

U.S. AIR FORCE
INSTALLATION RESTORATION PROGRAM

WILLOW GROVE AIR RESERVE FACILITY, PA

DECISION DOCUMENT

WASTE OIL STORAGE AREA (SITE SS05)

AUGUST 1990

HEADQUARTERS, U.S. AIR FORCE RESERVE
ROBINS AIR FORCE BASE, GEORGIA 31098-6001

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INTRODUCTION

The objective of this decision document is to describe the setting, present the technical findings of previous studies, evaluate potential remedial alternatives, and ultimately document the Air Force Reserve (AFRES) position on the final status of the Waste Oil Storage Area, Bldg 4330 (Installation Restoration Program (IRP) Site SS05) at the Willow Grove AFRES facility, Pennsylvania.

SITE IDENTIFICATION

The Willow Grove AFRES facility consists of approximately 162 acres located 23 miles north of Philadelphia in southeast Montgomery County and northeast of Willow Grove Naval Air Station (Fig 1). The IRP site described in this decision document consists of a 100 ft² area behind Building 330 previously used for storage of a waste-oil bowser (Fig 2).

BACKGROUND

Site Description

This site was used between 1970 and 1980 as a storage area for an above-ground tank (bowser) which was used for the storage of waste oils from various shops. The bowser was removed in 1980 at which time oil staining was observed in the surficial sediments of the area. Overfilling and spillage at the bowser were reported to have occurred in quantities ranging from 100 to 200 gallons per year.

Adjacent to, and downslope from, the bowser storage area, a spill of about 300 gallons of JP-4 fuel is known to have occurred in 1982. The spill occurred in a former vehicle storage area and was immediately reported to the Base Fire Department. Visibly contaminated soils were immediately excavated from the site.

Previous Investigations

An IRP Records Search for Willow Grove was completed by Roy F. Weston Inc. in November 1984. The purpose of the records search was to identify the potential for environmental contamination due to past waste disposal practices and to assess the probability for contamination migration. A total of seven sites were initially identified at the AFRES installation.

In 1989 and 1990 EA Engineering, Science, and Technology, Inc. (EA) conducted a Site Inspection (SI) at four sites at the Willow Grove AFRES facility in order to define the type and extent of contamination and determine the potential need for remedial action. In the Waste Oil Storage Area, this investigation consisted of a soil gas survey and the installation and sampling of two soil borings.

