Ground-Water Quality in Five Areas of Differing Land use in Nassau and Suffolk Counties, Long Island, New York

By Carolyn E. Leamond, Ralph J. Haefner, Stephen J. Cauller, and Paul E. Stackelberg

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CONVERSION FACTORS AND ABBREVIATED WATER-QUALITY UNITS

Multiply	*By*	*To obtain*
	Length	
inch (in)	25.4	millimeter
inch (in)	2.54	centimeter
foot (ft)	0.3048	meter
mile (mi)	1.609	kilometer
	Area	
acre	0.4047	hectare
square mile (mi^2)	2.59	square kilometer
	Power	
horsepower (hp)	746	watt
	Gradient	
foot per mile (ft/mi)	0.1914	meter per kilometer
	Hydraulic Conductivity	
foot per day (ft/d)	0.3080	meter per day
	Temperature	
degree Fahrenheit (°F)	$^5/_9$(°F-32)	degree Celsius (°C)

Chemical Concentration

milligram per liter (mg/L)
microgram per liter (µg/L)

Specific Conductance

microsiemens per centimeter at 25 degrees Celsius (µS/cm)

GROUND-WATER QUALITY IN FIVE AREAS OF DIFFERING LAND USE IN NASSAU AND SUFFOLK COUNTIES, LONG ISLAND, NEW YORK, 1987-88

By Carolyn E. LeaMond, Ralph J. Haefner, Stephen J. Cauller, and Paul E. Stackelberg

ABSTRACT

Water samples were collected from 90 water-table wells in five study areas in Nassau and Suffolk Counties as part of a study to relate shallow ground-water quality to land use statistically. The study areas were delineated according to predominant land use and to current and historic sewering practices. The areas included: (1) a long-term sewered suburban area (20 wells), (2) a recently sewered suburban area (20 wells), (3) an unsewered suburban area (20 wells), (4) an agricultural area (15 wells), and (5) an undeveloped area (15 wells). Additional samples were collected monthly from one well in each area for at least 1 year after initial sampling to provide a record of water-quality changes at each well.

Samples were analyzed for field characteristics and inorganic constituents; volatile and semivolatile organic compounds; organochlorine, organophosphorus and carbamate insecticides; and triazine and chlorophenoxy-acid herbicides. This report presents the chemical data in tables, graphs, and box plots.

Median water temperatures in the two sewered suburban areas were significantly higher (all significant differences determined by Tukey's Studentized Honest Significant Difference Range Test) than in the other three areas, and the median water temperature in the unsewered suburban area was significantly higher than in the agricultural or undeveloped areas. Median concentrations of calcium, sulfate, potassium, and boron were larger in the agricultural area than in the unsewered suburban area or the undeveloped area and were similar to median concentrations in the two sewered suburban areas. Median concentrations of nitrate-nitrogen, potassium, specific conductance, and total dissolved solids were smaller in the undeveloped area than in the other four areas. Median concentration of dissolved oxygen was larger in the undeveloped area than in the three suburban areas.

Volatile organic compounds (VOC's) were detected primarily in the three suburban study areas; detection was most frequent in the recently sewered suburban area, followed by the unsewered suburban area. The most commonly detected VOC's were 1,1,1-trichloroethane, trichloroethylene, and tetrachloro-ethylene.

Insecticides were detected primarily in suburban and agricultural areas. The most frequently detected pesticide group was the organochlorine insecticides. Carbamate insecticides, primarily aldicarb metabolites, were detected most frequently within the agricultural area and had the highest concentrations of all pesticides. Organophosphorus insecticides were detected infrequently and at low concentrations. Triazine herbicides were detected in the three suburban study areas only.

Results indicate that ground-water quality differs among the five study areas, and that the differences for several constituents are statistically significant.

INTRODUCTION

The Long Island aquifer system is considered by the U.S. Environmental Protection Agency (USEPA) to be the sole source of potable water for about 2.6 million people in Nassau and Suffolk Counties on Long Island, N.Y. (fig. 1). The aquifer system consists of unconsolidated gravel, sand, silt, and clay deposits of Pleistocene and Cretaceous age and is bounded on the north and south by saltwater and on the bottom by crystalline bedrock. Recharge to the aquifer is through (1) rainfall that percolates through the sediments, (2) recharge basins that collect rainfall and storm-sewer runoff, and (3) septic systems.

Pumping from the upper glacial (water-table) aquifer for public supply has been restricted locally as a result of human-induced contamination and lowering of the water table; the primary source of ground water for public supply in Nassau County is the deeper Magothy aquifer (Nassau County Department of Health, 1988, p. 11). Contamination in the upper glacial aquifer, and the possibility of contaminant migration into the Magothy aquifer, have made the effects of development and land use on ground-water quality a growing public concern; therefore, data on the effects of human activities on the quality of ground water are essential to the development of land-management and water-management plans by State and local agencies.

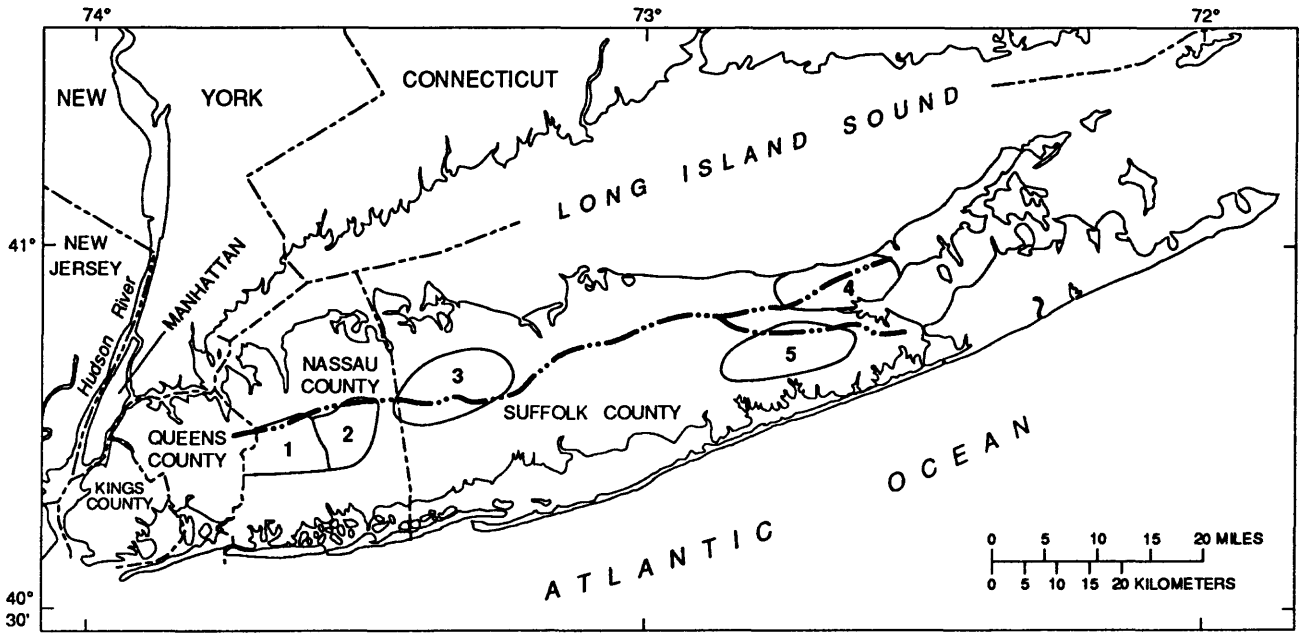

Figure 1.--Location of Nassau and Suffolk Counties and of the five study areas.

In 1984, the U.S. Geological Survey (USGS) began regional ground-water-quality assessments of 14 areas of the United States to assess the quality of the nation's ground water and the nature and extent of contamination and thereby provide a basis for appraising ground-water quality in other parts of the country (Helsel and Ragone, 1984). The Long Island aquifer system in Nassau and Suffolk Counties (fig. 1) was selected as part of this study because (1) a vast amount of hydrogeologic and chemical data is available, (2) the 1,170-mi^2 area is large enough to be of regional importance, and (3) the aquifer system is hydrologically similar to other systems in the Atlantic Coastal Plain. The first phase of this project (Eckhardt and others, 1989) was a reconnaissance study to statistically evaluate and compare water-quality data from ground-water samples representing 10 categories of land use on Long Island.

The second phase of this study, in which the data presented herein were collected, was designed to statistically relate ground-water quality in 90 water-table wells in five study areas to land use. (Well locations are shown in fig. 3.) Each study area contains a unique assemblage of land-use characteristics and sewering practices. The five areas include a long-term sewered suburban area (33.5 mi^2) and a recently sewered suburban area (30.2 mi^2) in Nassau County; and an unsewered suburban area (58.8 mi^2), an agricultural area (41.2 mi^2), and an undeveloped area (48.9 mi^2) in Suffolk County. Locations of the five study areas are shown in figure 1. Each of the five areas lies on the regional ground-water divide, where the principal direction of ground-water flow is downward. Hence, contamination introduced at or near the land surface in these areas migrates deeper into the aquifer system than it would elsewhere and moves at rates largely determined by the local vertical hydraulic conductivity and gradient. Each of the 90 wells was sampled once during 1987, and one representative well in each area was sampled monthly for at least 1 year to provide a record of seasonal variability.

Purpose and Scope

This report presents and summarizes water-quality data collected during 1987-88 to statistically relate contaminant distributions to development and land use. The data are summarized in the text and presented in tables, graphs, and box plots and consist of chemical analyses of (1) samples from the 90 wells that were sampled once, and (2) samples from the five wells that were sampled monthly. The data represent inorganic constituents, volatile organic compounds (VOC's), semivolatile organic compounds, and pesticides. All tables are given at the end of the report.

Acknowledgments

Thanks are extended to Michael Alarcon and James Adamski of the Nassau County Department of Health (NCDH) for coordinating analytical services provided by the NCDH laboratory, and to Stephen Cary of the Suffolk County Department of Health Services (SCDHS) for coordinating analytical services provided by the SCDHS laboratory. Arthur Kunz and Carole Swick of the Long Island Regional Planning Board (LIRPB) made many helpful suggestions related to the land-use-classification system. The LIRPB also provided land-use data and population statistics. The Suffolk County Water Authority provided funding for the digital automation of land-use data.

HYDROGEOLOGIC SETTING

The aquifer system that underlies Long Island is composed of unconsolidated glacial and fluvial or deltaic deposits that unconformably overlie relatively impermeable crystalline bedrock. The bedrock surface dips gently to the southeast at an average slope of 65 ft/mi (McClymonds and Franke, 1972, and Soren and Simmons, 1987). The total thickness of overlying sediments is approximately 2,000 ft in south-central Suffolk County and decreases toward the north shore, where bedrock is exposed on the far northwest corner of the island (McClymonds and Franke, 1972, and Soren and Simmons, 1987). The sediments consist of mixtures of Pleistocene and Cretaceous gravel, sand, silt, and clay (fig. 2). The upper glacial aquifer and upper part of the Magothy aquifer are the only parts of the Long Island aquifer system that are relevant to this study; neither the deeper parts of the Magothy nor the underlying Raritan Clay nor the Lloyd aquifer are discussed.

The upper glacial aquifer consists of Pleistocene glacial moraine and outwash deposits. The thickness ranges from 0 ft to more than 600 ft in northeastern Nassau County and northwestern Suffolk County (McClymonds and Franke, 1972). In general, the thickness is greatest along the north shore and gradually decreases toward the southern shore. The water table lies within the upper glacial aquifer throughout most of Long Island but intersects the underlying Magothy aquifer in parts of northeastern Nassau and northwestern Suffolk Counties and in areas where the upper glacial aquifer is absent.

