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Research and Development

 **EPA Site Analysis**
Horseshoe Road Site
Sayreville, New Jersey

EPA Region 2
and OERR



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October 1991

Site Analysis
Horseshoe Road Site
Sayreville, New Jersey

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NOTICE

This document has undergone a technical and quality control/assurance review and approval by personnel of the EPA/ORD Environmental Monitoring Systems Laboratory at Las Vegas (EMSL-LV), and is for internal Agency use and distribution only.

ABSTRACT

This report presents an analysis of aerial photography of the Horseshoe Road Site, located in Sayreville, New Jersey. The site was analyzed to assist the Environmental Protection Agency's (EPA) Region 2 in locating sources of contamination onsite and potential migration pathways of those contaminants.

Collateral information supplied by EPA Region 2 states that a variety of operations took place at the Horseshoe Road Site, including precious metals recovery and the incineration of hazardous waste, as well as the manufacture of varnishes, cements, polymers, dyes, roofing materials, and feedstock products. Two main disposal areas were utilized onsite, possibly containing more than one thousand deteriorating buried drums.

The EPA's Environmental Photographic Interpretation Center in Warrenton, Virginia, a branch of the Advanced Monitoring Systems Division of the Environmental Monitoring Systems Laboratory in Las Vegas, Nevada, performed this analysis at the request of the Superfund Support Section of EPA Region 2 in New York, New York, and the Office of Emergency and Remedial Response in Washington, D.C. This analysis covers the period between 1939 and 1991, and the report was completed in October 1991.

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INTRODUCTION

An analysis of aerial photography was performed on the Horseshoe Road Site, located approximately 4.5 kilometers (2.7 miles) northeast of Sayreville, New Jersey, at the request of the U.S. Environmental Protection Agency's (EPA) Region 2 to assist in identifying sources of contamination onsite and likely migration pathways of contaminants into the surrounding area.

The Horseshoe Road Site comprises approximately 10 hectares (25 acres) and is composed of four main areas: Area A (Atlantic Resources Corporation), the Horseshoe Road Dump, Area B (Atlantic Development Corporation), and the Sayreville Pesticide Dump. The site is bordered by the Raritan River on the northwest and a railroad on the east.

This analysis updates and expands a previous report (TS-PIC-85176-I; see References for complete citation) prepared in 1986 for the New Jersey Department of Environmental Protection (NJDEP), which covered the period from 1963 to 1984 and focused on activities in Areas A and B.

Figure 1 shows the site location, keyed to a photocopy of a U.S. Geological Survey (USGS) 1:24,000-scale topographic map. Site boundaries or areas used in this analysis were determined from observations made from the aerial photography in conjunction with collateral data supplied by EPA Region 2 and do not necessarily denote legal property lines or ownership.

Aerial photography of the Horseshoe Road Site includes black and white photography from 1939, 1940, 1947, 1951, 1954, 1957, 1962, 1963, 1966, 1967, 1972, 1974, 1975, and 1978; color photography from 1981, 1986, 1988, and 1991; and color infrared photography from 1983 and 1984. Photography from 1940, 1947, 1951, 1963, 1966, 1967, 1975, 1978, 1983, 1984, and 1988 was analyzed but not reproduced for this report due to the poor resolution of the photography and/or a lack of significant change in features onsite. Any significant changes noted in those years will be annotated and discussed in the following year of photography reproduced in this report.

