CETHA-BC-CR-89284

AD-A214 548

U S A T H A M A

U.S. Army Toxic and Hazardous Materials Agency

Enhanced Preliminary Assessment Report:

Croom Army Housing Units Croom, Maryland

October 1989

prepared for

Commander
U.S. Army Toxic and Hazardous Materials Agency
Aberdeen Proving Ground, Maryland 21010-5401

prepared by

Environmental Research Division
Argonne National Laboratory
Argonne, Illinois 60439

NOTICE

The views, opinions, and/or findings contained in this report are those of the author(s) and should not be construed as an official Department of the Army position, policy, or decision unless so designated by other documentation.

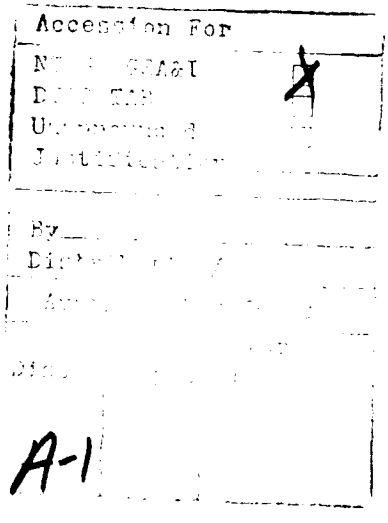
The use of trade names in this report does not constitute an official endorsement or approval of the use of such commercial products. This report may not be cited for purposes of advertisement.

CETHA-BC-CR-89284

Enhanced Preliminary Assessment Report:

Croom Army Housing Units Croom, Maryland

October 1989



prepared for

Commander, U.S. Army Toxic and Hazardous Materials Agency,
Aberdeen Proving Ground, Maryland 21010-5401

Environmental Research Division,
Argonne National Laboratory, Argonne, Illinois 60439-4815

U.S. Department of Energy Contract W-31-109-Eng-38

REPORT DOCUMENTATION PAGE

1a. REPORT SECURITY CLASSIFICATION Unclassified	1b. RESTRICTIVE MARKINGS
2a. SECURITY CLASSIFICATION AUTHORITY	3. DISTRIBUTION / AVAILABILITY OF REPORT Distribution Unlimited
2b. DECLASSIFICATION / DOWNGRADING SCHEDULE	
4. PERFORMING ORGANIZATION REPORT NUMBER(S)	5. MONITORING ORGANIZATION REPORT NUMBER(S) CETHA-BC-CR89284
6a. NAME OF PERFORMING ORGANIZATION Environmental Research Div. Argonne National Laboratory 6b. OFFICE SYMBOL (If applicable) ERD	7a. NAME OF MONITORING ORGANIZATION U.S. Army Toxic & Hazardous Matls. Agency
6c. ADDRESS (City, State, and ZIP Code) Building 203 9700 South Cass Avenue Argonne, IL 60439	7b. ADDRESS (City, State, and ZIP Code) Attn: CETHA-BC Aberdeen Proving Ground, MD 21010-5401
8a. NAME OF FUNDING / SPONSORING ORGANIZATION U.S. Army Toxic & Hazardous Materials Agency 8b. OFFICE SYMBOL (If applicable) CETHA-BC	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER U.S. Department of Energy Contract W-31-109-ENG-38
8c. ADDRESS (City, State, and ZIP Code) U.S. Army Toxic & Hazardous Materials Agency Attn: CETHA-BC Aberdeen Proving Ground, MD 21010-5401	10. SOURCE OF FUNDING NUMBERS PROGRAM ELEMENT NO. / PROJECT NO. / TASK NO. / WORK UNIT ACCESSION NO.
11. TITLE (Include Security Classification) Enhanced Preliminary Assessment Report: Croom Army Housing Units Croom, MD	
12. PERSONAL AUTHOR(S)	
13a. TYPE OF REPORT Final 13b. TIME COVERED FROM _____ TO _____	14. DATE OF REPORT (Year, Month, Day) October, 1989 15. PAGE COUNT
16. SUPPLEMENTARY NOTATION	
COSATI CODES: FIELD / GROUP / SUB-GROUP	18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)

19. ABSTRACT (Continue on reverse if necessary and identify by block number)

Argonne National Laboratory has conducted an enhanced preliminary assessment of the Army housing property located in Croom, [illegible] The objectives of this assessment include identifying and characterizing all environmentally significant operations, identifying areas of environmental contamination that may require immediate remedial actions, identifying other actions which may be necessary to resolve all identified environmental problems, and identifying other environmental concerns that may present impediments to the expeditious sale of this property.

20. DISTRIBUTION / AVAILABILITY OF ABSTRACT ☒ UNCLASSIFIED/UNLIMITED ☐ SAME AS RPT ☐ DTIC USERS	21. ABSTRACT SECURITY CLASSIFICATION Unclassified
22a. NAME OF RESPONSIBLE INDIVIDUAL Joseph A. Ricci, Project Officer	22b. TELEPHONE (Include Area Code) (301)671-3461 22c. OFFICE SYMBOL CETHA-BC

CONTENTS

SUMMARY 1

1 INTRODUCTION 3

1.1 Authority for the PA 3
1.2 Objectives 4
1.3 Procedures 5

2 PROPERTY CHARACTERIZATION 6

2.1 General Property Information 6
2.2 Description of Facility 6
2.3 Property History 9
2.3.1 Nike Defense Program and Typical Battery-Level Practices 9
2.3.2 Croom Housing Units 11
2.4 Environmental Setting and Surrounding Land Use 11
2.5 Geologic and Hydrologic Settings 11

3 ENVIRONMENTALLY SIGNIFICANT OPERATIONS 14

3.1 ESO Locations 14
3.2 Underground Storage Tanks 14
3.3 Sewage Treatment System 14

4 KNOWN AND SUSPECTED RELEASES 15

5 PRELIMINARY ASSESSMENT CONCLUSIONS 16

6 RECOMMENDATIONS 17

REFERENCES 18

APPENDIX: Photographs of Croom Housing Facility and Surrounding Land 19

FIGURES

1 Vicinity Map of Croom Army Housing Units 7

2 Site Plan Map of Croom Army Housing Units 8

SUMMARY

The Croom housing area, located in Prince Georges County, Md., does not represent an imminent or substantial threat to human health or the environment. Although this property was originally developed in conjunction with a Nike missile battery located in Croom, Md., no wastes associated with the operation and maintenance of the missile-launch or tracking areas are known to have been delivered to or managed at this housing property. Furthermore, this housing property existed independently of the battery with respect to water and sewer facilities. Electrical power, however, had at one time been supplied to the housing area from the missile-launch site of the Nike battery.