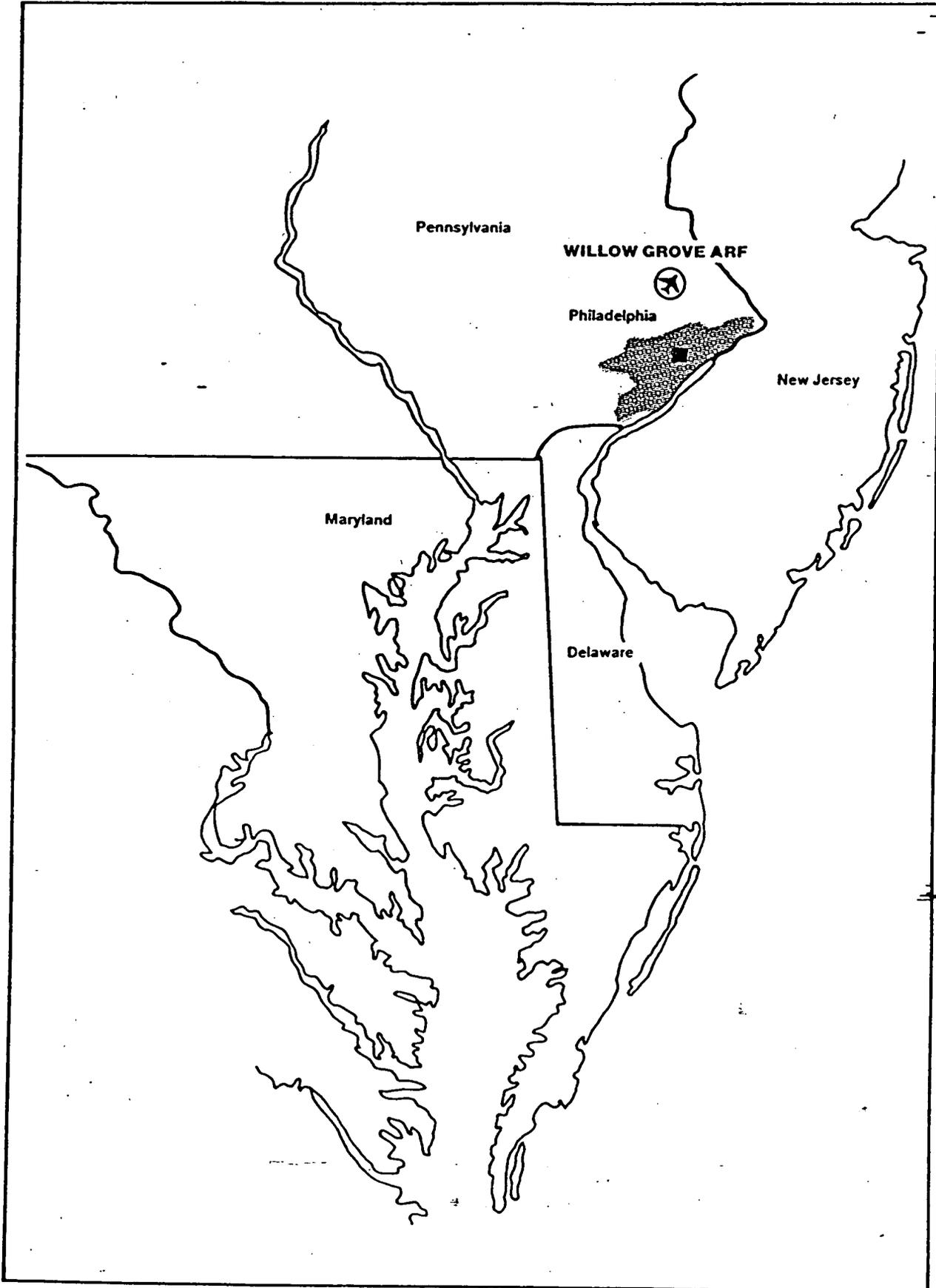


Figure 1: LOCATION OF WILLOW GROVE ARF

WESTERN

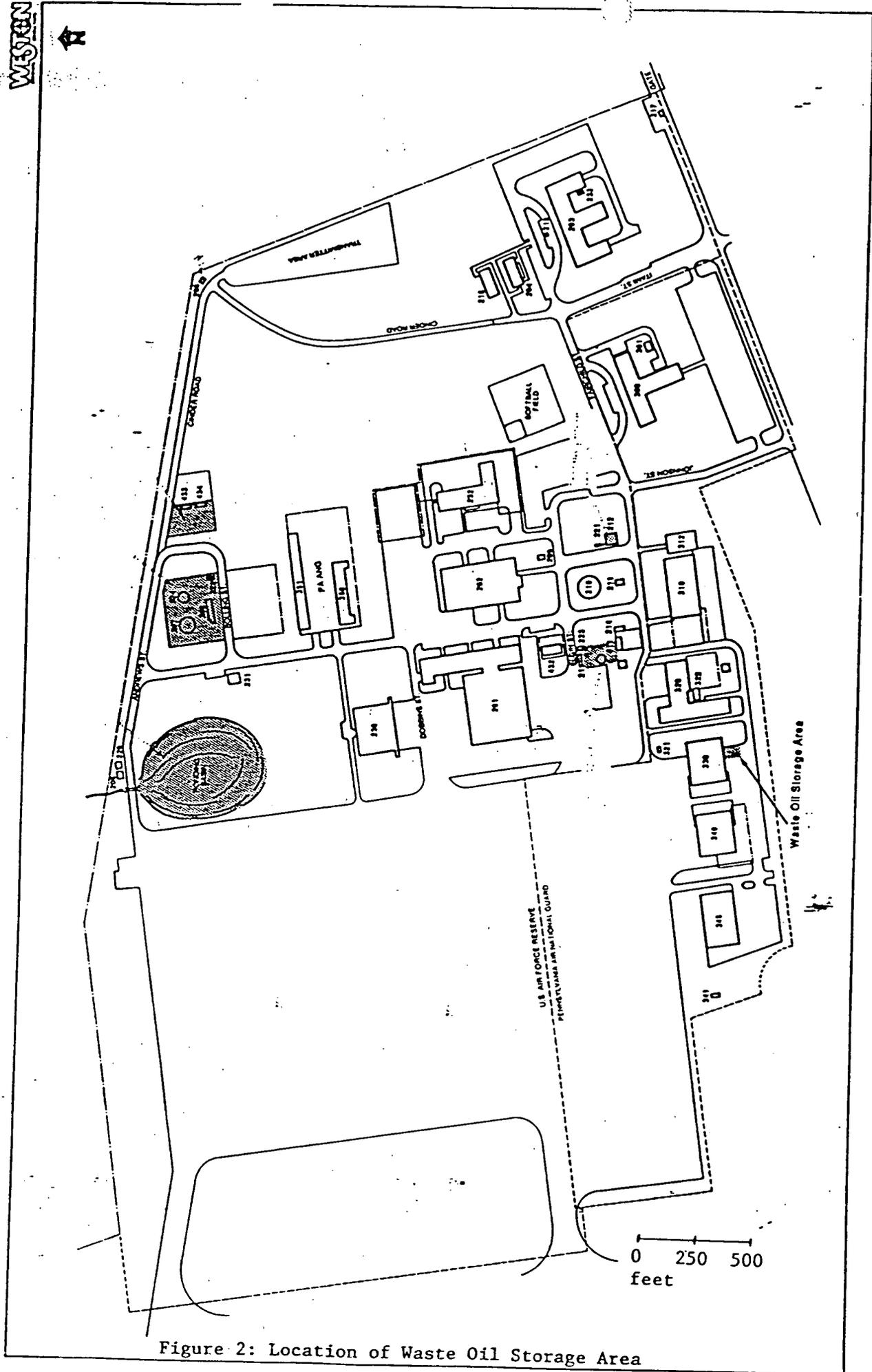


Figure 2: Location of Waste Oil Storage Area

ENVIRONMENTAL SETTING

Willow Grove is located in the Southeastern Coastal Plain/Allegheny Plateau physiographic province. The topography consists of gently northwestwardly sloping hills and nearly level plains. Elevations range from 264 to 315 feet above mean sea level.

Willow Grove receives an average annual precipitation of approximately 41 inches with an average annual net precipitation of 18 inches. Maximum rainfall occurs in late summer in connection with local thunderstorms. The one-year, 24-hour rainfall in the vicinity of Willow Grove is about 2.7 inches.

The predominant bedrock at Willow Grove consists of the sandstones and shales of the Stockton Formation. The Stockton Formation is overlain by a thin (2 to 15 feet) cover of soil and unconsolidated sediments. Bedrock in the area dips generally to the northwest and contains zones of well developed vertical jointing.

Groundwater beneath the facility that occurs within the Stockton Formation is strongly influenced by the size, frequency, distribution, and orientation of fractures within the consolidated sediments. The surficial sediments are generally in good hydrologic connection with the underlying bedrock and act as a storage medium for seasonal infiltration which is slowly transmitted as recharge to the bedrock aquifer. All groundwater within the surficial sediments and the Stockton Formation flow generally to the northwest below Willow Grove ARF. The Stockton Formation is the major water producing aquifer for private and industrial applications in the area of Willow Grove.

Surface-water runoff from the base is collected through a series of manmade ditches, culverts, and storm sewers which discharge into a local ponding basin. Discharge from the basin flows northward into Little Neshaminy Creek and then into the Delaware River.

