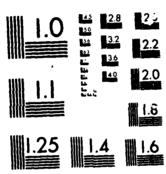
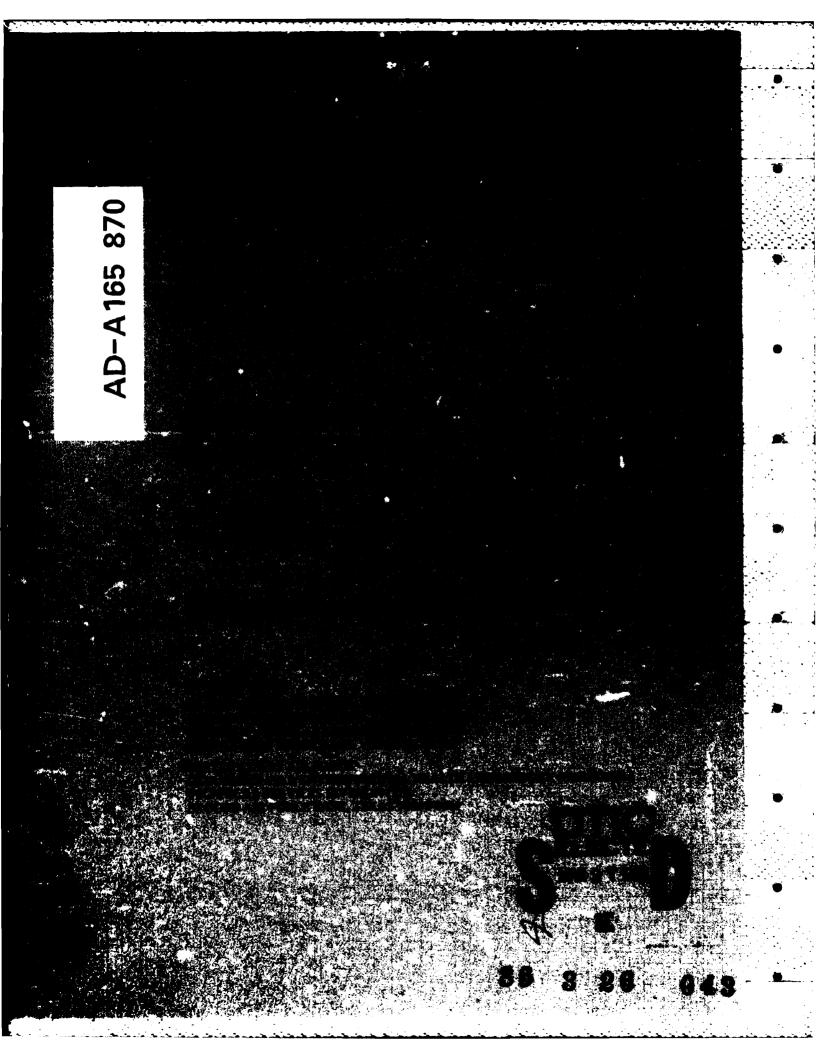


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organic halogens (TOX), total phenolics, and oil and grease], which are nonspecific indicators of contamination. Samples near waste sites were analyzed for specific constituents [cadmium, chromium, iron, nickel, lead, zinc, dichlorodiphenyltrichloroethane (DDT), and purgeable organics] where prior information indicated they may be present. Samples from base supply wells were tested for selected nonspecific and `specific constituents.

At the Southwest Landfill, no significant threat to human health or the environment is indicated by testing results in Phase II Stage 1. Movement of only very small amounts (i.e., fractions of a pound per year) of potentially toxic substances was detected. This indicates the need for additional monitoring to refine estimates of substances moving in groundwater.

At the Lily Pad Pond Fill site, no significant potential impact to human health or the environment is indicated by monitoring data.

At the North POL area, there is significant evidence of fuel and/or fuel-type substances in groundwater and shallow strata. It is reasonable to believe that the storage tanks at the North POL area are the source. Lead, toluene, and ethyl benzene were detected at significant levels. However, there is little chance shallow groundwater would be ingested. Levels found are not expected to harm aquatic life. No information is available regarding potential impacts to plant life.

Additional sampling and analysis are needed to determine the extent of the affected area.

Results of analysis on all Moody AFB supply wells indicate that no significant contamination exists in any well. TOX levels of 120 and 94 ug/l were found in wells MAFB-7 and MAFB-10, respectively. These are above the 40 ug/1 which is the level selected to indicate additional testing may be prudent.

Recommended additional work includes installing nine additional wells at the Southwest Landfill and ten wells at the North POL area. Sampling and analysis of existing plus new wells at the landfill, POL area, and wells MAFB-7 and 10 are recommended. No additional activities are recommended for the Lily Pad Pond Fill site.

INSTALLATION RESTORATION PROGRAM PHASE II - CONFIRMATION/QUANTIFICATION STAGE 1

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FINAL REPORT

FOR

MOODY AIR FORCE BASE MOODY AIR FORCE BASE, GEORGIA 31601

HEADQUARTERS TACTICAL AIR COMMAND COMMAND SURGEON'S OFFICE (HQ TAC/SGPB) BIOENVIRONMENTAL ENGINEERING DIVISION LANGLEY AIR FORCE BASE, VIRGINIA 23665

DECEMBER 1985

PREPARED BY

WATER AND AIR RESEARCH, INC. P.O. BOX 1121 GAINESVILLE, FLORIDA 32602

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NOTICE

This report has been prepared for the United States Air Force by Water and Air Research, Inc., for the purpose of aiding in the implementation of the Air Force Installation Restoration Program. It is not an endorsement of any product. The views expressed herein are those of the contractor and do not necessarily reflect the official views of the publishing agency, the United States Air Force, nor the Department of Defense.

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PREFACE

This report has been prepared for the United States Air Force by Water and Air Research, Inc. (WAR) under Contract No. F33615-81-D-4007-0014. It constitutes the report of the Phase II, Stage 1 Installation Restoration Program investigation for Moody Air Force Base, Georgia.

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Fieldwork for the study was performed between April and September 1984. Lt. Maria R. LaMagna, Technical Services Division, USAF OEHL was the technical monitor. TABLE OF CONTENTS (Page 1 of 3) E

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SUMMARY

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SUMMARY

The Phase II Stage 1 Installation Restoration Program (IRP) Confirmation/Quantification Survey for Moody Air Force Base (Moody AFB) investigated three suspected hazardous waste disposal sites. These included a former landfill site; a construction rubble fill site; and a petroleum, oil, and lubricants (POL) storage area. Site characteristics are summarized in Table S-1. In addition, testing of all existing water supply (potable and industrial) wells was conducted.

Shallow groundwater monitoring wells were installed at two of the sites. Shallow pits were excavated at the remaining site. Shallow groundwater from monitor wells and pits, deeper groundwater from existing wells, and surface water were sampled for the constituents listed in Table S-2. Most of these analyses were screening tests [pH, specific conductance, dissolved organic carbon (DOC), total organic halogens (TOX), total phenolics, and oil and grease], which are nonspecific indicators of contamination. Samples near waste sites were analyzed for specific constituents [cadmium, chromium, iron, nickel, lead, zinc, dichlorodiphenyltrichloroethane (DDT), and purgeable organics] where prior information indicated they may be present. Samples from base supply wells were screened for selected nonspecific and specific constituents.

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At the Southwest Landfill, no significant threat to human health or the environment is indicated by testing results in Phase II Stage 1. Movement of only very small amounts (i.e., fractions of a pound per year) of potentially toxic substances was detected. Testing results used as a screening procedure indicate the need for additional monitoring to refine estimates of substances moving in groundwater. There is a small potential for substances moving in groundwater to migrate to Mission Lake and perhaps Well MAFB-7. Because the lake is used for fishing and the well is a potable supply, human health can be impacted if subsequent investigation indicates that significant amounts of wastes migrate from the landfill. Table S-1. Churacteristics of Phuse II Stage 1 Sites, Moody AFB, Georgia

Muse I Records Scarch SIte No.	Phase II Staye 1 Site No.	Site Description	Period of Usage	Ncarest ⁿ rinking Water Well (feet)	Neurest Surface Water Body (feet)	Depth to Groundwater (feet)	Evidence/Quantity of Hazardous Wastes	Possible Hazardous Waste Types
~	-	Southwest Landfill	1955-1972	<3,000	<500	0-10	Known/small	Paints, thimers, solvents, and oils.
×	2	Lily Pad Pond Fill Site	Late 1960s - 1979	<5,000	Adjacent	0-10	Known/small	Containerized waste, oils, and solvents.
12	e	North MN, Area	Unknown- present	3,000	2,500	0-10	Suspected/small	Avlation gasoline, and diesel oil.

lation Restonation Program Records Search for Moody Air Force Base, Georgia (CH2M-Hill, 1983).

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Site Description	Sample Locations	Sample Analyses*
Southwest Landfill	Six monitor wells.	GACI, metals, oil and grease, COD, pesticide/ herbicide scan; VOC at Wells 3 and 6 only.
Lily Pad Pond Fill	Six monitor wells, four surface water samples 100 feet from fill edge.	GWCI, total phenolics, metals, oil and grease, COD; VOC at all wells and two surface water sites.
North POL Area	Two shallow pits.	GWCI, oil and grease, DOC, OOD, presence of visible fuel layer, volatile aromatics per EPA method 503.1
Moody Supply Wells	Wells 1, 2, 3, 5, 5a, 7, 10†, 12, 13.	GWCI, metals, oil and grease.
Moody Supply Wells	Wells 4, 6, 8.	GWCI, metals, oil and grease, pesticide/ herbicide scan.

Table S-2. Summary of Sampling and Analyses for Phase II Stage 1 Survey, Moody AFB, Georgia

*The following sample analyses are used:

GWCI = groundwater contamination indicators: pH, specific conductance, and total organic carbon (dissolved fraction).

Metals = arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver. COD = chemical oxygen demand.

Pesticide/herbicide scan = DDT and DDT metabolites, heptachlor, heptachlor epoxide, Lindane, chlordane, diazinon, malathion, toxaphene, 2,4-D, and 2,4,5-T.

VOC = volatile organic compounds as specified in EPA Methods 601 and 602.

Moody Well 10 is located at Grassy Pond Recreational Annex.

Several of the organic compounds detected in Well L-3 near the landfill are more dense than water and may move vertically in groundwater.

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At the Lily Pad Pond Fill site, no significant potential impact to human health or the environment is indicated by monitoring data. Toluene and benzene were detected in very small amounts (i.e., 1.8 and 4.7 ug/l, respectively). These levels do not threaten aquatic life in surrounding surface waters. Levels of phenolic compounds cannot be assessed in terms of regulatory criteria because a total phenolic scan was performed. Because the site is remote and because it is reasonable to expect that at least some phenolics detected are naturally occurring compounds, no significant impact is expected due to phenolics.

At the North POL area, there is significant evidence of fuel and/or fuel-type substances in groundwater and shallow strata. It is reasonable to believe that the storage tanks at the North POL area are the source of these substances. There is also an indication that either these substances can be relatively difficult to detect during seasonal periods of higher groundwater (e.g., during April 1984) or that these substances moved into the vicinity of the sampling pits between the times on-site work was performed (i.e., April and September 1984).

Lead was detected at 200 ug/l which exceeds drinking water criteria (i.e., 50 ug/l). Toluene (180 ug/l) and ethyl benzene (690 ug/l) exceeded recommended ambient criteria levels. Detectable amounts were found for several other volatile organic compounds which do not have recommended ambient criteria. However, there is little chance shallow groundwater would be ingested. Levels found are not expected to harm aquatic life. No information is available regarding potential impacts to plant life. Evidence of possible harm to trees was reported in the Phase I IRP report by CH2M-Hill (1983). Seepage would have to persist laterally about 800 feet to reach a surface stream. Main base potable wells are about 2,000 feet away and about 400 feet deep, and they are rel:tively isolated from surface strata by one or more layers of low

S-4

permeability. Therefore, there is no apparent immediate threat to human health or the environment.

There is no detailed information regarding the extent of the affected area and additional sampling and analysis would be needed to determine this. There is also no detailed information regarding which tank(s) or line(s) may be leaking. Examination and testing at the North POL area is necessary to develop this information.

Results of analysis on all Moody AFB supply wells indicate that no significant contamination exists in any well. TOX levels of 120 and 94 ug/1 were found in wells MAFB-7 and MAFB-10, respectively. These are above the 40 ug/1 which is the level selected to indicate additional testing may be prudent.

Well MAFB-10 should be tested for volatile organic compounds to determine whether or not the TOX level found in the well indicates significant contamination. If organics are found, other wells at Grassy Pond should be tested in a similar fashion.

A summary of recommended additional testing is shown in Table S-3.

Table S-3. Summary of Recommended Future Actions

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Site	Fieldwork	Analyses
Southwest Landfill	Install: six new wells approximately 25 feet deep; three new wells approx- imately 100 feet deep. Sample: nine new wells plus existing monitoring Wells L-1, L-2, and L-3, plus existing Moody Well MAFB-7.	All 13 wells for volatile organics, arsenic, and mercury.
Lily Pad Pond Fill	None.	None.
North POL Area	Install: 10 new monitoring wells approximately 15 feet deep. Sample: All 10 wells in wet and dry seasons. Test: All tanks and lines in the storage area for leaks.	All 10 wells for DOC, benzene, xylene, and toluene.
Moody AFB Supply Wells	Sample: Wells 7 and 10.	Well 7 as noted under Southwest Landfill. Well 10 for volatile organics.

Note: Order is as addressed throughout text and not on a priority basis.

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1.0 INTRODUCTION

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1.0 INTRODUCTION

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1.1 INSTALLATION RESTORATION PROGRAM BACKGROUND

This report describes Phase II Stage 1 of the IRP for Moody AFB, Georgia. Phase II Stage 1 pertains to confirmation and quantification of suspected contamination at past hazardous waste disposal sites.

The United States Air Force (USAF), due to its primary mission, has long been engaged in a wide variety of operations dealing with toxic and hazardous materials. Federal, state, and local governments have developed strict regulations to require that disposers identify the locations and contents of disposal sites and take action to eliminate the hazards in an environmentally responsible manner. The primary federal legislation governing disposal of hazardous waste is the Resource Conservation and Recovery Act (RCRA) of 1976, as amended. Under Section 6003 of RCRA, federal agencies are directed to assist the U.S. Environmental Protection Agency (EPA), and under Section 3012 state agencies are required to inventory past disposal sites and make the information available to the requesting agencies. To assure compliance with these hazardous waste regulations, the Department of Defense (DOD) developed the IRP. The current DOD IRP policy is contained in Defense Environmental Quality Program Policy Memorandum (DEQPPM) 81-5, dated 11 December 1981 and implemented by USAF message dated 21 January 1982. DEQPPM 81-5 reissued and amplified all previous directives and memoranda on the IRP. DOD policy is to identify and fully evaluate suspected problems associated with past hazardous contamination, and to control hazards to health and welfare that resulted from these past operations. The IRP will be the basis for response actions on USAF installations under the provisions of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as clarified by Executive Order 12316.

The IRP is implemented in four phases. Phase I is an initial assessment records search designed to identify possible hazardous waste contaminated sites and potential problems that may result in contaminant migration from the installation. The Phase I report, completed for Moody AFB in February 1983 (CH2M-Hill, 1983), reviews the history of base operations and waste disposal practices, the geological and hydrogeological conditions which may affect contaminant migration, and the ecological setting. All hazardous waste disposal sites identified in the Phase I report are ranked on the basis of a standard evaluation system [Hazardous Assessment Rating Methodology (HARM)], which is applied to all installation record searches (CH2M-Hill, 1983). Site rating forms for the three sites included in Phase II Stage 1 work are reproduced from the Phase 1 report in Appendix K. Ŵ.

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Phase II of the IRP, Confirmation and Quantification, is designed to confirm the presence and quantify the extent of contamination caused by migration of hazardous materials from present or abandoned waste disposal sites with HARM rankings indicative of significant environmental contamination. Phase II IRP studies are implemented in two or three parts. Phase II Presurvey, completed for Moody AFB in October 1983 (WAR, 1983), consists of work plan development and costing of hydrogeological and chemical investigations. Phase II Stage 1, described in this report, consists of field surveys, environmental sampling and analyses, data reduction and interpretation, and development of recommendations for remedial action and/or long-term monitoring. Succeeding stages in Phase II, if necessary, provide additional monitoring data upon which design of mitigative actions are based. In Phase III, Technology Base Development, appropriate technology is selected and the engineering design of corrective action options selected for implementation by the USAF is completed. Phase IV, Operations/ Remedial Action, involves construction, operation, and maintenance of the corrective action option designed under Phase III.

Water and Air Research, Inc. (WAR) under contract with the USAF provided geotechnical, field sampling, analytical, and engineering expertise in the implementation of Phase II surveys at selected USAF facilities. The WAR contract, number F33615-81-D-4007, became effective on July 20, 1981. In August 1983, contract order number 0012 was issued to initiate the

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Phase II Presurvey at Moody AFB. This action was based on results of the Moody AFB Phase I Records Search Report and HARM rankings of sites investigated. Based on findings of the Phase I records search and the Phase II Presurvey and other USAF assessments, a scope of work was developed for the Moody AFB Phase II Stage 1 survey. Order number 0014 was issued to WAR in January 1984 to initiate this work. The Phase I report also contained recommendations for technical work at another Moody AFB site, the DDT Burial Site. This work was not included in Phase II work. Rather, it was included in a Phase IV assessment under a separate order.

1.2 FACILITY DESCRIPTION AND HISTORY

1.2.1 Introduction

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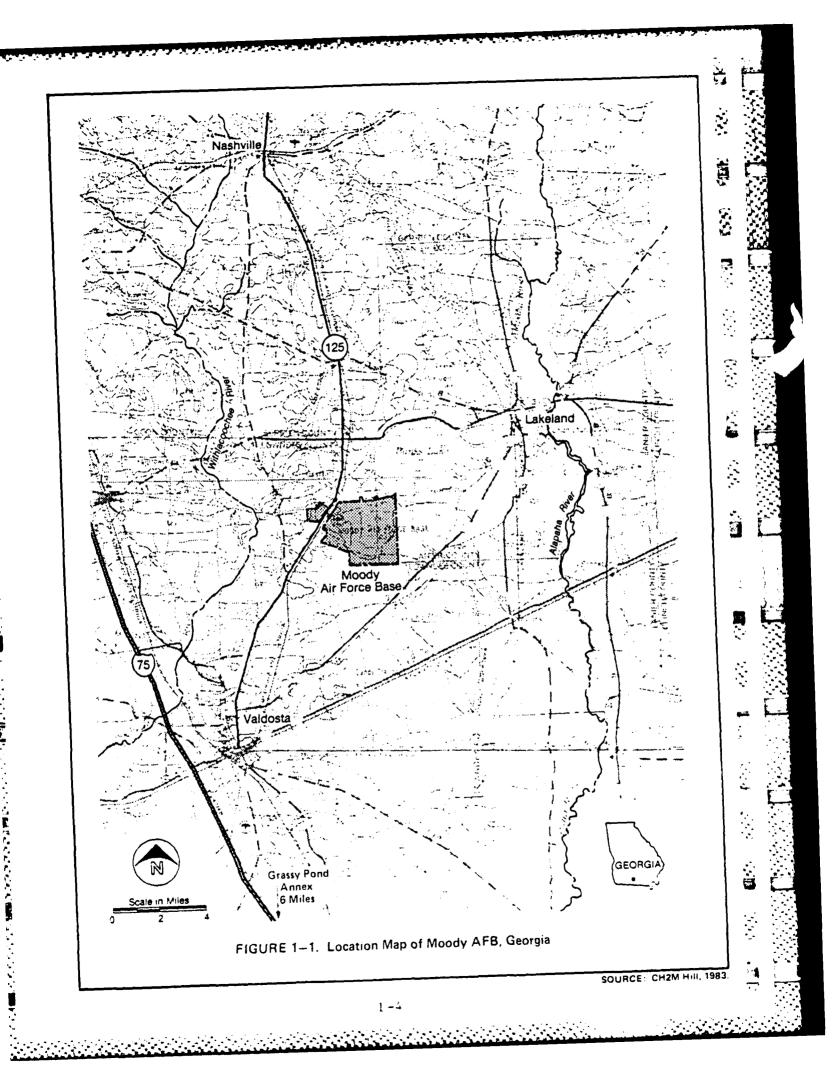
A brief description of Moody AFB and its history is given in the Phase I Records Search Report (CH2M-Hill, 1983). The material presented below is abridged from that report. A summary of the environmental setting is presented in Section 2.0.

1.2.2 Base Location

Moody AFB is located on 5,160 acres of land in Lowndes and Lanier Counties in south-central Georgia. Nearby towns include Valdosta, about 10 miles to the southwest, and Lakeland, about 6 miles northeast (Figure 1-1). The closest large cities include Atlanta, Georgia, 234 miles to the north, and Jacksonville, Florida, about 120 miles to the southeast. Georgia State Highway 125 is the access road to Moody AFB, and U.S. Interstate Highway 75 passes about 10 miles to the west of the base.

The Grassy Pond Recreational Annex is located 25 miles southwest of Moody AFB, just 3 miles north of the Georgia/Florida state line. This site consists of about 500 acres of land originally sold to the United States Government in 1928 for use as a fish hatchery facility. Major surface features at the site include Grassy Pond (160 acres), Lot Pond (30 acres), and over 300 acres of upland forest and developed areas.

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Grassy and Lot Ponds are natural water bodies that have been slightly modified by the construction of spillways. Drainage is from Lot Pond to Grassy Pond, and then to the aquifer by a natural sinkhole and two drainage wells. Grassy Pond Recreational Annex has been used primarily as a relaxation/recreation site by the USAF since 1952.

1.2.3 Organization and History

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Moody AFB was established in 1941 as an advanced pilot training school for Army Air Corps cadets. Original base boundaries included over 9,000 acres of land acquired by use permit from the United States Department of Agriculture (USDA) and by lease. The base was named in honor of Captain George Moody who was a test pilot for the first AT-10, a twin engine trainer used at Moody AFB during World War II. During the war, base population exceeded 40,000 officers, airmen, and cadets.

In 1946, following the end of World War II, Moody AFB was placed on inactive status until it was reopened in 1951 after the outbreak of the Korean conflict. From that time until 1975, Moody AFB was primarily involved in pilot training under the Air Training Command (ATC), with preflight, primary, and basic pilot training programs. In late 1975, ATC deactivated the 38th Flying Training Wing and the base was reassigned to Tactical Air Command (TAC) and the 347th Tactical Fighter Wing (TFW).

Today the mission of the 347th TFW is to deploy overseas during wartime commitments in support of United States or allied ground forces. This mission is fulfilled by three Tactical Fighter Squadrons, the 68th, 70th, and 339th, using F-4E Phantom II aircraft. A total of 72 of these aircraft are assigned to Moody AFB. Work force presently at Moody AFB numbers approximately 4,000, of whom 3,300 are military personnel and 700 are civilian employees. The major organizations and missions assigned to Moody AFB are listed below:

- o 347th TFW
- o 68th, 70th, and 339th Tactical Fighter Squadrons
- o 347th Combat Support Group and Squadrons

- o USAF Hospital Moody
- o Detachment 23, 3rd Weather Squadron
- o 1878th Communications Squadron
- o Detachment 322, 3751st Field Training Unit

1.3 DESCRIPTIONS OF PHASE II STAGE 1 SITES

1.3.1 Introduction

A total of 14 sites were identified during the Phase I records search, three of which were selected for Phase II Stage 1 confirmation. These sites were recommended for further action by CH2M-Hill (1983), and a summary of these three sites is given in Table 1-1. Site descriptions given in this section for sites identified during the Phase I records search are excerpted from the Phase I report (CH2M-Hill, 1983). Phase I site descriptions were updated, as necessary, to incorporate more recent information. General locations of the three Phase II disposal sites are shown in Figure 1-2. Summary information on HARM scores and subscores is given with each site description.

1.3.2 Southwest Landfill

This site occupies nearly 30 acres of USAF fee-owned property along the southwest corner boundary of Moody AFB, west of Mission Lake (Site No. 1 on Figure 1-2). Activity at this site was initiated in 1955 and continued until 1972. The entire area was reported to consist of trenches about 14 feet deep, filled with general base refuse. A small quantity of low-level radioactive waste (electron tubes) was reportedly buried during the 1950s; however, the exact location is not known. No large quantities of hazardous wastes were reported from this site; however, small quantities of oil and solvent wastes are suspected. Tail ditches were dug at the site for collection of leachate and are still evident. No visible contamination was observed. Loblolly pines have been planted over much of the fill area. Some organic debris (leaves, branches, and grass clippings) are deposited at this site and some composting has been done with sludge from the sewage treatment plant. Table 1-1. Churacteristics of Phrise II Stage 1 Sites, Moody AFB, Georgia

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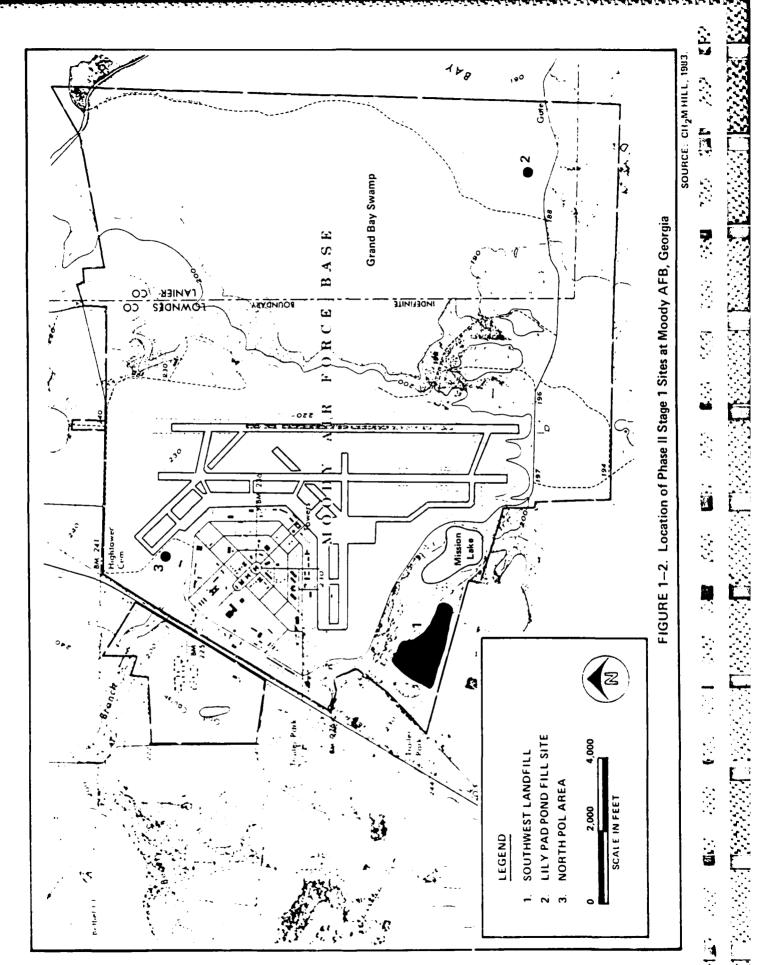
Records Scarch Site Ea.	Phase II Stage 1 Site No.	Site Description	Period of Usage	Drinking Water Well (feet)	Surface Water Body (feet)	Depth to Groundwater (feet)	Evidence/Quantity of Hazardous Wastes	Possible Hazardous Waste Typ es
	1	Southwest Landfill	1955–1972	(3,000	<500	0-10	Known/small	Paints, thimers, solvents, and oils.
	5	Lily Pad Pond Fill Site	Late 1960 <mark>s-</mark> 1979	<5,000	Adjacent	0-10	Known/small	Containerized waste, oils, and solvents.
	£	North POL Area	Unknown– present	3,000	2,500	0-10	Suspected/small	Aviation gasoline and diesel oil.

Source: Installation Restoration Program Records Search for Moody Air Force Base, Georgia (Gi2rHill, 1983).

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Due to proximity to Mission Lake and the base boundary, and the presence of a nearby off-base water supply well located about 1,300 feet upgradient from the site, pathways (63) and receptors (64) HARM subscores were fairly high. A total score of 56 for this site resulted from a greater suspected waste quantity than in other landfills.

1.3.3 Lily Pad Pond Fill Site

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The Lily Pad Pond Fill site is located on USDA property (USAF use permit) near the southeastern corner of the base (site No. 2 on Figure 1-2). This site was formerly a wetland area which was filled with runway demolition rubble from the late 1960s until 1979. Some unauthorized dumping of industrial type wastes also occurred including drums, metal, lumber, and aircraft tires. Some of this waste material is still visible around the edge of the fill site, and some wastes from the area have produced visible contamination of the pond surface with oily residues. It is not known if any full drums of wastes are buried at this site. The Lily Pad Pond Fill site is currently (since 1979) being used as the Explosive Ordnance Disposal (EOD) area, and a deep pit in the middle of this area contains wood and metal but no cans or drums.

Due to location of this site, in a wetland area near the base boundary and water supply wells, the receptors subscore was 48. The waste characteristic subscore was 40 based on small confirmed quantities of oily wastes, and the pathways subscore was 80 because of indirect evidence for contaminant migration. The site received a total HARM score of 56.

1.3.4 North POL Area

This site is the old POL storage yard located on USAF fee-owned property near the northwestern corner of Moody AFB (site No. 3 on Figure 1-2). At this site, four 25,000-gallon buried tanks were formerly used to store leaded aviation gasoline and are currently used to store diesel heating oil. Although there were no verbal reports of spills at this area, the presence of a small stand of dead loblolly pine trees adjacent to the fence indicates the probability of spills and of fuel-saturated soil. Due to the proximity of this site to several water supply wells, the base boundary, and populated areas, it received a receptors subscore of 52. The waste characteristics subscore was 40 and the indirect evidence of contamination contributed a parthways subscore of 80. A total score of 55 was computed for this site.

1.4 PROJECT STAFF

Sec. 1

Key personnel participating in the Moody AFB Phase II Stage 1 survey are listed below. Resumes of the project staff are included as Appendix G.

- J.H. Sullivan, Ph.D., P.E., Environmental Engineer: Project Manager.
- J.A. Steinberg, Ph.D., P.E., Water Resources Engineer.
- W.G. Thiess, M.S., Environmental Engineer.
- W.D. Adams, M.S., Hydrogeologist.
- C.R. Fellows, M.S., Chemist.
- R.D. Baker, Chemist.

2.0 ENVIRONMENTAL SETTING

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2.0 ENVIRONMENTAL SETTING

2.1 INTRODUCTION

A detailed assessment of the environmental setting at Moody AFB is given in the Phase I Records Search Report (CH2M-Hill, 1983). The following descriptions are abridged from that document.

2.2 METEOROLOGY

The climate of Moody AFB is classified as humid subtropical. This results from the relatively low latitude (approximately 31° north latitude) and proximity to the Gulf of Mexico (80 miles) and Atlantic Ocean (100 miles). These water bodies help to produce a climate that is typified by long, humid summers with frequent convectional storms, and short, mild winters interrupted by frontal storm systems and infrequent cold snaps. The spring and fall seasons are generally short and mild.

The average annual temperature for Moody AFB is 68°F and monthly mean temperatures vary from 52°F in January to 82°F in July and August. The average daily maximum in July is 91°F while the highest recorded temperature in 30 years of record is 104°F in June. On the average there are 73 days per year with maximum temperatures greater than 90°F. The average daily minimum temperature in January is 42°F while the lowest recorded temperature at Moody AFB is 9°F. The average number of days with freezing temperatures is 17 per year.

Mean annual precipitation recorded at Moody AFB is 47.0 inches. This rainfall is well distributed throughout the year, although summer is generally the wettest season and fall is the driest. Summer rainfall is often poorly distributed over the base due to the localized nature of the derstorm activity. Lake evaporation at Moody AFB is estimated to be between 40 and 45 inches per year.

An average of 58 thunderstorms per year are recorded at Moody AFB. Extreme storm events, sometimes accompanied by tornados, occur occasionally in the area; and tropical storms, accompanied by several

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days of heavy rains, occur with a frequency of about 1 in 5 years. Maximum rainfall recorded in a 24-hour period is 5.6 inches.

Relative humidity is generally high with an annual average of 68 percent. Highest humidities are recorded in the early morning. Mean cloud cover is approximately 60 percent during the summer and 50 percent in winter. On the average, some fog is encountered at Moody AFB 185 days per year.

Wind speed at Moody AFB averages only 4 knots; however, a maximum wind speed of 65 knots has been recorded. Wind direction is generally from the north during the winter, from the west during the spring and early summer, and from the east during the late summer and fall.

2.3 GEOLOGY

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2.3.1 Physiography

Moody AFB is located in the Coastal Terraces region of the Atlantic Coastal Plain physiographic province. This region is characterized by flat to sloping plateaus separated by shallow river valleys, broad wetland depressions, and topography for which the dominant geomorphic process is solution (i.e., karst topography).

The base facilities are located on a level plateau between the Withlacoochee River on the west and the Alapaha River on the east. The eastern portion of the base is located in a low area known as Grand Bay Swamp. Land surface elevations vary from approximately 190 feet above mean sea level (msl) on the eastern portion to about 240 feet above msl near the center of the base. Slopes range from 0 to 5 percent. The groundwater table is generally 10 to 20 feet below the ground surface.

2.3.2 Soils

On the high ground western portion of the base, the surface soils are mostly in the Tifton series. The soil profile consists of about 2 to 5 feet of well-drained, moderately permeable loamy fine sands overlying less permeable sandy clays and clayey sands. Permeabilities of the surficial fine sands are moderate to high, ranging from 10^{-4} to 10^{-2} centimeters per second. Permeabilities of the underlying sandy clays are moderate to low, ranging from 10^{-4} to 10^{-6} centimeters per second.

On the eastern portion of Moody AFB, in the Grand Bay Swamp area, surface soils are classified in the Dasher series. These are poorly-drained organic soils formed in association with wetland plant communities. The water table is generally near the ground surface.

2.3.3 Geology

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In general, stratigraphy consists of a few feet of sandy deposits of Recent, Pleistocene, and Pliocene age overlying successively older formations including, from youngest to oldest, the Miccosukee, Hawthorn, Suwannee, Ocala, Cl ibourne, and Wilcox Formations. Each of these formations is essentially flat-lying.

The Miccosukee Formation crops out along the western edge of the base. It is composed of yellow to red-brown clayey sand, clay, silt, and gravel. On the eastern portion of the base, sands and gravels of Pliocene to Pleistocene age lie inconformably on the Miccosukee, acting hydraulically with the Miccosukee as a single unit. The Miccosukee Formation and the Pliocene and Pleistocene deposits attain a maximum thickness of about 100 feet.

Underlying the Miccosukee Formation is the Hawthorn Formation which is approximately 150 feet thick at this location. The Hawthorn (Miocene age) consists of clay, claystone, sand, limestone, and marl, and is locally cherty and commonly phosphatic. The upper part of the formation is made up of clastics while the lower part is a brown cherty, sandy limestone that is highly permeable. This lower unit generally ranges from about 20 to 60 feet in thickness.

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The top of the Suwannee limestone (Oligocene age) is found at about 200 feet below ground surface at Moody AFB. This unit is highly permeable, yellow to white fossiliferous, porous, crystalline limestone which is approximately 100 to 200 feet thick.

Beneath the Suwannee limestone is the Ocala limestone of early Eocene age. The top of this formation is approximately 340 feet below land surface, and it is approximately 350 feet thick. This limestone is cream to white in color, is fossiliferous, and contains abundant interbedded dolomite. It includes large solution cavities and caverns. Subsurface permeability is generally greatest at the erosional interface with the overlying Suwannee limestone.

Underlying the Ocala limestone are up to 2,000 feet of marine sedimentary deposits of the Claiborne and Wilcox groups.

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Water wells in the Moody AFB area very rarely penetrate below the upper part of the Ocala limestone because ample groundwater is found in the Suwannee and Ocala deposits.

2.4 HYDROLOGY

2.4.1 Surface Water

Moody AFB lies between the Withlacoochee and Alapaha Rivers which flow south from Georgia into Florida. Drainage from this area is ultimately to the Gulf of Mexico by way of the Suwannee River in Florida. The western portion of the base drains to the westerly-flowing Beatty Creek in the Withlacoochee Watershed. Treated effluent from the base sewage treatment plant is discharged to Beatty Creek and, during dry periods, is reported to provide most of the creek flow. The eastern portion of Moody AFB drains into Grand Bay, which is the headwater of Grand Bay Creek, in the Alapaha Watershed.

Surface water features on Moody AFB include Mission Lake, a 31-acre impoundment south of the runway area; a small golf course pond; drainage

ditches and storm drains in the runway area; seasonally wet areas of Grand Bay on the eastern portion of the base; and part of Shiner Pond at the northeast corner of the base.

2.4.2 Groundwater

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Groundwater occurs under water table or perched water table conditions in the deposits of Miocene to Pleistocene age underlying Moody AFB. The water table is generally 10 to 20 feet below land surface in the western portion of the base and varies from the surface to 10 feet below land surface in the eastern portion. Water levels are expected to vary with seasons in response to variations in rainfall. The surface of the water table is expected to follow the slope of the overlying topography; direction of groundwater flow within the water table aquifer is therefore expected to follow the slope of the ground surface.

Recharge to the water table aquifer is through direct rainfall infiltration, and discharge is primarily to local surface water drainages. The water table aquifer is about 80 to 100 feet thick and is separated from the underlying principal artesian aquifer by a clay layer of relatively low permeability (less than 10^{-6} centimeters per second) which is about 50 feet thick. The clay confining layer is not completely impermeable and does allow some water to pass from the surficial water table aquifer to the principal artesian aquifer.

Sand and gravel beds within the water table aquifer yield small to moderate amounts of water; however, in the vicinity of Moody AFB, there are no known potable water supply wells in the water table aquifer.

Water levels in the principal artesian aquifer are declining in response to long-term withdrawals from the aquifer in the Valdosta area. In the 18-year period from 1957 to 1975, average groundwater levels declined in downtown Valdosta by 8.2 feet, or approximately 0.46 foot per year. Similar water level declines have also been documented in other wells in south-central Georgia. There are 11 active wells on Moody AFB and three active wells at Grassy Pond Recereational Annex. All tap the principal artesian aquifer. These wells have a combined capacity of more than 2,700 gallons per minute (gpm). Locations of the wells at the main base are shown on Figure 2-1. A summary of well construction details is given in Table 2-1. Figure 2-2 illustrates a representative stratigraphic log and some construction details for the three primary potable water supply wells at Moody AFB, as presented in the Phase I report. Ś

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The potential for movement of contaminants to the water table at Moody AFB is high because recharge is directly from rainfall. Pollutants would likely travel vertically downward to the water table, then flow laterally to discharge to adjacent surface waters.

The hydraulic connection between the water table aquifer and the principal artesian aquifer is poor due to the presence of a thick, lowpermeability clay layer at a depth of about 100 to 150 feet; therefore, the potential for contaminants to enter the principal artesian aquifer and migrate to major potable water supply wells is low. There are no known direct hydraulic connections between the water table aquifer and the principal artesian aquifer within 8 miles of the base. It is possible that a direct hydraulic connection could occur around poorly constructed or faulty well casings.

A summary of the typical water quality of the principal artesian aquifer of this region is given in Table 2-2. Also shown is a representative water quality analysis for Moody AFB Wells 1, 2, and 3, and the applicable drinking water standards for comparison.

Water quality problems in some wells in the vicinity of Moody AFB arise from naturally high concentrations of sulfate, hydrogen sulfide, iron, and color. No water quality problems have been reported with the base water supply.

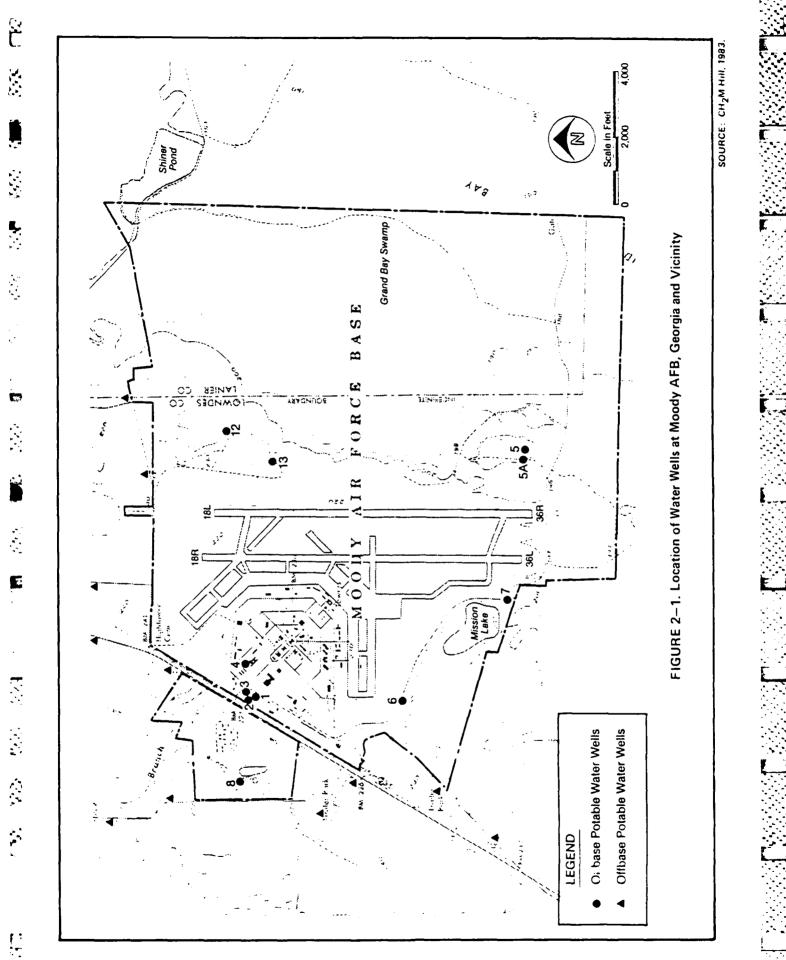


Table 2-1. Well Construction Details of Water Wells at Moody AFB, Georgia and Grassy Pond Recreational Annex

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We I I	Location	(feet)	(inches)	(gpm)	Remarks
1	Building 913	425	10	700	PotableMain system.
~	Building 947	425	12	650	PotableMaín system.
~	Building 984	440	10	700	PotableMain system.
4	100 feet north of Building 205	345	Q	250	NonpotableAir conditioning currently not in use (Aug. 1984).
5	Building 1114Ordnance Area	250	Q	180	NonpotableFire protection.
SΛ	40 feet west of Building 1112	150	6	100	Potable-Ordnance area.
و	Building 1702Former Jet Engine Test Cell	210	4	19	NonpotableFire protection.
7	Building 1705Nission Lake Recreational Area	195	4	10	PotableMission Lake Recreational Area.
x	Colf Course	400	9	220	NonpotableGolf course irrigation.
6	Urassy Pond Recreational Annex	1	4	1	Potable.
10	Grassy Pond Recreational Annex	140	1.5	40	Potable.
11	Grassy Pond Recreational Annex	ł	10	 1	Irrigation supply.
12	Building 1500Transmitter Site	215	4	20	PotableTransmitter site.
13	Building 15()1Receiver Site	225	4	20	PotableReceiver site.

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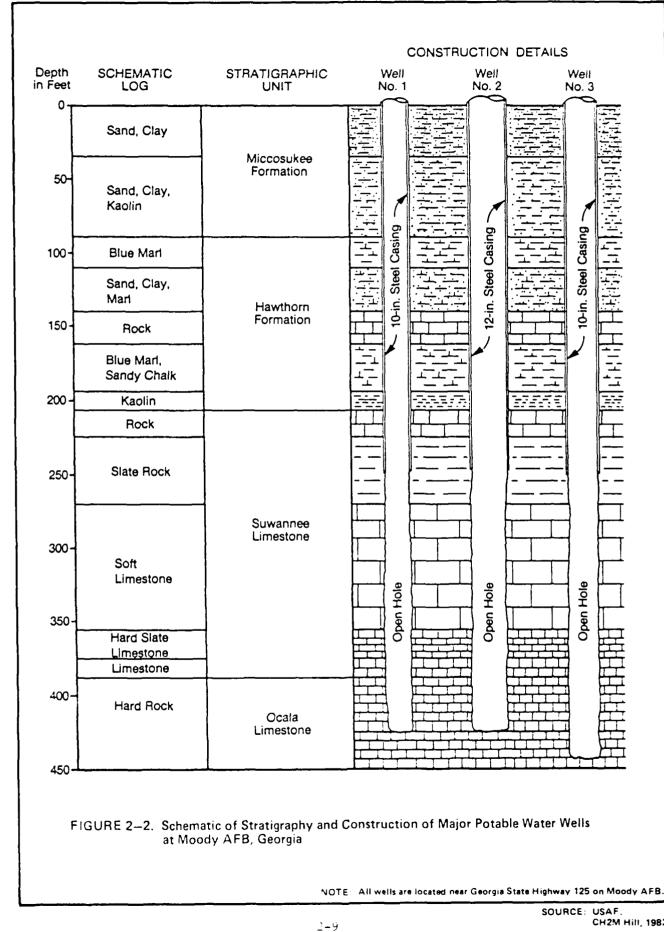
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CH2M Hill, 1983.

	Average for	Ra	ase Well	c##	EPA and Georgia Drinking
Parameter*	Lowndes County†		2	3	Water Standards
Arsenic	0.005	<0.01	<0.01	<0.01	0.05
Cadmium	0.002	<0.01	<0.01	<0.01	0.01
Chromium	0.001	<0.05	<0.05	<0.05	0.05
Copper	0.002		_		1.0
Lead	0.003	<0.02	<0.02	<0.02	0.05
Mercury	0.0001	<0.002	<0.002	<0.002	0.002
Selenium	0.004	<0.01	<0.01	<0.01	0.01
Strontium	0.086	_	—	—	5.0
Zinc	0.021	<0.05	<0.05	<0.05	—
Silica as SiO ₂	27	37.6	36.0	33.2	
Aluminum	0.026	—	—	—	_
Iron	0.028	0.1	<0.1	0.147	0.3
Manganese	0.015	<0.05	<0.05	<0.05	0.05
Calcium	33	24.6	25.8	28.6	
Magnesium	8.6	10.2	9.8	10.0	
Sodium	3.5	2.9	2.8	2.7	
Potassium	0.7	0.8			—
Alkalinity as CaOO3	105	108	108	110	—
Hardness as CaCO3	119	103	105	113	<u> </u>
Sulfate as SO4	14	17	20	27	250
Chloride	3.6	4	<1	a	250
Fluoride	0.3	_	—	<u> </u>	1.6
Nitrate	0.3	<0.1	<0.1	<0.1	10
Dissolved solids	165	158	196	192	5 00
Specific conductance (umhos/cm)) 244			-	_
Color (platinum-cobalt blue)	10	5	5	15	15

Table 2-2. Water Quality Characteristics of the Principal Artesian Aquifer in the Vicinity of Moody AFB, Georgia

*Data reported in mg/l unless otherwise indicated. *Sampled 1974-1975. **Sampled January 1982.

Source: CH2MHill, 1983.

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2.5 ECOLOGY

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Approximately 60 percent, or 3,100 acres, of Moody AFB is considered unimproved, indicating the presence of seminatural to natural ecological conditions. Major habitats found on-base include upland pine forests, pine flatwoods, gum-bay-shrub swamps, and freshwater ponds.

There are 1,431 acres of managed forest lands on Noody AFB. The tree species that are planted and harvested by the United States Forest Service are loblolly and longleaf pine. No timber management is practiced on approximately 1,600 acres of wetland habitat located in Grand Bay. This land has a mixture of plant species characteristic of shallow coastal plain wetland areas, including many evergreen shrubs and vines, sweetbay, black gum, pond pine, and cypress. An interesting component of this unmanaged area is Dudley's Hammock, a mesic hardwood hammock vegetated by magnolia and several species of oak and hickories. Although more common in north and central Florida, this plant association is unusual this far north.

Wildlife is abundant in the unimproved areas of the base. Common mammals include rabbits, squirrels (including fox squirrels), opossums, skunks, raccoons, deer, bobcats, and foxes. Over 100 species of birds are known to occur in the vicinity of the base.

