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# USATHAMA

U.S. Army Toxic and Hazardous Materials Agency

## Enhanced Preliminary Assessment Report:

### Spring Valley Army Housing Units Ramapo, New York

November 1989

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prepared for

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

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## SUMMARY

The Spring Valley housing facility does not present an imminent or substantial threat to human health or the environment. There is no evidence to suggest that hazardous or toxic materials have ever been released from the property. No immediate remedial actions, therefore, are warranted for the site.

Although these housing units were originally developed in support of a Nike missile battery, there is no evidence that Nike missile-related wastes were ever delivered to this property for storage or management. The housing area was independent of Nike battery operations with respect to water and electrical utilities. However, the housing area was briefly connected to the Nike battery's nearby missile-launch area by a sanitary sewer.

The following actions are recommended prior to release of the property:

- Sample each of the six on-site electrical transformers for PCBs; label the transformers appropriately.
- Remove the abandoned liquified propane gas (LPG) tank.
- Sample soils surrounding the abandoned sewer line, which once connected this housing area to the nearby Nike launcher area, for the presence of Nike-related contaminants.

These recommendations assume that this property will continue to be used for residential housing.

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## 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 Spring Valley housing area addressed in this preliminary assessment.<sup>1</sup>

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 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 Ramapo, N.Y.

### 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 at Fort Hamilton, N.Y., on August 7, 1989.<sup>2</sup> A site visit was conducted at the Spring Valley family housing area on August 10, 1989, at which time some of the unit interiors were inspected and additional information was obtained through personal observations of ANL investigators. 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.

ANL investigators revisited the property on September 9, 1989, at which time the interiors of the remaining units were inspected. Additional information was obtained from a visit to the nearby Tappan Army Reserve Center, where information was provided by the shop foreman and local housing supervisor.

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

Access to individual housing units was obtained through the military housing inspector stationed at Fort Hamilton in Brooklyn, N.Y.

## 2 PROPERTY CHARACTERIZATION

### 2.1 GENERAL PROPERTY INFORMATION

The Spring Valley housing area is located on Grandview Avenue in the Town of Ramapo, Rockland County, in southeastern New York, just north of the City of Spring Valley. The housing facility is approximately 3 miles north of the intersection of the Garden State Parkway (the primary roadway south to New Jersey) and the New York State Thruway (the major east-west roadway in the region).

Spring Valley housing consists of 4.88 acres with 12 single-story residential buildings. To the east and southeast, on approximately 73.46 acres, is located a school and several buildings utilized by the Food Services Division of the Ramapo Central School District No. 2. This property was formerly a Nike missile site. The remaining area surrounding the Spring Valley housing facility is predominantly residential.

Figures 1 and 2 show the general location of the facility.

The family housing units, now administered through Fort Hamilton, were constructed in 1957-1958.<sup>2</sup> Individual septic systems for each residence were added in the mid-1960s.<sup>3</sup> Other minor repairs and renovations have been performed as required. The buildings are occupied at full capacity by active-duty military personnel assigned primarily to recruiting duties in the area.<sup>2,3</sup>

### 2.2 DESCRIPTION OF FACILITY

Figure 3 presents the site plan of the housing property.<sup>4</sup>

#### Housing Units

The Spring Valley housing area consists of 12, three-bedroom, "Capehart"-style homes built on concrete slab foundations. Capehart is the model name given to these homes by the builder, National Homes. Each has a living/dining room, kitchen, and utility or storage room, with a gross area of 1,200 square feet. All units have one and one-half bathrooms. Renovations in the last five years have included new windows, storm doors, kitchens, and oil-fired furnaces.<sup>2,5</sup>

#### Utilities

Since development of the property, the housing units have been supplied with city water; no drinking water wells exist on the property. Water is supplied by the Spring Valley Water Supply Company. The property receives electricity from Rockland Light and Power Company. These services are linked to main sources on Grandview Avenue.<sup>2,5</sup> Gas for cooking and hot water is provided by an above-ground LPG tank adjacent to each home. Solid waste is removed by the local disposal service.<sup>2</sup>

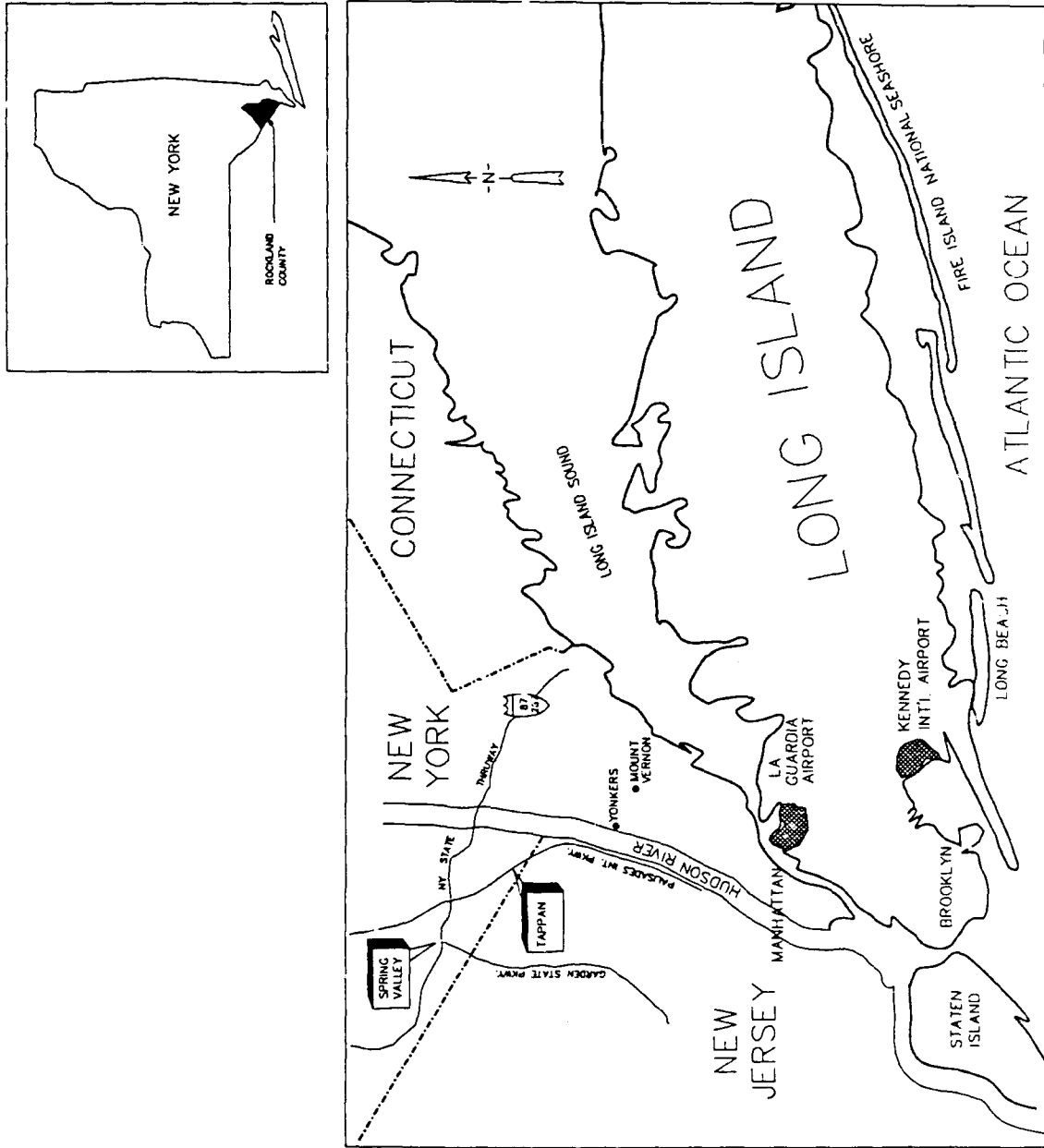
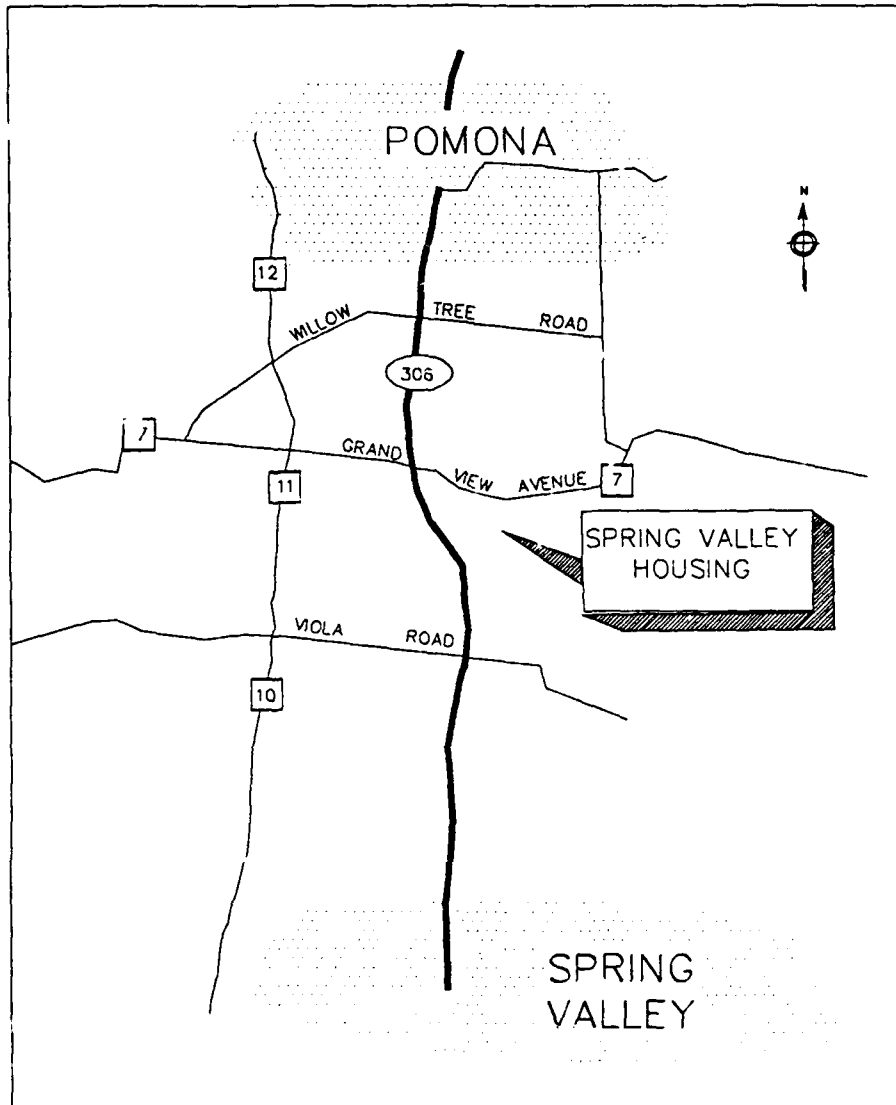


