	Tank # 1 Soil	Detection Limit
Gasoline	ND	0.5
Diesel	ND	0.5

ND = Parameter not detected

TABLE III C

Fort Barrette UST
Tank # 5 Soil

Total Petroleum Hydrocarbons
(mg/kg)

	Tank # 5 Soil	Detection Limit
Gasoline	ND	0.5
Diesel	ND	0.5

ND = Parameter not detected

Figure 1

Map of project area (prepared by M & E Pacific).

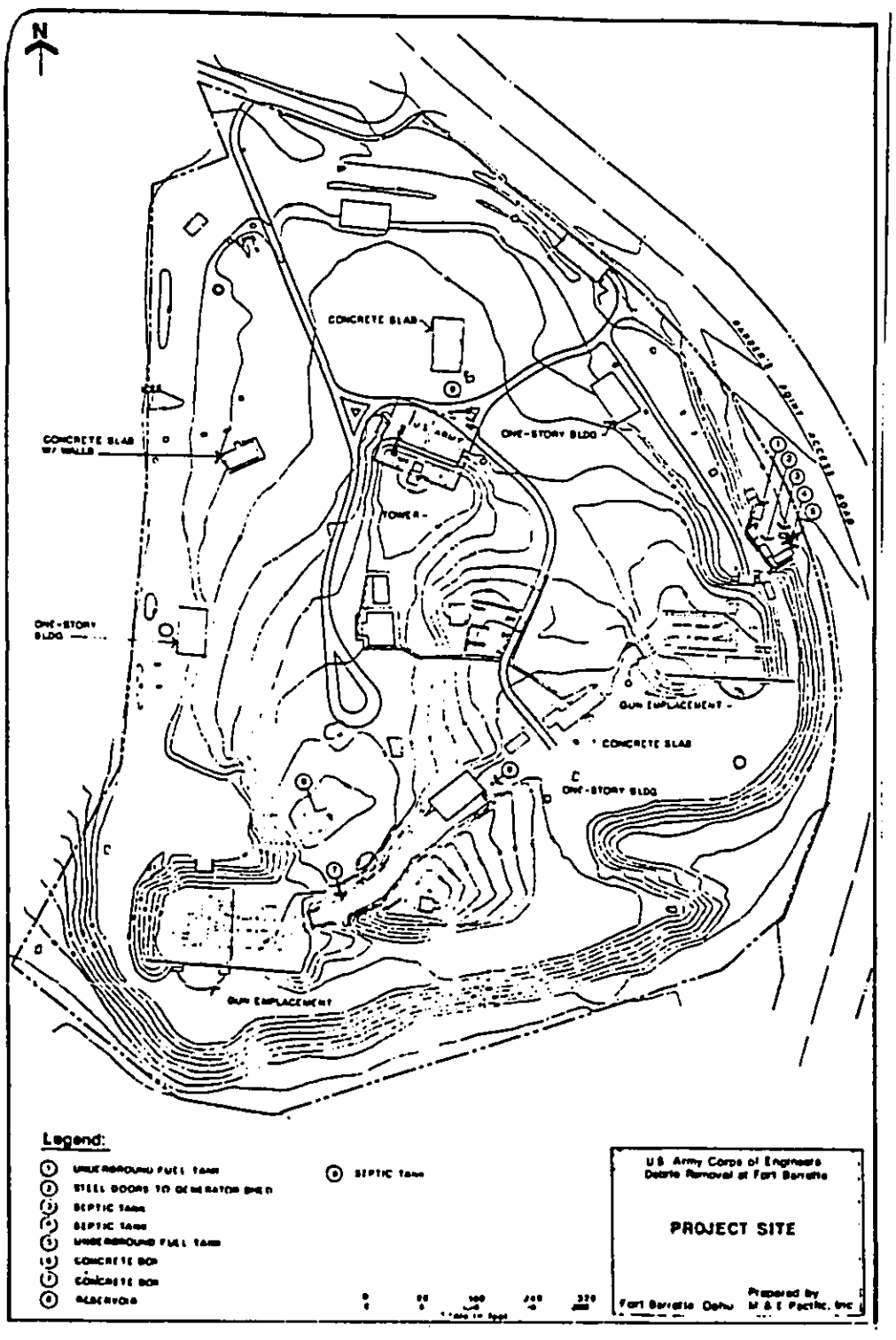


Figure 2

Laddered entry to Tank # 5 vault.

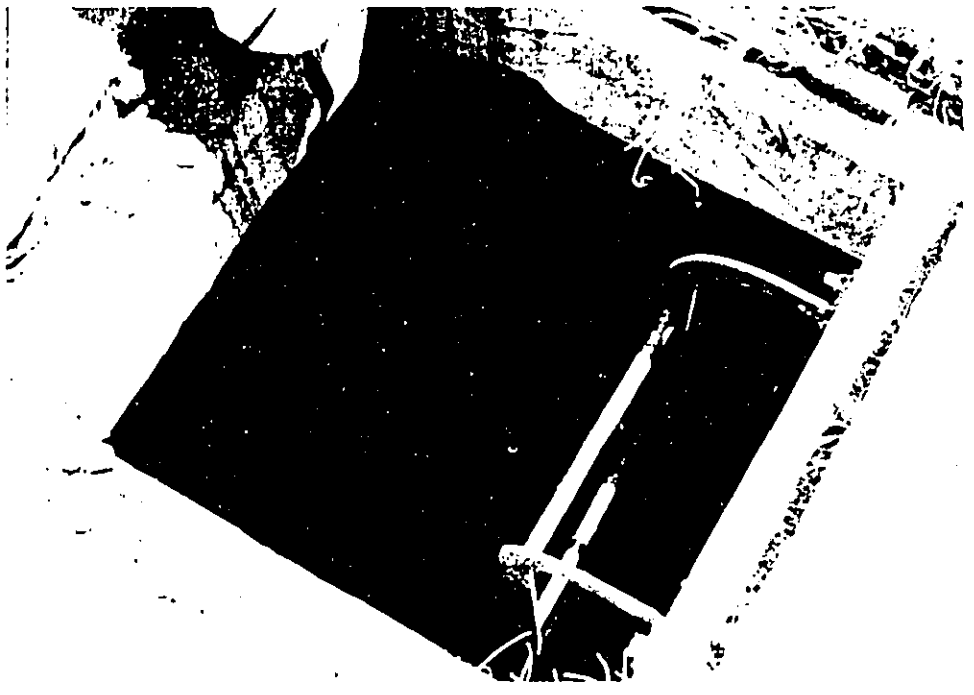


Figure 3

Sampling Tank # 1 through uncapped vent.

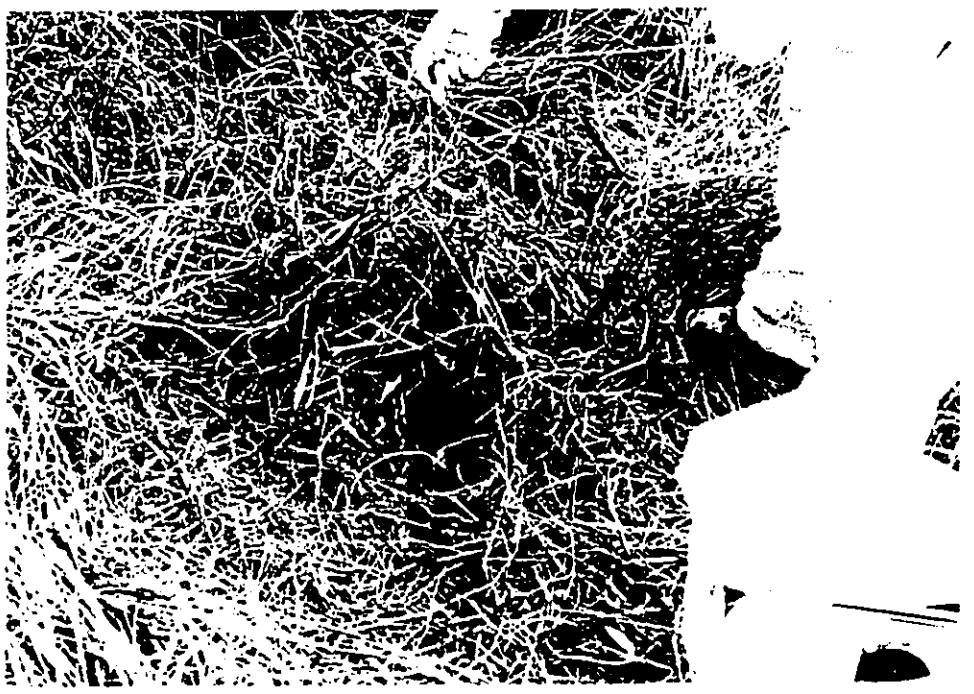


Figure 4

Sampling Tank # 5 through uncapped vent. Vial repeatedly retrieved empty and unsoiled.

Figures 5

Noting sampling events in the field. Ground level area over Tank # 5.

APPENDIX B

Federal Register. Environmental Protection Agency.
40 CFR Parts 280 and 281. Underground Storage Tanks

Friday
September 23, 1988

Part II

Environmental Protection Agency

40 CFR Parts 280 and 281

Underground Storage Tanks; Technical Requirements and State Program Approval; Final Rules

b. *Small Businesses in the General Industry Sector.* An estimated 24 to 41 percent of all USTs in the general industry sector are owned by firms with less than $1 million in assets. A typical small firm in this segment was assumed to have $300,000 in assets and net profits of $21,000 a year. Overall, these firms represent about 12 percent of all UST-owning firms in the general industry sector.

The cost of corrective action for non-plume release (i.e., no ground-water contamination) would leave a small general industry firm in severe financial distress, and the cost of corrective action for a plume release (i.e., contamination of ground water) would lead to the failure of the firm. Replacing a tank would cause a small general industry firm a temporary financial hardship; however, this hardship would not seriously threaten the survival of the firm.

c. *Small Local Government Entities.* Local government entities of all sizes own USTs. In 1982, the typical municipality with a population less than 50,000 had general revenues of $1.7 million. The costs of replacing even a single UST would represent 2 percent of the revenue of such a municipality, a significant expenditure that would have to be taken into account when planning. A corrective action that required cleaning up a dispersed plume would represent more than 13 percent of the general revenues of such a community, a sum that would probably cause severe financial distress.

In 1982, of the 38,886 local governments classified as counties, municipalities, and townships, 37,581 (approximately 97 percent) had populations of 50,000 or less. Almost all UST-owning local governments would, therefore, be subject to potentially substantial economic impacts under the technical standards rule if an UST release occurred.

C. Paperwork Reduction Act

The information collection requirements in this rule have been approved by the Office of Management and Budget (OMB) under the Paperwork Reduction Act (44 U.S.C. 3501 *et seq.*) and have been assigned OMB Control Number 2050–0068. Reporting and recordkeeping burden on the public for this collection is estimated at 8,265,229 hours for the 1,750,000 respondents, with an average of 4 hours per response. These burden estimates include all aspects of the collection effort and may include time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

If you wish to submit comments regarding any aspect of this collection of information, including suggestions for reducing the burden, or if you would like a copy of the information collection request (please reference ICR # 1360), contact Rick Westlund, Information Policy Branch, PM-223, U.S. Environmental Protection Agency, 401 M Street SW., Washington, DC 20460 (202–382–2745); and Marcus Peacock, Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, DC 20503.

List of Subjects in 40 CFR Part 280

Administration practice and procedures, Confidential business information, Ground water, Hazardous materials, Reporting and recordkeeping requirements, Underground storage tanks, Water pollution control, Water supply.

September 8, 1988.

Lee Thomas,

Administrator.

For the reasons set out in the Preamble, Part 280 of Title 40 of the Code of Federal Regulations is revised to read as follows:

PART 280—TECHNICAL STANDARDS AND CORRECTIVE ACTION REQUIREMENTS FOR OWNERS AND OPERATORS OF UNDERGROUND STORAGE TANKS (UST)

Subpart A—Program Scope and Interim Prohibition

Authority: 42 U.S.C. 6912, 6991, 6991(a), 6991(b), 6991(c), 6991(d), 6991(e), 6991(f), 6991(h).

Subpart A—Program Scope and Interim Prohibition

§ 280.10 Applicability.

(a) The requirements of this part apply to all owners and operators of an UST system as defined in § 280.12 except as otherwise provided in paragraphs (b), (c), and (d) of this section. Any UST system listed in paragraph (c) of this section must meet the requirements of § 280.11.

(b) The following UST systems are excluded from the requirements of this part:

(1) Any UST system holding hazardous wastes listed or identified under Subtitle C of the Solid Waste Disposal Act, or a mixture of such hazardous waste and other regulated substances.

(2) Any wastewater treatment tank system that is part of a wastewater

treatment facility regulated under section 402 or 307(b) of the Clean Water Act.

(3) Equipment or machinery that contains regulated substances for operational purposes such as hydraulic lift tanks and electrical equipment tanks.

(4) Any UST system whose capacity is 110 gallons or less.

(5) Any UST system that contains a *de minimis* concentration of regulated substances.

(6) Any emergency spill or overflow containment UST system that is expeditiously emptied after use.