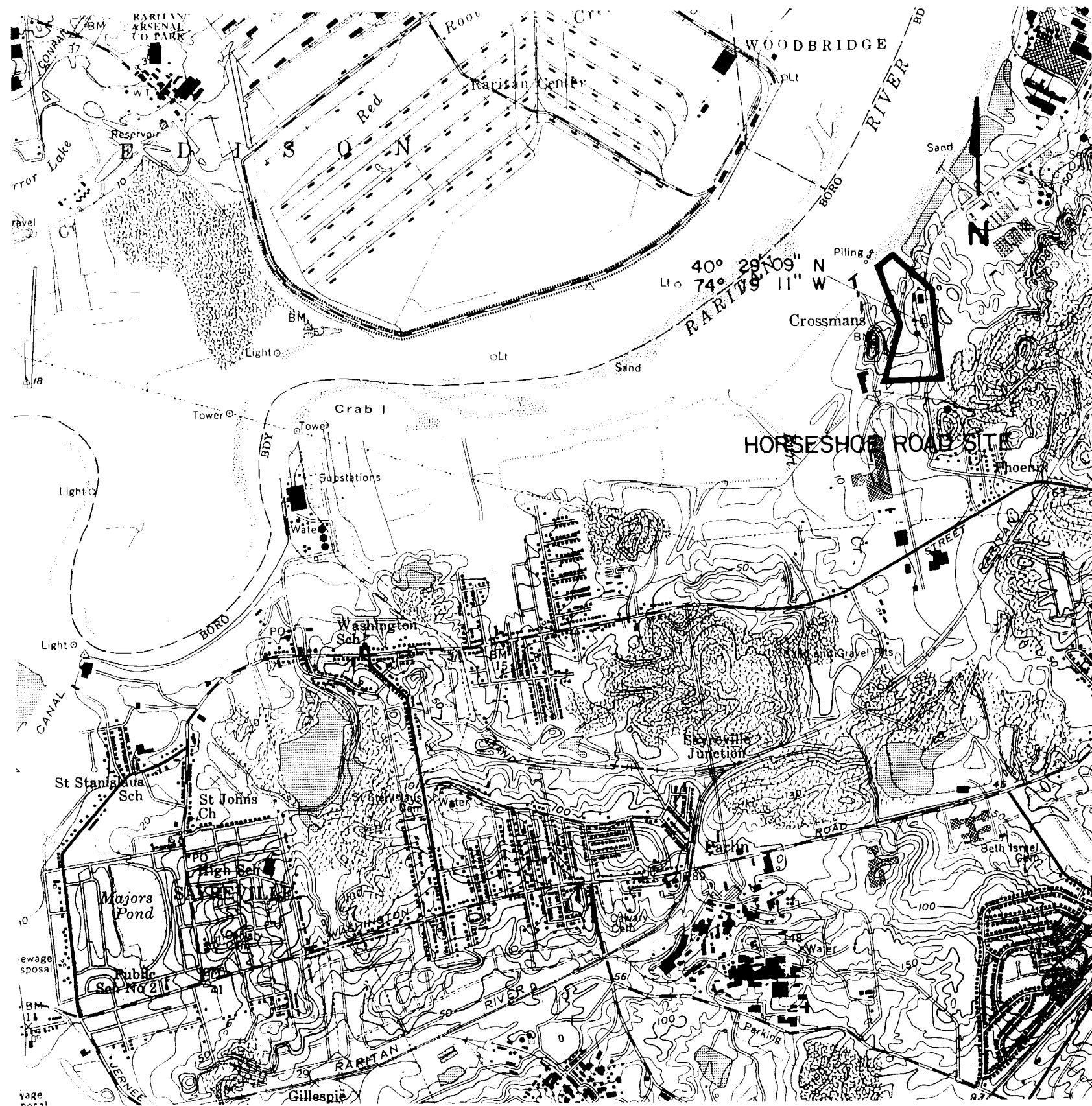


FIGURE I
HORSESHOE ROAD SITE

LOCATION MAP
SOUTH AMBOY, NJ-NY QUAD

APPROX. SCALE 1:24,000

Horizontal tanks, vertical tanks, and trailers are observed throughout the site during this analysis. Only those tanks and trailers which appear to be of a suspicious nature and/or are associated with staining will be annotated and discussed.

The EPA's Environmental Photographic Interpretation Center in Warrenton, Virginia, a branch of the Advanced Monitoring Systems Division of the Environmental Monitoring Systems Laboratory in Las Vegas, Nevada, performed this analysis at the request of the Superfund Support Section of EPA Region 2 in New York, New York, and the Office of Emergency and Remedial Response in Washington, D.C. This analysis covers the period from 1939 to 1991, and the report was completed in October 1991.

SITE SUMMARY

Area A was used by the Atlantic Resources Corporation for solvent and precious metals recovery through incineration beginning around 1972. Testing in this portion of the site revealed high concentrations of heavy metals and organic compounds, including dioxin. Prior to 1972, ammonia is suspected to have been disposed in lagoons onsite. Possible impoundments were observed in Area A on the 1939, 1940, 1967, 1972, and 1975 photography. Stains were seen throughout Area A, as were areas of standing liquid.

The Horseshoe Road Dump, in the northwestern portion of the site, contains an undetermined number of buried drums. Chemical analysis of the disposal area revealed high concentrations of lead, chromium, cadmium, phenols, PCBs, and pesticides. The disposal area is suspected to have been active between 1972 and 1978 when dark-toned objects, most likely drums, and vehicles were observed from the photography. Vehicles, dark-toned material, and a possible stain were noted farther north, indicating that disposal may have taken place there as well.