Several aquatic habitats are present on Moody AFB, including Mission Lake, the unnamed golf course lake, and Shiner Pond. These water bodies were formed by impounding water courses and are stocked with game fish for recreational activities. The most popular sport fish in this area are black bass, bluegill sunfish, and bullhead.

Several threatened and endangered plant and animal species are reported to occur on or in the vicinity of Moody AFB. The American alligator is reported to reside in Mission Lake and adjacent wetland areas. Three sightings of Florida panthers have been reported from Moody AFB or its immediate vicinity in the past 10 years. An inactive southern bald

eagle nest is present at Grassy Pond Recreational Annex and an active nest is located nearby at Pike Pond. Bald eagles probably feed at Banks Lake adjacent to Moody AFB. An inactive red-cockaded woodpecker colony has been reported from western Lowndes County; however, no breeding sites have been located on Moody AFB. The range of other protected species such as the indigo snake and peregrine falcon includes Moody AFB; however, there are no reported sightings from the base. Several threatened plant species are reported to occur in the wetland portions of the base, including the yellow, hooded, and parrot pitcher plants.

3.0 FIELD PROGRAM

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3.0 FIELD PROGRAM

3.1 DEVELOPMENT OF FIELD PROGRAM

3.1.1 Introduction

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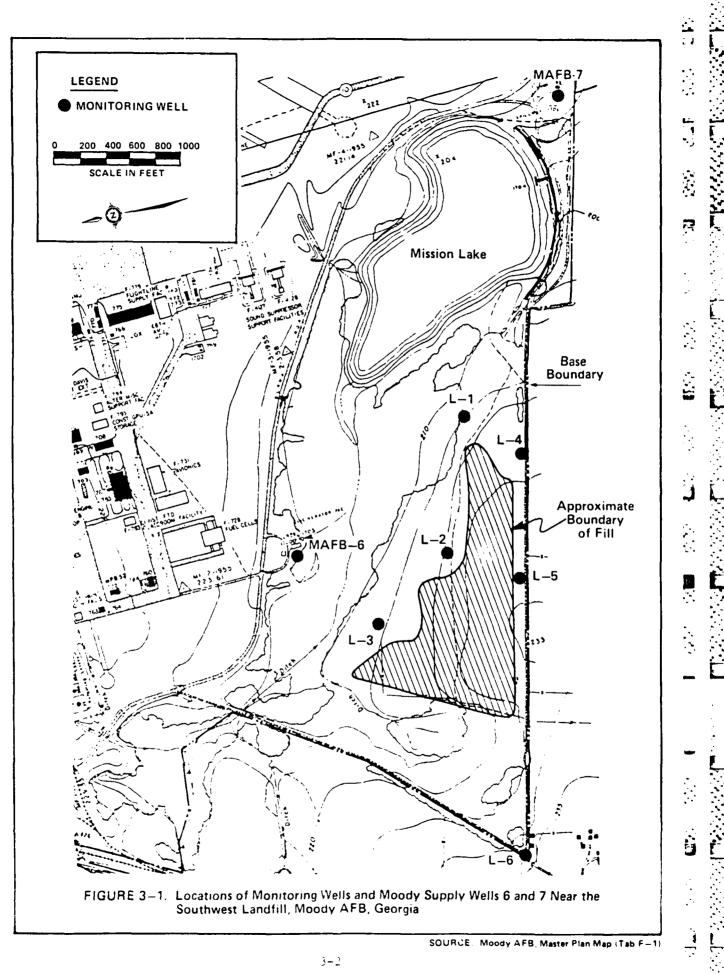
The Moody AFB Phase II Stage 1 field program was developed by USAF Occupational and Environmental Health Laboratory (OEHL) personnel based on findings and recommendations of the Phase I records search (CH2M-Hill, 1983) and Phase II Presurvey (WAR, 1983). The formal description of work appears in Appendix B. Locations of monitoring wells and sampling points are shown in Figures 3-1 through 3-3. The work scope reflects Phase I and Phase II Presurvey recommendations and includes amendments which reflect changes in contamination assessment or screening strategies and/or budgetary constraints.

3.1.2 Screening as the Basis for the Field Program

The Moody AFB Phase II Stage 1 survey was designed to determine if environmental contamination has resulted from waste disposal practices at three sites. If so, the survey attempts to estimate extent of contamination. In addition to analyses for specific parameters, the survey utilizes general screening parameters such as pH, specific conductance, total phenolics, DOC, and TOX to indicate presence of nonspecific classes of pollutants. In subsequent discussions the parameters pH, specific conductance, total organic carbon (TOC), and TOX are collectively referred to as groundwater contamination indicators (GWCI). For sites where values of screening parameters indicate that a problem may exist, additional sampling and analyses for specific constituents is needed to confirm contamination and/or determine extent of contamination. Upgradient or background wells are included sparingly. If specification of background groundwater quality becomes necessary to assess contamination at a site without upgradient wells, upgradient wells must be installed and sampled.

3.1.3 Summary of the Planned Field Program

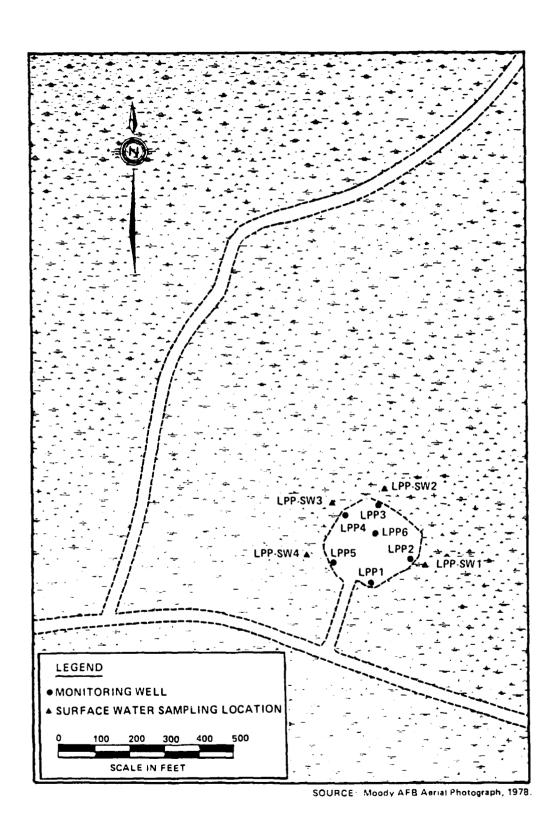
Recommendations contained in the Phase I records search included conducting Phase II type work at three sites: Southwest Landfill, Lily Pad Pond Fill site, and North POL area.



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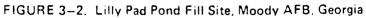
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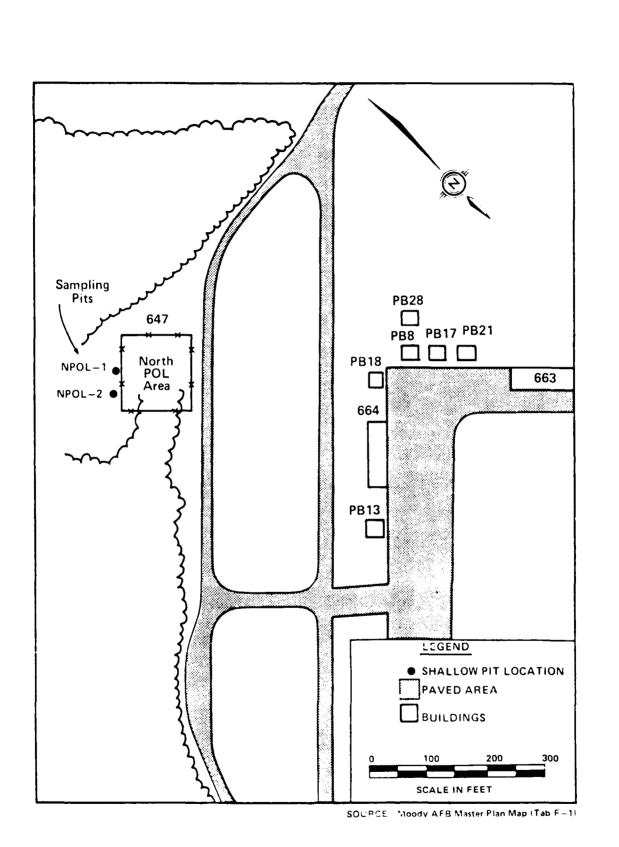
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These were the sites judged as highest priority based on application of the USAF HARM (CH2N-Hill, 1983). No significant additional information was developed subsequent to the Phase I work, and the Phase II Presurvey included recommendations for work only at these three sites. Recommended work in both surveys was very similar. Subsequent amendments by the USAF included adding testing at all Moody AFB water supply wells and one well at the Grassy Pond Recreational Annex.

Six wells at the Southeast Landfill were planned including one upgradient well situated between the fill and an off-base water supply well referenced in the Phase I report (CH2M-Hill, 1983, p. IV-32). One sample was to be collected from each of the 25-foot deep wells. Analysis included GWCI; chemical oxygen demand (COD); oil and grease; and eight metals, eight pesticides, and two herbicides. Additional sampling was specified where initial screening detected potential contamination. Finally, to better define local conditions, testing to determine aquifer hydraulic characteristics was specified at one well to be selected during fieldwork.

Six wells at the Lily Pad Pond Fill site were planned surrounding the fill area. One sample was to be collected from each of the approximately 10-foot-deep wells. Surface water samples were to be collected from the wetland area at four locations surrounding the fill. All samples were analyzed for GWCI, COD, oil and grease, total phenolics, and eight metals. Provisions for additional sampling were included if screening indicated possible contamination presence.

At the North POL Area two shallow sampling pits were specified to a depth of about 2 feet below the water table. Soil exposed during excavation was to be inspected for indications of fuel presence. Groundwater samples were to be collected from both pits and tested for GWCI, COD, oil and grease, and lead. Provisions for additional sampling were included if screening indicated possible contamination presence. Sampling of all 11 Moody AFB (potable and industrial) water supply wells and one well at Grassy Pond Recreational Annex was planned. Testing included GWCI, oil and grease, and eight metals. Samples from three wells were to also be tested for eight pesticides and two herbicides.

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3.2 IMPLEMENTATION OF FIELD PROGRAM

3.2.1 Introduction

The Phase II Stage 1 field program was implemented according to the provisions outlined above. Fieldwork consisted of monitoring well installation, digging of shallow sampling pits, collection of groundwater and surface water samples for laboratory analyses, and aquifer testing. These activities are described in the sections below. The safety plan presented in Appendix H was adhered to throughout the field program.

3.2.2 Monitoring Well Installation

Monitoring wells were installed during March 26-31, 1984, by Wright Test Drilling, Inc., of Mobile, Alabama. Wells were installed through 6-inch outer diameter hollow-stem augers. No fluids were introduced into bore holes. Split-spoon samples were collected after every 5 feet of drilling according to American Society for Testing Materials (ASTM) Standard D-1586-67. Soil samples were given visual classifications and descriptions in the field for preparation of a lithologic log for each well. Completion logs for all wells installed during the Phase II Stage 1 survey appear in Appendix C.

Monitor well casings and screen sections consist of 2-inch schedule 40 polyvinyl chloride (PVC) with threaded, flush joints. Slot width of the screen sections is 0.010 inch. Casing and screen sections were cleaned with potable water prior to installation. After augering to the desired depth, the pre-assembled PVC well section was installed through the auger stem. Augers were then withdrawn, allowing soil below the water table to collapse around the screen. Height of the casing top was adjusted to approximately 2.5 feet above the ground surface. Wells were backfilled with clean sand to approximately 4.5 feet below the ground surface. A bentonite seal approximately 1 foot thick was placed on top of the sand. The remainder of the annular space was filled with sand-cement grout. A 5-foot by 6-inch steel protective casing with hinged, locking lid was installed into the grout until the top was within 2 to 6 inches of the PVC casing top. Above-ground portions of the steel casings were painted. Both steel and PVC casings are vented. Each well was equipped with a 4-foot by 1.25-inch PVC bailer attached by nylon cord to the screw-on PVC casing cap.

Diagrams of well installations are shown on the well completion logs in Appendix C. Wells at the Southeast Landfill were screened between 5.5 and 24.5 feet below ground level, and wells at the Lily Pad Pond Fill site were screened between 5.5 and 9.5 feet below ground level.

Each well was developed by bailing a minimum of five times the volume of water standing in the casing. All tools used within the hole were washed with potable water between wells to minimize the possibility of cross-contamination.

Surveyors licensed by the State of Georgia surveyed all monitoring wells installed at the Southwest Landfill in July 1984. Casing top elevations were determined to within <u>+0.1</u> foot and referenced to msl. Horizontal location coordinates were also determined by reference to the Georgia State Plane Coordinate System, Traverse Mercator-Nest Zone. Well elevations and coordinates were entered on well completion logs (Appendix C).

3.2.3 Sample Collection and Analysis

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 3.2.3.1 <u>General Sampling and Analysis</u>--Water samples were collected between April 23-26 and between September 6-9, 1984. September sampling was triggered by levels of TOX found at some locations and by quality control concerns detected in some of the laboratory results for samples collected in April.

Quality control issues involved the following:

o Results of analyses of COD samples collected in April were rejected due to lack of precision in duplicates; one duplicate set showed an order of magnitude difference (i.e., 6.5 vs. 85 mg/l) and the other set showed a marginal, approximately 40 percent difference (i.e., 28 vs. 41 mg/l). 3

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- o Results of analyses of pesticide/herbicide samples collected in April were rejected because recoveries of the malathion, toxaphene, and 2,4,5-T spikes were 0, 2, 4, and 0 percents, respectively; recoveries of DDT isomers ranged from 89 to 126 percent and were judged acceptable, but DDT was repeated to ensure compatibility of results (i.e., among all pesticide/herbicide data).
- o Results of analysis for silver and mercury were rejected because recoveries ranged from 11 to 59 percent for silver and were less than 10 percent for mercury; all metals were reanalyzed to ensure compatibility of results (i.e., between mercury and silver and the other six metals).

Satisfactory quality control was achieved for all analyses performed on the September samples. A listing of samples collected is given in collected is given in Table 3-1. General sampling procedures for each sample type are described below. Sample collection procedures for specific analytes are described in Appendix E. Sample container descriptions, preservation methods, and holding times are listed in Table E-1 of Appendix E. Sample chain of custody forms are reproduced in Appendix F.

3.2.3.2 <u>Well Samples</u>--Prior to collecting well samples, depth to the water surface was measured and the volume of standing water in the well was determined. A minimum of three times the volume of standing water was removed from the well by pumping or bailing. Moody AFB supply wells were purged before sampling. Purging information is included in Table 3-2.

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Table 3-1.	Summary of Sampling and Analyses for Phase II Stage 1 Survey, Moody AFB	,
	Georgia	

Site Description	Sample Locations	Sample Analyses*
Southwest Landfill	Six monitor wells.	GWCI, metals, oil and grease, COD, pesticide/ herbicide scan; VOC at Well 3 and 6 only.
Lily Pad Pond Fill	Six monitor wells, four surface water samples 100 feet from fill edge.	GWCI, total phenolics, metals, oil and grease, OOD; VOC at all wells and two surface water sites.
North POL Area	Two shallow pits.	GWCI, oil and grease, DOC, ODD, presence of visible fuel layer, volatile aromatics per EPA method 503.1
Moody Supply Wells	Wells 1, 2, 3, 5, 5a, 7, 10†, 12, 13.	GWCI, metals, oil and grease.
Moody Supply Wells	Wells 4, 6, 8.	GWCI, metals, oil and grease, pesticide/ herbicide scan.

*The following sample analyses are used:

GWCI = groundwater contamination indicators: pH, specific conductance, and total organic carbon (dissolved fraction).

Metals = arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver. COD = chemical oxygen demand.

Pesticide/herbicide scan = DDT and DDT metabolites, heptachlor, heptachlor epoxide, Lindane, chlordane, diazinon, malathion, toxaphene, 2,4-D, and 2,4,5-T.

 $\rm VOC$ = volatile organic compounds as specified in EPA Methods 601 and 602.

Moody Well 10 is located at Grassy Pond Recreational Annex.

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Information on Parging Prior to Sampling Potable Water Wells, Moody AFB, Georgia, September 1984 Table 3-2.

HARDER STREET

No.11	Locat i on	Well Type	Purge Time (min)	Gallons	No. of Casing No. of Unnes
I	Building 913	Potable-main system	20	14,000	8.1
. 1	Building 947	Potable-main system	94	61,100	24
	Building 984	Potable-main system	18	12,600	7.0
4	100 ft. north of Building 205	Nonpotable, air conditioning	66	16,500	33
5	Building 1114-Ordnance Area	Nonpotable, fire protection	12	2,160	5.9
۲ç.	Building 1112-Ordnance Area	Potable	18	1,800	8.2
þ	Building 1702-Test Cell	Noupotable, fire protection	110	2,090	15
7	Building 1705-Mission Lake Recreation Area	Potable	87	435	3.4
æ	Golf Course	Nonpotable, irrigation	75	16,500	28
10	Grassy Pond	Potable	2	80	6.2
12	Building 1500-Transmitter Site	Potable	104	2,080	15
13	Building 1501-Receiver Site	Potable	111	2,220	15

*Purge volumes are estimated from pump capacities or flow measurements and minimum purge times immediately prior to sampling.

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Specific conductance, temperature, and pH measurements were taken from a plastic bucket filled with the bailer immediately prior to sample collection. Sample bottles were filled from the bailer with strict adherence to quality assurance procedures described in Appendix E. Bottle numbers and field observations were recorded on field data sheets which are reproduced in Appendices D-1 and D-2 for April and September samplings, respectively.

3.2.3.3 <u>Surface Water Samples</u>--Prior to collecting surface water samples at the Lily Pad Pond Fill site, water depth was estimated and specific conductance, temperature, and pH were measured <u>in situ</u>. Each sample location was marked by driving a numbered PVC stake into the bottom. Grab samples were collected from just below the surface in the appropriate bottles. Bottle numbers and field observations were recorded on field data sheets.

3.2.3.4 <u>Shallow Pits</u>--In April, hand shovels were used to dig two pits to a depth of approximately 4 feet at the North POL area. After sampling, the pits were backfilled. In September, a backhoe was used to dig two shallow sampling pits to a depth of approximately 9 feet, at which point sufficient water had accumulated to obtain a sample. After sampling, the backhoe pits were backfilled. The backhoe pits were larger than the shoveled pits and were located within about 15 feet of them. Grab samples were collected directly from the pits and transferred to appropriate bottles. Specific conductance, temperature, and pH were measured in samples taken in open containers. Exposed soil in the pits was examined for evidence of fuel contamination. Sample bottle numbers and field observations were recorded on field data sheets.

3.2.4 Aquifer Testing

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A single well aquifer test was conducted at one well at the Southwest Landfill to determine values of horizontal hydraulic conductivity representative of the surrounding soil. A rising-head test (Naval Facilities

Engineering Command, 1982) was used and is described in Appendix I. The work was completed in early May 1984.

This test was performed at the Southwest Landfill in Well L-4 because this well was easily accessible and believed to be representative of the local hydrogeology. The following steps were taken:

- Determine the static water level by taking a series of preliminary water level measurements,
- 2. Rapidly remove water from the well, and

 Measure the rise in water level (i.e., recovery) as a function of time.

4.0 DISCUSSION OF RESULTS AND SIGNIFICANT FINDINGS

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4.0 DISCUSSION OF RESULTS AND SIGNIFICANT FINDINGS

4.1 RELEVANT WATER QUALITY CRITERIA AND STANDARDS

4.1.1 Introduction

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Numerical groundwater and/or surface water standards can provide a direct basis for contamination assessment. Analytical results which exceed, or in some instances approach, regulatory maxima indicate a need for attention. Standards applicable to water resources in the vicinity of Moody AFB are described below. Also discussed are water quality criteria which, while not directly applicable, may indicate levels of substance below which there is a minimal need for further action.

4.1.2 EPA Interim Drinking Water Regulations

Drinking water maximum contaminant levels (mcls) established by regulations are not directly applicable to groundwater sampled during the Moody AFB Phase II Stage 1 survey since the regulations pertain to public water systems. They do, however, provide a means of determining potential adverse effects on deeper potable water supplies downgradient from the shallower groundwaters sampled. Primary and secondary drinking water mcls established by EPA for constituents analyzed during the Noody AFB Phase II Stage 1 survey are given in Table 4-1.

4.1.3 EPA Water Quality Criteria

EPA has established water quality criteria for 64 toxic pollutants or pollutant categories (EPA, 1980). Criteria exist for freshwater and saltwater aquatic life and human health. A summary of criteria for parameters analyzed in the Moody AFB Phase II Stage 1 survey is given in Appendix J, Table J-1. Criteria for saltwater aquatic life are not listed in Table J-1 since there are no saltwater systems impacted by disposal sites at Moody AFB.

Human health criteria are derived from animal toxicity data and are given as ambient criteria for noncarcinogenic pollutants and concentrations estimated to cause a specified level of incremental cancer risk for carcinogens. Human health criteria assume that lifetime intake of the

Parameter	MCL Established by EPA Interim Drinking Water
	Primary Standards, ug/l
<u>IETALS</u>	
Arsenic	50
Barium	1000
Cadmium	10
Chromium	50
Lead	50
Mercury	2
Selenium	10
Silver	50
CHLORINATED HYDROCARBONS	
Endrin	0.2
Lindane	4
Methoxychlor	100
Toxaphene	5
CHLOROPHENOXYS	
2,4-D	100
2,4,5-TP Silvex	10
	Secondary Standards

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Table 4-1. Relevant EPA MCLs for Drinking Water

Source: EPA National Interim Drinking Water Regulations, 40 CFR 143 (as amended

6.5 - 8.5 pH units

through March 12, 1982).

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pollutant comes from two sources: (1) drinking an average of 2 liters of water per day, and (2) ingesting an average of 6.5 grams of fish per day. Concentrations shown for incremental cancer risk in Appendix J, Table J-1 indicate those which are estimated to cause a lifetime carcinogenic risk of 10^{-6} , or one cancer in a population of 1 million. These concentrations are conservative (low) and are often well below analytical detection limits. Methods for determining human health criteria are discussed in detail by EPA (1980).

EPA water quality criteria are intended as guidelines and have no direct regulatory impact. Ambient criteria provide guidelines for potable water and consumption of aquatic organisms.

4.1.4 State of Georgia Ambient Water Quality Criteria

Georgia Water Quality Regulations (GWQR) contain specific water quality standards only for parameters such as bacteria, solids, dissolved oxygen, pH, and temperature. Standards for these parameters are given for drinking water supplies and all categories of surface waters. Ambient criteria for specific chemical contaminants are not established by GWQR. Chemical contamination of groundwater and surface water is addressed in the regulations by the following general statement:

"All waters shall be free from toxic, corrosive, acidic, and caustic substances discharged from municipalities, industries or other sources in amounts, concentrations or combinations which are harmful to humans, animals, or aquatic life."

EPA drinking water standards and water quality criteria are applied to drinking water supplies and surface waters within the state to determine what levels of contamination are harmful (Fernstrom, 1984; Winn, 1984).

4.2 ANALYTICAL RESULTS

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Field measurements and laboratory analysis results are presented in Tables 4-2 through 4-12. Data for the six wells at the Southwest Landfill are shown in Table 4-2 (GWCI, DOC, COD, oil and grease, and

Constituent	Well Locations						
(and units)	L-1	L-2	L-3	L-4	L-5	L-6	
pH (S.U.) (April) (September)	4.3 3.8	4.4 3.8	5.0 5.0	5.2 4.2	4.8 4.2	6.2 5.6	
Specific conductance (April) @ 25°C (umhos/cm) (September)	23 27	27 39	730 480	62 54	39 52	92 87	
TOX (ug Cl/l) (April)	27	26	110	42	32	36	
DOC (mg/l) (April) (September)	<1.0 <0.5	<1.0 <0.5	<1.0 2.1	13.4 <0.5	<1.0 <0.5	<1.0 <0.5	
COD (mg/1)	2.9	3.9	9.3	6.2	1.0	2.9	
Oil and grease (mg/l) (April)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Arsenic (ug/l)	<2	<2	<2	<2	<2	<2	
Barium (ug/l)	9	12	69	22	14	14	
Cadmium (ug/l)	<6	<6	<6	<6	<6	<6	
Chromium (ug/1)	<15	<15	<15	<15	<15	<15	
Lead (ug/l)	<10	<10	<10	<10	<10	<10	
Mercury (ug/l)	0.1	0.2	0.1	0.2	0.2	0.3	
Selenium (ug/l)	<4	<4	<4	<4	<4	<4	
Silver (ug/l)	<6	<6	<6	<6	<6	<6	

Table 4-2. Results of Analyses of Environmental Samples Collected in the Vicinity of the Southwest Landfill, Moody AFB, Georgia, April and September 1984

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Unless otherwise noted, samples collected in September 1984.

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Constituent	Detection			Well Lo	cations		
(and units)	Limit	L-1	L-2	L-3	L-4	L-5	L-6
Heptachlor (ug/l)	0.005	BDL*	BDL	BDL	BDL	BDL	BDL
Heptachlor epoxide (ug/l)	0.005	BDL	BDL	BDL	BDL	BDL	BDL
Lindane (ug/l)	0.002	BDL	BDL	BDL	BDL	BDL	BDL
Chlordane (ug/l)	0.005	BDL	BDL	BDL	BDL	BDL	BDL
Toxaphene (ug/l)	0.01	BDL	BDL	BDL	BDL	BDL	BDL
Diazinon (ug/l)	0.005	BDL	BDL	BDL	BDL	BDL	BDL
Malathion (ug/l)	0.01	BDL	BDL	BDL	BDL	BDL	BDL
2,4-D (ug/1)	0.03	BDL	BDL	BDL	BDL	BDL	BDL
2,4,5-T (ug/1)	0.02	BDL	BDL	BDL	BDL	BDL	BDL
DDT-R (ug/1)†	0.03	BDL	BDL	BDL	BDL	BDL	BDL

Table 4-3. Pesticide and Herbicide Concentrations in Samples Collected at the Southwest Landfill, Moody AFB, Georgia, September 1984

*BDL = Below detection limit.

tDDT-R represents the total of the following six isomers: o,p DDE; p,p DDE; o,p DDD; p,p DDD; o,p DDT; and p,p DDT. Detection limit (0.02 ug/1) is for each isomer.

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	Detection		Locations
Compound	Limit*	L-3	L-6
CHOD 601			
Bromodichloromethane	1.0	BDL†	BDL
Bromoform	1.0	BDL	BDL
Bromomethane	1.0	BDL	BDL
Carbon tetrachloride	1.0	BDL	BDL
Chlorobenzene	1.0	9.2	BDL
Chloroethane	1.0	BDL	BDL
2-Chloroethylvinyl ether	1.0	BDL	BDL
Chloroform	1.0	BDL	BDL
Chloromethane	1.0	BDL	BDL
Dibromochloromethane	1.0	BDL	BDL
1,2-Dichlorobenzene	1.0	BDL	BDL
1,3-Dichlorobenzene	1.0	BDL	BDL
1,4-Dichlorobenzene	1.0	8.8	BDL
Dichlorodifluoromethane	1.0	BDL	BDL
1,1-Dichloroethane	1.0	BDL	BDL
1,2-Dichloroethane	0.1	BDL	BDL
Trans-1,2-Dichloroethene	1.0	BDL	BDL
1,2-Dichloropropane	1.0	BDL	BDL
Cis-1,3-Dichloropropene	1.0	BDL	BDL
Trans-1,3-Dichloropropene	e 1.0	BDL	BDL
Methylene chloride	1.0	BDL	BDL
1,1,2,2-Tetrachloroethand	e 1.0	BDL	BDL
Tetrachloroethene	1.0	BDL	BDL
1,1,1-Trichloroethane	1.0	BDL	BDL
1,1,2-Trichloroethane	1.0	BDL	BDL
Trichloroethene	1.0	2.1	BDL
Trichlorofluoromethane	1.0	BDL	BDL
Vinyl chloride	1.0	BDL	BDL
THOD 602			
Benzene	0.5	3.7	BDL
Ethyl benzene	1.0	BDL	BDL
Toluene	1.0	BDL	BDL
Xylenes	1.0	BDL	BDL

Table 4-4. Concentrations of Volatile Organic Compounds Found in Samples Collected at the Southwest Landfill, Moody AFB, Georgia, September 1984

*All values in ug/1.

"BDL = Below detection limit.

Constituent	Well Locations							
(and units)	LPP-1	LPP-2	LPP-3	LPP-4	LPP-5	LPP-6		
oH (S.U.) (April)	5.5	6.0	4.7	4.9	5.8	6.3		
(September)	6.1	5.8	5.7	5.4	6.3	6.3		
Specific conductance (April)		1,390	240	230	940	1,470		
3 25°C (umhos/cm) (September)	1,790	1,100	340	290	960	220		
TOX (ug Cl/l) (April)	120	120	74	74	92	81		
DOC (mg/l) (April)	34	49	66	41	86	26		
(September)	52	58	50	45	60	19		
COD (mg/1)	140	190	180	110	190	85		
Dil and grease (mg/l) (April)	<0.5	<0.5	<0.5	<0.5	0.8	<0.		
Phenolics (ug/1)	9	20	12	32	12	16		
Arsenic (ug/1)	<2	<2	<2	<2	<2	3		
Barium (ug/l)	200	220	84	130	140	33 0		
Cadmium (ug/1)	<6	<6	7.6	10	<6	<6		
Chromium (ug/l)	<15	<15	22	27	<15	<15		
Lead (ug/l)	14	<10	<10	<10	<10	<10		
Mercury (ug/l)	<0.1	<0.1	<0.1	0.12	0.2	<0.		
Selenium (ug/l)	<4	<4	<4	<4	<4	<4		
Silver (ug/1)	<6	<6	<6	<6	<6	<6		

Table 4-5. Results of Analyses of Environmental Samples Collected in the Vicinity ofthe Lily Pad Pond Fill Site, Noody AFB, Georgia, April and September 1984

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Unless otherwise noted, samples collected in September 1984.

Table 4-6. Concentrations of Volatile Organic Compounds Found in Samples Collected in Wells at the Lily Pad Pond Fill Site (Site 2), Moody AFB, Georgia, September 1984

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	Detection	Well Locations					
Compound	Limit*	IPP-1	LPP-2	LPP-3	LPP-4	LPP-5	LPP-(
METHOD 601							
Bromodichloromethane	1.0	BDL†	BDL	BDL	BDL	BDL	BDL
Bromoform	1.0	BDL	BDL	BDL	BDL	BDL	BDL
Bromomethane	1.0	BDL	BDL	BDL	BDL	BDL	BDL
Carbon tetrachloride	1.0	BDL	BDL	BDL	BDL	BDL	BDL
Chlorobenzene	1.0	BDL	BDL	BDL	BDL	BDL	BDL
Chloroethane	1.0	BDL	BDL	BDL	BDL	BDL	BDL
2-Chloroethylvinyl ether	1.0	BDL	BDL.	BDL	BDL	BDL	BDL
Chloroform	1.0	BDL	BDL	BDL	BDL	BDL	BDL
Chloromethane	1.0	BDL	BDL	BDL	BDL	BDL	BDL
Dibromochloromethane	1.0	BDL	BDL	BDL	BDL	BDL	BDL
1,2-Dichlorobenzene	1.0	BDL	BDL	BDL	BDL	BDL	BDL
1,3-Dichlorobenzene	1.0	BDL	BDL	BDL	BDL	BDL	BDL
1,4-Dichlorobenzene	1.0	BDL	BDL	BDL	BDL	BDL	BDL
Dichlorodifluoromethane	1.0	BDL	BDL	BDL	BDL	BDL	BDL
1,1-Dichloroethane	1.0	BDL	BDL	BDL	BDL	BDL	BDL
1,2-Dichloroethane	0.1	BDL	BDL	BDL	BDL.	BDL	BDL
1,1-Dichloroethene	1.0	BDL	BDL	BDL	BDL	BDL	BDL
Trans-1,2-Dichloroethene	1.0	BDL	BDL	BDL	BDL	BDL	BDL
1,2-Dichloropropane	1.0	BDL	BDL	BDL	BDL	BDL	BDL
Cis-1,3-Dichloropropene	1.0	BDL.	BDL	BDL	BDL	BDL	BDL
Trans-1,3-Dichloropropene	1.0	BDL	BDL	BDL	BDL	BDL	BDL
Methylene chloride	1.0	BDL	BDL	BDL.	BDL	BDL	BDL
1,1,2,2-Tetrachloroethane	1.0	BDL	BDL	BDL	BDL	BDL	BDL
Tetrachloroethene	1.0	BDL	BDL	BDL.	BDL	BDL	BDL
1,1,1-Trichloroethane	1.0	BDL	BDL	BDL	BDL	BDL	BDL
1,1,2-Trichloroethane	1.0	BDL	BDL	BDL	BDL	BDL	BDL
Trichloroethene	1.0	BDL	BDL	BDL	BDL	BDL	BDL
Trichlorofluoromethane	1.0	BDL	BDL	BDL	BDL	BDL	BDL
Vinyl chloride	1.0	BDL	BDL	BDL	BDL.	BDL	BDL
19THOD 602							
Benzene	0.5	BDL	BDL	BDL	BDL.	4.7	BDL
Ethyl binzene	1.0	BDL	BDL	BDL	BDL	BDL	RDL
	1.0	BDL	BDL	BDL	1.8	BDL	BDL
	1.0	BDL	BDL	BDL	BDL	BDL	BDL

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-Mill = Relaw petection limit.

Constituent	_	Surface Wat	er Location	IS
(and units)	LPP-SW1	LPP-SW2	LPP-SW3	LPP-SW4
pH (S.U.) (April) (September)	3.5 4.0	3.8 4.4	4.1 4.1	4.5 4.1
Specific conductance (April) @ 25°C (umhos/cm) (September)	23 34	20 30	20 32	20 32
TOX (ug C1/1) (April)	72	61	44	41
DOC (mg/l) (April) (September)	15 16	12 15	7 12	7 14
COD (mg/l)	59	51	50	49
Oil and grease (mg/l) (April)	<0.5	<0.5	<0.5	<0.5
Phenolics (ug/l) (April)	8	5	10	11
Arsenic (ug/1)	<2	<2	<2	<2
Barium (ug/l)	11	12	10	8
Cadmium (ug/l)	<6	<6	<6	<6
Chromium (ug/1)	<15	<15	<15	<15
Lead (ug/1)	<10	<10	<10	<20
Mercury (ug/l)	<0.1	<0.1	<0.1	<0.1
Selenium (ug/1)	<4	<4	<4	<4
Silver (ug/1)	<6	<6	<6	<6

Table 4-7. Results of Analyses of Surface Water Samples Collected in the Vicinity of the Lily Pad Pond Fill Site, Moody AFB, Georgia, April and September 1984

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Unless otherwise noted, samples collected in September 1984.

	Detection	Surface Wa	ter Locations
Compound	Limit*	LPP-SW1	LPP-SW2
THOD 601			
Bromodichloromethane	1.0	BDL†	BDL
Bromoform	1.0	BDL	BDL
Bromomethane	1.0	BDL	BDL
Carbon tetrachloride	1.0	BDL	BDL
Chlorobenzene	1.0	BDL	BDL
Chloroethane	1.0	BDL	BDL
2-Chloroethylvinyl ether	1.0	BDL	BDL
Chloroform	1.0	BDL	BDL
Chloromethane	1.0	BDL	BDL
Dibromochloromethane	1.0	BDL	BDL
1,2-Dichlorobenzene	1.0	BDL	BDL
1,3-Dichlorobenzene	1.0	BDL	BDL
1,4-Dichlorobenzene	1.0	BDL	BDL
Dichlorodifluoromethane	1.0	BDL	BDL
l,1-Dichloroethane	1.0	BDL	BDL
1,2-Dichloroethane	0.1	BDL	BDL
1,1-Dichloroethene	1.0	BDL	BDL
Trans-1,2-Dichloroethene	1.0	BDL	BDL
1,2-Dichloropropane	1.0	BDL	BDL
Cis-1,3-Dichloropropene	1.0	BDL	BDL
Trans-1, 3-Dichloropropene	e 1.0	BDL	BDL
Methylene chloride	1.0	BDL	BDL
1,1,2,2-Tetrachloroethane	e 1.0	BDL	BDL
Tetrachloroethene	1.0	BDL	BDL
1,1,1-Trichloroethane	1.0	BDL	BDL
1,1,2-Trichloroethane	1.0	BDL	BDL
Trichloroethene	1.0	BDL	BDL
Trichlorofluoromethane	1.0	BDL	BDL
Vinyl chloride	1.0	BDL	BDL
THOD 602			
Benzene	0.5	BDL	BDL
Ethyl benzene	1.0	BDL	BDL
Toluene	1.0	BDL	BDL
Xylenes	1.0	BDL	BDL BDL

Table 4-8. Concentrations of Volatile Organic Compounds Found in Samples Collected in Surface Water at the Lily Pad Pond Fill Site, Moody AFB, Georgia, September 1984 _____

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*All values in ug/1.

TSDL = Below detection limit.

Constituent	Well	Number
(and units)	NPOL-1	NPOL-2
pH (S.U.) (April)	3.8	3.7
(September)	4.8	4.2
Specific conductance (April)	32	29
@ 25°C (umhos/cm) (September)	120	55
DOC (mg/l) (April)	1.2	1.4
(September)	9.6	2.3
COD (mg/1)	55	18
Oil and grease (mg/l)	50	3.4
Lead (ug/l)	200	28

Table 4-9.	Results of Analyses of Environmental Samples Collected in the
	Vicinity of the North POL Area, Moody AFB, Georgia, April and
	September 1984

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Unless otherwise noted, samples collected in September 1984.

Compound*	Pit #1	Pit #2
Benzene	120	32
l,l,2-Trichloroethylene	24	2.6
a-Trifluorotoluene	<10	<10
Toluene	180	<1.0
1,1,2,2-Tetrachloroethylene†	9.1	5.8
Ethyl benzene	690	33
l-Chlorocyclohexene-l	<10	<1.0
p-Xylene	1,600	26
n-Xylene	1,700	<1.0
o-Xylene	520	2.2
Isopropylbenzene	<10	4.8
Styrene	<10	<1.0
p-Bromofluorobenzene	<10	<1.0
n-Propylbenzene	29	13
t-Butylbenzene	<10	<1.0
Bromobenzene	<10	<1.0
sec-Butylbenzene	<10	<1.0
1,3,5-Trimethylbenzene	129	20
p-Cymene	<10	<1.0
1,2,4-Trimethylbenzene	<10	<10
Cyclopropylbenzene	<10	6.7
n-Butylbenzene	<10	2.8
2,3-Benzofuran	<10	<1.0
lexachlorobutadiene	<10	<1.0
Yaphthalene	14	6.2

Table 4-10. Concentrations of Volatile Organic Compounds Found in Water Samples Collected in Shallow Pits Near the North POL Area, Moody AFB, Georgia, September 1984 5

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*Excluding chlorinated benzenes (all units ug/l). †Nonconfirmable-coelutes with benzene on the confirmation column.

All compounds having a concentration greater than 10 ug/1 (ppb) have been confirmed using the second column in the liethod.

Constituent (all units)	I-striv	MAFB-2	MAFB-3	MAF134	NAFB-5	W MAFB-5a	Well Locations MAFB-6 M	ons MAFB-7	MFB-8	MFB-10	MAFB-12	MAFB-13
pt (S.U.) (April) (September)	7.2 7.2	7.0 7.2	7.2 7.2	7.3 7.3	7.3 6.9	6.6 7.2	7.2 7.7	7.1 7.4	7.4 7.4	6.5 6.7	7.6 7.2	7.8 7.4
Specific conductance (April) # 25°C (undos/cm) (September)	230 240	230 240	260 260	250 290	220 200	180 240	210 240	230 250	240 230	110 100	230 250	240 250
10X (ug c1/1) (Apri1)	25	23	87	45	35	38	32	120	50	ま	30	29
JNKC (E4;/1)	0.15	<1.0	0.15	0.1 >	<1.0	0.1>	0.1>	0.15	<1.0	4.9	<1.0	<1.0
0il and grease (mg/l) (April)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Arsenic (ng/1)	Q	Q	Q	Ø	Q	\$	Q	4	₿	\$	₽	4
Burium $(u_i/1)$	18	20	23	18	7	14	12	11	21	23	હ્ય	77
Carbitum (ug/1)	4>	9>	9>	9>	9≻	9	\$\$	%	9>	9>	\$	9
Chromium (ug/l)	<15	<15	<15	<15	<15	<15	<15	<15	<15	<15	<15	<15
1×34 (ug/1)	<20	20	C 20	8	20	8	2 3	<20	3 3	<20	<20	<20
k rcury ($\eta_k/1$)	<0.1	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	0.5	0.1	<0.1	0.1	0.1
Selenitum (tų;/l)	5	4	4>	4>	4>	⋧	4	4>	4>	45	\$	4
Silver (48/1)	\$	9	9>	99	9>	\$	9>	9	9>	9>	<ó	\$

Constituent	Detection	Well Locations			
(and units)	Limit	MAFB-4	MAFB-6	MAFB-8	
Heptachlor (ug/l)	0.005	BDL*	BDL	BDL	
Heptachlor epoxide (ug/l)	0.005	BDL	BDL	BDL	
Lindane (ug/l)	0.002	BDL	BDL	BDL	
Chlordane (ug/l)	0.005	BDL	BDL	BDL	
Toxaphene (ug/l)	0.010	BDL	BDL	BDL	
Diazinon (ug/l)	0.005	BDL	BDL	BDL	
Malathion (ug/l)	0.010	BDL	BDL	BDL	
2,4-D (ug/1)	0.03	BDL	BDL	BDL	
2,4,5-T (ug/1)	0.02	BDL	BDL	BDL	
DDT-R†	0.03	BDL	BDL	BDL	

Table 4-12. Pesticide and Herbicide Concentrations in Samples Collected from Existing Wells at Moody AFB, Georgia, September 1984

*BDL = Below detection limit.

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tDDT-R represents the total of the following six isomers: o,p DDE; p,p DDE; o,p DDD; p,p DDD; o,p DDT; and p,p DDT. metals); Table 4-3 (pesticide/herbicide scans); Table 4-4 (volatile organic compounds at Wells L-3 and L-6 only). Data for the six wells at the Lily Pad Pond Fill site are shown in Table 4-5 (GWCI, DOC, COD, oil and grease, total phenolics, and metals) and Table 4-6 (volatile organic compounds). Data for four surface water samples near the Lily Pad Pond Fill site are shown in Table 4-7 (GWCI, DOC, COD, oil and grease, total phenolics, and metals) and Table organic compounds at two locations).

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Results of analysis on samples collected at the North POL area are shown in Table 4-9 (pH, specific conductance, DOC, COD, oil and grease, and lead) and Table 4-10 (volatile aromatics). Data for Moody AFB water supply wells are shown in Table 4-11 (GWCI, DOC, oil and grease, and metals) and Table 4-12 (pesticide/herbicide scans at Wells 4, 6, and 8).

Values for total phenolics and TOX are for samples collected in April 1984. Values for oil and grease at the North POL area are for samples collected in September 1984, and all other oil and grease data are for April samples.

Metals, pesticide/herbicide scans, and COD results for April did not meet quality control requirements as noted in Section 3.2.3.1. September sampling results did meet quality control checks and these are the data reported for these constituents. Because COD was reanalyzed, DOC was also reanalyzed. It would be difficult to compare COD and DOC results for samples collected at different times. DOC data for April samples met quality control requirements and are included.

Both April and September field data (i.e., pH and specific conductance) are reported.

4.3 HYDROGEOLOGIC RESULTS

4.3.1 Introduction

Static water levels in each well were measured in April and September 1984. This information and elevations of the shallow groundwater surface at the Southwest Landfill are presented below.

Aquifer testing was completed in Well L-4 in May 1984, and results of that work are also presented in this section.

4.3.2 Shallow Groundwater Surface at Southwest Landfill

Static water levels measured at the time of sampling and surveyed well head elevations for each well at the Southwest Landfill are shown on Table 4-13. Elevations of the surface for the shallow aquifer are indicated on Figures 4-1 and 4-2 for April and September, respectively. Water table surface elevations were typically 4 feet higher in April than in September. These data confirm water table slopes inferred from land surface slopes. Well L-6 is clearly upgradient from all other wells.

It is not possible to accurately define lines of equal water surface elevation using only the six measurements shown on Figures 4-1 and 4-2. However, the data demonstrate that, in general, shallow aquifer flow is to the east and north (i.e., toward the upper left in the figures). The data indicate that it is more easterly in September than in April.

4.3.3 Depths to Water at Lily Pad Pond Fill Site

Depths to water from top of casing for each well at the Lily Pad Pond Fill site are shown on field sheets in Appendices D-1 and D-2 for April and September samplings, respectively. These depths varied between 3.1 feet and 5.2 feet in April and 4.1 feet and 6.2 feet in September. All wells recovered slowly and were bailed almost dry before being allowed to recover for sampling.

Well heads were not surveyed and no groundwater surface data were developed for this site. It was possible to identify direction of groundwater movement because of the small area and the mounded topography

			April	September	
Well Head Elevation Well (ft msl*)	Depth to Water (ft)	Elevation of Water Surface (ft msl)	Depth to Water (ft)	Elevation of Water Surface (ft msl)	
L-1	218.39	5.00	213.4	9.48	208.9
L-2	222.85	7.12	215.7	11.33	211.5
L-3	218.60	5.04	213.6	7.17	211.4
L-4	222.29	5.75	216.4	10.33	212.0
L - 5	227.53	9.17	218.4	14.38	213.2
L-6	237.47	5.81	231.7	14.02	223.4

Table 4-13. Static Water Levels and Surveyed Well Head Elevations for Each Well at the Southwest Landfill, Noody AFB, Georgia, April and September 1984

*Mean sea level.