FIGURE 1 Location Map of Spring Valley Army Housing Facilities

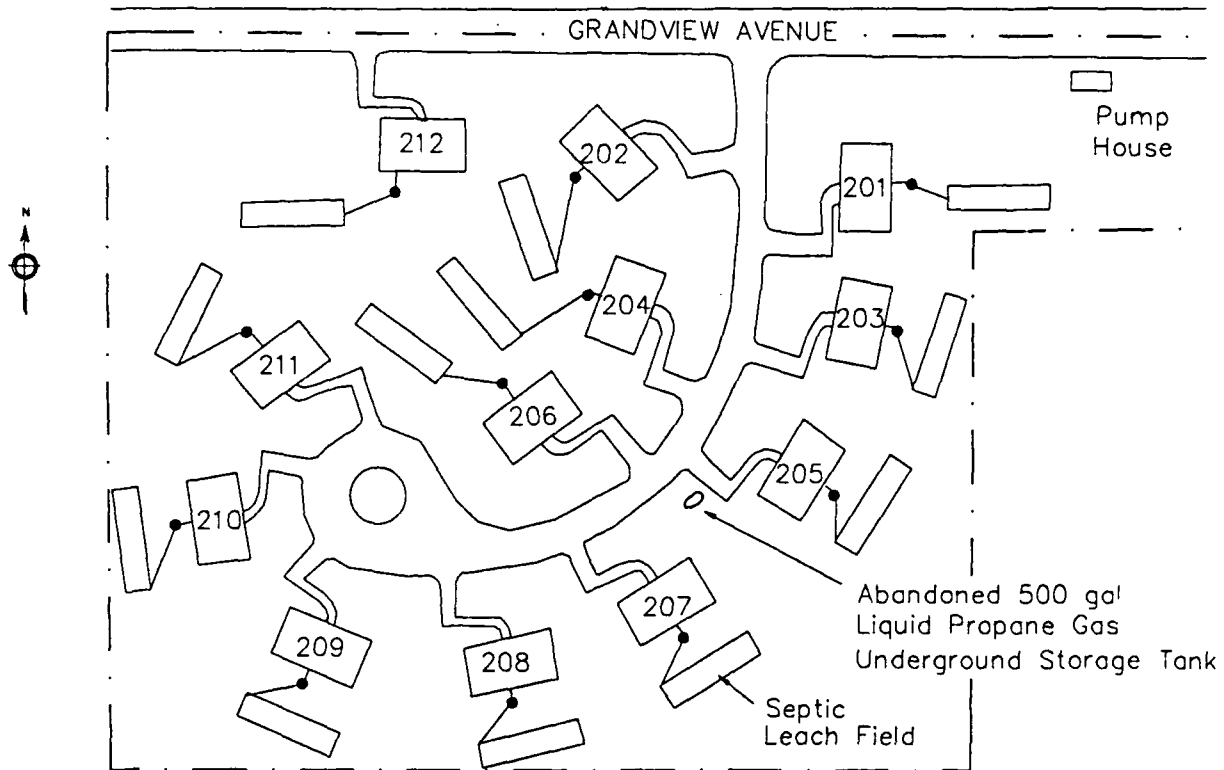


**FIGURE 2 Vicinity Map of Spring Valley Army Housing Units**

### **Sewage**

Each housing unit has a septic tank leading to a tile leach field, installed in the mid-1960s, in its backyard.<sup>4</sup> The exact distances from the building to the septic tank and then to the leach field were not provided, but the overall length is approximately 55 feet. Installation standards called for the house sewer to be laid with a minimum 0.5% slope from the building. Installation of the tile leach field was to have a maximum 0.5% slope. Connecting piping of approximately 6 inches in diameter was used.