Area B was used for a variety of operations, including the manufacture of pharmaceutical chemical supplies, insecticides, pigments and varnishes, polymers and resins and feedstock products. Contaminants found in this area include toluene, chloroform, ethylbenzene, and nitrobenzene. This portion of the site first appeared active in 1954. Beginning in 1957, drainage routes were observed leading from buildings into the wetlands to the west. A large impoundment was utilized from 1967 through 1972, and possible impoundments were noted in 1962 and 1981. Containers, areas of standing liquid, and stains were consistently seen in Area B.

The Sayreville Pesticide Dump contains an estimated 1,000 exposed, partially buried, or completely buried drums. Contaminants found in this portion of the site include benzene, toluene, mercury, and naphthalene. Photography of the site revealed what appeared to be an active disposal area between 1957 and 1975, during which light- and dark-toned coarse-textured objects and piled light-toned material were observed.

METHODOLOGY

A search of government and commercial sources was undertaken to obtain the best available aerial photography of the site spanning the desired time frame. The photography and other sources of information used in this report are listed in the References section.

The analysis was performed by viewing backlit transparencies of aerial photography through stereoscopes. Stereoscopic viewing creates a perceived three-dimensional effect which, when combined with viewing at various magnifications, enables the analyst to identify signatures associated with different features and environmental conditions. The term "signature" refers to a combination of visible characteristics (such as color, tone, shadow, texture, size, shape, pattern, and association) which permit a specific object or condition to be recognized on aerial photography.

Photographic prints were made from those years of aerial photographic coverage that reveal significant information about the site. The analyst's findings are annotated on overlays to prints and/or base maps and described in the accompanying text. Site boundaries or areas used in this analysis were determined from the aerial photography in conjunction with collateral data supplied by EPA Region 2 and do not necessarily denote legal property lines or ownership.

Due to factors inherent in the photographic printing process, prints do not exhibit the level of detail that is visible in the original aerial photography. Therefore, some features identified from the aerial photography may not be clearly discernible, or even visible, on the photographic prints presented in this report.

The terms "possible" and "probable" are used to indicate the degree of certainty of signature identification. "Possible" is used when only a few characteristics are discernible or these characteristics are not unique to a signature. "Probable" is used when incrementally more characteristics are discernible. No qualifying terms are used when the characteristics of a signature allow for a definite feature identification.

AERIAL PHOTO SITE ANALYSIS

DECEMBER 15, 1939 (FIGURE 2)

This year represents the earliest available photography for the site.

A drainage analysis was performed for this year for the site and surrounding area. Drainage routes within the site will continue to be annotated on all subsequent years of photography. Streams within and around the site originate from the southeast and flow north and west to the Raritan River, which flows east. From the site, the Raritan River continues approximately 5.6 kilometers (3.5 miles) to Raritan Bay.

Area A - Two buildings (B1 and B2) exist onsite and are observed as separate buildings until 1972.

Light-toned (LT) material (M) is seen at the end of a suspected drainage pathway that leads from B1 to the wetlands northwest of the site.

Reportedly, prior to 1972, a company operating within Area A disposed ammonia into three lagoons onsite.¹ Two possible impoundments (IM) are seen southeast of B2. Three pits containing liquid exist east of the site, and are identified on a 1941 USGS topographic map as clay pits. These clay pits arouse suspicion because of their physical connection to the Horseshoe Road Site; an access road leads east from the site through the clay pits. Another access road enters the site from the south.

¹Based on information supplied by EPA Region 2. Throughout the remainder of this report, collateral information will be identified with an asterisk (*).



- LEGEND**
- B - Building
 - BR - Breach
 - C - Containers
 - D - Drums
 - DB - Debris
 - DG - Disturbed Ground
 - DK - Dark-Toned
 - HRD - Horseshoe Road Dump
 - HT - Horizontal Tank
 - IM - Impoundment
 - IE - Leachate
 - LT - Light-Toned
 - M - Material
 - R - Refuse
 - SL - Standing Liquid
 - SPD - Stayville Pesticide
 - ST - Stain
 - V - Vehicle
-
- - - - - Access Road
 - - - - - Channelized Drainage
 - - - - - Edge of Slope
 - - - - - Historical Boundary
 - - - - - Natural Drainage
 - - - - - Pit/Depression
 - - - - - Revetment
 - - - - - Site Boundary
 - - - - - Suspected Drainage
 - - - - - Wetlands

FIGURE 2
HORSESHOE ROAD SITE

DECEMBER 15, 1939

APPROX. SCALE 1:4,000

AUGUST 27, 1954 (FIGURE 3)

Photography from 1940, 1947 and 1951 was analyzed but not reproduced for this report due to the lack of significant change. Any significant features noted during those years will be discussed and annotated during this year of analysis.

