

# Health Assessment for

ROCKAWAY TOWNSHIP WELLS

CERCLIS NO. NJD980654214

ROCKAWAY TOWNSHIP, MORRIS COUNTY, NEW JERSEY

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Agency for Toxic Substances and Disease Registry  
U.S. Public Health Service

**HEALTH ASSESSMENT  
ROCKAWAY TOWNSHIP WELLS  
MORRIS COUNTY  
ROCKAWAY TOWNSHIP, NEW JERSEY**

Prepared by:  
Environmental Health Service  
New Jersey Department of Health

Prepared for:  
Agency for Toxic Substances and Disease Registry (ATSDR)

**OBJECTIVES**

The purpose of this health assessment is to identify the health concerns and need for a study of the community affected by the Rockaway Township Wells Superfund site, to determine the need for additional environmental sampling, and make recommendations regarding immediate public health actions to be undertaken.

**SUMMARY**

The Rockaway Township Wells in Morris County, New Jersey have experienced contamination with volatile organic chemicals in the past. Because the wells served a population of approximately 12,500 persons, a potential threat to the public health existed. The addition of a treatment system in 1980 to remove volatile organics substantially reduced the exposure to the community. Continued and frequent monitoring of the raw and treated water from the wells must be maintained to ensure the efficacy of treatment.

On the basis of the information reviewed, the Rockaway Township Well Site is a potential public health concern. Since human exposure to on-site/off-site contaminants has occurred in the past, the population of Rockaway Township served by the wells is being considered for inclusion in a large-scale epidemiologic study of the effects of drinking water contamination.

**BACKGROUND**

The Rockaway Township Wells site is a wellfield area containing a cluster of three municipal wells (#4, #6, and #7)

within 100 feet of each other. In 1979 and 1980, the wells were found to contain a variety of volatile organic contaminants including trichloroethylene, di-isopropyl ether, and methyl tertiary butyl ether. Monitoring wells in the area have indicated widespread contamination in the milligram per liter range of a variety of chlorinated solvents and fuel components. A treatment system for the combined pumping of the wells was installed in 1980, consisting of an air-stripping unit and an activated carbon filtration system. According to the draft Remedial Investigation report, only wells #6 and #7 are currently in operation.

The wells are located adjacent to White Meadow Brook between Green Pond and Ford Roads in Rockaway Township, and serve a population estimated at 12,500 persons. Near the wellfield are two gasoline service stations, freight and transit facilities associated with a rail track, and industrial properties. Groundwater contamination in the area appears to be a result of several sources including the gasoline stations and industrial facilities (RI report).

Shell Oil and Morton Thiokol have been identified to be among the responsible parties and have signed administrative consent orders to fund the remedial investigation and feasibility study (draft RI report). Additional contaminant sources may be found during the Phase II Remedial Investigation scheduled for completion in September 1989.

The wellfield is located in a large bedrock valley filled with sand and gravel (glacial drift) up to 200 feet thick. The Valley Fill Aquifer is the only supply source capable of meeting the Township's water demand. Local groundwater flow is toward the wellfield from all directions as a result of the cone-of-depression caused by pumping (draft RI report).

The Rockaway Township Wells site is one of several groundwater contamination problems in the area. Municipal wells in nearby Rockaway Boro, Denville Township, Dover Town, Wharton Boro, and Parsippany-Troy Hills Township have also been found to contain volatile organic contaminants.

#### **SITE VISIT**

Information used in this assessment includes information provided by NJDEP staff who have been to the site. A site visit to the Rockaway Township Wells site will be conducted by NJDOH. As the site itself consists of wells, there is not much to see or be concerned about on-site. The site visit will concentrate on the industrial area near the wells and the properties of the potentially responsible parties.

## COMMUNITY CONCERNS

A review of NJDEP Community Relations documents and interviews with the Rockaway Township Health Department Environmental Coordinator revealed a generally positive perception and response by the public to remediation efforts at the site.

In 1980, residents complained of unpleasant tastes and odors in the water supply. Actions by Rockaway Township to treat the water and inform the public as to the status of the problem resulted in a relatively low level of community concern.

## ENVIRONMENTAL CONTAMINATION

Volatile organic contamination of the Rockaway Township Wells was first discovered in December 1979 when 148 micrograms per liter (ug/l) of trichloroethylene (TCE) was found in well #6. Subsequent sampling of all three wells indicated the presence of TCE up to 362 ug/l. The maximum values by well between 1979 and 1982 are summarized below. These values are representative of peak exposure concentrations, and are not indicative of current concentrations.

<u>Contaminant</u>	<u>Maximum Concentration</u> (in ug/l)		
	<u>#4</u>	<u>#6</u>	<u>#7</u>
Trichloroethylene	33	362	94
1,1,1-Trichloroethane	12	184	11
1,2-Dichloroethylene	59	289	8
Ethylbenzene	-	-	14
Methyl t-Butyl Ether	-	-	100
Di-isopropyl Ether	-	-	40

As part of the Remedial Investigation, monitoring wells were drilled at similar depths near the municipal wells. Samples taken from the wells in 1985 and 1986 revealed the presence of acrolein, benzene, toluene, xylenes, ethylbenzene, trichloroethylene, tetrachloroethylene, 1,1,1-trichloroethane, 1,1-dichloroethylene, carbon tetrachloride, chloroform, vinyl chloride, and di-isopropyl ether. The most widespread contaminants were the chlorinated solvents at concentrations into the milligram per liter range. Localized high concentrations of fuel components such as benzene were also detected.