Prior to installation of the individual septic systems, the housing area and nearby Nike facility utilized a sewage-treatment system located at the missile launcher area and presumably built in 1957-1958. The adjacent Nike missile site property was later transferred to the school district. The plant was reportedly abandoned in 1963 and has



**FIGURE 3 Site Plan Map of Spring Valley Army Housing Units**

since been demolished. No additional information was available from Fort Hamilton personnel regarding the abandonment of the treatment facility.<sup>2</sup>

### Fuel Storage

Each home has an underground storage tank that holds 550 gallons of fuel oil for heating.<sup>2,3</sup> The tanks are located in the rear of each home, where the furnace is positioned. In approximately 1983, the 12 housing units had their original underground tanks, which were installed in 1957, replaced by fiberglass tanks.<sup>2,6</sup> There is no documentation of spills or leaks from any of the original tanks. Instead, their replacement was a matter of good engineering practice, dictated by the tanks' advancing ages.

Adjacent to each home is an above-ground LPG tank for cooking and hot water. These small individual tanks have been used since the mid-1970s. Prior to this, all housing units were linked to a common underground LPG tank buried adjacent to the driveway of unit #205<sup>2,7,8</sup> (see Fig. 3). According to Fort Hamilton personnel, the LPG underground tank presumably installed at the time the houses were constructed,<sup>5</sup> was abandoned and left in place. The pipes leading from the tank were capped at each housing unit. The LPG tank fill pipe and valve are still visible.<sup>2</sup>

### **Storm Drainage System**

There is no record of storm drainage problems at the facility. The road network directs much of the rainfall runoff. Also, the property to the rear of the housing area has a slight downward slope toward the southeast in the direction of the school district property.<sup>2</sup>

### **Other Permanent Structures or Property Improvements**

Building 213, a small, windowless, locked structure near the entrance to the housing facility off Grandview Avenue, houses the water meter for the property. According to Fort Hamilton personnel, it also contains a water storage tank and pump, installed at the time of Nike site operations to provide water in case the local utility source was interrupted. Though never used for that purpose, the pump is maintained to prevent freezing of the water lines connected to the tank.<sup>2</sup>

## **2.3 PROPERTY HISTORY**

### **2.3.1 Nike Defense Program and Typical Battery-Level Practices**

Generic information on the national Nike anti-aircraft defense program has been compiled in two studies, one commissioned by the Army Corps of Engineers<sup>9</sup> and the other by the U.S. Army Toxic and Hazardous Materials Agency.<sup>10</sup> 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 exceded 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 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.

As the Nike program drew to a close, the Army Air Defense Command declared the Nike battery and adjacent housing excess. Authorized under the Federal Property and Administrative Services Act of 1949 (Public Law 63-377) for transfer of surplus Federal property for educational or public health uses, the Nike battery area was transferred from the U.S. General Services Administration to the Ramapo Central School District No. 2 in November 1966.<sup>11</sup>

### **2.3.2 Spring Valley Family Housing**

The Nike missile site near Spring Valley, N.Y., was operated as a typical Nike battery. It consisted of two distinct and separate operating units on 73.46 acres; the missile-launch area and the fire-control area, with a line of sight between them for communications purposes.<sup>9</sup> The Spring Valley housing area, developed in 1957-1958, was located on the adjacent 4.88 acres for use by the Nike battery personnel. A separate area in nearby Tappan, N.Y., was constructed to serve as battalion headquarters for several Nike sites in the region, including Nike missile site NY 99.<sup>2</sup>

The Spring Valley housing area was transferred to Fort Hamilton control in 1973.<sup>3,5</sup> Since that time, these buildings have been occupied by the families of active-duty military personnel assigned primarily to recruiting duties in the area. Housing occupancy is at capacity. Except for periodic renovations, no other permanent structures have been added since that time.<sup>2</sup>

## **2.4 ENVIRONMENTAL SETTING AND SURROUNDING LAND USE**

The Spring Valley housing facility is located on Grandview Avenue in the Town of Ramapo, N.Y. The surrounding area is predominantly residential with single-family homes on wooded, approximately 1-acre lots. However, the area does not appear to be densely populated. South and east of the housing property and adjacent to it are the Merrill L. Colton School and a food services facility belonging to the Ramapo Central School District No 2.

The Tappan Army Reserve Center (former battalion headquarters for Nike sites in the region) is located about six miles to the west. The primary activity at the Reserve Center now is vehicle maintenance and service performed as one aspect of personnel training. The facility is government-owned and derives its engineering support from Fort Hamilton. The Tappan Army Reserve Center provides branch engineering support for the Spring Valley housing area.<sup>2</sup>

Spring Valley, a small metropolitan area encompassing Ramapo, has an estimated population near 30,000. This region of Rockland County has a total population near 100,000, and is increasingly urbanized toward the west and south.<sup>12</sup>

There are no known endangered or threatened animal or plant species in the area affected by the proposed closure action. No structures on-site are considered to be of historical significance. No cemetery (private or military) is situated on the housing property.<sup>2,3</sup>

The property adjacent to the housing area is now owned by the Ramapo Central School District No. 2. A school is located to the south, the former site of the missile launch area. The Food Services Division of the school district now occupies the former IFC area, to the east and southeast. Some of the Nike battery buildings once used as barracks or a mess hall, or for storage, are now used by the Food Services Division for cold storage, hot storage, and administration.<sup>2</sup>

## 2.5 GEOLOGIC AND HYDROLOGIC SETTINGS

Rockland County, a 180-square-mile area in southeastern New York State, is bounded on the east by the Hudson River (flowing north-south), on the north and northwest by Orange County, and on the south and southwest by New Jersey. Principal physiographic features are the Hudson River; numerous small lakes; the Palisade Mountain Range, extending north of Tappan along the Hudson River; and the Ramapo Mountain Range in the western portion of the county, extending north from the point at which the Ramapo and Mahwah rivers enter New Jersey.<sup>13</sup>

Approximately one-third of Rockland County is drained by eastward-flowing streams tributary to the Hudson River; the remainder (in the region of Spring Valley and west) is drained by southward-flowing streams entering the Hackensack and Passaic river systems of New Jersey.<sup>13</sup>

Rockland County is situated within the Coastal Plain Province of the mid-Atlantic area and consists of crystalline bedrock mantled by unconsolidated materials. The soil cover includes three types of deposits: local stream and lake deposits of sand, gravel, silt, and clay; stratified deposits of sand and gravel, distributed primarily along the major stream valleys of the county; and an unstratified and poorly sorted mixture ranging from clay particles to large boulders. This unstratified and poorly sorted material forms the soil cover in most of the county.

The geology and topography of the region were greatly modified by glaciation. Ice covered the entire county and deposited poorly sorted clay, silt, sand, and boulders over the area. To the west of the Spring Valley region, two major channels were carved into the bedrock surface and later buried by unconsolidated deposits of highly permeable outwash sand and gravel. These two channels, roughly parallel to the modern Ramapo and Mahwah rivers, form a valley-fill aquifer providing water for the regional population totaling approximately 100,000 people. An estimated 10 million gallons per day is withdrawn.<sup>12</sup> The Ramapo-Mahwah aquifer system underlying the valley floor of the Ramapo and Mahwah rivers lies mostly in Rockland County but extends into Orange County to the northwest and into Bergen County, N.J., to the south.<sup>12</sup>

The climate of the area is the humid continental type. A warm, humid summer and cold, snowy winter are typically separated by a mild spring and fall. Average annual precipitation is 48 inches with fairly uniform distribution throughout the year. Coastal storms occur throughout the year, and severe thunderstorms are common during the summer.<sup>14</sup> The average annual temperature is near 12°C, ranging from approximately 0°C in January to 25°C in July.