RESULTS AND SIGNIFICANCE OF PREVIOUS INVESTIGATIONS

Results and Significance of Soil Borings

As part of the Site Investigation conducted by EA in 1989, two soil borings were emplaced in the area of the Waste Oil Storage Area. One boring was placed within the bounds of the former bowser storage area and the other within the area of the suspected JP-4 spill area (Fig 3). The boring at the waste oil bowser storage area was drilled until bedrock was reached at four and one half foot depth. The boring in the spill area was drilled until bedrock was reached at eight foot depth. No groundwater was encountered during the drilling of the soil borings. The cuttings from both borings were collected and sampled for volatile and semivolatile organic compounds, total petroleum hydrocarbons, and total organic carbon.

Results of the analysis revealed only low levels (24 mg/Kg) of total petroleum hydrocarbons to be present within the former bowser storage area. No volatile or semivolatile compounds were positively identified within the bowser storage area.

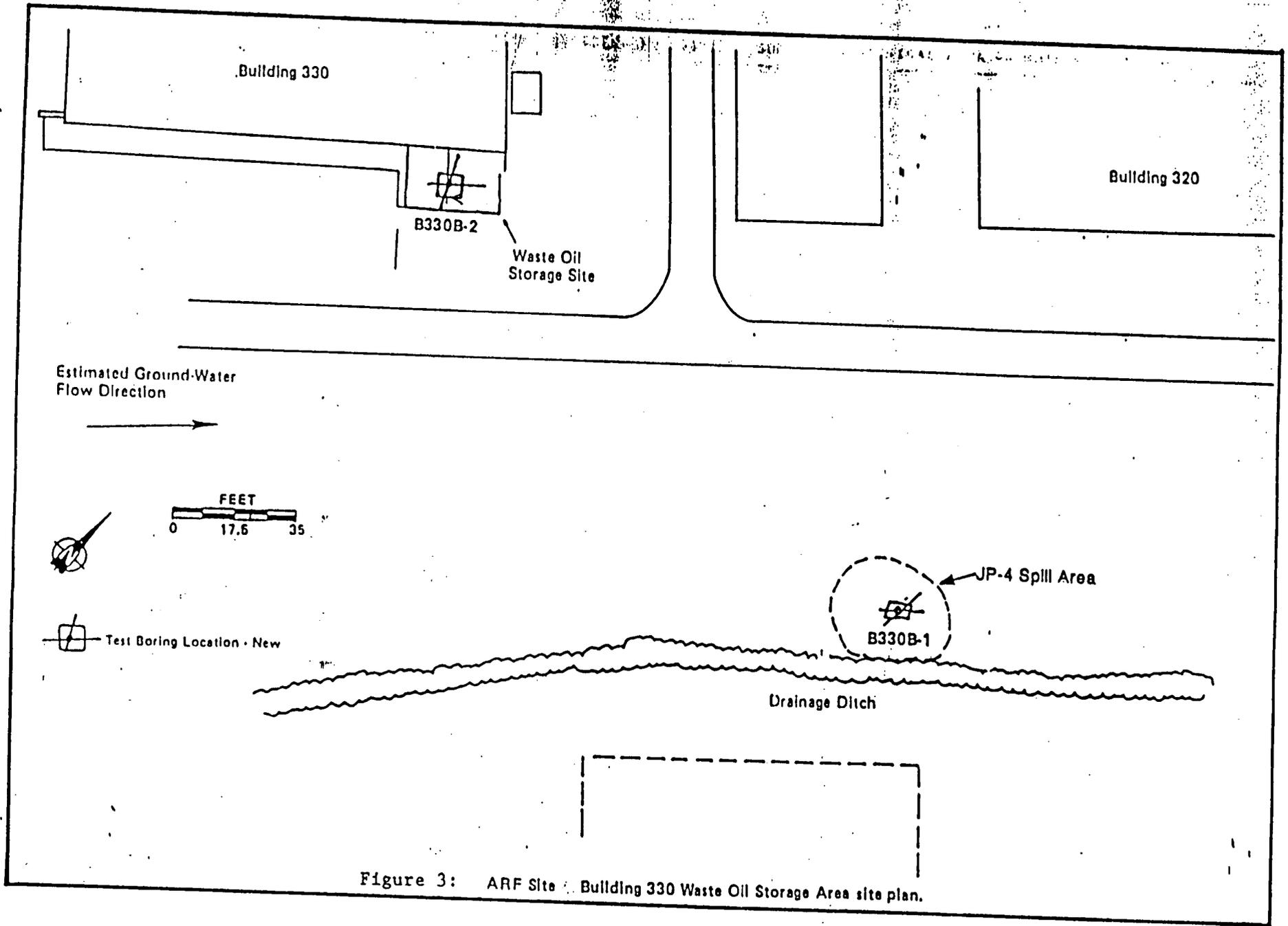


Figure 3: ARF Site - Building 330 Waste Oil Storage Area site plan.