The property facilities included in this preliminary assessment consist of the housing units, the water pumping station, and the sewage treatment system. The environmentally significant operations associated with the property are the (1) underground storage tanks (USTs) and (2) the sewage treatment system.

Based on the review of both historical and current practices at the property, the ANL reviewers have concluded that the Croom housing area is well maintained and poses no imminent or substantial risk to human health or the environment. However, the reviewers found several deficiencies in the existing property in three areas which could have a potential future impact on the property and the surrounding environment.

- Aged USTs with no secondary containment devices.
- Inadequate disinfection of wastewater and effluent from sewage treatment system.

The following actions are recommended:

- Replacement of the 300-gallon underground gasoline-storage tank.
- Inspection of the seven 550-gallon underground fuel-storage tanks and associated distribution systems for signs of corrosion and leakage.
- Installation of a dechlorinator and an aerator or an ultraviolet-light disinfection system in the sewage treatment system.

1 INTRODUCTION

In October 1988, Congress passed the Defense Authorization Amendments and Base Closure and Realignment Act, Public Law 100-526. This legislation provided the framework for making decisions about military base closures and realignments. The overall objective of the legislation is to close and realign bases so as to maximize savings without impairing the Army's overall military mission. In December 1988, the Defense Secretary's ad hoc Commission on Base Realignment and Closure issued its final report nominating candidate installations. The Commission's recommendations, subsequently approved by Congress, affect 111 Army installations, of which 81 are to be closed. Among the affected installations are 53 military housing areas, including the Croom housing area addressed in this preliminary assessment.[1]

Legislative directives require that all base closures and realignments be performed in accordance with applicable provisions of the National Environmental Policy Act (NEPA). As a result, NEPA documentation is being prepared for all properties scheduled to be closed or realigned. The newly formed Base Closure Division of the U.S. Army Toxic and Hazardous Materials Agency is responsible for supervising the preliminary assessment effort for all affected properties. These USATHAMA assessments will subsequently be incorporated into the NEPA documentation being prepared for the properties.

This document is a report of the enhanced preliminary assessment (PA) conducted by Argonne National Laboratory (ANL) at the Army stand-alone housing area in Croom, Md.

1.1 AUTHORITY FOR THE PA

The USATHAMA has engaged ANL to support the Base Closure Program by assessing the environmental quality of the installations proposed for closure or realignment. Preliminary assessments are being conducted under the authority of the Defense Department's Installation Restoration Program (IRP); the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Public Law 91-510, also known as Superfund; the Superfund Amendments and Reauthorization Act of 1986, Public Law 99-499; and the Defense Authorization Amendments and Base Closure and Realignment Act of 1988, Public Law 100-526.

In conducting preliminary assessments, ANL has followed the methodologies and procedures outlined in Phase I of the IRP. Consequently, this PA addresses all documented or suspected incidents of actual or potential release of hazardous or toxic constituents to the environment.

In addition, this PA is "enhanced" to cover topics not normally addressed in a Phase I preliminary assessment. Specifically, this assessment considers and evaluates the following topical areas and issues:

- Status with respect to regulatory compliance,
- Asbestos,
- Polychlorinated biphenyls (PCBs),
- Radon hazards (to be assessed and reported on independently),
- Underground storage tanks,
- Current or potential restraints on facility utilization,
- Environmental issues requiring resolution,
- Health-risk perspectives associated with residential land use, and
- Other environmental concerns that might present impediments to the expeditious "excessing," or transfer and/or release, of federally owned property.

1.2 OBJECTIVES

This enhanced PA is based on existing information from Army housing records of initial property acquisition, initial construction, and major renovations and remodeling performed by local contractors or by the Army Corps of Engineers. The PA effort does not include the generation of new data. The objectives of the PA include:

- Identifying and characterizing all environmentally significant operations (ESOs),
- Identifying property areas or ESOs that may require a site investigation,
- Identifying ESOs or areas of environmental contamination that may require immediate remedial action,
- Identifying other actions that may be necessary to address and resolve all identified environmental problems, and
- Identifying other environmental concerns that may present impediments to the expeditious transfer of this property.

1.3 PROCEDURES

The PA began with a review of Army housing records located at Cameron Station, near Alexandria, Va., on May 22, 1989. Additional information was obtained from Fort McNair on May 23, 1989, and by telephone conversation with officials from Cameron Station. A site visit was conducted at Croom, Md., on May 22, 1989; further information was obtained through personal observations of ANL investigators, and through interviews with a long-term worker at the housing units. Photographs were taken of the housing units and surrounding properties as a means of documenting the condition of the housing units and immediate land uses. Site photographs are appended.

All available information was evaluated with respect to actual or potential releases to air, soil, and surface and ground waters.

Attempts to gain access to the housing units through involvement of the senior occupant were unsuccessful. Therefore, inspections of the interiors of houses were not performed during the initial site visit. However, ANL investigators revisited the property on September 8, 1989, at which time, visual inspections of the interiors of all the units were performed.

2 PROPERTY CHARACTERIZATION

2.1 GENERAL PROPERTY INFORMATION[2,3]

The Croom housing area lies in Prince Georges County, Md., adjacent to the village of Croom. It is on the east side of Mt. Calvert Road, which intersects Maryland Rt. 382 (Croom Road) on the east; and is approximately four miles southeast of Upper Marlboro, Md. The Croom housing area occupies 3.5 acres of land and 0.11 acre in perpetual easement. The area was acquired in 1956 and developed as part of the Nike missile defense system. The Nike antiaircraft program has since been phased out, but the housing has remained.

Figure 1 shows the general location of the facility.

2.2 DESCRIPTION OF FACILITY

Figure 2 presents the site plan of the housing area.

Housing Units[4]

The Croom housing area is a 3.5-acre land parcel surrounded by farms or private properties on all four sides. There are fences at the perimeter of the housing area, but the entrance is not guarded by a gate. Within the property, there is one short street, which ends in a small children's play area to the north. There are three 2-story apartment buildings with faced brick and wood-shake siding facing the street. These buildings are approximately 32 years old. Altogether, there are 12 dwelling units. Five are 2-bedroom units, and seven are 3-bedroom units. The units are air conditioned and have fuel oil forced-air heating. One large storage shed is situated between a pumphouse and an elevated water storage tank; it is used to store bulky items like lawn mowers. Separate storage sheds are provided for each individual unit in the backyards.