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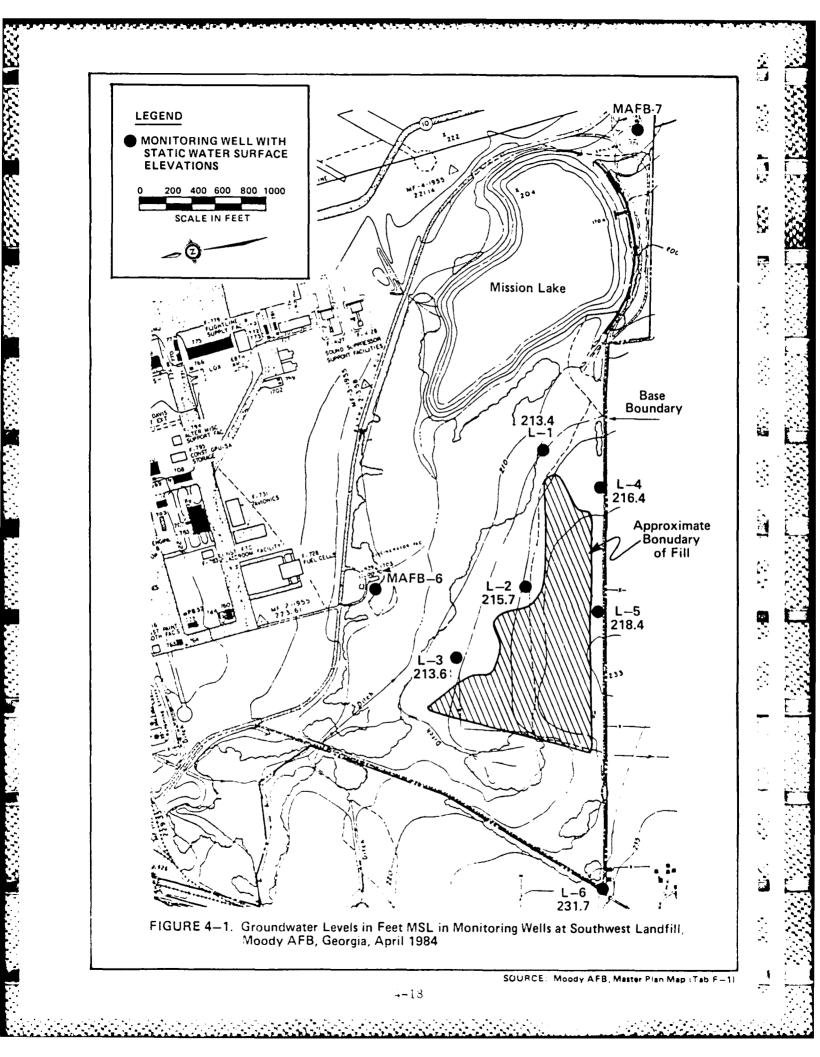
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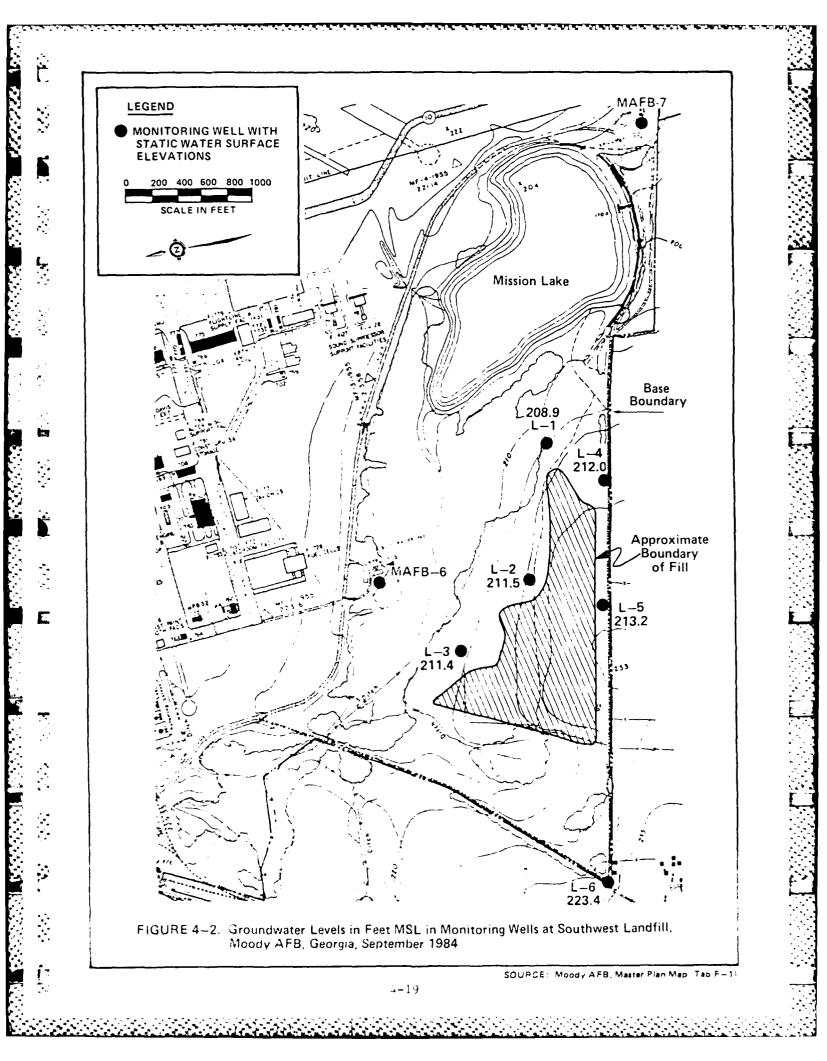
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of the fill site, and because the adjacent surface water provided a horizontal water table surface surrounding the fill.

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4.3.4 Aquifer Testing at Southwest Landfill

The shallow aquifer in the vicinity of the Southwest Landfill was tested by means of a rising head test in Well L-4. Results of the test are plotted in Figure 4-3. The well was drawn down approximately 2 feet and allowed to recover over a period of 100 minutes. Figure 4-3 shows drawdown ratio (H_t/H_0) versus time.

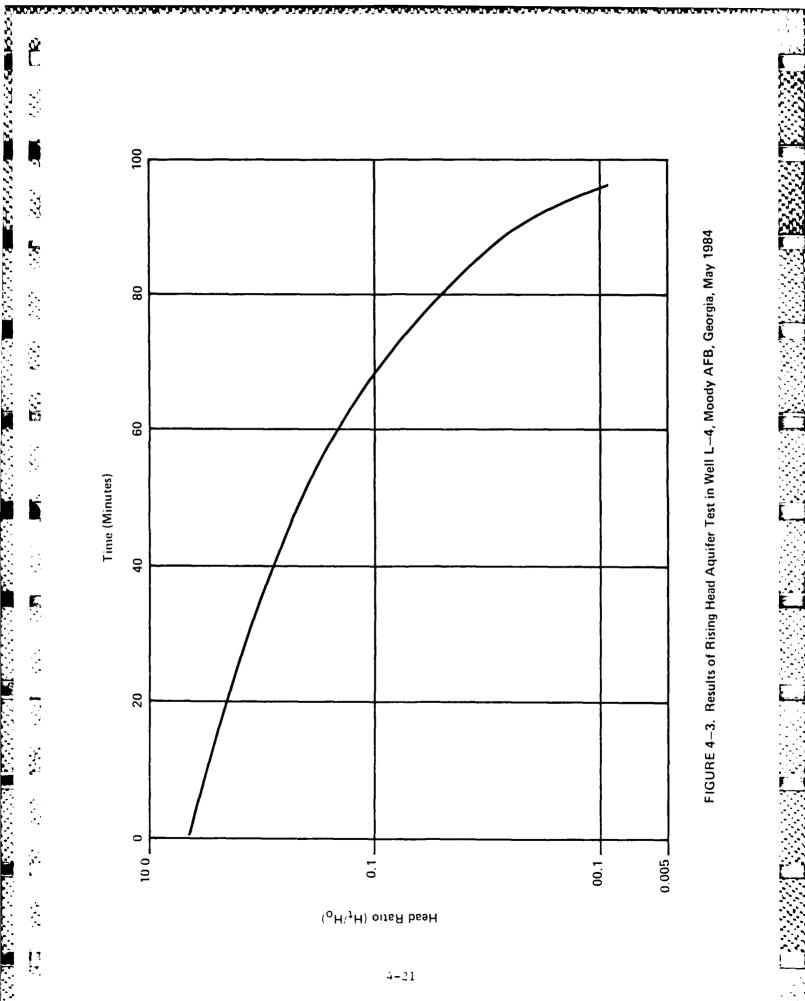
Straight line approximations were drawn for portions of the curve between 1 and 40 minutes. Slopes of these lines were used with the method referenced in Section 3.2.3 to calculate estimates of hydraulic conductivity. The two values calculated are 8.1 x 10^{-6} centimeters per second (cm/sec) and 1.1 x 10^{-5} cm/sec. Therefore, 1 x 10^{-5} cm/sec is a useful estimate of average aquifer hydraulic conductivity throughout the upper 25 feet. Details of the calculations are given in Appendix I.

4.4 DISCUSSION OF RESULTS

4.4.1 Introduction

Results of fieldwork are presented in two contexts. First, narrative explanations of some of the more salient numerical findings are presented. This information is presented for each sampling site. Second, results are interpreted with respect to potential significant impacts to human health and/or environment. This information is presented in Section 5.4.

The following paragraph explains the rationale for data assessment. It pertains to both the narrative description of results and the discussion of significance of results.



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4.4.2 General

Results of analyses on environmental samples collected during the Moody AFB Phase II Stage 1 survey are discussed in terms of relevant water quality standards and criteria whenever possible.

Where groundwater standards are not available for assessing groundwater quality, Georgia or EPA criteria for surface water nearest the site can be used as an indirect comparison. In order to estimate potential impact of groundwater quality on receiving surface water, the following factors must be taken into account:

- Rate of migration of the contaminant from shallow groundwater to the adjacent surface water; and
- Fate of the contaminant once it reaches the surface water (i.e., degree of dispersion or mixing, degree of dissolution, adsorption on sediments or vegetation, etc.).

With the limited data available, these factors cannot be quantified. Thus, if groundwater concentrations of a particular pollutant exceed adjacent surface water criteria it cannot be said with certainty that the surface water will be adversely impacted. However, if groundwater parameters are within adjacent surface water criteria, it can be stated with certainty that the surface water criteria will not be exceeded due to local groundwater discharge.

EPA has established water quality criteria for 21 specific phenolic compounds, as listed in Appendix J, Table J-1. These criteria can be used for comparison with total phenolic data only to determine whether the potential exists for criteria to be exceeded. If the total phenolic concentration of a water sample exceeds a criterion for a specific phenolic compound or group of phenolic compounds, then the potential exists for that criterion to be exceeded.

EPA water quality criteria are listed in Table J-1 for metals, purgeable organics, and phenolic compounds. EPA water quality criteria are not -stablished for all purgeable organic compounds analyzed in this survey.

For detected compounds without criteria, published toxicity data (also shown in Table J-1) are used to assess potential environmental and human health hazards.

There are no criteria or standards for direct evaluation of TOX data. If used in a rigorous manner (e.g., RCRA groundwater compliance monitoring), extensive background and monitoring data are required to determine statistically whether monitoring well levels are significantly higher than background well levels. When used as a screening indicator, as is the case in this survey, such data are not available. For the purposes of interpreting TOX data reported in this survey, a TOX concentration of approximately 40 micrograms of chloride per liter (ug Cl/l) was selected as being sufficiently high to indicate the potential for significant groundwater contamination. This concentration is based on the EPA mcl for trihalomethanes (THMs) which is 100 micrograms per liter (ug/1) for the sum of bromoform, chloroform, bromodichloromethane, and dibromochloromethane concentrations. Molecular weights for these species range from 119.4 for chloroform to 252.8 for bromoform. A chloroform concentration of 100 ug/1 would be equivalent to 89 ug C1/1 reported as TOX, the ratio of the chloride weight $(3 \times 35.5 = 106.5)$ to the molecular weight (119.4). A bromoform concentration of 100 ug/l would be equivalent to 42 ug Cl/l reported as TOX, the ratio of the halogen weight reported as chlorine $(3 \times 35.5 = 106.5)$ to the molecular weight (252.8). The cut-off level for TOX, 40 ug C1/1, was based on the concentration of bromoform that could be present in a sample without exceeding the 100 ug/1 THM standard. A TOX concentration of 40 ug Cl/l corresponds to a range of 45 ug/1 (all chloroform) to 95 ug/1 (all bromoform) total THMs and is four times the reported detection limit for the analysis. These comparisons are based on molecular weight considerations only and assume 100 percent accuracy of analytical methods.

Similarly, there are no criteria or standards for direct evaluation of COD and DOC data. Background COD and DOC concentrations in natural water samples can vary widely, depending primarily on decomposition of organic

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matter in the soil. COD and DOC data for this survey are evaluated subjectively as an indication of general organic contamination.

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4.4.3 Southwest Landfill

TOX levels varied from 27 to 110 ug/1 with the highest level at Well L-3. TOX in the upgradient Well L-6 was 36 ug/1. The level found in L-3 was enough above the level in Well L-6 to indicate more detailed volatile organics analysis. Specific conductance in Well L-3 [728 micro mhos per centimeter (umhos/cm) in April] was the highest of all wells at the site. Values in other wells were much lower ranging from 23 to 92 umhos/cm. Similar values were found in September.

Measurements in both April and September showed all wells to have pH levels below neutral (i.e., acidic). No indication of oil and grease was found. DOC and COD results showed little variability among wells. September values were (slightly) highest in Well L-3.

Metals were generally not detected at significant levels at any well. Very low concentrations (i.e., well below regulatory maxima) of barium and mercury were found with levels in the upgradient and downgradient wells being within one order of magnitude. Levels of other metals were below detection limits.

No detectable levels of pesticides or herbicides were found in any well at the site.

Detailed analysis of volatile organic compounds indicate detectable amounts of four compounds: chlorobenzene, 1,4-dichlorobenzene, trichloroethene, and benzene. All concentrations were less than 10 ug/1.

4.4.4 Lily Pad Pond Fill Site

Results of analysis of well samples are shown in Tables 4-5 and 4-6, and results of analyses of surface water samples are shown in Tables 4-7 and 4-8.

TOX levels in wells varied between 74 and 120 ug/1. Two surface water samples were near 40 ug/1 (i.e., 44 and 41 ug/1) while two were higher (61 and 72 ug/1). Based on these values, volatile organic scans were run on additional samples collected from all wells and the two higher surface water locations. No organic compounds were detected in the surface water samples. Toluene in Well LPP-4 and benzene in Well LPP-5 were detected at levels well below 10 ug/1 (i.e., 1.8 and 4.7 ug/1, respectively). These were the only organic compounds detected in wells.

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Measurements of pH indicated slightly acidic conditions in wells and surface water. Specific conductance in wells varied between over 200 umhos/cm to over 1,700 umhos/cm. Values in respective wells were similar for both sampling periods except for well LPP-6, which showed specific conductances of 1,470 and 220 umhos/cm. The reason for the large difference in well LPP-6 is not known and could be attributable to equipment error. Values in surface water were much lower (i.e., 20 to 35 umhos/cm) than values in wells..

Levels of DOC and COD were both consistent in wells and also consistent, and lower, in surface waters. DOC values varied between 19 and 60 milligrams per liter (mg/l) in wells and between 12 and 16 mg/l in surface waters. Corresponding ranges for COD were 85 to 190 mg/l and 49 to 59 mg/l, respectively. Only one sample (Well LPP-5) showed any measurable amount of oil and grease (i.e., 0.8 mg/l). Total phenolics concentration ranged in wells from a high of 32 ug/l (LPP-4) to a low of 9 ug/l (LPP-1) and in surface water from a low of 5 ug/l to a high of 11 ug/l.

Barium was detected in very small amounts (i.e., less than 350 ug/l) in all samples. Lead (14 ug/l) was found in Well LPP-1. Detectable amounts of cadmium (7.6 ug/l) and chromium (22 ug/l) were found in Well LPP-3. Cadmium (10 ug/l), chromium (27 ug/l), and mercury (0.12 ug/l) were found in Well LPP-4. Lead at 0.2 ug/l was detected in Well LPP-5 and arsenic at 5 ug/l was found in Well LPP-6.

4.4.5 North POL Area

At the North POL area, samples were taken from two open pits. During digging, fuel or fuel-type substances were detected by odors and sheens on standing water in the pits.

Sampling results shown in Tables 4-9 and 4-10 show acidic pH levels. Specific conductance and DOC increased between the April and September measurements. COD levels were 55 and 18 mg/l in respective pits. Oil and grease was detected in both pits with substantially more found in one pit (i.e., 50 versus 3.4 mg/l). Lead results were similar: 200 ug/l was found in one pit and 28 ug/l found in the other.

Levels of DOC and oil and grease were found at levels which triggered additional testing for volatile organics as shown in Table 4-10. Results indicate detectable amounts of several compounds, including benzene; 1,1,2-Trichloroethylene; toluene; 1,1,2,2-tetrachloroethylene; ethyl benzene; xylenes; isopropylbenzene; propylbenzene; 1,3,5-trimethylbenzene; cyclopropylbenzene; butylbenzene; and napthalene. Generally, amounts were higher in Pit 1 which also showed the higher concentrations of DOC, COD, oil and grease, and lead.

Results indicate a difference between conditions in April and September which was confirmed by field observation. In April, groundwater levels were 3 or 4 feet higher than in September, and no fuel odors or sheens were detected.

4.4.6 Moody AFB Supply Wells

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Field measurements indicated relatively uniform levels of pH in all wells. Levels varied between 7 and 8 standard units. Specific conductance varied between 200 and 290 unhos/cm for all main base wells. Well MAFB-10 at Grassy Pond showed lower specific conductance (100 to 110 unhos/cm).

TOX levels varied between 23 and 120 ug/1 with Wells MAFB-1, 2, 5, 5a, 6, 12, and 13 all showing levels inder 40 ug/1. Wells MAFB-3, 4, and 8

ranged between 40 and 50 ug/l. Only Wells MAFB-7 and 10 showed TOX concentrations much higher than 40 ug/l (i.e., 120 and 94 ug/l, respectively). MAFB-10 at Grassy Pond is 25 miles south of MAFB-7 at Mission Lake.

Only one well (MAFB-10) showed any amount of DOC (i.e., 4.9 mg/1). Oil and grease was not detected in any well. Barium was found in levels below 44 ug/1. No cadmium, chromium, selenium, or silver was detected. Arsenic at 4 ug/1 was indicated in Well MAFB-7 and lead was found at the detection limit (20 ug/1) in Wells MAFB-4, 5, and 5a. Detectable amounts of mercury were found in Wells MAFB-2 (0.2 ug/1), MAFB-7 (0.5 ug/1), MAFB-8 (0.1 ug/1), MAFB-12 (0.1 ug/1), and MAFB-13 (0.1 ug/1).

No detectable amounts of pesticides or herbicides were found.

4.5 SIGNIFICANT FINDINGS

4.5.1 Introduction

Significance of field and laboratory observations and measurements are presented for each site in this section.

4.5.2 Southwest Landfill

In general, no direct evidence of environmental degradation or harm to public health was found at the Southwest Landfill. Levels of metals found were well below acceptable levels in drinking water. Allowable levels of barium are approximately 15 times more than those found at the site. Concentrations of mercury were typically one-tenth the concentrations allowable in drinking water. Concentration of other metals were below detection limits.

Levels of volatile organics are generally below levels which are expected to adversely impact biota. The concentration of chlorobenzene found (9.2 ug/l) is about one-fifth the level expected to be toxic to aquatic life (50 ug/l). The concentration of 1,4-dichlorobenzene detected was 3.3 ug/l which is only a fraction of the concentration expected to harm aquatic life (763 ug/l). The amount of trichloroethene measured (2.1 ug/l) is very small when compared with the amount expected to harm biota (21,900 ug/l), and the 3.7 ug/l of benzene detected is small when compared to 5,300 ug/l, the amount causing toxic effects in aquatic life.

In general, the levels of organics found are also small when compared to ambient and human health criteria. No such criteria exist for chlorobenzene. The concentration of 1,4-dichlorobenzene is well below the 400 ug/l recommended as an ambient criterion. The concentration of trichloroethane falls below the estimated one in one million cancer risk level of 2.7 ug/l. Only benzene was found at a level which exceeds the one in one million cancer risk level (i.e., 3.7 ug/l versus 0.66 ug/l).

It is possible to estimate the rate of mass or substance moving through the shallow portion of the aquifer. This can be accomplished by using results of aquifer tests at Well L-4 and approximations to Darcy's Law. Darcy's Law relates rate of water movement (Q) through porous media under an unconfined situation as:

Q = A K dh/dx

where A is area of flow through the aquifer in a vertical plane perpendicular to the hydraulic gradient dh/dx, dh/dx is approximated as the slope of the potentiometric surface in the direction of water movement, and K is hydraulic conductivity.

The value of A is calculated by first estimating the horizontal distance along the north edge of the landfill, generally perpendicular to shallow groundwater movement as 1,800 feet. Then, by using a depth of saturated shallow aquifer of 25 feet, A equals 45,000 square feet. Shallow groundwater surface measurements can be used to estimate a gradient of 0.005 feet of water table decline per foot of horizontal distance. The value of K estimated from aquifer tests is 1×10^{-5} cm/sec. Using these values, Q is estimated as 2.3 x 10^3 cubic feet per year.

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If 10 ug/1 of some substance is found in groundwater, the amount moving through the aquifer, using the value of Q estimated above, is about one one-thousandth of a pound per year. Since those organic substances detected were all found at levels less than 10 ug/1, the amount of substance moving away from the landfill is less than 0.001 pound in a year.

No significant environmental impact is indicated by the data recorded at the Southwest Landfill because: (1) estimates of substance moving through the upper portion of the aquifer are very small; (2) levels of organics detected are well below levels expected to be harmful to biota; and (3) only long-term, direct ingestion of shallow groundwater can even be considered a potential threat to human health. Sampling results do not rule out the potential for further examination of groundwater near the landfill. This is because the substances detected were typically used at Moody AFB and it is not known if higher or lower levels of substances exist nearby (vertically or horizontally) in groundwater.

4.5.3 Lily Pad Pond Fill Site

The limited sampling results confirm the presence of industrial-type substances at this site in amounts which are not expected to pose a threat to human health or the environment. Most substances detected in the wells inserted at the fill were not detected in surface water samples.

The level of toluene detected (1.8 ug/l) in Well LPP-4 was approximately one-tenth of the level recommended as an ambient water criterion (14.3 ug/l). Benzene (4.7 ug/l) was found in Well LPP-5 at a level which is one-thousandth of the level found to cause harm to aduatic life. This level exceeds the level estimated to cause cancer in one person in a million (0.66 ug/l). However, water from Well LPP-5 would have to be ingested daily for many years to result in significant human exposure. In summary, the levels of these two substances are not expected to pose a significant threat to human health or the environment.

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Metals were detected at relatively small concentrations. For example, lead in Well LPP-1 was found at 14 ug/1 or approximately one-third the recommended level for water being ingested. The largest barium concentration, 350 ug/1, is one-third the recommended maximum level in drinking water. Mercury found in Wells LPP-4 and LPP-5 is present at about one-tenth maximum drinking water levels. Likewise, the highest concentrations of chromium are well below potable water maxima. Cadmium was found in Well LPP-4 at 10 ug/1, which is the maximum level allowed in drinking water. Therefore, levels of metals detected in all wells are considered low and can be expected to pose no threat to human health or the environment.

Levels of total phenolics indicate the presence of compounds which may be natural organic substances, residues from waste disposal, or a combination of both sources. Comparing levels to regulatory criteria is difficult because individual phenolic compounds were not identified in the scan.

4.5.4 North POL Area

Direct evidence of contamination from fuel and/or fuel-type substance was found. Odors, sheens, and analytical results confirm the presence of nonnatural substances in both test pits.

The preponderance of organic compounds found are benzene, benzenerelated, xylene, and toluene. All of these are major components of fuels typically used at Moody AFB. The level of toluene found in one pit (180 ug/1) substantially exceeds the recombended ambient criterion (14.3 ug/1). Benzene levels in both pits exceed the one in one million cancer risk level (0.66 ug/1) but are substantially lower than the level which harms freshwater aquatic life (5,300 ug/1).

An important finding during field testing was the difference between inditions in April and September. No evidence of contamination was found in April, a period of higher groundwater conditions. The contrast

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between April and September results is significant. This could indicate that fuel contamination remains below several feet of overlying seasonal groundwater, or it could indicate that fuel substances had not yet migrated to the sampling points in April.

4.5.5 Moody AFB Supply Wells

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No directly measured contamination was found in any of the water supply wells. Five wells have levels of TOX above 40 ug/1, which may or may not represent contamination. Values detected include 48, 45, 120, 50, and 94 ug/1 in wells MAFB-3, 4, 7, 8, and 10, respectively. Of these wells, MAFB-3, 7, and 10 are used as potable supplies. Wells 7 and 10 are located at recreation areas and do not contribute to the main drinking water system. Wells 7 and 10 are also the only wells which showed TOX levels substantially above 40 ug Cl/1. These two wells are among the shallowest at Moody AFB (195 and 140 feet deep, respectively). Well 5a is also shallow (150 feet deep), yet showed low TOX. The significance of shallowness may be that the higher Strata contains naturally occurring substances which caused the higher TOX results. On the other hand, shallowness may indicate a greater susceptibility for contaminants from the surface to reach the well. In either case, TOX results do not directly indicate contamination.

Specific conductance levels (i.e., 100 to 290 umhos/cm) are typical for other wells in the area, as shown in Table 2-2 (i.e., 244 umhos/cm). Metals concentrations were at or near detection limits which are substantially lower than applicable drinking water standards. No significant impact on human health or the environment is indicated by any metals concentration.

Although levels of arsenic and mercury found in Well MAFB-7 are very low (i.e., 4 and 0.5 ug/l, respectively) and do not indicate any significant contamination, these levels and the level of TOX were the highest found in any well. Because of these findings and because the well is relative-ly shallow, used as a potable supply, and downgradient from the Southwest

Landfill, the potential for limited impact of waste disposal activities on Well MAFB-7 cannot be ruled out. The higher TOX and DOC levels in Well MAFB-10 also means the potential for contamination cannot be ruled out. That well is also relatively shallow and used as a potable supply.

No other significant indication of contamination is shown by the data. TOX levels in Wells MAFB-3, 4, and 8 (i.e., 48, 45, and 50 ug/1, respectively) are not believed to be significant when compared to the level found in monitoring Well L-6 (i.e., 36 ug/1), the background well at the Southwest Landfill.

5.0 ALTERNATIVE MEASURES

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5.0 ALTERNATIVE MEASURES

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Three alternatives are possible for the sites investigated: (1) correct the contamination; (2) conduct further monitoring to determine the need, if any, of cleanup; or (3) take no further action.

Alternative 1 is appropriate where there is clear indication that present or future human or environmental problems will exist. The priority for actions would depend on the magnitude of the threat and whether that threat was current or future.

Alternative 3 is appropriate for sites where there is little, if any, evidence to indicate that the site is or will ever be a source of significant contamination. This is a difficult decision in that one can never be absolutely sure that no problem will ever exist at a site. However, reasonable judgments must be made so that resources can be allocated to sites that have the highest potential for adverse environmental impact.

Alternative 2 is appropriate where insufficient evidence exists to place a site in either the Alternative 1 or 3 categories. This alternative should be utilized with care since there is some risk that delay could allow contamination to spread and worsen a problem. The goal should be to gather enough evidence in a timely manner to resolve the question of whether or not the site requires cleanup actions.

At Moody AFB, all three types of alternative measures are indicated by Phase II Stage 1 monitoring results. Data for the North POL area show fuel or fuel-type substances have entered the environment. Alternative 1 type action is required to at least address and locate the source of these substances (i.e., leaking fuel tanks or lines). Since extent of contamination is not known at the North POL area, Alternative 2 actions are also appropriate.

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Results at the Southwest Landfill indicate further monitoring to be appropriate. Results at the Lily Pad Pond Fill site indicate Alternative 3 is appropriate. Finally, monitoring of Moody AFB supply wells indicate Alternative 3 for most wells and Alternative 2 for two wells (i.e., MAFB-7 and 10). ÷.

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Possible future actions are discussed in Section 6.0.

6.0 CONCLUSIONS AND RECOMMENDATIONS

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6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 INTRODUCTION

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Results of field monitoring and on-site experience have been presented and discussed. Comments regarding significant aspects of results have been presented. This information forms the basis for technical conclusions included in this section. In turn, these conclusions form the basis for recommendations for further actions or no further actions. Each site is addressed.

In general, technical assessments relate to perceived environmental or public health risk assessment. No attempt is made to address risk management practice, or policy. No attempt has been made to compare potential risk to potential assessment costs or remediation costs.

Based on limited assessment of potential environmental risks and magnitude and extent of potential contamination, the following order of priority for work is recommended:

- Southwest Landfill including Well MAFB-7;
- o Well MAFB-10; and
- o North POL area.

No established procedure has been applied to arrive at this ordering. No measure of relative priority is available (i.e., the first is slightly versus substantially more important than the second). The order presented represents technical judgment based on field observation, monitoring results, and potential risk to humans and/or environment.

Brief summaries of each site and recommended future actions are shown in Table 6-1 and described in the sections which follow.

6.2 SOUTHWEST LANDFILL

6.2.1 Conclusions

No significant threat to human health or environment is indicated by the Phase II Stage 1 testing results. Movement of only very small amounts

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Table 6-1.	Summary	of	Recommended	Future	Actions
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Site	Site Fieldwork	
Southwest Landfill	Install: six new wells approximately 25 feet deep; three new wells approx- imately 100 feet deep. Sample: nine new wells plus existing monitoring Wells L-1, L-2, and L-3, plus existing Moody Well MAFB-7.	All 13 wells for volatile organics, arsenic, and mercury.
Lily Pad Pond Fill	None.	None.
North POL area	Install: 10 new monitoring wells approximately 15 feet deep. Sample: All 10 wells in wet and dry seasons. Test: All tanks and lines in the storage area for leaks.	All 10 wells for DOC, benzene, xylene, and toluene.
Moody AFB Supply Wells	Sample: Wells 7 and 10.	Well 7 as noted under Southwest Landfill. Well 10 for volatile organics.

Note: Order is as addressed throughout text and not on a priority basis.

(i.e., fractions of a pound per year) of potentially toxic substances were detected. Testing results used as a screening procedure indicate the need for additional monitoring to refine estimates of substances moving in groundwater. Substances moving in groundwater may migrate to Mission Lake and perhaps Well MAFB-7. Because the lake is used for fishing and the well is a potable supply, human health can be impacted if subsequent investigation indicates that significant amounts of wastes are migrating from the landfill. 重要 クイン やく ビジョンたたけ フィ

Several of the organic compounds detected in L-3 are more dense than water and may move vertically in groundwater. To better determine if substances are migrating in groundwater, additional shallow and deeper groundwater sampling is needed.

6.2.2 Recommendations

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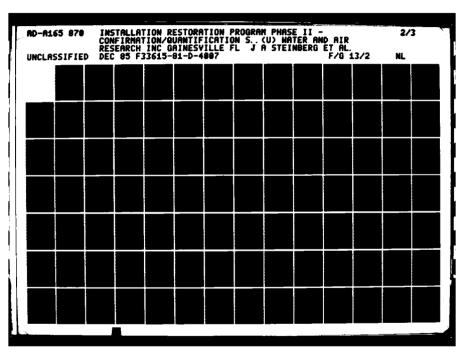
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A total of nine additional monitoring wells are needed to determine if waste substances are impacting shallow and deeper groundwater near the landfill. Also, Wells MAFB-7, L-1, L-2, and L-3 should be sampled along with the new monitoring wells. Six new wells should be installed to depths of approximately 25 feet. Four of these should be located along a line between existing Wells L-2 and L-3 approximately 200 feet apart. Two others should be placed 200 and 400 feet west of Well L-3.

Three other new wells should be installed into deeper strata to test for potential downward movement of waste. These wells should be approximately 100 feet deep and carefully cased to avoid inducing vertical movement of groundwater. These wells should be located near existing Wells L-1 and L-3 and about halfway between L-2 and L-3. Strata should be carefully characterized with specific regard for confining layers and with regard for occurrence (or lack) of uniformity among the three bore holes.

All wells (i.e., nine new plus four existing) should be tested for volatile organics, arsenic, and mercury.





MICROCOPY RESOLUTION TEST CHART

6.3 LILY PAD POND FILL SITE

6.3.1 Conclusions

No significant potential impact to human health or environment is indicated by monitoring data. Toluene and benzene were detected in very small amounts (i.e., 1.8 and 4.7 ug/1, respectively). These levels do not threaten aquatic life in surrounding surface waters. Levels of phenolic compounds cannot be assessed in terms of regulatory criteria because a total phenolic scan was performed. Analysis for individual phenolic compounds would be necessary to permit comparisons to regulatory criteria. Because the site is remote and it is reasonable to expect that at least some phenolics detected are naturally occurring compounds, no significant impact is expected due to phenolics. Ë

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6.3.2 Recommendations

No additional testing is proposed at the Lily Pad Pond Fill site.

6.4 NORTH POL AREA

6.4.1 Conclusions

There is strong evidence of fuel and/or fuel-type substances in groundwater and shallow strata. It is reasonable to believe that the storage tanks at the North POL area are the source of these substances. There is also an indication that either these substances can be relatively difficult to detect during seasonal periods of higher groundwater (e.g., during April 1984) sampling or that these substances moved into the vicinity of the sampling pits between the times fieldwork was performed (i.e., April and September 1984).

Lead was detected at 200 ug/l which exceeds drinking water criteria (i.e., 50 ug/l). Toluene (180 ug/l) and ethyl benzene (690 ug/l) exceeded recommended ambient criteria levels. Detectable amounts were found for several other volatile organic compounds which do not have recommended ambient criteria. However, there is little chance shallow groundwater would be ingested. Levels found are not expected to harm iduatic life. No information is available regarding potential impacts to plant life. Evidence of possible harm to trees was reported in the Phase 1 IRP report (CH2M-Hill, 1983). Seepage would have to persist laterally about 800 feet to reach a surface stream. Main base potable wells are about 2,000 feet away and about 400 feet deep and they are relatively isolated from surface strata by one or more layers of low permeability. Therefore, there is no apparent immediate threat to human health or the environment.

There is no detailed information regarding the extent of the affected area and additional sampling and analysis is needed to determine this. There is also no detailed information regarding which tank(s) or line(s) may be leaking. Examination and testing at the North POL area is necessary to develop this information.

6.4.2 Recommendations

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Field testing is needed to determine the extent of groundwater affected by the substances detected in the two sampling pits. Additional shallow monitoring wells are needed downgradient to sample groundwater. Ten additional wells should be installed to depths of approximately 15 feet. Wells should be located between radials extending south and southwest from the North POL area at distances of approximately 50, 100, 150, and 200 feet from the perimeter fence. Well samples should be collected in wet and dry seasons. Analysis should include DOC, benzene, xylene, and toluene.

Testing is needed to determine how fuels are entering the ground. Therefore, fuel tanks and lines should be tested using routine procedures equivalent to those given by the National Fire Protection Association (NFPA) Standard 329 (1983), "Underground Leakage of Flammable and Combustible Liquids".

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6.5 MOODY AFB SUPPLY WELLS

6.5.1 Conclusions

Results of analysis indicate that no significant contamination exists in any well sampled. However, levels of TOX in Wells MAFB-7 (120 ug/1) and 10 (94 ug/1) indicate additional testing would be prudent. Well MAFB-7 is discussed in recommendations for further work at the Southwest Landfill. Well MAFB-10 is a potable use well and therefore should be tested further.

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6.5.2 Recommendations

Well MAFB-10 should be tested for volatile organic compounds to determine whether or not the TOX level found in the well indicates significant contamination. If organics are found, other wells at Grassy Pond should be tested in similar fashion.

7.0 REFERENCES

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APPENDICES

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APPENDIX A

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LIST OF ACRONYMS, ABBREVIATIONS, AND UNITS OF MEASUREMENT

APPENDIX A

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LIST OF ACRONYMS, ABBREVIATIONS, AND UNITS OF MESUREMENT (Page 1 of 2)

AFB	Air Force Base
ATC	Air Training Command
ASTM	American Society for Testing Materials
AFFFs	Aqueous film forming foams
AAFES	Army and Air Force Exchange Service
avgas	Aviation gasoline
BOD	Biochemical oxygen demand
COD	Chemical Oxygen Demand
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DEQPPM	Defense Environmental Quality Program Policy Memorandum
DFSP	Defense Fuels Supply Point
DPDO	Defense Property Disposal Office
DOD	Department of Defense
DDT	Dichlorodiphenyltrichloroethane
DOC	Dissolved organic carbon (analysis for total organic carbon on a filtered water sample)
EOD	Explosive Ordnance Disposal
FAC	Florida Administrative Code
FDER	Florida Department of Environmental Regulation
FWQS	Florida Water Quality Standards
gpd	Gallons per day
gpm	Gallons per minute
GC	Gas chromatograph
GWQR	Georgia Water Quality Regulations
GWCI	Groundwater contamination indicators
HARM	Hazardous Assessment Rating Methodology
ICP	Inductively Coupled Plasma Spectrometry
IR	Infrared
IRP	Installation Restoration Program
15	Jet petroleum
mcl	Maximum contaminant level
msl	Mean sea level
ug C1/1	Micrograms chloride per liter
ug/kg	Micrograms per kilogram
ug/1	Micrograms per liter
umho/cm	Micro mho per centimeter
ng/kg	Milligrams per kilogram
mg/1	Milligrams per liter

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APPENDIX A

LIST OF ACRONYMS, ABBREVIATIONS, AND UNITS OF MEASURE (Page 2 of 2)

NIOSH	National Institute for Occupational Safety and Health
NPDES	National Pollutant Discharge Elimination System
OEHL	Occupational and Environmental Health Laboratory
OSHA	Occupational Safety and Health Administration
PCP	Pentachlorophenol
POL	Petroleum, oil, and lubricants
РСВ	Polychlorinated biphenyl
PVC	Polyvinyl chloride
QA/QC	Quality assurance/quality control
RCRA	Resource Conservation and Recovery Act
TAC	Tactical Air Command
TFW	Tactical Fighter Wing
TSI	Technical Services, Inc.
TDS	Total dissolved solids
TOC	Total organic carbon
TOX	Total organic halogens
TCE	Trichloroethane
THM	Trihalomethanes
UBTL	Utah Biomedical Testing Lab
USAF	United States Air Force
USDA	United States Department of Agriculture
EPA	U.S. Environmental Protection Agency
VOA	Volatile aromatics
VOC	Volatile Organic Compounds
VOH	Volatile halocarbons
WAR	Water and Air Research, Inc.

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APPENDIX B FORMAL SCOPE OF WORK

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INSTALLATION RESTORATION PROGRAM Phase IIB Field Evaluation Moody AFB GA

I. Description of Work

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The purpose of this task is to determine if environmental contamination has resulted from waste disposal practices at Moody AFB GA; to provide estimates of the magnitude and extent of comtamination, should comtamination be found; to identify potential environmental consequences of migrating pollutants; to identify any additional investigations and their attendant costs necessary to properly evaluate the magnitude, extent and direction of movement of discovered contaminants.

The presurvey report (mailed under separate cover) and Phase I IRP report (mailed under separate cover), incorporated background and description of the sites for this task. To accomplish the survey effort, the contractor shall take the following steps:

A. General

1. The areal extent of each site shall be determined by reviewing available aerial photos of the base, and by field reconnaissance.

2. Each location where surface water samples are collected shall be marked with a permanent marker, and the location recorded on a project map for the site.

3. A total of 12 monitoring wells shall be installed. The exact location of wells shall be determined in the field.

4. Ground-water monitoring wells shall comply with U.S. EPA publication 330/9-81-002 <u>NEIC Manual for Groundwater/Subsurface Investigations at</u> <u>Hazardous Waste Sites</u>, and State of Georgia requirements for monitoring well installation. Only screw type joints shall be used. Glue fittings are not permitted.

5. Monitoring wells shall be of sufficient depth to collect samples representative of aquifer quality and to intercept contaminants if they are present. All wells shall be developed, water levels measured, and locations surveyed and recorded on a site map, unless surveying is excluded in following sections.

6. All water samples shall be analyzed on site by the contractor for pH, temperature, and specific conductance. Sampling, maximum holding time, and preservation of samples shall comply strictly with the following references: Standard Methods for the Examination of Water and Wastewater, 15th Ed. (1980), pp 35-42; ASTM, Part 31, pp 72-82, (1976), Method D-3370; and <u>Methods for Chemical Analysis of Waters and Wastes</u>, EPA Manual 600/479-020, pp xiii to xix (1979). All water samples shall be analyzed using minimum detection levels, as specified in Attachment 1.

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7. Field data collected for each site shall be plotted and mapped. The nature of contamination and the magnitude and potential for contaminant flow within each site to receiving streams and ground waters shall be determined or estimated. Upon completion of the sampling and analysis, the data shall be tabulated in the next R&D Status Report, as specified in Item VI below.

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8. Analysis for all metals and TOC shall be for the dissolved fraction of these substances in both ground-water and surface water samples.

B. In addition to items delineated in A above, conduct the following specific actions at sites identified on Moody AFB GA.

1. Monitoring of Existing Wells

a. The contractor shall collect one ground-water sample from existing Moody wells nos. 1,2,3,4,5,5a,6,7,8,12, and 13. The contractor shall also collect one ground-water sample from one of the three existing wells (nos. 9,10,11) at the Grassy Pond Recreational Annex.

b. The Air Force will provide access to pump raw water (i.e., a sampling stream) at a location prior to any treatment. The Air Force will activate pumps at all sites to purge wells for a sufficient time to be agreed upon between contractor and base personnel.

c. Each ground-water sample shall be analyzed for pH, specific conductance, oil and grease-infrared method (O&G/IR), Total Organic Halogens (TOX), Total Organic Carbon (TOC), arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver. The ground-water samples from wells nos. 4, 6, and 8 shall also be analyzed for the pesticides listed in Attachment 1.

2. Site 1. Southwest Landfill

a. Install six ground-water monitoring wells. One well shall be up-gradient. One well shall be located east of the landfill; two wells shall be located north of the landfill; two wells shall be located between the landfill and the base boundary to the south.

b. Each well shall be drilled to a depth of 25 feet. Wells shall be screened from two feet above the water table to the bottom of the well.

c. Collect one ground-water sample from each well.

d. Each sample shall be analyzed for O&G/IR, TOX, COD, TOC, pesticides specified in Attachment 1, arsenic, barium, cadmium, chromium, lead, mercury, selenium and silver.

e. Results of these analys 3 shall be included in the next R&D Status Report.

(1) For those wells where TCX and TOC results justify another round of sampling, the contractor will be directed to resample and analyze for volatile organics, using EPA Methods 601 and 602 (VOC).

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(2) For those wells where O&G/IR, COD, pesticides, or metals justify another round of sampling, the contractor will be directed to resample for that (those) parameter(s).

f. If second round sampling is performed, the up-gradient well shall be resampled for that (those) parameter(s).

g. Any second round sampling shall be performed three to six months after the first round.

h. The contractor shall conduct aquifer testing in one well at this site, using a mini-rate pumping test, or a slug test, as appropriate, to determine values of horizontal hydraulic conductivity representative of surrounding soil.

3. Site 2. Lily Pad Pond Fill Site

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a. Install six ground-water monitoring wells along the edge surrounding the fill. Well locations shall not be surveyed.

b. Each well shall be drilled to a depth of ten feet. The lower five feet of each well shall be screened.

c. Collect one ground-water sample from each well.

d. Collect one standing water sample from each of four locations 100 feet from the edge of the fill.

e. Ground-water and surface water samples shall be analyzed for O&G/IR, TOX, COD, TOC, phenols, arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver.

f. Results of these analyses shall be included in the next R&D Status Report.

g. For those wells and surface water sampling locations where TOX and TOC results justify another round of sampling, the contractor will be directed to resample and analyze for VOC.

h. Any second round sampling shall be performed three to six months after the first round.

4. Site 3. North POL Area

a. Excavate two soil borings to a depth of one foot below the water table. Total depth per boring shall not exceed six feet. The two borings shall be separated by a minimum of 30 feet.

b. During augering, soil shall be inspected for fuel contamination.

c. Collect two ground-water samples from each hole.

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d. One ground-water sample from each hole shall be temporarily The contractor shall pay strict attention to preservation method archived. and holding time.

e. One ground-water sample from each hole shall be analyzed immediately for O&G/IR, COD, TOC, and lead.

f. For either or both holes where O&G/IR exceeds 600 ug/L, and/or TOC exceeds 3 mg/L, the contractor will analyze the archived sample(s) using Method 503.1 for volatile aromatics, to exclude chlorinated benzenes. Results of all analyses shall be included in the next R&D Status Report.

C. Well Installation and Clean-up

The well and boring area shall be cleaned following the completion of each well and boring. Drill cuttings shall be removed and the general area cleaned. If hazardous waste is generated in the process of well installation, the contractor shall be responsible for proper containerization (according to local Civil Engineering office requirements) for eventual government disposal. Disposal of drill cuttings is not the responsibility of the contractor.

D. Data Review

Results of sampling and analysis shall be tabulated and incorporated into the monthly R&D Status Reports and forwarded to the USAF OEHL for review as soon as they become available, as specified in Item VI below. Total results of sampling and analysis shall be tabulated and incorporated into the Informal Technical Information Report (Sequence 3, Attachment 1 as reflected in Item VI below), and forwarded to USAF OEHL/CVT for review.

E. Reporting

1. A draft report delineating all findings of this field investigation shall be prepared and forwarded to the USAF OEHL, as specified in Item VI below, for Air Force review and comment. This report shall include a discussicn of the regional hydrogeology, well logs of all project wells, data from water level surveys, water quality analysis results, available geohydrologic cross sections, ground-water surface and gradient vector maps, available vertical and horizontal flow vectors, and laboratory quality assurance information. The report shall follow the USAF OEHL supplied format (mailed under separate cover).

2. Estimates shall be made of the magnitude and direction of movement of contaminants discovered. Potential environmental consequences of discovered contamination shall be identified or estimated. Where survey data are insufficient to properly determine or estimate the magnitude and direction of movement of discovered contaminants, fully justified specific recommendations shall be made for additional efforts required to properly evaluate contamination migration.

3. Specific requirements, if any, for future soil borings or for future ground-water and surface water monitoring must be identified.

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The contractor shall provide cost estimates for all additional work recommended to permit proper determination of contaminants. The recommendations provided shall include all efforts required to determine the magnitude and direction of movement of discovered contaminants along with an estimate of the time required to accomplish the proposed effort. This information shall be provided in a separately bound appendix to the draft final report.

II. Site Location and Dates

Moody AFB GA USAF Hospital/SGPB Dates to be established

III. Base Support: None

IV. Government Furnished Property: None

- V. Government Points of Contact:
 - 1. 1Lt Dulcie Weisman USAF OEHL/ECQ Brooks AFB TX 78235 (512)536-3305 AV 240-3305

2. Capt Kenneth Branton USAF Hospital/SGPB Moody AFB GA 31699 (912)333-3503 AV 460-3505 3. Col Jerry Dougherty HQ TAC/SGPAE Langley AFB VA 23665 (804)764-2180 AV 432-2180

VI. In addition to sequence numbers 1, 5 and 11 which are applicable to all orders, the reference numbers below are applicable to this order. Also shown are data applicable to this order.

Sequence Nr	Block 10	Block 11	Block 12	Block 13	Block 14
3	ON E/T	**	**		
4	ON E/R	84JUL27	84AUG27	84 D E C 3 O	

*A minimum of two draft reports will be required. After incorporating Air Force comments concerning the first draft report, the contractor shall supply the USAF OEHL with a second draft report. The report will be forwarded to the applicable regulatory agencies for their comments. The contractor shall supply the USAF OEHL with 20 copies of each draft report and 50 copies plus the original camera ready copy of the final report.

#Upon completion of all analyses.

VII. The ceiling price of Items 0001 and 0002, as contemplated by the payment clause, is \$65,956.86.

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volatile aromatics	••
phenol	1 μg/L
TOCa	1 mg/L
TOXa	5 μg/L
OEG/IR	0.1 mg/L
cadmium	10 µg/L
chromium	50 μg/L
lead	20 μg/L
mercury	1 μg/L
selenium	10 μg/L
silver	10 μg/L
barium	200 µg/L
arsenic	1 0 μg/L

*As specified in EPA Methods 601 and 602 **As specified in EPA Nethod 503.1

a Detection limits for TOX and TOC must be at least three times the noise levels of the analytical instrumentation. Laboratory water used as a blank must show a level less than three times the noise level, or be corrected for before reporting of results. TOC samples must be treated to remove inorganic carbon and results reported as nonpurgeable TOC.