Within the Spill Area, analysis of the soil revealed the existence of higher levels of total petroleum hydrocarbons (530 mg/Kg) as well as limited volatile and semivolatile organics (benzene and 2-methylnaphthalene).

CONTAMINATION ASSESSMENT

Analysis of the soils within the former bowser storage area behind Building 330 revealed the existence of only very low levels of total petroleum hydrocarbons. No other contaminants were detected within the soils and shallow groundwater does not appear to be present at the site. There is currently no evidence of any adverse environmental impact due to past operations at this Waste Oil Storage Area.

Analysis of the soils within the JP-4 spill area has revealed the existence of elevated levels of total petroleum hydrocarbons as well as minor volatile and semivolatile contaminants. This spill site is located adjacent to a local drainage ditch which receives drainage from an upgradient Navy Fuel Farm. Due to the reported excavation of contaminated soils at the time of the spill and the suspected contamination at the upgradient fuel farm (the Navy Fuel Farm is currently under investigation under the Navy's IRP program), the exact source of the detected contamination cannot be determined with certainty. Further investigation of the contamination detected adjacent to the drainage ditch will be undertaken through the Navy IRP program.

CONTROL MEASURES

Identification of Control Measures

The following alternative control measures were identified for the Waste Oil Storage Area, Building 330:

1. Excavation of contaminated soils.
2. Treatment of contaminated soils.
3. No Further Action.

Screening of Control Measures

The control measures were screened to select a technically feasible and cost-effective plan to control the release of hazardous substances to the environment. The following criteria were used to screen each control measure:

1. Currently known characteristics of the site.
2. Technical feasibility and effectiveness of the remedial action at the site.

Evaluation of the Alternative Control Measures

Alternative 1: Excavation of contaminated soils.

This alternative was not chosen due to: (1) the low levels of contamination detected at the site; (2) the limited extent of detected contamination; (3) and the low risk to human health and the environment posed by the contaminant detected. Further investigation of the contamination detected adjacent to the drainage ditch will be undertaken through the Navy IRP program.

Alternative 2: Treatment of contaminated soils.

This alternative was not chosen due to: (1) the low levels of contamination detected at the site; (2) the limited extent of detected contamination; and (3) the low risk to human health and the environment posed by the contaminants detected. Therefore, the high cost of implementing soil remediation technology at this site is not justified. Further investigation of the contamination detected adjacent to the drainage ditch will be undertaken through the Navy IRP program.

Alternative 3: No Further Action

This alternative was chosen due to the low levels of contamination detected at the bowser storage site and the limited extent of detected contamination. The Navy IRP program will further address the contamination detected near the drainage ditch.

RECOMMENDATIONS

No significant contamination has been detected within the former bowser storage area of the Waste Oil Storage Area. This site poses no threat to the public health or the environment of the Willow Grove Air Reserve Facility area. The low-level contamination detected adjacent to the drainage ditch will continue to be addressed through the NAVY IRP program currently active at Naval Air Station Willow Grove. Based on the results of the most recent analysis, we feel further investigation of the area is not warranted. AFRES recommends that no further action be taken at the Waste Oil Storage Area, Building 330 (Site SS05) at the Willow Grove AFRES facility.

REFERENCES

Roy F. Weston, Inc. 1984. INSTALLATION RESTORATION PROGRAM PHASE I - RECORDS SEARCH, WILLOW GROVE AIR RESERVE FACILITY, WILLOW GROVE, PENNSYLVANIA, prepared for United States Air Force Reserve, Robins AFB, Georgia 31098.

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