

Site Review And Update

MONTCLAIR/WEST ORANGE RADIUM SITE

MONTCLAIR/WEST ORANGE, ESSEX COUNTY, NEW JERSEY

CERCLIS NO. NJD980785653

AND

GLEN RIDGE RADIUM SITE

GLEN RIDGE, ESSEX COUNTY, NEW JERSEY

CERCLIS NO. NJD980785646

SEPTEMBER 21, 1992

REVISED

JUNE 2, 1993

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.

REVISED SITE REVIEW AND UPDATE

MONTCLAIR/WEST ORANGE RADIUM SITE

MONTCLAIR/WEST ORANGE, ESSEX COUNTY, NEW JERSEY

CERCLIS NO. NJD980785653

AND

GLEN RIDGE RADIUM SITE

GLEN RIDGE, ESSEX COUNTY, NEW JERSEY

CERCLIS NO. NJD980785646

Prepared by

Remedial Programs Branch
Division of Health Assessment and Consultation
Agency for Toxic Substances and Disease Registry

SUMMARY OF BACKGROUND AND HISTORY

The Montclair/West Orange and Glen Ridge Radium sites are both listed on the Superfund National Priority List (NPL). The two sites include three noncontiguous study areas in residential communities of suburban Essex County in northeastern New Jersey, about 12 miles west of New York City (Figure 1). The Montclair and Glen Ridge Radium sites were identified as a result of the New Jersey Department of Environmental Protection's (NJDEP) program to investigate a former radium processing facility (U.S. Radium Corporation) that operated in the state in the early part of the century (1915-26). The possibility of past radioactive waste disposal at distant site locations prompted NJDEP to request from the U.S. Environmental Protection Agency (EPA) an aerial gamma radiation survey of a selected area in eastern Essex County. In 1981, the helicopter survey identified a number of areas with elevated gamma radiation. In September 1983, the NJDEP conducted a preliminary ground investigation that confirmed contamination in small areas of Montclair and Glen Ridge (later referred to as study areas). During the survey, it was evident that outdoor/indoor gamma radiation and indoor radon decay products were above acceptable levels on certain properties. As the EPA assessment of the area continued, the West Orange study area was added to the investigation in April 1984 and in October, the Montclair/West Orange and Glen Ridge Radium study areas were proposed for the EPA Superfund National Priorities List with final inclusion in February 1985 (4,5,7).

Soils of the Montclair/West Orange and Glen Ridge sites are contaminated with radium²²⁶ and other radionuclides in concentrations that sometimes exceed background by more than three orders of magnitude. Soil contamination has caused elevated levels of indoor/outdoor gamma radiation and elevated concentrations of indoor radon and radon decay products on certain properties in the study areas. Those concentrations exceed federal and state exposure limits for the general public (7,10,11).

Past EPA Actions

EPA began preliminary investigations in late 1983 to assess the extent of contamination at the Montclair/West Orange and Glen Ridge sites. As a result of a Centers for Disease Control (CDC) Public Health Advisory, EPA performed emergency remedial actions during the fall of 1983, which consisted of installing ventilation systems in houses with elevated radon decay product concentrations and placing lead shielding in houses with elevated gamma radiation levels to reduce indoor exposures. EPA has also initiated a quarterly monitoring program of these homes (7).

In November 1984, EPA began the remedial investigation and feasibility study (RI/FS) to determine the nature and extent of contamination and to develop remedial alternatives to alleviate the contamination.

In May 1984, EPA and NJDEP jointly planned a pilot study to evaluate the feasibility of excavation and off-site disposal of the radium-contaminated soil. Twelve properties, with varying degrees of contamination, were selected for the study and preliminary engineering assessments were prepared. With the initiation of the full RI/FS in the fall of 1984, EPA decided to forgo the pilot study.

NJDEP decided to proceed with excavation of the contaminated soil and initiated a pilot program. The pilot program was initiated in June 1985 and continued into the summer of 1988. Four properties were remediated and five other properties remained in various stages of remediation because the NJDEP designated disposal site refused to accept the material from the site. The pilot program demonstrated that excavation of radium-contaminated soil is a feasible remedial action.

EPA completed the remedial investigation of the radium-contaminated sites in April 1985 and released the draft RI/FS reports to the public on September 13, 1985. As a result of the RI/FS, EPA authorized additional installation of ventilation equipment and gamma radiation shielding for houses with excess radon gas and/or gamma radiation. In addition, EPA continued the quarterly monitoring program, collecting data on additional properties within the study areas.