### 3 ENVIRONMENTALLY SIGNIFICANT OPERATIONS

#### 3.1 ASBESTOS

In July 1989, Fort Hamilton issued a request for proposals to do a comprehensive survey of all military housing under its administration, including those units at the Spring Valley housing area. The objective is to identify those buildings with friable and nonfriable materials containing asbestos.<sup>14</sup> The materials to be sampled include suspended ceiling tile, floor tile, asbestos siding, plaster gypsum wallboard, and dust accumulated inside ductwork. The proposal also requires the recipient contractor/laboratory doing the asbestos analysis to be a participant in the Environmental Protection Agency Bulk Sample Quality Assurance Program at Research Triangle Park, N.C., and in the National Institute of Occupational Safety and Health Proficiency Analytical Testing Program. At the time of the ANL site visit, however, no contract had been awarded to do the asbestos sampling and testing at the Spring Valley housing area.

Unit #205, representative of the Spring Valley housing units, was inspected during the site visit. There was no insulation material on the heating pipes extending from the furnace. The floor tiles do not appear to be made of asbestos-containing materials. Aluminum siding covers the outside frame.

#### 3.2 RADON

The New York Area Command (NYAC) instituted a radon surveillance program in February 1989.<sup>15</sup> The radon monitoring program is to consist of two parts: (1) radon measurement and (2) radon mitigation, if necessary. This program was intended to implement Army directives on radon monitoring. Radon detectors had been distributed to housing occupants in March 1989.<sup>2</sup> Monitoring is intended to last one year.

In September 1989, ANL investigators installed radon monitors in the housing units in a separate monitoring effort conducted under the Base Closure program. Monitoring will last for a period of 90 days.

#### 3.3 UNDERGROUND STORAGE TANKS

A 550-gallon underground storage tank for heating fuel is located in the back of each residence.<sup>2,5</sup> Inspection of the area surrounding the nearby fill pipe at a few of the residences showed minor soil stains probably resulting from small spills during tank refilling. In 1986, the 12 underground tanks were replaced with new, fiberglass tanks.<sup>2,7</sup> No documentation was found to indicate that failure or suspected leaks prompted the replacement. There is no documentation that soil sampling was performed during the tank replacement operation.<sup>2</sup>

A 500-gallon underground tank for LPG is located adjacent to the driveway of unit #205. It was formerly used to provide LPG fuel to all housing units through an underground piping network. It has been abandoned and small individual LPG tanks at each residence are now provided. It is not known whether the tank has been emptied. The fill pipe and valve are still present. Distribution piping at each housing unit has been capped, according to Fort Hamilton personnel.<sup>2</sup> The tank is presumed to have been installed 30 years ago, at the time the homes were constructed.<sup>8</sup>

### 3.4 PCB TRANSFORMERS

Six Army-owned transformers are located at two locations within the housing area; three are on one pole near the Grandview Avenue entrance to the facility, and three others are on a pole among the housing units. It was unknown whether or not the transformers have been tested for the presence of PCBs. Manufacture date of the transformers is unknown, although a site figure dated 1968 showed the transformer positions.<sup>8</sup> None of the poles holding transformers were labeled with PCB identification tags. There was no sign of oil leakage around the transformers or poles.<sup>2</sup>

### 3.5 WASTEWATER DISPOSAL

Each residence has a septic tank leading to a tile leach field, installed in the mid-1960s, in its backyard.<sup>2,4</sup> No operational problems with these septic systems were reported by site personnel.

No information was available regarding operation of the original sewage treatment system built for the housing area and the adjacent Nike facility. The treatment system was located to the east of the housing area on the property now used by the Ramapo School District Food Services Division. According to Fort Hamilton personnel, the treatment system was abandoned in 1963 when the Nike facilities were linked to the Rockland County Sewage District. Apparently the sewage plant has since been at least partially demolished by the current owners of the property. However, the leach field for the system, with an access port and pump station, is still identifiable east of the structures now used by the Food Services Division of the Ramapo Central School District.<sup>2</sup>

#### 4 KNOWN AND SUSPECTED RELEASES

No major releases or impacts to the environment are known to have occurred at the Spring Valley housing area. Minor soil stains of fuel oil are evident at some residences, probably the result of small spills during tank refilling. A 500-gallon underground storage tank, formerly used to supply liquid propane gas to each housing unit, is still located adjacent to the driveway of unit #205. The capped fill pipe and valve are still visible. It is unknown whether the tank still contains fuel. No other hazardous materials or wastes are stored on site.

## 5 PRELIMINARY ASSESSMENT CONCLUSIONS

The Spring Valley housing area was originally developed as part of the Nike missile battery near Spring Valley, N.Y. There is no documentation that wastes associated with the operation or maintenance of the missile battery were delivered to or managed in the housing area. However, the housing facility and the battery operations shared a common sewage system for a short time, providing a potential underground pathway for hazardous or toxic materials.

There is no documentation that the six on-site electrical transformers have been tested for PCBs. However, there were no indications of spills or leaks from any of these transformers.

The Nike operations property was transferred to the Ramapo School District some years before control of the housing area was given to Fort Hamilton. Therefore, very little information concerning the Nike operations was provided to Fort Hamilton or available during the site visit.

An underground LPG storage tank, approximately 30 years of age, is no longer used. Located adjacent to the driveway of unit #205, it is unknown whether the tank still contains fuel.

## 6 RECOMMENDATIONS

The Spring Valley housing area does not present an imminent or substantial threat to human health or the environment. There is no evidence to suggest that hazardous or toxic materials have ever been released from the property. No immediate remedial actions, therefore, are warranted for the site.

Fort Hamilton housing officials have already begun appropriate actions to address potential problems with asbestos and radon. These actions should be allowed to continue to completion.

The following actions are recommended prior to release of the property:

- Sample each of the six on-site electrical transformers for PCBs; label the transformers appropriately.
- Remove the abandoned LPG tank.
- Sample soils surrounding the abandoned sewer line, which once connected this housing area to the nearby Nike launcher area, for the presence of Nike-related contaminants.

These recommendations assume that this property will continue to be used for residential housing.

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10. 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).
11. Memo from the U.S. Department of Health, Education, and Welfare, Region II, New York City, to the Office of the Post Engineer Fort Dix, N.J., regarding transfer of the Nike Battery NY 99, Spring Valley, N.Y. (Nov. 25, 1966).
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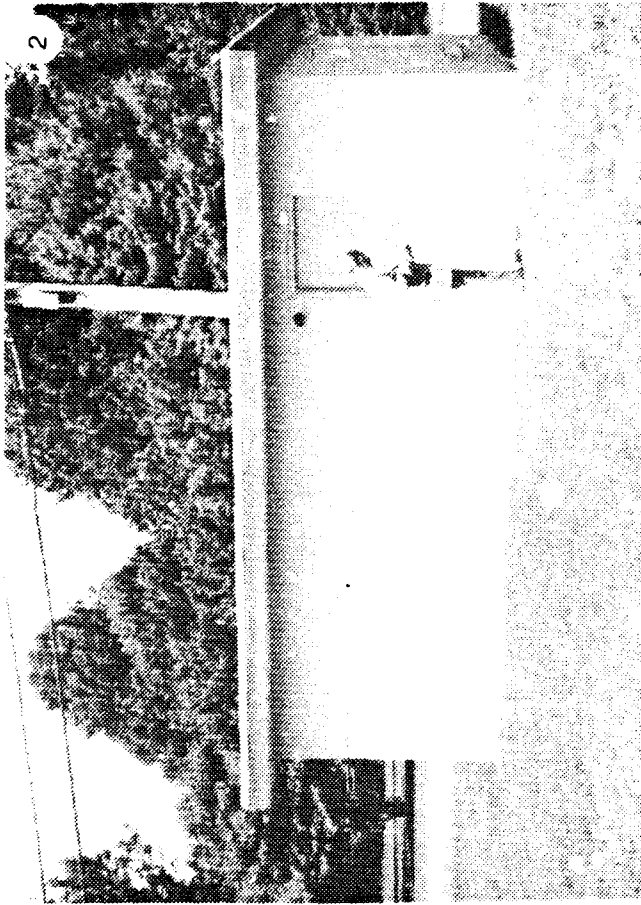
13. *Evaluation of Rainfall-Runoff Data Network, Rockland County, New York*, prepared by Richard Lumia, U.S. Geological Survey, Water Resources Investigations, Report 81-49, Albany, N.Y. (1982).
14. Work order for a comprehensive survey of asbestos at Fort Hamilton, N.Y., and housing units under its administration (July, 1989).
15. Radon Surveillance Program order from the Department of Engineering and Housing, New York Area Command (Feb. 1989).