The average horizontal hydraulic conductivity within the upper glacial aquifer is 270 ft/d but may be greater within outwash deposits along the south shore, where coarse sand and gravel are abundant (Franke and Cohen, 1972). Localized clay units within the upper glacial aquifer have been identified and

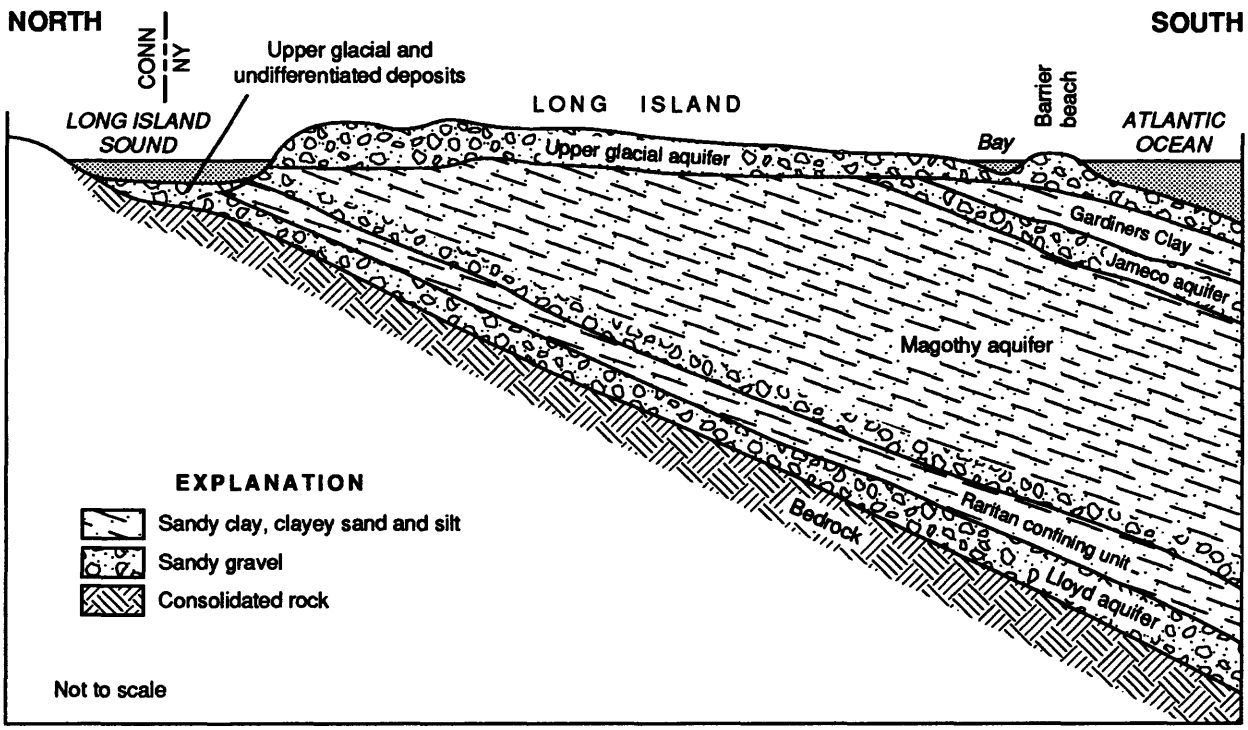

Figure 2.--Generalized geologic section through the Long Island aquifer system in Nassau County. (Modified from McClymonds and Franke, 1972, fig. 3.)

include the "Manorville clay" (Lubke, 1964), the "Smithtown clay" (Lubke, 1964), and the "20-foot clay" (Doriski and Wilde-Katz, 1983). These clay units tend to retard the vertical movement of ground water and may locally separate deeper zones of the aquifer from the water-table aquifer.

The Magothy aquifer, which underlies the upper glacial aquifer, consists of Cretaceous fluvial or deltaic sediments of fine to medium sand with some lenses of coarse sand and sandy to solid clay (McClymonds and Franke, 1972). The Magothy and upper glacial aquifer commonly are considered to be hydraulically continuous except in areas on the south shore, where they may be separated by the Gardiners Clay; the Gardiners Clay does not extend beneath any of the five study areas, however. The thickness of the Magothy aquifer ranges from about 100 ft along the north shore to 1,000 ft near the south shore in Suffolk County (McClymonds and Franke, 1972, Soren and Simmons, 1987).

The horizontal hydraulic conductivity of the Magothy aquifer generally is much lower than that of the upper glacial aquifer and averages about 50 ft/d (Franke and Cohen, 1972). Localized clay lenses are also present within the Magothy aquifer, but their location and extent have not been delineated. The clay lenses are not extensive but may retard downward movement of water, as do the clay units within the upper glacial aquifer.

The aquifer system is recharged primarily by precipitation, which averages 44 in/yr. Franke and Cohen (1972) estimate that about half the precipitation (21 in/yr) reaches the ground-water system. Water that infiltrates the ground near the regional ground-water divide (fig. 1) flows downward and recharges the deeper aquifers and eventually discharges along the shores into Long Island Sound and (or) the Atlantic Ocean; water that enters far from the divide flows seaward with a greater horizontal component.

DESCRIPTION OF STUDY AREAS

The five study areas each have a unique assemblage of land use and population history. Two of the study areas are in Nassau County, and three are in Suffolk County. Each study area lies approximately on the ground-water divide.

Population

By the early 1900's, New York City had begun to expand into Kings and Queens Counties on western Long Island, but Nassau and Suffolk Counties remained rural. After World War II and into the 1950s, extensive migration from New York City into Nassau County caused a sharp population increase. By 1970, the population of Nassau County had reached 1.4 million but, by 1980, had decreased slightly to 1.3 million, the same as in 1960. The downward trend in population during 1970-80 was due largely to migration to the more rural Suffolk County. Suffolk County's population grew at a slower rate than Nassau County's until 1950, then quadrupled between 1950 and 1970. Unlike Nassau County, Suffolk County's population continued to grow through the 1970's, although at a reduced rate, and reached 1.3 million in 1980 (Long Island Regional Planning Board, 1982b).

The highest population density in the five study areas is in the sewered suburban areas of Nassau County (10 to 14 people per acre). Generally, the population density decreases eastward. Population density in the unsewered suburban area in western Suffolk County, which is mainly dense residential

development, is about 6 per acre. Population densities in the agricultural and undeveloped areas are less than 1 per acre (U.S. Bureau of the Census, 1980).

Land Use and Sewering Practices

The three suburban study areas differ from each other in sewering practices. The long-term sewered suburban area began hookups to regional sewage-treatment facilities in 1955 and completed the work in 1965 (Mark Maimone, Nassau County Department of Public Works, oral commun., 1989); the recently sewered suburban area began hookups to regional sewage-treatment facilities in 1980 and completed the work in 1987. The unsewered suburban area and the agricultural and undeveloped areas continue to dispose of sewage primarily through onsite septic tanks or cesspools. Before the installation of regional sewage-treatment facilities in Nassau County, all sewage disposal was through onsite systems.

METHODS

The study involved quantification of a land-use classification system, selection and sampling of wells, water-quality analyses, and development of a quality-assurance procedure, as described below.

Land-Use Classification

Classification of the five study areas was based on the predominant land use and sewering characteristics within each area. Land-use information for Nassau and Suffolk Counties was mapped and tabulated at a scale of 1:24,000 by the Long Island Regional Planning Board (1982a) from 1980 aerial photographs. That information was classified into 12 land-use categories in accordance with the classification developed for the 1966 Bi-county Comprehensive Plan (Long Island Regional Planning Board, 1982a). Photographic copies of the original 1980-81 hand-colored land-use maps were digitized, coded, and stored in a computerized geographic information system (GIS) format to permit spatial analysis of this information. Overlaying study-area boundaries onto the digitized land-use maps enabled identification and quantification of the predominant land use within each study area (table 1, at end of report).

Well Selection

A network of 90 water-quality-monitoring wells was designed to provide chemical data that are representative of shallow ground-water quality in each of the five study areas. Each well was sampled once during 1987. The three suburban areas had 20 wells each, all screened in the upper glacial or upper Magothy aquifer, and the agricultural and undeveloped areas had 15 wells each, all screened in the upper glacial aquifer. Locations of the 90 wells are shown in figure 3 (p. 8-9).

The first step in the well-selection procedure was to identify shallow monitoring wells in the USGS data base for each of the study areas. For the purpose of this investigation, a shallow well was defined as a water-table well having a screen depth of less than 45 ft below the water table. Wells were then chosen from this group by a process of random selection wherein a grid was superimposed over a well map of each study area. The grid was used

to ensure uniform spatial representation of samples. The number of grid cells in each study area corresponded to the desired number of wells in each area (20 or 15), and size depended on the size of the study area and the number of grid cells. The wells within each grid cell were randomly numbered, and the lowest numbered well in each cell that was suitable for sampling was selected.

All wells selected for sampling were monitoring wells owned by the USGS, Nassau County Department of Public Works, or Suffolk County Water Authority. The advantage of using monitoring wells (as opposed to public-supply or industrial-supply wells) is that well evacuation and sampling could be done consistently by methods described further on. The wells range in diameter from 2 to 6 in. Pertinent well characteristics are summarized in table 2.

One of the wells in each area was selected for additional monthly sampling, and sampling was continued for at least 1 year after initial sampling to establish a record of seasonal fluctuation in ground-water quality at these five wells. These wells were selected to provide values representative of the respective study areas and were selected according to initial sampling results.

Sampling

Methods of sample collection were designed to provide accurate and representative samples from the shallow ground-water system. The 90 wells were each sampled once during June-October 1987; the monthly well sampling continued through December 1988.

Water levels were measured before pumping for entry into the Geological Survey's data base and to calculate casing volumes. A 2-in-diameter, stainless-steel submersible pump with 1/2-in Teflon[1] discharge tubing was used for well evacuation and sampling. The pump was placed 5 ft above the top of the well screen, and at least three casing volumes were pumped before sampling. A 1-HP seven-stage submersible pump with polyvinyl chloride (PVC) flush thread pipe and Teflon sampling tube was used at three wells where the small-diameter pump was not adequate to evacuate the well; these wells are S-73811, S-46283, and S-75456 (the first is in the undeveloped area, and the second two are in the unsewered suburban area; see fig. 3).

The Teflon sampling tube was equipped with a smaller diameter Teflon variable-flow tube designed to minimize aeration and exposure to the atmosphere during sampling and thereby minimize volatilization of certain organic constituents or escape of dissolved gasses that may have been present in the sample. This sampling tube was used to collect samples for VOC analysis and field measurement of dissolved oxygen.

Samples were taken at the pump discharge for measurement of temperature, pH, and specific conductance at about 15-minute intervals. Stable measurements of these field measurements were required before sample collection. The pH was required to have stabilized to within 0.05 pH units, and the temperature to within 0.1 °C between two successive measurements.

Dissolved oxygen was measured at the time of sampling by the Winkler titration method (Brown and others, 1970). The method was modified slightly in that half the required amount of sample water was used, and the resulting values were multiplied by 2.