In February 1987, realizing that a soil excavation alternative would be difficult to implement in the near future, EPA began a supplemental feasibility study in March 1987 to develop and evaluate measures to protect public health. A draft supplemental feasibility study was issued in April 1989 in conjunction with a *proposed plan* that described the remedial alternatives. In addition to the excavation of the more severely contaminated properties, radon control systems and gamma radiation shielding would be installed at a number of less contaminated properties, which would also necessitate limited soil excavation.

EPA released its first Record of Decision (ROD) for the Montclair/West Orange and Glen Ridge sites on June 30, 1989. EPA issued an additional ROD in June 1990 to include residential, public properties, and streets not included in the 1989 ROD. These Records of Decision explain the cleanup plan which consists of the removal of radium contaminated material from properties, public areas, and streets included in the sites. This removal is already in progress and has been completed on several properties which will be further described in the Current Site Conditions Section of this document.

Past CDC and ATSDR Actions

The Centers for Disease Control (CDC) with the concurrence of the New Jersey Department of Health (NJDOH), and EPA issued a public health advisory on December 6, 1983 based on the risk of indoor radon exposure. In the Advisory, CDC endorsed a plan by EPA to temporarily lower the indoor radon concentrations as soon as possible and to permanently remediate the site within two years. In April 1985, the Agency for Toxic Substances and Disease Registry (ATSDR) released a Preliminary Health Assessment for the Montclair/West Orange site (3,7).

The 1985 Preliminary Health Assessment for Montclair/West Orange did not address contaminants of concern, environmental and/or human pathways, and public and/or community health concerns. Instead, the preliminary health assessment reviewed the 1985 RI/FS Draft Work Plan for Montclair/Glen Ridge and concluded that several potential remedial technologies in the draft would not meet current environmental standards. ATSDR recommended permanent removal and disposal of contaminated material at the sites to ensure public health (2,3).

The EPA Final Community Relations Plan for the Montclair/West Orange and Glen Ridge sites (July, 1985) addresses community health concerns, which focused on radiation exposure, economic concerns, soil excavation and remediation, and concerns about relocation. The community expressed specific health concerns about the following: chronic exposure to radon gas, radon decay products, excessive gamma radiation exposure, and soil removal. The community was also concerned about how potential health effects would impact the elderly, pregnant women, and young children (4).

In November 1986, CDC issued a revised health assessment report for the Montclair/West Orange and Glen Ridge sites, confirming its initial assessment (public health advisory) of the existing health hazards at the sites. The health assessment considered health risks to short- and long-term exposure to radionuclides and their decay products and gamma radiation. Potential exposure pathways were also addressed (7).

ATSDR actively participated in a 1988 health consultation, which reviewed the Montclair, NJ State Remedial Plan and the Montclair/West Orange and Glen Ridge, NJ Feasibility Study. ATSDR participated at the availability sessions held by EPA during the release of the draft feasibility study in 1989 (5,9).

Past New Jersey Department Of Health (NJDOH) Actions

In December 1983, the NJDOH performed a community health evaluation survey at Montclair, Glen Ridge, and West Orange, Essex County, New Jersey as a result of the September 1983 gamma

radiation ground investigation by NJDEP, which identified 37 homes with elevated gamma radiation. The survey includes information on length of residency, smoking history, cancer, occupation, and past residents. Thirty-six households responded to the survey on December 5 and 6, 1983, however one household withdrew from the survey, so 35 questionnaires were used for the analysis. Five different types of cancer were reported by three women and two men, respectively: skin, ovarian, breast, colon, and lung. An epidemiologic excess was not found for any one cancer and when all cancers were combined, there were fewer people with cancer than would have been expected in the population surveyed (1).

In May 1988, the NJDOH issued a health study on *Mortality Experience of Residents Exposed to Elevated Indoor Levels of Radon From an Industrial Source*. The study included forty-five houses in Montclair, Glen Ridge, and West Orange, Essex County, New Jersey which were documented in the Winter of 1983-84 to have indoor radon gas concentrations in excess of Federal and New Jersey guidelines (6).

Residency histories, vital status, and cause of death (if deceased) for all individuals who had ever lived in any of the 45 homes (from the 1920s to 1983) for at least one year were collected for the study. Data was collected to determine standardized mortality ratios of more than 90% of the people who lived in the study areas. Lung cancer was the focus of the mortality study because it is the only disease known to be associated with radon exposure. The observed standardized mortality data was compared to expected mortality rates of the United States and New Jersey populations according to age, sex, race, time period, and cause of death (6).