**APPENDIX:**  
**PHOTOGRAPHS OF SPRING VALLEY HOUSING FACILITY  
AND SURROUNDING LAND**

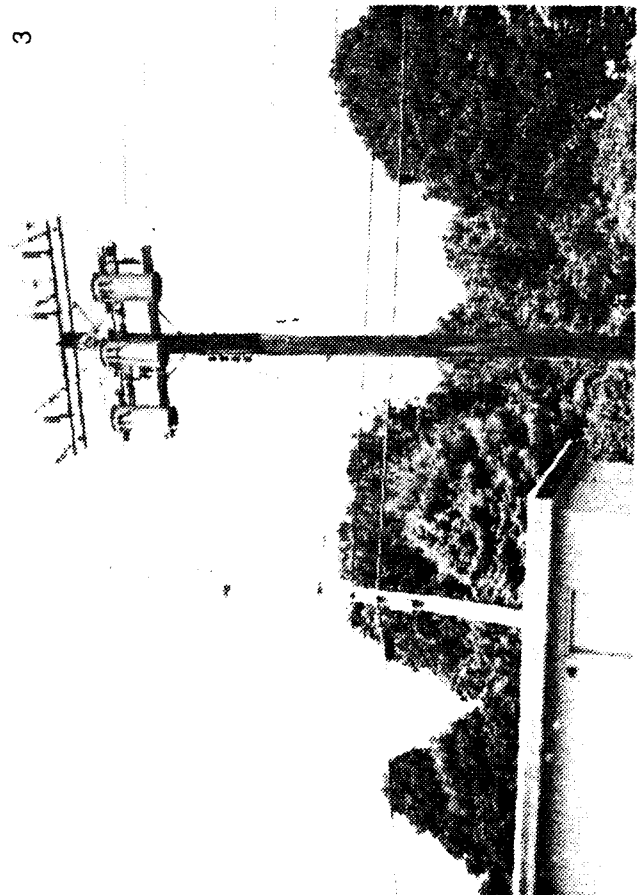




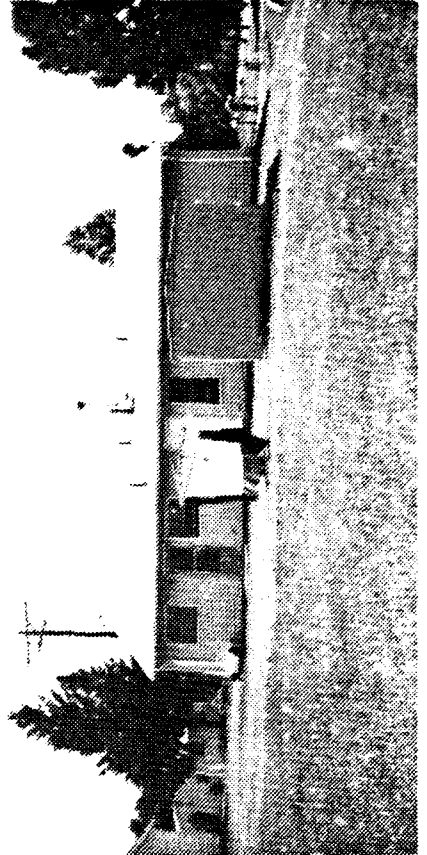
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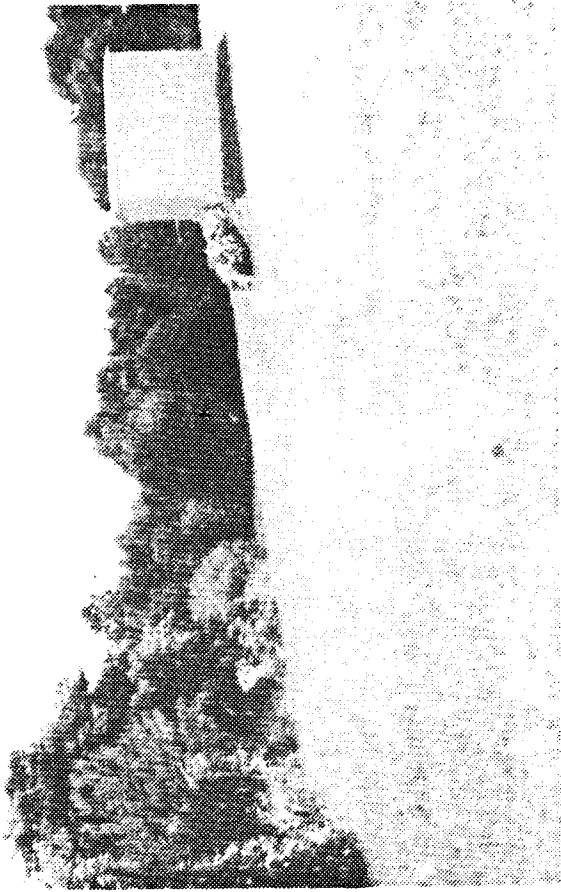


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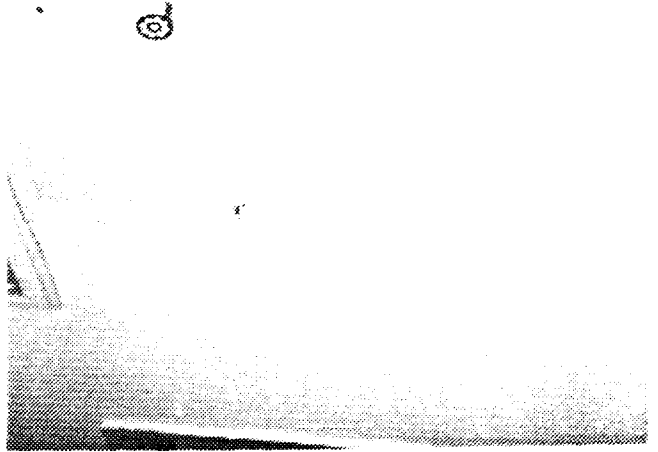