(c) *Deferrals.* Subparts B, C, D, E, and G do not apply to any of the following types of UST systems:

(1) Wastewater treatment tank systems;

(2) Any UST systems containing radioactive material that are regulated under the Atomic Energy Act of 1954 (42 U.S.C. 2011 and following);

(3) Any UST system that is part of an emergency generator system at nuclear power generation facilities regulated by the Nuclear Regulatory Commission under 10 CFR Part 50, Appendix A;

(4) Airport hydrant fuel distribution systems; and

(5) UST systems with field-constructed tanks.

(d) *Deferrals.* Subpart D does not apply to any UST system that stores fuel solely for use by emergency power generators.

§ 280.11 Interim prohibition for deferred UST systems.

(a) No person may install an UST system listed in § 280.10(c) for the purpose of storing regulated substances unless the UST system (whether of single- or double-wall construction):

(1) Will prevent releases due to corrosion or structural failure for the operational life of the UST system;

(2) Is cathodically protected against corrosion, constructed of noncorrodible material, steel clad with a noncorrodible material, or designed in a manner to prevent the release or threatened release of any stored substance; and

(3) Is constructed or lined with material that is compatible with the stored substance.

(b) Notwithstanding paragraph (a) of this section, an UST system without corrosion protection may be installed at a site that is determined by a corrosion expert not to be corrosive enough to cause it to have a release due to corrosion during its operating life. Owners and operators must maintain records that demonstrate compliance with the requirements of this paragraph for the remaining life of the tank.

Note: The National Association of Corrosion Engineers Standard RP-02-85, "Control of External Corrosion on Metallic Buried, Partially Buried, or Submerged Liquid Storage Systems," may be used as guidance for complying with paragraph (b) of this section.

§ 280.12 Definitions.

"Aboveground release" means any release to the surface of the land or to surface water. This includes, but is not limited to, releases from the aboveground portion of an UST system and aboveground releases associated with overfills and transfer operations as the regulated substance moves to or from an UST system.

"Ancillary equipment" means any devices including, but not limited to, such devices as piping, fittings, flanges, valves, and pumps used to distribute, meter, or control the flow of regulated substances to and from an UST.

"Belowground release" means any release to the subsurface of the land and to ground water. This includes, but is not limited to, releases from the belowground portions of an underground storage tank system and belowground releases associated with overfills and transfer operations as the regulated substance moves to or from an underground storage tank.

"Beneath the surface of the ground" means beneath the ground surface or otherwise covered with earthen materials.

"Cathodic protection" is a technique to prevent corrosion of a metal surface by making that surface the cathode of an electrochemical cell. For example, a tank system can be cathodically protected through the application of either galvanic anodes or impressed current.

"Cathodic protection tester" means a person who can demonstrate an understanding of the principles and measurements of all common types of cathodic protection systems as applied to buried or submerged metal piping and tank systems. At a minimum, such persons must have education and experience in soil resistivity, stray current, structure-to-soil potential, and component electrical isolation measurements of buried metal piping and tank systems.

"CERCLA" means the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended.

"Compatible" means the ability of two or more substances to maintain their respective physical and chemical properties upon contact with one another for the design life of the tank system under conditions likely to be encountered in the UST.

"Connected piping" means all underground piping including valves, elbows, joints, flanges, and flexible connectors attached to a tank system through which regulated substances flow. For the purpose of determining how much piping is connected to any individual UST system, the piping that joins two UST systems should be allocated equally between them.

"Consumptive use" with respect to heating oil means consumed on the premises.

"Corrosion expert" means a person who, by reason of thorough knowledge of the physical sciences and the principles of engineering and mathematics acquired by a professional education and related practical experience, is qualified to engage in the practice of corrosion control on buried or submerged metal piping systems and metal tanks. Such a person must be accredited or certified as being qualified by the National Association of Corrosion Engineers or be a registered professional engineer who has certification or licensing that includes education and experience in corrosion control of buried or submerged metal piping systems and metal tanks.

"Dielectric material" means a material that does not conduct direct electrical current. Dielectric coatings are used to electrically isolate UST systems from the surrounding soils. Dielectric bushings are used to electrically isolate portions of the UST system (e.g., tank from piping).

"Electrical equipment" means underground equipment that contains dielectric fluid that is necessary for the operation of equipment such as transformers and buried electrical cable.

"Excavation zone" means the volume containing the tank system and backfill material bounded by the ground surface, walls, and floor of the pit and trenches into which the UST system is placed at the time of installation.

"Existing tank system" means a tank system used to contain an accumulation of regulated substances or for which installation has commenced on or before December 22, 1988. Installation is considered to have commenced if:

(a) The owner or operator has obtained all federal, state, and local approvals or permits necessary to begin physical construction of the site or installation of the tank system; and if,

(b)(1) Either a continuous on-site physical construction or installation program has begun; or,

(2) The owner or operator has entered into contractual obligations—which cannot be cancelled or modified without substantial loss—for physical

construction at the site or installation of the tank system to be completed within a reasonable time.

"Farm tank" is a tank located on a tract of land devoted to the production of crops or raising animals, including fish, and associated residences and improvements. A farm tank must be located on the farm property. "Farm" includes fish hatcheries, rangeland and nurseries with growing operations.

"Flow-through process tank" is a tank that forms an integral part of a production process through which there is a steady, variable, recurring, or intermittent flow of materials during the operation of the process. Flow-through process tanks do not include tanks used for the storage of materials prior to their introduction into the production process or for the storage of finished products or by products from the production process.

"Free product" refers to a regulated substance that is present as a non-aqueous phase liquid (e.g., liquid not dissolved in water.)

"Gathering lines" means any pipeline, equipment, facility, or building used in the transportation of oil or gas during oil or gas production or gathering operations.

"Hazardous substance UST system" means an underground storage tank system that contains a hazardous substance defined in section 101(14) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (but not including any substance regulated as a hazardous waste under subtitle C) or any mixture of such substances and petroleum, and which is not a petroleum UST system.

"Heating oil" means petroleum that is No. 1, No. 2, No. 4—light, No. 4—heavy, No. 5—light, No. 5—heavy, and No. 6 technical grades of fuel oil; other residual fuel oils (including Navy Special Fuel Oil and Bunker C); and other fuels when used as substitutes for one of these fuel oils. Heating oil is typically used in the operation of heating equipment, boilers, or furnaces.

"Hydraulic lift tank" means a tank holding hydraulic fluid for a closed loop mechanical system that uses compressed air or hydraulic fluid to operate lifts, elevators, and other similar devices.

"Implementing agency" means EPA, or, in the case of a state with a program approved under section 9001 (or pursuant to a memorandum of agreement with EPA), the designated state or local agency responsible for carrying out an approved UST program.

"Liquid trap" means sumps, well cellars, and other traps used in association with oil and gas production, gathering, and extraction operations (including gas production plants), for the purpose of collecting oil, water, and other liquids. These liquid traps may temporarily collect liquids for subsequent disposition or reinjection into a production or pipeline stream, or may collect and separate liquids from a gas stream.

"Maintenance" means the normal operational upkeep to prevent an underground storage tank system from releasing product.

"Motor fuel" means petroleum or a petroleum-based substance that is motor gasoline, aviation gasoline, No. 1 or No. 2 diesel fuel, or any grade of gasohol, and is typically used in the operation of a motor engine.

"New tank system" means a tank system that will be used to contain an accumulation of regulated substances and for which installation has commenced after December 22, 1988. (See also "Existing Tank System.")

"Noncommercial purposes" with respect to motor fuel means not for resale.

"On the premises where stored" with respect to heating oil means UST systems located on the same property where the stored heating oil is used.

"Operational life" refers to the period beginning when installation of the tank system has commenced until the time the tank system is properly closed under Subpart G.

"Operator" means any person in control of, or having responsibility for, the daily operation of the UST system.

"Overfill release" is a release that occurs when a tank is filled beyond its capacity, resulting in a discharge of the regulated substance to the environment.

"Owner" means:

(a) In the case of an UST system in use on November 8, 1984, or brought into use after that date, any person who owns an UST system used for storage, use, or dispensing of regulated substances; and

(b) In the case of any UST system in use before November 8, 1984, but no longer in use on that date, any person who owned such UST immediately before the discontinuation of its use.

"Person" means an individual, trust, firm, joint stock company, Federal agency, corporation, state, municipality, commission, political subdivision of a state, or any interstate body. "Person" also includes a consortium, a joint venture, a commercial entity, and the United States Government.

"Petroleum UST system" means an underground storage tank system that contains petroleum or a mixture of petroleum with de minimis quantities of other regulated substances. Such systems include those containing motor fuels, jet fuels, distillate fuel oils, residual fuel oils, lubricants, petroleum solvents, and used oils.

"Pipe" or "Piping" means a hollow cylinder or tubular conduit that is constructed of non-earthen materials.

"Pipeline facilities (including gathering lines)" are new and existing pipe rights-of-way and any associated equipment, facilities, or buildings.

"Regulated substance" means:

(a) Any substance defined in section 101(14) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980 (but not including any substance regulated as a hazardous waste under subtitle C), and

(b) Petroleum, including crude oil or any fraction thereof that is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute).

The term "regulated substance" includes but is not limited to petroleum and petroleum-based substances comprised of a complex blend of hydrocarbons derived from crude oil though processes of separation, conversion, upgrading, and finishing, such as motor fuels, jet fuels, distillate fuel oils, residual fuel oils, lubricants, petroleum solvents, and used oils.

"Release" means any spilling, leaking, emitting, discharging, escaping, leaching or disposing from an UST into ground water, surface water or subsurface soils.

"Release detection" means determining whether a release of a regulated substance has occurred from the UST system into the environment or into the interstitial space between the UST system and its secondary barrier or secondary containment around it.

"Repair" means to restore a tank or UST system component that has caused a release of product from the UST system.

"Residential tank" is a tank located on property used primarily for dwelling purposes.

"SARA" means the Superfund Amendments and Reauthorization Act of 1986.

"Septic tank" is a water tight covered receptacle designed to receive or process, through liquid separation or biological digestion, the sewage discharged from a building sewer. The effluent from such receptacle is distributed for disposal through the soil and settled solids and scum from the tank are pumped out periodically and hauled to a treatment facility.

"Storm water or wastewater collection system" means piping, pumps, conduits, and any other equipment

necessary to collect and transport the flow of surface water run-off resulting from precipitation, or domestic, commercial, or industrial wastewater to and from retention areas or any areas where treatment is designated to occur. The collection of storm water and wastewater does not include treatment except where incidental to conveyance.

"Surface impoundment" is a natural topographic depression, man-made excavation, or diked area formed primarily of earthen materials (although it may be lined with man-made materials) that is not an injection well.

"Tank" is a stationary device designed to contain an accumulation of regulated substances and constructed of non-earthen materials (e.g., concrete, steel, plastic) that provide structural support.

"Underground area" means an underground room, such as a basement, cellar, shaft or vault, providing enough space for physical inspection of the exterior of the tank situated on or above the surface of the floor.

"Underground release" means any belowground release.

"Underground storage tank" or "UST" means any one or combination of tanks (including underground pipes connected thereto) that is used to contain an accumulation of regulated substances, and the volume of which (including the volume of underground pipes connected thereto) is 10 percent or more beneath the surface of the ground. This term does not include any:

(a) Farm or residential tank of 1,100 gallons or less capacity used for storing motor fuel for noncommercial purposes;

(b) Tank used for storing heating oil for consumptive use on the premises where stored;

(c) Septic tank;

(d) Pipeline facility (including gathering lines) regulated under:

(1) The Natural Gas Pipeline Safety Act of 1968 (49 U.S.C. App. 1671, *et seq.*), or

(2) The Hazardous Liquid Pipeline Safety Act of 1979 (49 U.S.C. App. 2001, *et seq.*), or

(3) Which is an intrastate pipeline facility regulated under state laws comparable to the provisions of the law referred to in paragraph (d)(1) or (d)(2) of this definition;

(e) Surface impoundment, pit, pond, or lagoon;

(f) Storm-water or wastewater collection system;

(g) Flow-through process tank;

(h) Liquid trap or associated gathering lines directly related to oil or gas production and gathering operations; or

(i) Storage tank situated in an underground area (such as a basement, cellar, mineworking, drift, shaft, or tunnel) if the storage tank is situated upon or above the surface of the floor.

The term "underground storage tank" or "UST" does not include any pipes connected to any tank which is described in paragraphs (a) through (i) of this definition.

"Upgrade" means the addition or retrofit of some systems such as cathodic protection, lining, or spill and overfill controls to improve the ability of an underground storage tank system to prevent the release of product.

"UST system" or "Tank system" means an underground storage tank, connected underground piping, underground ancillary equipment, and containment system, if any.

"Wastewater treatment tank" means a tank that is designed to receive and treat an influent wastewater through physical, chemical, or biological methods.

Subpart B—UST Systems: Design, Construction, Installation and Notification

§ 280.20 Performance standards for new UST systems.

In order to prevent releases due to structural failure, corrosion, or spills and overfills for as long as the UST system is used to store regulated substances, all owners and operators of new UST systems must meet the following requirements.

(a) *Tanks.* Each tank must be properly designed and constructed, and any portion underground that routinely contains product must be protected from corrosion, in accordance with a code of practice developed by a nationally recognized association or independent testing laboratory as specified below:

(1) The tank is constructed of fiberglass-reinforced plastic; or

Note: The following industry codes may be used to comply with paragraph (a)(1) of this section: Underwriters Laboratories Standard 1316, "Standard for Glass-Fiber-Reinforced Plastic Underground Storage Tanks for Petroleum Products"; Underwriter's Laboratories of Canada CAN1-5015-M83, "Standard for Reinforced Plastic Underground Tanks for Petroleum Products"; or American Society of Testing and Materials Standard D1021-85, "Standard Specification for Glass Fiber Reinforced Polyester Underground Petroleum Storage Tanks."