A higher rate of lung cancer was found for white males in the study group when compared to the expected death rate from lung cancer for white males in both the United States and New Jersey populations; however, the small size of the study group does not rule out chance. In addition, the study did not consider smoking or occupation as contributors to the observed difference because it was not possible to collect complete smoking and occupational histories (6).

CURRENT SITE CONDITIONS

On April 24, 1992, ATSDR personnel, Greg Ulirsch, and Arthur Block, Region II Office, James Pasqualo, NJDOH representative, EPA representatives, and a local health department representative visited the Montclair/West Orange, and Glen Ridge sites and properties surrounding the U.S. Radium Corporation site (in Orange, New Jersey).

The contaminated areas in Montclair, West Orange, and Glen Ridge, exist in well-established residential neighborhoods with single- and two-family homes. The three study areas include public areas, such as streets and/or parks, in addition to residential properties (12).

A small portion of the populations of Montclair/West Orange, and Glen Ridge study areas may have been exposed to radionuclides and their by-products for up to 40 years at indeterminate concentrations.

Active remediation is ongoing on residential properties. During active remediation, the work area is enclosed and access is denied until remediation is complete. During remediation, contaminated soil is removed from the site and clean soil is used as back fill material (12).

The Montclair study area covers approximately 100 acres, which includes 239 properties in the town of Montclair and 127 properties in the town of West Orange. The West Orange study area covers approximately 20 acres and includes 75 properties in the town of West Orange. The Glen Ridge study area covers approximately 90 acres and includes 274 properties in the town of Glen Ridge and 32 properties in the city of East Orange. Boundaries of the study areas are not final and are subject to further classification by EPA during its ongoing remediation (11).

Since the release of the 1985 preliminary health assessment, CDC, EPA, and ATSDR have been involved in activities at the Montclair/West Orange and Glen Ridge sites.

EPA Actions

Remediation of properties at the Montclair/West Orange and Glen Ridge sites has been active since 1991 with complete remediation of 55 homes, 25 homes in the construction phase, and another 55 homes proposed for cleanup within the next year (14,16). During the process of remediation, the EPA contractor performing the cleanup is responsible for documenting the post-excavation levels of gamma radiation and radium. In addition, an independent contractor performs identical surveys. Gamma exposure measurements and soil samples are taken after excavation is complete to ensure that the cleanup has met EPA criteria. The results of these tests must be below EPA criteria for a property to be considered fully remediated (17). EPA then conducts a one-year radon test in the home.

EPA has installed radon mitigation systems in approximately 40 homes at the sites where elevated levels of radon were detected. EPA continues to maintain those systems in homes where they were installed until the remediation of the property is complete (13).

The installation of 24 groundwater monitoring wells has been completed and two rounds of groundwater samples were collected by June 1992. The results of the groundwater sampling analyses are expected shortly (13).

CURRENT ISSUES

Public Health Concerns

Past, present, and future exposures to radionuclides and their decay products at the Montclair/West Orange and Glen Ridge sites may still pose public health concerns.

The 1986 CDC health assessment evaluated exposure pathways through which radiation poses a threat. However, recent data is available from the 1989 feasibility study, which may alter risk levels of exposure at the sites. In addition, the 1986 CDC health assessment presented exposure pathways. Those pathways include inhalation of radon and radon decay products, irradiation by gamma radiation, ingestion and/or inhalation of radium--contaminated soil, and ingestion of vegetables grown in contaminated soil. Groundwater exposure, however, was not considered because environmental data was not available (7).

Community Health Concerns

Community health concerns still exist. EPA has assigned a full time community relations person to the site to address the many concerns still expressed by the community (4,14,16).

During the public availability meetings for the 1989 feasibility study, the community was primarily concerned about health issues. They were particularly concerned whether any longitudinal health studies were proposed for the communities within the study areas. The community also expressed concern about the possibility of groundwater contamination in the study areas.

During the ATSDR site visit on April 1992, the EPA community relations person mentioned in general that the community was not concerned about the need for health studies.

CONCLUSIONS

The 1985 preliminary health assessment conclusions and recommendations were valid. Recommendations to remove and to permanently dispose of contaminated soil are currently being acted upon through EPA's active site remediation.

ATSDR concurs with EPA that removal of the contaminated material is protective of human health and the environment; however, the

process of removal is under active remediation and will continue into 1994 as contract work for cleanup. Therefore, the potential for present and future exposures still exists to radionuclides and their decay by-products in contaminated soil.

Groundwater contamination was not previously described in the 1985 preliminary health assessment; however, the main source of drinking water for the Montclair/West Orange and Glen Ridge area is surface water (17,18). The groundwater is not used as a drinking water supply (17,18).