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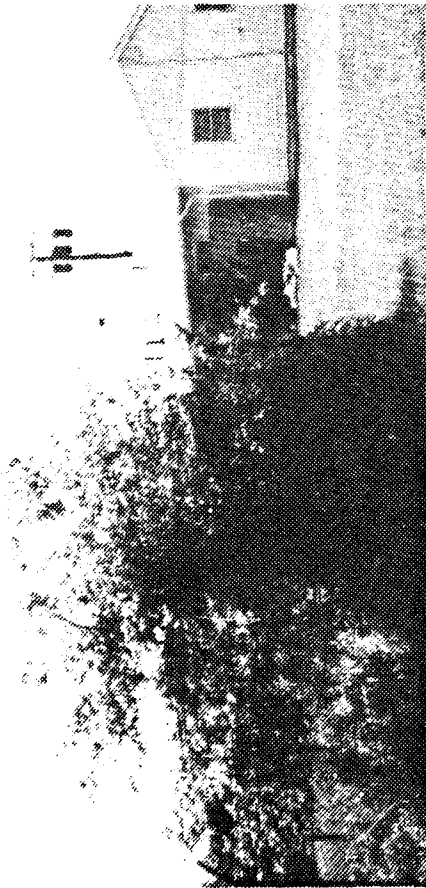
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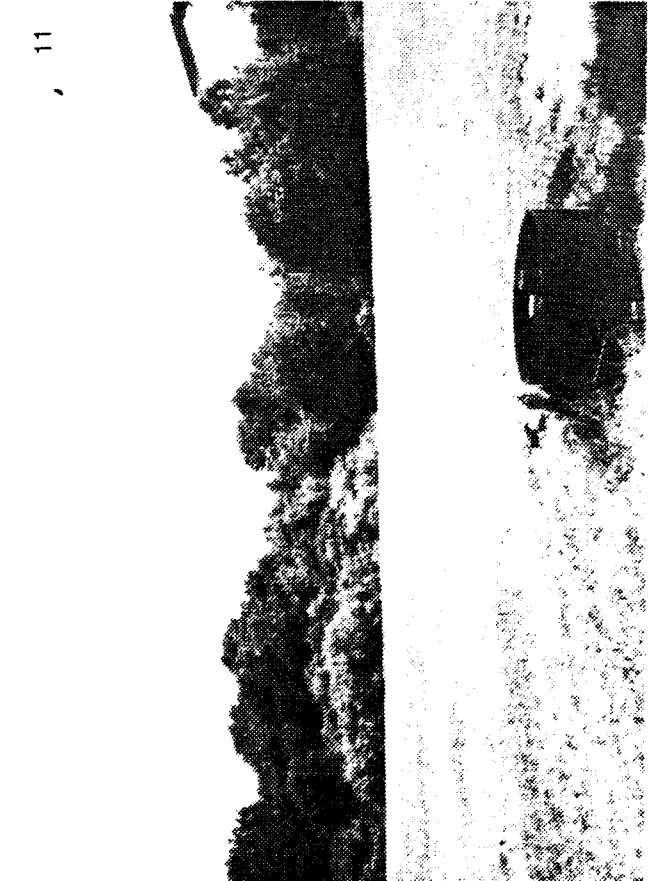
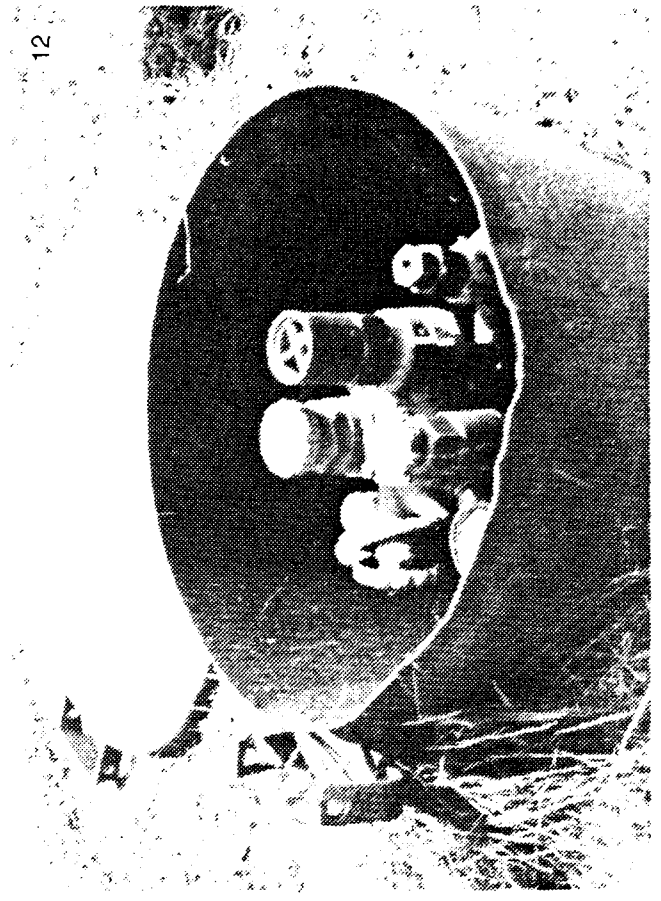


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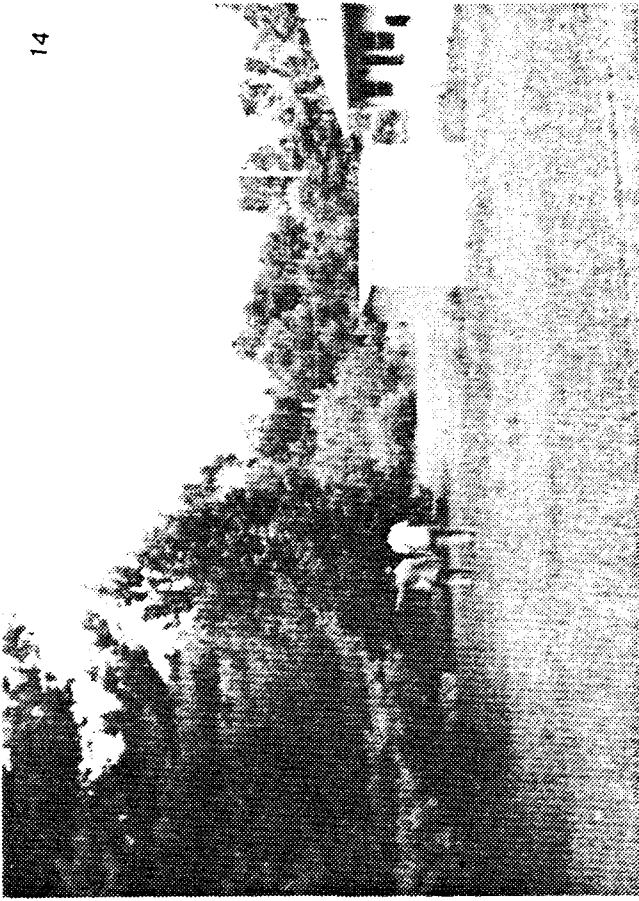


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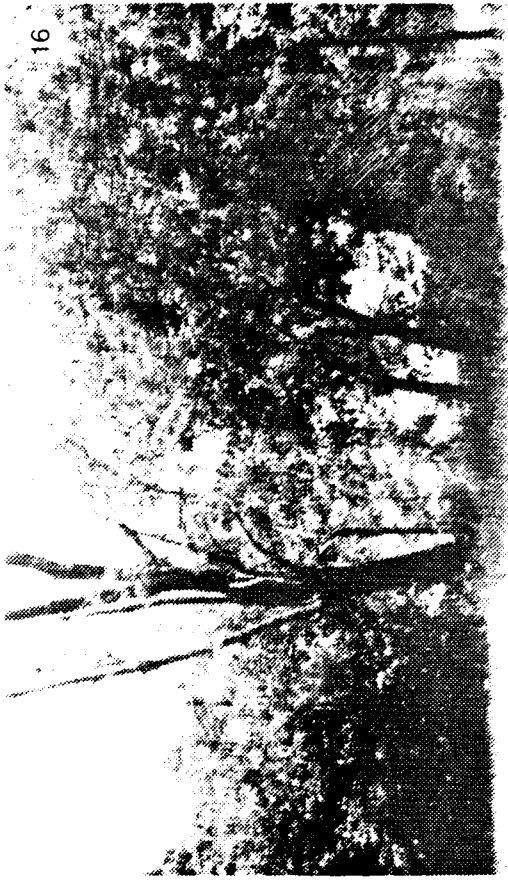