Utilities

Electric power is supplied to the Croom housing units by the Potomac Electric Power Company (PEPCO). There are five pole-mounted transformers on this property. These transformers are owned by PEPCO. According to Cameron Station housing officials, the transformers have not been tested for the presence of PCBs.

Underground Storage of Heating Oil

The units are heated by No. 2 fuel oil stored in seven 550-gallon underground tanks. The tanks are located in the fronts of the buildings on well-drained ground under the sidewalks. Fuel is distributed through copper piping to the 12 dwelling units, each of

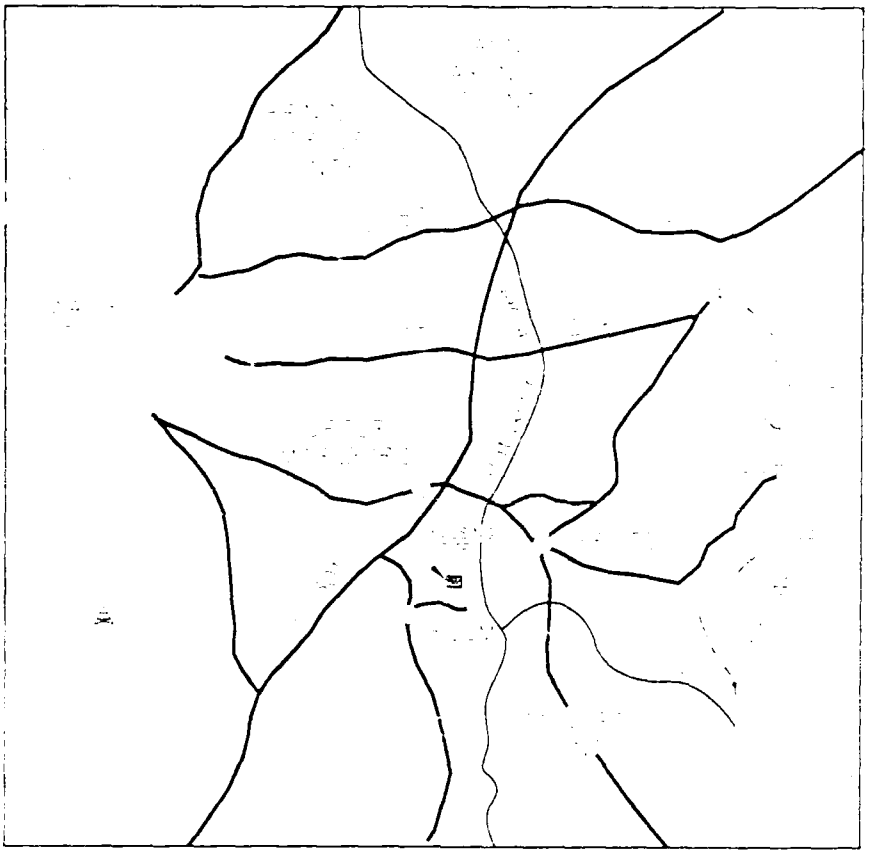


FIGURE 1 Vicinity Map of Croom Army Housing Units

which has its own furnace. The tanks were replaced approximately 15 years ago, when leakages were discovered in the original tanks installed in 1956 during housing construction. The present tanks are of insulated steel construction with asphalt coating. So far, no leakages have been detected from any of the replacement tanks.

Water Pumping Station[4,5]

The Croom housing area has its own water distribution system, which consists of a well, pumphouse, an above-ground storage tank, and water mains. These structure are all located to the west side of the street, adjacent to one of the apartment buildings. The well itself is located inside the pumphouse, which has concrete flooring, masonry walls and built-up roof. The well has a diameter of 6 in. and is 407 ft below ground level. Water is pumped with a 3-horsepower, 3-phase submergible pump, and treated with a solution of 11% sodium hypochlorite before being piped to the elevated steel water storage tank, which has a capacity of 35,000 gallons. Well water is monitored by Delmarva Labs twice a month to ascertain that the coliform bacteria count, chlorine residual, and pH are within the limits set by the Safe Drinking Water Act.[6] According to personnel interviewed, housing residents had a problem with the potable water once, and