(2) The tank is constructed of steel and cathodically protected in the following manner:

(i) The tank is coated with a suitable dielectric material;

(ii) Field-installed cathodic protection systems are designed by a corrosion expert;

(iii) Impressed current systems are designed to allow determination of current operating status as required in § 280.31(c); and

(iv) Cathodic protection systems are operated and maintained in accordance with § 280.31 or according to guidelines established by the implementing agency; or

Note: The following codes and standards may be used to comply with paragraph (a)(2) of this section:

(A) Steel Tank Institute "Specification for STI-P3 System of External Corrosion Protection of Underground Steel Storage Tanks";

(B) Underwriters Laboratories Standard 1746, "Corrosion Protection Systems for Underground Storage Tanks";

(C) Underwriters Laboratories of Canada CAN4-S603-M85, "Standard for Steel Underground Tanks for Flammable and Combustible Liquids," and CAN4-G03.1-M85, "Standard for Galvanic Corrosion Protection Systems for Underground Tanks for Flammable and Combustible Liquids," and CAN4-S631-M84, "Isolating Bushings for Steel Underground Tanks Protected with Coatings and Galvanic Systems"; or

(D) National Association of Corrosion Engineers Standard RP-02-85, "Control of External Corrosion on Metallic Buried, Partially Buried, or Submerged Liquid Storage Systems," and Underwriters Laboratories Standard 58, "Standard for Steel Underground Tanks for Flammable and Combustible Liquids."

(3) The tank is constructed of a steel-fiberglass-reinforced-plastic composite; or

Note: The following industry codes may be used to comply with paragraph (a)(3) of this section: Underwriters Laboratories Standard 1746, "Corrosion Protection Systems for Underground Storage Tanks," or the Association for Composite Tanks ACT-100, "Specification for the Fabrication of FRP Clad Underground Storage Tanks."

(4) The tank is constructed of metal without additional corrosion protection measures provided that:

(i) The tank is installed at a site that is determined by a corrosion expert not to be corrosive enough to cause it to have a release due to corrosion during its operating life; and

(ii) Owners and operators maintain records that demonstrate compliance with the requirements of paragraphs (a)(4)(i) for the remaining life of the tank; or

(5) The tank construction and corrosion protection are determined by the implementing agency to be designed to prevent the release or threatened release of any stored regulated substance in a manner that is no less protective of human health and the environment than paragraphs (a) (1) through (4) of this section.

(b) *Piping.* The piping that routinely contains regulated substances and is in contact with the ground must be properly designed, constructed, and protected from corrosion in accordance with a code of practice developed by a nationally recognized association or independent testing laboratory as specified below:

(1) The piping is constructed of fiberglass-reinforced plastic; or

Note: The following codes and standards may be used to comply with paragraph (b)(1) of this section:

(A) Underwriters Laboratories Subject 971, "UL Listed Non Metal Pipe";

(B) Underwriters Laboratories Standard 567, "Pipe Connectors for Flammable and Combustible and LP Gas";

(C) Underwriters Laboratories of Canada Guide ULC-107, "Glass Fiber Reinforced Plastic Pipe and Fittings for Flammable Liquids"; and

(D) Underwriters Laboratories of Canada Standard CAN 4-S633-M81, "Flexible Underground Hose Connectors."

(2) The piping is constructed of steel and cathodically protected in the following manner:

(i) The piping is coated with a suitable dielectric material;

(ii) Field-installed cathodic protection systems are designed by a corrosion expert;

(iii) Impressed current systems are designed to allow determination of current operating status as required in § 280.31(c); and

(iv) Cathodic protection systems are operated and maintained in accordance with § 280.31 or guidelines established by the implementing agency; or

Note: The following codes and standards may be used to comply with paragraph (b)(2) of this section:

(A) National Fire Protection Association Standard 30, "Flammable and Combustible Liquids Code";

(B) American Petroleum Institute Publication 1615, "Installation of Underground Petroleum Storage Systems";

(C) American Petroleum Institute Publication 1632, "Cathodic Protection of Underground Petroleum Storage Tanks and Piping Systems"; and

(D) National Association of Corrosion Engineers Standard RP-01-69, "Control of External Corrosion on Submerged Metallic Piping Systems."

(3) The piping is constructed of metal without additional corrosion protection measures provided that:

(i) The piping is installed at a site that is determined by a corrosion expert to not be corrosive enough to cause it to have a release due to corrosion during its operating life; and

(ii) Owners and operators maintain records that demonstrate compliance with the requirements of paragraph (b)(3)(i) of this section for the remaining life of the piping; or

Note: National Fire Protection Association Standard 30, "Flammable and Combustible Liquids Code"; and National Association of Corrosion Engineers Standard RP-01-69, "Control of External Corrosion on Submerged Metallic Piping Systems," may be used to comply with paragraph (b)(3) of this section.

(4) The piping construction and corrosion protection are determined by the implementing agency to be designed to prevent the release or threatened release of any stored regulated substance in a manner that is no less protective of human health and the environment than the requirements in paragraphs (b) (1) through (3) of this section.

(c) *Spill and overfill prevention equipment.* (1) Except as provided in paragraph (c)(2) of this section, to prevent spilling and overfilling associated with product transfer to the UST system, owners and operators must use the following spill and overfill prevention equipment:

(i) Spill prevention equipment that will prevent release of product to the environment when the transfer hose is detached from the fill pipe (for example, a spill catchment basin); and

(ii) Overfill prevention equipment that will:

(A) Automatically shut off flow into the tank when the tank is no more than 95 percent full; or

(B) Alert the transfer operator when the tank is no more than 90 percent full by restricting the flow into the tank or triggering a high-level alarm.

(2) Owners and operators are not required to use the spill and overfill prevention equipment specified in paragraph (c)(1) of this section if:

(i) Alternative equipment is used that is determined by the implementing agency to be no less protective of human health and the environment than the equipment specified in paragraph (c)(1) (i) or (ii) of this section; or

(ii) The UST system is filled by transfers of no more than 25 gallons at one time.

(d) *Installation.* All tanks and piping must be properly installed in accordance with a code of practice developed by a nationally recognized association or independent testing laboratory and in accordance with the manufacturer's instructions.

Note: Tank and piping system installation practices and procedures described in the following codes may be used to comply with the requirements of paragraph (d) of this section:

(i) American Petroleum Institute Publication 1615, "Installation of Underground Petroleum Storage System"; or

(ii) Petroleum Equipment Institute Publication RP100, "Recommended Practices for Installation of Underground Liquid Storage Systems"; or

(iii) American National Standards Institute Standard B31.3, "Petroleum Refinery Piping," and American National Standards Institute Standard B31.4 "Liquid Petroleum Transportation Piping System."

(e) *Certification of installation.* All owners and operators must ensure that one or more of the following methods of certification, testing, or inspection is used to demonstrate compliance with paragraph (d) of this section by providing a certification of compliance on the UST notification form in accordance with § 280.22.

(1) The installer has been certified by the tank and piping manufacturers; or

(2) The installer has been certified or licensed by the implementing agency; or

(3) The installation has been inspected and certified by a registered professional engineer with education and experience in UST system installation; or

(4) The installation has been inspected and approved by the *implementing agency; or*

(5) All work listed in the manufacturer's installation checklists has been completed; or

(6) The owner and operator have complied with another method for ensuring compliance with paragraph (d) of this section that is determined by the implementing agency to be no less protective of human health and the environment.

§ 280.21 Upgrading of existing UST systems.

(a) *Alternatives allowed.* Not later than December 22, 1998, all existing UST systems must comply with one of the following requirements:

(1) New UST system performance standards under § 280.20;

(2) The upgrading requirements in paragraphs (b) through (d) of this section; or

(3) Closure requirements under Subpart G of this part, including applicable requirements for corrective action under Subpart F.

(b) *Tank upgrading requirements.* Steel tanks must be upgraded to meet one of the following requirements in accordance with a code of practice developed by a nationally recognized association or independent testing laboratory:

(1) *Interior lining.* A tank may be upgraded by internal lining if:

(i) The lining is installed in accordance with the requirements of § 280.33, and

(ii) Within 10 years after lining, and every 5 years thereafter, the lined tank is internally inspected and found to be structurally sound with the lining still performing in accordance with original design specifications.

(2) *Cathodic protection.* A tank may be upgraded by cathodic protection if the cathodic protection system meets the requirements of § 280.20(a)(2) (ii), (iii), and (iv) and the integrity of the tank is ensured using one of the following methods:

(i) The tank is internally inspected and assessed to ensure that the tank is structurally sound and free of corrosion holes prior to installing the cathodic protection system; or

(ii) The tank has been installed for less than 10 years and is monitored monthly for releases in accordance with § 280.43 (d) through (h); or

(iii) The tank has been installed for less than 10 years and is assessed for corrosion holes by conducting two (2) tightness tests that meet the requirements of § 280.43(c). The first tightness test must be conducted prior to installing the cathodic protection system. The second tightness test must be conducted between three (3) and six (6) months following the first operation of the cathodic protection system; or

(iv) The tank is assessed for corrosion holes by a method that is determined by the implementing agency to prevent releases in a manner that is no less protective of human health and the environment than paragraphs (b)(2) (i) through (iii) of this section.

(3) *Internal lining combined with cathodic protection.* A tank may be upgraded by both internal lining and cathodic protection if:

(i) The lining is installed in accordance with the requirements of § 280.33; and

(ii) The cathodic protection system meets the requirements of § 280.20(a)(2) (ii), (iii), and (iv).

Note: The following codes and standards may be used to comply with this section:

(A) American Petroleum Institute Publication 1631, "Recommended Practice for the Interior Lining of Existing Steel Underground Storage Tanks";

(B) National Leak Prevention Association Standard 631, "Spill Prevention, Minimum 10 Year Life Extension of Existing Steel Underground Tanks by Lining Without the Addition of Cathodic Protection";

(C) National Association of Corrosion Engineers Standard RP–02–85, "Control of External Corrosion on Metallic Buried, Partially Buried, or Submerged Liquid Storage Systems"; and

(D) American Petroleum Institute Publication 1632, "Cathodic Protection of Underground Petroleum Storage Tanks and Piping Systems."

(c) *Piping upgrading requirements.* Metal piping that routinely contains regulated substances and is in contact with the ground must be cathodically protected in accordance with a code of practice developed by a nationally recognized association or independent testing laboratory and must meet the requirements of § 280.20(b)(2) (ii), (iii), and (iv).

Note: The codes and standards listed in the note following § 280.20(b)(2) may be used to comply with this requirement.

(d) *Spill and overfill prevention equipment.* To prevent spilling and overfilling associated with product transfer to the UST system, all existing UST systems must comply with new UST system spill and overfill prevention equipment requirements specified in § 280.20(c).

§ 280.22 Notification requirements.

(a) Any owner who brings an underground storage tank system into *use after May 8, 1986, must within 30* days of bringing such tank into use, submit, in the form prescribed in Appendix I of this part, a notice of existence of such tank system to the state or local agency or department designated in Appendix II of this part to receive such notice.

Note: Owners and operators of UST systems that were in the ground on or after May 8, 1986, unless taken out of operation on or before January 1, 1974, were required to notify the designated state or local agency in accordance with the Hazardous and Solid Waste Amendments of 1984, Pub. L. 98–616, on a form published by EPA on November 8, 1985 (50 FR 46602) unless notice was given pursuant to section 103(c) of CERCLA. Owners and operators who have not complied with the notification requirements may use portions I through VI of the notification form contained in Appendix I of this part.

(b) In states where state law, regulations, or procedures require owners to use forms that differ from those set forth in Appendix I of this part to fulfill the requirements of this section, the state forms may be submitted in lieu of the forms set forth in Appendix I of this part. If a state requires that its form be used in lieu of the form presented in this regulation, such form must meet the requirements of section 9002.

(c) Owners required to submit notices under paragraph (a) of this section must provide notices to the appropriate agencies or departments identified in Appendix II of this part for each tank they own. Owners may provide notice for several tanks using one notification form, but owners who own tanks located at more than one place of operation must file a separate notification form for each separate place of operation.

(d) Notices required to be submitted under paragraph (a) of this section must provide all of the information in sections I through VI of the prescribed form (or appropriate state form) for each tank for which notice must be given. Notices for tanks installed after December 22, 1988 must also provide all of the information in section VII of the prescribed form (or appropriate state form) for each tank for which notice must be given.

(e) All owners and operators of new UST systems must certify in the notification form compliance with the following requirements:

(1) Installation of tanks and piping under § 280.20(e);

(2) Cathodic protection of steel tanks and piping under § 280.20 (a) and (b);

(3) Financial responsibility under Subpart H of this part; and

(4) Release detection under §§ 280.41 and 280.42.

(f) All owners and operators of new UST systems must ensure that the installer certifies in the notification form that the methods used to install the tanks and piping complies with the requirements in § 280.20(d).

(g) Beginning October 24, 1988, any person who sells a tank intended to be used as an underground storage tank must notify the purchaser of such tank of the owner's notification obligations under paragraph (a) of this section. The form provided in Appendix III of this part may be used to comply with this requirement.