Area A - The light-toned material northwest of Area A was again present in 1940, 1947, and 1951. In 1954, the material appears to be dispersing through the wetlands. Channelized drainage was seen in 1951 in Area A. B3, located north of B2, appeared to be under construction in 1951. A horizontal tank (HT) with staining (ST) was observed west of B3. Southeast of B3, a stain was seen in 1951, and a possible stain farther east is noted in 1954. Six horizontal tanks (not annotated) were present in 1951 north of B2 and are seen at that location through 1957.

The two possible impoundments southeast of B2 were again visible in 1940. By 1947 they had been filled with a light-toned material. Liquid was again seen within the clay pits (no longer annotated) in 1940 and 1951. The pits are now beginning to revegetate.

The current configuration of Horseshoe Road was first noted in 1947. Because access roads are clearly discernible on future years of photography, they will no longer be annotated with a line symbol.

Area B - B4 and B5 were added to the site between 1951 and 1954. No staining or liquid discharge is observed in this area. Southeast of B5, an area of disturbed ground (DG) was noted in 1947 and 1951 adjacent to a natural slope (identified by the edge of slope symbol). The appearance of the disturbed ground is similar to that of the clay pits. In 1954 the area appears to have been graded smooth and is in use as a parking area.



- LEGEND
- B - Building
 - BR - Breach
 - C - Containers
 - D - Drums
 - DB - Debris
 - DG - Disturbed Ground
 - DK - Dark-Toned
 - HRD - Horseshoe Road Dump
 - HT - Horizontal Tank
 - IM - Impoundment
 - IE - Leachate
 - LT - Light-Toned
 - M - Material
 - R - Refuse
 - SL - Standing Liquid
 - SFD - Sayreville Pesticide P
 - ST - Stain
 - V - Vehicle
- - - - - Access Road
 - - - - - Channelized Drainage
 - Edge of Slope
 - Historical Boundary
 - Natural Drainage
 - Pit/Depression
 - Revetment
 - Site Boundary
 - Suspected Drainage
 - Wetlands

FIGURE 3
HORSESHOE ROAD SITE

AUGUST 27, 1954

APPROX. SCALE 1:3,500

SEPTEMBER 24, 1957 (FIGURE 4)

Area A - Drainage channels leading from B1 and B3 were altered between 1954 and 1957, when material was apparently deposited in the western portion of the site during the creation of a utility corridor. A stain is seen west of B3 during this year. Staining, possibly leachate (LE), is observed southwest of B1, adjacent to a drainage pathway which leads west and north into the wetlands.

A pond (non-contact cooling water pond*) appears to be under construction. The piled light-toned material north of the pond may be related to its construction.

Area B - B6 was added to the site between 1954 and 1957. Reportedly, floor drains from buildings onsite were used to discharge materials to the wetlands west of the site.* A drainage route is seen between B4 and B6, and leads west. Drainage is also seen on the south side of B6 where liquid is apparently being discharged. The liquid flows into a ditch that lies between B6 and B5 and continues west. Probable containers (C) are noted along this route, and a possible area of standing liquid (SL) is seen farther south. Channelized drainage has been formed along the base of a hill southeast of B5, and leads west.

Sayreville Pesticide Dump (SPD) - Disposal appears to be taking place southeast of B5, where disturbed ground was noted in 1947 and 1951. Piles of light-toned material are seen along the slope and on the surface of what is now referred to as the Sayreville Pesticide Dump. Observations are possible from the aerial photographs because trees have been cleared, forming a triangular area that extends north to the slope. Disposal is not visible farther west due to the heavy tree canopy. No access routes lead west from the triangular cleared area; however, collateral information indicates that disposal of drums did occur much farther west than is visible on the photography.*



