

Site Review And Update

COMBE FILL SOUTH LANDFILL

CHESTER AND WASHINGTON TOWNSHIPS, MORRIS COUNTY, NEW JERSEY

CERCLIS NO. NJD094966611

JUNE 6, 1994

**U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Agency for Toxic Substances and Disease Registry
Division of Health Assessment and Consultation
Atlanta, Georgia**

Site Review and Update: A Note of Explanation

The purpose of the Site Review and Update is to discuss the current status of a hazardous waste site and to identify future ATSDR activities planned for the site. The SRU is generally reserved to update activities for those sites for which public health assessments have been previously prepared (it is not intended to be an addendum to a public health assessment). The SRU, in conjunction with the ATSDR Site Ranking Scheme, will be used to determine relative priorities for future ATSDR public health actions.

SITE REVIEW AND UPDATE

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Prepared By:

**New Jersey Department of Health
Under Cooperative Agreement with the
Agency for Toxic Substances and Disease Registry**

SUMMARY OF BACKGROUND AND HISTORY

The Combe Fill South (CFS) Landfill site is located on the township boundary between Chester and Washington Townships in Morris County, New Jersey (Figure 1). This inactive municipal landfill occupies approximately eighty acres located within a 115 acre site off of Parker Road, about two miles southwest of the Borough of Chester (Figure 2).

The Combe Fill South (CFS) Landfill site is situated in a semi-rural area and the land use in the vicinity of the landfill consists primarily of low-density residential (lot sizes are generally more than two acres). The population within a 1-mile radius of the site is about 800 and the nearest residence is less than a quarter-mile from the site. Landfill leachate, groundwater, and surface water runoff from the southwestern portion of the site constitute the headwaters of the East and West Branches of Trout Brook, which flows southeast toward the Lamington (known locally as Black) River.

The landfill began its operation as a municipal refuse facility in the 1940's owned and operated by the Filiberto family. In 1970 and 1971 the landfill was operated by Filiberto Sanitation, Incorporated. In July 1972 due a to fish kill in Trout Brook, the Division of Fish and Game requested a geologic investigation of the area. In December 1972 a " Certificate of Registration " was issued by New Jersey Department of Environmental Protection and Energy (NJDEPE) to Chester Hills Inc. to operate a sanitary landfill on the site.

Inspections of landfilling operations by the Bureau of Solid Waste of NJDEPE were conducted on a semiregular basis every few months from 1972 to 1981. During this period, the landfill was cited for numerous operational violations by the NJDEPE. In 1977, two observation wells were installed by Chester Hills Inc., to monitor groundwater contamination at the site. Based on the groundwater sampling at the Combe Fill South Landfill site, the NJDEPE determined that groundwater contamination exists at the landfill and is likely to contaminate the local water supplies. In September 1978, the ownership and operation of the landfill were transferred from Chester Hills Inc. to the Combe Fill Corp. The Combe Fill South (CFS) Landfill was approved by NJDEPE for the disposal of municipal and industrial wastes.

Beginning in 1981, sampling and analyses of groundwater and leachate at the site, private potable wells in the vicinity of the site, and nearby surface waters (Trout Brook) were conducted by the Chester and Washington Townships, NJDEPE, and environmental interest groups.

During May and June 1981, water samples were collected from 90 private potable wells near the site by a local citizen's group, in cooperation with the Chester and Washington Townships. The NJDEPE also took samples from private potable wells in June 1981. Additional private potable well samples were also collected and analyzed during 1982 to 1986. Several of the wells contained chloroform, benzene, 1,2-dichloroethane, methylene chloride, tetrachloroethylene (PCE), trichloroethylene (TCE), and other volatile organic compounds (VOC's). Elevated levels of metals were detected in some of the potable private wells. As contamination in private

potable wells was detected, the NJDEPE authorized and evaluated commercially available filter systems being used in several local contaminated private wells. Additional private potable wells were sampled and analyzed. Once informed about well water contamination, home owners installed water filtration system privately. The maximum reported concentrations of contaminants in private potable wells were: methylene chloride - 190 ppb (1981), benzene - 44 ppb (1983), chloroform - 63 ppb (1981), TCE - 37 ppb (1985).

In 1981, bottled water was provided to residents whose private potable wells were affected by site related contaminants. However, it had been reported that the residents affected may not have been using the bottled water because it was not delivered directly to individual homes.

The Combe Fill Corporation operated the landfill until October 1981, at which time they declared bankruptcy and ceased operation. In June 1982, NJDEPE authorized and evaluated commercially available filter systems being used in several local private wells.

In September 1983, the CFS Landfill site was placed on the National Priority List (NPL).

The Remedial Investigation (RI) was completed in May 1986, and concluded that soil, sediments, surface water and groundwater at the site is contaminated with elevated levels of Volatile Organic Compounds (VOCs). The draft Feasibility study (FS) was completed in May 1986 and final FS was issued in January 1987. A Record of Decision (ROD) was signed in September 1986. The major elements of the selected remedy included an alternate water supply for residents with contaminated private potable wells, capping of the landfill, including surface water controls and a gas venting system, and pumping and treatment of groundwater contamination in the shallow aquifer immediately beneath the site.