Subpart C—General Operating Requirements

§ 280.30 Spill and overfill control.

(a) Owners and operators must ensure that releases due to spilling or overfilling do not occur. The owner and operator must ensure that the volume available in the tank is greater than the volume of product to be transferred to the tank before the transfer is made and that the transfer operation is monitored constantly to prevent overfilling and spilling.

Note: The transfer procedures described in National Fire Protection Association Publication 385 may be used to comply with paragraph (a) of this section. Further guidance on spill and overfill prevention appears in American Petroleum Institute Publication 1621, "Recommended Practice for Bulk Liquid Stock Control at Retail Outlets," and National Fire Protection Association Standard 30, "Flammable and Combustible Liquids Code."

(b) The owner and operator must report, investigate, and clean up any

spills and overfills in accordance with § 280.53.

§ 280.31 Operation and maintenance of corrosion protection.

All owners and operators of steel UST systems with corrosion protection must comply with the following requirements to ensure that releases due to corrosion are prevented for as long as the UST system is used to store regulated substances:

(a) All corrosion protection systems must be operated and maintained to continuously provide corrosion protection to the metal components of that portion of the tank and piping that routinely contain regulated substances and are in contact with the ground.

(b) All UST systems equipped with cathodic protection systems must be inspected for proper operation by a qualified cathodic protection tester in accordance with the following requirements:

(1) *Frequency.* All cathodic protection systems must be tested within 6 months of installation and at least every 3 years thereafter or according to another reasonable time frame established by the implementing agency; and

(2) *Inspection criteria.* The criteria that are used to determine that cathodic protection is adequate as required by this section must be in accordance with a code of practice developed by a nationally recognized association.

Note: National Association of Corrosion Engineers Standard RP–02–85, "Control of External Corrosion on Metallic Buried, Partially Buried, or Submerged Liquid Storage Systems," may be used to comply with paragraph (b)(2) of this section.

(c) UST systems with impressed current cathodic protection systems must also be inspected every 60 days to ensure the equipment is running properly.

(d) For UST systems using cathodic protection, records of the operation of the cathodic protection must be maintained (in accordance with § 280.34) to demonstrate compliance with the performance standards in this section. These records must provide the following:

(1) The results of the last three inspections required in paragraph (c) of this section; and

(2) The results of testing from the last two inspections required in paragraph (b) of this section.

§ 280.32 Compatibility.

Owners and operators must use an UST system made of or lined with materials that are compatible with the substance stored in the UST system.

Note: Owners and operators storing alcohol blends may use the following codes to comply with the requirements of this section:

(a) American Petroleum Institute Publication 1626, "Storing and Handling Ethanol and Gasoline-Ethanol Blends at Distribution Terminals and Service Stations"; and

(b) American Petroleum Institute Publication 1627, "Storage and Handling of Gasoline-Methanol/Cosolvent Blends at Distribution Terminals and Service Stations."

§ 280.33 Repairs allowed.

Owners and operators of UST systems must ensure that repairs will prevent releases due to structural failure or corrosion as long as the UST system is used to store regulated substances. The repairs must meet the following requirements:

(a) Repairs to UST systems must be properly conducted in accordance with a code of practice developed by a nationally recognized association or an independent testing laboratory.

Note: The following codes and standards may be used to comply with paragraph (a) of this section: National Fire Protection Association Standard 30, "Flammable and Combustible Liquids Code"; American Petroleum Institute Publication 2200, "Repairing Crude Oil, Liquified Petroleum Gas, and Product Pipelines"; American Petroleum Institute Publication 1631, "Recommended Practice for the Interior Lining of Existing Steel Underground Storage Tanks"; and National Leak Prevention Association Standard 631, "Spill Prevention, Minimum 10 Year Life Extension of Existing Steel Underground Tanks by Lining Without the Addition of Cathodic Protection."

(b) Repairs to fiberglass-reinforced plastic tanks may be made by the manufacturer's authorized representatives or in accordance with a code of practice developed by a nationally recognized association or an independent testing laboratory.

(c) Metal pipe sections and fittings that have released product as a result of corrosion or other damage must be replaced. Fiberglass pipes and fittings may be repaired in accordance with the manufacturer's specifications.

(d) Repaired tanks and piping must be tightness tested in accordance with § 280.43(c) and § 280.44(b) within 30 days following the date of the completion of the repair except as provided in paragraphs (d) (1) through (3), of this section:

(1) The repaired tank is internally inspected in accordance with a code of practice developed by a nationally recognized association or an independent testing laboratory; or

(2) The repaired portion of the UST system is monitored monthly for releases in accordance with a method specified in § 280.43 (d) through (h); or

(3) Another test method is used that is determined by the implementing agency to be no less protective of human health and the environment than those listed above.

(e) Within 6 months following the repair of any cathodically protected UST system, the cathodic protection system must be tested in accordance with § 280.31 (b) and (c) to ensure that it is operating properly.

(f) UST system owners and operators must maintain records of each repair for the remaining operating life of the UST system that demonstrate compliance with the requirements of this section.

§ 280.34 Reporting and recordkeeping.

Owners and operators of UST systems must cooperate fully with inspections, monitoring and testing conducted by the implementing agency, as well as requests for document submission, testing, and monitoring by the owner or operator pursuant to section 9005 of Subtitle I of the Resource Conservation and Recovery Act, as amended.

(a) *Reporting.* Owners and operators must submit the following information to the implementing agency:

(1) Notification for all UST systems (§ 280.22), which includes certification of installation for new UST systems (§ 280.20(e)),

(2) Reports of all releases including suspected releases (§ 280.50), spills and overfills (§ 280.53), and confirmed releases (§ 280.61);

(3) Corrective actions planned or taken including initial abatement measures (§ 280.62), initial site characterization (§ 280.63), free product removal (§ 280.64), investigation of soil and ground-water cleanup (§ 280.65), and corrective action plan (§ 280.66); and

(4) A notification before permanent closure or change-in-service (§ 280.71).

(b) *Recordkeeping.* Owners and operators must maintain the following information:

(1) A corrosion expert's analysis of site corrosion potential if corrosion protection equipment is not used (§ 280.20(a)(4); § 280.20(b)(3)).

(2) Documentation of operation of corrosion protection equipment (§ 280.31);

(3) Documentation of UST system repairs (§ 280.33(f));

(4) Recent compliance with release detection requirements (§ 280.45); and

(5) Results of the site investigation conducted at permanent closure (§ 280.74).

(c) *Availability and Maintenance of Records.* Owners and operators must keep the records required either:

(1) At the UST site and immediately available for inspection by the implementing agency; or

(2) At a readily available alternative site and be provided for inspection to the implementing agency upon request.

(3) In the case of permanent closure records required under § 280.74, owners and operators are also provided with the additional alternative of mailing closure records to the implementing agency if they cannot be kept at the site or an alternative site as indicated above.

Note: The recordkeeping and reporting requirements in this section have been approved by the Office of Management and Budget and have been assigned OMB Control No. 2050–0068.

Subpart D—Release Detection

§ 280.40 General requirements for all UST systems.

(a) Owners and operators of new and existing UST systems must provide a method, or combination of methods, of release detection that:

(1) Can detect a release from any portion of the tank and the connected underground piping that routinely contains product;

(2) Is installed, calibrated, operated, and maintained in accordance with the manufacturer's instructions, including routine maintenance and service checks for operability or running condition; and

(3) Meets the performance requirements in § 280.43 or 280.44, with any performance claims and their manner of determination described in writing by the equipment manufacturer or installer. In addition, methods used after December 22, 1990 except for methods permanently installed prior to that date, must be capable of detecting the leak rate or quantity specified for that method in § 280.43 (b), (c), and (d) or 280.44 (a) and (b) with a probability of detection of 0.95 and a probability of false alarm of 0.05.

(b) When a release detection method operated in accordance with the performance standards in § 280.43 and § 280.44 indicates a release may have occurred, owners and operators must notify the implementing agency in accordance with Subpart E.

(c) Owners and operators of all UST systems must comply with the release detection requirements of this subpart by December 22 of the year listed in the following table:

SCHEDULE FOR PHASE-IN OF RELEASE DETECTION

Year system was installed	Year when release detection is required (by December 22 of the year indicated)				
	1989	1990	1991	1992	1993
Before 1965 or date unknown	RD	P			
1965-69		P/RD			
1970-74		P	RD		
1975-79		P		RD	
1980-88		P			RD
New tanks (after December 22)	immediately upon installation.				

P = Must begin release detection for all pressurized piping in accordance with § 280.41(b)(1) and § 280.42(b)(4).

RD = Must begin release detection for tanks and suction piping in accordance with § 280.41(a), § 280.41(b)(2), and § 280.42

(d) Any existing UST system that cannot apply a method of release detection that complies with the requirements of this subpart must complete the closure procedures in Subpart G by the date on which release detection is required for that UST system under paragraph (c) of this section.

§ 280.41 Requirements for petroleum UST systems.

Owners and operators of petroleum UST systems must provide release detection for tanks and piping as follows:

(a) *Tanks.* Tanks must be monitored at least every 30 days for releases using one of the methods listed in § 280.43 (d) through (h) except that:

(1) UST systems that meet the performance standards in § 280.20 or § 280.21, and the monthly inventory control requirements in § 280.43 (a) or (b), may use tank tightness testing (conducted in accordance with § 280.43(c)) at least every 5 years until December 22, 1998, or until 10 years after the tank is installed or upgraded under § 280.21(b), whichever is later;

(2) UST systems that do not meet the performance standards in § 280.20 or § 280.21 may use monthly inventory controls (conducted in accordance with § 280.43(a) or (b)) and annual tank tightness testing (conducted in accordance with § 280.43(c)) until December 22, 1998 when the tank must be upgraded under § 280.21 or permanently closed under § 280.71; and

(3) Tanks with capacity of 550 gallons or less may use weekly tank gauging (conducted in accordance with § 280.43(b)).

(b) *Piping.* Underground piping that routinely contains regulated substances must be monitored for releases in a manner that meets one of the following requirements:

(1) *Pressurized piping.* Underground piping that conveys regulated substances under pressure must:

(i) Be equipped with an automatic line leak detector conducted in accordance with § 280.44(a); and

(ii) Have an annual line tightness test conducted in accordance with § 280.44(b) or have monthly monitoring conducted in accordance with § 280.44(c).

(2) *Suction piping.* Underground piping that conveys regulated substances under suction must either have a line tightness test conducted at least every 3 years and in accordance with § 280.44(b), or use a monthly monitoring method conduct in accordance with § 280.44(c). No release detection is required for suction piping that is designed and constructed to meet the following standards:

(i) The below-grade piping operates at less than atmospheric pressure;

(ii) The below-grade piping is sloped so that the contents of the pipe will drain back into the storage tank if the suction is released;

(iii) Only one check valve is included in each suction line;

(iv) The check valve is located directly below and as close as practical to the suction pump; and

(v) A method is provided that allows compliance with paragraphs (b)(2) (ii)–(iv) of this section to be readily determined.

§ 280.42 Requirements for hazardous substance UST systems.

Owners and operators of hazardous substance UST systems must provide release detection that meets the following requirements:

(a) Release detection at existing UST systems must meet the requirements for petroleum UST systems in § 280.41. By December 22, 1998, all existing hazardous substance UST systems must meet the release detection requirements for new systems in paragraph (b) of this section.

(b) Release detection at new hazardous substance UST systems must meet the following requirements:

(1) Secondary containment systems must be designed, constructed and installed to:

(i) Contain regulated substances released from the tank system until they are detected and removed;

(ii) Prevent the release of regulated substances to the environment at any time during the operational life of the UST system; and

(iii) To be checked for evidence of a release at least every 30 days.

Note.—The provisions of 40 CFR 265.193, Containment and Detection of Releases, may be used to comply with these requirements.

(2) Double-walled tanks must be designed, constructed, and installed to:

(i) Contain a release from any portion of the inner tank within the outer wall; and

(ii) Detect the failure of the inner wall.

(3) External liners (including vaults) must be designed, constructed, and installed to:

(i) Contain 100 percent of the capacity of the largest tank within its boundary;

(ii) Prevent the interference of precipitation or ground-water intrusion with the ability to contain or detect a release of regulated substances; and

(iii) Surround the tank completely (i.e., it is capable of preventing lateral as well as vertical migration of regulated substances).

(4) Underground piping must be equipped with secondary containment that satisfies the requirements of paragraph (b)(1) of this section (e.g., trench liners, jacketing of double-walled pipe). In addition, underground piping that conveys regulated substances under pressure must be equipped with an automatic line leak detector in accordance with § 280.44(a).

(5) Other methods of release detection may be used if owners and operators:

(i) Demonstrate to the implementing agency that an alternate method can detect a release of the stored substance as effectively as any of the methods allowed in §§ 280.43(b) through (h) can detect a release of petroleum;

(ii) Provide information to the implementing agency on effective corrective action technologies, health risks, and chemical and physical properties of the stored substance, and the characteristics of the UST site; and,

(iii) Obtain approval from the implementing agency to use the alternate release detection method before the installation and operation of the new UST system.

§ 280.43 Methods of release detection for tanks.