Pesticide Analyses (µg/L)

DDT Isomer		0.02
heptachlor		0.02
heptachlor	epoxide	0.02
lindane		0.01
chlordane		0.02
diazinon		0.02
malathion		0.10
toxaphene		1.00
2,4-D		0.06
2,4,5-T		0.06

F33615-91-0-4007/0014

APPENDIX C MONITORING WELLS COMPLETION LOGS

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Boring No. L-!		Location Coordinates
Hole Size <u>6 in</u> .	Slot <u>0.01 in</u> .	
Screen Size 2 in.	Mat'l Sch. 40 PVC	Filter Materials 20-30 Sand
Casino Size 2 in.	Mat'l Sch. 40 PVC	Grout Type Sand Cement
Geologist J. Stein	berg	Protective Casing <u>6-in. steel</u>
Date Start 3139'94 ''	40 Finish 3/00/20 17/5	Static Water Level
Contractor WAR/WTD		Top of Well Elevation _ 219.33' ms).
Driller P. Wrigh	nt	Drill Type 6-in. Hollow Stem Auger
· · · · · · · · · · · · · · · · · · ·		

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.		Depth				SPT
<u>بر:</u>	Sketch	(Feet)	Sample	Lithology	USCS	(BL/FT)
		+2.5	SURFACE	Charley sand, very fine, some organics, black (1048 2/1), saturated	SC	
L		e C	5-6594	Sandy Clay, 15% sand, brownish Mellow (ICYR 6/12) SCTOJ white (ICYR 4/1) 1090, Red (ICYR 4/3)403 Maist	્દ	5+15
	BENT	- 3.0 - 4.0 - 5.5	9-10.314	Clay, 15 DCC sand, Coarse to fine, Light Dray (EVR 71), yellowish brown (ICVR 5/3) and her (ICR 4/3), moist, vistis	CL	17+3'
				Olay, 10-1572 Sundy Fine to VFine, Vellowish brown (164R5,8) with Strong brown (7,54R46)	にし	ेड +©€
	Jand Janes		20-0154	Clay, 10-1590 sandy fine -1/ fine, No 1603 (10 YR 7/6) 9000, ye "aush ned (15 YR 1/6) 1090, saturated		15-32
-			25-XEST	2 ay 10% Sand paly yellow 12.54 9/421 Saturated	CL	5-6
:						
		- 25 2			, , , ,	
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	-15 3 * · · · · · · · · · · · · · · · · · ·
Boring No. L- 2	Location Coordinates
Hole Size 6 in. Slot 0.01 in.	
Screen Size 2 in. Mat'l Sch. 40 PVC	Filter Materials
Casing Size 2 in. Mat'l Sch. 40 PVC	Grout Type_Sand Cement
Geologist J. Steinberg	Protective Casing <u>6-in. steel</u>
Date Start 212014 1000 Finish 212-184 16-5	5 Static Water Level
Contractor WAR/WTD	Top of Well Elevation 222.35' ~s
Driller P. Wright	Drill Type 6-in. Hollow Stem Auger

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	Depth				SPT
Sketch	(Feet)	Sample	Lithology	USCS	(BL/FT)
	+ 2.5	SUFFARE	Clayey sand, 30% Clay, fine -Vfin Sand, some organic material, dark gray (1048411) 50%, prownish yellow (1048616), saturated	SC	
4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	- C O	5-10554	Sandy Clay, 10-15% sand, white CT.SVR 20, 70%, Mant brown CT.SVR 4/42 60%, Med (10 R 4/6) CCCO, Stightly Moist to Ory	CL	90+93
BENT	30	12 H.7 SF	Sanduralay, 10-15% sand, white (10 YR S/), Eatorated	CL	14+17
	5.5		Sandy clay, 1070 sand, white	CL	9+12
		00-01597	Eandy Clay, DCPO sand, white Course 512070, arounish relieus CICYR 618) 2000, very incist	Ċ_	4-12
		92-36274	Schery day 202 sand, Malto - ine jushite (ICMRS), Jos-pratece		9.1
	- 24 5 - 25 2			i	
· · · · · · · · · · · ·	• • • • • • • • • • • • •	· - · · · · · · ·	<u> </u>	• -	•

È		· ····································	<u>);</u>
Boring No. L-3		Location Coor invates	
	Slot 0.01 in.		
🔒 Screen Size 2 in.	Mat'l Sch. 40 PVC	Filter Materials	20-30 Sand
Casing Size 2 in.	Mat'l Sch. 40 PVC	Grout Type Sand Cem	ient
Geologist J. Steinberg	g	Protective Casing_6-	in. steel
Geologist J. Steinberg	Finish Spanzy Mar	Static Water Level	
Contractor WAR/WTD	· ,	Top of Well Elevation	n 218.60 / ms
Driller P. Wright		Drill Type 6-in. Hol	low Stem Auger

	Sketch	Depth (Feet)	Sample	Lithology	USCS	SPT (BL/FT)
			SURFAUE	Some organics, Vick gray	<u>(</u>)	
		+2.5	5-6551	Chayey cand, fine mely work cane white 17.3 18 stal, maist	SC	4+6
	L 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	• •	10-11.5 \$4	Sandy Clay 1407 Sandy white (TIST VR SEL PODDISH NELLOW TREETS (TISTUR 7/2, Decomposit	01	14-12
	6ENT /	- 3.0 - 4 0 - 5.5		Clayer sand, 70-80% sand, readar, ang char to sub ang viarn mechan to the, white (75% %)	SC	12+17
E			ac -21.5 ft	Clavey sand, 100-70% Sand, well sor tell, scorounderd, medium - me, while Cliptic Victorianth strong brown (7.5 YR 5/3) bunds (3202-Very maist - saturated	SC	5+5
1				sundy glay 1270 sand periods h Wellow (7759R 6/9) with White straws (255%	<u>, -</u>	(0+7
, v.		. 24.5				· • •
•	· · · · · · · · · · · · · · · · · · ·	. :5 2				: • •
ţ'e	<u> </u>	•	• • • • • • •		•	

	SHEET 1
Boring No. L-4	Location Coordinates <u>1999</u>
Hole Size <u>6 in.</u> Slot <u>0.01 in.</u>	
Screen Size 2 in. Mat'l Sch. 40 PVC	Filter Materials 20-30 Sand
Casing Size 2 in. Mat'l Sch. 40 PVC	Grout TypeSand Cement
Geologist J. Steinberg	Protective Casing <u>6-in. steel</u>
Date Start 3/3/94 OROD Finish 2/2/101 1090	Static Water Level
Contractor WAR/WTD	Top of Well Flevation 222.23 ms
Driller P. Wright	Orill Type 6-in. Hollow Stem Auger

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·	Depth				SPT
Sketch	(Feet)	Sample	Lithology	USCS	(BL/FT)
	+2.5	Surface	Markey Soundy, 600% sandy poorly sontedy medicing to fine, colouridant to subrandred, reaturated, crown 17.5 YR 5/43	د) ()	_
A . 4 . 4 . 4 GROUT BENT /	3 0 4 0 5 5	5-6.554	Sandy Clay (70%) mixed with May eysand (30%), 60-70% sandy Clay 10-15%, Class eysand white (7.5 VR 5%) sandy clay Stand blown (7.5 VR 5%) store and mal (10R 4% store, maist) sand subangular, fine, weth corted	92-50	'2H3
		19-11,5 94	Sandy Elan, 202 Sandy Sine, Low, te Cicile Stranges	<u>C</u> L	11+1ご
		15-14514	Sandy Clau. 30% Sandy N. Sinky White (1048 3/12, maist	22	12+15
		JC -Q1.5 54	Eanburgley, 30% sand, very fine, white (715 VR 500) 10%, strong brown (755 VR 518) 20%, new (JOYR 52 20%, and part reb (715 VR 6, 2) 2000 inclust	ЭL.	7 + 11
		75-71,5 ¹⁴	Detersunden inder 11 St baser		3.3
	 245 -252	:	And Canadian Andrew Canadian Constraints		

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Boring No.	L- 5				
Boring No	6 in	Slot	0.01 in		······
📕 Screen Size_	2 in.	_Mat'l	Sch. 40 PVC	Filter Materials	20-30 Sand
Casing Size	2 in.	Mat'l_	Sch. 40 PVC	Grout Type Sand Cem	ent
_Geologist	J. Steinberg			Protective Casing 6-	in. steel
Date Start 3	21/44 1339	Finish	3/31/24 1550	Static Water Level	
	WAR/WTD			Top of Well Elevation	n 227.53 ms
Driller	P. Wright			Drill Type 6-in. Hol	low Stem Auger

	Sketch	Depth (Feet)	Sample	Lithology	USCS	SPT (BL/FT)
	ſ <u></u> _	+ 2.5	SUR face «	Howersand, 6090 sand, medium to fine, we corted scipangular, wellowish brown (101R 9/3), moist	≤C.	
		e 0	5-126555	Sandy alay, 30-40% sandy aney white LUVE Shi apay with provinish wellow (IVAR 6/6) 1000000 MOIST	e:_	14+15
	6 212 6 212 8 1 0 2 4 2 8 1 0 2 4 2 8 1 0 2 4 2 0 0 0 0 0 0 0 0 0 0 0 0 0	- 3.0 - 4.0 - 5.5	ronne se	Sandy var, 30-40% sant. Sing Whitelic resp. Ore restrice 4133 30%, and reading relicio (7.5 yrb/c) 20%, moist	CL	9+[1
			576,597	sandy alay , 20% sandy angulari fine white (10YR 8/1), maist	21	11+14
	SAND		90-205 \$F	Sand (Slar, 145-50% sand, Schandlar, Sine, vellan (16487) Schandlar, Sine, vellan (16487) Schandlar, Sine, vellan (1648) and white house shi 16%, saturated	21	
			25-76244	Clayersand in 2" ayers with Iand Clay alternate avers, Sund Trates in spean, sange 207 cland, Singe with soft of the Shite Condy Singe with the Shite Condy Singer Shite Condenses Shite C	S.L.	5 LIG
		· 245				
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Boring No. L- 6		Location Coordinates	<u> </u>
Hole Size <u>6 in.</u>	Slot 0.01 in.		
Screen Size 2 in.	Mat'l Sch. 40 PVC	Filter Materials	20-30 Sand
Casing Size 2 in.	Mat'l Sch. 40 PVC	Grout Type Sand Cem	ent
Geologist J. Steinbe	erg	Protective Casing 6-	in. steel
Date Start 213/184 12	y Finish BIRIAN MAD	Static Water Level	
Contractor WAR/WTE	, ,	Top of Well Elevation	237.47 ms
Driller <u>P. Wrigh</u>		Drill Type 6-in. Hol	low Stem Auger

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	Depth	1			SPT
Sketch	(Feet)	Sample	Lithology	USCS	(BL/FT)
	- + 2.5	surface	Sandy e'uy Borz sandy U.Sine) Subrounded, stellewish Drown CIUVR 512 GUYS and denk apary CIUVR 443 4592, maist	<u>.</u>	_
	0	5-4599	Sandy elay, 20% sandy USiney Subanacian unite (UNR 8/15709. MEN (ICR 419) 2057, Nellow (ICNR 70) 1070, moist	CL	(++i)
	- 4 U 5.5	10-11.53+	Sando Chay, 2052 Sando / Sango Subango Latino (Love 21) anth Vellago Strack (10 ve 7/3), moist	<u></u>	10-13
		15- 16,3 \$t	Well Scoted, Subanalian, white Star 21, white period streak 1957 P. S.B. must	26	13+17
		5-27.584	Sandy chart 2020 sandy his ine, worth sont the colored of the which is the rest of the colored inter as the colored of the colored is the assisted of the colored of the colored is the colored		
		95 <u>96</u> 973	Concentration is a second and and a second programmer and a second programmer and a second se		
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- Boring No. LPP-1		Location Coordinates_	
Hole Size 6 in.	Slot 0.01 in.	_	
Screen Size 2 in.	Mat'l Sch. 40 PVC	Filter Materials	20-30 Sand
Casing Size <u>2</u> in.	Mat'l Sch. 40 PVC	Grout Type Sand Ceme	ent
Geologist J. Stei	nberg	Protective Casing	6-in. steel
Date Start ZING/201	nberg <u>///Finish_3/://////////////</u> 00	Static Water Level	
Contractor WAR/WTD		Top of Well Elevation	TOT SATURIES
Driller P. Wrig	ht	Drill Type 6-in. Ho.	llow Stem Auger

TANK N

		Depth				SPT
	Sketch	(Feet)	Sample	Lithology	USCS	(BL/FT)
		+2.5	0-15+	sand, U.F., Subangular 120-30% silt and Clay, USTUS cronnics wet, Ukinnan brown (1048 71)	ઽ૯	NA
		° C	5-6.54+	Ricy, DC, 30%, organics, 5-19% VF scind, Lecturated, U.D. Brown, 110 - R 7(2)	04	WCH*
	GROUTY GROUTY GENT	3.C 4 0	10-11.54	sand, IF, Subangular, 5-1072 Sultander org, Saturation, V. Sk. gray (CVR 311)	SP	11,7
		5.5				
		4 5 - 10, J				
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4						
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Eorina No	LPP-2		
Hole Size	6 in.		0.01 in.
Screen Size	2 in.	Mat'l_	Sch. 40 PVC
Casing Size	2 in.	Mat'l	Sch. 40 PVC
Geologist	J. Steinber	g	
Date Start 2	1-3/24 1-3	Finish_	21- 13 1 - 14
Contractor	WAR/WTD		· /
Driller	P. Wright		

Saft T	
Location Cuordinates	
-	
Filter Materials	20 - 17 Sati 1
Grout Type Sand Ceme	nt
Protective Casing	6-in. steel
Static Water Level	
Top of Well Elevation	rot. 500 11/11
Orill Type 6-in. Hol	low Stem Auger

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	Depth	l			SPT
Sketch	(Feet)	Sample	Lithology	USCS	(BL/FT)
	+2.5	0-162	Sundy VF, Subangulur, 4372 cilt and alwy, Fr. atomics, ct. Brown gray (10 YR 512), Tuet	30	i)ņ
	- o c	<u>+</u> -1,15++	Sample where out of split	-	-
GROUT	3.C 4.0	19.37.55 EF	Char, 19-1592, 11 F gaging, TR. Concerned, contrated, carek 2000 - 2000	C1_	1777
JAND	5.5				
	45				
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		· ·	с - з	•	• · · · · · · · · · · · · · · · · ·

Boring No. LPP- 2 Hole Size 6 in.		Location Coordinates
Hole Size 6 in.	Slot_0.01 in.	
Screen Size 2 in.	Mat'l Sch. 40 PVC	Filter Materials 20-30 Sand
	Mat'l Sch. 40 PVC	Grout Type Sand Cement
Geologist J. Steint	erg	Protective Casing 6-in. steel
Geologist J. Steint	C Finish 2049-0841	Static Water Level
Contractor WAR/WTD		Top of Well Elevation yet survives
Driller P. Wright	:	Drill Type 6-in, Hollow Stem Auger

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	Sketch	Depth (Feet)	Sample	Lithology	USCS	SPT (BL/FT)
- •		+2.5	SUPFace.	time sand, subangular, maist, 5-10% s. tandulay, ant brownish gray (10 VR 2015)	59	
1 77		- o c	E-10ELE	Mayne Land, 90% Bandy VE Land, March 23, brown, Sathorizad	55	5 4 F
	CACUTY CACUTY GENT	- 3.c - 4. o - 5.5	5-9-2 ⁵ 5	Ennow Allow, Some charmines, Norocch most in spiritorshy En 40% Some, Clark Men. May VR Thus, Samerate	0.	5-ių
	sAND					
		-45 -10,2				
6						
- -						
		:			i	
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•				6 – ()		

		SHEET <u>1 05 1</u>
Boring No. LPP- 1-1		Location Coordinates
Hole Size 6 in.	Slot_0.01 in.	
Screen Size 2 in.	Mat'l Sch. 40 PVC	Filter Materials 20-30 Sand
Casing Size 2 in.	Mat'l Sch. 40 PVC	Grout Type <u>Sand Cement</u>
Geologist J. Steint	erg	Protective Casing 6-in. steel
Date Start 2:29/84 09	STEFINISh 3/2-12-05	Static Water Level
Contractor WAR/WTD	· · · · · · · · · · · · · · · · · · ·	Top of Well Elevation Not Surveyed
Driller P. Wright		Drill Type 6-in. Hollow Stem Auger

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	Depth				SPT
Sketch	(Feet)	Sample	Lithology	USCS	(BL/FT)
	+2.5	0-141	Sand, fine to medium, schangolar 2500 5. It and clay, moist, TRI organics, the brownish gray (10) R 6/00	ΞP	NA
	0.0	5-659+	Very Sine sundy 10-15% elay, grayish brewn (254 5/2), Saturateli	SC	1-4
	3.C 4.0 5.5	10-11.34	Fine Eand DO BOR MIN, Clark gray (MYR HI), Eaturated	20	36+13
	-4.5 -10,2				
				1	- -
				•	1
	• • • • • • • • • • • • • • • • • • • •	• 	C-10	•	.

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• •					CHEET		F	
3	Boring No	LPP- E			Location Coordinates			
	Boring No Hole Size	6 in.	_Slot_	0.01 in.				
	Screen Size	2 in.	_Mat'l_	Sch. 40 PVC	Filter Materials	20-3	10 Sand	
	Casing Size	2 in.	Mat'l	Sch. 40 PVC	Grout Type Sand Cem	ient		
-	Geologist	J. Steinber	g		Protective Casing	6-ir	n. stee	i
S	Date Start <u>3</u>	134/40 11.3	Finish	41.5121 1S.	Static Water Level			
• •	Contractor	,			Top of Well Elevation	n <u>r.o</u> T	5:11/12	L. 20
	Driller				Orill Type 6-in. Ho	llow St	em Aug	er

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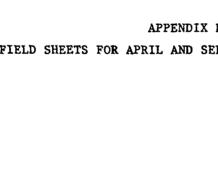
	Sketch	Depth (Feet)	Sample	Lithology	USCS	SPT (BL/FT)
		+2.5	0-151	Sandy fine, subangular, 2502 silt ovid Blay, TR organics, muist, light brownish gray Lily R 4/2)	ξþ	માત
Ð		- º C	5-6.554	Sand, some Clay and organics, Fine, and dar to subang d'an Crown Kione 5/3), saturated	57	4+6
	GROUTY GROUTY BENT.	- 3.C -4 0	10-11.594	Sanow Glaw, 472 very fine sind, 11 Mark Gray (15 yr 3/2), Saturated-	CL	9+14
		5.5				
		- 4.5 - 10, 2				
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L.						
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C-11

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Boring No. L				Location Coordinates			
Hole Size 6	in.	Slot_0.01	in.		·		<u> </u>
Screen Size_2	in.	Mat'l_Sch.	40 PVC	Filter Materials	20-30 Sa	<u>ni</u>	
Casing Size <u>2</u>	in.	Mat'l Sch.	40 PVC	Grout Type Sand Cemer	nt		
Geologist J	. Steinberg			Protective Casing	6-in. st	eel	
Date Start 3				Static Water Level			
Contractor w	7			Top of Well Elevation	105 SW	MUNIC.	
Driller <u>p</u>	. Wright			Drill Type 6-in. Hol		uger	
Driller <u>p</u> Sketch	. Wright Depth (Feet)	Sample			low Stem A	S	РТ , - Т)
	Depth	Sample Southace	darkb	Orill Type 6-in. Hol	low Stem A US	SCS (BL	

Sketch	Depth (Feet)	Sample	Lithology	USCS	SPT (BL, FT)
	+2.5	SUPACE	Charley Sandy, Sine - machum, bream CT.SVR Ely 4692, Oark brean (T.SVR 414) Tomos, 15-2002 Developers	કલ્	
	- ° C	5-10.554	Brown, Fine sandy Early and Fill material ander coprately,	?	Era
NT.	3.0	10-11.59F	Santy Bay 418 Santy Burg	<u>e.</u>	17+15
ND	5.5				
	45				
	1 - - - -				
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APPENDIX D FIELD SHEETS FOR APRIL AND SEPTEMBER 1984 SAMPLING _____



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FIELD SHEETS FOR APRIL 1984 SAMPLING

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MOODY AFB PHASE IIB FIELD SAMPLE SHEET

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S	ample	∙d by:		<u>RD6</u>		5~C	Date:	4/24/84	Time:	1000	
	Ś		omple cklis								
andfill Wells	LPP Wolls	LPP Surface Water	69	rea bles	Potable Wells						
					<u>ا</u>	IN SITU MEASUREM	ENIS				
x	1				X	pH	ance 20	4.3	10	23 3	25
X	1	- F			x	Specific conduct Depth to water s		umho/cm @	5 0	<u>~</u>	~>
X	i.		X X	1	x	Volume of water		· · · · · · · · · · · · · · · · · · ·	18 90	Ι.	
x	: ^ 	× x			· •	Sample depth	pargor prior		<u>i ga</u>		
•	1	X	1			Total water dept	h				
	Н			x		Auger hole depth					
	;			x		Depth to water i	n auger hole_				
	Ì					SAMPLE COLLECTIO	N AND PRESERV	ATTON			
) i					Parameters to be Analyzed		Holding Time (d)	Container No(s)	Sa
Θ) x	: x		x	x	4 oz. plastic	DOC	Filter, HCl, 4°C	28	T2	15
i	1	x	j.		x	40 ml. vials (2)	TOX	4°C	14	X1 x2	
8) x	x	ł	x		4 oz. plastic	COD	H ₂ SO ₄ , 4°C	28	D3	
R R		. x	1	x	1	l qt. glass/Tefl	. 0il&Grease		28	G26	
0	X					l qt. glass/Tefl		H ₂ SO ₄ , 4°C	 28		
		· ^		x*		40 ml. vials (4)	VQA	4°C	14		
0				[^~ 				Filter, HNO3	28 **	M28	
X	א (ג ;	x			X	l qt. glass			·	MAD	·
	•		1	X		l qt. glass	Lead	Filter, HNO3	180	017	
C) 1	: 1			1	l qt. glass/Tefl		4°C	40	<u> </u>	
\Im		:	1		Xt	l qt. glass/Tefl			40	HI	·
1	i		X	1	· [l qt. glass/Tefl	. DOT	4°C	40		- <u></u>
	i		•			MISCELI ANDOUS					
		x	•	X	x		number of pe	ontamination in s rmanent location ion.			
с 	×m+:	TS A	D OBS	EKVATI	ioris	WELL RE	CHARGE	5 SLOWL	CAI	LES OLY	·
-	<u> </u>				- <u></u> .						

a	mpled	by:		RDB	T	SJC Date: <u>4/24/54</u> Time: <u>1/25</u>
	Si	te Cc	mplet	ion		
	1		klist		r1	
		ir fac	Area Lls	Area Hole	ble	
Wells	Wells	LPP Sur Water	DDT Are Wells	POL Area Auger Hol	Potable Wells	
3		3	<u> </u>	™ ₹		IN SITU MEASUREMENTS
Y)	x	x	x	x	x	pH 4.4 Specific conductance 23 untho/cm @ 8 $27 \oplus 25 ° c$
R	X	x	X	х	X	Specific conductance 23 unho/cm (2) 18 27 \odot 25 $^{\circ}$ C Depth to water surface from casing top 7 1/2
(A) (A)	X X		X X		x	Volume of water purged prior to sampling 18 gal
ଞ	^	x				Sample depth
		x				Total water depth
1				X		Auger hole depth Depth to water in auger hole
				X		
1	1					SAMPLE COLLECTION AND PRESERVATION Container Parameters to Preservation Holding Container Sample
						Container Parameters to Preservation Holding Container Sample Description be Analyzed Method Time (d) No(s) No.
\bigotimes	x	x		x	x	4 oz. plastic DOC Filter, HC1, 4°C 28 <u>77</u> <u>15638</u>
20000	x	x			x	40 ml. vials (2) TOX 4°C 14 X3 X4
X	x	x	!	x		4 oz. plastic COD H ₂ SO ₄ , 4°C 28 <u>D18</u>
Š	x	x		x	x	l qt. glass/Tefl. Oil&Grease H ₂ SO ₄ , 4°C 28 <u>G25</u>
	x	x				l qt. glass/Tefl. Phenols H ₂ SO ₄ , 4°C 28
				X*		40 ml. vials (4) VOA 4°C 14
Ø	x	x		[x	l qt. glass Metals (8) Filter, HNO3 28**
-				x		l qt. glass Lead Filter, HNO3 180
Ì	1				x	l qt. glass/Tefl. Pesticides 4°C 40 <u>C3</u>
×)					X	l qt. glass/Tefl. Herbicides HCl, 4°C 40 HQ Ψ
•			х			l qt. glass/Tefl. DOT 4°C 40
	:	1				MISCELLANFOUS
	1	1		x	!	Record observations of fuel contamination in soil.
		X			x	Place and record number of permanent location marker. Describe sampling value location.
				.	· · · · · ·	
œ	MMEN	IS AN	D OBS	ERVATI	IONS	WATER TURBID, MILKY ORANGE, NO ODOR.
	_		- <u></u> .			

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	Si		omple			
Wells	uells	LPP Surface	DDT Area Wells	rea foles	Potable Wells	
30	x	X		x	x	IN SITU MEASUREMENTS pH 5.0
× × × ×	x	x		x	x	Specific conductance 700 unho/cm @ 23.0 728@ 25 .
X	x		x			Depth to water surface from casing top 5 2
(¥	x		X		X	Volume of water purged prior to sampling <u>18 gel</u> . Sample depth
		X X				Total water depth
		л		x		Auger hole depth
	;		1	x		Depth to water in auger hole
	;					SAMPLE COLLECTION AND PRESERVATION
						Container Parameters to Preservation Holding Container Sam
				ļ		Description be Analyzed Method Time (d) No(s) No
\bigotimes	x	X		x	x	4 oz. plastic DOC Filter, HCl, 4°C 28 [54
\bigotimes	x	Х	ļ		X	40 ml. vials (2) TOX 4°C 14 \times 14 \times 14
888	x	X		X		4 oz. plastic COD H_2SO_4 , 4°C 28 D_{11}
\otimes	x	X		x	x	l qt. glass/Tefl. Oil&Grease H ₂ SO ₄ , 4°C 28 <u>G33</u>
	x	X		}		l qt. glass/Tefl. Phenols H ₂ SO ₄ , 4°C 28
				X		40 ml. vials (4) VOA 4°C 14
(X)	x	Х			x	l qt. glass Metals (8) Filter, HNO3 28**
				X		l qt. glass Lead Filter, HNO3 180
\mathbf{x}			i		Xt	l qt. glass/Tefl. Pesticides 4°C 40 <u>C?</u>
(\mathbf{x})			ļ	Ì	Xt	l qt. glass/Tefl. Herbicides HCl, 4°C 40 <u>HG</u> 🖞
			x			l qt. glass/Tefl. DDT 4°C 40
:	i			:		MISCELLANEOUS
		x		X	' x	Record observations of fuel contamination in soil. Place and record number of permanent location marker.
			L	• • • • •	· • •	
				ERVAT C E G		WATER VERY TURBID, RET. ORANGE FOR 95 ga TO MILKY ORANGE, NO GOOR.
	<u>/15_</u>	N		PRED	VEL	TO MICKE OPANICE, NO QUER.

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Se	-			<u>R</u> tion	<u>B /</u>	SJC Date: $4/24/84$ Time: 0905
Wells	LPP Wells	ace	DDT Area Pr Wells Fr	foles	Potable Wells	IN SITU MEASUREMENTS
x (x) (x) x x	X X X X	x	x x x	x	x x x	pH
				x x		Auger hole depth Depth to water in auger hole SAMPLE COLLECTION AND PRESERVATION Container Parameters to Preservation Holding Container Sample Analyzed Method Time (d) No(s)
<u></u> ଅ ୍	x	x x x		x x	x	4 oz. plastic DOC Filter, HC1, 4°C 28 $T20, 19$ 15640 40 ml. vials (2) TOX 4°C $X 3 - 16 14$ $X 1, X 2$ 14 4 oz. plastic COD H ₂ SO ₄ , 4°C 28 $D8, 13$ 14
X	y x x	x x		x x		1 qt. glass/Tefl. 0il&Grease H_2SO_4 , 4°C28 $G 27, 31$ 1 qt. glass/Tefl. Phenols H_2SO_4 , 4°C2840 ml. vials (4)VOA4°C
8	х	x		x		1 qt. glass Metals (8) Filter, HNO3 M 18 28** <u>M10,15</u> 1 qt. glass Lead Filter, HNO3 180
× ×			x			1 qt. glass/Tefl. Pesticides 4°C C/4 40 <u>C6,8,2</u> 1 qt. glass/Tefl. Herbicides HCl, 4°C 40 <u>H5,8,11</u> 1 qt. glass/Tefl. DDT 4°C 40
		x		x	x	MISCELLANEOUS Record observations of fuel contamination in soil. Place and record number of permanent location marker. Describe sampling value location.
α	OMEN	its an	D OBS	SERVAT	IONS_	CUNDITIONS JAME AS L-25

						scr i	ption	·· <u> </u>					
	Sæ	nple	d by	·:			<u> </u>	<u></u>	Date:		Time:		
		S		Compl <u>ieckl</u> i		on							
			face		1	Holes	e						
<u>Ifil</u>	si lom	lls	JZ.	DDT Area	POI. Area	er H	Potable Wells						
l anc	3	Ne.	ILPP Sun	DDT		Auger	9 9 3	IN SITU MEASURE	MENTS				
}	x	x	÷,	x :	x		x	pH	11110				
:	∧ X ∘	x			x	x	x	Specific conduc	tance	umho/cm @			°C
ł	Xi	x	;		x					casing top			
	X	x		ļ	x		x		purged prior	to sampling			
;	I			x				Sample depth					
			1	X				Auger hole dept					
						X X		Depth to water					
			:			л	· · ·	-			/		
•			•					SAMPLE COLLECTI Container	Parameters t		Holding	Container	Sample
ļ	Ì		į					Description	be Analyzed	Method	Time (d)	No(s)_	No.
	X	х		x		х	x	4 oz. plastic	DOC	Filter, HCl, 4°C	28	T19	156
‡	X	x	1	x			x	40 ml. vials (2) TOX	4°C	14	X13 X14	
	x	х	1	x		х		4 oz. plastic	COD	H ₂ SO ₄ , 4°C	28	D13	
	x	x		x		x	x	l qt. glass/Tef	1. 0il&Grease		28	G31	
		x	1	x				l qt. glass/Tef			28	HES.	
	i					X*		40 ml. vials (4			14		
	x	х		x			x	l qt. glass) Filter, HNO3	28**	M15	
						x		l qt. glass	Lead	Filter, HNO3	180		
	x		ł	ļ			XI				40	<u>C8</u>	
:	i						X				40	H8	$\overline{\mathbf{v}}$
	; 1		•		x			l qt. glass/Tef		4°C	40		
			1		1			MISCELLANEOUS					
				ŧ		x				contamination in s			
			-	X			x	Place and recor Describe sampli		ermanent location	marker.		
	â	ME	TS /	720 OF	SER	VATI		15671-	Herbicid	(H8) VOL	879	5 mL	
								SPIKED	WITH 1 m	<u>L ÒF S132-</u>	D (2	<u>05-7)</u>	
	_							15671-P	esticide	(C8) VOL		thin)	

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and the second
ampling Sin ample Local	te/Well No tion Descr	-		Q.(<u> </u>			
Sampled by:			I	Date:		Time:		
	mpletion							
Chee 1 3	cklist							
r s		ble						
LPP Wells LPP Sur Water	DDT Area Wells POL Are Auger Ho	Pot able Wells						
			IN SITU MEASUREMENTS	3				
x x	x x		pH					°C
X X		x	Specific conductance Depth to water surfa					
X	X	x	Volume of water purg					
x					· · · · · · · · · · · · · · · · · · ·			
x	Í		Total water depth					
	x		Auger hole depth					
	x		Depth to water in a	iger hole			<u> </u>	·
			SAMPLE COLLECTION AN	D PRESERVA	TION			
				meters to Analyzed	Preservation <u>Method</u>	Holding Time (d)	Container No(s)	SampleNo
x x	x	x	4 oz. plastic	DOC	Filter, HCl, 4°C	28		<u>15675</u>
x x		x	40 ml. vials (2)	TOX	4°C	14	<u>X15 X16</u>	
x x	x		4 oz. plastic	CUD	H ₂ SO ₄ , 4°C	28		
x x	x	x	l qt. glass/Tefl. Of	1&Grease	H ₂ SO ₄ , 4°C	28		
x x			l qt. glass/Tefl. 1	Thenols	H ₂ SO ₄ , 4°C	28		
	x	*	40 ml. vials (4)	VQA	4°C	14		
x x			l qt. glass	Aetals (8)	Filter, HNO3	28**	MIS	
	x		l qt. glass	Lead	Filter, HNO3	180		
c l		x	l qt. glass/Tefl. Pe	esticides	4°C>	40	<u>C2, H11</u>	1.
			l qt. glass/Tefl. He		HC1, 4°C →	40	CTY /	15679
	x		l qt. glass/Tefl.	DDT	4°C	40		
	1 1 1	;	MI SCELL ANEOUS					
1	x	-	Record observations	of fuel co	ntamination in s	oil.		
x x			Place and record nur	nber of per	manent location			
1 ; 		X	Describe sampling va	ilue locati	.on.			
OMENIS AN	D OBSERVAT	nous_	15679 - V				·····	
				and the second se	<u>5053-D2</u>	(TOXA	FHENE)	
			15675 - VOI SPIKED WIT			JED ME	TAL SOLA	,
			15675 - VOL				<u> </u>	<u> </u>

	mple :	Locat	ion D	escri	ption	: STTE L, SU LANDFILL -	
Sa	mpled	by:	£	05	/3	Date: <u>4/24/64</u> Time: <u>08</u>	30
	Si		mplet				
	T	ace	klist	S			
Lardfill Wrlls	ľ	.	Area Is	Area r Hole	Potable Wells		
unlls Wulls	LPP Wells	ЧЧ. РМ	DIJT Are Wells	POL			
<u> </u>	•					IN SITU MEASUREMENTS pH 4,8	
× ×	X :	X X	X X	X X	X X		39 @ 25 °C
\mathbf{x}	x x	X	X	X		Depth to water surface from casing top $9'2''$	
XX	x		X		x	Volume of water purged prior to sampling 17 gal.	
	•	x				Sample depth	
	Ì	х				Total water depth	
:	1			X		Auger hole depth Depth to water in auger hole	<u> </u>
	:			Х			
						SAMPLE COLLECTION AND PRESERVATION	
						Container Parameters to Preservation Holding Conta Description be Analyzed Method Time (d) No(
X	x	x		X	x	4 oz. plastic DOC Filter, HCl, 4°C 28 TZ	
$\overline{\mathscr{S}}$	x	x		~•	x	40 ml. vials (2) TOX 4°C 14 $\chi 7.\chi$	
Ø	x	x	Ĩ	х		4 oz. plastic COD H_2SO_4 , 4°C 28 <u>D 21</u>	
Ø	x	x	ļ	x	x	l qt. glass/Tefl. Oil&Grease H_2SO_4 , 4°C 28 GZ	8
	x	x		- •		l qt. glass/Tefl. Phenols H_2SO_4 , 4°C 28	
				Х*		40 ml. vials (4) VOA 4°C 14	
Ø	x	x				l qt. glass Metals (8) Filter, HNO3 28** ///	9
		-		х		l qt. glass Lead Filter, HNO3 180	···
X		1		~	X+	l qt. glass/Tefl. Pesticides 4°C 40 C7	2
\otimes	ļ					l qt. glass/Tefl. Herbicides HCl, 4° C 40 H	<u>, −−</u>
		İ	x			l qt. glass/Tefl. DDT 4°C 40	······
• '	ł	i	•		;		<u> </u>
	1				l	MISCELLANDOUS	
•				Х		Record observations of fuel contamination in soil.	
		X '				Place and record number of permanent location marker.	

MOODY AFB PHASE IIB FIELD SAMPLE SHEET

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Se				ER			T <u>LL IN (</u> SJC	<u>EFJIC OF</u> Date: <u>4</u>	RUAL (+/2+/54	Time:	0800	
	S			mplet								
-1			nec	klis	les							
S	s	Surface	er	Area 11s	POL Area Auger Holes	ah le Is						
Well	LPP Well	ILPP Sur	Water	DMT Are Wells	POL	Pot able Wells						
+		+				4	IN SITU MEASUREM	ETTS 2				
Ø	X		X	X	X	1 1	pH	ance 80	unito/cm @ /	8	C , 2	°C
x X	X X		x	X X	Х	X	Depth to water s			5'9310		
ע x	x	1		X		x	Volume of water		to sampling 2	O gal.	·	
			x				Sample depth		N/A			
			x				Total water dept					
ļ		i			х		Auger hole depth Depth to water i			<u> </u>		
		i			X		Depth to water in	n auger nore_				
		İ	ĺ			i	SAMPLE COLLECTIO					
							Container Description	Parameters to be Analyzed	o Preservation Method	Holding Time (d)	Container No(s)	Sampl No.
0	v		v		x	x	4 oz. plastic	DCC	Filter, HCl, 4°		T10	1560
とう	x x	i .	x x		~	x	40 ml. vials (2)	TOX	4°C	14	X9 X10	<u>10 00</u>
2	x	i	x		x		4 oz. plastic	000	H ₂ SO ₄ , 4°C	28	h7	
X) X X X) X		x		x	1				28	<u> </u>	
Ŷ	/ ^ X	1	x		^		l qt. glass/Tefl		H ₂ SO ₄ , 4°C	28		
	~				x		40 ml. vials (4)	VOA	4°C	14		+
îx)	x		x		~	x	l qt. glass) Filter, HNO3	28**	M20	
2	~ ^				x		l qt. glass	Lead	Filter, HD3	180		
- -	`	1			~	Xt			4°C	40	<u> </u>	;
	,		İ				l qt. glass/Tefl			40 40	<u> </u>	
ソ		Ì		х			l qt. glass/Tell		nci, 4 c 4°C	40 40		Y
1		1	1	^			i dr. glass/leri		4 0	40		
		-	;				MISCELLANEOUS					
					х		Record observation Place and record					
:			X			x	r,					
$\hat{\alpha}$	MAN	203) OESI	FRUAT		HILTER TILL	PRICHT	IKY CTUK	NA O	LAR	
_		••••	1.				WATER TILL	<u>, , , , , , , , , , , , , , , , , , , </u>	CICI PLINE	, 110 0		
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Site Completion Checklist (4/24/34) $(630)Checklist(4/24/34)$ $(630)Checklist(4/24/34)$ $(630)Checklist(4/24/34)$ $(630)(754)$ $(9)(754)$ $(9)(754)$ $(9)(9)(9)(754)$ (9)	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	
x 6 xxxxSpecific conductance $16.2.0$ unbolom 4 21 1754.43 xxxxxDepth to water surface from casing top $3'.6.34''$ $3'.4''$ $3'.4''$ xxxxxxVolume of water purged prior to samplingxxxxxVolume of water purged prior to samplingxxxxxVolume of water depthxxxxAuger hole depthxxxDepth to water in auger holeSAMPLE COLLECTION AND PRESERVATIONContainerParameters toDescriptionbe AnalyzedMethodTime (d)No(s)xxx <th></th>	
X	
XXXXXVolume of water purged prior to samplingXXXSample depthXXXSample depthTotal water depthAuger hole depthXXDepth to water in auger holeXXX<	<u>20 °C</u>
XXXSample depth Total water depth Auger hole depth Depth to water in auger holeXXX <t< td=""><td>ON 4/2:</td></t<>	ON 4/2:
XXTotal water depth Auger hole depth Depth to water in auger holeXXXXDepth to water in auger holeSAMPLE COLLECTION AND PRESERVATION Container Description XContainer Parameters to Preservation MethodXX	
XDepth to water in auger holeX X X SAMPLE COLLECTION AND PRESERVATIONContainerParameters toPreservationHoldingDescriptionbe AnalyzedMethodTime (d)No(s)XXX4 oz. plasticDOCFilter, HC1, 4°CXXX40 ml. vials (2)TOX4°C40 ml. vials (2)TOXXXX4 oz. plasticCODH2SO4, 4°CXXX1 qt. glass/Tefl. Oil&OreaseH2SO4, 4°C28DioXXX1 qt. glass/Tefl. PhenolsH2SO4, 4°C14XXX1 qt. glass glasticXXX1 qt. glass glasticX1 qt. glass glasticX1 qt. glass glasticX1 qt. glass glasticX1 qt. glass flasticX1	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	
XXXXXA oz. plasticDocFilter, HCl, 4°CContainer Time (d)Container No(s)XXXX4 oz. plasticDOCFilter, HCl, 4°C28 $T15$ XXXX4 oz. plasticDOCFilter, HCl, 4°C28 $T15$ XXXX4 oz. plasticCODH2SO4, 4°C28 $D10$ XXXX1 qt. glass/Tefl.Oil&GreaseH2SO4, 4°C28 $D10$ XXX1 qt. glass/Tefl.Pilter, H2SO4, 4°C28 $P7$ XXX1 qt. glass/Tefl.PhenolsH2SO4, 4°C28 $P7$ XXX1 qt. glass plasticMetals (8)Filter, H2O328** $M55$ XXX1 qt. glass plasticLeadFilter, H2O3180XX1 qt. glass/Tefl.Pesticides4°C40	
XXXXXA oz. plasticDOCFilter, HC1, 4°CZ8T15XXX4 oz. plasticDOCFilter, HC1, 4°C28T15XXX4 0 ml. vials (2)TOX4°C14X17, X18XXX4 oz. plasticCODH2SO4, 4°C28D10XXXX1 qt. glass/Tefl. OilbGreaseH2SO4, 4°C28G30XXX1 qt. glass/Tefl. PhenolsH2SO4, 4°C28P7XXX1 qt. glass/Tefl. PhenolsH2SO4, 4°C14XXX1 qt. glass/Tefl. PhenolsH2SO4, 4°C14XXX1 qt. glass/Tefl. PhenolsH2SO4, 4°C14XXX1 qt. glass/Tefl. PhenolsH2SO3, 4°C28XXX1 qt. glass/Tefl. PhenolsH2SO4, 4°C14XXX1 qt. glass/Tefl. PhenolsH2SO3, 4°C14XXX1 qt. glass/Tefl. PhenolsH2SO328**XXX1 qt. glass/Tefl. Phenols180180XX1 qt. glass/Tefl. Pesticides4°C40	
XXXX4 oz. plasticDOCFilter, HCl, 4°C28 $\overline{T15}$ XXXX40 ml. vials (2)TOX4°C14 $\overline{X17}$, $\overline{X18}$ XXX4 oz. plasticCODH ₂ SO ₄ , 4°C28 $\underline{D10}$ XXXX1 qt. glass/Tefl. Oil&GreaseH ₂ SO ₄ , 4°C28 $\underline{G30}$ XXX1 qt. glass/Tefl. PhenolsH ₂ SO ₄ , 4°C28 $\underline{P7}$ XXX1 qt. glass/Tefl. PhenolsH ₂ SO ₄ , 4°C28 $\underline{P7}$ XXX1 qt. glass/Tefl. PhenolsH ₂ SO ₄ , 4°C14 $\underline{N55}$ XXX1 qt. glass/Tefl. PhenolsH ₂ SO ₄ , 4°C14 $\underline{N55}$ XXX1 qt. glass plusticMetals (8) Filter, HNO328** $\underline{M55}$ XX1 qt. glass plusticLeadFilter, HNO3180XX1 qt. glass/Tefl. Pesticides4°C40	Sample No.
xxxx40 ml. vials (2)TOX4°C14 $X 17, X18$ xxxx4 oz. plasticCODH ₂ SO ₄ , 4°C28D1Oxxxx1 qt. glass/Tefl. Oil&GreaseH ₂ SO ₄ , 4°C28G3Oxxx1 qt. glass/Tefl. PhenolsH ₂ SO ₄ , 4°C28 $P7$ xxx1 qt. glass/Tefl. PhenolsH ₂ SO ₄ , 4°C28 $P7$ xxx1 qt. glass/Tefl. PhenolsH ₂ SO ₄ , 4°C14 $M5$ xxx1 qt. glass/Tefl. PhenolsH ₂ SO ₄ , 4°C14xxx1 qt. glass/Tefl. PhenolsH ₂ SO ₄ , 4°C14xxx1 qt. glass/Tefl. PhenolsH ₂ SO ₄ , 4°C14xxx1 qt. glass phase phaseMtals (8) Filter, HNO3180xxx1 qt. glass/Tefl. Pesticides4°C40	15643
xxx4 oz. plastic COD H_2SO_4 , 4°C28 $D \downarrow O$ xxxx1 qt. glass/Tefl. Oil&Grease H_2SO_4 , 4°C28 $D \downarrow O$ xxx1 qt. glass/Tefl. Phenols H_2SO_4 , 4°C28 $P \neq Z$ xxx40 ml. vials (4)VOA4°C14xxxxglass glass glasseM for a f	1
xxx1 qt. glass/Tefl. Oil&Grease H_2SO_4 , 4°C28G30xxx1 qt. glass/Tefl. Phenols H_2SO_4 , 4°C28 $P\vec{7}$ xxx40 ml. vials (4)VOA4°C14xxxx1 qt. glass plustic Metals (8) Filter, HiO_3 28** $M5$ xx1 qt. glass plustic LeadFilter, HiO_3 180xx1 qt. glass/Tefl. Pesticides 4°C40	
XX1 qt. glass/Tefl. Phenols H_2SO_4 , 4°C28 $P\vec{7}$ XX40 ml. vials (4)VOA4°C14XXI qt. glass puster Metals (8) Filter, BD328** $M5$ XI qt. glass plastic LeadFilter, BD3180XI qt. glass/Tefl. Pesticides4°C40	
XX*40 ml. vials (4)VOA4°C14XXI qt. glass pluster Metals (8) Filter, H203 $28**$ M5XI qt. glass pluster LeadFilter, H203180XI qt. glass/Tefl. Pesticides4°C40	
X l gt. glass flastic Lead Filter, HNO3 180 X l qt. glass/Tefl. Pesticides 40	
X l gt. glass flastic Lead Filter, HNO3 180 X l qt. glass/Tefl. Pesticides 40	
Xt l qt. glass/Tefl. Herbicides HCl, 4°C 40	
X l qt. glass/Tefl. DDT 4°C 40	
MISCELLANEOUS	
X Record observations of fuel contamination in soil.	
χ Place and record number of permanent location marker. χ Describe sampling value location.	
COMMENTS AND OBSERVATIONS Well receivers slowly	

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MOODY AFB PHASE II	B FIELD	SAMPLE	SHEET
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S	ampl	ed b	y: _	RL) <i>6 f</i>	WG	T/SJC Date: $4/23/84$ Time: $1205-1710$
				mple			
	1	ace	nec	klis	S		
v		Surf	er	Area Is	Area r Hole	Potable Wells	
4	dan	WELLS LPP Surf	Water	DIJT Area Wells	POL /	Pot ab Wells	
		<u> </u>	-+				IN SITU MEASUREMENTS
X	1 ~	4	X X	X X	X X	X X	pH 6.0 Specific conductance 1220 unho/cm @ 18.5 $1393 = 25 \cdot C$
X X	5			x			Depth to water surface from casing top 3 1"
x				x		x	Volume of water purged prior to sampling ~12 gallens har 445.
			x				Sample depth
			x				Total water depth
					X		Auger hole depth Depth to water in auger hole
	*	J			X		
							SAMPLE COLLECTION AND PRESERVATION
							ContainerParameters toPreservationHoldingContainerSampleDescriptionbe AnalyzedMethodTime (d)No(s)No.
x	10	ĸ	x		x	x	4 oz. plastic DOC Filter, HCl, 4°C 28 T-21 15644
х	· ·		x			x	40 ml. vials (2) TOX 4°C 14 $\times -23, \times -24$
Х			x		x		4 oz. plastic 000 H ₂ SO ₄ , 4°C 28 D-14
х		Ĩ	x		x	x	l qt. glass/Tefl. 0il&Grease H ₂ SO ₄ , 4°C 28 G-17
	6	Ŕ	x				l qt. glass/Tefl. Phenols H ₂ SO ₄ , 4°C 28 P-2
		1			۲	-	40 ml. vials (4) VOA 4°C 14
Х	6	<u>k</u>	x			x	l qt. glass pluster Metals (8) Filter, HNO3 28** M-36
		1			х		l qt. glass plustic Lead Filter, HNO3 180
х			ĺ			x	l qt. glass/Tefl. Pesticides 4°C 40
	1					1	l qt. glass/Tefl. Herbicides HCl, 4°C 40
				х			l qt. glass/Tefl. DDT 4°C 40
	[1						
					v		MISCELLANEOUS Record observations of fuel contamination in soil.
	•	;	x		Х	-	Place and record number of permanent location marker.
						x	Describe sampling value location.
(XME	NIS	AND	OBS	ERVAT	IONS	Very strong sulfide alex in conter-, take grave inter
_							k_{h} in 2β in h_{h}