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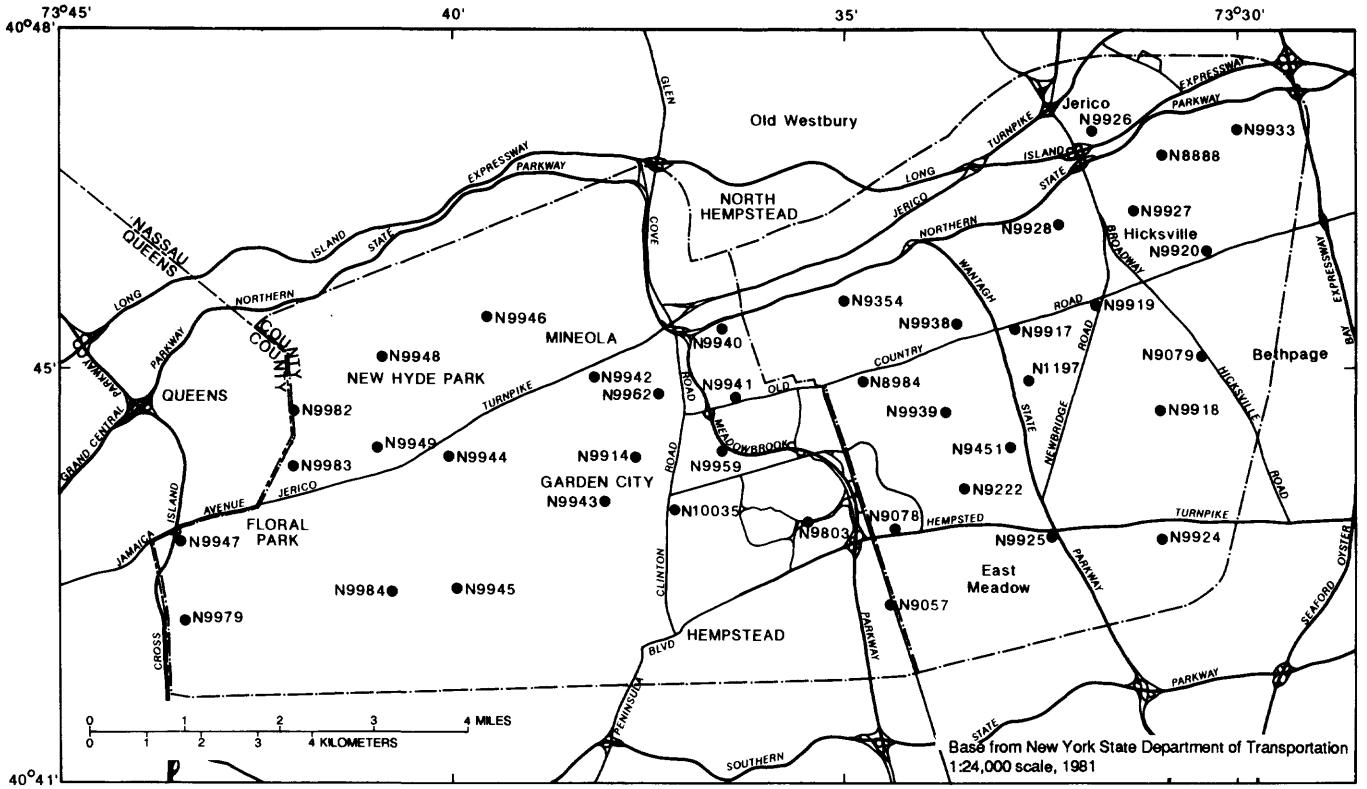
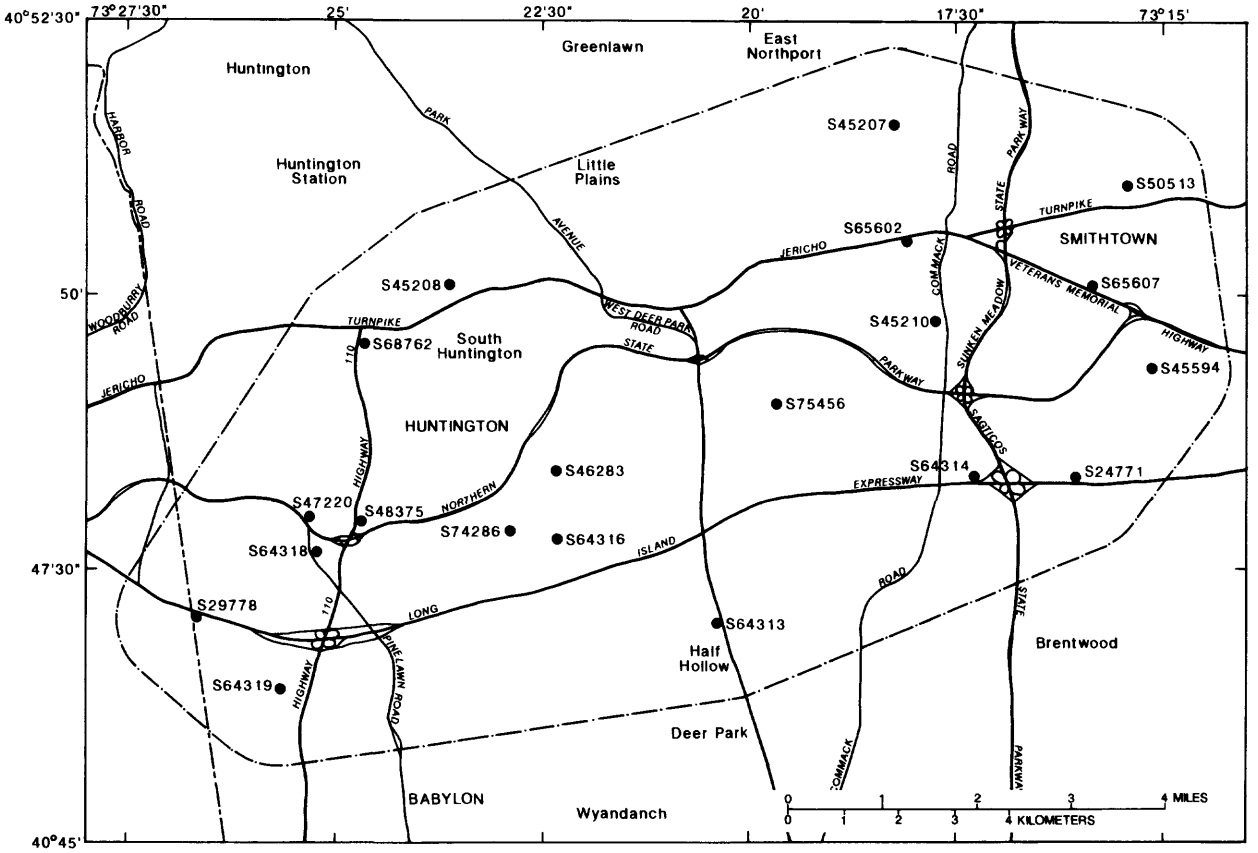
[1] Use of brand names is for identification purposes only and does not constitute endorsement by the U.S. Geological Survey.

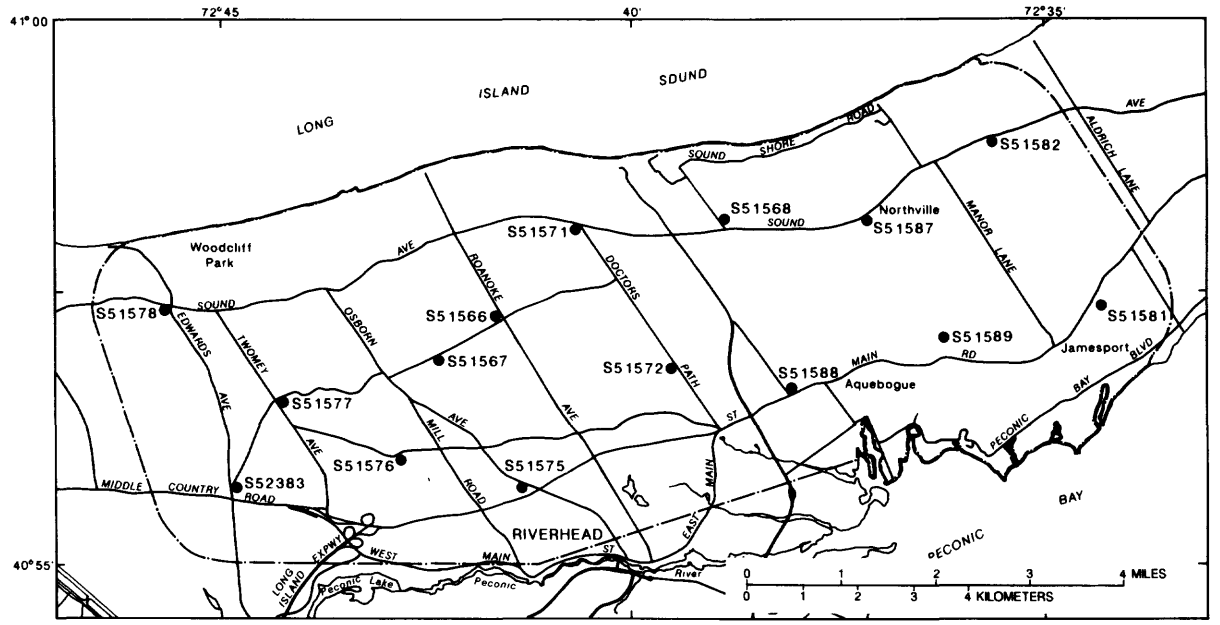


Long-term sewered (westernmost) area and recently sewered suburban area



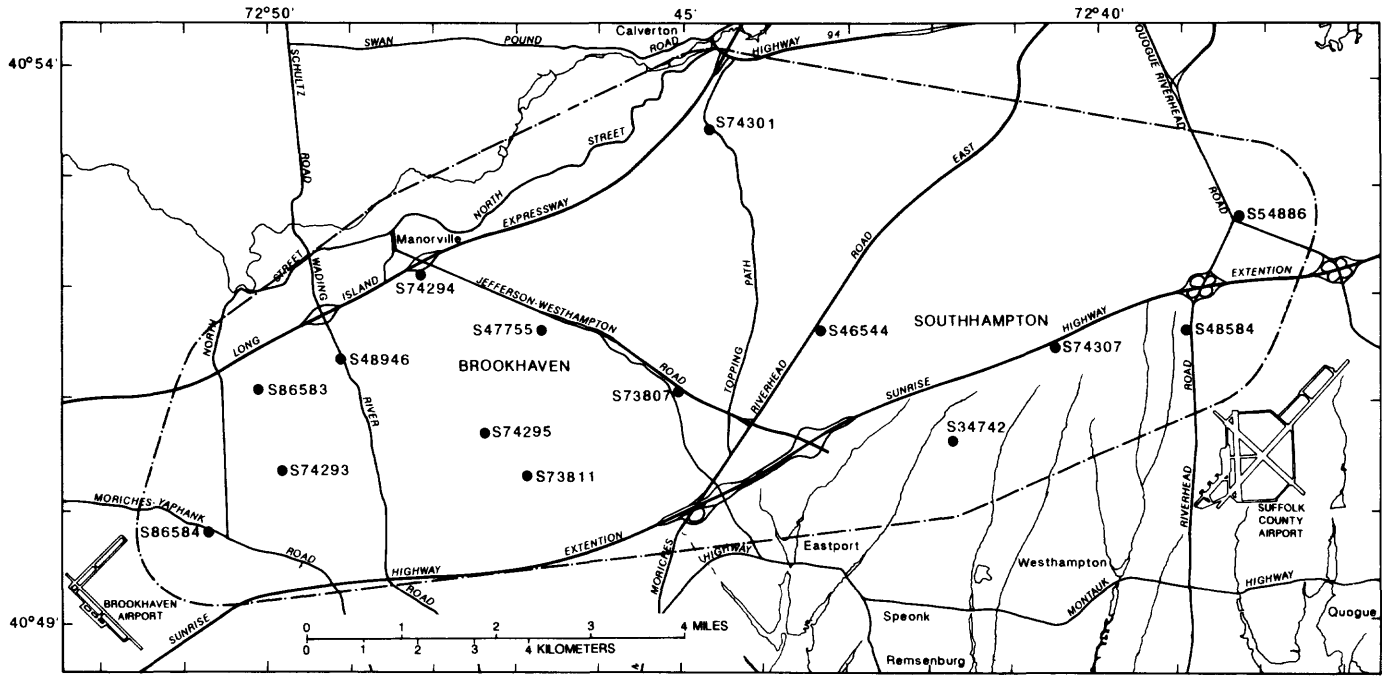
Unsewered suburban area

Figure 3.--Locations of wells sampled in the five study areas. (Study-area locations are shown in fig. 1).



Base from New York State Department of Transportation
1:24,000 scale, 1981

Agricultural area



Base from New York State Department of Transportation
1:24,000 scale, 1981

Undeveloped area

EXPLANATION

● N9946 **OBSERVATION WELL–**
Number is county well number

—·— **STUDY-AREA BOUNDARY**

Figure 3.--Locations of wells sampled in the five study areas (continued).