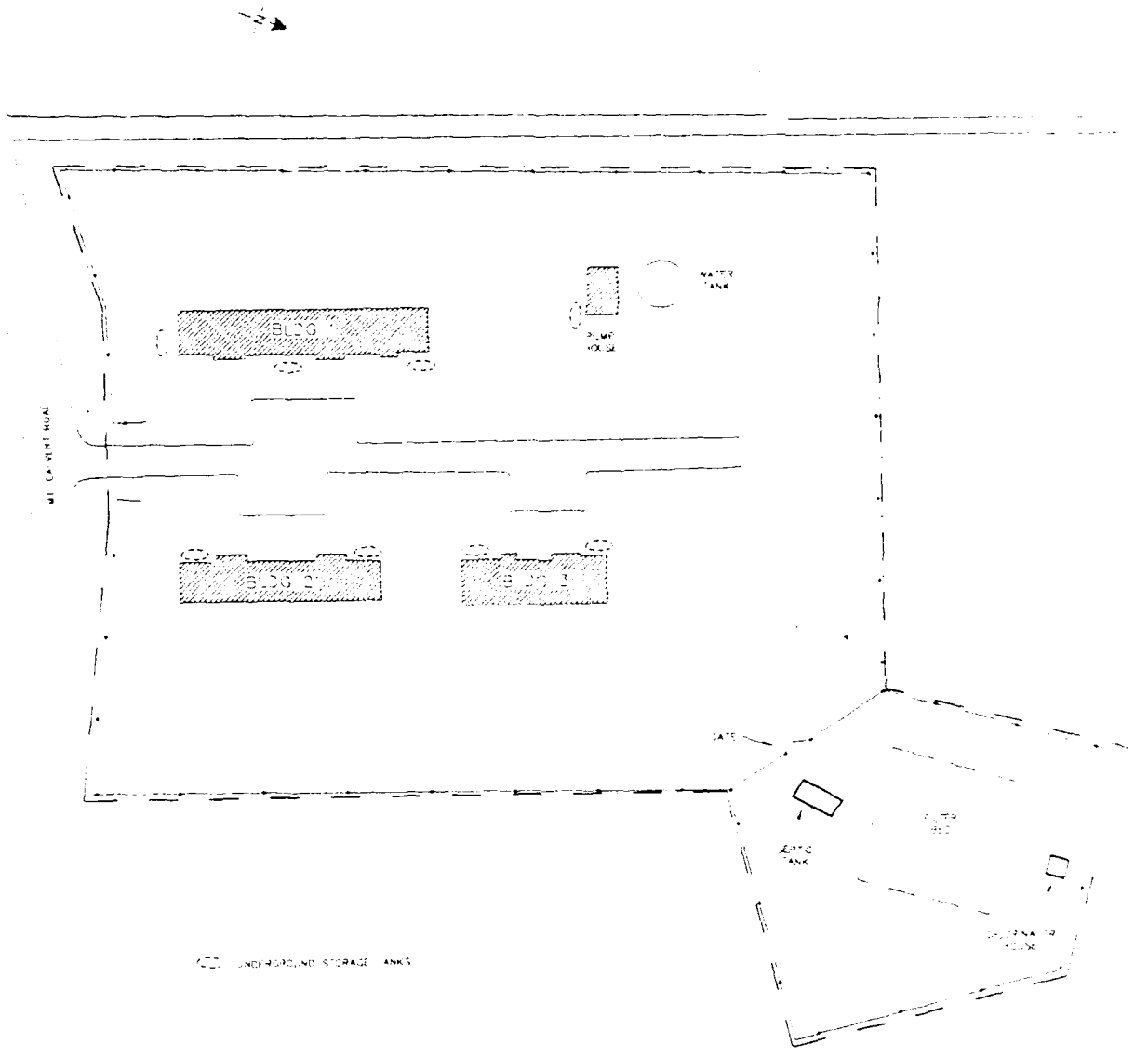


FIGURE 2 Site Plan Map of Croom Army Housing Units

the housing units were placed on bottled water for a short period of time. However, a "Notice of Violation" was not found among the documentation for this housing area during document review.

There is a 300-gallon underground fuel tank located just outside the south entrance of the pump house, and an emergency power generator inside the pumphouse. This equipment is used for the operation of the water pump for emergency water in case of fire or power failure.

Sewage[4,7]

The sewage treatment system for the Croom housing area consists of collection mains, a septic tank, sand filter, and chlorination chamber, which are downgradient in the northeast portion of the property. This area is enclosed with a separate barbed wired fence. The septic tank has a 4,000-gallon capacity. Lasters Septic Tank Service, a local contractor, pumps out the tanks with a vacuum tank truck every three months.[6] The septic lines are cleaned out once a year. Waste water is collected in the tank before it enters the 72 ft x 70 ft sand filter bed drain field, which is fitted with vents every few feet at its periphery. Herbicides are used to kill vegetation that grows on top of the drain field to prevent root systems from clogging up the pipes. The chlorinator house is located at the far northern part of the drain field. Waste water that overflows the drain field during the wet season is treated with 11% sodium hypochlorite solution before it is discharged to the land just beyond the site boundary.

Wastes[6]

Wastes generated on site are mostly limited to household refuse and food wastes. Waste Management of Greater Washington supplies two 8-yd^3 containers to handle refuse from the units. Garbage is picked up once a week.

2.3 PROPERTY HISTORY

2.3.1 Nike Defense Program and Typical Battery-Level Practices

Generic information on the national Nike antiaircraft defense program has been compiled in two studies, one commissioned by the Army Corps of Engineers[8] and the other by the U.S. Army Toxic and Hazardous Materials Agency.[9] In both studies, independent contractors relied on information contained in unclassified documents related to the Nike surface-to-air missile program, including engineering drawings and specifications (for the facilities and the missiles themselves), interviews with Army personnel participating in the Nike program, and operations manuals and directives relating to the operations and maintenance of Nike facilities. Taken together, these two reports represent the most complete assemblage of generic information on the Nike missile program from an environmental perspective. Salient points from both reports are condensed below.

At its zenith in the early 1960s, the Nike program included 291 batteries located throughout the continental United States. The program was completely phased out by 1976, with many of the properties sold to private concerns or excessed to state or local governments for nominal fees.

Nike Ajax missiles were first deployed in 1954 at installations throughout the continental United States, replacing, or in some cases augmenting, conventional artillery batteries and providing protection from aerial attack for strategic resources and population centers. Typically, Nike batteries were located in rural areas encircling the

protected area. The Ajax was a two-stage missile using a solid-fuel booster rocket and a liquid-fuel sustainer motor to deliver a warhead to airborne targets.

The Ajax missile was gradually replaced by the Nike Hercules missile, introduced in 1958. Like the Ajax, the Hercules was a two-stage missile, but it differed from the Ajax in that its second stage was a solid-fuel rather than liquid-fuel power source and its payload often was a nuclear rather than conventional warhead. Ajax-to-Hercules conversions occurred between 1958 and 1961 and required little change in existing Nike battery facilities. A third-generation missile, the Zeus, was phased out during development and consequently was never deployed.

A typical Nike missile battery consisted of two distinct and separate operating units, the launch operations and the integrated fire control (IFC) operations. The two operating areas were separated by distances of less than two miles, with lines of sight between them for communications purposes. A third separate area was also sometimes part of the battery. This area was typically equidistant from the two battery operating sites and contained housing for married personnel assigned to the battery. Occasionally, these housing areas also contained battalion headquarters, which were responsible for a number of Nike batteries.

Depending on area characteristics and convenience, the housing areas were often reliant on the launch or IFC sites for utilities such as potable water, electrical power, and sewage treatment. In those instances, buried utility lines connected the housing area to one or both of the other battery properties. It is also possible, however, that housing areas were completely independent of the missile launcher and tracking operations. In those instances, the necessary utilities were either maintained on the housing site or purchased from the local community. In many localities, as the character of the land area around the housing units changed from rural to suburban or urban, communities extended utility services to the housing unit locations, in which case conversions from independent systems to community systems were made.

A large variety of wastes was associated with the operation and maintenance of Nike missile batteries. Normally encountered wastes included benzene, carbon tetrachloride, chromium and lead (contained in paints and protective coatings), petroleum hydrocarbons, perchloroethylene, toluene, 1,1,1-trichloroethane, 1,1,2-trichloroethane, and trichloroethylene. Because of the rural locations of these batteries, and also because very few regulatory controls existed at that time, most of these wastes were managed "on-site." (Unused rocket propellants and explosives, however, would always have been returned to central supply depots and not disposed of on-site.) It is further conceivable that wastes generated at one of the Nike properties may have been transferred to its companion property for management or disposal.