There are approximately 300 private wells in the area delineated by the USEPA. In August 1991, NJDEPE conducted a private well water sampling and analyses in the vicinity of the site. The range of reported concentrations of VOC's in private potable wells were: methylene chloride (2 ppb - 190 ppb), benzene (1 ppb - 44 ppb), TCE (3 ppb - 390 ppb), PCE (2 ppb - 245 ppb), chloroform (1 ppb - 75 ppb) and 1,2-dichloroethane (6 ppb - 23 ppb). Manganese was detected in some of the private potable wells. The range of reported concentrations of manganese were 0.001 ppm to 0.011 ppm.

In 1991, affected private potable wells near the site were fitted with Point of Entry Treatment (POET) water filtration systems by NJDEPE. Quarterly monitoring and maintenance of the POET units began in August 1992 to ensure the potability of the effluent water.

In May 1988, the ATSDR and NJDOH completed a Health Assessment for the site. The primary completed exposure pathway identified involves the past exposure of residents to volatile organic compounds (VOCs) in private potable well water through ingestion, inhalation, and direct contact. It also concluded that residents still rely on water supplied from private potable wells which were contaminated and there was a potential for exposure to gases, volatilized contaminants, and re-entrained contaminated dust produced within the landfill. The air survey conducted at the site indicated the presence of methane which poses a potential hazard as an

explosive if allowed to accumulate in an enclosed environment. The health assessment also raised concern about consumption of trout from Trout Brook.

The 1988 Health Assessment identified the following community health concerns:

- 1) The potential adverse health effects of the past exposure to contaminated private potable well water.
- 2) The residents were also concerned about disposal practices at the landfill, which were alleviated by landfill closure in 1981.

The 1988 Health Assessment identified the following public health concerns:

- 1) The residents using private potable well water have probably been exposed to VOCs in the past at concentrations that may result in adverse health effects.
- 2) Local residents who still rely on private wells for their drinking water supply may be at risk.
- 3) Until the remedial activities are complete, there is a potential public health threat from consumption of trout from Trout Brook.
- 4) There had been a history of leachate seeps at the CFS landfill containing elevated levels of VOC's and metals. This created a potential exposure pathway to trespassers through dermal absorption and ingestion of contaminants present in leachate seeps.

In summary, in 1988 the ATSDR and NJDOH categorized the site as a potential public health concern because human exposures to VOC's contamination, is likely to have occurred in the past. In addition, NJDOH concluded that further information is needed to adequately assess the impact of the site on public health.

Recommendations were made to conduct the following activities:

- 1) All private well users in the area should have their water supplies tested for possible chemical contamination and an effort should be made to connect the alternate water source for both drinking and all other household purposes as soon as possible. In the mean time, the residents should be instructed to use the bottled water.
- 2) Public access to the site before and during remediation should be restricted.
- 3) During remediation, measures should be taken to protect people, on-site and off-site from exposure to any dusts or vapors that may be released.

- 4) A drinking water survey indicating the location and population using the groundwater (public and private wells) or the surface water should be conducted.
- 5) Additional information on the individuals living near the site should be obtained to facilitate defining possible exposures to sensitive populations (e.g., children and elderly).
- 6) The flesh samples of fish from the Trout Brook should be taken if consumption is identified.

In March 1993, at the request of NJDEPE, ATSDR completed a health consultation to evaluate the public health implications of the use of uncontaminated private potable wells located downgradient of the site for irrigating gardens, filling swimming pools, and other non-potable uses. These wells would be monitored for contamination every three months. NJDEPE requested the ATSDR to determine if the use of uncontaminated wells for these nonpotable purposes posed a public health hazard. NJDEPE further stipulated that if contamination were to be detected in a well during quarterly monitoring, the well would be removed from service. Many of the private potable wells near the CFS landfill are contaminated with VOC's. The maximum reported concentrations of contaminants in private potable wells were: trichloroethylene - 390 ppb, methylene chloride - 190 ppb, and tetrachloroethylene - 245 ppb. Water from one well contained benzene at a reported concentration of 44 ppb. The contaminated wells will be sealed, once the public water supply is available. Under the scenario proposed by NJDEPE, the ATSDR concluded that use of VOC-contaminated (VOC concentration of 100 ppb) water for filling the swimming pool could lead to dermal exposure to VOC's. However, because of the short-term nature of the exposure and since the wells are monitored for contamination every three months, no significant health impact would be anticipated.

PUBLIC HEALTH IMPLICATIONS

For an undetermined period of time, residents living near the CFS landfill site were exposed to various volatile organic compounds (VOC's) in their private potable wells. Residents with contaminated private wells may have been exposed to methylene chloride, benzene, TCE, PCE, chloroform and 1,2-dichloroethane in their drinking water for an unknown period of time until contamination was detected. Residents were provided with bottled water and they started installing filter systems in their affected potable wells.