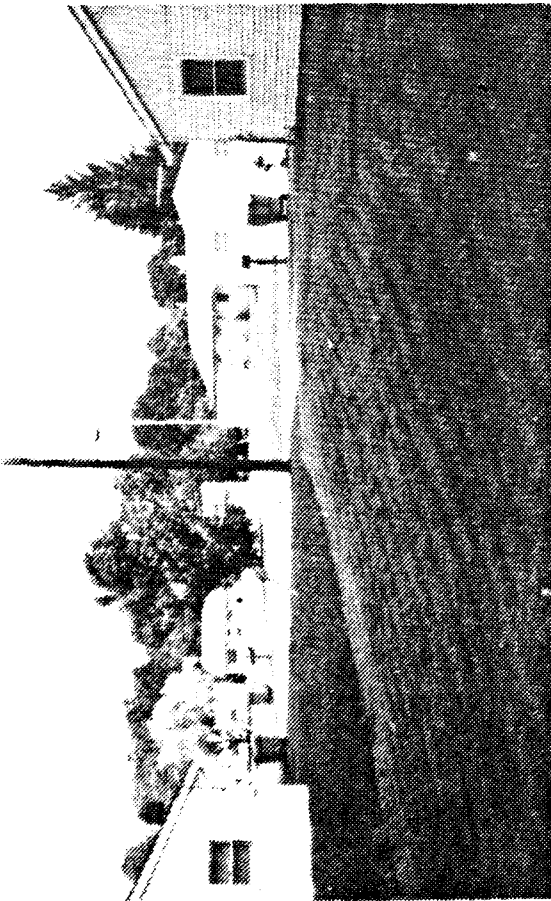
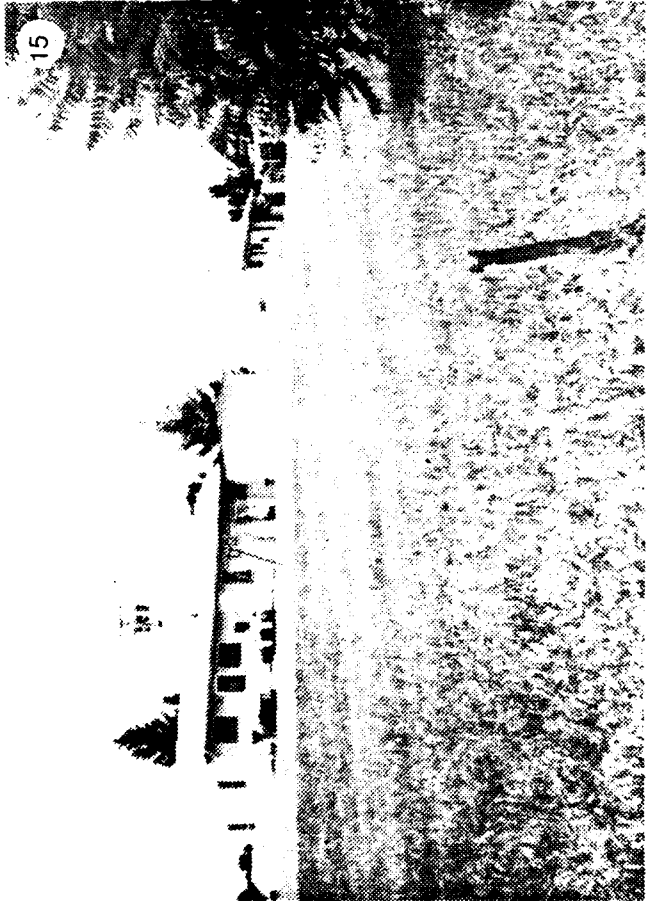
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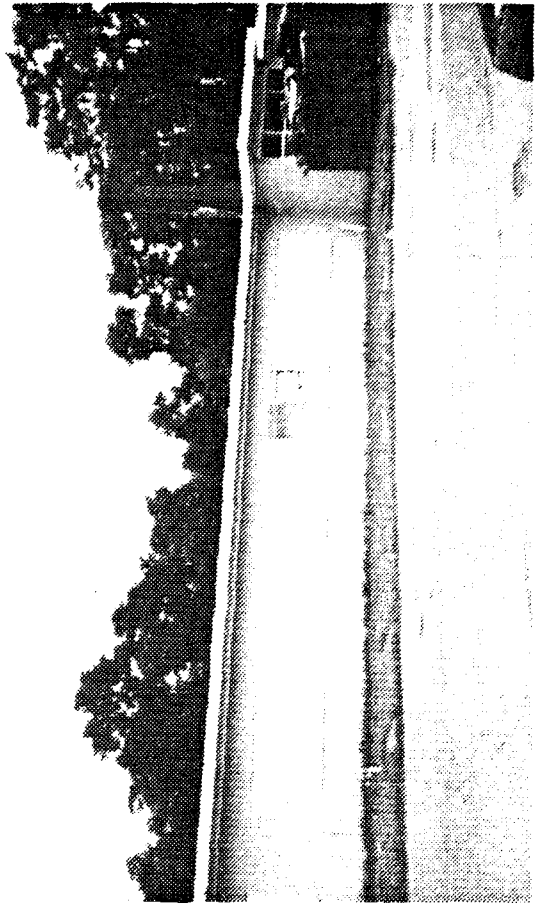
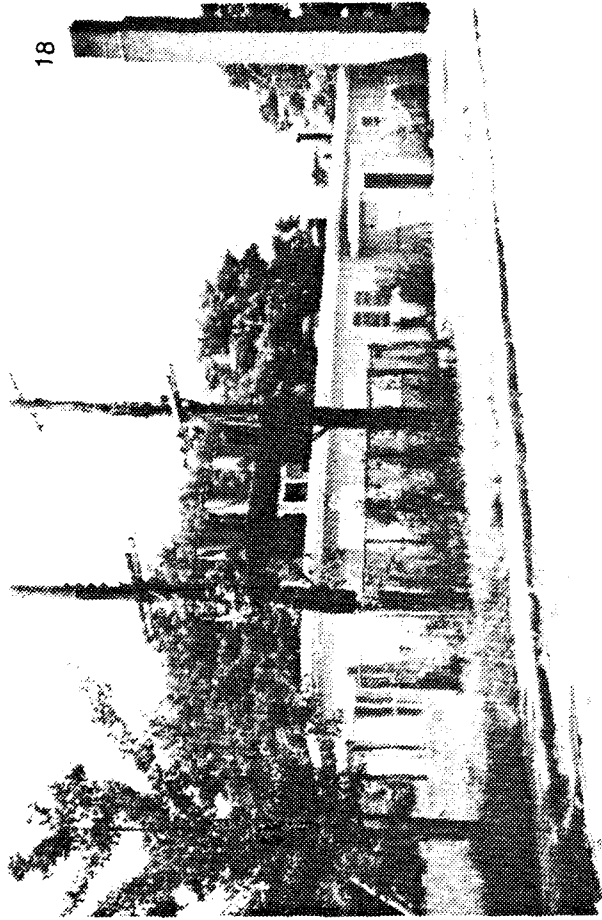