Wastes related to missile operation and maintenance would not have been purposely transferred from a battery operating area to a housing area with no facilities for waste management or disposal. In some instances, however, the sewage treatment facilities for all Nike battery properties were located at the housing area; that possibility cannot be automatically ignored. Finally, where housing areas received various utilities from either of the operating areas, it is also possible that wastes disposed of on those other properties may have migrated to the housing area via the buried utility lines. And

since decommissioning of the Nike batteries did not normally involve removal of buried utility or communication lines, any such contaminant migration is likely to have gone unnoticed.

2.3.2 Croom Housing Units[4]

The land on which the Croom housing area is located was formerly privately owned by B.T. Dufour and E.D. Early. The Air Force acquired the two parcels of land known as Tract #A-106-1, and #A-107-1 situated in Prince Georges County, by "Declaration of Taking" for use in connection with Nike site W-35-CL on July 2, 1956. In addition to the three apartment houses, necessary roadway, parking, and sidewalks; a water distribution system, a sewage treatment system, and an electrical distribution system had since been installed on site. The Nike missile program was discontinued by the late 1960s, but the housing facilities are still being used by military personnel.

Despite its affiliation with the Nike W-35-CL battery, the Croom housing area always remained independent of the battery with respect to water and sewer utilities. At the same time, during the period of Nike battery operation, electrical power was supplied to the housing area from the missile-launch area by means of above-ground power lines. No missile-related wastes were ever delivered to the housing area for management or disposal. During visual inspections of the housing unit interiors on September 8, 1989, it was determined that the water pipes had no insulation.

2.4 ENVIRONMENTAL SETTING AND SURROUNDING LAND USE

The Croom housing area is situated in a rural residential area on an elevated terrain. The neighborhood consists mostly of farms and wooded area, interspersed with houses that are set apart from each other. The land is characterized by undulating topography of low relief, with rolling hills and wide and flat drainage courses.

The former Nike W-35 missile-launch area is downgradient from the Croom housing area.

2.5 GEOLOGIC AND HYDROLOGIC SETTINGS

The housing area lies along the western edge of the Atlantic Coastal Plain Physiographic Province and just east of the fall line that separates the Piedmont to the west from the Coastal Plain Province to the east.

The Coastal Plain is a wedge of sediment deposited by fluvial and marine processes since the beginning of the Cretaceous period. The mostly unconsolidated sediments are composed of alternating layers of sand, silt, and clay that, locally, may be cemented into rock by iron and calcium carbonate precipitated from groundwater.

Enormous amounts of water are stored in the Coastal Plain sediments. However, only the more permeable units of the formations can yield enough water to be productive

aquifers. Most Coastal Plain aquifers contain both fresh and saline water. Directly below recharge areas the water is fresh, but, seaward and with depth, the water becomes saline. The location of the zone of diffusion depends on the volume of fresh water entering the aquifer from recharge (via rain) or leakage (via confining beds and other aquifers).

The Patuxent, Patapsco, and Magothy formations contain aquifers that are most important for water supply in regions nearest the fall line.

The Patuxent formation is a major water-bearing formation that accounts for more than 2,300 x 10^6 gallon/day of groundwater withdrawals in Prince Georges County. It consists of irregularly stratified, cross-bedded, and lenticular white or light gray to orange-brown sands and quartz gravels. Gray to ocherous silt and clay beds occur in various areas in amounts that range from less than 25% to more than 75% of the formation. In the east coastal area, the formation consists of about 50% water-bearing sand and gravel; this percentage decreases, however, toward the southwest, where clays predominate. In Prince Georges County, the natural water quality of the Patuxent formation is generally low in chlorides and total dissolved solids.

The Magothy formation is one of the most extensive water-bearing aquifers in the Coastal Plain of Maryland and accounts for more than 1,500 x 10^6 gallon/day of groundwater withdrawals in Prince Georges County. It underlies almost the entire Eastern Shore and large portions of Anne Arundel, Calvert, Charles, and Prince Georges counties west of Chesapeake Bay. The formation consists of light grey to white loose sand and fine gravel containing interbedded lignite, pyrite, and clay layers. The coarser sands and gravels commonly occur near the base of the formation, and clays increase toward its top. A potential problem in the Magothy aquifer is the possible intrusion of brackish water into those outcrops of the formation under Chesapeake Bay and its tributaries. This can occur if large withdrawals of water from the Magothy aquifer cause its potentiometric surface to fall below sea level in outcrop areas. Present pumping rates in these areas of the aquifer are nearing the rate of long-term safe yield. The limits of the ability of the aquifer to recharge these areas has nearly been reached.

The Patapsco is a multiaquifer formation accounting for less than 1,000 x 10^6 gallon/day of groundwater withdrawals in Prince Georges County. The Patapsco consists of fluvial and swamp sediments deposited during the Early Cretaceous period. It is characterized by irregularly stratified interbedded silt and clay; and clayey, quartzose sand, with minor amounts of gravel. The formation outcrops in a broad uneven belt about 5 miles wide from Delaware southwestward to Washington, D.C.; most recharge occurs near the updip limits of the formation. In most upward-dip areas, which cover many of the Maryland Coastal Plain areas west of Chesapeake Bay, the natural quality of groundwater is suitable for potable water supplies and other uses. However, the depositional nature of the formation is sometimes a problem. Thick water-bearing sands exist as channel and lens deposits; consequently, they are limited in their lateral extent in many locations, with the sand beds being too thin to supply large-capacity wells.

3 ENVIRONMENTALLY SIGNIFICANT OPERATIONS

3.1 ESO LOCATIONS

Environmentally significant operations at the Croom housing area include: one underground gasoline storage tank; seven underground heating fuel storage tanks and fuel-distribution piping; and a sewage treatment system.

3.2 UNDERGROUND STORAGE TANKS

There are eight USTs located on the property. Seven 550-gallon tanks store heating fuels; the eighth, a 300-gallon tank, stores gasoline.

The 300-gallon gasoline tank is constructed of steel, but it is unknown whether the tank is cathodically protected. The exact date of installation is not known, but it is presumed to have been installed during the initial Nike battery construction in the early 1950s. There has not been any known leakage or spill associated with this particular tank. There is no documentation of leak-testing performed on this tank.