The Combe Fill South (CFS) Landfill began operation in 1940's. Although exposure to methylene chloride, benzene, TCE, PCE, chloroform and 1,2-dichloroethane could have occurred for up to approximately 34 years for most of the VOC's (1947 to 1981), the levels of contamination prior to 1981 are not known. One private potable well showed contamination with TCE during 1985 sampling, representing an exposure duration of 38 years (1947 to 1985). Benzene was detected in a private potable well at a concentration of 44 ppb in 1983. Many residents with contaminated private potable wells had the filtration system installed privately

since 1982. Additional wells were detected with site related contaminants during each subsequent private potable well sampling. Once informed about contamination, home owners installed water filtration system privately. In 1991, affected private potable wells near the site were fitted with Point of Entry Treatment (POET) water filtration systems by NJDEPE.

In this section, NJDOH will discuss the health effects in persons exposed to specific contaminants. To evaluate health effects, ATSDR has developed a Minimal Risk Level (MRL) for contaminants commonly found at hazardous waste sites. The MRL is an estimate of daily human exposure to a contaminant below which non-cancer, adverse health effects are unlikely to occur. MRLs are developed for each route of exposure, such as ingestion and inhalation, and for the length of exposure, such as acute (less than 14 days), intermediate (15 to 364 days), and chronic (greater than 365 days). ATSDR presents these MRLs in the Toxicological Profiles. These chemical-specific profiles provide information on health effects, environmental transport, human exposure, and regulatory status. In the following discussion, NJDOH used ATSDR Toxicological Profiles for the contaminants of concern at the site. The NJDOH will use a USEPA Reference Dose (RfD) as a health guideline, when a MRL is not available. The RfD is an estimate of daily human exposure of a contaminant for a lifetime below which (non-cancer) health effects are unlikely to occur.

Private Potable Well Pathways

The toxicological evaluation of the completed exposure pathway at the CFS landfill is based upon a duration of thirty-four (34) years for the ingestion pathway, except for TCE which was evaluated for an exposure duration of 38 years. The use of a 34 year exposure duration represents the time from the earliest documented land filling operations at the site (1947) to the installation of a water filtration system (1982).

The toxicological effects of the contaminants detected in private potable wells in the vicinity of the CFS landfill site have been considered singly. The cumulative or synergistic effects of possible mixture of contaminants may serve to enhance their public health significance. Additionally, individual or mixtures of contaminants may have the ability to produce greater adverse health effects in children as compared to adult. Non-potable domestic usage of contaminated water (showers) may be associated with significant exposure through the inhalation and dermal contact routes. Current literature suggests exposure doses from these routes may approach those associated with direct ingestion (Reference #7). There is no data available to estimate the exposure doses to these secondary routes of exposure at the CFS landfill site. This toxicological discussion recognizes their potential contribution to exposure dose estimates and consequent public health implications. Cancer estimates are based on an intake of 2 liters of water per day for a 70 kilogram adult for a lifetime (70) years.

Since exposure to most residents near the CFS landfill site would likely have occurred during the period from 1947 to 1981-1985, an exposure duration of 34 to 38 years was used to estimate exposure doses and resultant lifetime excess cancer risk estimates. Toxicological evaluation was completed for the most frequently detected chemicals in private potable wells near the site and

exposure dose calculations were based upon the maximum concentrations detected, thus representing a worse case exposure scenario.

Methylene Chloride

Exposure to methylene chloride through inhalation, skin contact, and ingestion may have occurred in CFS Landfill site residents who used contaminated private well water. Based upon maximum levels of methylene chloride (190 ppb) detected in private potable wells in 1981 near the site, estimated exposure doses (EED) were below the USEPA chronic oral RfD of 0.06 mg/kg/day. EED were also well below the Minimum Risk Level (MRL) for chronic oral exposure represented in the ATSDR Toxicological Profile for methylene chloride. At such concentrations, it is not likely that adverse health effects would occur.

USEPA considers methylene chloride to be a probable human carcinogen. Calculated Lifetime Excess Cancer Risk (LECR) shows that chronic oral exposure to methylene chloride at maximum concentrations found in private potable wells for a duration of 34 years would be expected to result in a no apparent increased cancer risk.

Trichloroethylene(TCE)

TCE exposure through skin contact and ingestion of contaminated private well water may have occurred in some residents. No chronic oral MRL or RfD is available for trichloroethylene to evaluate the potential for non-carcinogenic health effects. However, Estimated Exposure Doses (EED) calculated from the maximum reported concentration of trichloroethylene (37 ppb) in 1985 near the site were well below the No Observed Adverse Effects Level (NOAEL) for animal studies presented in the ATSDR Toxicological Profile for this chemical. At such concentrations, it is unlikely that non-carcinogenic adverse health effects would occur. TCE is considered by the USEPA to be a possible human carcinogen based on limited animal studies. Chronic oral exposure to TCE at maximum concentrations found in potable wells for a duration of 38 years would result in insignificant or no increased cancer risk.

Benzene

Benzene was detected in two private potable wells only. Presently there is no MRL or RfD for chronic oral exposure to benzene. However, exposure doses calculated from the maximum reported levels of benzene (44 ppb) in 1983 near the site were below the No Observed Adverse Effect Level (NOAEL) for animal studies presented in the ATSDR Toxicological Profile for Benzene. At such concentrations, it is not likely that non-carcinogenic adverse health effects would occur.

Benzene is considered by the USEPA to be a known human carcinogen. The Lifetime Excess Cancer Risk (LECR) associated with the chronic oral exposure route for benzene at the site for a duration of 36 years would result in no apparent increased cancer risk.