- LEGEND**
- B - Building
 - BR - Beach
 - C - Containers
 - D - Drums
 - DB - Debris
 - DG - Disturbed Ground
 - DK - Dark-Toned
 - HRP - Horseshoe Road Pump
 - HT - Horizontal Tank
 - IM - Impoundment
 - LE - Leachate
 - LT - Light-Toned
 - M - Material
 - R - Refuse
 - SL - Standing Liquid
 - SPP - Sayreville Pesticide Plant
 - ST - Stain
 - V - Vehicle
- - Access Road
 - - Channelized Drainage
 - - Edge of Slope
 - - Historical Boundary
 - - Natural Drainage
 - - Pit/Depression
 - - Revetment
 - - Site Boundary
 - - Suspected Drainage
 - ψ - Wetlands

FIGURE 4
HORSESHOE ROAD SITE

SEPTEMBER 24, 1957

APPROX. SCALE 1:3,200

JANUARY 13, 1962 (FIGURE 5)

Area A - Drainage patterns were altered between 1957 and 1962 in Area A, which now appears to be inactive. Possible standing liquid is noted west of B1. A possible horizontal tank is visible west of Area A, at the base of the hill (not annotated) created during the construction of the utility corridor. Drainage leads west from the former clay pits.

The pond is now twice the size as was seen in 1957; a breach (BR) exists on its west wall. A drainage pathway extends northwest from the breach. Light-toned stains are visible along the drainage route, which turns south before continuing west. Channelized drainage east of the railroad (not annotated) appears to enter the east side of the pond. Probable refuse (R) is visible north of the pond. No significant activity is noted at the pond in subsequent years; therefore, it will no longer be annotated or discussed.

Area B - A drainage route appears to extend north from B4 where it connects with the pathway that leads away from the pond. A possible impoundment is noted adjacent to the route. Possible containers are adjacent to B4 near the point from which the drainage appears to originate, and possible refuse is noted on the south side of B4.

Containers, possibly including drums (D), are scattered throughout Area B and concentrated in two spots. The first group is located next to the drainage pathway between B6 and B5. The second group of containers is found southeast of B5 along the drainage channel (no longer annotated), first observed in 1957. Light-toned material is seen south of B5. Possible standing liquid is visible farther west, adjacent to a drainage pathway.

Sayreville Pesticide Dump - Coarse-textured, light- and dark-toned items (not annotated) are seen on the slope and surface of this area which contained piled light-toned material in 1957.



LEGEND

- B - Building
 - BR - Breach
 - C - Containers
 - D - Drums
 - DB - Debris
 - DG - Disturbed Ground
 - DK - Dark-Toned
 - HRD - Horseshoe Road Pump
 - HT - Horizontal Tank
 - IN - Impoundment
 - IE - Leachate
 - LT - Light-Toned
 - M - Material
 - R - Refuse
 - SL - Standing Liquid
 - SFD - Sayreville Pesticide
 - ST - Stain
 - V - Vehicle
-
- Access Road
 - Channelized Drainage
 - Edge of Slope
 - Historical Boundary
 - Natural Drainage
 - Pit/Depression
 - Revetment
 - Site Boundary
 - Suspected Drainage
 - Wetlands

FIGURE 5
HORSESHOE ROAD SITE

JANUARY 13, 1962

APPROX SCALE 1:3,400

SEPTEMBER 10, 1972 (FIGURE 6)

Photography from 1963, 1966, and 1967 was not reproduced for this report because of the lack of significant change in features relevant to this analysis.

Area A - An area of possible standing liquid was noted east of B3 in 1963. Possible refuse was seen south and east of B2 in 1966, and probable refuse now exists north of B2. Farther south, piled light-toned material and two possible impoundments are visible. One of these possible impoundments was also seen in 1967, north of the pond, with probable standing liquid beside it. Two possible stains, one of which appears to have originated from the southern impoundment, are located west of these features.

Horseshoe Road Dump (HRD) - Disposal may now be taking place in this area, where a possible horizontal tank was visible in 1962. The edge of slope symbol has been identified on Figure 6 and in future years of this analysis in order to show the placement of objects in relation to the slope. Several vehicles (V) are seen at the edge of the slope. Vehicles are also noted farther north, adjacent to a large possible stain.

Area B - Probable containers were seen east of B5 between 1966 and 1972, and in 1967 possible standing liquid was noted adjacent to the containers. The drainage pathway between B6 and B5 leads to an impoundment which was first seen in 1967. Probable containers were noted in 1966 where B7 (unnamed in collateral data) now exists. Standing liquid north of B4 and possible drums east of B4 are noted in 1972.