The seven 550-gallon heating-fuel tanks are constructed of insulated steel with black coating. These tanks were installed about 15 years ago as replacements for original tanks that were there since the 1950s. A long-term employee, associated with the housing units for 22 years, has indicated that some small amount of fuel did escape during the replacement of the tanks. However, this individual does not remember any specific action taken for soil cleanup at that time; nor is he aware of any spill or leakage that might have occurred in the years following the tank replacements. No written documentation on the tank replacement effort was located.

3.3 SEWAGE TREATMENT SYSTEM[10-13]

The sewage treatment system consists of a 4,000-gallon septic tank, sand filter, collection mains, and a chlorinator house. A leach field (drain field) is situated between the septic tank and the chlorinator house. Lasters Septic Tank Service pumps the tanks four times a year, and the septic lines are cleaned annually. Effluent water that runs off the drain field is treated with sodium hypochlorite prior to discharge onto the neighboring property. In order to meet the Maryland pollutant discharge requirements, installation of a dechlorinator and aerator was originally scheduled for January 1989. These devices are needed to eliminate the present amount of detectable chlorine and boost the amount of oxygen. However, in light of the pending closure of the Croom housing area, the Army decided to suspend the project and has tried to convince the State of Maryland to allow it to continue operating the sewage treatment system in its current condition until closure or property ownership transfer. The State has not yet responded to this suggestion. Depending on that response, the Army would propose installation of an ultraviolet-light disinfection system to upgrade the sewage treatment system rather than install a dechlorinator and aerator as previously recommended by the State.

4 KNOWN AND SUSPECTED RELEASES

There have been no documented releases of contaminants to groundwater or surface waters, soil, or air from the Croom housing area.

The site is on an elevated ground at 162 ft; the chlorinator house is at an elevation of 128 ft. The immediate vicinity of the housing area consists mostly of farms and uninhabitated wooded areas. No public supplies are located downgradient from the property. There is no known well used for potable water in the areas surrounding the Croom housing units. Effluent from the sewage treatment system is unlikely to affect groundwater. Direct effects on humans because of drinking water contamination are therefore unlikely.

The disinfection process of the waste treatment on site has been found to be inadequate. Effluent from the sewage treatment system is discharged to an intermittent stream downgradient from the chlorinator house.

According to personnel interviewed, there were small quantities of No. 2 fuel oil contamination of the soil when the underground fuel tanks were replaced about 15 years ago. It is unclear whether subsequent soil cleanup and decontamination steps were taken at that time.

The residential nature of activities in this area suggests that any release would be nominal, resulting mostly from operation of the building furnaces, vehicle emission, or evaporative losses during refueling activities of the USTs.

In addition, because the heating-oil storage tanks are underground, and the intermittent stream is several hundred yards downgradient and off to one remote corner, a direct effect on human health or the environment because of surface water contamination from the hydrocarbons is unlikely.

5 PRELIMINARY ASSESSMENT CONCLUSIONS

Although these housing units were originally developed in support of a Nike missile battery, all available documentation and circumstantial evidence support the probability of the fully independent operation of this housing property from other Nike battery activities. No Nike-related wastes were delivered to this property for management or disposal. Furthermore, because this property was independent of the Nike missile operations with respect to all necessary utilities, there is no possibility of migration of Nike-related wastes along buried utility lines.

The Croom housing area is well maintained in general. Past and current activities on site do not indicate any significant violation that would have an adverse effect on the environment. However, two general areas might need to be addressed prior to property closure.

1. Underground Storage Tanks

The 300-gallon underground gasoline tank is not known to have been replaced since its installation in the 1950s. Even though the soil in which it is embedded is supposed to be well drained, the tank is near the end of its useful life. The seven 550-gallon heating-fuel tanks are approximately 15 years old. The original tanks (installed in the same locations in 1956) are known to have leaked. However, there is no documentation regarding the extent of the resulting contamination or whether remediation was successfully completed. Although these seven are insulated with asphalt coating, they have no secondary containment devices. In case of leakage, contaminants will spread, making subsequent clean-ups costly.

2. Sewage Treatment System[10-13]

The present sewage treatment system is quite well maintained, but it is nonetheless "antiquated." The 1984 Croom Sewage Treatment Plant study by the Norfolk, Va., District recommended an ultraviolet-light disinfection system for the housing facility. In 1986, the Maryland Department of Health and Mental Hygiene found the area's disinfection of wastewater inadequate during a wastewater treatment plant inspection. The Department suggested the installation of a dechlorinator and an aerator to satisfy State law and for continuing operation of the Croom housing area sewage treatment system.

6 RECOMMENDATIONS

The Croom housing area presents no imminent or substantial threat to human health or the environment. However, based on available documentations, interviews with personnel who have knowledge regarding the housing facility, and personal observations, the following actions are recommended :

- Removal of the 300-gallon underground gasoline storage tank; sampling and analyses of soils from all areas of the tank envelope for the presence of petroleum products after the original tank is removed; and remediation of any contamination.

- Inspection of the seven 550-gallon underground heating-fuel tanks to ensure tank integrity and absence of soil contamination. If leakage is found to have occurred, the corroded tank should be excavated and replaced, and contaminated soil disposed in an accepted manner.

- Installation of a dechlorinator and an aerator (or an ultraviolet-light disinfection system) to upgrade the sewage treatment facility.

The recommendations assume that this property will most likely continue to be used for residential housing.

REFERENCES

1. *Base Realignments and Closures*, Report of the Secretary's Commission (Dec. 1988).

2. *Preliminary Report of Excess*, Croom Housing area; David J. Ghiglio, Deputy Chief of Staff for Engineering and Housing.

3. *Report of Excess Real Property*, J.W. Fehrer, Real Estate Division, U.S. Army Engineer District, Baltimore (May 10, 1963).

4. Real Property Records of Nike W-35, brought forth from old cards (July 31, 1970).

5. Invoice from Shannahan Artesian Well Co., Inc. to Army Corps of Engineers (June 28, 1976).

6. Purchase Request and Commitment Forms, 1988.

7. Map of Special AAA Site W-35 Army Family Housing Standard Type Water and Sanitary Sewer System (May 1956).

8. U.S. Army Corps of Engineers, Huntsville Div., *Investigation of Former Nike Missile Sites for Potential Toxic and Hazardous Waste Contamination*, Law Engineering and Testing Co., LEG-Government Services Division, LEG Job #601 (March 1986).