Tetrachloroethylene(PCE)

Based upon maximum reported levels of tetrachloroethylene (7 ppb) detected in private potable wells in 1981 near the site, estimated exposure doses were below the USEPA chronic oral RfD of 0.01 mg/kg/day. No chronic oral MRL is available. However, Estimated Exposure Doses (EED) calculated from the maximum reported concentration of tetrachloroethylene were well below the No Observed adverse Effects Level (NOAEL) for animal studies presented in the ATSDR Toxicological Profile for this chemical. At such concentrations, it is unlikely that non-carcinogenic adverse health effects would occur.

Tetrachloroethylene is considered as a probable human carcinogen by USEPA. Chronic oral exposure to tetrachloroethylene at maximum concentrations found in private potable wells for a duration of 34 years would result in insignificant or no increased cancer risk.

Chloroform

Based upon maximum concentrations of chloroform (63 ppb) detected in private potable wells in 1981 near the site, calculated exposure doses are significantly below the ATSDR Minimum Risk Level (MRL) of 0.01 mg/kg/day for chronic oral exposure. At such concentrations, it is not likely that non-carcinogenic adverse health effects would occur.

Chloroform is considered by the USEPA to be a probable human carcinogen. Chronic oral exposure to chloroform at maximum concentrations found in private potable wells for a duration of 34 years would result in insignificant or no increased cancer risk as calculated by Lifetime Excess Cancer Risk (LECR).

CURRENT CONDITIONS OF SITE

On February 16, 1994, Narendra P. Singh, and Howard Rubin of the NJDOH conducted a site visit of Combe Fill South (CFS) Landfill accompanied by the ATSDR Regional Representative, Steven L. Jones, the U.S. Environmental Protection Agency (USEPA) Remedial Project Manager, and a representative of the Chester Township Board of Health. The site visit included a formal presentation by the NJDEPE site construction manager.

The CFS landfill site is fenced and hazard warning signs are posted. The site is guarded on a 24 hour basis and there was no evidence of any trespassing on the site. As noted in the site documents, the surrounding area is semi-rural. Conditions at the site have changed since the 1988 health assessment. NJDEPE, in conjunction with the USEPA awarded a remedial contract for construction activities at the CFS site. Additional groundwater monitoring wells have been installed near the perimeter of the site to monitor the effectiveness of the ongoing remediation work. Remediation of the site contaminants and provision for an alternate public water supply to affected residents is underway.

CURRENT ISSUES

The Remedial Investigation (RI) conducted at the site has confirmed the presence of site related contaminants in both shallow and deep aquifers underlying the site. The deep aquifer is the major source of potable water in the vicinity of the landfill. There are six public wells within two miles of the landfill, all of which tap the deep aquifer. The potable private wells in the area are relatively shallow and tap the shallow aquifer.

The contaminants were first discovered during sampling by NJDEPE, Chester and Washington Townships in 1981. The contaminants found in private potable wells were benzene, dichloroethane, methylene chloride, tetrachloroethylene (PCE), trichloroethylene (TCE) and other volatile organic compounds (VOC's). Elevated levels of metals were detected in some of the private potable wells.

The NJDEPE private well user survey indicated that presently water use is mainly for the domestic purposes. However, many homeowners are using private well water for feeding livestock and for irrigation purposes.

Many private wells in Washington and Chester Townships have been affected by site related contaminants. The private potable wells northeast of the site, along Parker Road and Schoolhouse Lane, have already been contaminated with various site related chemicals that have migrated off-site. Other private potable wells farther downgradient of the site are at risk due to the continued off-site migration of the contaminated groundwater. However, private potable wells are being monitored periodically for the presence of site related contaminants.

Most of the Chester Township residents use private wells for their water supply needs while a portion of Washington Township is served by the Washington Township MUA public water supply system. The production wells of the Washington Township MUA are not affected by the contamination.

There are approximately 300 potable private wells in the area delineated by the USEPA. The provision of an alternate public water supply for residences that are using private well water that has been impacted is under progress by extending Washington Township MUA waterlines and is anticipated to be completed by spring of 1995 (Figure 3).

Currently, there are no completed exposure pathways associated with the site as 50 affected wells near the site are fitted with Point of Entry Treatment (POET) water filtration systems. The system consists of a water softener followed by a dual canister filled with granular activated carbon.

The POET units were installed by NJDEPE in 1991 and will be removed once the homeowners are connected with the public waterlines. However, many residents with contaminated private potable wells had the filtration system installed privately since 1982. Some of the private potable wells with higher levels of contamination were fitted with an air stripping system.

Quarterly monitoring and maintenance of the POET units began in August 1992 to ensure the potability of the effluent water. The results of the fifth round of sampling indicated that all the systems were functioning properly.

The ATSDR/NJDOH have public health concerns regarding resident's past exposures to the contaminated private well water. The potential public health concern as identified in the health assessment regarding soil gases produced within the waste piles were addressed by installation of an active collection and treatment system for methane and any other landfill-generated gases.

Community concerns are associated with the potential health risks resulting from past exposure to the contaminated private well water.