Sample-collection procedures differed according to the type of analysis. Samples for major inorganic ion analysis were not filtered. Samples for dissolved metals and dissolved boron analyses were filtered and acidified in the field with nitric acid. Samples for base-neutral and acid-extractable compound analyses were treated with mercuric chloride at the time of sampling to prevent biodegradation of organic compounds.

Samples were chilled immediately after collection and delivered to the NCDH laboratory within 4 days of collection. Samples analyzed by either the NWQL or the USGS laboratory in Ocala, Fla. were sent by overnight mail within 4 days of collection. Samples for analysis of carbamate pesticides were frozen upon return to the USGS office in Syosset and delivered to SCDHS laboratory within 4 days of collection.

Chemical Analyses and Quality Assurance

A list of inorganic chemicals and organic compounds for which ground-water samples were analyzed is given in table 3. The Nassau County Department of Health (NCDH) laboratory provided analytical services for volatile organic compounds (VOC's) and all inorganic constituents except boron, which was done by the National Water Quality Laboratory (NWQL) of the USGS in Arvada, Colo. The Suffolk County Department of Health Services (SCDHS) laboratory provided analyses for carbamate pesticides. Both NCDH and SCDHS laboratories participate in the USGS standard-reference water-sample program. Analyses for organochlorine and organophosphorus insecticides and triazine and chlorophenoxy-acid herbicides were done by NWQL.

In addition to VOC analyses by NCDH laboratory, duplicate samples for VOC analyses were collected at all 90 wells and at the single well in each area that was sampled monthly and analyzed by the USGS in Syosset by purge and trap liquid-sample concentration and gas chromatography with flame-ionization detection (GC-FID). Qualitative information from these analyses were used as a screening method to select 13 duplicate samples from the 90-well network, and six duplicate samples from the wells sampled monthly for VOC analysis by GC-MS (gas chromatography with mass spectroscopy) by the NWQL. The duplicate samples selected for analysis by NWQL were those with relatively high concentrations of VOC's, as indicated by GC-FID scans.

The detection limit for all VOC's analyzed by NWQL was 0.2 µg/L, about 1 order of magnitude lower than the detection limits achieved by NCDH laboratory, which range from 1 to 10 µg/L. Thus, the NWQL analyses provide quantitative information for water samples with small VOC concentrations that NCDH laboratory reported as less than detection limits. This provides a means of assessing the value of analyzing for certain constituents at relatively high levels, as well as for comparing results among laboratories, and thereby provides a measure of quality assurance. Analysis by NWQL included 35 VOC's and analysis by NCDH laboratory included 16 VOC's. All VOC's analyzed by NCDH laboratory were also analyzed by NWQL except for trichlorofluoromethane, which was analyzed only by the NCDH laboratory.

Samples from 90 wells were analyzed for presence of methylene chloride-extractable compounds (including semivolatiles) through GC-FID by the USGS lab in Ocala, Fla. This qualitative information was used as a screening method to identify wells to be resampled for quantitative analysis for semivolatile organic compounds by NWQL through GC-MS methods. Wells at which concentrations were indicated by GC-FID scans to range over 20 µg/L or more were resampled.

WATER QUALITY

Samples from network wells were analyzed for inorganic constituents; volatile organic compounds, organochlorine, organophosphorus, and carbamate insecticides; chlorophenoxy-acid and triazine herbicides; and semivolatile organic compounds (qualitative analysis of 90 samples and quantitative analysis of 24 samples). Samples from wells sampled monthly in each study area were analyzed for major inorganic ions, trace inorganic elements, and VOC's; those from the agricultural area and undeveloped area also were analyzed for carbamate pesticides; and those from the agricultural area were additionally analyzed for organochlorine and organophosphorus insecticides, triazine herbicides, and chlorophenoxy-acid herbicides.

Samples from Network Wells

Results of analyses for inorganic constituents, VOC's, semivolatile organic compounds, and pesticides in samples from the 90-well network are presented in tables 4 through 11. This section summarizes detection frequencies of VOC's, pesticides, and semivolatile compounds in each study area.

Long-Term Sewered Suburban Area

VOC's were detected in samples from 10 of the 20 wells sampled in this area (table 6). The most frequently detected VOC in samples from this area, tetrachloroethylene (PCE), was detected in 5 samples, trichloroethylene (TCE) was detected in 4 samples, and 1,1,1-trichloroethane (TCA) was detected in 3 samples. Chloroform, chlorobenzene, and carbon tetrachloride also were each detected in 1 sample. The highest VOC concentration was 25 µg/L PCE. Duplicate samples from five wells were analyzed by the NWQL (table 7A); results indicated detectable chloroform in samples from all five wells and detectable TCA in samples from four wells. The highest concentration of TCE was 17 µg/L.

Organochlorine insecticides were detected in samples from 10 of the wells in this area (table 8). The most frequently detected compound was dieldrin (seven samples), followed by chlordane and heptachlor epoxide (four samples each). The largest concentration detected of these compounds was 1.3 µg/L chlordane. The triazine herbicides simazine and atrazine were detected, as were the chlorophenoxy-acid herbicides 2,4-D and Silvex (table 9). Neither organophosphorus nor carbamate pesticides (tables 9, 10) were detected in this area.

Thirteen wells were resampled for analysis of semivolatile organic compounds by NWQL; *bis*(2-ethylhexyl) phthalate was detected in one sample at the detection limit of 5 µg/L (table 11A).

Recently Sewered Suburban Area

VOC's were detected in samples from 14 of the 19 wells sampled in this area (VOC analysis results for one sample were not received) (table 6). TCA, the most frequently detected VOC, was detected in 13 of the 19 samples. TCE and PCE, the second most frequently detected compounds, were each detected in 5 samples. High concentrations of TCA (12,000 µg/L), TCE (390 µg/L), benzene (210 µg/L), and PCE (89 µg/L) were detected in this area. *Trans*-1,2-dichloroethylene was detected in three of the samples. 1,1-Dichloroethane was detected in two samples, and benzene, chloroform, 1,1,2-trichloroethane, and

xylene were each detected in one sample. Analysis of duplicate samples from three wells by NWQL all indicate detectable amounts of TCA, PCE, and TCE (table 7A). Chloroform was detected in two of the three samples.

The most frequently detected organochlorine insecticide was dieldrin, which was detected in 16 out of 20 samples. Chlordane was detected in 12 samples, and heptachlor epoxide was detected in 5 samples (table 8). The triazine herbicides simazine, atrazine, and prometone, the chlorophenoxy-acid herbicide 2,4-D, and the organophosphorus insecticide diazinon also were detected in samples from this area (table 9). Carbamate pesticides were not detected (table 10).

Two of the wells in this area were selected for resampling for analysis of semivolatile compounds by NWQL; naphthalene and *bis*(2-ethylhexyl) phthalate each were detected in one well (table 11A).

Unsewered Suburban Area

VOC's were detected in samples from 8 of the 20 wells (table 6). The most frequently detected VOC's were TCA, detected in 8 samples, TCE, detected in 4 samples; and 1,1-dichloroethane, detected in 3 samples. The highest VOC concentration detected was 290 µg/L TCE. VOC analysis of duplicate samples from five wells by NWQL (table 7A) detected two VOC's (1,2-dichloroethane and 1,1-dichloroethylene) that were not analyzed for by NCDH laboratory and that were detected only in samples from wells in this area. Analysis of the five duplicate samples by NWQL also detected chloroform, 1,1-dichloroethane, PCE, TCA, TCE, *trans*-1,2-dichloroethylene, and 1,1,2-trichloroethane.

Three organochlorine insecticides were detected in 5 of the 20 samples from this area (table 8)--dieldrin, chlordane, and heptachlor epoxide; three triazine herbicides (promtone, simazine, and atrazine) also were detected (table 9A), as were the chlorophenoxy-acid herbicide 2,4-D and the organophosphorus insecticide diazinon (table 9A). Carbofuran, a carbamate pesticide, was detected in one well at the detection limit (table 10).

Five of the wells in this area were resampled for semivolatile organic compounds by NWQL. Results indicated the presence of di-*n*-octylphthalate and *bis*(2-ethylhexyl) phthalate in two samples (table 11A).

Agricultural Area

VOC's were not detected in the 15 samples analyzed by NCDH laboratory (table 6). Organochlorine insecticides were detected in all 14 samples analyzed (organochlorine results for one sample in this area were not received) (table 8). The most frequently detected compound was heptachlor epoxide, which was detected in 7 of the 14 samples. Dieldrin, endosulfan, and DDD were detected in 5 samples. The chlorophenoxy-acid herbicide 2,4-D, and ethion, an organophosphorus insecticide, were each detected in one sample from this area (table 9A). Aldicarb sulfoxide and aldicarb sulfone were the most frequently detected carbamate insecticides (detected in 10 of 15 samples) and were detected at higher concentrations than any pesticide in this area (table 10).

Resampling of four of these wells for semivolatile compounds by NWQL resulted in the detection of *bis*(2-ethylhexyl) phthalate at 12.0 µg/L in one well (table 11A).

Undeveloped Area

VOC analyses by the NCDH laboratory detected chloroform at the detection limit in 1 sample (table 6). The organochlorine insecticide endosulfan also was detected in 1 sample (table 8), but no chlorophenoxy-acid herbicides, triazine herbicides, or organophosphorus insecticides were detected (tables 8, 9A, 9B). Aldicarb sulfoxide, aldicarb sulfone, and carbofuran were each detected in 1 sample (table 10). One well in this area was resampled for analysis for semivolatiles by NWQL, but no detections were reported (table 11A).

Samples from Wells Sampled Monthly

One well in each study area was sampled monthly to evaluate temporal variability of water quality at each well. This section discusses the results of water-quality analyses and temporal variability at these five wells and includes a summary of water-quality data.

Concentrations of inorganic ions and trace elements, and field measurements of pH, temperature, dissolved oxygen, and specific conductance in samples from the five wells, are given in tables 12A and 12B. Results of VOC analyses by NCDH laboratory are given in table 12C, and results of VOC analysis by NWQL for six samples from four of the wells sampled monthly are given in table 12D. Results of the agricultural area's monthly analyses for organochlorine and carbamate insecticides are given in tables 13A and 13B. Organochlorine and organophosphorus insecticides, and chlorophenoxy-acid and triazine herbicides not detected in water samples from the agricultural area's monthly well, are listed in table 13C. Temporal changes in concentrations of selected constituents at these wells are plotted in figure 4.

Long-Term-Sewered Suburban Area

Well N-9984 was sampled initially in September 1987 and monthly throughout 1988. Examination of the temporal changes at this well indicates low variability for all inorganic constituents and field characteristics except temperature and alkalinity (fig. 4A). Temperature reached a minimum during January and a maximum during July; alkalinity concentrations fluctuated from 10 to 19 mg/L as $CaCO_3$.

The only VOC detected in the NCDH Laboratory analysis of samples from this well was TCA, which was found in 10 of the 13 samples (table 12C). One sample from this well was analyzed for VOC's by NWQL, and TCA, PCE, and chloroform were detected at levels lower than NCDH laboratory detection limits (table 12D).

Recently Sewered Suburban Area

Well N-9939 was sampled monthly from September 1987 through December 1988. Examination of temporal changes at this well indicates low variability for all inorganic constituents and field characteristics except temperature. Temperature reaches a minimum during January and a maximum during June (fig. 4A).

Analysis by the NCDH laboratory detected six VOC's in samples from this well (table 12C). PCE, which was detected in all 16 samples, and *trans*-1,2-dichloroethylene, which was detected in 12 of 16 samples, were detected at concentrations as large as 14 µg/L. TCA and TCE were each detected in 13 of 16 samples, but at smaller concentrations. Chloroform was detected in three samples, and 1,1-dichloroethane was detected in one sample. Two samples from this well were analyzed for VOC' s by NWQL, and eight VOC's were detected in

each (table 12D). The largest concentrations detected were 11 µg/L *trans*-1,2-dichloroethylene and 7.6 µg/L PCE. Also detected were TCA, TCE, 1,1-dichloroethane, toluene, chloroform, and 1,1-dichloroethylene.