9. U.S. Army Toxic and Hazardous Materials Agency, *Historical Overview of the Nike Missile System*, prepared by B.N. McMaster et al., Environmental Science and Engineering, Inc., for USATHAMA Assessments Div., Aberdeen Proving Ground, Md. (Dec. 1984).

10. Waste Water Treatment Plant inspection Report, Department of Health and Mental Hygiene, Office of Environmental Programs (June 1986).

11. Memorandum for ADCSEH, Subject: Croom Family Housing Area - Sewage discharge, from David J. Ghiglio, Engineering and Housing Directorate (Feb. 13, 1989).

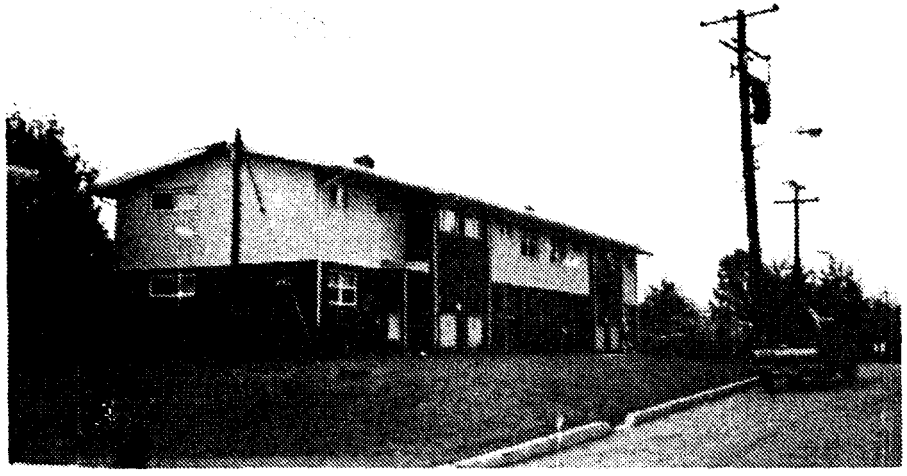
12. Memorandum for CENAC-EC, Subject: Install Aerator, Stephen Etsell, Engineering and Housing Directorate (April 4, 1989).

13. Turner, Richard B., Engineering and Construction, Letter to Stephen Etsell, Engineering and Housing Directorate, Subject: Install Aerator (May 5, 1989).

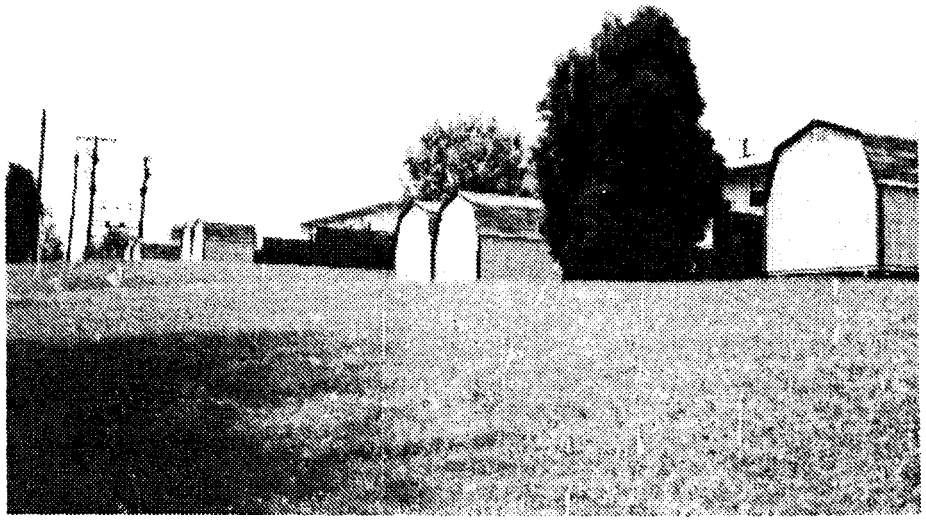
APPENDIX:

PHOTOGRAPHS OF CROOM HOUSING FACILITY AND SURROUNDING LAND

1

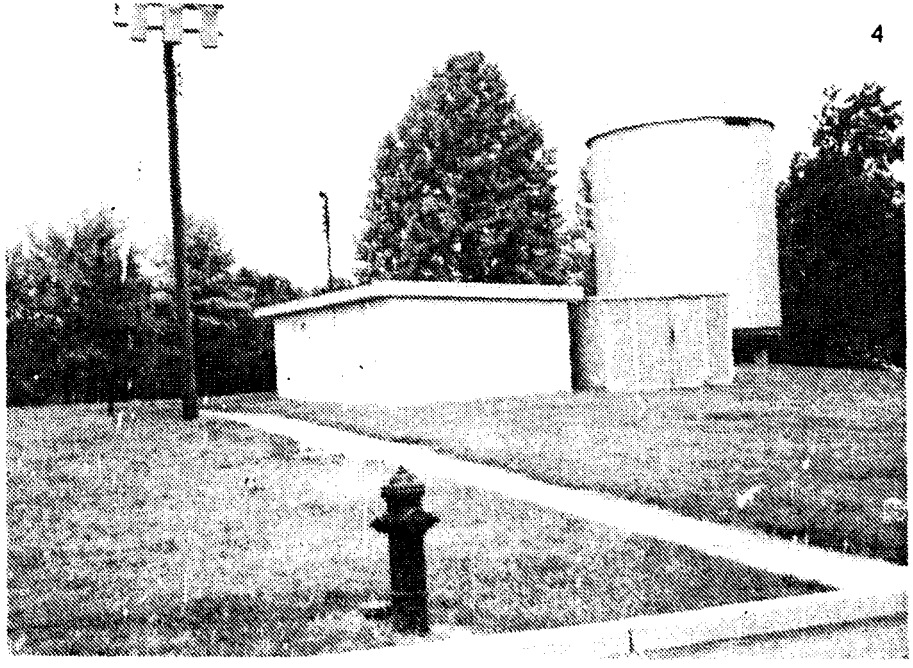


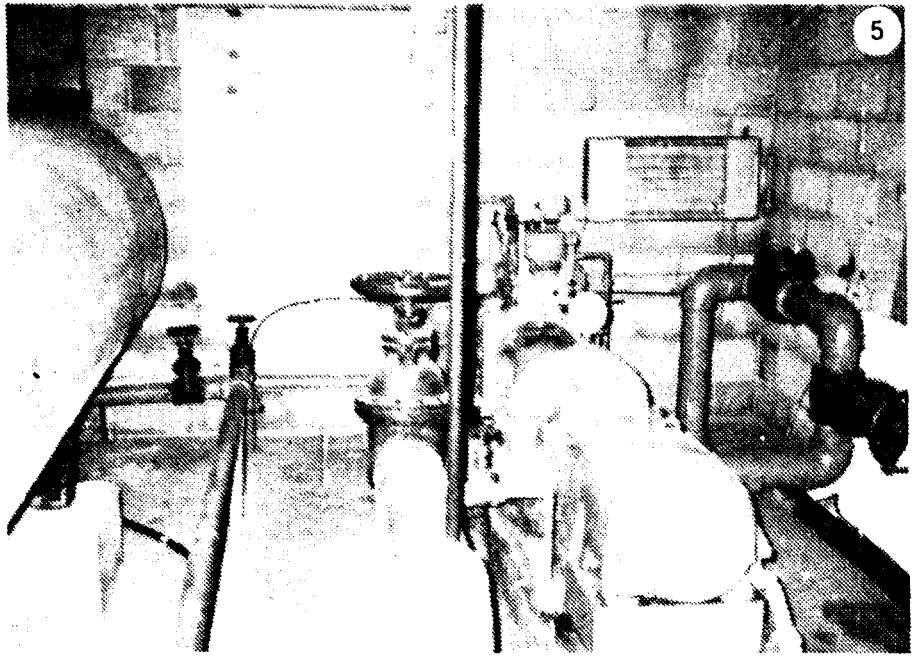
2

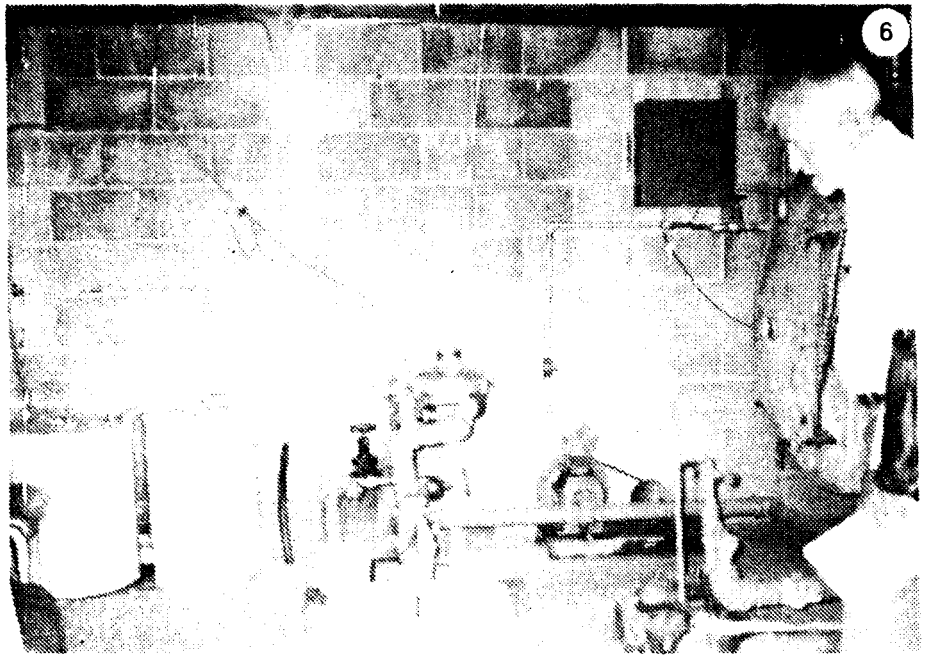


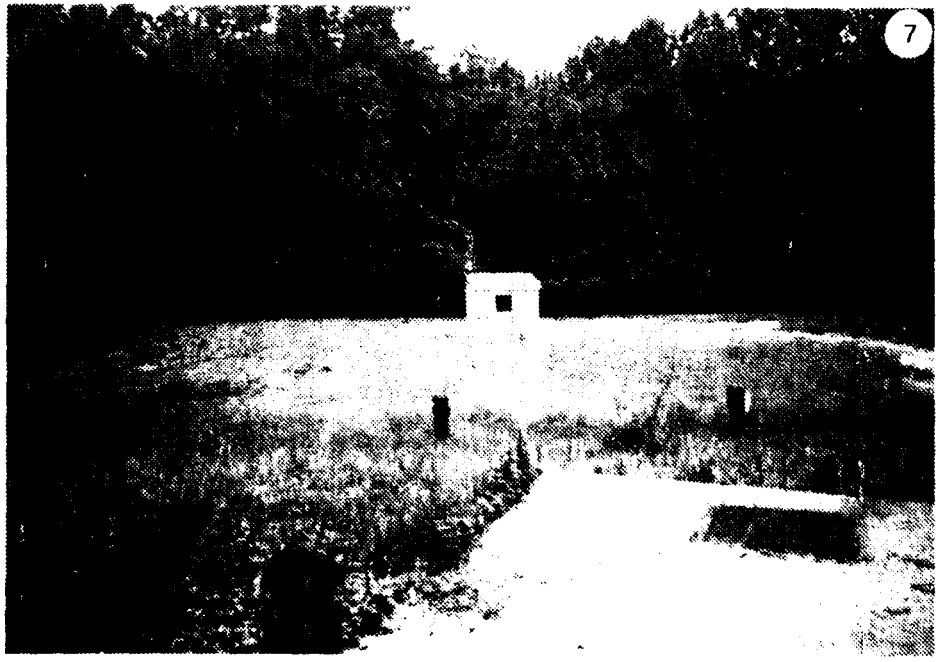
3

4




5


6


7

IDENTIFICATIONS OF PHOTOGRAPHS

1. One of the three apartment buildings; a pole-mounted transformer at top right (transformers maintained by the local utility).

2. Storage barns behind the buildings.

3. Vent or riser for underground storage tanks. The tanks are located underneath the sidewalk.

4. A view (left to right) of the pump house, storage shed, and elevated water storage tank; structures are adjacent to the building on the west side of the street.

5. and 6. Inside views of the pump house, showing the motor, plumbing, and other accessories for pumping water from the well.

7. The sewage-treatment system; part of the sand-bed filter system (72 feet x 70 feet) is seen in the foreground, with chlorinator house for the treatment of effluent water from the filter bed in the background. Septic tanks, which form part of the treatment system, are underground. The disinfection of wastewater is inadequate.