In the past, community concerns were associated with contamination of Trout Brook stream. Sampling and analyses of surface water for site related contaminants (VOC's, pesticides/PCB's, and metals) during the RI indicated that stream is not contaminated at the exposure point (i.e., the State Park). The results of the surface water and sediment sampling of Trout Brook and Black River at State Park revealed no pollutants at any of the sampling locations. NJDEPE concluded that recreational fishing in Trout Brook and Black River would not cause adverse health effects. ATSDR/NJDOH concur with this conclusion since no pollutants were detected in the surface water of Trout Brook and Black River at State Park. NJDOH has not identified any additional community health concerns.

CONCLUSIONS

1. Based on the Remedial Investigation, site-related contamination is present in soil, sediment, surface water and groundwater at the site and in groundwater off-site with VOC's. The conclusion that was made regarding the contaminated leachate seeps and soil as potential exposure pathway to trespassers does not appear to be likely because a local official informed NJDOH that trespassing at the site was never a problem.
2. Conclusions that were made in the 1988 health assessment regarding the site being of potential public health concern are no longer valid. Off-site migration of site related contaminants in groundwater have contaminated many private potable wells. However, installation of POET systems in contaminated wells have mitigated the exposure from these contaminants.
3. ATSDR and the NJDOH currently consider the site to pose a no apparent public health hazard as long as private potable well monitoring program continues until remedial activities specified in the ROD are implemented. No data are available indicating the nature and extent of contaminants from which to evaluate the public health significance of potential exposures prior to 1981. This information is needed to completely evaluate the community health concerns about past exposures to contaminated drinking water. However, the most conservative estimate of the duration of exposure to the VOC's via

drinking water from private potable wells would be approximately between 34 to 38 years. Based on a worse case scenario of exposure dose and duration, the residents would not experience any adverse health effects from the past exposure to contaminants in their private potable wells. Thus the ATSDR/NJDOH has determined that the site posed no apparent public health hazard because of these past exposures.

4. Under present site conditions there are no completed exposure pathways associated with the contaminated groundwater as affected potable wells near the site are fitted with Point of Entry Treatment (POET) systems and are monitored quarterly to ensure the potability of the effluent water. Other private potable wells farther downgradient of the site are at risk due to the continued off-site migration of the contaminated groundwater. However, private potable wells are being monitored periodically for the presence of site related contaminants.
5. The former conclusion that the potential for exposure to gases, volatilized contaminants, and re-entrained contaminated dust produced within the landfill was not valid. Air sampling and analysis, conducted during RI as part of the air quality investigation for the CFS landfill concluded that the landfill does not have a significant impact on overall air quality in the area. ATSDR/NJDOH agrees with this conclusion based upon the air sampling results. Soil gas data is inadequate to determine the significance of subsurface methane gas migration off the site. Installation of an active collection and treatment system for methane and any other landfill-generated gases will prevent any soil gas build-up.
6. The recommendation in the health assessment that the workers on-site be protected from contaminants during remediation is being followed in accordance with 29 CFR 1910.120.
7. As recommended in the health assessment, the site is fenced and guarded on a 24 hour basis.
8. As recommended in the health assessment, the provision of an alternate public water supply for residences that are using well water that had been impacted is under progress and is anticipated to be completed by spring of 1995.
9. The ATSDR/NJDOH have not identified any additional community health concerns associated with site related contaminants.
10. The remedial activities specified in the ROD, when implemented, are sufficient to address remaining concerns of the ATSDR, the NJDOH, and the community (except past exposures) regarding the site and are consistent with protection of the public health.
11. Future environmental, toxicological, health outcome data or changes in the conditions as a result of implementing the proposed plan, may determine the need for additional actions at this site.

RECOMMENDATIONS

The NJDOH and ATSDR do not recommend any further assessment (i.e., a health consultation or public health assessment) of the site at this time.

HEALTH ACTIVITIES RECOMMENDATION PANEL RECOMMENDATION

The data and information developed in the Site Review and Update for the Combe Fill South Landfill site, Morris County, New Jersey, has been evaluated by ATSDR's Health Activities Recommendation Panel (HARP) for appropriate follow-up with respect to health activities. Because of past exposures to site-related contaminants, the panel determined that health education activities are indicated.

PUBLIC HEALTH ACTION PLAN

The Public Health Action Plan (PHAP) for the Combe Fill South site contains a description of the actions that have been or will be taken by ATSDR and/or NJDOH at or in the vicinity of the site subsequent to the completion of this Site Review and Update. The purpose of the PHAP is to ensure that this Site Review and Update not only identifies public health hazards, but provides a plan of action designed to mitigate and prevent adverse human health effects resulting from exposure to hazardous substances in the environment. Included, is a commitment on the part of ATSDR/NJDOH to follow up on this plan to ensure that it is implemented.

Actions Planned

1. The NJDOH will provide health education to persons who have had their drinking water affected by site-related contaminants.
2. ATSDR and the NJDOH will coordinate with the appropriate environmental agencies to develop plans to implement the recommendations contained in this public health consultation.
3. ATSDR will provide an annual follow up to this PHAP, outlining the actions completed and those in progress. This report will be placed in repositories that contain copies of this site review and update, and will be provided to persons who request it.