Each method of release detection for tanks used to meet the requirements of § 280.41 must be conducted in accordance with the following:

(a) *Inventory control.* Product inventory control (or another test of equivalent performance) must be conducted monthly to detect a release of at least 1.0 percent of flow-through plus 130 gallons on a monthly basis in the following manner:

(1) Inventory volume measurements for regulated substance inputs, withdrawals, and the amount still remaining in the tank are recorded each operating day;

(2) The equipment used is capable of measuring the level of product over the full range of the tank's height to the nearest one-eighth of an inch;

(3) The regulated substance inputs are reconciled with delivery receipts by measurement of the tank inventory volume before and after delivery;

(4) Deliveries are made through a drop tube that extends to within one foot of the tank bottom;

(5) Product dispensing is metered and recorded within the local standards for meter calibration or an accuracy of 6 cubic inches for every 5 gallons of product withdrawn; and

(6) The measurement of any water level in the bottom of the tank is made to the nearest one-eighth of an inch at least once a month.

Note: Practices described in the American Petroleum Institute Publication 1621, "Recommended Practice for Bulk Liquid Stock Control at Retail Outlets," may be used, where applicable, as guidance in meeting the requirements of this paragraph.

(b) *Manual tank gauging.* Manual tank gauging must meet the following requirements:

(1) Tank liquid level measurements are taken at the beginning and ending of a period of at least 36 hours during which no liquid is added to or removed from the tank;

(2) Level measurements are based on an average of two consecutive stick readings at both the beginning and ending of the period;

(3) The equipment used is capable of measuring the level of product over the full range of the tank's height to the nearest one-eighth of an inch;

(4) A leak is suspected and subject to the requirements of Subpart E if the variation between beginning and ending measurements exceeds the weekly or monthly standards in the following table:

Nominal tank capacity	Weekly standard (one test)	Monthly standard (average of four tests)
550 gallons or less	10 gallons	5 gallons
551-1,000 gallons	13 gallons	7 gallons
1,001-2,000 gallons	26 gallons	13 gallons

(5) Only tanks of 550 gallons or less nominal capacity may use this as the sole method of release detection. Tanks of 551 to 2,000 gallons may use the method in place of manual inventory control in § 280.43(a). Tanks of greater than 2,000 gallons nominal capacity may not use this method to meet the requirements of this subpart.

(c) *Tank tightness testing.* Tank tightness testing (or another test of equivalent performance) must be capable of detecting a 0.1 gallon per hour leak rate from any portion of the tank that routinely contains product while accounting for the effects of thermal expansion or contraction of the product, vapor pockets, tank deformation, evaporation or condensation, and the location of the water table.

(d) *Automatic tank gauging.* Equipment for automatic tank gauging that tests for the loss of product and conducts inventory control must meet the following requirements:

(1) The automatic product level monitor test can detect a 0.2 gallon per hour leak rate from any portion of the tank that routinely contains product; and

(2) Inventory control (or another test of equivalent performance) is conducted in accordance with the requirements of § 280.43(a).

(e) *Vapor monitoring.* Testing or monitoring for vapors within the soil gas of the excavation zone must meet the following requirements:

(1) The materials used as backfill are sufficiently porous (e.g., gravel, sand, crushed rock) to readily allow diffusion of vapors from releases into the excavation area;

(2) The stored regulated substance, or a tracer compound placed in the tank system, is sufficiently volatile (e.g., gasoline) to result in a vapor level that is detectable by the monitoring devices located in the excavation zone in the event of a release from the tank;

(3) The measurement of vapors by the monitoring device is not rendered inoperative by the ground water, rainfall, or soil moisture or other known interferences so that a release could go undetected for more than 30 days;

(4) The level of background contamination in the excavation zone will not interfere with the method used to detect releases from the tank;

(5) The vapor monitors are designed and operated to detect any significant increase in concentration above background of the regulated substance stored in the tank system, a component or components of that substance, or a tracer compound placed in the tank system;

(6) In the UST excavation zone, the site is assessed to ensure compliance with the requirements in paragraphs (e)(1) through (4) of this section and to

establish the number and positioning of monitoring wells that will detect releases within the excavation zone from any portion of the tank that routinely contains product; and

(7) Monitoring wells are clearly marked and secured to avoid unauthorized access and tampering.

(f) *Ground-water monitoring.* Testing or monitoring for liquids on the ground water must meet the following requirements:

(1) The regulated substance stored is immiscible in water and has a specific gravity of less than one;

(2) Ground water is never more than 20 feet from the ground surface and the hydraulic conductivity of the soil(s) between the UST system and the monitoring wells or devices is not less than 0.01 cm/sec (e.g., the soil should consist of gravels, coarse to medium sands, coarse silts or other permeable materials);

(3) The slotted portion of the monitoring well casing must be designed to prevent migration of natural soils or filter pack into the well and to allow entry of regulated substance on the water table into the well under both high and low ground-water conditions;

(4) Monitoring wells shall be sealed from the ground surface to the top of the filter pack;

(5) Monitoring wells or devices intercept the excavation zone or are as close to it as is technically feasible;

(6) The continuous monitoring devices or manual methods used can detect the presence of at least one-eighth of an inch of free product on top of the ground water in the monitoring wells;

(7) Within and immediately below the UST system excavation zone, the site is assessed to ensure compliance with the requirements in paragraphs (f) (1) through (5) of this section and to establish the number and positioning of monitoring wells or devices that will detect releases from any portion of the tank that routinely contains product; and

(8) Monitoring wells are clearly marked and secured to avoid unauthorized access and tampering.

(g) *Interstitial monitoring.* Interstitial [illegible] between the UST system and [illegible] immediately around or beneath [illegible] be used, but only if the system [illegible] signed, constructed and [illegible] to detect a leak from any [illegible] the tank that routinely [illegible] duct and also meets one of [illegible] wing requirements.

[illegible] ble-walled UST systems, [illegible] tes[illegible] method can [illegible] through the inner wall [illegible] the tank that routinely

Note: The provisions outlined in the Steel Tank Institute's "Standard for Dual Wall Underground Storage Tanks" may be used as guidance for aspects of the design and construction of underground steel double-walled tanks.

(2) For UST systems with a secondary barrier within the excavation zone, the sampling or testing method used can detect a release between the UST system and the secondary barrier;

(i) The secondary barrier around or beneath the UST system consists of artificially constructed material that is sufficiently thick and impermeable (at least 10^{-6} cm/sec for the regulated substance stored) to direct a release to the monitoring point and permit its detection;

(ii) The barrier is compatible with the regulated substance stored so that a release from the UST system will not cause a deterioration of the barrier allowing a release to pass through undetected;

(iii) For cathodically protected tanks, the secondary barrier must be installed so that it does not interfere with the proper operation of the cathodic protection system;

(iv) The ground water, soil moisture, or rainfall will not render the testing or sampling method used inoperative so that a release could go undetected for more than 30 days;

(v) The site is assessed to ensure that the secondary barrier is always above the ground water and not in a 25-year flood plain, unless the barrier and monitoring designs are for use under such conditions; and,

(vi) Monitoring wells are clearly marked and secured to avoid unauthorized access and tampering.

(3) For tanks with an internally fitted liner, an automated device can detect a release between the inner wall of the tank and the liner, and the liner is compatible with the substance stored.

(h) *Other methods.* Any other type of release detection method, or combination of methods, can be used if:

(1) It can detect a 0.2 gallon per hour leak rate or a release of 150 gallons within a month with a probability of detection of 0.95 and a probability of false alarm of 0.05; or

(2) The implementing agency may approve another method if the owner and operator can demonstrate that the method can detect a release as effectively as any of the methods allowed in paragraphs (c) through (h) of this section. In comparing methods, the implementing agency shall consider the size of release that the method can detect and the frequency and reliability with which it can be detected. If the method is approved, the owner and operator must comply with any conditions imposed by the implementing agency on its use to ensure the protection of human health and the environment.

§ 280.44 Methods of release detection for piping.

Each method of release detection for piping used to meet the requirements of § 280.41 must be conducted in accordance with the following:

(a) *Automatic line leak detectors.* Methods which alert the operator to the presence of a leak by restricting or shutting off the flow of regulated substances through piping or triggering an audible or visual alarm may be used only if they detect leaks of 3 gallons per hour at 10 pounds per square inch line pressure within 1 hour. An annual test of the operation of the leak detector must be conducted in accordance with the manufacturer's requirements.

(b) *Line tightness testing.* A periodic test of piping may be conducted only if it can detect a 0.1 gallon per hour leak rate at one and one-half times the operating pressure.

(c) *Applicable tank methods.* Any of the methods in § 280.43 (e) through (h) may be used if they are designed to detect a release from any portion of the underground piping that routinely contains regulated substances.

§ 280.45 Release detection recordkeeping.

All UST system owners and operators must maintain records in accordance with § 280.34 demonstrating compliance with all applicable requirements of this Subpart. These records must include the following:

(a) All written performance claims pertaining to any release detection system used, and the manner in which these claims have been justified or tested by the equipment manufacturer or installer, must be maintained for 5 years, or for another reasonable period of time determined by the implementing agency, from the date of installation;

(b) The results of any sampling, testing, or monitoring must be maintained for at least 1 year, or for another reasonable period of time determined by the implementing agency, except that the results of tank tightness testing conducted in accordance with § 280.43(c) must be retained until the next test is conducted; and

(c) Written documentation of all calibration, maintenance, and repair of release detection equipment permanently located on-site must be maintained for at least one year after the servicing work is completed, or for another reasonable time period

determined by the implementing agency. Any schedules of required calibration and maintenance provided by the release detection equipment manufacturer must be retained for 5 years from the date of installation.

Subpart E—Release Reporting, Investigation, and Confirmation

§ 280.50 Reporting of suspected releases.

Owners and operators of UST systems must report to the implementing agency within 24 hours, or another reasonable time period specified by the implementing agency, and follow the procedures in § 280.52 for any of the following conditions:

(a) The discovery by owners and operators or others of released regulated substances at the UST site or in the surrounding area (such as the presence of free product or vapors in soils, basements, sewer and utility lines, and nearby surface water).

(b) Unusual operating conditions observed by owners and operators (such as the erratic behavior of product dispensing equipment, the sudden loss of product from the UST system, or an unexplained presence of water in the tank), unless system equipment is found to be defective but not leaking, and is immediately repaired or replaced; and,

(c) Monitoring results from a release detection method required under § 280.41 and § 280.42 that indicate a release may have occurred unless:

(1) The monitoring device is found to be defective, and is immediately repaired, recalibrated or replaced, and additional monitoring does not confirm the initial result; or

(2) In the case of inventory control, a second month of data does not confirm the initial result.

§ 280.51 Investigation due to off-site impacts.

When required by the implementing agency, owners and operators of UST systems must follow the procedures in § 280.52 to determine if the UST system is the source of off-site impacts. These impacts include the discovery of regulated substances (such as the presence of free product or vapors in soils, basements, sewer and utility lines, and nearby surface and drinking waters) that has been observed by the implementing agency or brought to its attention by another party.

§ 280.52 Release investigation and confirmation steps.

Unless corrective action is initiated in accordance with Subpart F, owners and operators must immediately investigate and confirm all suspected releases of regulated substances requiring reporting under § 280.50 within 7 days, or another reasonable time period specified by the implementing agency, using either the following steps or another procedure approved by the implementing agency:

(a) *System test.* Owners and operators must conduct tests (according to the requirements for tightness testing in § 280.43(c) and § 280.44(b)) that determine whether a leak exists in that portion of the tank that routinely contains product, or the attached delivery piping, or both.

(1) Owners and operators must repair, replace or upgrade the UST system, and begin corrective action in accordance with Subpart F if the test results for the system, tank, or delivery piping indicate that a leak exists.

(2) Further investigation is not required if the test results for the system, tank, and delivery piping do not indicate that a leak exists and if environmental contamination is not the basis for suspecting a release.

(3) Owners and operators must conduct a site check as described in paragraph (b) of this section if the test results for the system, tank, and delivery piping do not indicate that a leak exists but environmental contamination is the basis for suspecting a release.

(b) *Site check.* Owners and operators must measure for the presence of a release where contamination is most likely to be present at the UST site. In selecting sample types, sample locations, and measurement methods, owners and operators must consider the nature of the stored substance, the type of initial alarm or cause for suspicion, the type of backfill, the depth of ground water, and other factors appropriate for identifying the presence and source of the release.

(1) If the test results for the excavation zone or the UST site indicate that a release has occurred, owners and operators must begin corrective action in accordance with Subpart F;

(2) If the test results for the excavation zone or the UST site do not indicate that a release has occurred, further investigation is not required.

§ 280.53 Reporting and cleanup of spills and overfills.

(a) Owners and operators of UST systems must contain and immediately clean up a spill or overfill and report to the implementing agency within 24 hours, or another reasonable time period specified by the implementing agency, and begin corrective action in accordance with Subpart F in the following cases:

(1) Spill or overfill of petroleum that results in a release to the environment that exceeds 25 gallons or another reasonable amount specified by the implementing agency, or that causes a sheen on nearby surface water; and

(2) Spill or overfill of a hazardous substance that results in a release to the environment that equals or exceeds its reportable quantity under CERCLA (40 CFR Part 302).

(b) Owners and operators of UST systems must contain and immediately clean up a spill or overfill of petroleum that is less than 25 gallons or another reasonable amount specified by the implementing agency, and a spill or overfill of a hazardous substance that is less than the reportable quantity. If cleanup cannot be accomplished within 24 hours, or another reasonable time period established by the implementing agency, owners and operators must immediately notify the implementing agency.