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S	ample	l by:		205	75	SJC	Date:	4/24/84	Time:	1635	
	Si		mple					,			
	_	Che g	klis	les							
s III	s	Surfa Iter	Vrea Is	Area r Ho	Potable Wells						
Wells	LPP Wells	PP S Wat	DDT A Well	POL	Potab Wells						
						IN SITU MEASURE pH 4.7	MENTS				
X	(X)	X X	X X	X X	X	specific conduc	tance 72 c	umbo/am @ 20		243 @ 2	25 °c
X X	X	^	X			Depth to water				1414	
Х	-		Х		x	Volume of water	purged prior	to sampling		/	
		х				Sample depth					
		Х		x		Total water dep Auger hole dept					
				X		Depth to water					
					 	SAMPLE COLLECTI	ON AND PRESER	VATTON			
						Container	Parameters t		Holding	Container	Sample
	~					Description	be Analyzed	Method	Time (d)	$N_0(s)$	<u>No.</u>
x	\otimes	х		x	x	4 oz. plastic	DOC	Filter, HCl, 4°C	28	TII	1564
x	\otimes	x			x	40 ml. vials (2) TOX	4°C	14	<u>X21,22</u>	
x	Ø	x		X		4 oz. plastic	COD	H ₂ SO ₄ , 4°C	28	<u> </u>	
x	Q	x		Х	X	l qt. glass/Tef		- ,	28	G3Z	
	(\mathbf{y})	х				l qt. glass/Tef		H ₂ SO ₄ , 4°C	28	<u> </u>	
				X*	1 1	40 ml. vials (4		4°C	14		
x	Y	x		.,	X	l qt. glas s plass) Filter, HNO3 Filter, HNO3	28** 180	_ <u>M2</u>	¥
v	1	1		X		l qt. glas s ومانه l qt. glass/Tef		• 5	40		
X	1				1 1	l qt. glass/lef			40 40	·	<u></u>
ĺ		1	x			l qt. glass/Tef		4°C	40		
!			Λ				., .,		70		
					ı İ	MISCELLANEOUS Record observat	ions of fuel	contamination in s	ail		
		X)		х	: 1 . ·	Place and recor	d number of p	ermanent location			
	i		• •	.	X	Describe sampli	ng valw e loca	tion.			
a	(ME)	s at	0.085	RVAT	[045_	Well recov	ens very	slening ();	uhrs		
							<u> </u>	· ·			

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				Descri			•
Sa	mpled	l by:	_ <u>_</u> R	<u>DF</u> [W	<u>GT/SIC</u> Date: <u>4/23/84</u> Time: <u>1320</u>	ــــــ ا بر
	Si		omple				
		ace	cklis	es			č
ls	LPP Wells	P Surf Water	DT Area Wells	POL Area Auger Holo	Potable Wells		
Wells	LPP Wel	uz Mz	DOT	POL	Po B	IN SITU MEASUREMENTS	F.
x	Î	x	x	x	x	pH 4.9	
x	(\mathbf{x})	X	{	x	x	Specific conductance 199 unho/cm @ 185 227 @ 25°C	•
x	x)x)x)	,	x			Depth to water surface from casing top 3102	У.
x	X		x	ļ	x	Volume of water purged prior to sampling <u>8 guillos 125 well volumes</u>) Sample depth	
		X				Total water depth	
		Х		x		Auger hole depth	
				x		Depth to water in auger hole	
						SAMPLE COLLECTION AND PRESERVATION	٠.
					-	Container Parameters to Preservation Holding Container Sample	
						Description be Analyzed Method Time (d) No(s) No.	
х	X	/ X		x	x	4 oz. plastic DOC Filter, HCl, 4°C 28 <u>T-28</u> 15646	
x	(X) X	х		ļ	x	40 ml. vials (2) TOX 4°C 14 $\frac{x-25, x-26}{x-26}$	
х		х		x		4 oz. plastic COD H ₂ SO ₄ , 4°C 28 <u>0-2</u> C	
x	X	x	1	x	Х	1 qt. glass/Tefl. Oil&Grease H ₂ SO ₄ , 4°C 28 <u>G-G</u>	-
	X	x		ļ		1 qt. glass/Tefl. Phenols H ₂ SO ₄ , 4°C 28 <u>β-3</u>	1
				X*		40 ml. vials (4) VOA 4°C 14	
x	X	X			x	l qt. glass plantic Metals (8) Filter, HNO3 28** M-13	•, •
				x		l qt. glass rinche Lead Filter, HNO3 180	
Х					X1	l qt. glass/Tefl. Pesticides 4°C 40	-
					Xt	l qt. glass/Tefl. Herbicides HCl, 4°C 40	
1			x			1 qt. glass/Tefl. DDT 4°C 40	•
			*	1	'	MISCELLANFOUS	
ļ	÷			x		Record observations of fuel contamination in soil.	نا
		x				Place and record number of permanent location marker. Describe sampling value location.	<u>.</u> .
			L		X		
C	(MAEN)	rs an				Water will very tracked in her sumpled there here	
-	.	<u> </u>	<u> </u>	<u></u>		en well remark youth (4 10 min)	
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S	ample	d by:	Rr	Rn	, 6 T	1330	Date:	4/24/84	Time:	1700	
	S		omple								
		Che l v l v l v l v l v l v l v l v l v l v	cklis 	es							
fill Is	s	P Surfé Water	Area	POL Area Auger Hol	Potable Wells						
Wells	LPP Wells	LPP .	DDT Are Wells	POL Augei	Pot Wel						
		F	+			IN SITU MEASUREME pH 5. S	NIS				
x x	X) X	X X		X X	X X	Specific conducta	nce 850	untho/an @ 2	υ	940 0	25 °C
X	X)	x			Depth to water su		asing top	q' 1 3/4	/4/10	1/2'
x	$\begin{vmatrix} \mathbf{\hat{x}} \\ \mathbf{x} \end{vmatrix}$]	x		x	Volume of water p	urged prior	to sampling			
		x				Sample depth					<u>. </u>
		X		x		Total water depth Auger hole depth					
1 				x		Depth to water in	auger hole				
						SAMPLE COLLECTION	ANT DEFET	ATTON			
				1			arameters to		Holding	Container	Sample
							be Analyzed	Method	Time (d)	No(s)	No.
x	X	x		x	X	4 oz. plastic	DOC	Filter, HCl, 4°	C 28	T25	<u>1564</u>
x	X	x			x	40 ml. vials (2)	TOX	4°C	14	<u>X19,X2D</u>	
x	X	x		X		4 oz. plastic	COD	H ₂ SO ₄ , 4°C	28	016	
x	^ -			x	X	l qt. glass/Tefl.	Oil&Grease	H ₂ SO ₄ , 4°C	28	<u>G7</u>	
	X	Þ x				l qt. glass/Tefl.	Phenols	H ₂ SO ₄ , 4°C	28	PI2	
				X*		40 ml. vials (4)	VOA	4°C	14		
X	X	þ x			X	1 qt. glass plushe	Metals (8)	-	28**	M3	<u> </u>
		1		x		l qt. glass plastic		Filter, HNO3	180		
x					X			4°C	40	<u> </u>	
					X	1 13			40		
			X			l qt. glass/Tefl.	DDT	4°C	40		
			1	;	1 1	MISCELLANEOUS					
. •		:	1	x		Record observation					
		X			x	Place and record Describe sampling			n marker.		
L		TC AL	+	•	·	•					
U	OTTA	15 M	0 065	ERVAL.		Well recove	N. very	stanly 13	244151		
		• • • • • • •	• • • •								

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Sa	mpled si		<u>KL</u>		/ WC	ST/SJC_	Date:	1/23/84	_ Time: .	1225 - 1	<u>310</u>
		Che	klis	t	·····						
Wells	LPP Wells	LPP Surface Water	DDT Area Wells	POL Area Auger Holes	Potable Wells	IN SITU MEASUREME	2415				
<	(x)	X	х	x	x	рн 6.	<u> </u>		; <i>C</i>	11169 (5)	25
K	X	Х	Х	X	X	Specific conducta Depth to water su			<u> </u>	1468 3	
K K	(X)		X X		x	-		to sampling ~ 9		e 175 well	V.C
^	\mathcal{O}	х	^			Sample depth	0- -	· · · · · · · · · · · · · · · · · · ·			
		x	l]		Total water depth	l			·····	
ļ				x		Auger hole depth				······································	
1	ł			x		Depth to water in	auger hole_	· - <u></u>			
						SAMPLE COLLECTION	AND PRESERV	ATION			
ĺ							arameters to be Analyzed		Holding Time (d)	Container No(s)	Sample No.
x	\bigotimes	х		x	x	4 oz. plastic	DOC	Filter, HCl, 4°C	28	TG	15648
x	(X)	x			x	40 ml. vials (2)	TOX	4°C	14	X27 28	
x	8	x		x		4 oz. plastic	COD	H ₂ SO ₄ , 4°C	28	D2.	
x	8	x		x		l qt. glass/Tefl.			28	G18	
	8	x				l qt. glass/Tefl.		H ₂ SO ₄ , 4°C	28	DG	
		~		x	*	40 ml. vials (4)	VQA	4°C	14	<u></u>	
x	\mathbf{x}	х			(X	1 gt. glass plash			28**	M27	
γ	9	~		x		1 qt. glass plushe		Filter, HNO3	180		
x	1					l qt. glass/Tefl.		4°C	40	·	
i.	1	:			1	l qt. glass/Tefl.			40		·····
			x			l qt. glass/Tefl.		4°C	40		<u> </u>
						I qui glass/lelli	001	40			<u>-</u>
				•	:	MISCELLANEOUS					
	1			X				ontamination in so rmanent location m			
÷		х		;	X	Describe sampling			m ket i		
<u>~</u>		×		•		Maren shirt .	L .	but when		1. 1	
~					26641		E I CI MAIL)	a tan tra	<u>, , , , , , , , , , , , , , , , , , , </u>	- Gray
		· · · · · · · · · · · · · · · · · · ·		¥			<u> </u>				

MCCTY	AFB	PHASE	IIB	FIELD	SAMPLE	SHEET	

~		<u>_</u> 1				<u>Surfaces</u>	_P1-2			Ful Pane	
Sampl	eđ	pà:	<u>K</u>	<u>(D 5</u>	<u>7 </u>	JC	Date:	4/23/84	Time:	1495	
			mple								
- T			<u>klis</u>	i sa							
S	LS Surface	5	Area .ls	POL Area Auger Hole	Potable Wells						
Wells LPP	Wells		DDT Are Wells	POL	Pot ; We []						
		<u> </u>		2		IN SITU MEASURE	ENTS				
x z	x	\mathbf{x}	Х	x	x	pH 3	5.5				
x i	x	$\langle \hat{\mathbf{x}} \rangle$. X	x	x	Specific conduct		umho/cm @	21 N/1	23 0 ;	<u> 25 ° c</u>
	X		Х			Depth to water		· · · · · · · · · · · · · · · · · · ·	<u>~~/ K</u> 11	7.	
X I	x	ا تیر	Х		X	Volume of water Sample depth	SURFA			<u>^ </u>	••••••
		(\mathbf{x})				Total water dep		S FT.			
		G		x		Auger hole dept					
				x		Depth to water	in auger hole				
	:					SAMPLE COLLECTIO	NI AND DDECED	57ATTON			
						Container	Parameters t		Holding	Container	Sampl
		ĺ				Description	be Analyzed		Time (d)		No.
x	x	$\overline{\mathbf{x}}$		x	x	4 oz. plastic	DOC	Filter, HCl, 4°(28	T9.23	1564
	x	ă			x	40 ml. vials (2) TOX	4°C	14	₩ X6364*	
	x			x		4 oz. plastic	COD	H ₂ SO ₄ , 4°C	28	N4 19	
	1	Å		x	1	l qt. glass/Tef		- ·	28	<u>G16.19</u>	
	X	g		^	^				28	010,11	
	x	Y				l qt. glass/Tef		H ₂ SO ₄ , 4°C		<u>PII, J0, 6</u>	
				X		40 ml. vials (4		4°C	14	<u> </u>	
X	x	(\mathbf{X})			x	1 qt. glass plust		_	28**	<u>M39,41,38</u>	<u> </u>
				X		l qt. glass pluc	nt Lead	Filter, HNO3	180		
x					Xt	l qt. glass/Tef	l. Pesticides	4°C	40		
					X	l qt. glass/Tef	l. Herbicides	HC1, 4°C	40		
1			х			l qt. glass/Tef	L. DOT	4°C	40		
!				1		MISCELLANEOUS					
1	i			х			ions of fuel	contamination in :	soil.		
:	t	(x)		Λ		Place and record	l number of p	ermanent location			
	Ĺ	\square		•	X	Describe sampli	ng valve loca	tion.			
OM	NIS	ANT:	OPS	ERVAT	IOIS	UNER HI	SHLY CE	CLORED LI	LY PA	DS ALGA	E .
Th		<u> </u>	۔ بار	EN:		JCK-UB EJ.	HES R	Mariace 5	4	pinice 1 n.	CE FK.
	 				· 	<u> </u>	- finter	d ben Gil	<u>) - 1931</u>	ikes Ne	l

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						Date: Time:	
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	Si		omple cklis				•
T		face	e	es l	e		
	l Is	P Sur Water	DDT Area Wells	POL Area	Potable Wells		-
	LPP Wells	ц Ц	DDT B	Aug. P	0 3	IN SITU MEASUREMENTS	2
$\frac{1}{1}$	x	x	x	x	x	pH	_
	X	X	x		x	Specific conductance unho/cm @°C	
ļ	x		x			Depth to water surface from casing top	• •.
	х		x		x	Volume of water purged prior to sampling	
		x	1			Sample depth	- :
		Х		x		Total water depthAuger hole depth	•
				X		Depth to water in auger hole	-
*						SAMPLE COLLECTION AND PRESERVATION	•.
1			1	l		Container Parameters to Preservation Holding Container Sample	
						Description be Analyzed Method Time (d) No(s) No.	-
	x	x		x	x	4 oz. plastic DOC Filter, HCl, 4°C 28 <u>T23</u> <u>15672</u>	ंगं
	x	X			x	40 ml. vials (2) TOX 4°C 14 X65 X66	
	x	X		x		4 oz. plastic COD H ₂ SO ₄ , 4°C 28 <u>D19</u>	
	x	X		x	x	l qt. glass/Tefl. Oil&Grease H ₂ SO ₄ , 4°C 28 <u>G19</u>	
	x	x		ļ		l qt. glass/Tefl. Phenols H ₂ SO ₄ , 4°C 28 <u>P10</u>	13
ł			}	x*	-	40 ml. vials (4) VOA 4°C 14	
	х	x			x	l qt. glass Metals (8) Filter, HNO3 28** M41 V	
1			1	x		l qt. glass Lead Filter, HNO3 180	
	ļ		1		Xt	l qt. glass/Tefl. Pesticides 4°C 40	-
Ì	1		1		X	l qt. glass/Tefl. Herbicides HCl, 4°C 40	-
		1	x			l qt. glass/Tefl. DDT 4°C 40	
ŧ			:		1	MISCELLANEOUS	•
ł	ļ		•	Х	:	Record observations of fuel contamination in soil.	
1	ł	X	i			Place and record number of permanent location marker. Describe sampling value location.	
<u>.</u>				•	X	where an amplifie watch to a to the	
n	MEN	rs an	D OBS	ERVAT	IONS_		۰.
				··			

2	ample	d by:					Date:		Time:		
	S		omple								
	1	une Bee	<u>cklis</u>	es							
Wells	LPP Wells	<u> </u>	DDT Area Wells	POL Area Auger Holo	Potable Wells						
					└ ──┤	IN SITU MEASUREM	ENIS				
X X		X X	X X	X X	X	Specific conducts	ance	umho/cm @		<u> </u>	°C
x	1		x			Depth to water s					
х	x		x		x	Volume of water	purged prior	to sampling			
		X				Sample depth					
		X				Total water depth Auger hole depth		<u></u>			
				X X		Depth to water in			·····	· <u>····································</u>	
						SAMPLE COLLECTIO	N AND PRESERV	ATION			
							Parameters to be Analyzed		Holding Time (d)	Container No(s)	SampleNo
х	x	x		x	x	4 oz. plastic	DOC	Filter, HCl, 4°C	28		
х	x	x			x	40 ml. vials (2)	TOX	4°C	14	X69, X70	15676
Х	x	x		x		4 oz. plastic	COD	H ₂ SO ₄ , 4°C	28		
х	x	x		x	x	l qt. glass/Tefl	. Oil&Grease	H ₂ SO ₄ , 4°C	28	·	
	x	x		1		l qt. glass/Tefl	. Phenols	H ₂ SO ₄ , 4°C	28	<u>P6</u>	
				X*		40 ml. vials (4)	VOA	4°C	14		
х	X	x		}	x	l qt. glass	Metals (8)	Filter, HNO3	28**	M38	<u> </u>
				x		l qt. glass	Lead	Filter, HNO3	180	<u></u>	
Х					Xt	l qt. glass/Tefl	. Pesticides	4°C	40		<u>-</u>
				Ì	Xt	l qt. glass/Tefl	. Herbicides	HC1, 4°C	40		
	1		x			l qt. glass/Tefl	. DDT	4°C	40		
				4 9 9		MISCELLANEOUS					
		i		x				ontamination in s			
	!	Х				Place and record Describe samplin		rmanent location : ion.	marker.		
	• • • • • • • • • • • •	<u>.</u>	•	• ···· ·	1	•					
C	XMEN	TS AN	D OBS	ERVATI	LONS	<u> 15676 -</u> SFIKED WI			L. 9%	is al	
_						15676 -		VOL. 846			

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MOODY AFB PHASE IIB FIFLD SAMPLE SHEET	MOODY	AFB	PHASE	IIB	FIFLD	SAMPLE	SHEET
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C		c (~	Descri				_
	mpled		, · Į	<u>, 10</u>	T'S	1C Date: 4/23/84 Time:	1540	_
					/			-
_	S:	ite G <u>Che</u>	mple <u>cklis</u>	t				
		L ACP	ę	Area Holes	e			
	P 11s	Sii ater	DDT Are Wells		Potable Wells			
E	l'Ph Wel	LPP S		POL	PC BC	IN SITU MEASUREMENTS		
()	x	X	x	x	x	рн 3.8		
	x	, ~		1	1	Specific conductance 19 unho/cm @ 21.5	20025.	Ċ
	X	\sim	Х		}	Depth to water surface from casing top N/A		
	X		X	Í	X	volume of water purged prior to sampling/A		
		¥.				Sample depth $SURFACE$ Total water depth $\sim 3 FT$		
			ł	x		Auger hole depth		
			I	i X		Depth to water in auger hole		_
;			,	1		SAMPLE COLLECTION AND PRESERVATION		
:							Container Sam	ple
					!	Description be Analyzed Method Time (d)		ю
	х	X	r	x	x	4 oz. plastic DOC Filter, HCl, 4°C 28	33150	650
	x	(Ŷ	, V		X	40 ml. vials (2) TOX 4°C 14 🚊	#X5960	
q	X	(X)	,	x		4 oz. plastic COD H ₂ SO ₄ , 4°C 28 <u>D</u>	17	
d	x	X		x	x	l qt. glass/Tefl. Oil&Grease H ₂ SO ₄ , 4°C 28 <u>(</u>	<u>312</u>	· ·
	х	x				l qt. glass/Tefl. Phenols H ₂ SO ₄ , 4°C 28	P5	[
)		X*		40 ml. vials (4) VOA 4°C 14		
d	х	X	- ,		x	l qt. glass purchet Metals (8) Filter, HNO3 28**	<u>M7</u>	r
1		\cup	-	x		l qt. glass واسماد Lead Filter, HNO3 180		
c					XI	l qt. glass/Tefl. Pesticides 4°C 40		
				ł	Xt	l qt. glass/Tefl. Herbicides HCl, 4°C 40		
			x			l qt. glass/Tefl. DDT 4°C 40		
				:	1	MISCELLANEOUS		
:+				: X	:	Record observations of fuel contamination in soil.		
		X	N.	:		Place and record number of permanent location marker.		
l					X	Describe sampling value location.		
χ	MEN	rs an	O OBS	ERVAT	IONS	WATER & SITE DESCRIPTION SAME	AS SW1	
_	Ξź	<u>΄ς ε</u>	IT	<u>[;]</u>	<u>ske</u>	HEAVER WOODED - Marker No 2 pt	ned allo	Ft.
_	<u> </u>			<u> </u>	••	- the free hill		

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Site Completion Directlist $\frac{11}{12} = \frac{1}{12} = \frac$	-	<u>~ !(</u> mle	<u>. (F</u> 1 hv:	+ u	NES 2 NR	1-	SIC MULL NO	$\frac{LPP-L}{Date:}$	4/73/84	Time:	1620	
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x x x1 qt. glass/Tefl. Oil&Grease H2SO4, 4°C28G.5x x x1 qt. glass/Tefl. PhenolsH2SO4, 4°C28F8xx40 ml. vials (4)VOA4°C14xx1 qt. glass ρ_{143}	ĸ					x	
x x x1 qt. glass/Tefl. Oil&Grease H2SO4, 4°C28G.5x x x1 qt. glass/Tefl. PhenolsH2SO4, 4°C28F8xx40 ml. vials (4)VOA4°C14xx1 qt. glass ρ_{143}	x	x	Ø		x		4 oz. plastic COD H_2SO_4 , 4°C 28 Dq
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	x	x	പ)	x	x	1 qt. glass/Tefl. 0i1&Grease H ₂ SO ₄ , 4°C 28 <u>G.5</u>
XX*40 ml. vials (4)VOA 4° C14X1 qt. glass $\rho_{1,\alpha,\beta+1}$ Metals (8) Filter, HNO3 28^{**} $M32$ X1 qt. glass $\rho_{1,\alpha,\beta+1}$ LeadFilter, HNO3180X11 qt. glass/Tefl. Pesticides 4° C40X11 qt. glass/Tefl. HerbicidesHCl, 4° C40X11 qt. glass/Tefl. HerbicidesHCl, 4° C40X1 qt. glass/Tefl. DDT 4° C40XRecord observations of fuel contamination in soil.XPlace and record number of permanent location marker.		x	_ L A				l qt. glass/Tefl. Phenols H_2SO_4 , 4°C 28 $\frac{1}{\beta}$
Xl qt. glass $\rho_{145}hc$ LeadFilter, HNO3180X1l qt. glass/Tefl. Pesticides4°C40X1l qt. glass/Tefl. HerbicidesHCl, 4°C40Xl qt. glass/Tefl. DDT4°C40XI qt. glass/Tefl. DDT4°C40XRecord observations of fuel contamination in soilYPlace and record number of permanent location marker.	:				X*		
Xl qt. glass $\rho_{145}hc$ LeadFilter, HNO3180X1l qt. glass/Tefl. Pesticides4°C40X1l qt. glass/Tefl. HerbicidesHCl, 4°C40Xl qt. glass/Tefl. DDT4°C40XI qt. glass/Tefl. DDT4°C40XRecord observations of fuel contamination in soilYPlace and record number of permanent location marker.	x	x	R)			
X 1 qt. glass/Tefl. Pesticides 4°C 40 X 1 qt. glass/Tefl. Herbicides HCl, 4°C 40 X 1 qt. glass/Tefl. DDT 4°C 40 X 1 qt. glass/Tefl. DDT 4°C 40 X Record observations of fuel contamination in soil. 9 X Place and record number of permanent location marker.					x		
Xt l qt. glass/Tefl. Herbicides HCl, 4°C 40 X l qt. glass/Tefl. DDT 4°C 40 MISCELLANEOUS MISCELLANEOUS	x		ĺ			X	
X 1 qt. glass/Tefl. DDT 4°C 40 MISCELLANEOUS X Record observations of fuel contamination in soil. Place and record number of permanent location marker.	İ					1 1	
$\begin{array}{c} \underline{\text{MISCELLANEOUS}}\\ \chi & \text{Record observations of fuel contamination in soil.}\\ \hline \chi & \text{Place and record number of permanent location marker.} \end{array}$				х			
x Record observations of fuel contamination in soil. (x) Place and record number of permanent location marker.	!					1	
$\{\mathbf{x}\}$ Place and record number of permanent location marker.		, ;	:		v	1	
X Describe sampling value location.	•		(x)		^		Place and record number of permanent location marker.
	•		$ \longrightarrow $.	X	Describe sampling value location.
		1 ENI		İ			
DOMENTS AND OBSERVATIONS MARKEN NG. 4 placed ~ 150 Ft. U.N.W. of W-11 Ne.							

						POL-1 NU		the new pel	<u>• • • • • • • • • • • • • • • • • • • </u>	n Er.	<u>. N. 6. C</u>
S	ampl∈	ત છુ	·	~ <u>∈</u> 7			Date:/	24/84	Time:	1640	
	5		Comple								
			ecklis	ales							
Wells	l s		Area	POL Area Auger Holes	Potable Wells						
Wells	uel Wel	LPP Sur Uator	DDT Are Wells	POL Ar	Pot Wel						
 	<u>.</u>	<u> </u>	+	100		IN SITU MEASUREM	ENIS				
X X	X X		,	$\sim \sim$) X X	Specific conduct	ance 32	umbo/cm@25	T. 0		°C
x	1	-	x	11		Depth to water s					
x	x		x		x	Volume of water	purged prior	to sampling me	11111		
		X	1	-		Sample depth			<u>.</u>		<u> </u>
	:	X		Ŵ		Total water dept Auger hole depth					
				$\frac{1}{x}$		Depth to water i		12.5FK			
	ł	:				SAMPLE COLLECTIO	N AND PRESERV	ATTON			
	(;					Parameters to		Holding	Container	Sample
				1		Description	be Analyzed	Method	Time (d)	No(s)	No.
х	X	X	:	X) x	4 oz. plastic	DOC	Filter, HCl, 4°C	28	T-29	1565
х	, X	X			x	40 ml. vials (2)	TOX	4°C	14		
X	x	X	($\left \begin{array}{c} \mathbf{x} \\ \mathbf{x} \end{array} \right $	/	4 oz. plastic	COD	H ₂ SO ₄ , 4°C	28	0-5	·
X	x	X	:	(X	X	l qt. glass/Tefl	. Oil&Grease		28	G-13	
	X	X	(l qt. glass/Tefl		H ₂ SO ₄ , 4°C	28		
				X*		40 ml. vials (4)		4°C	14	<u>V-1</u>	
x	x) >	(x	l qt. glass		Filter, HNO3	28**		
	!		1	X	1	l qt. glass plush		Filter, HNO3	180	M-4	
Х						l qt. glass/Tefl			40	. <u> </u>	
				1	Xt	l qt. glass/Tefl			40	<u></u>	
	:		X		1	l qt. glass/Tefl	. DDT	4°C	40		
						MISCELLANEOUS					
		•	!	Ò	,			ontamination in s rmanent location			
		· · · ·	(X	Describe samplin			uni ket .		
	****	т	 VID ORS	+		No widence	· • ·		• • •		1
Ý		, . , .			()					<u>n airtea</u>	<u>e to top</u> Tanàna tanàna di
					• • • • • • •		¥				
	*I-5 8	• ar	chived	!.							

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	mple	Locat		Descri		POL-2 NU	V' +,	2	<u>.</u>	<u> </u>	<u></u> \:'
Sar	moled	by:	`		<u></u>		Date:	4 . 2 4 . 4	Time:		
	Si	te G	mple	tion							
			klis								
	ļ	rtac r	ea	Area r Hole	le						
	Wells	LPP Sur Water	DVT Area Wells	PUL Area Auger Hol	Pot able Wells						
	- 3	HPP PR	G 3	a 4	· :3	IN SITU MEASUREM	ENIS				
	x	x	х	· ·	[⊳] x	pH 3.7					
	x	х	Х	X	x	Specific conduct. Depth to water se			2	290	<u>25 °c</u>
	x x		X X	-	x	Volume of water s		•			
	^	x	X		^	Sample depth					
	ļ	x				Total water dept		·			
				(x (x)		Auger hole depth					<u></u>
1				(X)		Depth to water in	n auger hole_	12.011			~ <u></u>
1	Ì					SAMPLE COLLECTIO					
						Container 2 Description	Parameters to be Analyzed		Holding Time (d)	Container No(s)	Sample No.
	v	v		R)	v	4 oz. plastic	DOC	Filter, HCl, 4°(T-22	15654
	X X	X		0	X X	40 ml. vials (2)		4°C	14		1 1
	x	x x		(\mathbf{x})	^	4 oz. plastic	000	чс H ₂ SO ₄ , 4°С	28	1)-22	
	X	x	i	X	x	l qt. glass/Tefl			28	6-15	
1	x	x		Â		l qt. glass/Tefl		H ₂ SO ₄ , 4°C	28		
				(x*		40 ml. vials (4)	VOA	4°C	14	V-2	
	·x	x			x	l qt. glass) Filter, HNO3	28**		
				Â.		l qt. glass	Lead	Filter, HNO3	180	M-1!	
		ļ			х+	l qt. glass/Tefl			40	<u> </u>	
Ì		ĺ				l qt. glass/Tefl			40	_ <u></u>	<u> </u>
1			х			l qt. glass/Tefl		4°C	40		
i i		ľ							-		·····
,	1				1	MISCELLANEOUS Record observativ	nos of funt a	contamination in s	soil		
	1	x		цХ Х	, , ,	Place and record	number of pe	ermanent location			
-					X	Describe sampling	g valute locat	ion.			
X	11NI	s ant) orsi	ERVATI	ows	No fact -	cn+6 mil	action in	din'	Ma Ser	<u> </u>
~	<u>^</u>	<u>ار .</u>								<u></u>	<u> </u>
											· <u> </u>

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EXAMPLE 1

S	ample	d by:	$-\omega$	6T		Date: Time:
	S	ite G				
		Che	cklis 	C SO		
Wells	LPP Wells	44	DIJT Area Wells	POL Area Auger Holcs	Potable Wells	
						IN SITU MEASUREMENTS
X X	X X	x x		1	\mathbf{x}	Specific conductance 227 untho/cm @ 24 231 325 °C
x	i.		x			Depth to water surface from casing top
Х	x		x		(X)	Volume of water purged prior to sampling ~ 13 declaration
		x			$ \vee $	Sample depth
		X	ĺ			Total water depthAuger hole depth
	:		1	X X		Depth to water in auger hole
	I.	-	1 !			
			i			SAMPLE COLLECTION AND PRESERVATION Container Parameters to Preservation Holding Container Samp
						Description be Analyzed Method Time (d) No(s) No
Х	x	x		x	8	4 oz. plastic DOC Filter, HCl, 4°C 28 <u>7-13</u> 156
х	x	x			\otimes	40 ml. vials (2) TOX 4°C 14 N-49, X-50
Х	x	x	ĺ	x		4 oz. plastic COD H ₂ SO ₄ , 4°C 28
х	x	x		x	X	l qt. glass/Tefl. Oil&Grease H ₂ SO ₄ , 4°C 28 <u>6-10</u>
	x	x				l qt. glass/Tefl. Phenols H ₂ SO ₄ , 4°C 28
	!	1		X*		40 ml. vials (4) VOA 4°C 14
x	x	x			X	l qt. glass plastic Metals (8) Filter, HNO3 28**
	i i	1		x		l qt. glass/Tefl. Pesticides 4°C 40
х	•			ļ	X	l qt. glass/Tefl. Pesticides 4°C 40
	;	1	!		X	l qt. glass/Tefl. Herbicides HCl, 4°C 40
			x			l qt. glass/Tefl. DDT 4°C 40
					1	MISCELLANFOUS
				х		Record observations of fuel contamination in soil.
		X			<u> </u>	Place and record number of permanent location marker.
	•	• · ·	.	•	<u>(x)</u>	Describe sampling value location.
C	XM1873	ins as	D 083	ERVAT	IONS_	the moter of the second second to a second the second seco
		غب د		:``	· # - •	and the start of the second start and the second start of
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- s	ampled	bv:		<u>.</u>		Date:
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	Si		omple cklis			
-		ace		es		
S	ls	Surf	Area	POL Area uger Hol	Potable Wells	
Wells	LPP Welis	PP Sur Water	DDT Are Wells	POL A Auger	Pot	
		⊢	<u>ы</u>			IN SITU MEASUREMENTS
Х	x	X	X	[X	pH 7.() Specific conductance 211 unho/cm @ 20.0 233 @ 25 °C
X	X	x	X	X	(\mathbf{x})	Depth to water surface from casing top 20.0
x x	X X		X X	}	(w	
~		х				Sample depth
		x	1			Total water depth
				x		Auger hole depth
				x		Depth to water in auger hole
		1				SAMPLE COLLECTION AND PRESERVATION
				ł		Container Parameters to Preservation Holding Container Sample
		1				Description be Analyzed Method Time (d) No(s) No.
X	1	Х		X		4 oz. plastic DOC Filter, HCl, 4°C 28 <u>T-31</u> [566]
X		X		}	X	
X	i 1	X		x		4 oz. plastic COD H_2SO_4 , 4°C 28
Х	X	X		X	(\mathbf{x})	
	X	X		}		l qt. glass/Tefl. Phenols H ₂ SO ₄ , 4°C 28
				X*		40 ml. vials (4) VOA 4°C 14
Х	x	X		1	X	1 qt. glass piwhic Metals (8) Filter, HNO3 28** M-33
				x		l qt. glass Lead Filter, HNO3 180
X					X	l qt. glass/Tefl. Pesticides 4°C 40
					X	l qt. glass/Tefl. Herbicides HCl, 4°C 40
			Х			l qt. glass/Tefl. DDT 4°C 40
						MISCELLANFOUS
				X	-	Record observations of fuel contamination in soil.
		x		•		Place and record number of permanent location marker. Describe sampling volve location.
	ļ				X	Describe sampling varge location.
C	OMENI	'S AN	D OBS	ERVAT	IONS_	Sumpled it have b b 5 A. from prop in main
		<u></u>	خېم	<u></u>	i i	
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				Descri		NAFB-3 No. 19 No. 3 No. 19 23 4							
Sa	mple	d by:	w	(T		Date: 41: 1/5-1 Time: 11-2-							
	S	ite C											
		<u> Che</u> ၂၂	cklis 	S									
: 111 s	s	urfe	rea s	POL Area Auger Hol	Potable Wells								
Landfill Wells	1.PP Well	LPP Sur Water	DDT Ar	POL	Pota Well:								
				+	*	IN SITU MEASUREMENTS PH 7.2							
X X	X X		1	1	Ų,	$\frac{1}{2} \frac{1}{2}	X	x		X			Depth to water surface from casing top
x	x	1	x	1	(\mathbf{x})	Volume of water purged prior to sampling ~ 28,000 gul							
		x		ľ	Ŭ	Sample depth							
. 1		X				Total water depthAuger hole depth							
1				X X		Depth to water in auger hole							
			•			SAMPLE COLLECTION AND PRESERVATION							
!		1	ļ			Container Parameters to Preservation Holding Container * Sam							
		ĺ		ł		Description be Analyzed Method Time (d) No(s) N							
x	Х	x	l	x	(X)								
x	Х	x			X								
x	Х	x		x		4 oz. plastic COD H ₂ SO ₄ , 4°C 28							
x	Х	x		X	X								
	Х	X				1 qt. glass/Tefl. Phenols H_2SO_4 , 4°C 28							
	-			X*		40 ml. vials (4) VOA 4°C 14 1 qt. glass Metals (8) Filter, HNO3 28** M-30							
X	Х	X			X								
v			1	X		l qt. glass Lead Filter, HNO3 180 l qt. glass/Tefl. Pesticides 4°C 40							
X		:				l qt. glass/Tefl. Herbicides HCl, 4°C 40							
		ļ	x			l qt. glass/Tefl. DDT 4°C 40							
		1 1	, ^	:	ļ								
		•			1	MISCELLANEOUS Record observations of fuel contamination in soil.							
		×	•	х		Place and record number of permanent location marker.							
<u> </u>		:	.	•	$(\hat{\mathbf{X}})$	Describe sampling value location.							
α	MEX	its an	D OBS	ERVATI	ans_	miles in inese bib is much discharge line							
			<u>.</u>		<u>.:</u>	continuity of 5 cl							
~													
	# T.s. +			1		· ·							
		⊬ arc s No.			FB-6	, and MAFB-8 only. $\forall X - 5i, X - 52$ also							

Sa	mple	Loca	tion I	Jescri	iption	:	Q.C	<u> </u>		·		
Sa	mple	d by:				Ľ	ate:		Time:			
	S		omplet									•
		l eg		es	e							
Wells	I.PP Wells	Sur ater	DDT Area Wells	POL Area Auger Holo	Potahl Wells							
ŝ	lan Wel	H M	DDT We	PO PO	2 2 3	IN SITU MEASUREMENTS						
x	x	x	x	x	x	pH	• 					•
X	X	i .	X			Specific conductance		_umho/cm @			°C	
x	х		x			Depth to water surfa						•
x	х	1	X		x	Volume of water purg Sample depth						
		x x				Total water depth						•
1				х		Auger hole depth						•
				x		Depth to water in au	ger hole					
		i L				SAMPLE COLLECTION AN	D PRESERV	ATION				
;		:					meters to		Holding	Container	Sample	
ł					!		Analyzed	Method	<u>Time (d)</u>	No(s)	No.	•••
X	х	ŧ	i I	х	X	4 oz. plastic	DOC	Filter, HCl, 4°C		<u>T30</u>	15674	3
Х ;	х	ļ			X	40 ml. vials (2)	TOX	4°C		X67,X68		
X	Х	1		X		4 oz. plastic	000	H ₂ SO ₄ , 4°C	28	G40		
x	X	(Х	X				28	070		
	х	X				l qt. glass/Tefl. F		H ₂ SO ₄ , 4°C 4°C	28 14			2
		-		X*		40 ml. vials (4)	VOA		14 28**	M12		
X	х	X			i (Filter, HNO3	180			
v		1		Х		l qt. glass l qt. glass/Tefl. Pe	Lead	Filter, HNO3 4°C	40			
X									40 40	<u></u>		-
		1	x		Xt	l qt. glass/lefl. He	DDT	нсі, 4 С 4°С	40 40			•
		:			1		001	- 0	-+0			•
			•		,	MISCELLANEOUS			: 1			
		x		X		Record observations Place and record num						
	·····	•	.		x	Describe sampling va						
α	PDE27	TS AP	e) orsi	ERVAT	IONS							••
												5
-		• •										
				· ·				······································				

						.: <u>M</u> iption	<u>Q.C.</u>	<u> </u>
Sa	mpl	ed	by:				Date: Time:	
		Sit		omple				
STITM	1.PP	1 DD Curface	our tack ter	DDT Area 74 Wells	ea bles	Potable Wells	IN SITU MEASUREMENTS	
	2	x x x	X X	1	x	X X	pH	°C
		×	x x	x	1	x	Volume of water purged prior to sampling Sample depth Total water depth Auger hole depth Depth to water in auger hole	
							SAMPLE COLLECTION AND PRESERVATIONContainerParameters toPreservationHoldingContainerContainerDescriptionbe AnalyzedMethodTime (d)No(set)	
	3	x	Х		X	x	4 oz. plastic DOC Filter, HCl, 4°C 28	VE7 15176
(†		X	Х			X		X52 15678
		X	X	1	X		4 oz. plastic COD H_2SO_4 , 4°C 28	
		X	X		X	X	1 U L 4	
Ì		X	Х		x		l qt. glass/Tefl. Phenols H_2SO_4 , 4°C 28 40 ml. vials (4) VOA 4°C 14	
,		v İ	v			x	l qt. glass Metals (8) Filter, HNO_3 28** $M2$	
		x	Х		x		l qt. glass Lead Filter, HNO3 180	<u></u>
d				ļ			l qt. glass/Tefl. Pesticides 4°C 40	
•1						X		
				x			l qt. glass/Tefl. DDT 4°C 40	
-		1			:		MISCELLANEOUS	
			x	•	x	x	Record observations of fuel contamination in soil. Place and record number of permanent location marker. Describe sampling value location.	
$\frac{+}{-}$	M	NR	5 AN	I) ORS	SERVAT		15678 - Metals (M21) WIL. 905 M SRIKED WITH GAL OF COMBINED MET TOX (XSI, XSI) 40 M EACH	
						<u>.</u> _	SFIKED WITH 200 pl OF SIGI-CZ	

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Sample	ed by:	<u>V.</u>			Date: 4124 54 Time: 2244 - 0000
:	Site G	omple	tion		
1	Che	<u>cklis</u> 	Se]	
v v	Surfa	rea s	POL Area Auger Hol	Potable Wells	
Wells LPP	LPP Sur Water	DDT Are Wells	POL	Pot	
					IN SITU MEASUREMENTS
X X X X		X X	X X	X	pH 7.3 Specific conductance 225 untho/cm (200) $249 = 25$ °C
x x x x	-	X		\bigcirc	Depth to water surface from casing top
x x		x	ł	X	Volume of water purged prior to sampling ~ 3.000 gal,
	x			_	Sample depth
	x				Total water depthAuger hole depth
			X X		Depth to water in auger hole
1					SAMPLE COLLECTION AND PRESERVATION
			:		Container Parameters to Preservation Holding Container Sample
		ĺ			Description be Analyzed Method Time (d) No(s) No.
x >	(x		x	(\mathbf{x})	4 oz. plastic DOC Filter, HCl, 4°C 28 <u>τ-3</u> <u>15662</u>
x	(x			\mathbf{x}	40 ml. vials (2) TOX 4°C 14 $x - 43, x - 44$
x x	x x		x		4 oz. plastic COD H ₂ SO ₄ , 4°C 28
x x	k x		x	X	1 qt. glass/Tefl. Oil&Grease H ₂ SO ₄ , 4°C 28 <u>6-11</u>
,	x x				l qt. glass/Tefl. Phenols H ₂ SO ₄ , 4°C 28
			X*		40 ml. vials (4) VOA 4°C 14
x x	K X			()	l qt. glass Metals (8) Filter, HNO3 28** <u>M-34</u>
	1		x		l qt. glass Lead Filter, HNO3 180
x					· · · · · · · · · · · · · · · · · · ·
		1)1 qt. glass/Tefl. Herbicides HCl, 4°C 40 H-7 V
		X			l qt. glass/Tefl. DDT 4°C 40
ł	1				MISCELLANEOUS
•	x	 •	X		Record observations of fuel contamination in soil. Place and record number of permanent location marker.
l		ĺ	1	(\mathbf{x})	Describe sampling water location.

S	amp		by:	1 44	OB/		GT/SJC	Date: 4	+/23/84	Time:	0940	
		Si		omple cklis								
	<u> </u>		- <u>une</u> 2		les							
s	ļ	s	LPP Surface Water	Area	POL Area Auger Holes	Potable Wells						
Wells	dan	Wells	JPP Sur Water	DDT Are Wells	10L Uger	Pot						
		_					IN SITU MEASUREME	NTS 7	,			
X	!	X	Х	X	1	(\mathbf{X})	pHSpecific conducta	$\frac{1.3}{205}$	inter a	Zi	722 0	25 °C
X		X	х	1		\otimes	Depth to water su				<u> </u>	<u> </u>
X X		X X		X X	1	G			· · · · · · · · · · · · · · · · · · ·	1966 -	, <i>I</i>	
Λ	 		х				Sample depth		· · · · · · · · · · · · · · · · · · ·) <u> </u>	
			х	1	}		Total water depth					
	1				x		Auger hole depth					
	ſ				x		Depth to water ir	auger hole_				
		;			1		SAMPLE COLLECTION	AND PRESERV	ATION			
ļ								arameters to be Analyzed	Preservation Method	Holding Time (d)	Container No(s)	Sampl No.
x		x	х		x	(X)	, 4 oz. plastic	DOC	Filter, HCl, 4°C	28	TH	1560
X		x	х			$\widetilde{\mathbf{x}}$	40 ml. vials (2)	TOX	4°C	14	X47.48	
x		x	х		x		4 oz. plastic	COD	H ₂ SO ₄ , 4°C	28		
x		x	х		x	\mathbf{x}	l qt. glass/Tefl.	0il&Grease		28	G8	
		x	x	ļ			l qt. glass/Tefl.		H ₂ SO ₄ , 4°C	28	· · · · · · · · · · · · · · · · ·	
					X*		40 ml. vials (4)	VQA	4°C	14		
x		x	x			$\overline{\mathbf{x}}$	l qt. glass		Filter, HNO3	28**	M35	
			~		x	O	l qt. glass	Lead	Filter, HNO3	180		
x						Y	l qt. glass/Tefl.		•	40		
	i	i i				V.	l qt. glass/Tefl.					
				x	1	1	l qt. glass/Tefl.		4°C	40		- <u></u>
					1	1	MISCELLANEOUS	501	40	40		
					x		Record observatio	ns of fuel c	ontamination in s	oil.		
			х				Place and record			marker.		
e	 .			• • • • • •	÷	X	Describe sampling	, valu e locat	ton.			
0	()M	ENI	s an	d obs	ERVATI	ons_	Sumpled a	t prin	valie in	(-me	6 line 1	ust
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						Ender 1114 Contractor fortable wert
S	ampled	l by:	RI	<u>11 /</u>	n í	7/5.3C Date: $4/23/86$ Time: 29.97
	Si	te G	omple	tion		
	<u> </u>	Che	<u>cklis</u>	es		
		r fac	ea		le	
ells	LPP Wells	P Sur Water	MT Are	POL Area Wiger Hol	Pot al We l 15	
Wells	33	I-T-I	DMT Let	N IN	₽.3	IN SITU MEASUREMENTS
х	x	X	x	x	CX	рн
х		х		1	X	
х	x		x			Depth to water surface from casing top
х	x		x		X	Volume of water purged prior to sampling <u>~ 1266.jc./</u>
		X				Sample depth Total water depth
		Х		x		Auger hole depth
	1			x	1	Depth to water in auger hole
						SAMPLE COLLECTION AND PRESERVATION Container Parameters to Preservation Holding Container Sample
						Description be Analyzed Method Time (d) No(s) No.
x	x	x		x	(x)	4 oz. plastic DOC Filter, HCl, 4°C 28 <u>T-24</u> [5663
x		x			(x	40 ml. vials (2) TOX 4°C 14 $x-31, x-32$
х	x	x		x	\square	4 oz. plastic COD H ₂ SO ₄ , 4°C 28
x	x	x		x	(x)	l qt. glass/Tefl. Oil&Grease H ₂ SO ₄ , 4°C 28 G
	x	х				l qt. glass/Tefl. Phenols H ₂ SO ₄ , 4°C 28
				X		40 ml. vials (4) VOA 4°C 14
х	x	х			CX	l qt. glass Metals (8) Filter, HNO3 28** M-4C
				x	\square	l qt. glass Lead Filter, HNO3 180
х			!		y	l qt. glass/Tefl. Pesticides 4°C 40
л						l qt. glass/Tefl. Herbicides HCl, 4°C 40
			x			l qt. glass/Tefl. DDT 4°C 40
				ļ		
	•					MISCELLANEOUS
	•	x	;	х	(Record observations of fuel contamination in soil. Place and record number of permanent location marker.
	i	X	:		IN	Describe sampling value location.
	·····					
U	OMENI			ERVAT.		Bildy 1114 - Sulfile outer detection
-	<u>) : -</u> -	<u></u>		<u> 7 % h</u>	<u>in i</u>	- BIRLEY THE SALTA IN CLEAR OF HIS MAR

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						T/510	Date:	+123/24	Time:	120	
	ç	ir a C	~ ~ 1a	• i							
			omple <u>cklis</u>		· · · · · ·						
1		face	a a	Area Holes	e						
Lardfill Wells	P ills	LPP Surf Water	DDT Area Wells	POL Area Auger Hol	Potable Wells						
Lan	LPP	ddT	50 3	PO Aug	4 3	IN SITU MEASURE	MENTS				
x	X	x	x	x	R	pH 7.2	•				<u> </u>
x	x	x	x	x	X	Specific conduc			2.5 .:	2110	25°C
x	X	ĺ	x			Depth to water					
́Х	X	1	X		Ø	Volume of water Sample depth	purged prior	to sampling		-	
		X X				Total water dep	 th				
1		^		x		Auger hole dept					
				x		Depth to water	in auger hole				
						SAMPLE COLLECTI	ON AND PRESERV	ATION			
:						Container	Parameters to	Preservation	Holding	Container	Sample
					0	Description	be Analyzed	Method	Time (d)		No.
X	x	X		X		4 oz. plastic	DOC	Filter, HCl, 4°C		<u>T-8</u>	1566
X	x	X			(X)	40 ml. vials (2		4°C	14	<u>x-41, x-42</u>	
X	X	X		x		4 oz. plastic	QOD	H ₂ SO ₄ , 4°C	28	·	
Х	X	X		x) (Ý)	l qt. glass/Tef			28	6-3	
	X	X				l qt. glass/Tef		H ₂ SO ₄ , 4°C	28	<u> </u>	
				X ⁴		40 ml. vials (4		4°C	14		
X	x	X			X	l qt. glass		Filter, HNO3	28**	M-31	
				X		l qt. glass	Lead	Filter, HNO3	180		
. X						l qt. glass/Tef			40	<u>c-4</u>	
					X	1 13 - 1			40	<u>H-9</u>	V
i	1		X			l qt. glass/Tef	I. DOT	4°C	40		
	:	1 1 1)	: }	MISCELLANEOUS					
	1			X				ontamination in semanent location i			
	4	X	1		/x	/ Describe sampli					
·	Y 34473			+		Sumpleal a	4		6.1		
, c	A CLEAN	15 M		/ 2		1		immedially		<u>a percen</u>	<u> </u>
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					41.72 - 4	, and MAFB-8 only					

Sa	mpled	by:	R	ŊB,	ZS.	JC/WGT Date: <u>4/23/84</u> Time: <u>0905</u>
	Si		mple			
		<u>_One</u> 22	klis	es		
Wells	s	4- I	Area Is	POL Area Auger Hol	able Is	
Wells	LPP Wells	LPP Sur Water	DDT Are Wells	POL	Pot Wel	
				<u> </u>		IN SITU MEASUREMENTS pH 7.1
X X	x x	X X	X X		\bigotimes	Specific conductance $208'$ unho/cm (20.5) $2.5 \circ C$
x	x	~	X			Depth to water surface from casing top
x	x		х	1	(\mathbf{x})	Volume of water purged prior to sampling ~ 300 gate
		x				Sample depth
		х		x		Total water depth Auger hole depth
	1			x		Depth to water in auger hole
	1			: i	•	SAMPLE COLLECTION AND PRESERVATION
						Container Parameters to Preservation Holding Container Sample
						Description be Analyzed Method Time (d) No(s) No.
x	х	х		x	\otimes	4 oz. plastic DOC Filter, HC1, 4°C 28 <u>T-5</u> 5666
x	х	x			\otimes	40 ml. vials (2) TOX 4°C 14 <u>X-45, X-46</u>
x	x	x		x		4 oz. plastic COD H ₂ SO ₄ , 4°C 28
x	X	X		x	Ø	l qt. glass/Tefl. Oil&Grease H ₂ SO ₄ , 4°C 28 <u>G-4</u>
	x	x				l qt. glass/Tefl. Phenols H ₂ SO ₄ , 4°C 28
				X*		40 ml. vials (4) VOA 4°C 14
x	X	X			X	l qt. glass Metals (8) Filter, HNO3 28** <u>M-24</u>
				X		l qt. glass Lead Filter, HNO ₃ 180
X				 	X	l qt. glass/Tefl. Pesticides 4°C 40
				1	X	l qt. glass/Tefl. Herbicídes HCl, 4°C 40
		1	X		1	l qt. glass/Tefl. DDT 4°C 40
ł						MISCELLANEOUS
		x		х	ĺ	Record observations of fuel contamination in soil. Place and record number of permanent location marker.
		X			(\mathbf{x})) Describe sampling walter location.