ATSDR will reevaluate and expand the Public Health Action Plan (PHAP) when needed. New environmental, toxicological, health outcome data, or the results of implementing the above proposed actions may determine the need for additional actions at this site.

CERTIFICATION

The Site Review and Update for the Combe Fill South site was prepared by the New Jersey Department of Health under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). It is in accordance with approved methodology and procedures existing at the time the site review and update was initiated.



Technical Project Officer, SPS, RPB, DHAC

The Division of Health Assessment and Consultation (DHAC), ATSDR, has reviewed this Site Review and Update and concurs with its findings.



Division Director, DHAC, ATSDR

DOCUMENTS REVIEWED

1. New Jersey Department of Environmental Protection and Energy (NJDEPE), Site Remediation Program and Bureau of Community Relations - Project Update, Combe Fill South (CFS) Landfill site . January 1994.
2. Agency for Toxic Substances and Disease Registry (ATSDR) - Public Health Consultation, Combe Fill South (CFS) Landfill site . March 1993.
3. NJDOH Health Assessment for the Combe Fill South (CFS) Landfill site, Chester Township, Morris County, New Jersey. May 1988.
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5. New Jersey Department of Environmental Protection and Energy (NJDEPE) , Final Remedial Investigation Report for the Combe Fill South (CFS) Landfill site, Chester Township, Morris County, New Jersey. May 1986.
6. New Jersey Department of Environmental Protection and Energy (NJDEPE) , Draft Feasibility Study Report for the Combe Fill South (CFS) Landfill site, Chester Township, Morris County, New Jersey. May 1986.
7. Ram, N.M., Christman, R.F., and Cantor, K.P., Eds., "Significance and Treatment of VOC's in Water Supplies", Chelsea, Maine, Lewis Publishers, pp.485-504.
8. Agency for Toxic Substances and Disease Registry. Toxicological Profile for 1,2-dichloroethane. Atlanta: ATSDR, December 1989.
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10. Agency for Toxic Substances and Disease Registry, Draft Toxicological Profile for Benzene. Atlanta: ATSDR, 1989.
11. Agency for Toxic Substances and Disease Registry, Draft Toxicological Profile for Methylene chloride, Atlanta, ATSDR, 1991.
12. Agency for Toxic Substances and Disease Registry, Draft Toxicological Profile for Trichloroethylene, Atlanta, ATSDR, 1991.
13. Agency for Toxic Substances and Disease Registry, Draft Toxicological Profile for Chloroform, Atlanta, ATSDR, 1991.

INTERVIEWS/PERSONAL COMMUNICATIONS:

1. USEPA:

-Site Manager

2. Site Remediation Program/NJDEPE:

-Site Manager

-Site Construction Manager

3. Bureau of Community Relations/NJDEPE:

-Community Relations Coordinator

4. Bureau of Wellfield Remediation/NJDEPE:

-Site Manager

5. Chester Township Board of Health:

-Sanitary Inspector

PREPARERS OF REPORT

Preparers of Report:

**Narendra P. Singh, M.D., M.S., C.I.H.
Research Scientist
ATSDR Health Assessment Project
Environmental Health Service
New Jersey Department of Health**