Note: Pursuant to §§ 302.6 and 355.40, a release of a hazardous substance equal to or in excess of its reportable quantity must also be reported immediately (rather than within 24 hours) to the National Response Center under sections 102 and 103 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 and to appropriate state and local authorities under Title III of the Superfund Amendments and Reauthorization Act of 1986.

Subpart F—Release Response and Corrective Action for UST Systems Containing Petroleum or Hazardous Substances

§ 280.60 General.

Owners and operators of petroleum or hazardous substance UST systems must, in response to a confirmed release from the UST system, comply with the requirements of this subpart except for USTs excluded under § 280.10(b) and UST systems subject to RCRA Subtitle C corrective action requirements under section 3004(u) of the Resource Conservation and Recovery Act, as amended.

§ 280.61 Initial response.

Upon confirmation of a release in accordance with § 280.52 or after a release from the UST system is identified in any other manner, owners and operators must perform the following initial response actions within 24 hours of a release or within another reasonable period of time determined by the implementing agency:

(a) Report the release to the implementing agency (e.g., by telephone or electronic mail);

(b) Take immediate action to prevent any further release of the regulated substance into the environment; and

(c) Identify and mitigate fire, explosion, and vapor hazards.

§ 280.62 Initial abatement measures and site check.

(a) Unless directed to do otherwise by the implementing agency, owners and operators must perform the following abatement measures:

(1) Remove as much of the regulated substance from the UST system as is necessary to prevent further release to the environment;

(2) Visually inspect any aboveground releases or exposed belowground releases and prevent further migration of the released substance into surrounding soils and ground water;

(3) Continue to monitor and mitigate any additional fire and safety hazards posed by vapors or free product that have migrated from the UST excavation zone and entered into subsurface structures (such as sewers or basements);

(4) Remedy hazards posed by contaminated soils that are excavated or exposed as a result of release confirmation, site investigation, abatement, or corrective action activities. If these remedies include treatment or disposal of soils, the owner and operator must comply with applicable State and local requirements;

(5) Measure for the presence of a release where contamination is most likely to be present at the UST site, unless the presence and source of the release have been confirmed in accordance with the site check required by § 280.52(b) or the closure site assessment of § 280.72(a). In selecting sample types, sample locations, and measurement methods, the owner and operator must consider the nature of the stored substance, the type of backfill, depth to ground water and other factors as appropriate for identifying the presence and source of the release; and

(6) Investigate to determine the possible presence of free product, and begin free product removal as soon as practicable and in accordance with § 280.64.

(b) Within 20 days after release confirmation, or within another reasonable period of time determined by the implementing agency, owners and operators must submit a report to the implementing agency summarizing the initial abatement steps taken under paragraph (a) of this section and any resulting information or data.

§ 280.63 Initial site characterization.

(a) Unless directed to do otherwise by the implementing agency, owners and operators must assemble information about the site and the nature of the release, including information gained while confirming the release or completing the initial abatement measures in § 280.60 and § 280.61. This information must include, but is not necessarily limited to the following:

(1) Data on the nature and estimated quantity of release;

(2) Data from available sources and/or site investigations concerning the following factors: surrounding populations, water quality, use and approximate locations of wells potentially affected by the release, subsurface soil conditions, locations of subsurface sewers, climatological conditions, and land use;

(3) Results of the site check required under § 280.62(a)(5); and

(4) Results of the free product investigations required under § 280.62(a)(6), to be used by owners and operators to determine whether free product must be recovered under § 280.64.

(b) *Within 45 days of release* confirmation or another reasonable period of time determined by the implementing agency, owners and operators must submit the information collected in compliance with paragraph (a) of this section to the implementing agency in a manner that demonstrates its applicability and technical adequacy, or in a format and according to the schedule required by the implementing agency.

§ 280.64 Free product removal.

At sites where investigations under § 280.62(a)(6) indicate the presence of free product, owners and operators must remove free product to the maximum extent practicable as determined by the implementing agency while continuing, as necessary, any actions initiated under §§ 280.61 through 280.63, or preparing for actions required under §§ 280.65 through 280.66. In meeting the requirements of this section, owners and operators must:

(a) Conduct free product removal in a manner that minimizes the spread of contamination into previously uncontaminated zones by using recovery and disposal techniques appropriate to the hydrogeologic conditions at the site, and that properly treats, discharges or disposes of recovery byproducts in compliance with applicable local, State and Federal regulations;

(b) Use abatement of free product migration as a minimum objective for the design of the free product removal system;

(c) Handle any flammable products in a safe and competent manner to prevent fires or explosions; and

(d) Unless directed to do otherwise by the implementing agency, prepare and submit to the implementing agency, within 45 days after confirming a release, a free product removal report that provides at least the following information:

(1) The name of the person(s) responsible for implementing the free product removal measures;

(2) The estimated quantity, type, and thickness of free product observed or measured in wells, boreholes, and excavations;

(3) The type of free product recovery system used;

(4) Whether any discharge will take place on-site or off-site during the recovery operation and where this discharge will be located;

(5) The type of treatment applied to, and the effluent quality expected from, any discharge;

(6) The steps that have been or are being taken to obtain necessary permits for any discharge; and

(7) The disposition of the recovered free product.

§ 280.65 Investigations for soil and ground-water cleanup.

(a) In order to determine the full extent and location of soils contaminated by the release and the presence and concentrations of dissolved product contamination in the ground water, owners and operators must conduct investigations of the release, the release site, and the surrounding area possibly affected by the release if any of the following conditions exist:

(1) There is evidence that ground-water wells have been affected by the release (e.g., as found during release confirmation or previous corrective action measures);

(2) Free product is found to need recovery in compliance with § 280.64;

(3) There is evidence that contaminated soils may be in contact with ground water (e.g., as found during conduct of the initial response measures or investigations required under §§ 280.60 through 280.64); and

(4) The implementing agency requests an investigation, based on the potential effects of contaminated soil or ground water on nearby surface water and ground-water resources.

(b) Owners and operators must submit the information collected under paragraph (a) of this section as soon as practicable or in accordance with a schedule established by the implementing agency.

§ 280.66 Corrective action plan.

(a) At any point after reviewing the information submitted in compliance with § 280.61 through § 280.63, the implementing agency may require owners and operators to submit additional information or to develop and submit a corrective action plan for responding to contaminated soils and ground water. If a plan is required, owners and operators must submit the plan according to a schedule and format established by the implementing agency. Alternatively, owners and operators may, after fulfilling the requirements of § 280.61 through § 280.63, choose to submit a corrective action plan for responding to contaminated soil and ground water. In either case, owners and operators are responsible for submitting a plan that provides for adequate protection of human health and the environment as determined by the implementing agency, and must modify their plan as necessary to meet this standard.

(b) The implementing agency will approve the corrective action plan only after ensuring that implementation of the plan will adequately protect human health, safety, and the environment. In making this determination, the implementing agency should consider the following factors as appropriate:

(1) The physical and chemical characteristics of the regulated substance, including its toxicity, persistence, and potential for migration;

(2) The hydrogeologic characteristics of the facility and the surrounding area;

(3) The proximity, quality, and current and future uses of nearby surface water and ground water;

(4) The potential effects of residual contamination on nearby surface water and ground water;

(5) An exposure assessment; and

(6) Any information assembled in compliance with this subpart.

(c) Upon approval of the corrective action plan or as directed by the implementing agency, owners and operators must implement the plan, including modifications to the plan made by the implementing agency. They must monitor, evaluate, and report the results of implementing the plan in accordance with a schedule and in a format established by the implementing agency.

(d) Owners and operators may, in the interest of minimizing environmental contamination and promoting more effective cleanup, begin cleanup of soil and ground water before the corrective action plan is approved provided that they:

(1) Notify the implementing agency of their intention to begin cleanup;

(2) Comply with any conditions imposed by the implementing agency, including halting cleanup or mitigating adverse consequences from cleanup activities; and

(3) Incorporate these self-initiated cleanup measures in the corrective action plan that is submitted to the implementing agency for approval.

§ 280.67 Public participation.

(a) For each confirmed release that requires a corrective action plan, the implementing agency must provide notice to the public by means designed to reach those members of the public directly affected by the release and the planned corrective action. This notice may include, but is not limited to, public notice in local newspapers, block advertisements, public service announcements, publication in a state register, letters to individual households, or personal contacts by field staff.

(b) The implementing agency must ensure that site release information and decisions concerning the corrective action plan are made available to the public for inspection upon request.

(c) Before approving a corrective action plan, the implementing agency may hold a public meeting to consider comments on the proposed corrective action plan if there is sufficient public interest, or for any other reason.

(d) The implementing agency must give public notice that complies with paragraph (a) of this section if implementation of an approved corrective action plan does not achieve the established cleanup levels in the plan and termination of that plan is under consideration by the implementing agency.

Subpart G—Out-of-Service UST Systems and Closure

§ 280.70 Temporary closure.

(a) When an UST system is temporarily closed, owners and operators must continue operation and maintenance of corrosion protection in accordance with § 280.31, and any release detection in accordance with Subpart D. Subparts E and F must be complied with if a release is suspected or confirmed. However, release detection is not required as long as the UST system is empty. The UST system is empty when all materials have been removed using commonly employed practices so that no more than 2.5 centimeters (one inch) of residue, or 0.3 percent by weight of the total capacity of the UST system, remain in the system.

(b) When an UST system is temporarily closed for 3 months or more, owners and operators must also comply with the following requirements:

(1) Leave vent lines open and functioning; and

(2) Cap and secure all other lines, pumps, manways, and ancillary equipment.

(c) When an UST system is temporarily closed for more than 12 months, owners and operators must permanently close the UST system if it does not meet either performance standards in § 280.20 for new UST systems or the upgrading requirements in § 280.21, *except that* the spill and overfill equipment requirements do not have to be met. Owners and operators must permanently close the substandard UST systems at the end of this 12-month period in accordance with §§ 280.71–280.74, *unless* the implementing agency provides an extension of the 12-month temporary closure period. Owners and operators must complete a site assessment in accordance with § 280.72 before such an extension can be applied for.

§ 280.71 Permanent closure and changes-in-service.

(a) At least 30 days before beginning either permanent closure or a change-in-service under paragraphs (b) and (c) of this section, or within another reasonable time period determined by the implementing agency, owners and operators must notify the implementing agency of their intent to permanently close or make the change-in-service, *unless* such action is in response to corrective action. The required assessment of the excavation zone under § 280.72 must be performed after notifying the implementing agency but before completion of the permanent closure or a change-in-service.

(b) To permanently close a tank, owners and operators must empty and clean it by removing all liquids and accumulated sludges. All tanks taken out of service permanently must also be either removed from the ground or filled with an inert solid material.

(c) Continued use of an UST system to store a non-regulated substance is considered a change-in-service. Before a change-in-service, owners and operators must empty and clean the tank by removing all liquid and accumulated sludge and conduct a site assessment in accordance with § 280.72.

Note: The following cleaning and closure procedures may be used to comply with this section:

(A) American Petroleum Institute Recommended Practice 1604, "Removal and Disposal of Used Underground Petroleum Storage Tanks";

(B) American Petroleum Institute Publication 2015, "Cleaning Petroleum Storage Tanks";

(C) American Petroleum Institute Recommended Practice 1631, "Interior Lining of Underground Storage Tanks," may be used as guidance for compliance with this section; and

(D) The National Institute for Occupational Safety and Health "Criteria for a Recommended Standard • • • Working in Confined Space" may be used as guidance for conducting safe closure procedures at some hazardous substance tanks.

§ 280.72 Assessing the site at closure or change-in-service.

(a) Before permanent closure or a change-in-service is completed, owners and operators must measure for the presence of a release where contamination is most likely to be present at the UST site. In selecting sample types, sample locations, and measurement methods, owners and operators must consider the method of closure, the nature of the stored substance, the type of backfill, the depth to ground water, and other factors appropriate for identifying the presence of a release. The requirements of this section are satisfied if one of the external release detection methods allowed in § 280.43 (c) and (f) is operating in accordance with the requirements in § 280.43 at the time of closure, and indicates no release has occurred.

(b) If contaminated soils, contaminated ground water, or free product as a liquid or vapor is discovered under paragraph (a) of this section, or by any other manner, owners and operators must begin corrective action in accordance with Subpart F.

§ 280.73 Applicability to previously closed UST systems.

When directed by the implementing agency, the owner and operator of an UST system permanently closed before December 22, 1988 must assess the excavation zone and close the UST system in accordance with this Subpart if releases from the UST may, in the judgment of the implementing agency, pose a current or potential threat to human health and the environment.

§ 280.74 Closure records.

Owners and operators must maintain records in accordance with § 280.34 that are capable of demonstrating compliance with closure requirements under this Subpart. The results of the excavation zone assessment required in § 280.72 must be maintained for at least 3 years after completion of permanent closure or change-in-service in one of the following ways:

(a) By the owners and operators who took the UST system out of service;

(b) By the current owners and operators of the UST system site; or

(c) By mailing these records to the implementing agency if they cannot be maintained at the closed facility.

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Notification for Underground Storage Tanks

FORM APPROVED
OMB NO. 2050-0068
APPROVAL EXPIRES 9-30-91

STATE USE ONLY

I.D. Number

Date Received

GENERAL INFORMATION

Notification is required by Federal law for all underground tanks that have been used to store regulated substances since January 1, 1974, that are in the ground as of May 8, 1986, or that are brought into use after May 8, 1986. The information requested is required by Section 9002 of the Resource Conservation and Recovery Act (RCRA), as amended.