Past exposures, the potential for current and future exposures to radionuclides and their by-products in contaminated soil, the availability of new data (1989 feasibility study, groundwater data), and community concern about long term health impact from past exposures warrants further evaluation by ATSDR to determine the public health implications at Montclair, West Orange, and Glen Ridge, New Jersey.

RECOMMENDATIONS

ATSDR recommends that public health assessment(s) be written for the Montclair, West Orange, and Glen Ridge and U.S. Radium sites.

Health Activities Recommendations Panel Statement

The public health review of the site was reviewed by the Health Activities Recommendations Panel on September 3, 1992. The panel's statement follows:

The data and information developed in this site review and update have been evaluated to determine if follow-up actions are indicated. Further site evaluation is needed to determine public health actions.

DOCUMENTS REVIEWED

Documents reviewed by ATSDR for this summary are as follows:

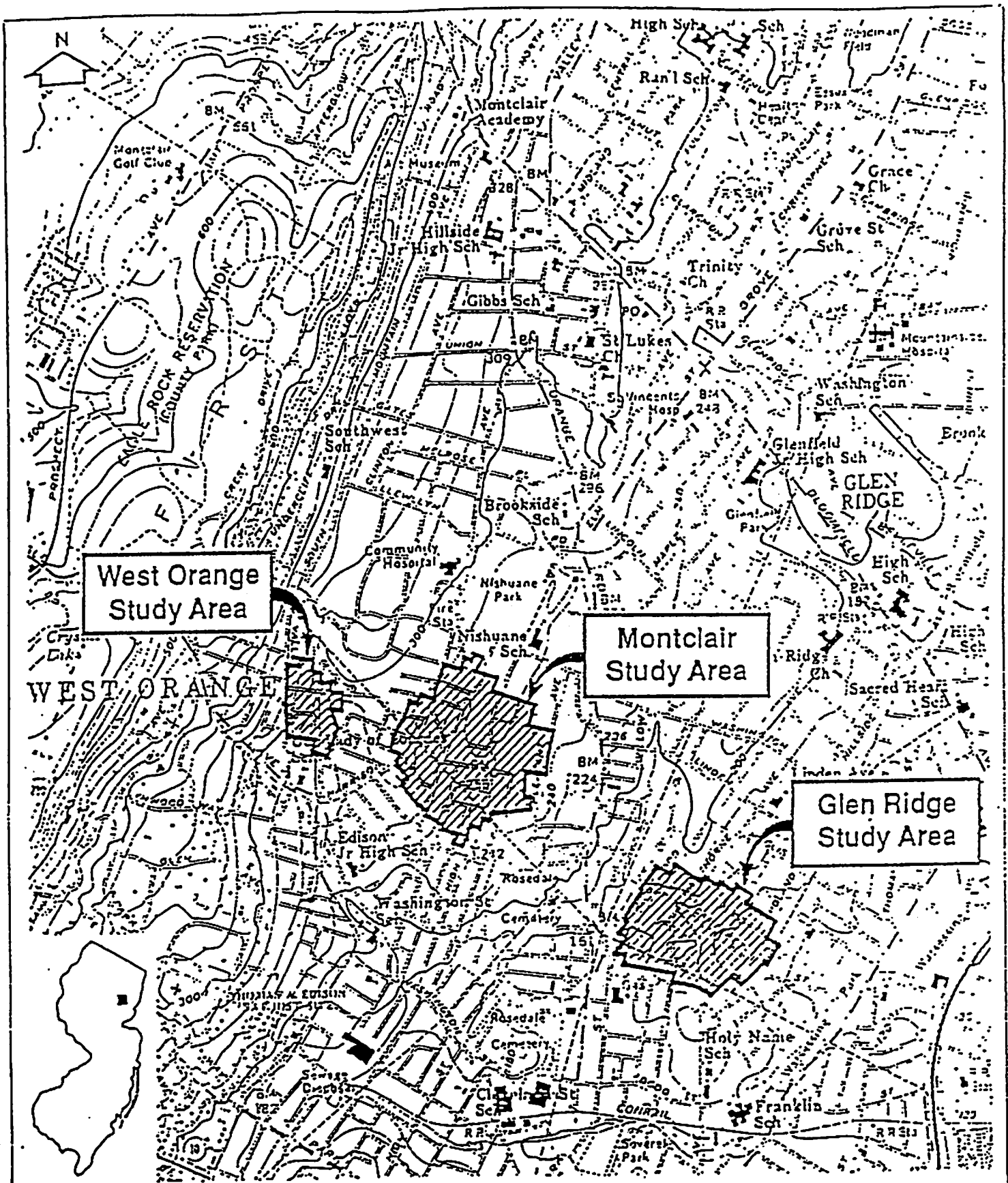
1. NJDOH. December 21, 1983. Legislative Briefing on Radiation Problem (Essex County). New Jersey Department of Health, J.Richard Goldstein, MD, Commissioner of Health.
2. EPA. January 18, 1985. Draft Work Plan for the Glen Ridge, New Jersey Low Level Radiation Site Remedial