<u>. : : : : :</u>

S	amp	led	by:		167		<u> </u>	Date: 4	124/84	Time:	2805-08	35
		Si			ation							
	-		<u>Che</u> ဦ	<u>cklis</u> I	Sa	11						
Wells	ddTl	Wells	LPP Surfa Water	DDT Area	POL Area Auger Holes	Potable Wells	IN SITU MEASURFM	FNTS				
х		x	x	x	x	Q	рН 7,ц					
x		x	x	1	1	(\mathbf{x})	·	ance 212	umho/cm @ 19	, i	2390	25 °C
x		x		x			Depth to water s					
x		x		x		X		purged prior	to sampling \sim	6000	gal.	
			Х		Ì		Sample depth					<u> </u>
į			Х	ł			Total water dept Auger hole depth					
					X X		Depth to water i					
							-					
i		Í			ł		SAMPLE COLLECTIO	N AND PRESERV Parameters to		Holding	Container	Sample
								be Analyzed	Method	Time (d)		No.
x		x	x	}	x	Ŕ	4 oz. plastic	DOC	Filter, HC1, 4°C	28	T-16	1566
x		x	х			X	40 ml. vials (2)	TOX	4°C	14	X-39 X-40	1
x		x	x		x		4 oz. plastic	000	H ₂ SO ₄ , 4°C	28		
x		x	x		x	(x)	l qt. glass/Tefl			28	G-9	
		x	х		1		l qt. glass/Tefl		H ₂ SO ₄ , 4°C	28		
					x		40 ml. vials (4)		4°C	14		
x		x	x			(x	l qt. glas s plust		Filter, HNO3	28**	N1-24	
				ļ	x	9	l qt. glass	Lead	Filter, HNO3	180		
x) l qt. glass/Tefl	. Pesticides	5	40	C-10	
••				1		X	l qt. glass/Tefl			40	H -10	
				x			l qt. glass/Tefl		4°C	40	<u> </u>	
1					•		• •					·
		1			i i	:	MISCELLANEOUS	6.6.1				
		•	х		X				ontamination in s rmanent location			
	_					$\int C \mathbf{x}$	Describe samplin	g valu e locat	ion.			
a	M	ENI	'S AN	D OR	SERVAT	IONS	Servered at	1 - I	discharge	3.54	te larel	
_								<u></u>	······································			

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Sa	mpled	d by:		<u>v 6</u> 1	Γ	Date:	2-120	Time:	.445	P
	Si	ite Q	mole	tion						¥.5
		Che	klis		<u> </u>					
		ir face ir	ea	Area Hole	ole					1.
Wells	LPP Wells	'P Sur Water	DDT Are Wells	POL /	Pot ab Wells					R
3		3	10 ³	4 T		IN SITU MEASUREMENTS				
x	X	x	Х	x	\odot	pH 6.5			16.0 0	25 00
X	X	Х	X	х	X	Specific conductance 107 Depth to water surface from c		_4	109 @	<u> </u>
X X	X X		X		(X ¹			- 1600 -	······································	 r.
^	л	x	^		C	Sample depth	· · <u>···-</u>		*	
		X	1			Total water depth				
				x		Auger hole depth				
•				х		Depth to water in auger hole_				·
i						SAMPLE COLLECTION AND PRESERV				
ļ						Container Parameters to Description be Analyzed		Holding Time (d)	Container No(s)	Sample 🔅 No.
	v	v		x		4 oz. plastic DOC	Filter, HCl, 4°		T-14	15668
X X	X			X	8	40 ml. vials (2) TOX	4°C	14	X-55,X-56	13000
X X	X X	x		x	0	4 oz. plastic COD	H ₂ SO ₄ , 4°C	28	<u></u>	
x	x	x		x	R) l qt. glass/Tefl. Oil&Grease		28	<u> </u>	
	x	X				l qt. glass/Tefl. Phenols		28	<u> </u>	
	~			X		40 ml. vials (4) VOA	4°C	14		<u>53</u>
x	x	x			X) 1 qt. glass plushic Metals (8)		28**	M-37	
	~			x	10	l qt. glass plustic Lead	Filter, HNO3	180	<u></u>	
x					x	1 gt. glass/Tefl. Pesticides	5	40		······································
		•		1		l qt. glass/Tefl. Herbicides		40		
		1	x			l qt. glass/Tefl. DDT	4°C	40		
1							-	-		
, ,						MISCELLANEOUS Record observations of fuel of	continution in	coil		
		x		X		Place and record number of pe				
		.		L	X	Describe sampling value locat	ion.			
α	ME	ts an	d obsi	ERVAT	IONS_	Sampled at hose bil	2 livertly	behind	1 MESSING	+mnk,
		<u>د.م.:</u>	<u> </u>	<u>ed</u>	+~	mel off (chlorine (red abend	of somp	ling point)
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Sa	ample	Loca	tion	Descri	ption	"Mella, Bldg 1500 - Trunsmitter Sive
S	ample	d by:	4	67		Date: $4/24/76/$ Time: $5350 - 1010$
	S	ite G	omple cklis			
Wells	LPP Wells	LPP Surface Water	R S	POL Area Auger Holes	Potable Wells	IN SITU MEASUREMENTS
x x x	X X X	x	x x x	x x	× ×	pH 7.6 Specific conductance 221 unho/cm @ 23 230 3 25 °C Depth to water surface from casing top
x	х	x x	x	x x	X	Sample depth Total water depth Auger hole depth Depth to water in auger hole SAMPLE COLLECTION AND PRESERVATION Container Parameters to Preservation Holding Container
x x	x x			x	XX	Descriptionbe AnalyzedMethodTime (d)No(s)No.4 oz. plasticDOCFilter, HCl, 4°C28 τ_{-32} 15/26/940 ml. vials (2)TOX4°C14 x_{-35} , x_{-36} 1
x	x			x		4 oz. plastic COD H ₂ SO ₄ , 4°C 28
x	x x	!		x	X	1 qt. glass/Tefl. Oil&Grease H2SO4, 4°C 28 G-27 1 qt. glass/Tefl. Phenols H2SO4, 4°C 28
x	х	x		x*		40 ml. vials (4) VOA 4°C 14)1 qt. glass $e^{i_{4}+i_{1}}$ Metals (8) Filter, HNO3 28** M-25 V 1 qt. glass $e^{i_{4}+i_{1}}$ Lead Filter, HNO3 180
x				^	X	l qt. glass/Tefl. Pesticides 4°C 40 l qt. glass/Tefl. Herbicides HCl, 4°C 40
			x			l qt. glass/Tefl. DDT 4°C 40
		x		x	X	MISCELLANEOUS Record observations of fuel contamination in soil. Place and record number of permanent location marker. Describe sampling value location.
	(M47)	TTS AN	D OBS	ERVAT		Sampling valve undernath pressure tank
		e arc				, and MAFB-8 only.

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Site Completion Direcklist $x = \frac{1}{29} \frac{1}{29} \frac{1}{4} \frac{1}{11} \frac{1}{10} \frac{1}{29} \frac{1}{$	ampled by: WGT	$\frac{\text{Date: } 4/24/54}{\text{Date: } 4/24/54} \text{Time: } 1025 - 1035}$
$\begin{array}{c c c c c c c c c c c c c c c c c c c $		
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Checklist	
IN SITU MEASUREMENTS X X X X X X X X X X X X X X X X X X X		
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$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		
x x	X X X X	
xxxDepth to water surface from casing topxxxxxxxxXSample depthTotal water depthTotal water depthTotal water depthAuger hole depthDepth to water in auger holeSample depthXxxDepth to water in auger holeSAMPLE COLLECTION AND PRESERVATIONContainerSampleContainerParameters toPreservationHolding MethodContainerSample depthSample depthNo.ContainerParameters toPreservationDescriptionbe AnalyzedMethodTime (d)No(s)ContainerNo.No.ContainerSample depthNo.ContainerParameters toPreservationHolding No(s)ContainerSample depthSample depthNo.No.No.ContainerParameters toPreservationHolding No(s)No.ContainerParameters toPreservationHolding No(s)No.ContainerParameters toPreservationHolding No(s)No.ContainerParameters toPreservationHolding No(s)No.ContainerParameters toPreservationHolding No.No.ContainerParameters toPreservationHolding No.No.ContainerA co.Parameters toPreservationKXXX4 oz.Plass/Tefl.K <t< td=""><td></td><td></td></t<>		
XXSample depth Total water depth Depth to water in auger holeTotal water depth Depth to water in auger holeXXXDepth to water in auger holeSAMPLE COLLECTION AND PRESERVATION ContainerContainer DescriptionParameters to PreservationContainerParameters to PreservationTime (d) No(s)No(s)No.Container DescriptionParameters to PreservationPreservation MethodContainerParameters to PreservationTime (d) 		Depth to water surface from casing top
XXTotal water depth Auger hole depth Depth to water in auger holeXXX <td>x x</td> <td></td>	x x	
XXAuger hole depth Depth to water in auger holeSAMPLE COLLECTION AND PRESERVATION ContainerSample DescriptionContainerParameters to PreservationHolding Time (d)Container No(s)ContainerParameters to PreservationFilter, HCl, 4°C28 T-18XXX4 oz. plasticDOC Filter, HCl, 4°C14 X-29,X-30XXX4 oz. plasticCOD H2SO4, 4°C28 H2SO4, 4°CXXXX1 qt. glass/Tefl.XXXX1 qt. glass/Tefl.Phenols H2SO4, 4°C28 H2SO4, 4°CXXXX1 qt. glass/Tefl.Phenols H2SO4, 4°C28 HXXXX1 qt. glass/Tefl.Phenols H2SO4, 4°C14 HXXXX1 qt. glass/Tefl.Phenols H2SO4, 4°C14 HXXXX1 qt. glass/Tefl.Phenols H2SO4, 4°C14 HXXXX1 qt. glass/Tefl.Phenols H2SO4, 4°C14 HXXXX1 qt. glass/Tefl.Pesticides 4°C40XXXXX1 qt. glass/Tefl.Pesticides 4°C40XXXXXX1 qt. glass/Tefl.Pesticides 4°C40XXXXXXX1 qt. glass/Tefl.Pesticides 4°C40XXXXX <td>x</td> <td></td>	x	
XDepth to water in auger holeXDepth to water in auger holeSAMPLE COLLECTION AND PRESERVATIONContainerParameters toDescriptionbe AnalyzedMethodTime (d)No.s)No.No.s) </td <td></td> <td></td>		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		
Container DescriptionParameters to be AnalyzedPreservation MethodHolding Time (d)Container No(s)Sample No.XXX4 oz. plasticDOCFilter, HCl, 4°C28 $T - 1 & X$ ///>///////////////////////////	X	
XXXX <		
x x x 4 oz. plastic DOC Filter, HC1, 4°C 28 $T - 18$ [567] x x x x x 40 ml. vials (2) TOX 4°C 14 $x - 29, x - 30$		
x x x x x 40 ml. vials (2) TOX 4° C 14 $\underline{X-29_{1}X-30}$	v v v	
XXX4 oz. plastic OOD H_2SO_4 , 4°C28XXXX1 qt. glass/Tefl. Oil&Grease H_2SO_4 , 4°C28XXX1 qt. glass/Tefl. Phenols H_2SO_4 , 4°C28XXX40 ml. vials (4)VOA4°C14XXX1 qt. glass/Tefl. Phenols H_2SO_4 , 4°C28XXX1 qt. glass/Tefl. Phenols H_2SO_4 , 4°C28XX1 qt. glass/Tefl. Phenols H_2SO_4 , 4°C28XX1 qt. glass/Tefl. Phenols H_2SO_4 , 4°C14X1 qt. glass ρ^{1n_1+iL} Metals (8) Filter, HNO328**X1 qt. glass ρ^{1n_1+iL} LeadFilter, HNO3180X1 qt. glass/Tefl. Pesticides4°C40		
x x x x 1 qt. glass/Tefl. Oil&Grease H2SO4, 4°C 28 $(5-23)$ x x x 1 qt. glass/Tefl. Phenols H2SO4, 4°C 28 x x 40 ml. vials (4) VOA 4°C 14 x x 1 qt. glass/Tefl. Phenols H2SO4, 4°C 28 M-26 x x 1 qt. glass/Tefl. Phenols H2SO4, 4°C 14 M-26 x x 1 qt. glass/Tefl. Phenols H2SO4, 4°C 14 M-26 x x 1 qt. glass $e^{1ax^{1+L}}$ Metals (8) Filter, HNO3 28** M-26 x 1 qt. glass $e^{1ax^{1+L}}$ Lead Filter, HNO3 180 180 x 1 qt. glass/Tefl. Pesticides 4°C 40 40 1 x 1 qt. glass/Tefl. Herbicides HCl, 4°C 40 40 1		
X X 1 qt. glass/Tefl. Phenols H_2SO_4 , 4°C 28 X X 40 ml. vials (4) VOA 4°C 14 X X 1 qtglass ρ^{1} Metals (8) Filter, HNO3 28** M2.6 X 1 qtglass ρ^{1} Metals (8) Filter, HNO3 180		
XX40 ml. vials (4)VOA 4° C14X1 qt. glass plankicMetals (8) Filter, HNO328**M-26X1 qt. glass plankicLeadFilter, HNO3180X1 qt. glass/Tefl. Pesticides4°C40X1 qt. glass/Tefl. HerbicidesHCl, 4°C40		
X X 1 qt. glass plassic Metals (8) Filter, HNO3 $28**$ M-26 X 1 qt. glass plassic Lead Filter, HNO3 180 X 1 qt. glass/Tefl. Pesticides 4°C 40 X 1 qt. glass/Tefl. Herbicides HCl, 4°C 40		
X 1 qt. glass e ^{1xy+L} Lead Filter, HNO3 180 X 1 qt. glass/Tefl. Pesticides 4°C 40 X 1 qt. glass/Tefl. Herbicides HCl, 4°C 40		
X 1 qt. glass/Tefl. Pesticides 4°C 40 X 1 qt. glass/Tefl. Herbicides HCl, 4°C 40		
1 qt. glass/Tefl. Herbicides HCl, 4°C 40	X	
X 1 qt. glass/Tefl. DDT 4°C 40		
	x	l qt. glass/Tefl. DDT 4°C 40
MISCELLANEOUS		MISCELLANEOUS
X Record observations of fuel contamination in soil.	x	Record observations of fuel contamination in soil.
X Place and record number of permanent location marker.		
A Black and meand a share of asymptotic location maybeen		Place and record number of permanent location marker.

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CONTRACTOR INCOMENTS

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FIELD SHEETS FOR SEPTEMBER 1984 SAMPLING

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							9/5-7/84 Fiel	d Trip			
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					ion: SW La						
Sample					perimeter	YEA		een land		Or is -	
	u oy	· <u>1</u> "	<u>c / 1</u>	~15_							
2		Campl		n			NEEDIS	-jeh		17 OF BRY	
		eckli	st		7			9	0198	1461/01:3	
_ +		LPP Surface Water	ea	Pot able					Jou	13ai/DR-	1.
Landfill Wells	ls s	P Surf Water	, Ar	a la							
Lantfil Wells	Hell Well	LPP W	POL	Pot	×						
				-		UREME	NTS				
	x	x	X	1	pH 3.8					<u></u>	
6 6 6	X X	X	X	X			nce 27,		C 344		<u>2.2.°</u> C
 ₩	X X							using top 4^{\prime}			
مجته	А	X		X	1		urged prior t	to sampling		<u>_1192t</u>	
		X	У		Sample depth Total water						
			X		Auger hole d	-				<u></u> , <u> </u>	
			X	1	Depth to wat		auger hole				
					}						
							AND PRESERVA	Preservation	Holding	Container	Samp
					Container Description	r	'arameters to be Analyzed	Method	Time (d		No
\otimes	Х	x	x		2 oz. plasti	с –		Filter, H ₂ SO ₄	4°C 28	 	165
3	x	x		{	l pt. glas			H ₂ SO ₄ , 4°C	25	C. 29	
×	x	X [†]			40 ml. vials			4°C	14		
Ö	x	· (• •		Filter, HNO3	2811	Fu' 9	+
U	^	X		X				Filter, WO3	180		
1-			X		2 qt. plasti			-	40	PE C.	
Ċ				x	1		Pesticides				
Œ				Xz	🗤 l qt. glass/	Tefl.	Herbicides	HC1, 4°C	40	<u>HE 12</u>	
					MISCELLANEOU	<u>s</u>					
			X	1	1			ontamination in	soil.		
]			_1_	X	Describe sam	pliną	g valve locat	10 n.			
		ND OF									

Wells L-3 and L-0 only. Thocations LPP-SWL and LPP-SW2 only.

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**Wells No. MAFH-4, MAFH-6, and MAFH-8 only. 1128 days for mercury, 5 months for other metals.

D-37

					MOXDY AFB PHASE IIB FIELD SAMPLE SHEET 9/5-7/84 Field Trip
Sample	e Loc	ation	n Des	Nu.:_L scriptio cithi C	-2 m: <u>sw Landfill north of eastern partion of</u> <u>n 100 ft. of edge of fill.</u> <u>Date: C.Scriff</u> <u>Time: 170-1730</u>
:		Gampl		я:	mil 14 get.
Lardfill + Wells	LPP Wells	LPP Surface 35 Water	7	Auger Holes Potable Wells	
୍ଦ୍ର ଥିଲି ।	X X X X	x x x x	2	1 1	IN SITU MEASUREMENTS pH = 2, 5 Specific conductance 37 unto/cm $e(Ticume = 15^{-1}) > 1.5^{\circ}C$ Depth to water surface from casing top $11' 4''$ Volume of water purged prior to sampling 14 3.44 Sample depth Total water depth Auger hole depth
× © ©	x x x	X X	2	K	Depth to water in auger hole <u>SAMPLE COLLECTION AND PRESERVATION</u> Container Parameters to Preservation Holding Container Sample Description be Analyzed Method Time (d) No(s) No. 2 oz. plastic DOC Filter, H_2SO_4 4°C 28 XX311 16577 1 pt. glass COD H_2SO_4 , 4°C 28 C.27 40 ml. vials (4) VOC 4°C 14
(X) (X) (X)	X	x† x	x	x x x* x*	40 ml. vials (4)VOC4°C142 qt. plasticMetals (8) Filter, HO32811 $\underline{PU 5}$ 2 qt. plasticLeadFilter, HO31801 qt. glass/Tefl. Pesticides4°C40 $\underline{PE 9}$ 1 qt. glass/Tefl. HerbicidesHC1, 4°C40 $\underline{HC1}$
0011162	FTS A		X		MISCELLANEOUS Record observations of fuel contamination in soil. Describe sampling value location. Mosmelly fines Sittly furthy
tioc	at ion	is 1PP	k-s‰l		P-5₩2 only. , and MAFB-8 only.

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1120 days for mercury, b months for other metals.

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				o.: <u>t</u> riota	-3 III SW Lundfill north of western purtion of
<u>Fil</u> mpl	id by	<u>wit</u>	hir Twr	2 10	0 the frem edge of Fill; near edge of swamp Date: Time: 7200 - 1230
:		uerkli T	1	77	Witted 17-jak
Wells ←	LPP Wells	LPP Surface Water	POL Area Auger Holes	Potable Wells	
\odot	X	x		x	IN SITU MEASUREMENTS pH5, 0
	X X	X	X	X	Specific conductance <u>41.5</u> unho/cm $(11/2) = 26.57$ <u>$23^{\circ}C$</u> Depth to water surface from casing top $7^{\circ}2^{\circ}$
Č;)	X	x		X	Volume of water purged prior to sampling 17544
		x	x		Sample depth
					Total water depthAuger hole depth
			x		Depth to water in auger hole
					SAMPLE COLLECTION AND PRESERVATION
					Container Parameters to Preservation Holding Container Sample Description be Analyzed Method Time (d) No(s) No.
\odot	x	x	x		2 oz. plastic DOC Filter, H2SO4 40C 28 XX655 1657
Θ	х	x	x		1 pt. glass 000 H ₂ SO ₄ , 4°C 28 <u>C31</u>
13	x	Xt			40 ml. vials (4) VOC 4°C 14 <u>V2</u>
\bigotimes	x	x		x	2 qt. plastic Metals (8) Filter, HNO3 2811 Pu4
_			X		2 qt. plastic Lead Filter, HNO3 180
۲ ێ		ļ		x**	l qt. glæss/Tefl. Pesticides 4°C 40 <u>PE 2</u>
(X)				X**	l qt. glass/Tefl. Herbicides HCl, 4°C 40 $\frac{12 \mathcal{E} \mathcal{L}}{\mathcal{L}}$
			x		MISCELLANEOUS Record obvergations of fuel contraination in soil
				x	Record observations of fuel contamination in soil. Describe sampling valve location.
M42	irs a	ND OH	SERVA	TIONS	ro Smili, yellin to circum fines, queles sette.

1120 days for mercury, 6 months for other metals.

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					MONDY AFB PHASE IIB FIELD SAMPLE SHELL 9/5-7/84 Field Trip	
ապրի	- i.oc	ation	n Des	criptio	-3 QC (VOC duplicate)	
ample	ad by	/: _]	rh.	2	Date: _ Gry Time: _ 1230	Ň
:		Comp		X 1		
Landfill Wells		LPP Surface	1	Auger Holes Potable Wells		
X X X	X X X	x x	X		IN SITU MEASUREMENTS pH Specific conductance unho/cm @ °C Depth to water surface from easing ten	•
X	X	X X)) X		Depth to water surface from casing top Volume of water purged prior to sampling Sample depth Total water depth Auger hole depth Depth to water in auger hole	
x	x	x	x		SAMPLE COLLECTION AND PRESERVATIONContainerParameters toPreservationHoldingContainerSampleDescriptionbe AnalyzedMethodTime (d)No(s)No.2 oz. plasticDOCFilter, H2SO44°C 28	
X	x x	x x†	x		1 pt. glass 000 H_2 SO4, 4°C 28 40 ml. vials (4) V0C 4°C 14 V_1 16565	<u>N</u>
× ×	х	x	x	x x**	? qt. plastic Metals (8) Filter, HNO3 2811 2 qt. plastic Lead Filter, HNO3 180 1 qt. glass/Tefl. Pesticides 4°C 40	
×				X**	l qt. glass/Tefl. Herbicides HCl, 4°C 40	
			x	x	MISCELLANEOUS Record observations of fuel contamination in soil. Describe sampling valve location.	.
0 11E N	rits a	ND OB	SERV	ATIONS_		
tLoca #Well	ntion s No	s LPP • MAF	⊶S₩I 18-4,	MAFB-6	P-SW2 only. , and MAFB-8 only. onths for other metals. D-40	

						9/5-7/84 Field Trip	
	-				<u> </u>		
						": sw Landfill, south of eastern purtio	<u>n of</u>
					MR	Date: <u>GSCPSY</u> Time: <u>C)575-</u>	0925
	;		•	etion		NCED HIGH	
ĩ	1	~	inikli Is		11		
	Lanitili Wells	L <i>PP</i> Wells	LPP Surface Water	POL Area Auger Hole	Potable Wells		
+					-1	IN SITU MEASUREMENIS	
	8	X X	X X	X X	X X	pH 4, 2 Specific conductance 50 unho/cm $((The, me - 21^{\circ}))$	a *c
}	ŏ	X	Â	Î		Specific conductance <u>50</u> untro/cm $((The 21'))$ Depth to water surface from casing top 1c' 4"	, 0 ° C
	(3)	X	х		X	Volume of water purged prior to sampling 15 gal	
			X			Sample depth	
						Total water depth	
						Auger hole depth Depth to water in auger hole	
	- {					SAMPLE COLLECTION AND PRESERVATION Container Parameters to Preservation Holding Container	Ser. 1
			1			Description be Analyzed Method Time (d) No(s)	SampleNo.
	(x)	X	x	X		2 oz. plastic DOC Filter, H2SO4 40C 28 XX 733	1657
	(X) (X)	x	x	x		1 pt. glass 000 H ₂ SO ₄ , 4°C 28 <u>C 3 7</u>	
	¥	x	X†			40 ml. vials (4) VOC 4°C 14	
1	X.	x	x		x	2 qt. plastic Metals (8) Filter, HNO3 28tt PU 3	
	- {		ļ	x		2 qt. plastic Lead Filter, HNO, 180	
	œ l				x**	l qt. glæss/Tefl. Pesticides 4°C 40 <u>PE-11</u>	
	3				<u>x</u> **	l qt. glass/Tefl. Herbicides HCl, 4°C 40 <u>HE 3</u>	<u></u>
						MISCELLANEOUS	
				X	x	Record observations of fuel contamination in soil. Describe sampling value location.	
	1.				TIONS	yellow place the math in the normal.	
	Hir		une 1	rh-	<u> </u>	en ent.	·

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D-41

n ç 21	ing S	ite/W	ell N	0.: L	-4 QC (duplicate all + metals spike)
որ հ	· Loc	ation	Desc	ript io	n: sw Landfill, south of eastern partion of
					side of perimeter read
nple	ed by	:2	<u>pc</u>	אית./	Date: 65:014 Time: 0545.0125
			etion	i	
		eckli La		T	
Wells	u.PP Wells	LPP Surface Water	POL Area Auger Hole	Pot able Wells	
				†1	
K K	X X	X X		1 1	pHSpecific conductance unito/cm @ °C
X	Х				Depth to water surface from casing top
	Х	X		X	Volume of water purged prior to sampling
		Х			Sample depth
			X		Total water depthAuger hole depth
			X		Auger hole depth Depth to water in auger hole
-					SAMPLE COLLECTION AND PRESERVATIONContainerParameters toPreservationHoldingContainerSampleDescriptionbe AnalyzedMethodTime (d)No(s)No.2 oz. plasticDOCFilter, H_2SO_4 4°C 28 $X \times 674$ 16566
Û	X	X	X		
	X	X	X		1 pt. glass 000 H_2SO_4 , 4°C 28 <u>C 3 2</u> 40 ml. vials (4) V0C 4°C 14 $P=2/P=1$
<u>6</u>	X	Xt			2 qt. plastic Metals (8) Filter, HNO3 (2) 28tt PU2 PUI
8	X	X	x	X	2 gt. plastic Lead Filter, HN, DA 100 PE 4
<u>.</u>			- <u> </u> ^	X**	Lat almo/Table Portividas 10°C /3 QC same) (41) PC 2/5(8)
	ļ		1		l qt. glass/Tefl. Herbicides HCl, 4°C (2 QC 40 HE 4/HCZ)
-					'samp)
1					MISCELLANEIUS 16569
			X	x	Record observations of fuel contamination in soil. 16567 16568 Describe sampling value location.
MĐ	NTS A	ND OF	SERV	TIONS	
			• •	_	

theations LPP-SWI and LPP-SW2 only.

DOWN INSPASSAR INSPASSAR

*Wells No. MAFB-4, MAFB-0, and MAFB-8 only.

1128 days for mircury, 6 months for other metals.

sauple	- Loc	ation	Desc	ייי <u>ר</u> ריוףד וט ארר גרר ה	5 n: sw Landfill south of central pertion of side of perimeter read Date: US-p54 Time: 0730 U955
:		Camp1 eckli	et ion st		neral light.
Lamfill <		LPP Surface Water	ea Dies	Potable Wells	IN SITU MEASUREMENTS
୍ର ମହନ୍ତି	X X X X	X X X X	x x x x x x x	x x x	pH 4.2. Specific conductance 45 unho/cm @ (Theme: zi') 21 °C Depth to water surface from casing top 14 '4'/2" Volume of water purged prior to sampling 11 gak Sample depth
 S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S S	X X X X	x x x [†] x	x x x	x x** x**	Container DescriptionParameters to be AnalyzedPreservation MethodHolding Time (d)Container No(s)Sample No2 oz. plasticDOCFilter, H_2SO_4 4°C28 $XX734/16^\circ$ 1 pt. glassOOD H_2SO_4 , 4°C28 C_{30} 40 ml. vials (4)VOC4°C142 qt. plasticMetals (8)Filter, HNO_3 2811 PUS'_4 2 qt. plasticLeadFilter, HNO_3 1801 qt. glass/Tefl.Pesticides4°C40 $PE12_4$ 1 qt. glass/Tefl.HerbicidesHC1, 4°C40 $HE7_4$ V
cume	NTS A	WD OF	X		<u>MISCELLANEOUS</u> Record observations of fuel contamination in soil. Describe sampling value location. multiplication flice quickly softer a normality.

1120 days for mercury, 6 months for other metals.

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MODY AFB PHASE IIB FLELD SAMPLE SHEAT 9/5-7/84 Field Trip

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Samplin, Site/Well No.: 1-6	_
Sample incation Description: SW Landfill upgradient well; at SU corne	Ý
of fill on SW side of bend in perimeter road Simpled by: DPC/JWR_ Date: CS4754 Time: 1000-	
	~~
Site Completion Need 11 Sol	
LPP Surface Wells Wells POL Area POL Area Potable Wells	
Lerl fill Wells Water fo Pol Are Wells Wells	
$\frac{\text{IN SITU MEASUREMENTS}}{(X) X X Y PH 5.6}$	
	•c
\textcircled{O} X Depth to water surface from casing top $14' V_4''$	<u> </u>
$\mathbf{\hat{\omega}} = \mathbf{\hat{x}} = \hat{$	_
X Sample depth	
X Total water depth	
X Auger hole depth X Depth to water in ager hole	
X Depth to water in auger hole	
SAMPLE COLLECTION AND PRESERVATION	
	mple No
Co X X X 2 oz. plastic DOC Filter, H ₂ SO ₄ 40C 28 XX6S4 163	581
\odot X X X 1 pt. glass OOO H ₂ SO ₄ , 4°C 28 <u>C 26</u>	
3 X X 40 ml. vials (4) VOC 4°C 14 $\frac{14}{14}$	
X X X 2 qt. plastic Metals (8) Filter, INO, 2811 PULC	
X 2 qt. plastic Lead Filter, HNO, 180	
x^* 1 qt. glass/Tefl. Pesticides 4°C 40 $PE'3$	/
X* 1 qt. glass/Tefl. Herbicides HCl, 4°C 40 HE S	/
MISCELLANFOUS	
XRecord observations of fuel contamination in soil.XDescribe sampling valve location.	
	1.V
COMMENTS AND OBSERVATIONS No Since dirty-Critican colored fines grickly	5. 16
wells $L \rightarrow and L \rightarrow only$.	
Merts D y and LPP-SWI and LPP-SW2 only.	
*Wells No. MAFB-4, MAFB-5, and MAFB-8 only.	
tizo days for mercury, o months for other metals. D-44	

					PP-1 n: L.y Paul Peaul ECD Site, First well on right k from access road, at edge of Fill Date: 9/6/84 Time: 1917
	site		let ion		
Wells	·	LPP Surface Water	ea o les	Potable Wells	
X X X X		x x x	X X		IN SITU MEASUREMENTS $pH_6.$ Specific conductance 1650 unto/cm @ ScT: 21°C Depth to water surface from casing top $4'7''$ $(9/5/84)$ Volume of water purged prior to sampling 3.2 bol
		X	x x x		Sample depth Total water depth Auger hole depth Depth to water in a ger hole
x	Ì	Ø	x		SAMPLE COLLECTION AND PRESERVATIONContainerParameters toPreservationHoldingContainerSampleDescriptionbe AnalyzedMethodTime (d)No(s)No.2 oz. plasticDOCFilter, H2S0440C 28XX36716587
x x*	(X) (X)	x xt	x		1 pt. glass 000 H_2SO_4 , 4°C 28 <u>C 25</u> 40 ml. vials (4) VOC 4°C 14 <u>V/3</u>
x		X		x	2 qt. plastic Metals (8) Filter, HNO3 2811 $PU-2$
x			X	x**	2 qt. plastic Lead Filter, ₩0, 180 1 qt. glass/Tefl. Pesticides 4°C 40
x				X**	l qt. glass/Tefl. Herbicides HCl, 4°C 40
			х	x	MISCELLANEOUS Record observations of fuel contamination in soil. Describe sampling value location.
	1		BSERV	TIONS	Water dark gray, turbed, slight septic adver, well

01					on: Lily Pad fond EOD Site, second well going
		r: J			Date: _9/6 Time: _1830
	Site	Gmpl	etio	n	
	$\frac{\alpha}{1}$	<u>wekli</u> Ta	r		I
		urface r	Area - Holor	6	
Wells	LI'P Wells	LPP Sur Water	POL	Potable Wells	
		E	цц, d	а. <u>-</u>	IN SITU MEASUREMENTS
x	(\tilde{X})	x	x	x	pH 5.8
X X	S C S	X	X	x	Specific conductance 0.20 unho/cm $0.5c = 21$ °C
X				x	Depth to water surface from casing top $4' 1 \frac{1}{8'}$ $(9/5/84)$ Volume of water purged prior to sampling $6(0)$ with
		X X			Volume of water purged prior to sampling <u>6.0 jett.</u> Sample depth
			x		Tocal water depth
			X	1 1	Auger hole depth
					Depth to water in auger hole
					SAMPLE COLLECTION AND PRESERVATION
					ContainerParameters toPreservationHoldingContainerSampleDescriptionbe AnalyzedMethodTime (d)No(s)No.
X	\bigotimes	x	x		2 oz. plastic DOC Filter, H2S04 40C 28 XX731 16583
x	0	x	X		1 pt. glass 000 H ₂ 30 ₄ , 4°C 28 <u>C19</u>
X*	\otimes	Xt			40 ml. vials (4) VOC 4°C 14 $V/2$
x	$\textcircled{\baselinetwidth}$	x		x	2 qt. plastic Metals (8) Filter, HNO3 2811 $PU-18$
			x		2 qt. plastic Lead Filter, HNO ₃ 180
хI				X*1	l qt. glæss/Tefl. Pesticides 4°C 40
				X**	l qt. glass/Tefl. Herbicides HCl, 4°C 40
		ł			
x		1			MTC/CET 1 ANEXNIC
			x		MISCELLANEOUS Record observations of fuel contamination in soil.

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	Sampled by: WGT Date: 968 Time: 1908										
•	Lantfill Wells	LPP Wells	LPP Surface Water	POL Area Auger Holes	Potable Wells	IN SITU MEASUREMENTS					
	x x x x x x x x x x x x x x	Colored Colore	x x x x x x x x x x x	x x x x x x x x	x x x x	pH <u>5.7</u> Specific conductance <u>335</u> unho/cm @ <u>5.7:24</u> °C Depth to water surface from casing top <u>4'9³/4" (9/5/84)</u> Volume of water purged prior to sampling <u>3.9</u> α 1. Sample depth Total water depth <u>1</u> Auger hole depth Depth to water in auger hole <u>1</u> SAMPLE COLLECTION AND PRESERVATION Container Parameters to Preservation Holding Container Samp Description <u>be Analyzed Method Time (d) No(s) Ne</u> 2 oz. plastic DOC Filter, H ₂ SO ₄ 4°C 28 <u>XX-732</u> <u>165</u> 1 pt. glass COD H ₂ SO ₄ , 4°C 28 <u>C-24</u> 40 ml. vials (4) VOC 4°C 14 <u>V-11</u> 2 qt. plastic Lead Filter, H ₀ ₃ 180 <u>1</u> 1 qt. glass/Tefl. Pesticides 4°C 40 <u>180</u>					
	X 00HHE 	NIS A	2i0 G%	SERVAL		l qt. glass/Tefl. Herbicides HCl, 4°C 40 <u>MISCELLANEOUS</u> Record observations of fuel contamination in soil. Describe sampling value location. <u>Winker light gray (1st bailer clear), twibid, liffle</u> <u>clearly</u>					

nple Nh	Loc Con	at ion	n Desi	criptio Ma_	9/5-7/84 Field Trip PP-3 Thod Thod r: Lily Pad Pand EOD Site, formath well from counter dock mise, at edge of fill Date: 9/7/84 Field Time: 1142
51		Gaipl eekli	etion st	1	
Wells (PP	ls	LPP Surface Water	ea Dies	Pot able Wells	
X (X (X , X	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	x x x	x x		IN SITU MEASUREMENTS pHS.7 Specific conductance 33.5/ unito/cm @SCT: 24 °C Depth to water surface from casing top Volume of water purged prior to sampling
	,	x	x x x		Sample depth Total water depth Auger hole depth Depth to water in auger hole
x		v	x		SAMPLE COLLECTION AND PRESERVATIONContainerParameters toPreservationHoldingContainerSampleDescriptionbe AnalyzedMethodTime (d)No(s)No.2 oz. plasticDOCFilter, HoSOL 40C 28
x	X	X X	x		2 oz. plastic DOC Filter, H ₂ SO ₄ 4°C 28 1 pt. glass OOD H ₂ SO ₄ , 4°C 28
*	X	xt			40 ml. vials (4) VOC 4°C 14
1	x)(Ti)		x	2 qt. plastic Metals (8) Filter, HNO3 28tt HX-9-discond;
	-		x		2 qt. plastic Lead Filter, HNO3 180 don't need
				x**	l qt. glass/Tefl. Pesticides 4°C 40
				X**	l qt. glass/Tefl. Herbicides HCl, 4°C 40
1 I			x	x	MISCELLANEOUS Record observations of fuel contamination in soil. Describe sampling value location.
		VD OB	SERVA	TIONS_	
MENT	'S A'				

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					PP-4 fourth
nplo A	e Loc Shi	at ion	Desc	riptu	on: Lily Pad Pond EOD Sike, Fith well from entrance
npli	ed by	: <u>W</u>	GT,	-T4	R Date: 9/6/84 Time: 1903
2		Gmpl		I.	
		eckli ay ay	š		
ls	ls	44 1	. Area r Hole	ble Is	
Wells	LPP Wells	LPP Sur Water	POL.	Potable Wells	
x	$\overline{(\mathbf{c})}$	x		x	IN SITU MEASUREMENTS pH 5-4
X	(S) (S) (S) (S) (S) (S) (S) (S) (S) (S)	X	X X	X	Specific conductance 275 unito/cm @ SCT : 22°C
X X	$\langle \mathbf{x} \rangle$			x	Depth to water surface from casing top $4'11''$ $(9/5/84)$ Volume of water purged prior to sampling 7.7_{60}
		X X	ł		Volume of water purged prior to sampling 7.7 gel
			x		Total water depth
			X X		Auger hole depth Depth to water in auger hole
	ł				
					SAMPLE COLLECTION AND PRESERVATION Container Parameters to Preservation Holding Container Sample
					Description be Analyzed Method Time (d) No(s) No.
x	(\mathbf{x})	x	x		2 oz. plastic DOC Filter, H ₂ SO ₄ 40C 28 (2) XX104 16585
X X*	(X)	X	X		1 pt. glass 000 H_2 504, 4°C 28 (2) $C-8$ 40 ml. vials (4) V0C 4°C 14 (8) $V-5$
x	\approx	X [†] X		x	40 ml. vials (4) VOC 4°C 14 (8) $V-5$ 2 qt. plastic Metals (8) Filter, HNO3 28tt(3) $PU-23$ $V/$
			x		2 qt. plastic Lead Filter, HO_3 180
x				x**	l qt. glass/Tefl. Pesticides 4°C 40
x				X*t	l qt. glass/Tefl. Herbicides HCl, 4°C 40
					MISCELLANEOUS
			x		Record observations of fuel contamination in soil.
				X	Describe sampling valve location.
tE	rts a	D OBS	SERVA	TIONS_	Water dark gray, turbid, stephic odor. Nell
er	<u>Cvť</u>	rs c	نسې	chly	·
viel I	ls L-	3 and	L-o	only.	
oca	at ion	s LPP~	-SWL .	and LP	P-Sw2 only. , and MAFB-8 only.

SCORESS SYNCERS SECOND

·	ed by				Date: Time:
1111 s	$-\frac{\alpha}{1}$	eckli agei	ea Dies		
X X X X	XXXXX	X X X X		X X X	IN SITU MEASUREMENTS pH
X X X X X X	(x)(x)(x)	x x x [†] x	x x x	X X** X**	SAMPLE COLLECTION AND PRESERVATIONContainerParameters to be AnalyzedPreservation MethodHolding Time (d)Container No(s)Sample No.2 oz. plasticDOCFilter, H_2SO_4 4°C 28XX 659165711 pt. glassCOD H_2SO_4 , 4°C28C-340 ml. vials (4)VOC4°C14V-82 qt. plasticMetais (8) Filter, HO_3 2811 $PU-13$, $Pu-22$ 2 qt. plasticLeadFilter, HO_3 1801 qt. glass/Tefl. Pesticides4°C40
			x	x	MISCELLANFOUS Record observations of fuel contamination in soil. Describe sampling valve location.

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Sampl	102 S	ite/w	Vell N	ю.: L	PP - 5					
					m: Lily Pail	iend Equ	Site Fil	ish n	eil from	entrar
<u></u>	ing	<u> </u>	nrit	ercla	ockwise (for	st en lef	+ clochni	<u>se), 6</u>	t clas el	6.611
Saupi	ed by	<u>ب</u> : י	WK			Date:	14/54	Time:	1932	
	site.			1						
	1	eekli Ta	5	1						
=		LPP Surface Water	POL Area Auger Hole	U						
Wells	LPP Wells	PP Sur Water	POL A	Pot able Wells						
53	1-1 :3	LP L	d R	Po	IN SITU MEASURE	ምድም በ				
x	62	x	x	X	pH 6 3					
X	1AV	X		x	Specific conduc	tance \$60	unho/cm (d	·····	SCT :	21 °C
X	Č,				Depth to water			5 '2 1/4 "	lairl	84)
X				X		purged prior	to sampling <u>3</u>	. Ugal.	- ·	·
		Х			Sample depth					
			X X		Total water dep Auger hole depti					
			X		Depth to water				······	
					-					<u> </u>
					SAMPLE COLLECTIO			11-1-4	Containen	C
					Description	Parameters to be Analyzed	Preservation Method	Holding Time (d)	Container No(s)	Samp No
x	X	x	X		2 oz. plastic	DOC	Filter, H ₂ SO ₄	4°C 28	XX 73	1658
x	\odot	x	x		l pt. glass	000	H ₂ SO ₄ , 4°C	28	6-23	·{
X*	(i)	xt			40 ml. vials (4) VOC	4°C	14	V-7	
x	(X)	x		x	2 qt. plastic	Metals (8)	Filter, HNO,	2811	HXIOI	
			x		2 qt. plastic	Lead	Filter, HD,	180		
x				x**	l qt. glass/Tel	. Pesticides	. 2	40		
x	Ì			X*1	l qt. glass/Tef.			40		
				.			· · ,		<u></u>	
					MISCELLANEOUS					
			x		Record observat	ons of fuel c	ontamination in	soil.		
				Х	Describe samplin	w valve locat	ion.			
(Y)MG-	- - - - - - - - - - - - - - - 	 	CE RUA			-	1.	. 1 .		
	, + I	<u>_r c</u>	<u>(</u>	2-5	Water dur	V.		21012 3	<u> </u>	<u> </u>
\sim						/				······
<u></u>										

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					MXDY AFB PHASE IIB FIELD SMPLE SHELL 975-7784 FUELT Trup
Sampl <u>mer</u> Sampl	e loc the ed by	at ion	n Des د ک W	eriptic ECe R	PP-6 n: L.ly Ped lend EUD Site, neur winter of GU, ntral mennd Date: 9/6 Time: 1810
		(amp) weck1		l)	
Lantfill Wells	LPP Wells	LPP Surface Water	POL Area	Pot able Wells	IN SITU MEASUREMENTS
X X X X		X X X			pH <u>G.</u> (Specific conductance <u>220</u> unbo/cm \leq <u>5CT 24 °C</u> Depth to water surface from casing top <u>G'2/4" (\cong'5/54) Volume of water purged prior to sampling $\Im = \Im = \Im = \Im$</u>
		X	x x x		Sample depth Total water depth Auger hole depth Depth to water in auger hole
x	x	x	x		SAMPLE COLLECTION AND PRESERVATIONContainerParameters toPreservationHoldingContainerSampleDescriptionbe AnalyzedMethodTime (d)No(s)No.2 oz. plasticDOCFilter, H2SO4400 28XX22416587
X	\odot	x	X	1	$1 \text{ pt. glass} 000 \text{HyS0}_4, 4^{\circ}\text{C} \qquad 28 C-5 \qquad 1$
X*	\otimes	xt			40 ml. vials (4) VOC 4°C 14 <u>V10</u>
х	(\mathbb{X})	х		x	2 qt. plastic Metals (8) Filter, HNO3 2811 <u>PU-10</u>
			X	: 1	2 qt. plastic Lead Filter, HNO3 180
X X				X** X**	l qt. glæss/Tefl. Pesticides 4°C 40 l qt. glæss/Tefl. Herbicides HCl, 4°C 40
			x	x	MISCELLANEOUS Record observations of fuel contamination in soil. Describe sampling value location.
CUMEI 	VIS A	ND OH	SERV/	NTIONS_ <u>*⊱ q</u>	water dark grav, turbed, slight septic alor.
<u></u>					
*****	is :-	1 at at	· · · · · · ·		

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thocations (PP-SW) and (PP-SW2 only.