The primary purpose of this notification program is to locate and evaluate underground tanks that store or have stored petroleum or hazardous substances. It is expected that the information you provide will be based on reasonably available records, or, in the absence of such records, your knowledge, belief, or recollection.

Who Must Notify? Section 9002 of RCRA, as amended, requires that, unless exempted, owners of underground tanks that store regulated substances must notify designated State or local agencies of the existence of their tanks. Owner means—

(a) in the case of an underground storage tank in use on November 8, 1984, or brought into use after that date, any person who owns an underground storage tank used for the storage, use, or dispensing of regulated substances, and

(b) in the case of any underground storage tank in use before November 8, 1984, but no longer in use on that date, any person who owned such tank immediately before the discontinuation of its use.

What Tanks Are Included? Underground storage tank is defined as any one or combination of tanks that (1) is used to contain an accumulation of "regulated substances," and (2) whose volume (including connected underground piping) is 10% or more beneath the ground. Some examples are underground tanks storing: 1. gasoline, used oil, or diesel fuel, and 2. industrial solvents, pesticides, herbicides or fumigants.

What Tanks Are Excluded? Tanks removed from the ground are not subject to notification. Other tanks excluded from notification are:

1. farm or residential tanks of 1,100 gallons or less capacity used for storing motor fuel for noncommercial purposes;
2. tanks used for storing heating oil for consumptive use on the premises where stored;
3. septic tanks;
4. pipeline facilities (including gathering lines) regulated under the Natural Gas Pipeline Safety Act of 1968, or the Hazardous Liquid Pipeline Safety Act of 1979, or which is an intrastate pipeline facility regulated under State laws;
5. surface impoundments, pits, ponds, or lagoons;
6. storm water or waste water collection systems;
7. flow-through process tanks;
8. liquid traps or associated gathering lines directly related to oil or gas production and gathering operations;
9. storage tanks situated in an underground area (such as a basement, cellar, mineworking, drift, shaft, or tunnel) if the storage tank is situated upon or above the surface of the floor.

What Substances Are Covered? The notification requirements apply to underground storage tanks that contain regulated substances. This includes any substance defined as hazardous in section 101 (14) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), with the exception of those substances regulated as hazardous waste under Subtitle C of RCRA. It also includes petroleum, e.g., crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute).

Where To Notify? Completed notification forms should be sent to the address given at the top of this page.

When To Notify? 1. Owners of underground storage tanks in use or that have been taken out of operation after January 1, 1974, but still in the ground, must notify by May 8, 1986. **2.** Owners who bring underground storage tanks into use after May 8, 1986, must notify within 30 days of bringing the tanks into use.

***Penalties:* Any owner who knowingly *fails to notify or submits false information* shall be subject to a civil penalty not to exceed $10,000 for each tank for which notification is not given or for which false information is submitted.**

INSTRUCTIONS

Please type or print in ink all items except "signature" in Section V. This form must be completed for each location containing underground storage tanks. If more than 5 tanks are owned at this location, photocopy the reverse side, and staple continuation sheets to this form.

Indicate number of continuation sheets attached

I. OWNERSHIP OF TANK(S)

Owner Name (Corporation, Individual, Public Agency, or Other Entity)

Street Address

County

City State ZIP Code

Area Code Phone Number

Type of Owner *(Mark all that apply ☒)*

☐ Current ☐ Former ☐ State or Local Gov't ☐ Federal Gov't (GSA facility I.D. no. _____) ☐ Private or Corporate ☐ Ownership uncertain

II. LOCATION OF TANK(S)

(If same as Section 1, mark box here ☐)

Facility Name or Company Site Identifier, as applicable

Street Address or State Road, as applicable

County

City (nearest) State ZIP Code

Indicate number of tanks at this location

Mark box here if tank(s) are located on land within an Indian reservation or on other Indian trust lands ☐

III. CONTACT PERSON AT TANK LOCATION

Name (If same as Section I, mark box here ☐) Job Title Area Code Phone Number

IV. TYPE OF NOTIFICATION

☐ Mark box here only if this is an amended or subsequent notification for this location.

V. CERTIFICATION (Read and sign after completing Section VI.)

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete.

Name and official title of owner or owner's authorized representative | Signature | Date Signed

CONTINUE ON THE REVERSE SIDE

Owner Name (from Section I) _____ Location (from Section II) _____ Page No. ____ of ____ Pages

VI. DESCRIPTION OF UNDERGROUND STORAGE TANKS *(Complete for each tank at this location.)*

Tank Identification No. (e.g., ABC-123), or Arbitrarily Assigned Sequential Number (e.g., 1,2,3...)		Tank No.	Tank No.	Tank No.	Tank No.	Tank No.
1. Status of Tank *(Mark all that apply ☒)*	Currently in Use	☐	☐	☐	☐	☐
	Temporarily Out of Use	☐	☐	☐	☐	☐
	Permanently Out of Use	☐	☐	☐	☐	☐
	Brought into Use after 5/8/86	☐	☐	☐	☐	☐
2. Estimated Age (Years)						
3. Estimated Total Capacity (Gallons)						
4. Material of Construction *(Mark one ☒)*	Steel	☐	☐	☐	☐	☐
	Concrete	☐	☐	☐	☐	☐
	Fiberglass Reinforced Plastic	☐	☐	☐	☐	☐
	Unknown	☐	☐	☐	☐	☐
	Other, Please Specify	_____	_____	_____	_____	_____
5. Internal Protection *(Mark all that apply ☒)*	Cathodic Protection	☐	☐	☐	☐	☐
	Interior Lining (e.g., epoxy resins)	☐	☐	☐	☐	☐
	None	☐	☐	☐	☐	☐
	Unknown	☐	☐	☐	☐	☐
	Other, Please Specify	_____	_____	_____	_____	_____
6. External Protection *(Mark all that apply ☒)*	Cathodic Protection	☐	☐	☐	☐	☐
	Painted (e.g., asphaltic)	☐	☐	☐	☐	☐
	Fiberglass Reinforced Plastic Coated	☐	☐	☐	☐	☐
	None	☐	☐	☐	☐	☐
	Unknown	☐	☐	☐	☐	☐
	Other, Please Specify	_____	_____	_____	_____	_____
7. Piping *(Mark all that apply ☒)*	Bare Steel	☐	☐	☐	☐	☐
	Galvanized Steel	☐	☐	☐	☐	☐
	Fiberglass Reinforced Plastic	☐	☐	☐	☐	☐
	Cathodically Protected	☐	☐	☐	☐	☐
	Unknown	☐	☐	☐	☐	☐
	Other, Please Specify	_____	_____	_____	_____	_____
8. Substance Currently or Last Stored in Greatest Quantity by Volume *(Mark all that apply ☒)*	**a. Empty**	☐	☐	☐	☐	☐
	b. Petroleum					
	Diesel	☐	☐	☐	☐	☐
	Kerosene	☐	☐	☐	☐	☐
	Gasoline (including alcohol blends)	☐	☐	☐	☐	☐
	Used Oil	☐	☐	☐	☐	☐
	Other, Please Specify	_____	_____	_____	_____	_____
	c. Hazardous Substance	☐	☐	☐	☐	☐
	Please Indicate Name of Principal CERCLA Substance	_____	_____	_____	_____	_____
	OR					
	Chemical Abstract Service (CAS) No.	_____	_____	_____	_____	_____
	Mark box ☒ if tank stores a mixture of substances	☐	☐	☐	☐	☐
	d. Unknown	☐	☐	☐	☐	☐
9. Additional Information (for tanks permanently taken out of service)						
	a. Estimated date last used (mo/yr)	/	/	/	/	/
	b. Estimated quantity of substance remaining (gal.)	_____	_____	_____	_____	_____
	c. Mark box ☒ if tank was filled with inert material (e.g., sand, concrete)	☐	☐	☐	☐	☐

VII. CERTIFICATION OF COMPLIANCE (COMPLETE FOR ALL NEW TANKS AT THIS LOCATION)

10. Installation (mark all that apply):

- ☐ The installer has been certified by the tank and piping manufacturers.
- ☐ The installer has been certified or licensed by the implementing agency.
- ☐ The installation has been inspected and certified by a registered professional engineer.
- ☐ The installation has been inspected and approved by the implementing agency.
- ☐ All work listed on the manufacturer's installation checklists has been completed.
- ☐ Another method was used as allowed by the implementing agency. Please specify:

_____

11. Release Detection (mark all that apply):

- ☐ Manual tank gauging.
- ☐ Tank tightness testing with inventory controls.
- ☐ Automatic tank gauging.
- ☐ Vapor monitoring.
- ☐ Ground-water monitoring.
- ☐ Interstitial monitoring within a secondary barrier.
- ☐ Interstitial monitoring within secondary containment.
- ☐ Automatic line leak detectors.
- ☐ Line tightness testing.
- ☐ Another method allowed by the implementing agency. Please specify:

_____

12. Corrosion Protection (if applicable)

- ☐ As specified for coated steel tanks with cathodic protection.
- ☐ As specified for coated steel piping with cathodic protection.
- ☐ Another method allowed by the implementing agency. Please specify:

_____

13. I have financial responsibility in accordance with Subpart I. Please specify:

Method: _____

Insurer: _____

Policy Number: _____

14. OATH: I certify that the information concerning installation provided in Item 10 is true to the best of my belief and knowledge.

Installer: _____ (Name) _____ (Date)

_____ (Position)

_____ (Company)

DAVID LINDSEY
CORPS OF ENGRS.

May 31, 1977

TO: YUKIO TAKETA

VIA: JOHN EVELAND

FROM: KUALOA ARCHAEOLOGICAL RESEARCH STAFF

SUBJECT: PUU O KAPOLEI - ARCHAEOLOGICAL RECONNAISSANCE SURVEY

The Kualoa Archaeological Research Project staff conducted a site reconnaissance survey, as requested, on May 13, 1977. Their findings and recommendations are contained in the attached report. The staff also wishes to express their appreciation to Mr. Raymond Au for his timely assistance.

If any questions arise concerning the contents of the report, please contact Stephan D. Clark or Robert D. Connolly, Archaeologists, Kualoa Regional Park, telephone 237-8252 or 237-8319.

STEPHAN D. CLARK

ROBERT D. CONNOLLY III

Attach.

cc: Milnor Lum

On May 13, 1977, the staff of the Kualoa Archaeological Research Project conducted an archaeological reconnaissance survey at Puu O Kapolei, just *makai* of Makakilo City, Oahu. Puu O Kapolei is the site of Fort Barrette, an abandoned army fort acquired by the City and County of Honolulu for park development. Its area measures approximately 1400 x 1000 feet, with elevations ranging from 80 to 160 feet above sea level. A heavy vegetative growth over most of the area consists chiefly of *keawe*, *haole koa*, sisal, and some domestic plants presumably planted by army personnel for landscaping purposes.

Puu O Kapolei is mentioned by J. G. McAllister in *Archaeology of Oahu* (1933), as the site of Puu Kapolei *heiau*. He states:

> The stones from the *heiau* supplied the rock crusher which was located on the side of this elevation, which is about 100 feet away from the sea side. There was formerly a large rock shelter on the sea side where Kamapuaa is said to have lived with his grandmother.

The staff conducted the survey by spreading out about 15 feet apart and making repeated walks back and forth, covering the entire area. Puu O Kapolei was found to be extensively modified. There are presently at least twenty abandoned, or partially abandoned, late historic military structures on the site, including bunkers, barracks, and a chapel. Construction of these buildings would have required very extensive bulldozing of the area. Several basalt rock free-standing, and retaining, walls were seen which appear to have been built by army personnel. No surface artifacts, midden, or prehistoric structures were seen, including McAllister's *heiau* and rock shelter, which were apparently destroyed before the time the army acquired the land for the fort.

The archaeological research staff recommends that because of the extensive land modifications at Puu O Kapolei, no further archaeological work will be required. If, however, during park development any evidence of prehistoric occupation *should* be uncovered, an archaeologist should be called in to evaluate the find.

GEORGE R. ARIYOSHI
GOVERNOR

ALBERT O.Y. TOM
Chairman

TELEPHONE NO.
548-6915

STATE OF HAWAII
ENVIRONMENTAL QUALITY COMMISSION
OFFICE OF THE GOVERNOR
550 HALEKAUWILA ST
ROOM 301
HONOLULU, HAWAII 96813

May 27, 1977

Young Suk Ko, Director
Department of Parks and
Recreation
City and County of Honolulu
Honolulu, Hawaii 96813

SUBJECT: Assessment of Fort Barrette

Dear Mr. Ko:

We have received your letter of May 23, notifying the Commission of your Department's decision to rescind the negative declaration for the proposed Fort Barrette park and to file an EIS in the near future.

Prior to the filing of the EIS, an EIS preparation notice should be filed with the Commission and consultation undertaken with appropriate parties. Requirements for preparation notices and consultation are given by EIS Regulations 1:31 and 1:41.

We shall publish notiece of the rescission and of the forthcoming preparation notice in the June 8 EQC Bulletin.

Thank you for your attention to the requirements of Chapter 343, HRS.