Unsewered Suburban Area

Well S-50513 was sampled monthly from July 1987 through December 1988. Examination of the temporal changes at this well indicates low variability for all inorganic constituents and field characteristics except for temperature (fig. 4A). Temperature reached a maximum during May 1988 and a minimum during November 1988.

Analysis for VOC's by NCDH laboratory detected TCA in all samples from this well; the maximum concentration was 11 µg/L (table 12C). Chloroform was

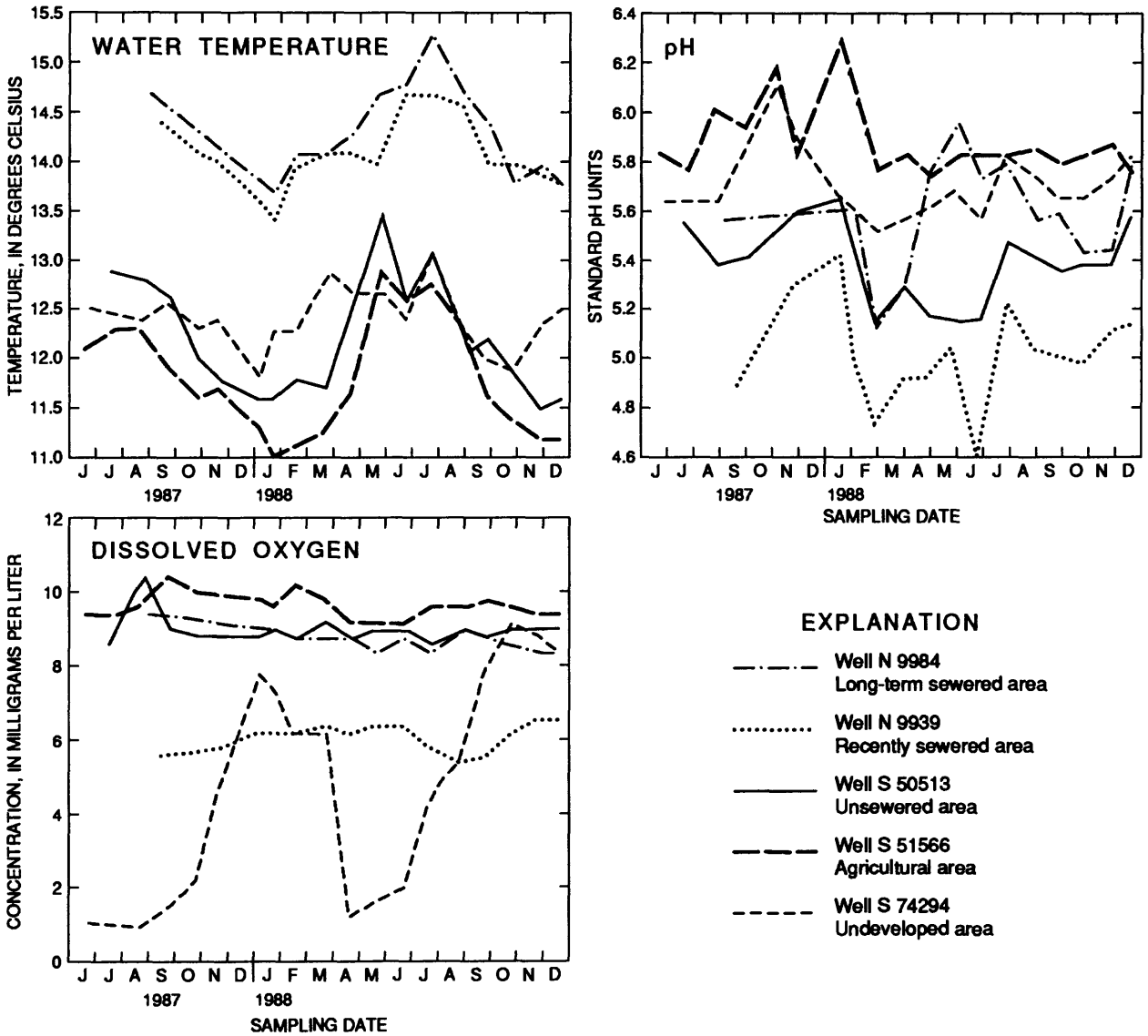


Figure 4A. Temporal variations in water temperature, pH, and dissolved-oxygen concentration in water samples from five wells sampled monthly.

detected in one sample at the detection limit of 1 µg/L. NWQL analyzed two monthly samples from this well for VOC's and detected five constituents in one sample and six in the other. The largest concentration detected was 16 µg/L TCA, followed by 6.7 µg/L 1,1-dichloroethane and 6.1 µg/L chloroform. PCE, 1,1-dichloroethylene, and carbon tetrachloride were also detected (table 12D).

Agricultural Area

Well S-51566 was sampled monthly from June 1987 through December 1988. Examination of the temporal changes at this well indicates low variability for all inorganic constituents and field characteristics except temperature, hardness, and calcium (figs. 4A, 4B, 4C). Temperature reached a minimum during January 1988 and a maximum during May 1988. Calcium concentrations and

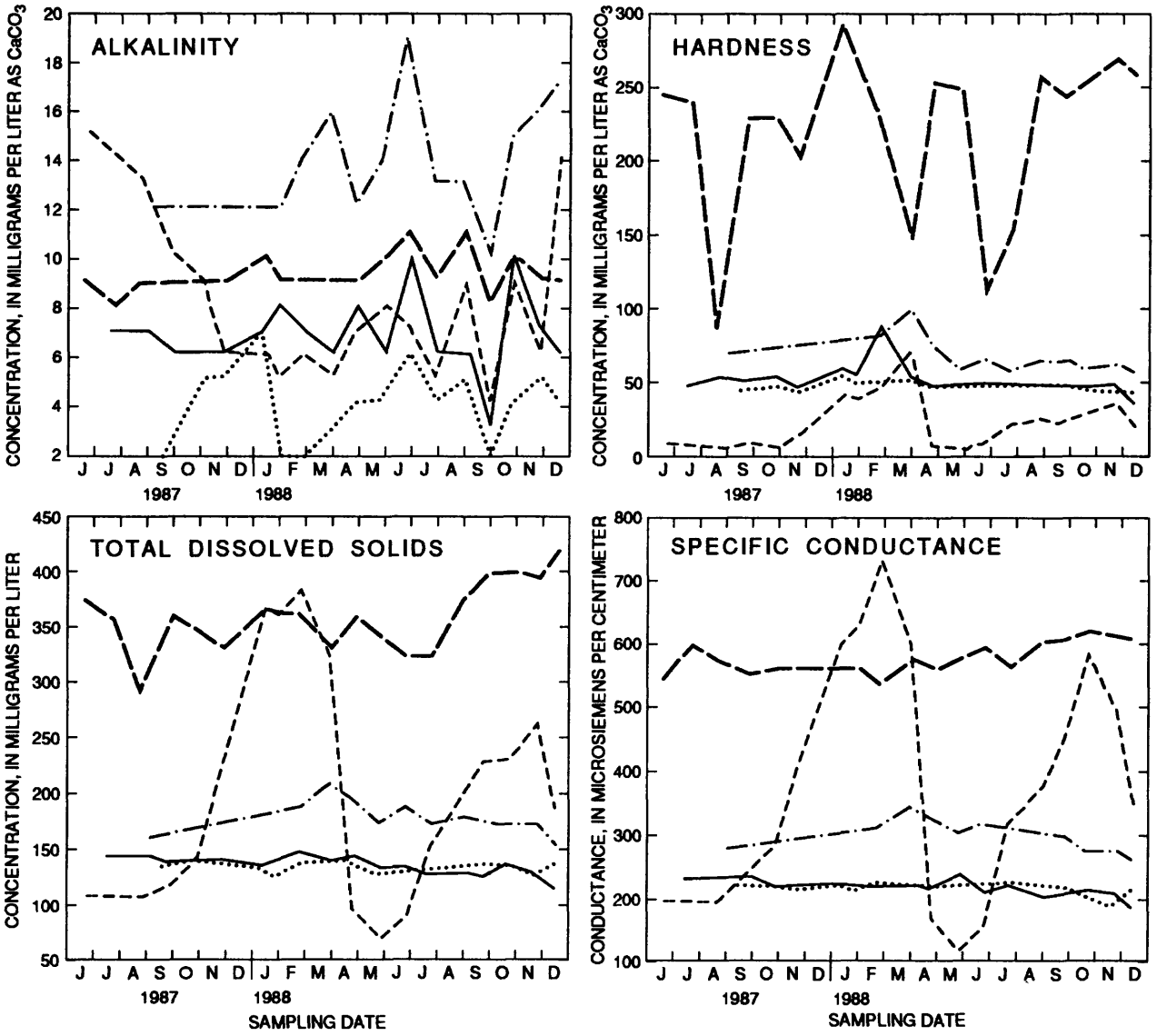


Figure 4B. Temporal variations in alkalinity, hardness, total dissolved solids, and specific conductance in water samples from five wells sampled monthly.

hardness fluctuated widely; calcium concentrations ranged from 22.0 to 94.0 mg/L, and hardness ranged from 86 to 294 mg/L as $CaCO_3$. Iron was detected in all 19 samples; the maximum concentration was 1,120 µg/L (table 12B). VOC's were not detected (table 12C).

Organochlorine insecticides were detected in 13 of 17 samples (table 13A). DDT was detected at the detection limit (0.01 µg/L) in 11 samples, and DDE was detected at the detection limit (0.01 µg/L) in 7 samples. DDD and endosulfan were detected less frequently. Carbamate pesticides, primarily aldicarb-sulfoxide and aldicarb sulfone, were detected in all samples from this well (table 13B). Maximum concentrations of these two constituents occurred during August 1987. Organophosphorus insecticides, chlorophenoxy-acid herbicides, and triazine herbicides were not detected (table 13C).