In 1986, monitoring of the Rockaway Township wells #6 and #7 under the state Safe Drinking Water Act indicated that

untreated water contained trichloroethylene up to 168 ug/l, 1,1,1-trichloroethane up to 20 ug/l, 1,2-dichloroethane up to 14 ug/l, trans-1,2-dichloroethylene up to 4 ug/l, and methyl t-butyl ether up to 2 ug/l.

Nine samples of water leaving the treatment plant in 1986 show that the treatment was effective in removing volatile organic substances from the water. No volatile organics were detected in 6 of the 9 samples; three samples contained trichloroethylene up to 5 ug/l (N.J. proposed maximum level = 1 ug/l) and 1,1,1-trichloroethane up to 3 ug/l (N.J. proposed maximum level = 26 ug/l).

According to the N.J. Department of Environmental Protection's Bureau of Safe Drinking Water, distribution system samples taken in 1987 and 1988 are reported to have non-detectable levels of volatile organic chemicals.

#### **QUALITY ASSURANCE QUALITY CONTROL**

Data collected under the Bureau of Safe Drinking Water monitoring programs must be performed by laboratories certified by the NJDEP. Data collected in the preparation of the Remedial Investigation have been examined by NJDEP and found to be of acceptable quality.

#### **DEMOGRAPHICS**

The Rockaway Township Water Department serves a population estimated at 12,500 persons. The total population of Rockaway Township according to the 1980 U.S. census was 19,580.

According to the RI, there are no private wells or production wells in the vicinity of the wellfield.

There is no information on the existence of sensitive populations in Rockaway Township to the potential effects of the drinking water contaminants.

#### **ENVIRONMENTAL DATA GAPS**

For the purposes of assessing human exposure, there is no need for additional environmental sampling other than that planned in Phase II of the Remedial Investigation and required by the state's public water supply monitoring regulations.

If further investigations indicate contamination of surface soils or surface waters associated with the site, with the potential for human exposure, additional data gaps may be identified.

## **EXPOSURE PATHWAYS**

The exposure pathway of greatest concern is ingestion of drinking water supplied by the Rockaway Township Water Department before construction of treatment in 1980. Since the contaminants are volatile, inhalation of the contaminants released into indoor air during water use was also a pathway of exposure. Absorption through the skin is a potential exposure pathway, but is unlikely to be a major pathway of concern.

Since there are reported to be no private wells in the vicinity, the construction of drinking water treatment at the Rockaway Township wellfield should have eliminated or substantially reduced exposure. The exposure pathways connected with the source of the contamination cannot be determined until the source is identified and delineated.

## **PUBLIC HEALTH IMPLICATIONS**

The volatile organic substances found in relatively high concentrations in the Rockaway Township Wells prior to 1980 may have posed a health risk to the community. Some of the substances are now known to be carcinogenic in laboratory animals and are classified as probable human carcinogens. In addition, the substances may exhibit toxicity to the nervous system, liver, and other organ systems. The appearance and intensity of these effects are dependent upon dose and duration of exposure.

The magnitude and duration of contamination prior to discovery in 1979 is not known. The public health implications of direct contact with the source of the contamination currently is not known. Although it is difficult to accurately determine the potential public health impact, it is unlikely that exposure resulted in any acute effects.

## **CONCLUSIONS AND RECOMMENDATIONS**

On the basis of the information reviewed, the Rockaway Township Well Site is a potential public health concern because humans have probably been exposed to TCE and 1,2-Dichloroethane at concentrations that may result in adverse health effects. As noted in the Environmental Contamination, and Exposure

Pathways, and Public Health Implications sections, human exposure to VOC's has occurred in the past via drinking water, and may still be occurring.

The construction of a treatment system at the Rockaway Township wellfield has effectively reduced or eliminated human exposure to contaminants from the site. Continued and frequent monitoring of the efficacy of treatment must be maintained because of the suspect quality of surrounding groundwater.

Information that is needed to better evaluate the potential public health impacts of the site include:

- 1) An identification and characterization of the source of the contamination. (This identification and characterization is designed to occur during Phase II of the RI.)
- 2) A description of the population that was exposed to the drinking water contamination before 1980, including information on the existence and size of sensitive subpopulations.

In accordance with CERCLA as amended, the Rockaway Township Wells site has been evaluated for appropriate follow-up with respect to health effects studies. Since human exposure to on-site and off-site contaminants has occurred in the past, this site is being considered for follow-up health studies. The site will be considered by NJDOH for inclusion in a larger scale epidemiological study of VOC's in drinking water. After consultation with Regional EPA staff and State and Local Health and Environmental Officials, the Division of Health Studies, ATSDR and NJDOH, will determine if the inclusion of Rockaway Township Wells site in a larger scale epidemiological study or any other follow-up public health actions or studies are appropriate for this site.

This Health Assessment was prepared by the State of New Jersey, Department of Health, Environmental Health Service, under a Cooperative Agreement with the Agency for Toxic Substances and Disease Registry. The Division of Health Assessment and Consultation and the Division of Health Studies of ATSDR have reviewed this Health Assessment and concur with its findings.

## REFERENCES

### Superfund Documents:

ATSDR Site Summary, Rockaway Township Wells, June 20, 1988  
Hazard Ranking System Worksheets, Rockaway Township Wells  
Draft Remedial Investigation Report, Rockaway Township  
Wellfield Site, ICF/SRW Associates, June 1988

### Personal Communications:

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