Sayreville Pesticide Dump - Disposal has apparently continued since 1962, progressing northwest towards Area B. Light-toned mounded material (not annotated), possibly a cover material, is seen during this year on the surface of the dump.



- LEGEND**
- B - Building
 - BR - Breach
 - C - Containers
 - D - Drums
 - DB - Debris
 - DG - Disturbed Ground
 - DK - Dark-Toned
 - HRD - Horseshoe Road Dump
 - HT - Horizontal Tank
 - IM - Impoundment
 - IE - Leachate
 - LT - Light-Toned
 - M - Material
 - R - Refuse
 - SL - Standing Liquid
 - SFD - Sayreville Posthole
 - ST - Stain
 - V - Vehicle
-
- Access Road
 - Channelized Drainage
 - Edge of Slope
 - Historical Boundary
 - Natural Drainage
 - Pit/Depression
 - Revetment
 - Site Boundary
 - Suspected Drainage
 - Wetlands

FIGURE 6
HORSESHOE ROAD SITE

SEPTEMBER 10, 1972

APPROX. SCALE 1:3,900

MARCH 13, 1974 (FIGURE 7)

Area A - A stain or standing liquid is noted west of B1, along a drainage pathway that leads west from B1. A probable stain or standing liquid is observed north of B3, outside a fence (not annotated) that has been added to the site. Drainage flows west from this stain. Possible drums are seen along the west side of B3. The probable refuse seen north of B2 in 1972 is no longer visible.

Horseshoe Road Dump - Dark-toned objects (not annotated) are visible along the slope. A possible vehicle, or trailer, is seen at the bottom of the slope. A group of vehicles, including some trailers, are observed farther north, where vehicles were seen in 1972, and dark-toned (DK) material is visible west of the vehicles.

Area B - The remnants of B7, which has apparently burned down, are seen in Area B. Probable containers, which may be debris from the building, are noted northeast of B7. Probable containers are also noted between B4 and B6, and west of B6. Drainage pathways are observed west of B6, leading to the impoundment west of B5. Standing liquid west and south of the impoundment indicates a possible overflow. Refuse is visible at the east side of the impoundment. Probable standing liquid is again seen farther east, adjacent to probable refuse which has been placed along the edge of the cleared area (not annotated) southwest of B5. Dark-toned material, possibly refuse, exists southeast of B5. A drainage pathway leads west from this material.

Sayreville Pesticide Dump - Light- and dark-toned objects (not annotated) are again seen along the slope of this disposal area.



- LEGEND**
- B - Building
 - BR - Breach
 - C - Containers
 - D - Drums
 - DB - Debris
 - DG - Disturbed Ground
 - DK - Dark-Toned
 - HRD - Horseshoe Road Dump
 - HT - Horizontal Tank
 - IM - Impoundment
 - LE - Leachate
 - LT - Light-Toned
 - M - Material
 - R - Refuse
 - SL - Standing Liquid
 - SPD - Sayreville Pesticide
 - ST - Stain
 - V - Vehicle
-
- - Access Road
 - > - Channelized Drainage
 - - Edge of Slope
 - - Historical Boundary
 - - Natural Drainage
 - - Pit/Depression
 - - Revetment
 - - Site Boundary
 - - Suspected Drainage
 - - Wetlands

FIGURE 7
HORSESHOE ROAD SITE

MARCH 13, 1974

APPROX. SCALE 1:2,700

OCTOBER 31, 1981 (FIGURE 8)

Photography from 1975 and 1978 has not been reproduced for this site due to the lack of change in significant features.

Area A - Incinerators were not seen in Area A until 1978, when four horizontal tanks/probable incinerators (not annotated) were observed. By 1981, four more had been added. Standing liquid, which may have originated from B1, was seen north of B1 in 1975. A possible impoundment was noted in 1975 west of B1. Containers, possibly drums, are present north of B3, and possible containers are seen west of B1. A possible standing liquid or stain is visible east of B3.

Two vertical tanks (not annotated) were present in 1978 northwest of B1, and a third was seen in 1981. Drainage routes leading from the north and west sides of B1 were still noted in 1975. By 1978, channelized drainage had been directed around the north side of the tanks. A revetment is now seen around the northern portion of the area; drainage flows west along its base into the channel.

Horseshoe Road Dump - Two possible vehicles were visible on the surface of this area in 1975, and several vehicles were again visible farther north. The mottled appearance of the slope in 1978 suggests that disposal continued to that year. However, by 1981, the area is revegetating and objects are not seen along the slope.