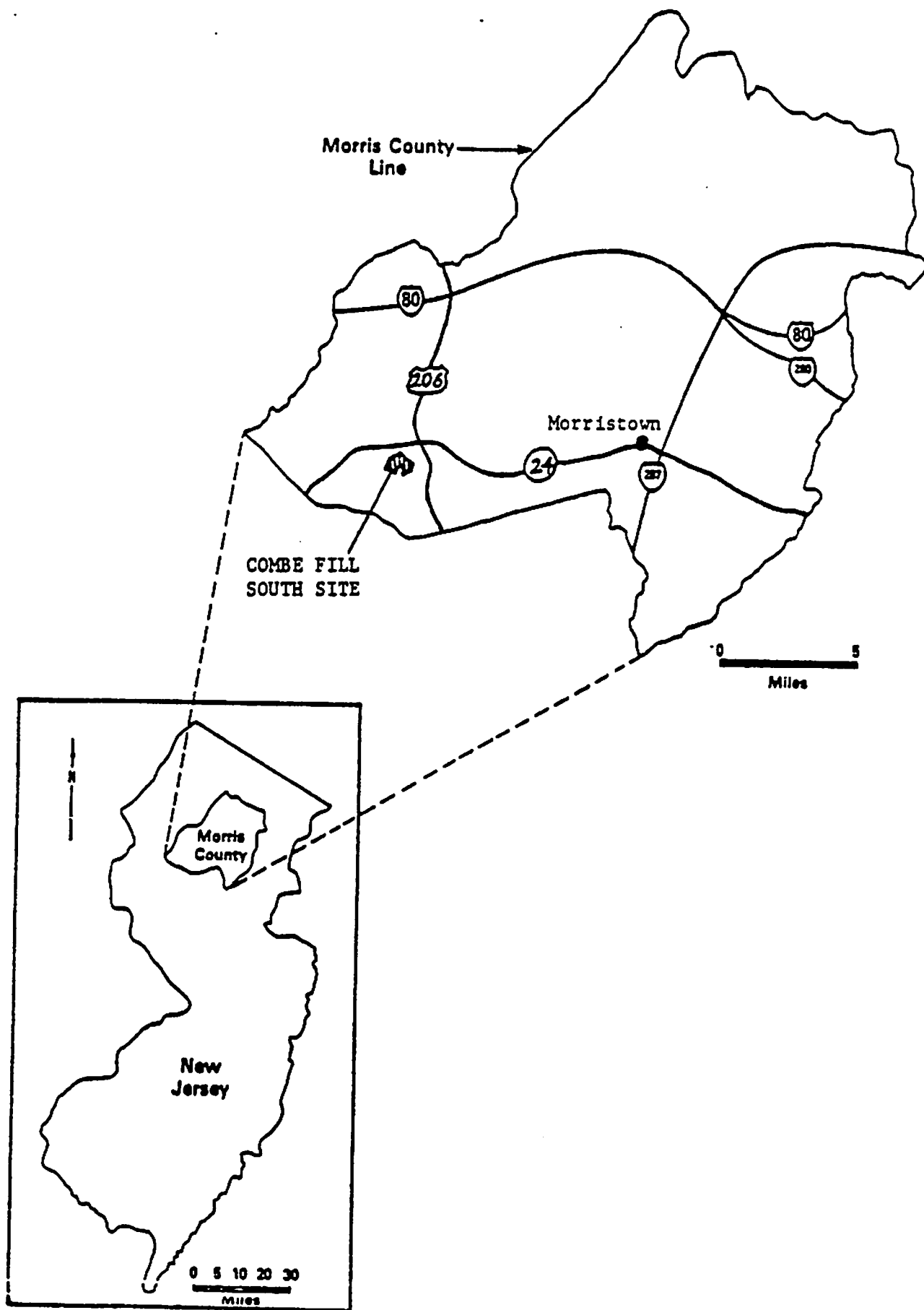
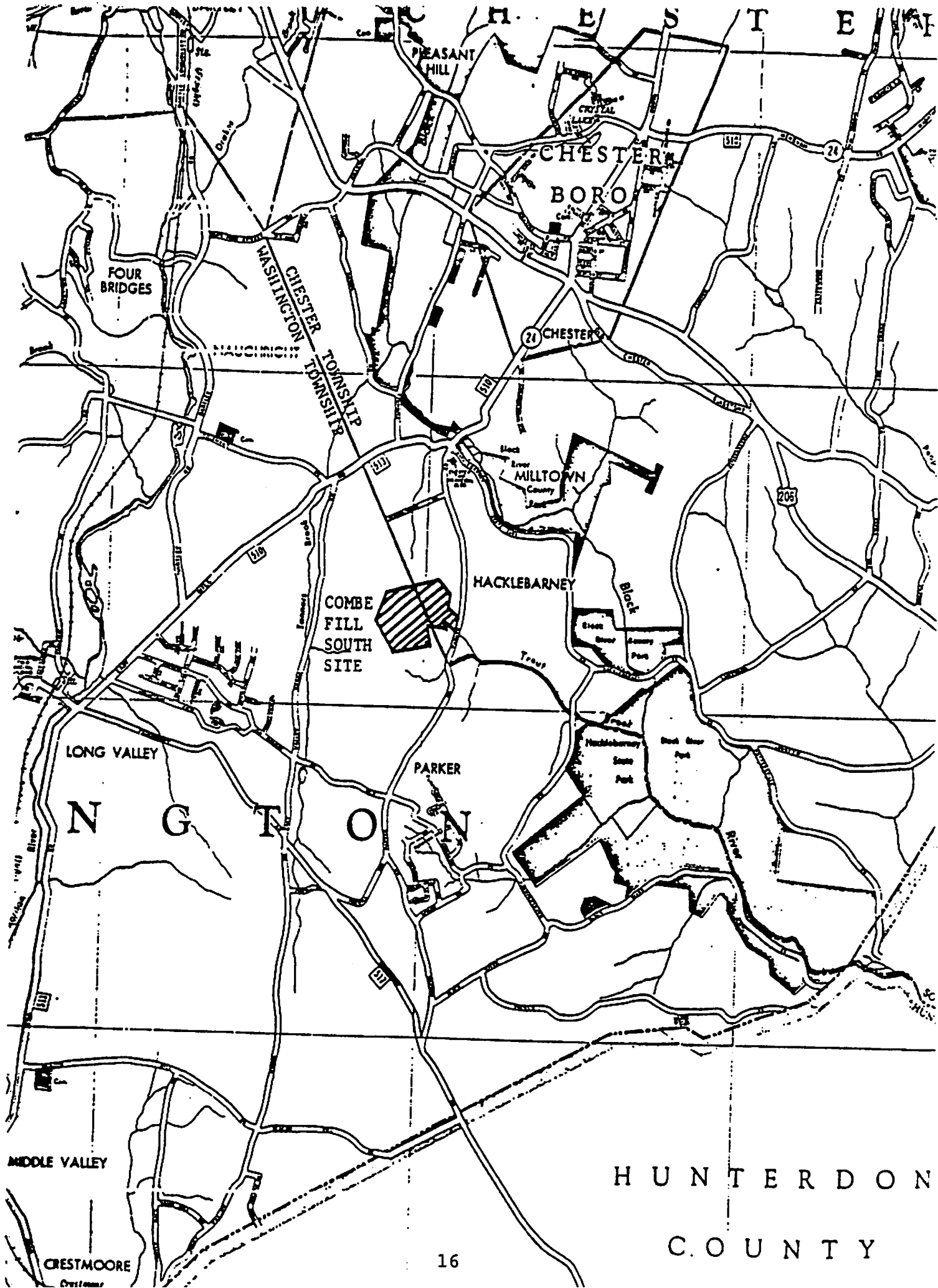
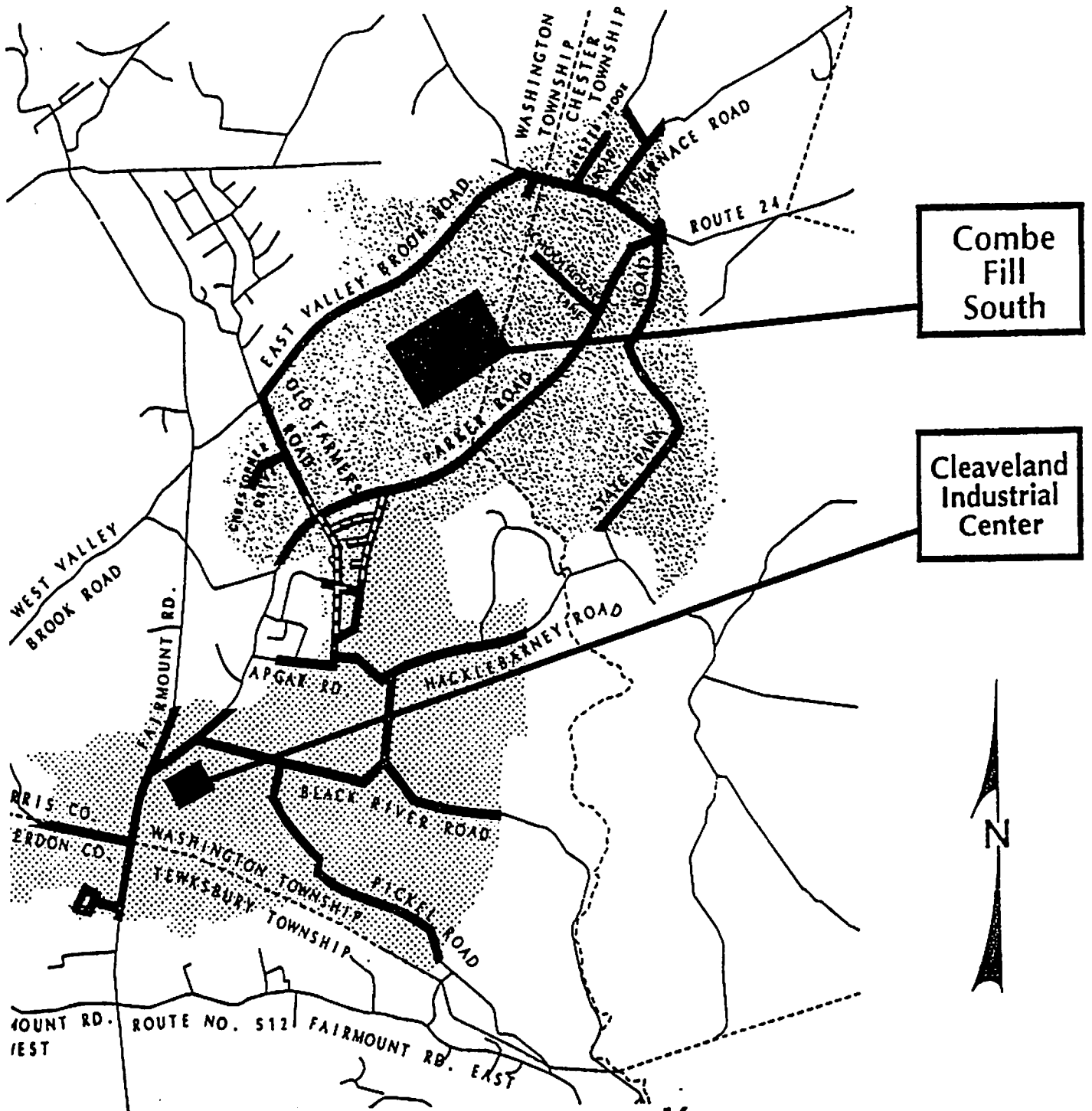


Figure 1. General Location of Site



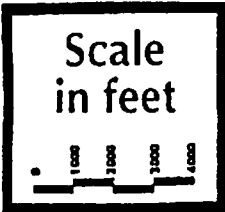
HUNTERDON
COUNTY

Waterline Areas for Combe Fill South Landfill perfund Site and Cleaveland Industrial Center Site



Combe
Fill
South

Cleaveland
Industrial
Center



- Key:**
- Roads
 - - - - Municipal / County Boundary
 - ▨ CFS Waterline Area
 - ▩ CIC Waterline Area
 - ▬ Existing Waterlines
 - ▬ Planned