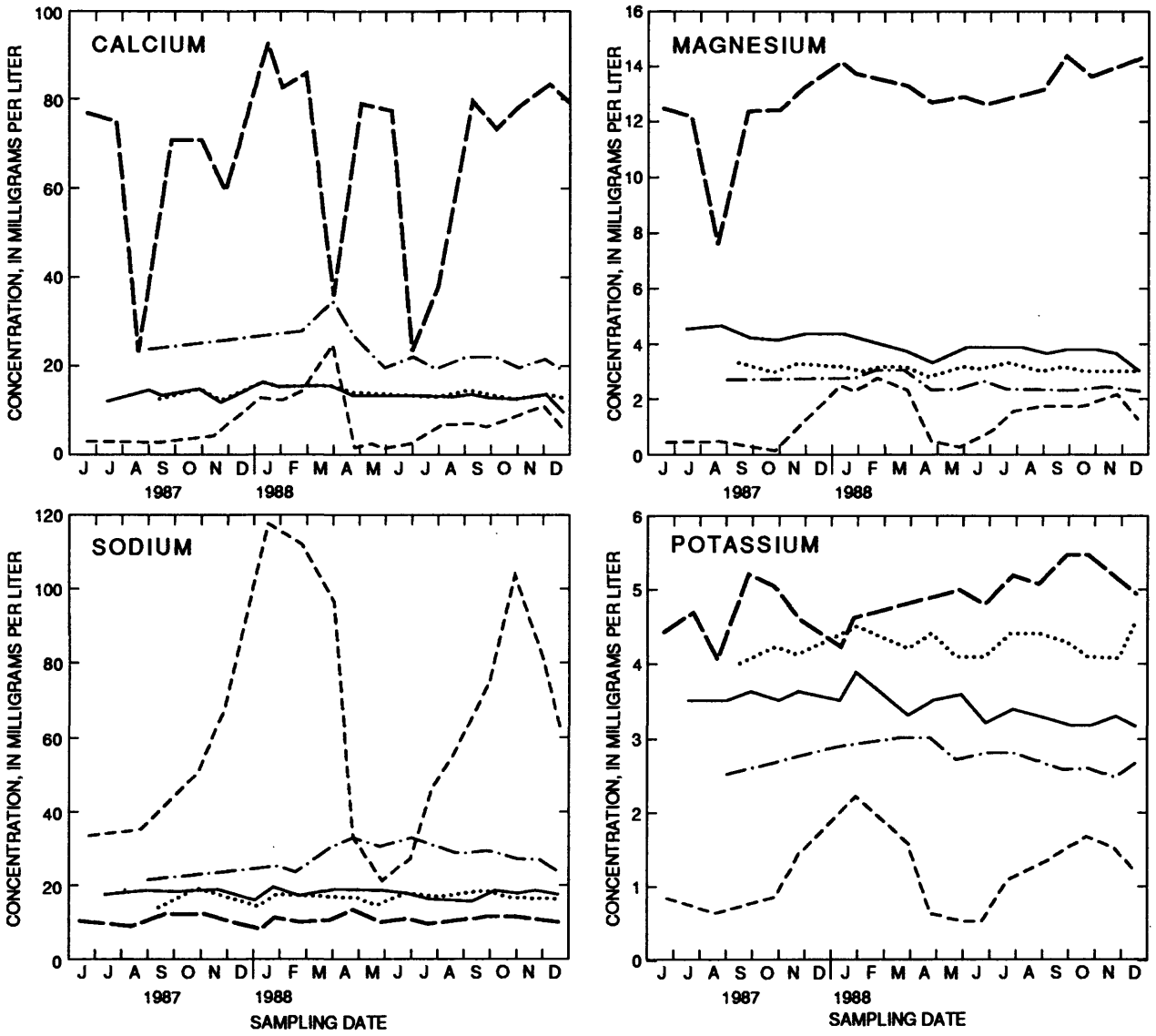


Figure 4C. Temporal variations in calcium, magnesium, sodium, and potassium in water samples from five wells sampled monthly.

Undeveloped Area

Well S-74294 was first sampled in June 1987, then monthly from August 1987 through December 1988. Temporal changes at this well indicate high variability of all constituents except magnesium, sulfate, and nitrate-nitrogen. Water temperature reached a minimum during January 1988. A distinct seasonal trend was observed for dissolved oxygen, specific conductance, total dissolved solids, sodium, and chloride; maximum values were measured during the winter, and minimum values during the summer. No trend was discernible for calcium or hardness; maximum values were measured in March 1988. Alkalinity ranged from 4 to 15 mg/L, and pH from 5.14 to 6.14. Iron was detected in 3 of the 18 samples from this well and had a maximum concentration of 310 µg/L (table 12B). Manganese was detected in 11 samples and had a maximum concentration of 150 µg/L (table 12B). Neither VOC's nor carbamate insecticides were detected in samples from this well (table 12C, 12D, and 13B).

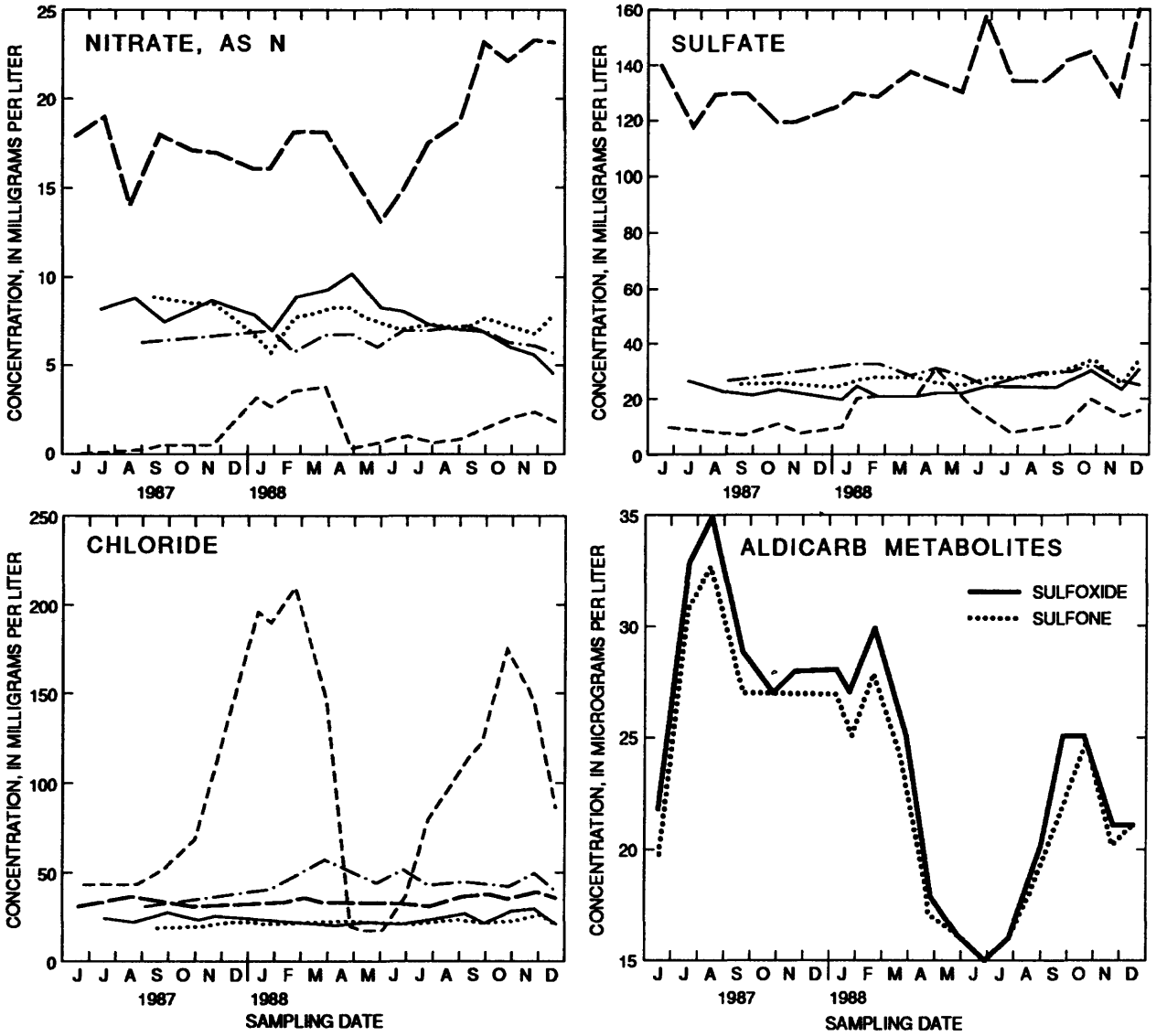


Figure 4D. Temporal variations in nitrate-nitrogen, sulfate, and chloride in water samples from five monthly wells, and aldicarb metabolites in water samples from the agricultural area's monthly well.

COMPARISONS AMONG THE FIVE STUDY AREAS

This section discusses selected inorganic constituents and field characteristics, inorganic trace elements, VOC's, pesticides, and semivolatile organic compounds in samples from network wells and compares them among the study areas. Results for selected inorganic constituents and field characteristics are summarized and illustrated by box plots. Box plots summarize the data distributions by showing the median, interquartile range (25th to 75th percentile), and outlying values (fig. 5A). The Kruskal-Wallis test, a nonparametric version of a one-way analysis of variance, was used on ranked concentrations of inorganic constituents and field characteristics to determine significant differences between study areas. Tukey's Honest Significant Difference (HSD) Range Test was used to indicate which groups (study area) differ significantly (alpha = 0.05) according to results from the Kruskal-Wallis test. These results are shown as boxed letters at the top of each box plot. Constituents with few detections above the detection limit, including most trace inorganic constituents, VOC's, and pesticides, are not easily illustrated by box plots; therefore the frequency of detections is used for comparison of these constituents among study areas. Pesticide results are arranged by pesticide groups for comparison and discussion.

Major Inorganic Ions and Field Characteristics

As illustrated by Tukey's test results (fig. 5, p. 20-23), concentrations of potassium, nitrate-nitrogen, and total dissolved solids, and specific conductance values were significantly smaller in the undeveloped area than in the other four areas. Concentrations of calcium, sulfate, and potassium were significantly larger in the agricultural area than in the unsewered suburban area. Water temperatures were significantly higher in the two sewered suburban areas than in the other three areas and were significantly lower in the agricultural and undeveloped area were than in the other three areas. Dissolved oxygen concentrations were significantly larger in the undeveloped area than in the three suburban areas.

Inorganic Trace Elements

Results of analyses for inorganic trace elements are given in table 5. The highest percentage of detections of iron and manganese was in samples from the agricultural area, followed by the recently sewered suburban area, the unsewered suburban area, the long-term sewered suburban area, and the undeveloped area, respectively. The highest iron concentration detected (14,800 µg/L) was in a sample from the long-term sewered suburban area and corresponded with a high manganese value of 2,750 µg/L. The highest manganese concentration detected (19,000 µg/L) was in a sample from the recently sewered suburban area and corresponded with a high iron concentration of 5,550 µg/L. The highest concentrations of iron and manganese in samples from the agricultural area were 4,900 and 1,500 µg/L, respectively.

Boron was detected in samples from all five areas; the highest concentration (360 µg/L) was in a sample from the recently sewered suburban area. Tukey's test results show that the median concentration in samples from the agricultural area was significantly higher than in a sample from the unsewered suburban area and the undeveloped area (fig. 5D). Boron concentrations in the undeveloped area were significantly lower than in samples from the other four study areas. Other inorganic trace elements detected were barium, cadmium, chromium, copper, lead, and methylene blue active substances (table 5).

Volatile Organic Compounds

Results of VOC analyses by the NCDH laboratory are shown in table 6; results of duplicate sample analysis by NWQL are given in tables 7A and 7B. VOC's were detected most commonly in samples from the recently sewered suburban area (14 out of 19 samples), followed by the long-term sewered suburban area (10 out of 20 samples), and the unsewered suburban area (8 out of 20 samples). VOC's were detected in 1 of the 15 samples from the undeveloped area, and in none of the 15 samples from the agricultural area.

The most commonly detected VOC's in samples from the three suburban study areas were TCA, TCE, and PCE. TCA was detected in 23 of 59 samples and was found most frequently in the recently sewered suburban area, where the highest concentration was 12,000 µg/L. TCE was detected in 13 of 59 samples and was found most frequently in the recently sewered suburban area, where the highest concentration was 390 µg/L. PCE was detected in 12 of 59 samples and was found most frequently in the recently sewered and long-term sewered suburban areas, where the highest concentration was 89 µg/L in the recently sewered suburban area.

Carbon tetrachloride and chlorobenzene were detected only in samples from the long-term sewered suburban area. *Trans*-1,2-dichloroethylene, 1,1,2-trichloroethane, benzene, and xylene were detected only in samples from the recently sewered suburban area, and trichlorofluoromethane was detected only in samples from the unsewered suburban area.

Duplicate samples from 13 of the 90 wells were sent to NWQL for GC-MS analysis for VOC's; the most frequently detected VOC's were TCA and chloroform, followed by PCE and TCE. These results cannot be compared among study areas, but comparison with NCDH laboratory results provides information on detection levels for various constituents and quality-assurance information on the 13 samples on which duplicate analyses were done. NWQL results reveal three constituents at concentrations below NCDH laboratory detection limits and a higher frequency of detection in samples from 13 wells than was apparent in the NCDH laboratory results for the 89 wells. These three constituents are chloroform, 1,1-dichloroethane, and *trans*-1,2-dichloroethylene. Chloroform was detected in 3 of the 89 samples above the detection limit of 1 µg/L by NCDH laboratory, and in 10 of 13 samples above the detection limit of 0.2 µg/L by NWQL. Five of the 10 detections were at concentrations below the NCDH laboratory detection limit.