Area B - In 1975, debris (DB) existed where B7 had stood. A rectangular possible impoundment was seen east of B4 in 1975. Debris was also seen during that year north and east of B6.

An area of standing liquid was observed from 1975 to 1981 in the location of the former impoundment west of B5. Scattered containers (not annotated) were visible west of B5, which appeared to have burned or been demolished between 1974 and 1975. A new building existed in 1975 east of the remnants of B5 and by 1978, B5 had been rebuilt at its original location. B4 and B5 were reportedly vacated by 1978, while B6 continued to be active into the early 1980's.* In 1981, the majority of the debris within Area B appears to have been removed. Containers are noted



LEGEND

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- BR - Breach
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- DG - Disturbed Ground
- DK - Dark-Toned
- HRD - Horseshoe Road Dump
- HT - Horizontal Tank
- IM - Impoundment
- IE - Leachate
- LT - Light-Toned
- M - Material
- R - Refuse
- SL - Standing Liquid
- SFD - Sayreville Pesticide
- ST - Stain
- V - Vehicle

- Access Road
- Channelized Drainage
- Edge of Slope
- Historical Boundary
- Natural Drainage
- Pit/Depression
- Revetment
- Site Boundary
- Suspected Drainage
- Wetlands

FIGURE 8
HORSESHOE ROAD SITE

OCTOBER 31, 1981

APPROX. SCALE 1:4,000

south of B6 and west of B5. Possible pits were observed in 1978 in a ground scarred area on the east side of Horseshoe Road, south of the pond.

Sayreville Pesticide Dump - Standing liquid, possibly leachate, appeared at the base of the slope in 1975. In that same year, possible light-toned objects were noted on the dump's surface. By 1981, the area is revegetating and no objects or vehicles are visible.

DECEMBER 5, 1986 (FIGURE 9)

Photography from 1983 and 1984 was not reproduced due to the poor resolution of the film.

Three separate frames have been joined to create Figure 9. The scale of this photography is variable; therefore, the site boundary shown is approximate.

Area A - The Atlantic Resources Corporation abandoned the site in August 1985.* Multiple stains are visible in Area A. Drums have been piled north of B3. Farther east, a container appears to have spilled, leaving a probable stain. Possible standing liquid is noted at the southeast corner of B2.

Containers and probable drums can be seen within the wetland area west of the inactive Horseshoe Road Dump.

Area B - A fire occurred at B6 in 1983 and the building was gutted, exposing a considerable amount of debris.* Debris is seen west of B6 and around the cement pad* (former location of B7). Probable drums are observed east and west of B6. Probable debris is found on the east side of Horseshoe Road.

Rust-colored standing liquid is visible west of B5, adjacent to horizontal tanks (not annotated). This liquid flows into the drainage route noted in past years.

Containers and drums are visible on the slope of the inactive Sayreville Pesticide Dump.



LEGEND

- B - Building
 - BR - Breach
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 - D - Drums
 - DB - Debris
 - DG - Disturbed Ground
 - DK - Dark-Toned
 - HRD - Horseshoe Road Pump
 - HT - Horizontal Tank
 - IM - Impoundment
 - IE - Leachate
 - LT - Light-Toned
 - M - Material
 - R - Refuse
 - SL - Standing Liquid
 - SFD - Sayreville Pesticide
 - ST - Stain
 - V - Vehicle
-
- - Access Road
 - ====> - Channelized Drainage
 - - Edge of Slope
 - - Historical Boundary
 - - Natural Drainage
 - - Pit/Depression
 - - Revetment
 - - Site Boundary
 - - Suspected Drainage
 - - Wetlands

FIGURE 9
HORSESHOE ROAD SITE

DECEMBER 5, 1986

SCALE: VARIABLE

JUNE 7, 1991 (FIGURE 10)

Photography from 1988 was not reproduced for this report due to the poor resolution of the film.

Area A - Stains remain visible throughout Area A. The three vertical tanks were removed between 1986 and 1988, and a stain remains in and around their former location. Stains are noted along the revetment north of the incinerators. Containers are visible north and southeast of B3. Staining exists east of B2, where standing liquid was observed in 1986. A possible stain is noted along a drainage route, first seen in 1962, that leads to the site from the former clay pits.