**Wells No. MAFB-4, MAFB-5, and MAFB-8 only.

ff25 days for mercury, 0 months for other metals.

nple	əd by		<u>NG</u> 2	<u>No.</u>	<u>IP-2 (ontward from fill) in swamp</u> <u>IR</u> <u>Date: 9/6/84</u> Time: 1502
Wells	LPP Wells	ł	POL Area Auger Holes	Pot able Wells	IN SITU MEASUREMENTS
X X X	X X X X	So Xos	x x x x x x x	X X X	pH 4.0 Specific conductance 35 unito/cm @ $SCT: 27 °C$ implify to water surface from casing top Volume of water purged prior to sampling Sample depth Gin Sample depth Gin Gin Gin Gin Total water depth 21 in Gin Gin Depth to water in auger hole Gin Gin Gin
x x x* x x x	X X X X X	N N N N N N N N N N N N N N N N N N N	x x x	X X** X**	l qt. glass/Tefl. Herbicides HCl, 4°C 40
	NTS A		SERVA	X	MISCELLANEOUS Record observations of fuel contamination in soil. Describe sampling value location. Water dark brown (tanning), no usible flow, no be atten marked by PVC state.

MXDY AFB PHASE 11B FLED SMPLE SHEET 9/5-7/8- Field Trip

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NN	· inc E	at ist	i besc WEL	1 No	m: Lily fail . Lff-3 (a	1 tword fro	<u>m 611) ir</u>	s sva	mp ·	<u>c f</u>].
			VGT_	,		Date:9	16184	11082	1535	
	<u>0</u>	nokli Ta j	st 🦻	Ţ]						
Lauffill Wells	u.P.P Wells	PP Surf.nc	POL Area Auger Hole	Pot able Wells						
<u> </u>	- 3	dd'l	P IA	Po	in situ measur	ements				
X	X	$\left[\begin{array}{c} \vdots \\ \vdots \\ \end{array} \right]$	x	x	pH 4.4					
X	X	10	X	X	Specific condu	ctance 31	unio/ca (SCT : 2	<mark>י °</mark> כ
X X	X X				Depth to water				- <u></u>	
Å	л	×		X	Volume of water		to sampling			
			x		Sample depth Total water de	· · · · · · · · · · · · · · · · · · ·				
į		0	X		Auger hole depi					
	1		x		Depth to water	in auger hole		······································		
					SAMPLE COLLECT	ION AND PRESERV	ATTON			
					Container Description	Parameters to be Analyzed		Holding Time (d)	Container No(s)	SampleNo
x	x	(X)	x		2 oz. plastic	DOC	Filter, H ₂ SO ₄	4°C 28	<u>xx 38</u>	16589
λ	x	(\tilde{x})	x		l pt. glass	000	H ₂ SO ₄ , 4°C	28	C-2	1
X*	x	(Rif)			40 ml. vials (4	4) VOC	4°C	14	V-15	
x	x	(x)		x	2 qt. plastic	Metals (8)	Filter, HNOy	2811	FL 113	\checkmark
		9	x	1	2 qt. plastic	Lead	Filter, HNO3	180		
X				x**	l qt. glass/Te	fl. Pesticides	4°C	40		- <u></u>
X				X*	l qt. glass/Ter	fl. Herbicides	HC1, 4°C	40		
					MISCELLANEOUS					
			x	v			ontamination in	soil.		
	[X	Describe sampli	ing valve locat	100.			
umma	ITS A	ND 08	SERVA	rians_	Same as	for LPP-	SWI LUCO	tion n	nerkel	by Fui
31	<u>er</u> ć									
			1> (
					P-SW2 only. , and MAFB-8 only	1.				
					onths for other a					
							D-54			

NV	<u>v</u> .1	<u> </u>	111	Ne	- Lily Pad Pend EUD Site, opproximately 100 ft - LPP-4 (outward from fill) in swamp.
Sample	∘d by	: <u>w</u>	61		Date: 9/6/54 Time: 1605
:		Gaupt			
		<u>a-ckli</u> Ta	<u>ه</u>	<u> </u>	I
=		ir fac	POL Area Auger Hole	2	
Landfil Wells	Li'P Wells	LPP Surf Water	POL Area uger Holo	Pot able Wells	
<u> </u>		11	- 7	a	IN SITU MEASUREMENTS
Х	х	(N) N)	x	x	pH 4.1
X X	X X	$ \mathcal{O} $	X	X	Specific conductance <u>37</u> unho/cm (<u>5CT: 27 °C</u>
X	i n X			X	Depth to water surface from casing top Volume of water purged prior to sampling
		XXXX			Sample depth 6;
		R.	x		Total water depth 14 in
			x		Auger hole depth
			X		Depth to water in auger hole
	1				SAMPLE COLLECTION AND PRESERVATION
					Container Parameters to Preservation Holding Container Samp Description be Analyzed Method Time (d) No(s) No
x	x	(\mathbf{x})	x	1	2 oz. plastic DOC Filter, H2S04 40C 28 XX 263 165
x	x	Tin I	x		l pt. glass 000 Hy904, 4°C 28 C-4
X*	x			ł	40 ml. vials (4) VOC 4°C 14
x	x	(\mathbf{x})		x	2 qt. plastic Metals (8) Filter, HNO3 2811 PU-11
		9	x		2 qt. plastic Lead Filter, HRD, 180
x				x**	l qt. glass/Tefl. Pesticides 4°C 40
x				x*f	l qt. glass/Tefl. Herbicides HCl, 4°C 40
			x	ł	MISCELLANFOUS Record observations of fuel contamination in soil.
				x	Describe sampling valve location.
*****	7DC A		TE DU A		See a Contraction of the Anti-
		- Ke		rions_	Same as for LPP-SWL . Location marked with
Le La		<u>, not</u>			

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MODY AFB PHASE IIB FIELD SAMPLE SHEET: 9/5-7/84 Field Trip

•				-PP-SW4 on: PLily Pad fond ECD Site, approximately 150 p	~ +
N.P.5t	- ci	NP	N. Ne	0. LPP-5 (outward from, Fil) in swamp	<u> </u>
Sampled			<u></u>	Date: $\frac{3}{6}/\frac{84}{100}$ Time: $\frac{1624}{100}$	
fill ls	Wells	Area 181			
Land Wel	LPP	POL	Pot		
		$\frac{1}{1}$	+{	IN SITU MEASUREMENTS	
1 1				pH 4. [Specific conductance 33 units/cm $\frac{1}{2}$ Set 2	-7 °C
	x C	1 "		Depth to water surface from casing top	
X :			X	Volume of water purged prior to sampling	
				Sample depth 6 m	
	X	X X	· · · ·	Total water depth 17 in	
			1 1	Auger hole depth	
			·	Depth to water in auger hole	
				SAMPLE COLLECTION AND PRESERVATION Container Parameters to Preservation Holding Container Description be Analyzed Method Time (d) No(s)	SampleNo
x X	< (x)	X		2 oz. plastic DOC Filter, $H_2SO_4 = 40C$ 28 $\times \times = 9.8$	16591
X X	(X)	x	{ }	1 pt. glass 000 H ₂ SO ₄ , 4°C 28 <u>C \6</u>	
x* >	(X	11		40 ml. vials (4) VOC 4°C 14	
x x	$\left \mathbf{x} \right $		x	2 qt. plastic Metals (8) Filter, HNO3 2811 P.1-12	
	P	x		2 qt. plastic Lead Filter, HNO3 180	
x			x**	l qt. glæss/Tefl. Pesticides 4°C 40	
x			X**	l qt. glass/Tefl. Herbicides HCl, 4°C 40	
		x	x	MISCELLANEOUS Record observations of fuel contamination in soil. Describe sampling value location.	
001112/15	AND O	ISERV	ATIONS	Same as for LPP-SWI Location marked by	rv c
str.K					
₩wells					
				PP-SW2 only.	
				b, and MAFB-8 only. months for other metals.	
				D-56	

					MXDY AFB PHASE IIB FIELD SAMPLE SHEET 9/5-7/84 Field Trip
ann I	ing S	ite/m	ATT N	i. · N	POL-1
-					Morth POL Aren, 51/2 Fence pusts SW of N conner,
					side) of fence
			v67		Date: 9/6/84 Time: 1120
	-				
		Compl wekli	etion st		
		2	1		
s 111	s s	LPP Surfac Water	POL Area Auger Holes	e le	
indf iel L	LPP Wells	PP Surl Water	OL BEL	Potable Wells	
ء لا	2	Ē	F 4	H F	IN SITU MEASUREMENTS
x	x	x	1ÑI	x	pli 4.8
X	X	X	Ŕ K	X	Specific conductance 118 unito/cm @ ScT = 26 °C
Х	X		ľ		Depth to water surface from casing top
Х	X	x		x	Volume of water purged prior to sampling
	ļ	X			Sample depth
			\otimes		Total water depth <u>Sin</u>
			(S) (S)		Auger hole depth 7.5 ft.
					Depth to water in auger hole <u>6 ft. 10 m.</u>
					SAMPLE COLLECTION AND PRESERVATION
					Container Parameters to Preservation Holding Container Sample
					Description be Analyzed Method Time (d) No(s) No.
Х	Х	X	(\mathbf{x})		2 oz. plastic DOC Filter, H_2SO_4 40C 28 <u>XX 671</u> <u>16597</u>
Х	X	X	(X)		1 pt. glass COD H ₂ SO ₄ , 4°C 28 <u>C-9</u>
λ*	X	Xt			40 ml. vials (4) VOC 4°C 14
x	X	x		x	2 qt. plastic Metals (8) Filter, HNO3 2811
			X		2 qt. plastic Lead Filter, HNO, 180 <u>PU-15</u>
x		Ì		x*1	l qt. glæss/Tefl. Pesticides 4°C 40
x				X*f	l qt. glass/Tefl. Herbicides HCl, 4°C 40
			X		191. glass/Tefl. 0.1+Gr. H2504.4°C PE-1 V
					MISCELLANFOUS
			(X)		Record observations of fuel contamination in soil.
				X	Describe sampling valve location.
OME	NTS A	ND OB	SERVA	TIONS	0.1 sheep clearly visible on water in backhoep.
-	<u>co 6</u>	~	el	oder	- in clayey sand below 4 Ft. depth. Fnel edir net
-	ر <u>مدر ما</u>		in_c	-	sand above 4- Ft. depth. Clarey sand below 4 Ft. is
de	1.1	- cele	rel	- b.	wo-Gray-orange-red). Strong Fuel ador in water
			A A -	1	the million of the set of the set of the set of the
50	mpie	e d.	66++		.th halgene cup taped to wood paddle.
Sa Miel Moc	mpie ls L- ation	r di 3 and 15 LPP	1.~o ∽5₩1	only. and LP	rr-Sw2 only.
Sic Wel Noc Wel	mpio 1s L- ation 1s No	e di 3 and 15 LPP 14 MAF	L~o ∽5₩1 Ъ~4,	only. and LP MAFB-0	

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MODY AFB PHASE IIB FIELD SAMPLE SHEET 9/5-7/84 Field Trip

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mple	e <u>e 1</u> ed by	: 	DP	C	n: North POL side) of Fend	Date:	24 Sag 84	Time:	0930 -	1000
:	(h	kmpl eckli g	st vn	<u> </u>						
Wells	s	LPP Surface Water	POL Area Auger Hole:	ole Is						
Wells	LPP Wells	LPP S	POL	Pot able Wells						
				$\left - \right $	IN SITU MEASUREM	FNTS				
X X	X X	X X	X	X X	pH Specific conduct	ance	umho/cm (e			• <u></u> C
x	X				Depth to water s					
X	X	x		x	Volume of water					
		x			Sample depth					
			X	{	Total water dept					
1			X	{ }	Auger hole depth Depth to water i		4.5 FT			
			r			_				
					SAMPLE COLLECTIC	N AND PRESERV Parameters to		Holding	Container	Sample
					Description	be Analyzed	Method	Time (d)	<u>No(s)</u>	No.
x	х	x	X		2 oz. plastic	DOC	Filter, H2SO4	4°C 28		
x	x	x	X		l pţ. glass	000	H ₂ 904, 4°C	28		
x*	x	xt	X		40 ml. vials (4)	VOC	4°C	14	V34-1	16853
x	x	x		x	2 qt. plastic	Metals (8)	Filter, HNO3	2811		
			X		2 qt. plastic	Lead	Filter, HNO3	180		
x			ľ	x**	l qt. glæss/Tefl	. Pesticides	4°C	40		
х				X**	l qt. glass/Tef	. Herbicides	HC1, 4°C	40		
					MISCELLANEOUS					
			¥		Record observat	ions of fuel o	contamination in	soil.		
			ľ	X	Describe samplin	ng valve locat	ion.			
ME	NTS A	ND OF	SERVA	TIONS	cinro 4	· · /				
	, 1	1. 5	<u>::;:</u>	<u>''' / 1</u>	CHARD LA	· · · · · ·		<u>بر</u>	·	
						<u></u>				
										

	ner		14 F		North POL Area, 21/2 fence posts NE of W NW (untside) of fence Date: <u>a/6/84</u> Time: <u>1133</u>
		Gampi a-skli	let ion ist		
Wells	LPP Wells	face	ea o les	Pot able Wells	
 X	x	 x		x	IN SITU MEASUREMENTS pH 4,Z
X X X X X X X	x x x x x x	x x x x x x	କ୍ଷାକ୍ର (କ୍ଷାକ୍ର କ୍ଷାକ୍ର	x	Specific conductance 55 unho/cm ($\frac{6}{25}$ $5c7:25$ °C Depth to water surface from casing top Volume of water purged prior to sampling Sample depth $567:25$ °C Total water purged prior to sampling Sample depth Total water depth 6 °A. Auger hole depth $8.5 ff$. Depth to water in auger hole $8.5 ff$. SAMPLE COLLECTION AND PRESERVATION Container Parameters to Preservation Pescription be Analyzed Method Time (d) No(s) 2 oz. plastic DOC DOC Filter, H_2SO_4 4°C 28 $XX 73o$ 1 pt. glass COD H_2SO_4 , 4°C 40 ml. vials (4) VOC 4°C
x x x	X	x	(X) (X) (X)	X X** X**	2 qt. plastic Metals (8) Filter, HNO3 2811 <u>PUT-16</u> 2 qt. plastic Lead Filter, HNO3 2811 <u>PUT-16</u> 1 qt. glass/Tefl. Pesticides 4°C 40 1 qt. glass/Tefl. Herbicides HCl, 4°C 40 1 qt glass/Tefl. $O:1+Gr$. H_2SO_{4} , 4°C $HE-9$ V <u>MISCELLANEOUS</u> Record observations of fuel contamination in soil. Describe sampling valve location.

MADY	AF B	PHASE	IIB	FIELD	SAMPLE	SHEET
		9/5-7	1/84	Field	Ттэр	

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ianple <u>com</u>	e loc	at ion	Desc 	riptio	North Pol Aren, 21/2 fence posts NE of W w (outside) of fence Date: 24 Sep 84 Time: 0932 - 1015
fill ls	Un st	LPP Surface of Water Water		ble ls	IN SITU MEASUREMENTS
X	X	x	X	X	pH
X X	X X	X	X	X	Specific conductanceumho/cm (C Depth to water surface from casing top
x	x	x		x	Volume of water purged prior to sampling
		X			Sample depth
			X		Total water depth $0.5/7$
			X		Auger hole depth $10.5 f^2$ Depth to water in auger hole $10.0 f^2$,
- {			Y		
					SAMPLE COLLECTION AND PRESERVATION Container Parameters to Preservation Holding Container Sample
					Description be Analyzed Method Time (d) No(s) No.
x	x	x	X		2 oz. plastic DOC Filter, H ₂ SO ₄ 4°C 28
x	x	x	X		1 pt. glass 000 H ₂ SO ₄ , 4°C 28
X*	x	xt	X		40 ml. vials (4) VOC 4°C 14 $\sqrt{0}A \cdot 2/v_0 r \cdot 3 \cdot 16854/165$
x	x	x		Ø	2 qt. plastic Metals (8) Filter, HNO3 281t
{			X		2 qt. plastic Lead Filter, HNO3 180
x				x**	l qt. glass/Tefl. Pesticides 4°C 40
x				X*1	l qt. glass/Tefl. Herbicides HCl, 4°C 40
	[
			X		MISCELLANEOUS Record observations of fuel contamination in scil.
			<u>r</u>	х	Describe sampling valve location.
()ME	ITS A	ND OBS	FRVA	TIONS	start will offer.
Un		5820	1		and prove 6 hours to lola.
		- 1-		i 	/ <u> </u>
		3 and			P-SW2 only.
"Well	ls No	. MAFI	5-4,	магв-6	, and MAFB-8 only.
†28 d	lays	for m	ercur	y, 6 m	onths for other metals. D-60

				100	Date: 9/5/54 Time: 1630
		Campl neckli		l	
Lanffill		LPP Surface Water		Potable Wells	
X X	X X	X X	x		IN SITU MEASUREMENTS pH 7,25 Specific conductance 225 untro/cm @ (21.5.+h.mm) SCT: 22 °C
x x x	XXX	x x x	x x x	Ś	Depth to water surface from casing top Volume of water purged prior to sampling $\sim 14,000$ gcl. Sample deptin Total water depth Auger hole depth Depth to water in auger hole SAMPLE COLLECTION AND PRESERVATION Container Parameters to Preservation Holding Container Sample Method Time (d) No(s) 2 oz. plastic DOC Filter, H $_2$ SO4 4°C 28
х х* х	x x x	X X [†] X	X	X	1 pt. glass OOD H_2SO_4 , 4°C 28 40 ml. vials (4) VOC 4°C 14 2 qt. plastic Metals (8) Filter, HNO3 2811 FL 102 16594
x x			x	X	2 qt. plastic Lead Filter, HNO; 180 1 qt. glass/Tefl. Pesticides 4°C 40 1 qt. glass/Tefl. Herbicides HCl, 4°C 40
			x	X)	MISCELLANEOUS Record observations of fuel contamination in soil. Describe sampling valve location.

MOODY AFB PHASE THE FIELD SAMPLE SHEET 9/5-7/84 Field Tru: ----

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apl	ed by	: _ v	16	7	lop	C Date: 9/5/64 Time: 1630
		Campl eckli		i (n 1		
	r	T	1	~ <u>~</u>		
		LPP Surface Water	Area	Auger Hole	e (
Wells	LPP Wells	PP Surl Water	POL	198	Pot able Wells	
3	- 3	L L		Au	a s	IN SITU MEASUREMENTS
	x	x	\square	~~~~~	X	pH
2	X	X		X X	Ŷ	Specific conductance units/cm (d °C
	Х			l		Depth to water surface from casing top
	X	X			X	Volume of water purged prior to sampling
		X				Sample depth
;				X X		Total water depth
1				A X		Auger hole depth Depth to water in auger hole
					Į	
						SAMPLE COLLECTION AND PRESERVATION
					ł	ContainerParameters toPreservationHoldingContainerSampleDescriptionbe AnalyzedMethodTime (d)No(s)No.
	x	x		x		2 oz. plastic DOC Filter, H ₂ SO ₄ 4°C 28
	X	x		x		1 pt. glass COD H ₂ SO ₄ , 4°C 28
*	x	xt				40 ml. vials (4) VOC 4°C 14 \rightarrow 165 73
	x	x			(\mathbf{x})	2 qt. plastic Metals (8) Filter, RNO3 2811 (HX-21)(FL-114)
				x		2 qt. plastic Lead Filter, HNO3 180
				ļ	م م م	l qt. glass/Tefl. Pesticides 4°C 40
					y	l qt. glass/Tefl. Herbicides HCl, 4°C 40
						MISCELLANEOUS
				X	X	Record observations of fuel contamination in soil. Describe sampling valve location.
1]	TS A	ND OB	SER	VAT	nais	

tt25 days for mercury, 5 months for other metals.

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errol	ing S	ite/w	iell N	ь.:М	AFB-2
-					n: Petuble Well No. 2, Main System, Bldg, 946
mple	əd by	: <u>v</u>	VGT	101	PC- Date: 9/5/84 Time: 1604
;		Gaipt eckli	etim st		
Wells	LPP Wells	LPP Surface Water	POL Area Auger Holes	Potable Wells	IN SITU MEASUREMENTS
X X X X	X X X X	X X X	X X	(X)	pH 7.2 pH 7.2 Specific conductance 234 unbo/cm $\frac{3}{22-therm}$ SCT $\frac{23}{C}$ Depth to water surface from casing top Volume of water purged prior to sampling $-55,560$ and $\sim 61,160$ cm
		X	x x x		Sample depth Total water depth Auger hole depth Depth to water in auger hole
					SAMPLE COLLECTION AND PRESERVATION Container Parameters to Preservation Holding Container Sample Description be Analyzed Method Time (d) No(s) No.
X	X	x	X		2 oz. plastic DOC Filter, H ₂ SO ₄ , 4°C 28 1 pt. glass COD H ₂ SO ₄ , 4°C 28
X	X	X	X		l pt. glass COD H ₂ SO ₄ , 4°C 28 40 ml. vials (4) VOC 4°C 14
X* X	X X	XI			2 qt. plastic Metals (8) Filter, HNO_3 2811 FLICO 16595
^		Х	x	$ \mathcal{O} $	2 qt. plastic Lead Filter, 1803 180
x			l î		l qt. glæss/Tefl. Pesticides 4°C 40
x				yre	l qt. glass/Tefl. Herbicides HCl, 4°C 40
			x	(X)	MISCELLANEOUS Record observations of fuel contamination in soil. Describe sampling value location.
1	NTS A	ND OF	SERVA	TIONS <u>Fren</u>	Sampling value in main discharge line 5 feet n pump inside Blog- 946. Strong sulfur edar.

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MXDY AFB PHASE IIB FIELD SAMPLE SHEET 9/5-7/84 Field Trip

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Sampling Site/Well No.: MAFB-3 Sample Location Description: Potential va

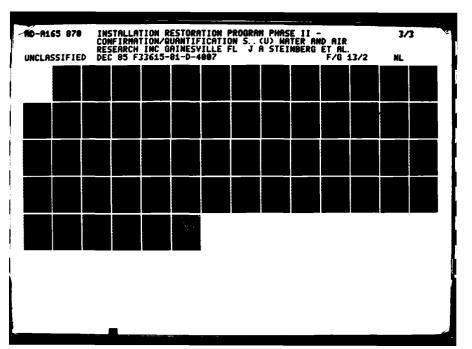
Sampl	ed by	:	<u>u (</u>	T	101	26	Date:	9/5/84	Time:	1629	
	Site (h	umpi eckli		i. n 1	_						
Lardfill Wells	LPP Wells	LPP Surface Water	POL Area	Auger Holes	Potable Wells	in situ measur	ements				
X X X X	X X X X	X X		X X		Depth to water	surface from				23 °C
~	~	X X		x x x	(X)	Volume of wate: Sample depth Total water dep Auger hole dep Depth to water	pth	to sampling	- 12, 6.00	2 gal	
						SAMPLE COLLECT Container Description	ION AND PRESER Parameters to be Analyzed	p Preservation	Holding Time (d)	Container No(s)	SampleNo.
x	x	x		x	[2 oz. plastic	DOC	Filter, H_2SO_4	40C 28		
x [X (x		x		l pt. glass	CCD	H ₂ SO ₄ , 4°C	28		<u> </u>
_X*	X	Xţ	Í	{	(40 ml. vials (4	4) VOC	4°C	14	·	
x	x	x			∇	2 qt. plastic	Metals (8) Filter, HNO3	2811	FL116	16596
				x		2 qt. plastic	Lead	Filter, HNO3	180		·
X					المتخبر	l qt. glæss/Tei	El. Pesticides	4°C	40		
x					J'A	l qt. glass/Tef	1. Herbicides	HC1, 4°C	40		
				x	(\mathbf{x})	MISCELLANEOUS Record observat Describe sampli		contamination in .	soil.		
xmer 	rts an _BL	D OB Ja	SER 9	VAI 8 -	TONS_	Sampling	valve 1	unted ju	st cut	side ne	st wall

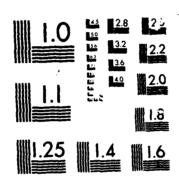
*Wells L-3 and L-0 only.

flocations LPP-SWL and LPP-SW2 only.

**Wells No. MAFB-4, MAFB-6, and MAFB-8 only.

1128 days for mercury, 6 months for other metals.





CULTURE V

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MICROCOPY RESOLUTION TEST CHART NATIONAL BURLAU DE CEANDARDS 1964 A

ampl	ing S	Site/W	iell I	ю.: <u>М</u>	AFB-4
ampl	e Loc	ation	n Deso	riptic	אר
ample	ed by	مد :	16	~	Date: 9/7/841 Time: 1425
			-		
		Ganpl eekli		, 	
		a de la	lrea Holos	$ \downarrow $	
Wel Is	P I Is	LPP Surt Water	L Area	Pot able Wells	
Ne.	dari Meri	dd 1	POL :	Pot ab Wel l	
					IN SITU MEASUREMENTS pH 7.3
X X	X X	X X	X		Specific conductance 285 unho/cm ℓ $\zeta cr \cdot 24.5^{\circ}C$
x	х				Depth to water surface from casing top
х	X	x		(\mathbf{x})	Volume of water purged prior to sampling ~ 16,500 gul
		X			Sample depth
			X		Total water depthAuger hole depth
			x		Depth to water in auger hole
				} [SAMPLE COLLECTION AND PRESERVATION Container Parameters to Preservation Holding Container Sample
					Description be Analyzed Method Time (d) No(s) No.
x	x	x	x		2 oz. plastic DOC Filter, H ₂ SO ₄ 40C 20
x	x	x	x		1 pt. glass 000 H ₂ SO ₄ , 4°C 28
X*	x	xt			40 ml. vials (4) VOC 4°C 14
x	x	x		(\mathbf{x})	2 qt. plastic Metals (8) Filter, HNO3 2811 <u>HX-10 16597</u>
			X		2 qt. plastic Lead Filter, HNO3 180
x				(**	1 qt. glæss/Tefl. Pesticides 4°C $40 PE - 1C$
x				X*	l qt. glass/Tefl. Herbicides HCl, 4°C 40 HE-ICI
					MISCELLANEOUS
ł			X	C.	Record observations of fuel contamination in soil.
			X	(X)	Record observations of fuel contamination in soil. Describe sampling valve location.
XA42	its a	ND OH	SERVA	TIONS	No shony clars, Sample, directly from 4-inch
				: 235	

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ampl	ed by	: <u>v</u>	167	-/0	ΡC	Date:	4/5/84	Time:	1110	
	Site	(* #itp i	et 101				•			
		eekli	st							
Landfull Wells	LPP Wells	LPP Surfice Water	POL Area	Pot able Wells	IN SITU MEASUREM	2705				
x	x	x	X	13	pH 6.9	2115				
Х	x	x	X	S)	Specific conducta			1 - + herm .)	SCT : 2:	2 °C
X X	X X			$(\hat{\mathbf{x}})$	Depth to water s			20-+		(())
~	Â	X X		01	Volume of water p Sample depth	purged prior	to sampling ~	-3006	Jat 1 2,1	60 yel
			x		Total water depth	<u></u> າ				
			x	1 1	Auger hole depth					
			X		Depth to water in	n auger hole_				
			-		SAMPLE COLLECTION	N AND PRESERV	ATION			
					Container 1 Description	Parameters to be Analyzed	Preservation Method	Holding Time (d)	Container No(s)	SampleNo
x	x	x	x		2 oz. plastic	DOC	Filter, H ₂ SO ₄	4°C 28		
x	x	x	x		1 pt. glass	CCD	H ₂ SO ₄ , 4°C	28		• <u></u>
X*	x	X†			40 ml. vials (4)	VOC	4 ° C	14		
x	x	x		(X)	2 qt. plastic	Metals (8)	Filter, HNO;	2811	FL 115	16598
			x		2 qt. plastic	Lead	Filter, HNO;	180	<u></u>	- <u></u>
x					l qt. glæss/Tefl.	Pesticides	4°C	40		·
x				X×	l qt. glass/Tefl.	Herbicides	HC1, 4°C	40		·
					MISCELLANEOUS					
	1		X		Record observation	ons of fuel c	ontamination in	soil.		
				\otimes	Describe sampling					
							ated ~ 3 fee		ch.	<i>r</i>
					Sameling 40				- h .	~

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1128 days for mercury, 6 months for other metals.

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					AFB-SA					
					on: Ordnunce	Aren po	table wel	1 40 F	eet wes	t cf
ample	ed by	: <u>v</u>	4 16T	106	1 <u>9.1112)</u> se	Date: 9	15/84	Time:	1543	
5		uππpl eckli		ר						
		T	1							
Wells	LPP Wells	Surfa	Area	ole						
Wells	Hel	PP	POL	Potable Wells						
				·[]	IN SITU MEASURE	MENIS				
x	X	x	x	· · ·	pH 7 2					•
X X	X X	х	X	(C)	 Specific conduct Depth to water 		$(\pi h)/m (2/2)$	5-thorm)	5(7:22	<u></u>
x	X	v		(X)	•		to sampling ~	1800 ~~		
		X X			Sample depth			<u> </u>		
			x		Total water dep	ch				
			X	1 1	Auger hole dept					
			X		Depth to water	in auger hole_				
[[{ {	SAMPLE COLLECTI	ON AND PRESERV	ATION			
					Container Description	Parameters to be Analyzed	Preservation Method	Holding Time (d)	Container No(s)	SampleNo
x	x	x	x		2 oz. plastic	DOC	Filter, H ₂ SO ₄	4°C 28		
x	x	x	x		l pt. glass	COD	H ₂ SO ₄ , 4°C	28		
X*	x	xt			40 ml. vials (4) VOC	4°C	14		
x	x	x		$\hat{\mathbf{x}}$	2 qt. plastic	Metals (8)	Filter, HNO3	2811	FL 118	16599
			x		2 qt. plastic	Lead	filter, HNO،	180		
x		{	ł	X	l qt. glæss/Tef	1. Pesticides	4°C	40	FL-HS	
x				X	l qt. glass/Tef	1. Herbicides	HC1, 4°C	40		
					MISCELLANEOUS					
			x				ontamination in	soil.		
				(X)	Describe sampli	ng valve locat	ion.			
MEN	TS AL	ND OB	SERVA	TIONS	Sampled n	+ value	in E-meh	mair	immed	intely
					wall at t	1, july 1117	in E-meb			

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		<u>لہ</u> : نوبیہ	-		Date: <u>9784</u> Time: <u>1045</u>
		144 k 1 T		· · · · · · · · · · · · · · · · · · ·	(
Lanif ill Wells	LPP Wells	LPP Surface Water	POL Area	Pot able Wells	IN SITU MEASUREMENTS
X	x	x	I s	(\mathbf{x})	pH7.7
X X	X X	X		C	Specific conductance ZZS unho/cm (decoded statements) ScT : ZZ *C Depth to water surface from casing top
х	X	x		(\mathbf{x})	Volume of water purged prior to sampling ~ 2090 (46.).
		X			Sample depth
			X	1 1	Total water depth
			X X	1 1	Auger hole depth Depth to water in auger hole
	i				SAMPLE COLLECTION AND PRESERVATION Container Parameters to Preservation Holding Container Sample
					Description be Analyzed Method Time (d) No(s) No.
x	x	x	x		2 oz. plastic DOC Filter, H ₂ SO ₄ 4°C 28
x	x	x	x		1 pt. glass 000 H ₂ SO ₄ , 4°C 28
x*	x	xt			40 ml. vials (4) VOC 4°C 14
x	x	x		(X)	2 qt. plastic Metals (8) Filter, HNO3 28tt PU-17 16600
			x		2 qt. plastic Lead Filter, HNO3 180
x				6.21	l qt. glass/Tefl. Pesticides 4°C 40 PE-102
x				0	l qt. glass/Tefl. Herbicides HCl, 4°C 40 HE-10
	}				MISCELLANEOUS
			X		Record observations of fuel contamination in soil.
				(\mathbf{x})	Describe sampling value location.

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NAMASAN ZURGER

					9/5-7/84 Field Irip				
Sampling Site/Mell No.: MAFB-7 Sample Location Description: Bldg. 1705 - Missien Lake: Potable well									
Sampled by: WGT, OPC. Date: 9/5/94 Time: 1127									
		Gaap) eerk b	let i n	:					
Wells		935	1	Pot able Wells					
3 34	_] _R	1 ² 1		· 64	IN SITU MEASUREMENTS				
X X X	X X X	X X X X		نې نې	pH_7.4 Specific conductance 234 unho/cm @ (21 + herm) ScT: 21.8 °C Depth to water surface from casing top Volume of water purged prior to sampling ~ 435 gel. Sample depth Total water depth Auger hole depth Depth to water in auger hole SAMPLE COLLECTION AND PRESERVATION Container Parameters to Preservation Holding Container Sample Method Time (d) No(s)				
x	x	x	x		2 oz. plastic DOC Filter, H ₂ SO ₄ 4°C 28				
x	X	x	x		1 pt. glass COD H ₂ SO ₄ , 4°C 28				
X*	X	xt	}		40 ml. vials (4) VOC 4°C 14				
X	X	x		(\mathfrak{S})	2 qt. plastic Metals (8) Filter, HNO3 2811 FL 117 16601				
			X	**	2 qt. plastic Lead Filter, HNO3 180				
X				X	l qt. glass/Tefl. Pesticides 4°C 40				
X	ITS AN	D OH	X		I qt. glass/Tefl, Herbicides HCl, 4°C 40 <u>MISCELLANEOUS</u> Record observations of fuel contamination in soil. Describe sampling value location. Sampling to place to detail beach				

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					MEXIN AFB PRASE IIB FIELD SAMPLE SEDT. 9/5-7/54 Field Irip						
ampl	104.3	nite/h	dell ta	0. : M 1	AFR - S						
anpi	нілк	ation	i Desci	riptio							
ample	ed by	/: <u>\</u>	.67		Date: 9/7/84 Sime: 1110						
	Site	ապորյ	letia.		·						
	:2	<u>ne kli</u> Ta	$\frac{1}{7}$	1 -1							
11		Surf 1	fred fole	9							
antri Wells	L'ir birl Is	LPP Sur Water	POL ,	Pot able hells							
					IN SITU MEASUREMENTS						
X X	X X	X X			pH 7.4 Specific conductance 225 unto/cm 16 SCT: 23 °C						
X	X		K	\odot	Depth to water surface from casing top						
Х	X	x		Ċ	Volume of water purged prior to sampling ~ 16,500 gel						
		X			Sample depth						
					Total water depthAuger hole depth						
			x		Depth to water in auger hole						
	{				SAMPLE COLLECTION AND PRESERVATION						
					Container Parameters to Preservation Holding Container Sampl Description be Analyzed Method Time (d) No(s) No.						
x	x	x	v		2 oz. plastic DOC Filter, H2SO4 4°C 28						
x	X	X	X		l pt. glass COD H ₂ SO ₄ , 4°C 28						
X*	x	xt			40 ml. vials (4) VOC 4°C 14						
x	х	x		$(\overline{\mathbf{x}})$	2 qt. plastic Metals (8) Filter, HNO3 2811 $fy-2.0$ 1660	2_					
			x		2 qt. plastic Lead Filter, HNO, 180						
х					l qt. glæss/Tefl. Pesticides 4°C 40 <u>PE-101</u>						
X					l qt. glass/Tefl. Herbicides HCl, 4°C 40 $HE \sim 11$ V						
			x		MISCELIANEOUS Record observations of fuel contamination in soil.						
				$\overline{\mathbb{V}}$	Describe sampling valve location.						
19 11	NIS .	AND O	ISERVA	TIONS	Water has sulfur ador. Sampled at end	i f					
<u></u>	<u>e h. (</u>		f		to lake						

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				ript w / V P C	Date: 9/5/84 Time: 1247
		umpl eesti			
Lantfill Wells	LI'P Wells	LPP Surface Water	POL Area August Holes	Pot able Wells	
X X X X	X X X X	X X X X	X X X X X X	(X) (X)	IN SITU MEASUREMENTS pli 6.7 Specific conductance 103 unho/cm (= (23 therm.) 5CT : 24 °C Depth to water surface from casing top Volume of water purged prior to sampling ~ 80 gul. Sample depth Total water depth Auger hole depth Depth to water in auger hole
X X X* X	X X X X	X X X [†] X	x x	$\overline{\mathbb{X}}$	SAMPLE COLLECTION AND PRESERVATIONContainerParameters toPreservationHoldingContainerSampleDescriptionbe AnalyzedMethodTime (d)No(s)No.2 oz. plasticDOCFilter, H_2SO_4 4°C 28
x x			x	yr. Yr	2 qt. plastic Lead Filter, HNO3 180 1 qt. glass/Tefl. Pesticides 4°C 40 1 qt. glass/Tefl. Herbicides HCl, 4°C 40 MISCELLANEOUS Record observations of fuel contamination in soil.
<u></u> {		<u>.'a.</u>			Describe sampling value location. <u>Sampled from 1-inch value at well head, ahead</u> <u>feed. freesure tonk is chead (downshears) of sampling</u>

					MAIN AF.	8 Hust 116 Flr 975-7754 Fr	du) Sanna Aib ell Ad Trup			
					4 <u>FB-12</u> m: <u>Transm</u>	ter site	putuble	Lace 11	(Bidg.	500.
Sampl	ed by	<u></u>	v G	7/01	۰ <u>८</u>	Date: 9	15/84	Time:	1504	
Lant111 Weils	511+ 	LPP Surface	.et 1. 1 st	- •	in situ measuri	እፋንያፕና				
X X X X	X X X X	X X X X		88 (x) (x) 88	pH <u>7.2</u> Specific conduc Depth to water	surface from c purged prior th	unho/cm_@ rasing top to sampling	- 2 0 80	sct : gul	22.5 °C
					SAMPLE COLLECT Container Description	-		Holding Time (d)	Containe No(s)	r Sample No.
X	х	X	2	1 1	2 oz. plastic	DOC	Filter, H ₂ SO ₄			
X	X	X	2		1 pt. glass	000	H ₂ SO ₄ , 4°C	28		
X*	X	Xţ			40 ml. vials (4		4°C	14		
X	X	Х			2 qt. plastic		Filter, HNO3		HX 3	16604
					2 qt. plastic l qt. glass/Tef	Lead	Filter, HNO3	180		
X X				X	l qt. glass/let			40 40		
	NTS A	4D 08 5 1	SFRV	ATIONS	MISCELLAGOUS Record observat Describe sampli Sampling wifter oder	ions of fuel c ng value locat $ablu \in locat$ $ablu \in locat$	ontamination in ion. a + a + b = a + b = b = a + b = b = b = b = b = b = b = b = b = b	soil. <u>bettem</u>	.t.p	<u>essure-</u>
					pling hist	on is der	instream	or mes	<u> 5 4 1 1</u>	<u></u>

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Marils L=3 and L=9 only.

thocations LPP-Swl and LPP-Sw2 only.

**Wells No. MAFb→, MAFb→, and MAFb→b only.

*'D days for moreory, b months for other metals.

mp Ie	ed by	: <u> </u>	16T	109	Date:	15/54	Time:	1521	
		(ang)l				·			
	<u></u>	$\frac{\alpha (1)}{2}$							
s	s	LPP Surface Water	PUL Area Auger Holes	s s					
Wells	LPP Wells	.PP Sur Water	FUL	Pot able Wells					
				<u> </u>	IN SITU MEASUREMENTS				
X	X	X	x	1	pii 7.4				• .
X X	X X	Х	X	(\mathfrak{D})	Specific conductance 236 Depth to water surface from α	unho/cm @		SCT : 22	2 <u>°C</u>
x	X			(Å)	Volume of water purged prior		22200	al.	
		X X			Sample depth	· · · · · · · · · · · · · · · · · · ·			
			X		Total water depth				
			X		Auger hole depth		<u></u>		
					Depth to water in auger hole				<u> </u>
					SAMPLE COLLECTION AND PRESERV	_ <u></u>		- · ·	- · ·
					Container Parameters to Description be Analyzed	Preservation Method	Holding Tíme (d)	Container No(s)	Sample No.
x	x	x	x		2 oz. plastic DOC	Filter, HoSO4	4°C 28		
x	x	x	x		1 pt. glass COD	H ₂ SO ₄ , 4°C	28		
x*	x	Xt			40 ml. vials (4) VOC	4°C	14		
x	x	x		$\langle \mathbf{x} \rangle$	2 qt. plastic Metals (8)	Filter, HNO;	2811	FL 108	16605
			x		2 qt. plastic Lead	Filter, HNO,	180		
x		ł		X	l qt. glæss/Tefl. Pesticides	4°C	40		
x				sit	l qt. glass/Tefl. Herbicides	HC1, 4°C	40		
	ł								
					MISCELLANEOUS				
- [x	(š)	Record observations of fuel of Describe sampling valve locat		sort.		
			1		Describe sampling valve local	100.			
				TIONS	Sampling value la				
51:	aht	<u> </u>	14	er o	lor. Pressure tank 1	aqueity 15	approx	-scegal.	<u>Simple</u>

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APPENDIX E

SAMPLING AND ANALYTICAL PROCEDURES

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APPENDIX E SAMPLING AND ANALYTICAL PROCEDURES

E-1.0 ANALYTICAL QUALITY CONTROL

All field sampling and quality control spiking were performed by WAR. All sample analyses, with the exception of TOX, were performed by TSI. TOX analyses were performed by UBTL. Each of the above organizations maintains a strict quality assurance/quality control (QA/QC) plan which is outlined in a detailed document. These QA/QC documents were not appended in this report due to their length. This appendix outlines QA/QC procedures directly relevant to the Moody AFB Phase II Stage 1 survey.

Accuracy of analytical techniques is assured by strict adherence to the methods listed in Table E-1. Integrity and representativeness of the sample is assured by sampling procedures described in Section E-2.0. A check on analytical quality control is provided for by duplicating a minimum of 10 percent of the samples in each analysis lot. Additional samples were collected to provide for spiking 10 percent of total phenolics and metals samples. Samples for DOC, COD, oil and grease, VOA, and VOH were not spiked. Duplicate and spike samples were labeled in such a way that the analytical laboratory could not identify them. Duplicat. /alues were averaged to obtain a best estimate of actual concentration. When results were below detection limits, a quantity equal to one-half the detection limit (i.e., an average between the detection limit and zero) was used to numerically represent the below-detection-limit result. Results of duplicate and spike analyses are shown in Tables E-2 and E-3.

E-2.0 SAMPLING INSTRUCTIONS FOR MOODY AFB

Descriptions of sample containers, preservation methods, and holding times are given in Table E-4. Sampling procedures are outlined below for each analysis group.

Parameter	Method	Detection Limit
рН*	ЕРА 150.1	
Specific conductance*	EPA 120.1	
Temerature*	EPA 170.1	-
Organic carbon	EPA 415.1	1 mg/1
TOX	EPA 9020†	10
0il and grease	EPA 413.2	0.5 mg/1
Total phenolics	EPA 420.1	1
Pesticides	EPA 608H	**
Herbicides	EPA(CERI) ††	**
Arsenic	EPA 200.7***	2
Barium	EPA 200.7	2
Cadmium	EPA 200.7	3
Chromium	EPA 200.7	6
Lead	EPA 200.7	20
Mercury	EPA 245.1	0.1
Selenium	EPA 200.7***	2
Silver	EPA 200.7	3

Table E-1. Analytical Chemistry Methods for Water Samples, Moody AFB, Georgia

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*Performed at the time of sample collection.

tEPA = EPA 'Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, 2nd Edition, 1982.

**See Table 4-4 for detection limits.

tHEPA(GERI)-Method as given in EPA Document, "Methods for Organochlorine Pesticides and Chloropenoxy Acid Herbicides in Drinking Water and Raw Source Water"

***Hydride modification.

22202350 222222222 22222

All detection limits are in ug/1 units except where noted.

Note: EPA = U.S. EPA 'Methods for Chemical Analysis of Water and Wastes," March 1979---Method Number.

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Analytics Quality Assurance Checks--Percent Recoveries for TOX, Phenolics, Metals, Pesticides, and Herbicides (Page 1 of 2) Table E-2.

	Unspiked Sample	l Sample		Field S	Field Spiked Sample		
Constituent	No.	Reported Conc.*	No.	Reported Level*	Difference	Spike Added	Percent Recovery
TOX	15671,15640	42	15675	55	13	29	45
	15672,15649	72	15676	68	-4	59	L-
	15674,15661	48	15678	16	47	120	39
Phenolics	15649,15672	8	15676	46	38	24	150
Arsenic	16566,16579	ć 2	16567	11	10	14	70
	16573,16594	<2	16574	25	24	23	100
	16571,16585	2	16572	86	84	80	100
Barium	16566,16579	20	16567	100	80	140	57
	16573,16594	100	16574	220	120	230	52
	16571,16585	130	16572	890	760	800	95
Cadmium	16566,16579	96	16567	6	0	14	0
	16573,16594	9¢	16574	22	19	23	83
	16571,16585	8	16572	92	84	80	105
Chromium	16566,16579	<15	16567	<15	0	34	0
	16573,16594	<15	16574	63	56	58	97
	16571,16585	27	16572	220	190	200	95
Lead	16566,16579	<20	16567	19	6	27	33
	16573,16594	<20	16574	07	30	46	65
	16571,16585	<20	16572	140	130	160	81

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Analytics Quality Assurance Checks--Percent Recoveries for TOX, Phenolics, Metals, Pesticides, and Herbicides (Page 2 of 2) Table E-2.

	Unspiked Sample	Sample		Field S	Field Spiked Sample		
Const i tuent	No.	Reported Conc.*	No.	Reported Level*	Difference	Spike Added	Percent Recovery
Mercury	16566.16579	0.2	16567	1.0	0.8	1.4	57
	16573,16594	0.07	16574	2.7	2.6	2.3	110
	16571,16585	0.1	16572	4.1	4.0	8.0	505
Selenium	16566.16579	47	16567	11	6	14	64
	16573, 16594	4	16574	10	30	23	35
	16571,16585	4	16572	76	72	62	16
Silver	16579	9>	16566†	12	6	10	66
	16594	6 6	16573†	26	23	25	92
	16585	%	16571†	69	66	75	88
Herbicide 2,4,5-T	16566,16579	<0.02	16570	9.6	9.6	16	60
Heptachlor Epoxide	16566,16579	<0.005	16569	4.4	4.4	3.8	110
Lindane	16566,16579	<0.002	16569	2.5	2.5	3.9	64
4alathion	16566,16579	<0.010	16568	16	16	38	42
o,p'-DDD	16566,16579	<0.005	16569	4.9	4.9	2.8	180
p, p'-DDD	16566,16579	<0.05	16569	6.9	6.9	4.7	150
o, p'-DDE	16566,16579	<0.05	16569	3.8	3.8	3.1	120
p, p'-DDE	16566,16579	<0.05	16569	3.0	3.0	2.7	110
o, p'-DDT	16566,16579	<0.05	16569	4.4	4.4	3.8	120
o.o'-DDT	16566,16579	<0.05	16569	4.7	4.7	5.4	87

*Units measured in ug/l. †Laboratory spikes. <u>نار الم</u>

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Constituents	Units	Sample No.	Value	Sample No.	Value
TOX	ug/1	15671	51	15640	33
		15672	75	15649	69
		15674	72	15661	25
Phenolics	ug/l	15649	8	15672	8
DOC	mg/l	16566	<0.5	16579	<0.5
		16571	33	16585	45
COD	mg/l	16566	3.9	16579	6.2
		16571	110	16585	120
0il & grease	mg/1	15640	<0.5	15671	<0.5
		15649	<0.5	15672	<0.5
		15661	<0.5	15674	<0.5
Arsenic	ug/1	16566	<2	16579	<2
		16573	<2	16594	<2
		16571	2	16585	<2
Barium	ug/l	16566	24	16579	20
		16573	193	16594	18
		16571	173	16585	94
Cadmium	ug/l	16566	<6	16579	<6
		16573	<6	16594	<6
		16571	16	16585	<6
Chromium	ug/l	16566	<15	16579	<15
		16573	<15	16594	<15
		16571	47	16585	<15
Lead	ug/l	16566	<20	165 79	<20
		16573	<20	16594	<20
		16571	<20	16585	<20
Mercury	ug/l	16566	0.2	1657 9	0.2
		16573	0.1	16594	<0.1
		16571	0.2	16585	<0.1
Selenium	ug/1	16566	<4	165 79	<4
		16573	<4	16594	<4
		16571	<4	16585	<4

Table E-3. Analytics Quality Assurance Checks--Values Reported for Duplicate Samples (Page 1 of 2)

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Constituents	Units	Sample No.	Value	Sample No.	Value
Pesticides	ug/l	16566	BDL*(all)	16579	BDL*(all)
Herbicides	ug/l	16566	BDL*(all)	16579	BDL*(all)
VOC Chlorobenzene 1,4-dichlorot Trichloroetha Benzene All other com VOA-Method 503.	penzene ine ipounds	16578 16854	9.2 8.8 2.1 3.7 BDL*	16565 16855	5.4 3.7 <1.0 <0.5 BDL*
Benzene 1,1,2-Trichlo a-Trifluoroto Toluene 1,1,2,2-Tetra Ethyl benzene 1-Chlorocyclo p-Xylene m-Xylene o-Xylene Isopropylbenz Styrene p-Bromofluoro n-Propylbenzen Bromobenzene sec-Butylbenz 1,3,5-Trimeth p-Cymene	oluene ochloroethy ohexene-1 ene obenzene ene sene		30 2.4 <10 <1.0 5.0 30 <1.0 28 <1.0 2.2 4.1 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0		$\begin{array}{c} 34\\ 2.8\\ <10\\ <1.0\\ 6.7\\ 36\\ <1.0\\ 25\\ <1.0\\ 2.3\\ 5.6\\ <1.0\\ <1.0\\ <1.0\\ 14\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ <1.0\\ $
1,2,4-Trimeth Cyclopropylbe n-Butylbenzer 2,3-Benzofura Hexachlorobut Naphthalene	enzene ne in		<10 6.7 2.7 <1.0 <1.0 5.6		<10 6.8 3.0 <1.0 <1.0 6.9

Table E-3. Analytics Quality Assurance Checks--Values Reported for Duplicate Samples (Page 2 of 2)

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*BDL = below detection limit.