Investigation/Feasibility Study. Volume 1. Contract Number 68-01-6939 prepared by Camp Dresser and McKee Inc.

3. ATSDR. April 11, 1985. Preliminary Health Assessment for Montclair/West Orange, New Jersey. CERCLIS NO. NJD980785653.
4. EPA. July 10, 1985. Final Community Relations Plan for Montclair/West Orange and Glen Ridge Radium Sites, Essex, New Jersey. U.S. EPA. Contract Number 68-01-0939 prepared by Camp Dresser and McKee Inc.
5. ATSDR. February 22, 1988. Health Consultation for 1) State Remedial Plan--Montclair, New Jersey; and 2) Montclair, West Orange, and Glen Ridge, NJ Feasibility Study.
6. NJDOH. May 1988. Mortality Experience Of Residents Exposed To Elevated Indoor Levels Of Radon From An Industrial Source. Environmental Health Service, Division of Occupational and Environmental Health, New Jersey State Department of Health.
7. EPA. April 3, 1989. Draft Supplemental Feasibility Study for Montclair/West Orange, and Glen Ridge Sites. Four Volumes. U.S. EPA Contract Number 68-01-6939 prepared by Camp Dresser and McKee Inc.
8. EPA. April 1989. Proposed Plan For Montclair/West Orange, and Glen Ridge Radium Sites. Prepared by U.S. EPA.
9. ATSDR. April 5,7 1989. ATSDR Regional Representative, EPA Region 2. EPA Public Availability Meeting at Montclair, West Orange, and Glen Ridge, Essex, New Jersey.
10. EPA. June 30, 1989. Record of Decision (ROD)--Montclair/West Orange Radium Site and Glen Ridge Radium Site. Montclair, West Orange, and Glen Ridge, Essex County, New Jersey.
11. EPA. June 1, 1990. Record of Decision--Montclair/West Orange Radium Site and Glen Ridge Radium Site. Montclair, West Orange, and Glen Ridge, Essex County, New Jersey. Supplemental ROD for properties not stated in ROD of June 1989.
12. ATSDR. April 24, 1992. Draft Trip Report Montclair/West Orange, and Glen Ridge Radium Sites and U.S. Radium Site. Montclair, West Orange, Glen Ridge, and East Orange, Essex County, New Jersey.
13. EPA. July 1992. Superfund Update of Montclair/West Orange, and Glen Ridge Radium Sites, Essex County, New Jersey.

14. ATSDR. July 13, 1992. Written Communication from ATSDR Regional Representative, EPA Region 2 on Montclair/West Orange and Glen Ridge Radium Sites, Essex County, New Jersey.
15. ATSDR. August 12, 1992. Communication with NJDOH Representative for request of health study information at Montclair/West Orange and Glen Ridge Radium Sites, Essex County, New Jersey.
16. EPA. August 13, 1992. Communication with EPA Community Relations Representative at Montclair, West Orange, and Glen Ridge Radium Sites. Montclair/West Orange, and Glen Ridge, Essex County, NJ.
17. ATSDR. November 3, 1992. Memorandum which includes the EPA Project Manager's Site Review and Update Comments (October 30, 1992) of the Montclair/West Orange, and Glen Ridge Radium Superfund Site, Essex County, New Jersey.
18. ATSDR. February 24, 1993. Memorandum which includes the New Jersey Department of Environmental Protection and Energy (NJDEPE) Site Review and Update Comments (January 7, 1993) of the Montclair/West Orange, and Glen Ridge Radium Superfund Site, Essex County, New Jersey.

Preparer of the report: Mark Rodriguez, MPH
Medical Officer
Remedial Programs Branch,
Health Science Section



Scale: 1"=2,000'

Source: U.S.G.S. Orange, N.J. Quadrangle

CDM

environmental engineers, scientists
and consultants

Figure 1

Location of Three Study Areas

Montclair/West Orange and Glen Ridge Radium Sites