Area B - Much of Area B has revegetated since 1986; debris remains scattered throughout this portion of the site. Drums are observed east of B4, but no staining is visible. East of B6, however, staining adjacent to containers is noted. Rust-colored stains dominate the area west of B5, where standing liquid was observed in past years.



LEGEND

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 - HT - Horizontal Tank
 - IM - Impoundment
 - IE - Leachate
 - LT - Light-Toned
 - M - Material
 - R - Refuse
 - SL - Standing Liquid
 - SFD - Sayreville Pesticide I
 - ST - Stain
 - V - Vehicle
-
- - - - - Access Road
 - - - - - Channelized Drainage
 - - - - - Edge of Slope
 - - - - - Historical Boundary
 - - - - - Natural Drainage
 - - - - - Fit/Depression
 - - - - - Revetment
 - - - - - Site Boundary
 - - - - - Suspected Drainage
 - ↓ - Wetlands

FIGURE 10
HORSESHOE ROAD SITE

JUNE 7, 1991

APPROX. SCALE 1:2,800

REFERENCES

AERIAL PHOTOGRAPHY

<u>Date</u>	<u>Agency</u>	<u>Mission Code</u>	<u>Agency Frame #</u>	<u>Orig. Scale</u>	<u>EPIC Frame #</u>
December 15, 1939	TXAERO ¹	---	5:211	1:20,000	27328
April 10, 1940	TXAERO	---	20:122,123	1:20,000	34599,34600
July 2, 1947	ASCS ²	CNA	1D:13,14	1:20,000	27326:45,46
April 7, 1951	TXAERO	---	289:3025, 3026	1:10,000	27333,27334
August 27, 1954	USGS ³	VHD	2:4,5	1:20,000	27518,27519
September 24, 1957	ASCS	CNA	15R:27,28	1:20,000	8996:71,72
January 13, 1962	TXAERO	1116	56:4027,4028	1:18,000	27344,27345
May 4, 1963	ASCS	CNA	1DD:149,150	1:20,000	8826,8827
December 4, 1966	ROBASI ⁴	PA	7:65,66	1:18,000	8799,8800
April 30, 1967	TXAERO	1630	3:186,197	1:30,000	5722,5723
September 10, 1972	ASCS	34023	272:144,145	1:40,000	14523,14524
March 13, 1974	TXAERO	2063	37:1738,1739	1:18,000	8934,8935
October 3, 1975	NOS ⁵	75BR	30:5982-5984	1:20,000	34850-34852
June 6, 1978	ASCS	34023	178:99,100	1:40,000	8823,8824
October 31, 1981	NOS	81EC	C:5278,5279	1:27,000	5278,5279
June 23, 1983	USFS ⁶	83/042	66,67	1:32,500	83/042:66,67
July 13, 1984	USFS	84/079	74	1:32,500	84/079:74

¹Aero Service Division, Western Geophysical Company, Houston, TX

²Agricultural Stabilization and Conservation Service, U.S. Department of Agriculture

³U.S. Geological Survey, U.S. Department of the Interior

⁴Robinson Aerial Survey, Philadelphia, PA

⁵National Ocean Survey, U.S. Department of Commerce

⁶U.S. Forest Service, U.S. Department of Agriculture

REFERENCES (cont.)

AERIAL PHOTOGRAPHY

<u>Date</u>	<u>Agency</u>	<u>Mission Code</u>	<u>Agency Frame #</u>	<u>Orig. Scale</u>	<u>EPIC Frame #</u>
December 5, 1986	EPA ¹	86/080	255,256	Variable	86/080:255,256
May 6, 1988	EPA	88/032	138,139	Variable	88/032:138,139
June 7, 1991	EPA	91/032	7-9	1:4,000	91/032:7-9

MAPS

<u>Source</u>	<u>Name</u>	<u>Scale</u>	<u>Date</u>
USGS	South Amboy, NJ-NY	1:24,000	1981
USGS	South Amboy, NJ-NY	1:24,000	1941
NWI ²	South Amboy, NJ-NY	1:24,000	Based on 1976 aerial photography

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Romberg, K., and K.J. Tammaro. 1986. Site Analysis, Atlantic Resources/Atlantic Development Corporation, Sayreville, New Jersey. Report No. TS-PIC-85176-I. U.S. Environmental Protection Agency, Environmental Photographic Interpretation Center.

¹U.S. Environmental Protection Agency

²National Wetlands Inventory, U.S. Fish and Wildlife Service, U.S. Department of the Interior