Sincerely,

Allan Suematsu
Executive Secretary

APPENDIX C

Puu O Kapolei - Archaeological Reconnaissance Survey

NEGATIVE DECLARATION
FOR LAND ACQUISITION
AND IMPROVEMENTS AT
KAPOLEI PARK

I. Project Description

A. Project Feature

½ of site

Land acquisition of approximately 14.7 acres of land for the expansion of Kapolei Park.

Latter increments to include construction of improvements including grading, sprinkler system, landscaping, utilities, comfort stations, picnic and camping facilities, parking and access road, open play areas and security lighting.

B. Objective

Provide recreation amenities for residents of the Ewa area, which is the proposed secondary urban center.

C. Funding

	LAND	SOURCE
FY 1979	$200,000	CDBG

II. Environmental Effects and Assessment of Significance (Short-term and long-term comparisons; irretrievable or irreversible commitment of resources; mitigating measures).

A. Physical Environment

1. Geographical Characteristics

Kapolei Park is situated between the Makakilo subdivision and the front gate of Barbers Point Naval Air Station. The site lies approximately 16 miles from downtown Honolulu.

The site is shaped roughly like a truncated cone with the highest promontory, 160 feet elevation, rising on the makai side and falling on the front gate side to about 115 feet elevation. The average slope is about 7%. Vegetation is heavy and mostly of the dryland shrubbery variety.

Soil type consists of Ewa silty clay loam and Lahaina silty clay. The surface of the Ewa silty clay loam is dark reddish-brown about 18 inches thick. The subsoil, about 42 inches thick, is dark reddish-brown and dark red silty clay loam that has subangular blocky structure. The substratum is coral lime stone, sand or gravelly alluvium. The soil is neutral in the surface layer and subsoil. Permeability is moderate, runoff slow, and the erosion hazard is slight.

The Lahaina soil series consist of well-drained soils. Most of the surface layer and, in places, part of the subsoil has been removed by erosion. Runoff is medium and the erosion hazard is severe.

2. Land Use

The site of Kapolei Park, formerly Fort Barrette, was constructed as a U.S. Army Coast Artillery Post sometime prior to 1931 on land ceded by the State of Hawaii to the Federal Government. The installation's original continguous area was roughly 40 acres. Most of the more level land (approximately 12 acres to be acquired) was declared surplus and sold between 1963-1967 to Campbell Estate, the State, and to A. B. Lau. The remaining 15.8 acres, transferred to the City by the Federal government, is quite steep and difficult to utilize other than a passive and natural type of park.

Land use policies governing the project site are:

State Land Use:	Agricultural
General Plan:	Military
Zoning:	Agricultural
Existing Land Use:	Park

Existing land uses surrounding the project site are agricultural lands used for the production of sugarcane, Makakilo residential subdivision and the Barbers Point Naval Station.

Agricultural lands surrounding the project area are proposed for residential use. Eventually, this area will become the secondary urban center on Oahu.

3. Flood/Tsunami Hazards

Being situated on a promontory, the project site is not subject to floods nor tsunamies.

4. Coastal Zone Standards

The project site is not subject to Shoreline Protection Ordinance No. 4529.

5. Flora and Fauna

There are no endangered species on the site. Existent flora and fauna include the following:

Flora

Common Name	Botanical Name
Hailoa	Waltheria americana
Ilima	Sida fallax
Kiawe	Prosopis pallida
Singapore Plumeria	Plumeria obtusa
Koali'awahia (Morning-glory)	Ipomoea congesta
Koa-haole	Leucaena leucocephala
Giant reed	Arundo donax
	Opuntia sp.
	Bougainvillea hybrid
Koli (Castor Bean)	Ricinus communis
Mau'u-pilipili (Bristly foxtail)	Setaria verticillata
	Passiflora foetida
Opiuma	Pithecellobium dulce
American pluchea	Pluchea odorata
Garden spurge	Euphorbia hirta
Rattlebox	Crotalaria spectabilis
Be-still tree	Thevetia peruviana
Cats-claw climber	Doxantha unguis-cati
Sausage tree	Kigelia africana
Sisal	Agave sisalana
Beggar's trick; Ko'oko'olau	Bidens pilosa
Pakai kuku (Spiny amaranth)	Amaranthus spinosus
Inikoa (Indigo)	Indigofera suffruticosa
Asystasia	Asystasia gangetica
Ohia-lomi (Tomato)	Lycopersicon esculentum
Ohai (Monkey pod)	Samanea saman
Ki-paoa	Ocimum basilicum
Bermuda grass, Manienie	Cynodon dactylon
Hairy abutilon	Abutilon grandifolium
Koali-kua-hulu (Hairy merremia)	Merremia aegyptia
Nohu	Tribulus cistoides
Acuan	Desmanthus virgatus

False mallow	Malvastrum coromandelianum
Rattle box	Crotolaria retusa
Golden crown-beard	Verbesina encelioides
Apple of Peru	Nicandra physalodes
Ko'oloa	Abutilon incanum
Natal red top	Rhynchelytrum repens
Coat buttons	Tridax procumbens
	Ipomoea obscura
Paragrass	Brachiaria mutica
Napier grass	Pennisetum purpureum

Fauna

Mammals

Polynesian Rat	Mus exulans
Roof Rat	Mus rattus
Norway Rat	Mus norvegicus
House Mouse	Mus musculus

Birds

Black-Crowned Night Heron	Nycticorax Nycticorax hoactli
Cattle Egret	Bubulcus ibis
Barn Owl	Tyto alba
Common Mynah	Acridotheres tristis
Chinese Lace-Necked Dove	Streptopelia chinensis
Barred Dove	Geopelia striata
House Sparrow	Passer domesticus
Brazilian Cardinal	Paroaria coronata
American Cardinal	Cardinalis cardinalis
Ricebird	Lonchura punctulata
Japanese White-Eye	Zosterops japonica japonica

Reptiles

Three species of introduced Gecko and one specie of introduced Skink which are all common to Oahu lowland environments.

6. Water Quality

   There are no groundwater resources suitable for domestic use in the project area.

7. Air Quality

   Use of the park will not generate air pollutants.

During the construction period, airborne emissions will consist of fugitive dust and construction vehicle and equipment emissions. Dust will be minimized by periodic sprinkling of water over the affected area. State laws on air pollution will govern the use of fuel burning equipment and internal combustion engines.

8. Noise Standards

Inasmuch as the project site is located in the midst of open sugarcane fields; and, the nearest residential subdivision is located approximately one-half mile from the project site, both interior and exterior noise will not have any detrimental impact on the environment.

9. Historic Preservation

The Kualoa Archaeological Research staff conducted a reconnaissance survey at Kapolei Park in May 1977. No surface artifacts, midden, or prehistoric structures were seen, including McAllister's heiau and rock shelter, which were apparently destroyed before the time the army acquired the site for the artillery base.

The archaeological research staff recommended that because of the extensive land modifications on the site, no further work will be required. If, however, during park development any evidence of prehistoric occupation should be uncovered, an archaeologist will be called to evaluate the find.

10. Traffic and Transportation

Access is readily available via Farrington Highway and Barbers Point access road.

Most of the park users will be travelling by private vehicles.

Additional transportation facilities will not be required.

11. Utilities

Electrical and sewage facilities are available.

An 8-inch waterline will be connected to existing resources in the vicinity of Farrington Highway.

12. Irreversible/Irretrievable Resources

Building materials and labor will be committed.

B. Socio-Economic Environment

1. Population/Recreation Standards

The 1975 Census indicated a population of 21,800 in the Ewa-Makakilo area. A population of 104,000 is expected by the year 2000. Based on the projected population and measuring it against the recommended 3 acres of park land per 1,000 population, there will be a need for approximately 312 acres of active recreation space. At present, there are only four playgrounds consisting of about 26 acres.

2. Police, Fire and Health

Emergency facilities are readily available in nearby communities. These include the Waianae Police Sub-Station; Leeward Hospital and the Makakilo Fire Station.

III. Alternatives

The only alternative considered is "no action." Inasmuch as there will be need for more public playgrounds in the Ewa-Makakilo area to support the projected population, this alternative is not acceptable.

APPENDIX D

PEMCO Field Report 1/10/90

PEMCO, LTD.

F I E L D R E P O R T

Date of visit: January 10, 1990 Project no.: 280.4

Project: Fort Barrette Environmental Assessment

Prepared by: Toan Nguyen

Weather: Clear

Purpose: Verify findings of the PUU O KAPOLEI - ARCHAEOLOGICAL RECONNAISSANCE SURVEY of May 31, 1977.

****

1. The field survey of the Fort Barrette site was accomplished by Mr. Toan Nguyen and Mr. George Krzyminski from PEMCO.

2. Insert from the archaeological survey:

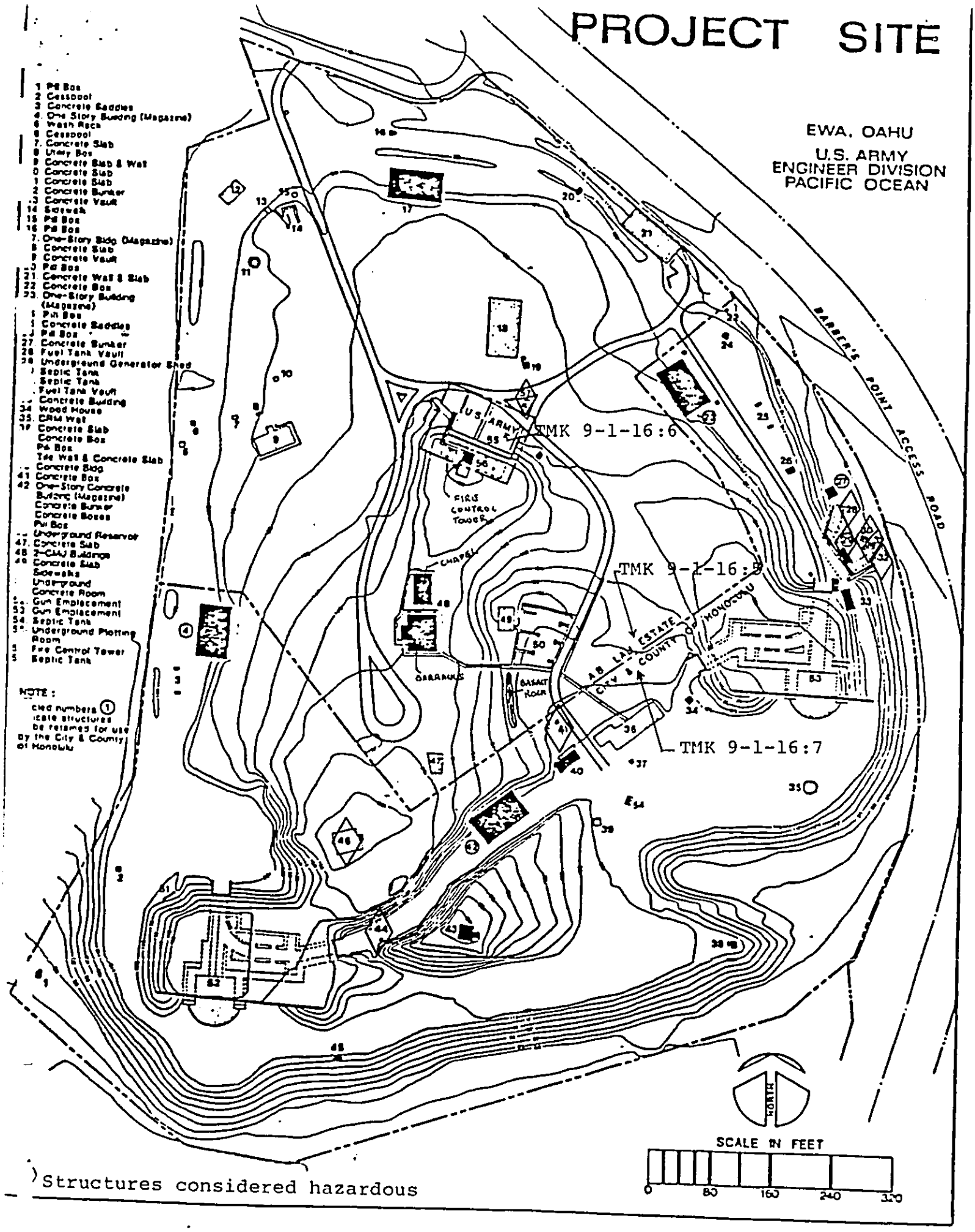
> "... There are presently at least twenty abandoned, or partially abandoned, late historic military structures on the site, including bunkers, barracks, and a chapel. Construction of these buildings would have required very extensive bulldozing of the area. Several basalt rock freestanding, and retaining walls were seen which appear to have been built by army personnel..."

3. The site is generally overgrown with grass. However, the remains of the structures that are mentioned in the archaeological survey may still be identified at various locations as indicated in the attached plan - project site.

4. Remains of what appear to be a chapel and living quarters (barracks) are identified as "2-CMU Buildings" south of the fire control tower. These structures are accessible by a gravel road from the tower, and also by a foot path from the site of some former housing units east of the structures. The chapel structure has a large meeting room, and two smaller rooms which appear to be a bathroom and an office. The CMU walls, roof, and concrete slab are still remaining. The barracks structure has several rooms which indicate living quarters. Only exterior and interior CMU walls, and concrete slabs of the structure are remaining.

5. Several archery practice ranges are scattered throughout the site. No animals were seen during the visit.

PROJECT SITE



(1) Structures considered hazardous