Pesticides

Organochlorine insecticides were detected most commonly in samples from the agricultural area (13 of 14 samples), followed by the recently sewered suburban area (16 of 20 samples), the long-term sewered suburban area (10 of 20 samples), the unsewered suburban area (4 of 20 samples), and the undeveloped area (1 of 15 samples). Dieldrin and heptachlor epoxide were detected in samples from the three suburban areas and the agricultural area; chlordane was detected only in samples from the three suburban areas. Endosulfan, DDD, DDE, lindane, methoxychlor, DDT, and perthane were detected only in samples from the agricultural area; one detection of endosulfan was reported for the undeveloped area. These results are summarized in table 8.

Organophosphorus insecticides were detected in 2 of the 20 samples from the unsewered suburban area, in 1 of the 20 samples from the recently sewered suburban area, and in 1 of the 15 samples from the agricultural area. Neither

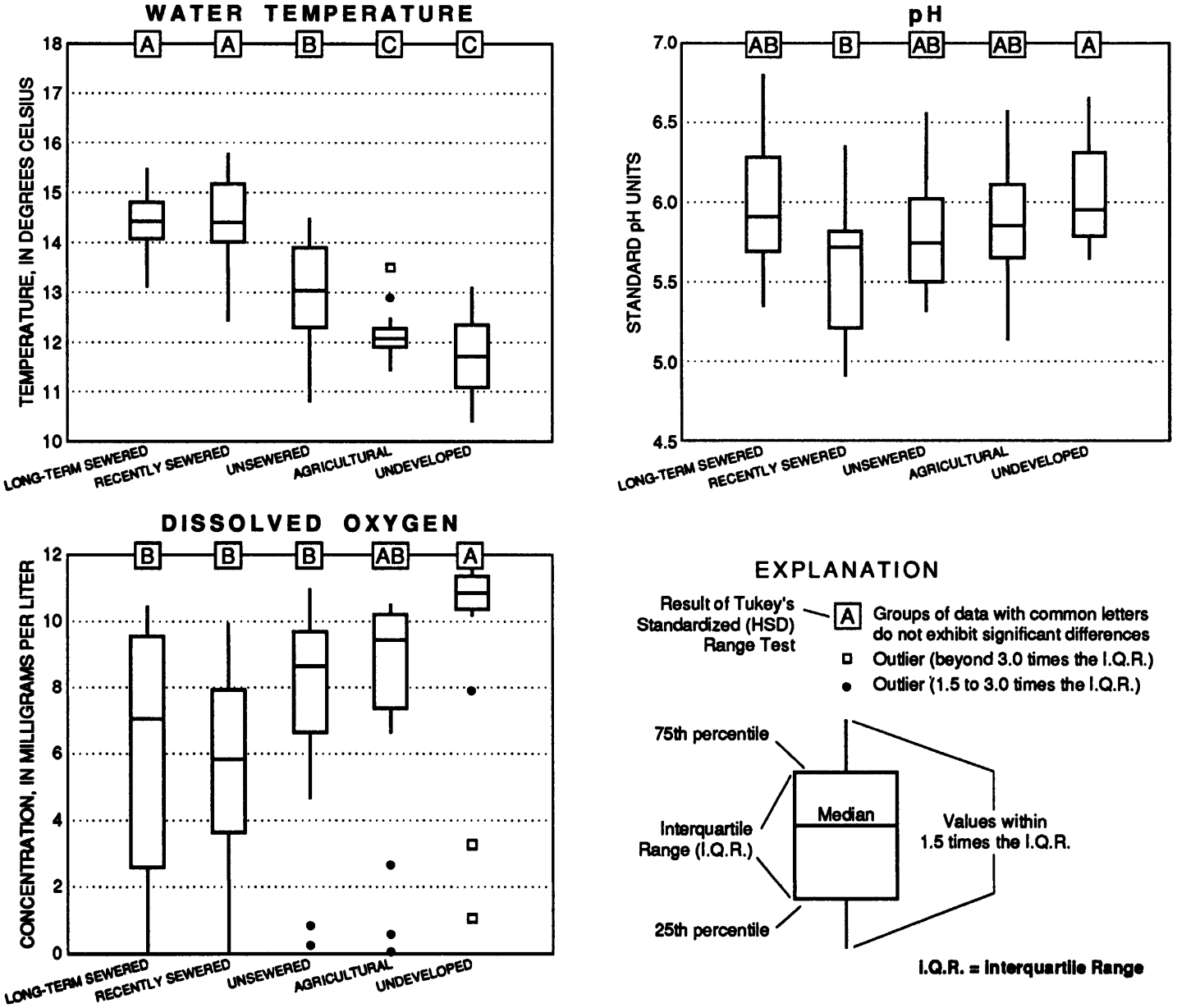


Figure 5A.--Range in water temperature, pH, and dissolved oxygen values in water samples from network wells.

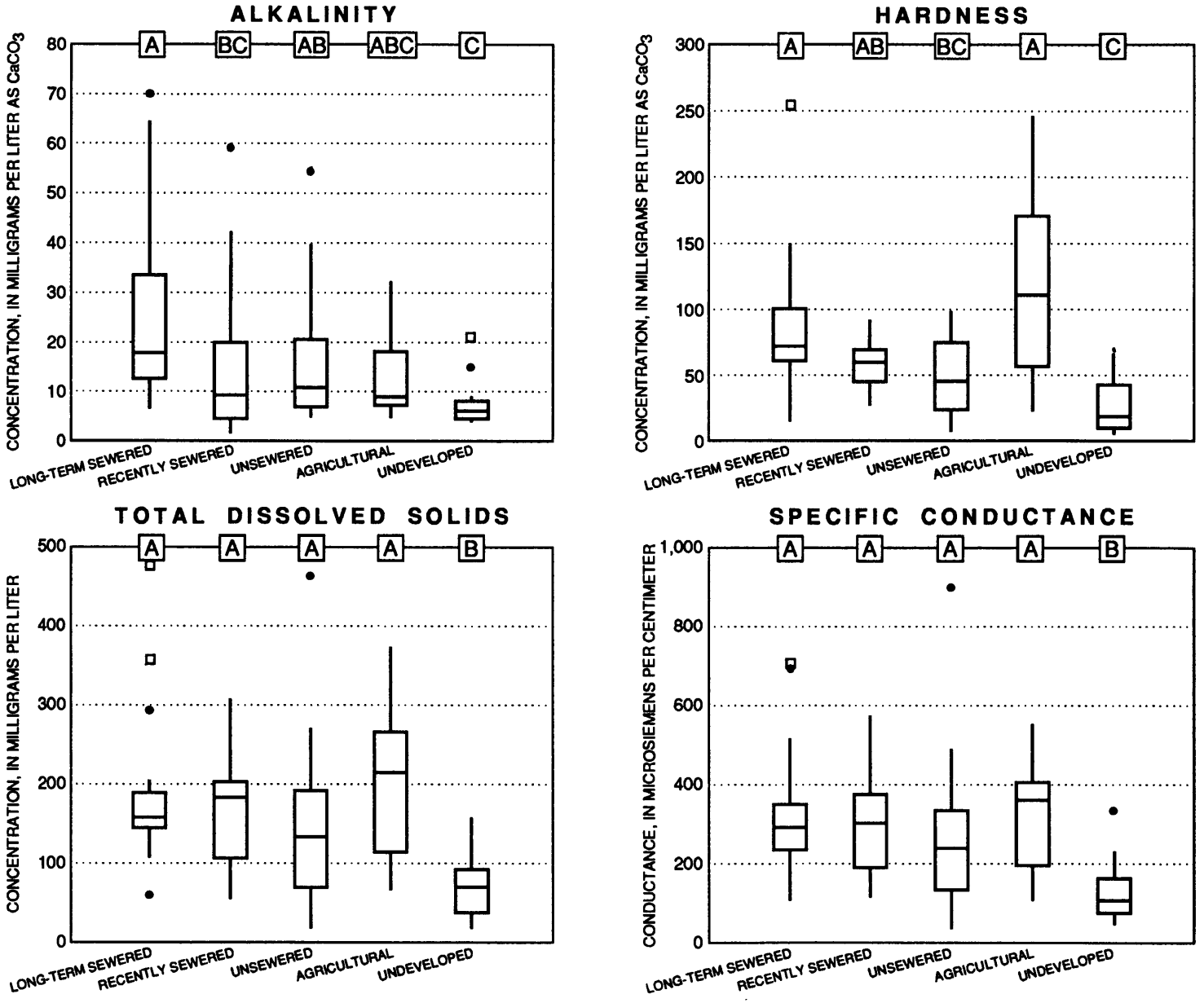


Figure 5B.--Range in alkalinity, hardness, total dissolved solids, and specific conductance values in water samples from network wells.

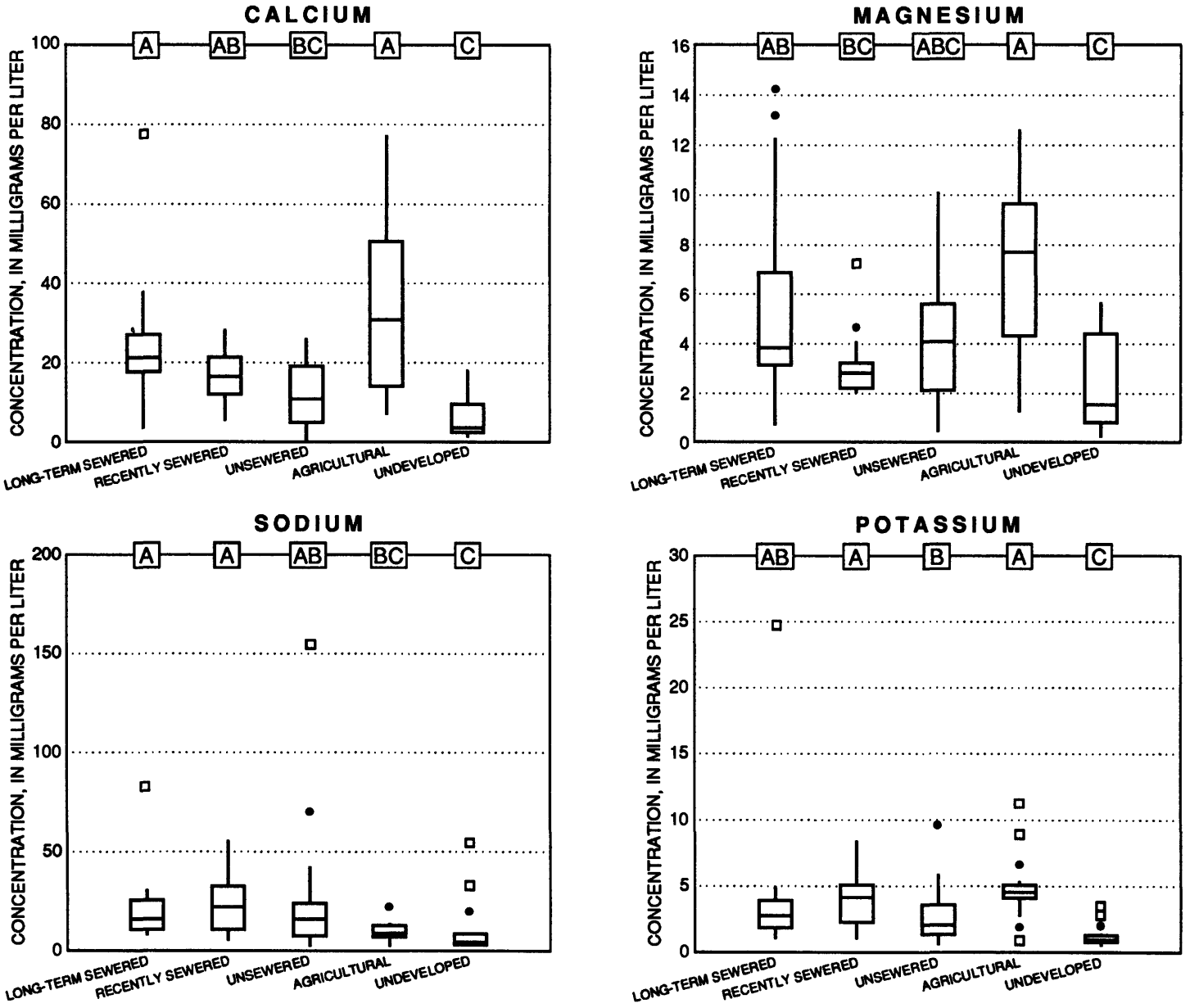


Figure 5C.--Range in calcium, magnesium, sodium,and potassium concentrations in water samples from network wells.