Table E-4. Sample Containers, Preservation Methods, and Nolding Times

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extraction, 6 months, extraction 28 dayst analysis 40 days 7 days 28 days 28 days 14 days 7 days 40 days 28 days 28 days Holding ** Time Filter, conc. HCl to pH < 2, chill to $^{4}{}^{\circ}C$ <2, chill to 4°C Conc. H_2SO_4 to pH <2, chill to 4°C No headspace in vial, chill to $4\,^{\circ}\mathrm{C}$ Conc. H_2SO_4 to pH <2, chill to 4°C No headspace in vial, chill to $4\,^{\circ}\mathrm{C}$ Conc. NC1 to pll <2, chill to 4°C Method of Preservation (Filtration, pH, etc.) Filter, conc. HNO3 to pH <2 Conc. H₂S04 to pll Chill to 4°C Teflon liner in cap Teflon liner in cap Teflon liner in cap Glass, 40 ml (2) Glass, 40 ml (4) Glass, 1 liter Plastic, 4 oz. Glass, 1 liter Plastic, 4 oz. Plastic, 4 oz. Glass, 1 qt. Teflon septa Teflon septa Glass, 1 qt. Container/ Volume Sample and organophosphate Type *3 33 З З З З З З 0il and grease **Organochloride** (dissolved) Purgeables Pesticides Herbicides Parameter Phenols Metals TOX DOC COD

*W = Water.

tMercury holding time is 28 days. **Not specified by method. U.S. Environmental Protection Agency (EPA). 1982. Technical Additions to Methods for Chemical Analysis of Water and Wastes, Table 1. FPA Environmental Monitoring and Support Laboratory, EPA-600/4-82-055, December 1982. Cincinnati, Ohio. Source:

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E-2.1 METALS

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Metal samples from the wells should be from the first bailer (1 liter). Bottle should be filled to very top if dissolved metals are desired and filtration is not performed immediately.

Filtration should be as follows:

- 1. Glass fiber filter should be rinsed with 20 to 30 milliliters of 0.5 \underline{N} HNO3 after being placed in suction apparatus. Discard rinse.
- 2. Rinse filter with 20 to 30 milliliters of sample. Discard rinse.
- Filter sample and return to bottle after the bottle has been rinsed with deionized water.
- For membrane filtration, place filter in apparatus with gridded side up and follow Steps 1 through 3.
- 5. Samples must be filtered through the 0.45-microgram filter for analytes to be considered dissolved. Filtration through a glass fiber filter reduces "binding" of the membrane filter but may not be needed for samples with little turbidity.

Preserve metal samples with 2 milliliters of HNO3 per liter (<u>after</u> filtration for dissolved metals), mix, and check pH by pouring small amount on pH test strip. pH should be less than 2; add more HNO3 if necessary. Refrigeration is not necessary.

E-2.2 DOC

Bottle should be completely filled to ensure sufficient sample after filtration. Procedure is the same as that for metals except 5 \underline{N} HCl is used for rinsing and concentrated HCl for preservation. These samples require refrigeration.

E-2.3 OIL AND GREASE

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Sample bottles should not be filled to top due to nature of analyte. Bottles are 1-liter glass with Teflon^m-lined caps. Preserve to a pH less than 2 with concentrated H_2SO_4 and refrigerate.

E-2.4 PURGEABLE ORGANICS

This sample should come from the first aliquot of a bailer to prevent the loss of any volatiles. Excess turbulence should be avoided (e.g., bubbling) when filling these bottles for the same reason. Fill bottle to an inverted meniscus, cap, and refrigerate immediately. A small convex dimple in the top of the septum indicates that the bottle is properly filled. There should be no air bubbles present in the bottle. This sample is taken in quadruplicate in 40-milliliter glass, screw-cap vials with Teflon^m septa. Preservation is by refrigeration.

E-2.5 TOX

The same procedure is used as for purgeable organics, except samples are taken in duplicate.

E-2.6 TOTAL PHENOLICS

Bottles should not be completely filled in order to leave room for spiking. Bottles are 1-liter glass with Teflon^m-lined caps. Preserve to a pH less than 2 with concentrated H₂SO₄ using disposable glass pipets. Refrigerate after acidification.

E-2.7 PESTICIDES/HERBICIDES

Samples are taken in 1-liter glass bottles with Teflon^m-lined caps. Separate fractions were taken for organochloride and organophosphate pesticides, and for herbicides. The herbicide fractions were preserved with concentrated HCl to pH less than 2. EPA recommends acidifying samples collected expressly for chlorophenoxy acid herbicide analysis in Section 7 of their publication "Characterization of Hazardous Waste Sites, a Methods Manual, Volume III, Available Laboratory Analytical Methods" (EPA-600/4-84-038, May 1984). They specifically suggest

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 ${\rm H_2SO_4}$; WAR used HCl because we believed it would prevent bacterial decomposition and potential hydrolysis of herbicides, while not interfering with subsequent extraction.

E-2.8 CHEMICAL OXYGEN DEMAND

Samples are taken in 4-ounce plastic bottles and preserved with concentrated sulfuric acid to pH less than 2. These samples require refrigeration.

APPENDIX F CHAIN OF CUSTODY FORMS

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ORD			Analysis Required		HELBICIDES										→ 		DDT-R ONLY		+	Date/Time	Date/Time		Date/Time		Date/Time	Date/Time	
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Water and Air Research, Inc. Water and Air Research, Inc. P.O. Box 1121 Gainesville, Florida 32602			Time		5						 						-5										
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scarch, 1 02 ALL		Date		4/3 0/14														->									
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RESUMES OF PROJECT STAFF

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APPENDIX G

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JAMES H. SULLIVAN, JR., Ph.D., P.E.

CHEMICAL ENGINEER WATER AND AIR RESEARCH, INC.

Relevant Experience

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Dr. Sullivan has played major roles in projects involving technical work directly related to groundwater monitoring and assessment at hazardous wastes sites. His recent experience includes work for a paper manufacturer, a phosphate plant, a landfill, and a cement manufacturer.

Dr. Sullivan directed preparation of Part A and Part B permit applications for the U.S. Navy. He has also worked directly on other projects related to RCRA groundwater monitoring and assessment programs and the permitting process. He is familiar with the DOD Hazardous Materials Information System which he has used to assess chemical/physical properties of DOD compounds. He directed a team of scientists and engineers working at two installations on initial assessment studies (IASs) for the U.S. Naval Energy and Environmental Support Activity (NEESA). Potential for contamination from past hazardous waste disposal was determined for approximately 80 candidate disposal sites. Recommendations for confirmation or remedial action were developed.

At U.S. Air Force bases he conducted Phase 2 Confirmation Studies of potential contamination from past hazardous waste disposal activities. He participated in field work and used field data to assess pollutant movement and severity of contamination. He recommended remedial measures and specified additional data needs for remedial design.

He directed a series of studies for the U.S. Army in which impacts of munitions wastes at several ammunition plants were defined. Siting of a new munitions plant was the objective of another study, and developings water quality criteria for hazardous substances using field and laboratory data was accomplished in another study. He conducted field work, data reduction, report preparation and briefings.

At a U.S. Army installation (Redstone Arsenal), Dr. Sullivan directed a nationally prominant study of environmental contamination from DDT. He was responsible for devising and evaluating engineering techniques for remedial action. The project involved several public agencies, with field data collected by four separate groups. He was responsible for reducing and interpreting all field data. Again he participated directly in field reconnaissance, records research, data compilation, data reduction, report writing, and briefings, including those before Congressional staffs.

Dr. Sullivan studied three solid waste disposal sites near Charleston, South Carolina and monitored groundwater impacts. In addition to gathering chemical data on groundwater and soils, fluorescent dye was used to trace groundwater movement. Evidence of hazardous substances in leachate was found and remedial action recommended.

Education

Ph.D.	Environmental Engineering
M.S.	Environmental Engineering
B.S.	Chemical Engineering

University of Florida University of Florida Georgia Institute of Technology

Professional Registrations and Society Memberships

Professional Engineer--Florida Member of 8 professional societies

Publications

Author and co-author of approximately 10 publications and 45 technical reports in water chemistry, potable water treatment, wastewater renovation, and environmental impact assessment.

WILLIAM G. THIESS

ENVIRONMENTAL ENGINEER WATER AND AIR RESEARCH, INC.

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Relevant Experience

Mr. Thiess has worked with hazardous waste management at facilities in Georgia, Florida, Alabama, and Texas. He prepared major portions of a Part B application for a commercial treatment, storage, and disposal facility in Georgia. He developed concept designs for container storage and sludge fixation (solidification) facilities. He developed all topographic information and process descriptions, and he designed plans for waste storage and handling.

Mr. Thiess prepared major portions of a Part B application for a Naval Air Station in Texas. He helped develop plans and specifications for a container storage building and vaulted, below-grade storage tanks. He prepared detailed facility descriptions. He has interfaced directly with permit agency staff to negotitate permit conditions.

Mr. Thiess has participated in initial assessment studies (IASs) of hazardous waste contamination at U.S. Marine Corps and U.S. Navy installations. For a naval shipyard, he was also responsible for developing recommendations for further groundwater assessment and remedial actions where contamination was apparent.

Mr. Thiess evaluated engineering alternatives for isolation or detoxification of DDT-contaminated sediments near Huntsville, Alabama. His primary role in this project was to select, design, and cost various mitigation alternatives. He also helped evaluate relative alternative effectiveness.

In another groundwater contamination study near Redstone Arsenal (Alabama), he supervised well sampling and laboratory analysis of hazardous organics according to rigid field and laboratory procedures.

For the U.S. Army Corps of Engineers (COE), Mobile District, he directed efforts to identify and assess impacts upon physical systems for the Coosa River Navigation Project environmental impact statement. For Savannah District, he supervised and participated in field work and data analysis for the Richard B. Russell Dam preimpoundment study.

He has participated in and directed portions of Section 208 projects in central Florida. He developed water and nutrient budgets for the Winter Haven chain of lakes in a study designed to evaluate restoration alternatives for Lake Howard. He was also responsible for design and implementation of a study to evaluate effects of septic tank drainfields on water quality in three central Florida lakes.

While a graduate research assistant at Clemson University (1978-1979), he was responsible for organizing and directing stream survey field work for a project sponsored by the U.S. Environmental Protection Agency (EPA) designed to evaluate the effectiveness of control measures for nonpoint source pollutants. He supervised laboratory work in sediment transport analysis and applied various digital computer models to drainage basins for erosion and sediment transport analysis. He dealt with various state and federal agency personnel, as well as local interests, during organization and implementation of the project.

Education

M.S. Environmental Engineering B.S. Environmental Engineering Clemson University Florida Institute of Technology

Professional Organizations

Chi Epsilon Water Pollution Control Federation American Water Works Association JERRY A. STEINBERG, Ph.D., P.E.

WATER RESOURCES ENGINEER WATER AND AIR RESEARCH, INC.

Relevant Experience

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Dr. Steinborg is an environmental engineer specializing in the management of hazardous wastes and defining pollutant transport. This includes working at abandoned sites, writing hazardous waste management plans, and preparing hazardous waste facility permits. He has worked directly with regulatory agency staff to negotiate types and amounts of information required and compliance schedules on Part B permits.

For the U.S. Navy he conducted hazardous waste inventory surveys at installations in Texas and Florida. He developed hazardous waste management plans for Naval Air Stations at Corpus Christi, Texas; and Pensacola and Jacksonville, Florida. He filed RCRA Part B permit applications for facilities in Georgia, Florida, and Texas. At one or more of these facilities, incinerators, surface impoundments, treatment in tanks, container storage, storage in tanks, and thermal treatment were permitted. Dr. Steinberg has worked on all components for Part B applications. He has developed closure plans, closure costs, preparedness/prevention measures, and contingency plans. Work included developing concept designs for facilities not meeting 40 CFR 264 requirements. Plans for modifying facilities to achieve compliance were developed. He has directed work for the Naval Energy and Environmental Support Activity (NEESA) at three installations assessing environmental contamination potential from hazardous waste disposal. This initial assessment study (IAS) involved bases in Virginia and North Carolina. In addition to directing the project, he actively participated in all technical phases including: archival research, on-site reconnaissance, data assessment, developing recommendations for confirmation or mitigative action, and report preparation.

For the U.S. Air Force, Dr. Steinberg has participated in installation restoration program (IRP) activities at six bases. At bases in Florida and North Carolina, he conducted on-site assessment of confirmation sites. He then developed work scopes for conducting confirmation work. He participated directly in confirmation assessments at bases in Florida and Virginia. Monitoring data were reviewed leading to determination of environmental degradation and the need for remedial actions. For the U.S. Army, he conducted field studies of dispersion of munitions wastes in surface waters at Holston AAP. At Longhorn and Louisiana AAP, he participated in field studies of munitions impacts on ambient water. He conducted pollutant dispersion analysis on the Clinch River (TN) to assess downstream effects of peaking power dam discharges.

In Dade County (FL) he assessed groundwater contamination from disposal of a proposed hazardous waste. Wells were sited and installed, sampling directed, and results interpreted. Evidence of pollutant movement beyond property boundaries was shown; however, hazardous constituents did not migrate far in the aquifer. Mitigation recommendations were made.

Dr. Steinberg has prepared comments for submission to the U.S. Environmental Protection Agency (EPA) addressing technical appropriateness of federal hazardous waste regulations. He has participated in EPA-sponsored workshops on Part B application filing. He has drafted two major American Society of Civil Engineers (ASCE) hazardous waste policy statements which have been presented to U.S. congressional committees. He is chairman of the ASCE Hazardous Waste Management Committee.

Education

Ph.D.	Environmental Engineering	University of Florida
M.S.E.	Water Resources Engineering	Vanderbilt University
B.C.E.	Civil Engineering	Vanderbilt University

Professional Registrations and Societies Professional Engineer--Florida American Society of Civil Engineers American Water Resources Association American Geophysical Union (Hydrology Section) ROBERT D. BAKER, JR.

ENVIRONMENTAL CHEMIST WATER AND AIR RESEARCH, INC.

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Relevant Experience

Mr. Baker is a highly skilled organic chemist who has diverse experience in analyzing environmental samples for various organic constituents. Examples of his recent work include:

- o Gas chromatographic (GC) analysis using FID, ECD, NPD, FPD, and Hall ECD and high-pressure liquid chromatographic (HPLC) analysis using variable wavelength UV/visible, fluorescence, and electrochemical detectors; and
- o Developing and testing methods for analysis for determining trace levels of organic contaminants in pesticide industry wastestreams, which included, among other analyses, detecting phenolics and volatiles using GC.

In work related to other pesticide manufacturers, he reviewed and assessed processes for more than 200 compounds. Using plant operating data, he identified possible impurities introduced through raw materials, by-products created from side-reactions, and potential contamination from various solvent media. This work ultimately led to development of pretreatment technologies.

Mr. Baker modified existing methods of analyzing for DDT in natural waters. Modification was necessary to meet extremely low detection limits with rigorous quality control because of low concentrations mandated in drinking water regulations.

Other types of analytic work by Mr. Baker include:

- o Analyzing natural water (river and lake) samples for organics for background EIS data--Georgia, South Carolina, Alabama, and Florida;
- o Analyzing water and sediment samples for low levels of DDT, PCBs, and other organics--Alabama and Virginia;
- o Developing improved techniques to accurately measure volatile hydrocarbon levels in soils--Virginia;
- o Analyzing fish tissue for hazardous waste contamination in blinded samples with better than 90-percent accuracy on duplicates and controls--Alabama;
- o Using HPLC to verify methods for analysis of 16 polynuclear aromatic hydrocarbon compounds and 2 benzidine compounds (wastewater matrix)--Ohio; and
- o Using HPLC to develop methods and analyze for hazardous (munitions) wastes--Louisiana and Texas.

Education

B.S. Chemistry Northeast Louisiana University

Professional Societies

American Unemical Society American Association for the Advancement of Science CHARLES R. FELLOWS

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ENVIRONMENTAL CHEMIST WATER AND AIR RESEARCH, INC.

Relevant Experience

Mr. Fellows is an environmental chemist trained in both field studies and formal laboratory chemistry.

As a member of hazardous waste site investigation teams, Mr. Fellows has conducted interviews regarding past disposal practices, past and present industrial/chemical processes, and the chemical and physical nature of disposed materials. On several occasions he has identified waste sites that posed an immediate concern to human health.

Mr. Fellows is familiar with and has used various appropriate safety procedures and techniques while sampling sites that have received hazardous wastes. He has collected groundwater, surface water, sediment, and leachates for a wide variety of organic, inorganic, and physical analyses. He is experienced in applying site assessment models to evaluate migration and health-threatening potential of chemical wastes at specific disposal sites.

In addition to the procedures mentioned above for collection, preservation, and analysis of various types of samples, he is familiar with the RCRA EP Toxicity Test Procedure, the U.S. Army Corps of Engineers Elutriate Test Procedure, and groundwater monitoring procedures for arsenic, heavy metals and other toxicants.

Mr. Fellows is directly responsible for inorganic chemical analyses. He performs quality assurance checks and often participates in actual laboratory water quality analyses. He recently worked with an industry generating hazardous wastes to develop suitable extraction methods for assessing waste toxicity. He helped to develop wastewater analysis protocols which mitigated interferences from chemicals in battery manufacturing wastes.

He directs sampling of groundwater monitoring wells and participates in developing field sampling networks for both surface waters and groundwaters.

Education

M.S. Water Chemistry B.S. Biology University of Florida Eckerd College

Publications

Author and co-author of several articles and technical reports

WILLIAM D. ADAMS

HYDROGEOLOGIST WATER AND AIR RESEARCH. INC.

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Relevant Experience

Mr. Adams is a graduate geologist who has specialized in engineering applications of hydrogeology. His practical experience is strongly oriented toward solving problems of pollutant transport in the subsurface environment.

He works on environmental contamination assessments and hazardous waste management/ permitting. He has conducted hydrogeologic work at abandoned hazardous waste sites at DOD installations in Alabama, Florida, North Carolina, Georgia, Virginia, and Arizona. At some of these bases, chemical agent disposal was investigated and elaborate health and safety precautions were used.

His project responsibilities have included: assembling and reviewing geologic and geohydrologic literature; quantifying pollutant movement potential using published documents and/or field test data; supervising monitoring well installation; selecting well sites, depths, and casing requirements; specifying rig clean-up procedures; and drafting reports of findings for DOD and regulatory staffs. Mr. Adams has also participated in staff briefings detailing interim and final findings.

He conducted a comprehensive hazardous waste inspection and survey at Pensacola Naval Air Station. Industrial facilities which generate substantial quantities of various wastes were visited and associated personnel debriefed to determine waste generation and handling practices. This information was used in two ways. First, Mr. Adams and his team developed a complete hazardous waste management plan for the entire complex. This ensured compliance with 40 CFR 260-265. A Part B permit application, including revised Part A, was then filed. Facilities permitted included container storage buildings, surface impoundments, and treatment in drying beds. A preliminary design for additional container storage was reviewed and concept design modifications made to ensure RCRA compliance (40 CFR 264). Although numerous tanks were used, all tank usage was reviewed and recommendations were made to alter hazardous waste storage practices. This eliminated the need to permit any tank.

Mr. Adams has also directed field work for installation restoration confirmation studies (Phase 2) at Langley Air Force Base, Virginia and Eglin Air Force Base, Florida. In these studies, he researched site geology, sited all wells, supervised well installation and development, and collected samples for inorganic and organic constituent analyses.

In another DOD study, Mr. Adams compared two potential depleted uranium burial sites. He planned and supervised the field work, lab work, and report preparation. An important aspect of the study was assessing potential routes of contaminant migration. This work included extensive field and laboratory soils testing and analysis.

Education

M.S.GeologyUniversity of FloridaB.S.GeologyUniversity of Florida

Professional Societies

National Water Works Association Florida Water Well Association

Publications

Author and co-author of several articles and technical reports.

APPENDIX H SAFETY PLAN

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APPENDIX H SAFETY PLAN

H-1.0 GENERAL

The safety plan presented herein gives guidelines for basic safety procedures and equipment utilized by WAR during the course of IRP Phase II surveys. Samples collected during Phase II surveys are typically environmental water and sediment samples as opposed to hazardous waste samples and normally do not require unusual levels of personnel protection. Detailed procedures and equipment required to minimize exposure to specific hazardous wastes or conditions requiring higher levels of protection are beyond the scope of this plan. References are provided from which waste-specific information on equipment and procedures can be obtained on a case-by-case basis.

H-2.0 INFORMATION REVIEW

Prior to initiating Phase II survey fieldwork, the Phase I records search is reviewed in detail to identify hazardous wastes or conditions that may be encountered at each site. Available toxicological data on materials suspected of being present at the sites are reviewed to determine if the base level of personnel protection outlined in Section H-5.0 is adequate. Hazards such as the presence of highly toxic or incompatible chemicals, toxic gases, radioactive material, or explosives may require more extensive precautionary measures than the base level of protection. Safety hazards requiring special attention are addressed on an individual basis using appropriate assessment methods and equipment and procedure recommendations given in the <u>EPA Field Health and Safety Manual</u> (EPA, 1980) and the <u>EPA Safety Manual for Hazardous Waste Site Investigations</u> (EPA, 1979). Hazardous conditions can be clarified or confirmed on preliminary site visits.

H-3.0 MEDICAL MONITORING PROGRAM

The person responsible for Phase II survey fieldwork will determine whether a medical monitoring program is necessary, based on results of the information review. If hazard levels are judged high enough to

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warrant this procedure, all field personnel will participate in a medical monitoring program. Guidelines for the program are given in Appendix I of the EPA Field Health and Safety Manual (EPA, 1980). 2

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H-4.0 FIELD PERSONNEL INDOCTRINATION

All field personnel will be informed by the project field supervisor of required safety equipment and procedures prior to on-site work. Subjects covered will include personal safety gear, general and site-specific safety procedures, and incident notification procedures.

H-5.0 PERSONNEL PROTECTION GEAR

The following items will be provided on-site for all field personnel:

- o Tyvek[®] disposable coveralls,
- o Rubber boots,
- o Rubber gloves,
- o Hard hats,
- o Eye protection (safety glasses or face shields).

Hearing protection (disposable ear plugs) will be provided for all work in the vicinity of the flight line or other noise hazards. Cartridgetype respirators will be available on-site for protection against inhalation of dust or vapors. If strong vapors are encountered, respirators will be utilized to facilitate evacuation of personnel and equipment from the site until the situation can be assessed or corrected.

Personal equipment described above will offer adequate protection for most situations encountered during the course of Phase II survey fieldwork. When conditions are identified that require a higher level of personal protection, the <u>EPA Safety Manual for Hazardous Waste Site</u> Investigations will be referred to for guidance.

H-6.0 SAFETY PROCEDURES

Hard hats and eye protection will be worn when appropriate, as directed by the project field supervisor. Protective clothing (boots, gloves, and coveralls) will be worn at all times while working on-site. Coveralls will be changed a minimum of once daily.

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The project field supervisor will consult with the base environmental coordinator or other responsible contact regarding site-specific hazards prior to entering sites. Special procedures for entering and working at particular sites will be clarified and conveyed to all field personnel. Examples of areas requiring strict procedures are active runways or taxiways, fuel handling or storage areas, and secure areas.

Prior to any drilling or digging on the sites, USAF Form 103 must be routed to all applicable base organizations for a clearance review. Circulation of this form is required to avoid contact with underground or overhead utilities, conflict with base activities, or breaches of security.

Additional safety procedures will be implemented, if warranted by the information review or conditions encountered at the site. Site-specific safety procedures will be based on guidelines given in the <u>EPA Field</u> <u>llealth and Safety Nanual</u> and the <u>EPA Safety Manual for Hazardous Waste</u> Site Investigations.

H-7.0 INCIDENT/ACCIDENT NOTIFICATION PROCEDURES

As a minimum, the following emergency phone numbers should be available on-site:

- 1. Ambulance or medical assistance,
- 2. Base fire department (or other if off-site), and
- 3. USAF base point of contact for project.

After contacting appropriate emergency services (if necessary), the base point of contact should be notified of the incident or accident so that it can be dealt with according to base policies and procedures.

References

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U.S. Environmental Protection Agency (EPA). 1979. Safety Manual for Hazardous Waste Site Investigations. EPA National Enforcement Investigations Center, Denver, Colorado. .

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U.S. Environmental Protection Agency (EPA). 1980. Field Health and Safety. EPA Region 4, Atlanta, Georgia.

APPENDIX 1

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AQUIFER TESTING METHOD AND DATA PRESENTATION

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APPENDIX I AQUIFER TESTING METHOD AND DATA PRESENTATION

I-1.0 AQUIFER HYDRAULIC TESTING

WAR performed single well aquifer tests at one well to determine values of horizontal hydraulic conductivity representative of the surrounding soil. A rising-head test¹ was used.

WAR performed this test at Moody AFB by:

- Determining the static water level by taking a series of preliminary water level measurements,
- 2. Rapidly removing water from the well, and

3. Measuring the rise in water levels as a function of time. Reduction of rising head test data was as follows:

- Determining the time since the test started for each water level measurement, and
- 2. Calculating the difference (H_t) between each water level measurement and the static water level (H_o) .

The data were plotted on semi-log paper as H_t/H_0 versus t. The straight line portion of the plot is used to determine hydraulic conductivity from the equation.

 t_1 , t_2 = elapsed time (sec.), and

H₃, H₂ = Ht/Ho at t₁ and t₂, respectively.

¹Naval Facilities Engineering Command. 1982. Soil Mechanics, Design Manual 7.1. Alexandria, Virginia. pp 7.1-103 - 7.1-108.

HYDRAULIC CONDUCTIVITY CALCULATIONS

Li. at Well L-4 equals total casing depth less depth to static water = 27.7 - 6.6 = 21.1 feet = 640 cm

From plot of recovery vs. time, two straight lines were approximated.

For first line: $H/_{Ho} = 0.61$ at t = 5 minutes $H/_{Ho} = 0.305$ at t = 45 minutes

For second line: $\rm H/_{Ho}$ = 0.66 at t = 5 minutes $\rm H/_{Ho}$ = 0.305 at t = 45 minutes

Radius of pipe equals 1 inch = 2.54 cm

For first line: K = 0.00048 cm/min $K = 8.1 \times 10^{-6} \text{ cm/sec}$

For second line: K = 0.00068 cm/min $K = 1.1 \times 10^{-5} \text{ cm/sec}$

APPENDIX J RELEVANT EPA WATER QUALITY CRITERIA

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Table J-1. Relevant EPA Water Quality Criteria (Page 1 of 5)

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	Critoria	for Frechu	ater Amiat	Critoria for Brochaster Amistic [ife 10/]	lkman llea	Human liealth Criteria, u;/1 Ingestion of and Annaric Or	Criteria, u;/1 Ingestion of Water and Anuatic Orcenisms
	Acute Toxici ty	Chronic Toxicity	Maximum 24-hr	Maximum	Potable Water Taste/Odor	Ambient	10-6 Incremental
Paraneter	Level*	Level*	Average	Concentration	Controlt	Criterion	Cancer Risk
M RGFARLF, OPCANICS							
Acrolein	68	21				320	
Acrylonytrile	7,550	2,600**				011	0.058
Benzene	5,300					0++	0.66
Carbon tetrachloride	35,200					45	0.40
Chlorinated ethancs							
1,2-dichlorocthme	118,000	20,000				011	0.94
1,1,2-trichloroethane		00 7 ° 6				0 1	0.60
1,1,2,2-tetrachloroethane		2,400				0++0	0.17
1,1,1-trichloroethane						18.4	
Chloroalkyl ethers	238,000						
bis-(chloromethyl)-ether						01	0.38 X 10 ⁻⁶
Chloroform		1,240				011	0.19
Dichlororthylenes	11,600						
1,1-dichlorocthylene						0++0	0.033
Dichloropropance	23,000	5,700					
Di chloropropenes	6,060	244				87	
Ethylbenzene	32,000					1.4	
Halcethers	360	122					
Halomethanes	11,000					0 1 +	0.19
Tetrachloroethy lene	5,280	840				1 5	0.80
Toluene	17,500					14.3	

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Table J-1. Relevant EPA Vater Quality Criteria (Page 2 of 5)

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	Criteria	for Freshw	ater Aquat	Criteria for Freshwater Aquatic Life, ug/l	Ihuran Nea	lhuman lealth Criteria, ug/l Inpestion of and Aquatic Or	Criteria, ug/l Ingestion of Water and Aquatic Organisms
	Acute Toxici ty	Chronic Toxicity	Maxdmum 24-hr •	Maximum	Potable Water Taste/Odor	Ambient	10 ⁻⁶ Incremental
Parameter	Leve]*	Level*	Average	Concentration	Controlt	Criteriou	Cancer Risk
FLKFABLE (FKWIICS							
Trichlorcethene Viny1 chloride	45,000	45,000 21,900 **				++5 5 5 7	2.7 2.0
BASE AEUTRAL EXTRACTABLE ONCAULCS	NICS						
Aconaphthene	1,700	520**			20		
Eenzidine	2,500					440	0.00012
Chlorinated hynzenes	250	50**					
Hexachlorobenzene						+to	0.00072
llexachloroethane	086					5+ 1-	1.9
Chlorinated napthalencs	1,600						
bis(2-chloroethyl) ether						ч+	0.03
his(2-chloroisopropy) ether						34.7	
Dichlorohenzenes	1,120	763				400	
Dichlorohenzidines						440	0.0103
2,4-dinitrotoluene	330	230				다	0.11
1,2-diphenylhydrazine	270					011	0.00042
Fluoranthene	3,980					42	
Hexachlorobutadione	8	9.3				110	0.45
Hexachlorocyclopentadiene	7	5.2			1	206	
Isophorone	117,000					5.2	
Nipthalene	2,300	620					
Nitrobenzene	27,000				30	8.01	

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Table J-1. Relevant EPA Mater Quality Criteria (Page 3 of 5)

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	Criteria Acute	for Freshw Chronic	ater Aquat	Criteria for Freshwater Aquatic Life, up./1 Acute Chronic Maximum	Potable Mater	and Aqua	and Aquatic Organisms
	Toxici ty	Toxici ty	24-hr.	Maximum	Taste/(Mor	Ambient	10 ⁻⁶ Incremental
Parameter	Level*	Level*	Averago	Concentration	Control †	Criterion	Cancer Risk
BASE/MEUTRAL EXTRACTABLE ORCANICS	NICS						
Puthalate esters	970	m					
Dimethyl phthalate						313	
Niethyl phthalate						350	
Dibutyl phthalate						¥	
PHENOLIC ONTROUTOS							
CILORIWATED RIENOLS							
4-chloro-3-methelphenol	ଚ						
2,3,5,6-tetrachlorophenol							
4chlorophenol							
3-monochlorophenol					0.10		
4-monoch lorophenol					0.10		
2,3-dichlorophenol					0.04		
2,5-dichlorophenol					0.50		
2,6-dichlorophenol					0.20		
3,4-dichlorophenol					0.30		
2,3,4,6-tetracholorophenol	П				1.0		
2,4,5-trichlorophenol					1.0	2,600	
2,4,6-trichlorophenol		070			2.0	011	1.2
2-methy1-4-chlorophenol					1,800		
3-methy1-4-chlorophenol					3,000		
3-methy1-6-chlorophenol					20		
2-chlorophenol		4,330	2,000**		0.10		
2,4-dichlorophenol		2,020	365		0.30	3.09	
2,4-dimethylphenol		2,120			400		

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Human Nealth Criteria, ug/1

	Cut tourin	for Brochu	ater Aduat	cuterain for Brachastar Annatic life. 10/1		Ingesti and Aquat	Ingestion of Vater and Aquatic Organisms
Parameter	Acute Toxicity Level*	Chronic Toxicity Level*	Maximum 24-hr. Average	Maximum Concentration	Potahle Water Taste/Nor Control†	Ambient Criterion	10 ⁻⁶ Incremental Cancer Risk
INEWALIC (UNPOUNDS Nitrophenols 2,4-dinitroo-cresol dinitrophenol Pentachlorophenol Phenol	230	150**			30 0.30	13.4 70 1,010 3.5	
FD HYDROCARBON	N PESTICIDES						0.000074
Aldrin Chlordane Dieldrin			0.0043	. 2.4 2.5		0 044	0.000046
DIT	1.050		0.0010	1.1			0.00024
Endrin Heotachlor			0.0023 0.0038	0.18 0.52		1	.00028
Lindane Polychlorinated biphenyls	2**		0.08 0.014	2		1	62000.
HEAVY METALS Cadmitum			***	***		10	
Chromium, trivalent Chromium, hexavalent		44	0.29 5.6	*** 21 ***	1.000	170,000 50	
Conner			>		•		

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Table J-1. Relevant EPA Water Quality Criteria (Page 5 of 5)

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lluman Health Criteria, ug/l Ingestion of Water and Aquatic Organisms	Ambient 10 ⁻⁶ Incremental Criterion Cancer Risk	5	0.144	13.4		0	
Iluman Health	Potable Vater Taste/Odor Av Control† Cr		۲ -		ъ	2(0)	
Oriteria for Freshwater Aquatic Life, ug/1	Acute Chronic Naximum Oxicity Toxicity 24-hr. Maximum Level* Level* Average Concentration			***	***	52	
ater Aquat	Naximum 24-hr. Average	+++++++++++++++++++++++++++++++++++++++		***	47	3.5	
for Freshw	Acute Chronic Naximum Toxicity 24-hr. Level* Level* Average		0.0017				
<u>Criteria</u>	Acute Toxicity Level*		0.00057				
	Parameter	SNEEV AND	Nercurv	Nickel	Zinc	Cyanide	

torganoleptic data used as basis for taste and odor control have no demonstrated relationship to adverse human health "Inxicity may occur at lower concentrations among species more sensitive than those tested.

ef fects.

**Data is not definitive.

tthero level may not be attainable at this time.

**** aximum level related to hardness of water, for which no data are available.

Source: EPA, 1980.

APPENDIX K

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REPRODUCTIONS FROM THE PHASE I REPORT OF HAZARD ASSESSMENT RATING FORMS FOR THE PHASE II STAGE I SITES

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	Page	Factor Score	r subscore dence exist	tore	on, floodin		2 '	0 e	م ر	7	5		0	re/3)	2	ە ي	æ	¢	:	36				•			Maste Characteristics Pathweys	ed by 3 +			
<u>8</u>		Hultiplier	imum facto direct evi- to B.	Subscore	er migrati		•	<i>.</i>		Ð			-	Subscore (100 × factor score/3)		.	=)	æ	•	Subtotals				Pathmays Subscore		atheays.	Cheracter ****	167 divic		-	
			essign mex dence. If ts, proceed		surface-wat proceed to						Subtotals	•		ore (100 ×						Subto	•			Path		tics, and f		Total	ctices	•	
		factor Reting (0-3)	itaminants, direct evi dence exis		ting, and		~		· -	~		'e subtotal	0	Subsc		• -	-	-	N/N		e subtotal		ar B-3 4bove			characteris			ng Jnanayi	eni - rue	¥
		-	If there is evidence of migration of hazardous contaminants, assign maximum factor subscore of 100 points for direct evidence or 80 points for indirect evidence. If direct evidence exists then proceed to C. If no evidence or indirect evidence exists, proceed to B.		Rate the migration potential for three potential pathways: surface-water migration, flooding, and ground-water migration. Select the highest rating, and proceed to C.		-					Subscore (100 × factor score subtotal/maximum score subtotal)									Subscore (100 x factor score subtotal/maximum score subtotal)		Enter the highest subscore value from A, B-1, B-2, or			Average the three subscores for receptors, maste characteristics, and pathways.			Apply factor for waste containment from maste manayenent practices	úross fotal Score a Maste Management Practices Fariar - Final Score S	1
		Rating Factor	of migration o t evidence or B If no evidence		otentiel for th ration. Select	gration	Distance to nearest surface water	£	1160	ty ,		or score subtot			ration		~		Direct access to ground mater		or score subtot	core	bscore value fr		CT ICES	bscores for rea			te containment	Maste Managemer	
Ê	III. PATHWAYS	Rati	13 evidence \$ for direc eed to C.		migration p id-water mig	Surface-water migration	nce to near	Net precipitation	Surface Dermeability	Rainfall intensity		(100 × fact	li ng		Ground-water migration	Vepti to ground mater Net precipitation	Soil permeability	Subsurface floms	t access to		(100 × fact	Highest pathway subscore	i highest su		WASTE MANAGEMENT PRACTICES	he three su			tor for mes	al Score A	
	11. 9/		if there 100 point then proc		Rate the and groun	1. Surfa	Dista	Net	Surfa	Rainf		Subscore	2. Flooding		3 čroun	Net p	5011	Subsu	Direc		Subscore	Highest p	Enter the			Average t			Apply fac	üross fot	
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	Page 1 of 2						Maximum Possible	Score	2 5	, o	18	30	81	27	81	81	180		3		anf i dence	s	s	I	9						
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	MAZARDOUS ASSESSMENT RATING FORM	e No.])	278	l, includes	ni ght				•			radius of	ter body		51 Ce				ore subtota		e estimated	aedium, L =	, S = suspec	dium, L =]o	esed on fact	tor = Subsc			ier = Kaste		ŋ
	12AH	Southwest Lendfill (Site No.]) Moody AFB	DATE OF OPERATION OR OCCURRENCE: 1955-1972 DMMER/OPERATOR: Moody AFB	COMMENTS/DESCRIPTION: Main Base Landfill, includes low-lavel radioactive tube disposal	N. Match, B. Maas, R. Knight			Factor	Population within 1,000 feet of site Distants to contact cold	Land use/zoning within 1 mile radius	boundary	Critical environments within 1 mile radius of site	Mater quality of nearest surface-water body	Ground-mater use of uppermost aquifer	Population served by surface-water supply mithin 3 miles domnstream of site	und-mater site			Receptors subscore (100 x factor score subtotal/maximum subtotal)		Select the factor score based on the estimated quantity, the degree of haza level of the information.	Waste quantity (S = small, M = medium, L = large)	Confidence level (C = confirmed, S = suspected)	Hezerd rating (H = high, H = medium, L = low)	factor Subscore A (from 20 to 100 based on factor score matrix)	Apply persistence factor factor Subscore A = Persistence factor = Subscore B		tiplier	Subscore 8 = Physical State Multiplier = Waste Cheracteristics Subscore		
		Southmest La Moody AFB	DR OCCURREN oody AFB	On: Main B	i. Hatch, B.			Reting Factor	Population within 1,000	ng mithin 1	Distance to reservation boundary	ronments wi	of nearest	use of uppe	rved by sur 3 miles do	Population served by ground-water supply within 3 miles of site			\$core [100	ERISTICS	ctor score information	ntity (S -	e level (C	t - H) ting	re A (from	ence factor	40 × 1.0 = 40	Apply physical state multiplier	Physical St	우비 	
		: 31	DATE OF OPERATION OR OCCURE OWNER/OPEPAIOR: Moody AFB	S/DESCRIPTIN	SITE RATED BY: N	RECEPTORS				d use/sont	itence to r	tical envi	ter quality	hund-weter	ulation se ply mithin	ply within			ceptors sub	WASTE CHARACTERISTICS	lect the fa-	Waste qua	Confidence		tor Subsco	ity persist	3	ily physics	score 8 . I	9	
		NAME OF SITE: LOCATION:	DATE OF	CONNENT!	SITE RA'	1. AEG			A. 700			E.	f. Wat	د د د	Т С С С С С С	- Pop			Ц. Ц	II. WAS	۲. ۲. ۲.	-	~		F. 46	8. App Fac		C. App	Sub		

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$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	variove: Noody AFB Lit of OftRalicku OR OCCURRENCE: sver∂oftRalDR: Moody AFB vervalS/DESCRIPTION: Rubble fill site, some industrial waste dispose			Factor Reting	
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$ \int \int \int \int \int \int \int \int \int \int \int \int \int \int \int \int \int \int \int$	wentwiss/DESCRIPTION: Rubble fill site, some industrial maste disposa			then proceed to t. If no evidence of indirect evidence exists, proceed to 8.	
$ \int \int \int \int \int \int \int \int \int \int \int \int \int \int \int \int \int \int \int$		-			
$ \frac{1}{10000000000000000000000000000000000$					on, flooding,
$ \frac{1}{10000000000000000000000000000000000$				1. Surface-water migration	
Interface Interface			Max i mum		2
$ \frac{1}{2} = 1$					2
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Population mithin 1,000 feet of site				2
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Cistance to nearest well			Surface permeability 6	18
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Land use/soning within 1 mile radius				24
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Distance to reservation boundary			Subtotali	108
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Critical environments within 1 mile radius of site			Subscore (100 × factor score subtotal/maximum score subtotal)	
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	water musiity of magrest surface-water body			· Z. Flooding	8
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$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Provide the served by surface water				
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	supply within 3 miles downstream of site	¥		Depth to ground water	*
Jacketing Solution <	Population served by ground-water 			Net precipitation 6	•
$\frac{1}{1000} = \frac{1}{1000} = \frac{1}{10000} = \frac{1}{10000000000000000000000000000000000$				Sail permeability	*
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with concretions Solution (10, 1 from a fraction and the confidence with a fraction and the confidence is the fraction and the confidence is the contraction. Solution (10, 1 from a fraction and the confidence is the contraction and the contraction and the confidence is the contraction and the contra	Receptors subscore (100 # factor score subtotal/maximum subtota))		7		
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3. Married rating $(n + n)q_0$, $n - adic_m$, $1 - icm$ N W. Will Wundchrüft FRUCIGS rates faster and an fracter score metric) 30 N W. Will Wundchrüft FRUCIGS rates faster and an fracter score metric) 30 N Nerrage the three unbiscores for recentor, matter characteristics, and pathways. rates faster rates 0 = 0.0 = 10 0 N N N 0 = 0.0 = 10 0 0 = 10 - 10 N N N N 0 = 10 - 10 0 0 0 N N N N N N 0 = 10 - 10 0 10 - 10 N			U		
$\frac{1}{1000} = \frac{1}{1000} = 1$			×		
More a period 0	Factor Subscore A (from 20 to 100 based on factor score matrix)		50		
3 - 10 - 30 $3 - 10 - 30$				Average the three subscores for receptors, maste characteristic:	
Apply payrical state witchilde				Receptors Waste Character	11.15 60
Subscore 8 + Physical State Multiplier - Vaste Characteristics Subscore B. Apply factor for waste containment from waste anagement practices V0 + 1.0 + <u>10</u> IIII Cross lotal Score 1 waste Mungement Practices Factor - Final Score V0 + 1.0 + <u>10</u> IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII				Pathmays Total 168 divid	d by] - 56
	Subscore B = Physical State Multiplier = Waste Characteristics Sut	bscore			Gross Total S.
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				ardous contam nts for indir direct eviden		otential path Mighest ratin								finum score su									imm score su		8-1, B-2, or			, waste chara			iste managemei	lices Factor		4 7 1
E		2		to of here of here of the second of the seco		for three pi Select the J		ace water					:	subtotal/max							uter		subtotal/max		olue from A, I			or receptors			nment from m	agement Pract		
•	~	Rating Factor		dence of migr direct evider . C. If no ev		ion potential r migration.	Surface-water migration	Distance to nearest surface mater	tation	ston	meability	tensity		factor score			r migration	stion	111ty	lows	Direct access to ground water		factor score	subscore	t subscore vi		PRACTICES	e subscores f			maste contañ	e x Waste Man		
	III. PATHWAYS			The traver is a victome of angration of hastodous contaninants, aning maximum factor subscore of 100 points for direct evidence or 80 points for indirect evidence. If direct evidence arists then proceed to C. The oridines or indirect evidence saists, proceed to B.		Rate the migration potential for three potential pathmays: surface-mater migration, flooding, and ground-mater migration. Selact the high-att rations, and proceed to C.	1. Surface-wat	Distance to	Net precipitation	Surface erosion	Surface permeability	Reinfell intensity		Subscore (100 × factor score subtotal/maximum score subtotal)	2. Flooding		3. Ground-water migration Danth to proved inter-	Net precipitation	Soll permeability	Subsurface flows	Direct acces		Subscore [100 # fector score subtotal/maximum score subtotal)	Highest pathmay subscore	Enter the highest subscore value from A, B-1, B-2, or B-3 above		WASTE NUNAGEMENT PRACTICES	Average the three subscores for receptors, meste characteristics, and pathways.			Apply factor for waste containment from waste management practices	Gress Total Score a Waste Management Practices Factor a Final Score		
•			.			si											-							т J	5			۲ ۲			B. A	Ū		
Í	Page 1 of 2							Maximum Possible	Score	12	90	•	8	ñ	18	27	91	81	180	;	*		idence	Ś	s	x	9							
-	Page							Factor	Score	•	96	e.	16	0	•	•	•	81	6				hezard, and the confidence											
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•	HAZARDOUS ASSESSMENT RATING FORM			L.	of drain out!									us of site	ody					:	ubtotal/maxis		imeted quant	m, L = large	suspected)	(= 10m)	on factor sci	Subscore 8			· Waste Chara			J - 17
	MAZARDOUS	(Site No. 12)		1941-Presen	1 doenstream	B. Nees, N. Match, R. Knight			٥٢	t of site		le radius	ndary	n 1 mile rad!	rface-mater b	ist aquifer	erneter trees of site		;		actor score s		ed on the est	Weste quantity (5 = smei), M = medium, L = large)	Confidence level (C = confirmed, S = suspected)	Mazard rating (H = high, M = medium, L = low)	to 100 besed	ance Factor =		lter	Hultiplier =			
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2		1E :	CH1 HOC	DATE OF OPERATION OR OCCURRENCE: 1941-Present	umersterentsternen. sommersternessenstream of drain outlets	SITE RATED BY: B.	RECEPTORS			Population within 1,000 feet of site	Distance to nearest well	Land use/zoning mithin 1 mile radius	Distance to reservation boundary	Critical environments within 1 mile radius of site	Mater quality of mearest surface-mater body	Cround-water use of uppermost aquifer	Population served by surface-water supply within 3 miles domnstreem of	Population served by ground-water			Receptors subscore (100 a factor score subtote//manimum subtote/)	WASTE CHARACTERISTICS	Selact the factor score based on the estimated quantity, the degree of level of the information.	1. Weste quant	2. Confidence	3. Hazard rati	Factor Subscore A (from 20 to 100 based on factor score matrix)	Apply persistence factor Factor Subscore à a Paristence Factor e Subscore B		Apply physical state multiplier	Subscore B × Physical State Multiplier = Maste Characteristics Subscore			
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