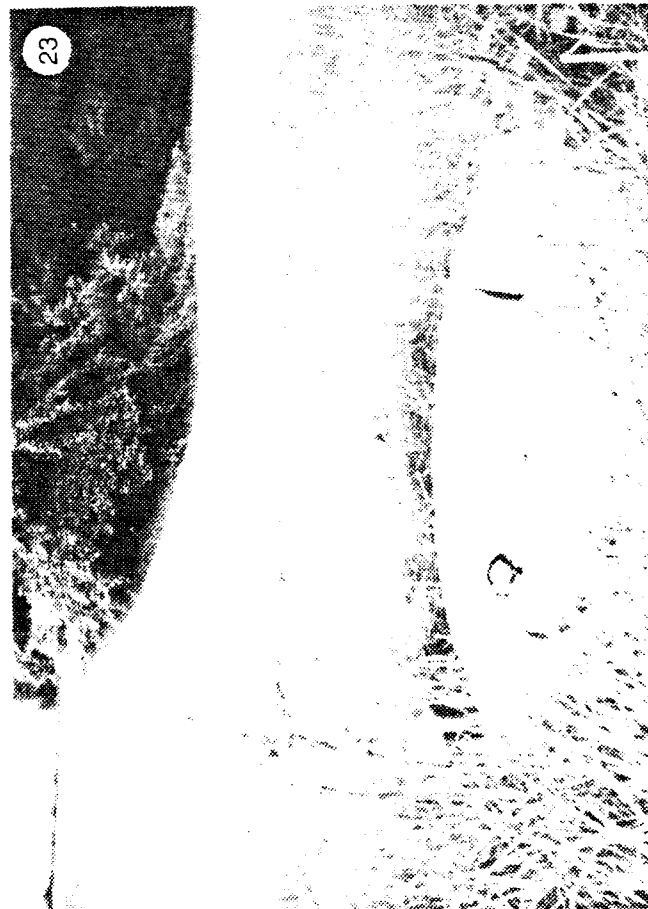
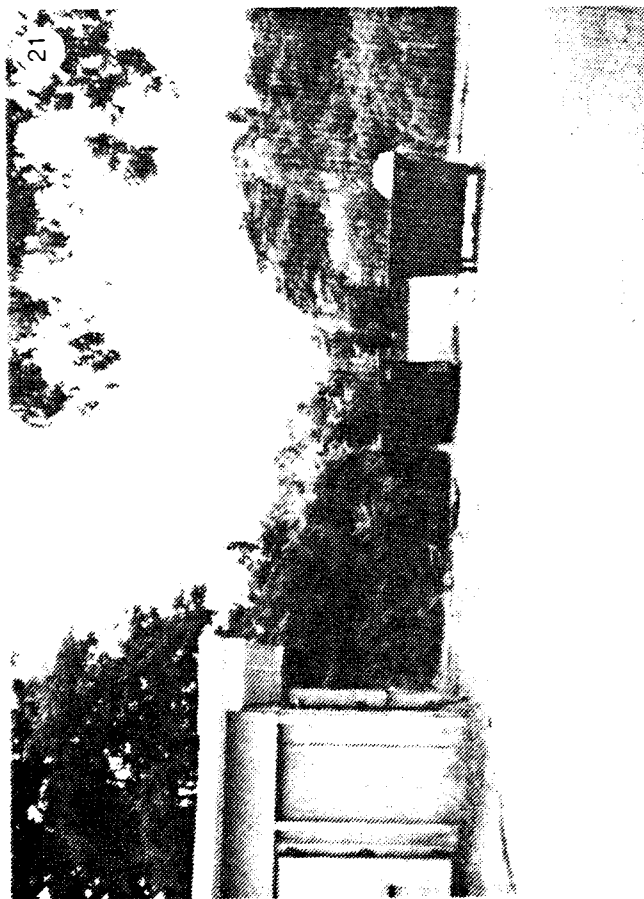
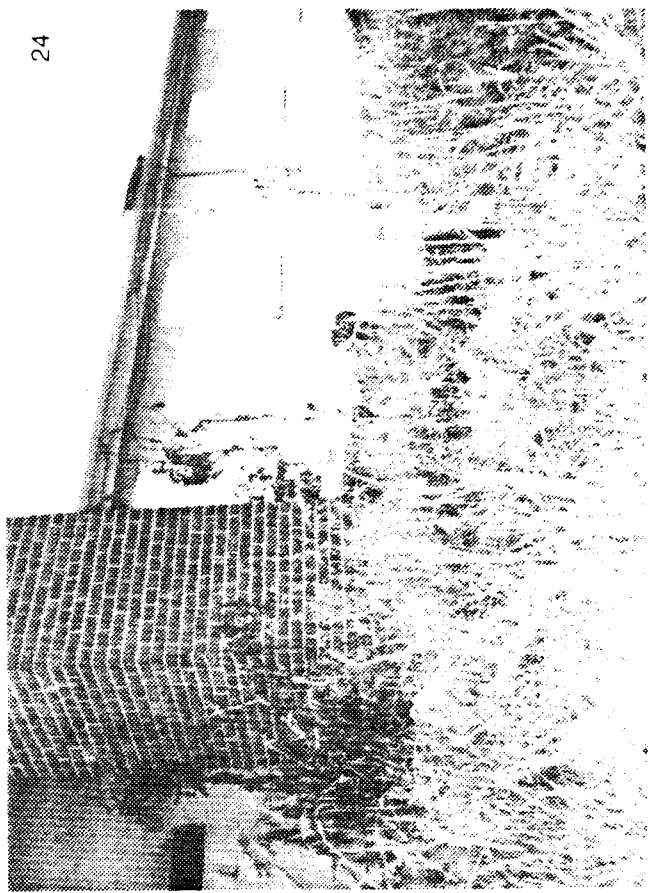
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**IDENTIFICATIONS OF PHOTOGRAPHS**

1. Sign at entrance to Spring Valley housing area.
2. Locked pumphouse (Bldg. 213), near housing area entrance at Grand View Ave.
3. Transformers adjacent to pumphouse and near housing area entrance.
4. Standing at pumphouse, looking west on Grand View Ave. toward rear of housing unit #201.
5. Spring Valley housing.
6. Standing between housing unit #201 and pumphouse, looking east/southeast toward school district property; a fence, overgrown with trees and bushes, separates the two properties.
7. Front of housing unit #405.
8. Radon detector in place in housing unit #405.
9. Vent pipe for heating-oil underground storage tank (UST); fill port not visible in photo; each unit has fiberglass 550-gallon UST.
10. Liquid propane tank (center rear of view) typical for all housing units.
11. Fill port/pressure valve for abandoned 500-gallon liquid propane (LP) underground storage tank adjacent to unit #205; prior to installation of individual LP tanks at each housing unit, this 500-gallon tank served all units.
12. Closer view of fill port/pressure valve for abandoned 500-gallon liquid propane underground storage tank.
13. Roadway loop at center of Spring Valley housing area.
14. The fence/tree line separating the housing property from the school district property runs along the eastern, southern, and much of the western border.
15. Standing at school property fence line looking northwest toward rear of housing unit #205; vent pipe in foreground assumed to date from abandoned sewage-treatment plant that served both the housing area and the Nike site until approximately 1963.

16. Sections of the fence separating the housing property and the school district property are broken, allowing free access between the two areas.
17. Inside school district property looking north toward Grand View Avenue.
18. Former Nike site buildings (barracks, mess hall, warehouse), now used for storage and administration by school districts food services division.
19. Former Nike site building, now used by food services division of the school district.
20. Another former Nike site building.
21. Edge of food services division dry storage building, looking east toward abandoned Nike site sewage-treatment plant leach field.
22. Abandoned Nike site sewage-treatment plant leach field.
23. Access port for former Nike site sewage-treatment plant facility.
24. Rear of school district food services division dry storage building; when used as a Nike site barracks, an oil-fired boiler was fueled from an underground storage tank; vent and fill pipe are visible in foreground.