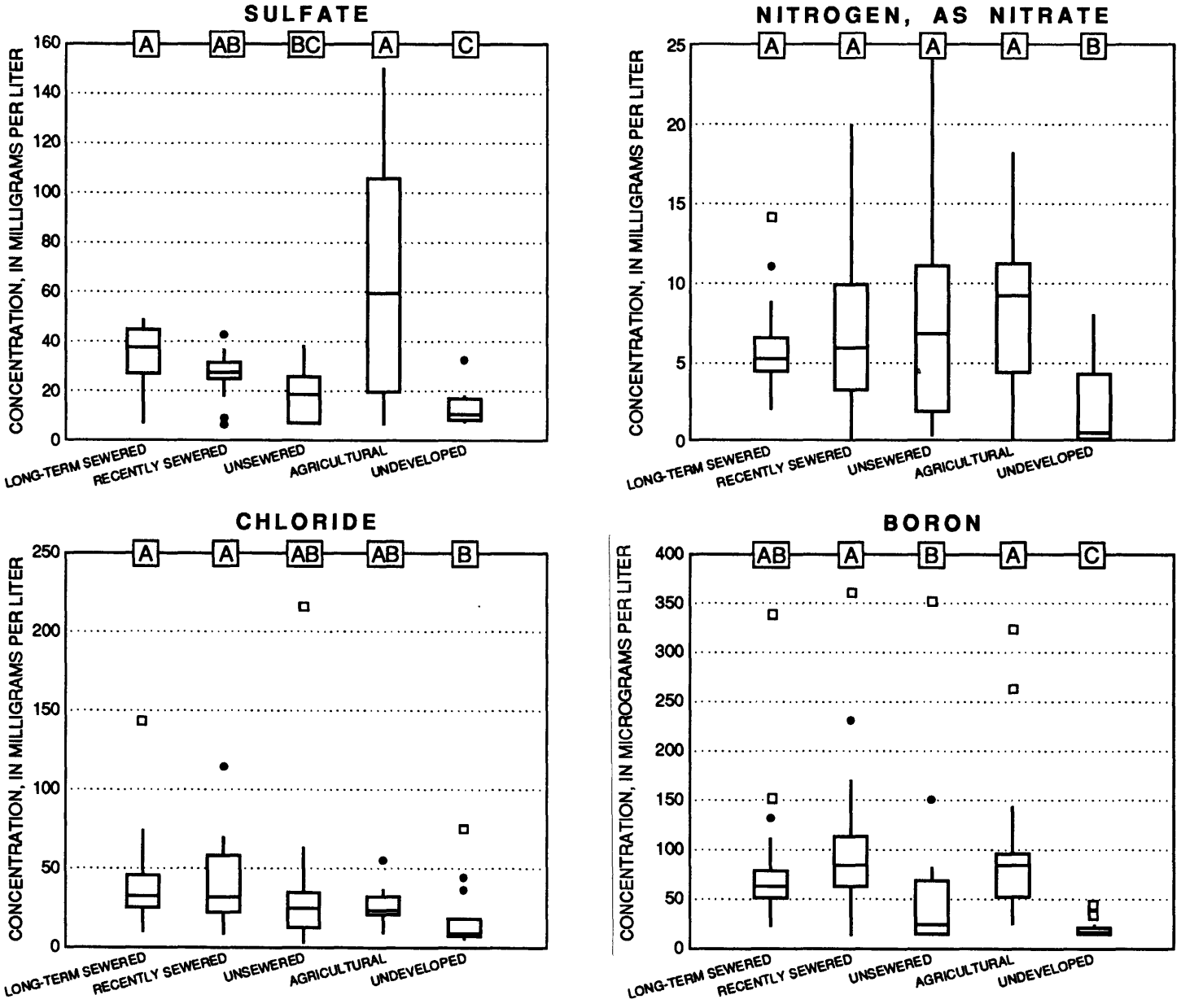


Figure 5D.--Range in sulfate, nitrate, chloride, and boron concentrations in water samples from network wells.

the long-term sewered suburban area nor the undeveloped area showed detection of these compounds. Results for these three groups of pesticides are given in tables 9A and 9B.

Carbamate insecticides were detected primarily in the agricultural area and to a lesser extent in the undeveloped area and the unsewered suburban area. Concentrations of these insecticides were the highest of any pesticide in these areas. These compounds were not detected in the two sewered suburban areas (table 10).

Chlorophenoxy-acid herbicides were detected in 1 of 15 samples from the agricultural area and in 1 of 20 samples from each of the three suburban areas; none were detected in the undeveloped area. Triazine herbicides were detected in 5 of 20 samples from each of the two sewered suburban areas and in 3 of 20 samples from the unsewered suburban area. These compounds were not detected in the agricultural or undeveloped areas.

Semivolatile Organic Compounds

Methylene chloride-extractable compounds were detected in samples from 47 of the 90 wells by GC-FID scans. Twenty-five wells were resampled for GC-MS analysis by NWQL. Semivolatile organic compounds detected in these analyses are listed in table 11A; those that were not detected are listed in table 11B. Of the 25 wells resampled for GC-MS analysis, semivolatile organic compounds were detected in samples from five. Compounds detected were di-*n*-octyl phthalate, *bis*(2-ethylhexyl) phthalate, and naphthalene.

SUMMARY

This report presents chemical data on water samples collected from 90 water-table wells in five study areas as part of a project to statistically relate land use to water quality. The study areas, delineated according to predominant land use and sewering practices, are a long-term-sewered suburban area, a recently sewered suburban area, an unsewered suburban area, an agricultural area, and an undeveloped area. One well in each study area was sampled monthly for at least a year after the initial sampling to give information on temporal variability in water quality at each well. Chemical constituents analyzed for in each sample were inorganic constituents and field characteristics; volatile and semivolatile organic compounds; organochlorine, organophosphorus, and carbamate insecticides; and triazine and chlorophenoxy-acid herbicides. Major results for each of the major constituent groups examined are presented below.

Inorganic constituents and field characteristics.--Median temperatures of samples from the two sewered suburban areas were significantly higher than those from the other three areas, and the median water temperature of samples from the unsewered suburban area was significantly higher than those of samples from the agricultural or undeveloped areas.

Specific conductance and concentrations of total dissolved solids, nitrate-nitrogen, and potassium were significantly lower in samples from the undeveloped area than in samples from the other four areas. Dissolved-oxygen concentrations were significantly higher in samples from the undeveloped area than in samples from the three suburban areas. Concentrations of calcium, sulfate, potassium, and boron were significantly higher in samples from the

agricultural area than in samples from the undeveloped area and the unsewered suburban area. Iron and manganese were detected most commonly, and typically at elevated concentrations, in the agricultural area and the recently sewered suburban area.

Volatile organic compounds.--VOC's were detected primarily in the three suburban study areas. The recently sewered suburban area had detections in 14 out of 19 samples; the long-term sewered suburban area had detections in 10 out of 20 samples; and the unsewered suburban area had detections in 8 out of 20 samples. In these three areas combined, TCA was detected most commonly (23 of 59 samples), followed by TCE (13 of 59 samples), and PCE (12 of the 59 samples).

Semivolatile organic compounds.--GC-FID scans (a qualitative analysis that indicates the presence of groups of compounds within a range of concentrations) detected methylene chloride-extractable compounds (including semivolatile organic compounds) in 47 of the 90 samples. Quantitative analysis detected semivolatile organic compounds in 5 of the 25 wells that were resampled; the compounds detected were di-*n*-octylphthalate, *bis*(2-ethylhexyl)phthalate, and naphthalene.

Pesticides.--Insecticides were detected primarily in the suburban areas and the agricultural area. Organochlorine insecticides in the three suburban areas were dieldrin, heptachlor epoxide, and chlordane. In the agricultural area, heptachlor epoxide was detected most frequently, followed by dieldrin, endosulfan, and DDD. Organophosphorus insecticides were detected in the recently sewered suburban area, the unsewered suburban area, and the agricultural area. Carbamate insecticides were detected primarily in the agricultural area, where aldicarb sulfone, aldicarb sulfoxide, and carbofuran were detected at the highest concentrations of any pesticide. Chlorophenoxy-acid herbicides were detected in one sample from each area except the undeveloped area, where none of these compounds were detected. The triazine herbicides simazine, atrazine, and prometone were detected in the three suburban areas, but no triazine herbicides were detected in the agricultural or undeveloped areas.

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Table 1.--Types of land use within the five study areas

[Values are in percent. Data from Long Island Regional Planning Board, 1982a. Locations are shown in fig. 1. mi^2 = square miles]

Type of land use	Classification and size of study area				
	Long-term sewered suburban (33.5 mi^2)	Recently sewered suburban (30.2 mi^2)	Unsewered suburban (58.8 mi^2)	Agri-cultural (41.2 mi^2)	Undeveloped (48.9 mi^2)
Residential					
Number of dwelling units per acre:					
1	3	3	19	3	3
2 to 4	6	1	33	5	2
5 to 10	49	57	0	1	0
11 or more	2	1	0	1	1
Commercial	13	7	3	2	0
Industrial	4	7	3	1	0
Institutional	9	6	9	1	2
Open space/ recreational	10	11	10	3	12
Agricultural	0	0	4	58	8
Utilities/ transporation	3	6	7	3	10
Vacant	3	2	10	21	62

Table 2.--Well-construction data on network wells and hydrogeologic characteristics at time of sampling

[All measurements are in feet. UPGL, upper glacial aquifer; MGTY, Magothy aquifer; SDBWT, screen depth below water table; --, no data]

Well number	Date sampled	Aquifer	Latitude	Longitude	Altitude	Well depth	Screen depth Top	Screen depth Bottom	Depth to water	SDBWT
LONG-TERM SEWERED SUBURBAN AREA										
N 9057	10-22-87	UPGL	404242	733422	70.24	47	42	47	25.4	19
N 9803	10-01-87	MGTY	404330	733530	82.37	62	54	59	29.7	27
N 9914	09-08-87	UPGL	404409	733741	99.56	57	49	54	44.9	7
N 9940	08-31-87	UPGL	404523	733634	107.05	53	45	50	42.4	5
N 9941	08-31-87	UPGL	404443	733625	86.51	50	42	47	25.3	19

Table 2.--Well-construction data on network wells and hydrogeologic characteristics at time of sampling (continued)

Well number	Date sampled	Aquifer	Latitude	Longitude	Altitude	Well depth	Screen depth Top	Screen depth Bottom	Depth to water	SDBWT
				LONG-TERM SEWERED SUBURBAN AREA (continued)						
N 9942	09-08-87	UPGL	404455	733814	112.82	69	61	66	53.5	10
N 9943	09-15-87	UPGL	404342	733805	90.91	69	61	66	42.5	21
N 9944	09-10-87	UPGL	404410	734004	96.01	80	72	77	49.6	25
N 9945	09-09-87	UPGL	404253	733956	75.72	67	59	64	39.0	22
N 9946	09-09-87	UPGL	404531	733935	106.19	60	52	57	50.1	4
N 9947	10-06-87	UPGL	404319	734329	81.22	109	101	106	59.9	44
N 9948	09-03-87	MGTY	404508	734056	124.83	114	106	111	81.3	27
N 9949	09-10-87	UPGL	404416	734058	106.90	100	91	96	64.8	29
N 9959	10-06-87	UPGL	404412	733634	81.38	54	48	54	23.4	28
N 9962	10-13-87	UPGL	404446	733724	110.86	65	60	65	50.4	12
N 9979	10-22-87	UPGL	404232	734325	70.64	95	87	92	54.6	35
N 9982	09-03-87	MGTY	404435	734202	120.07	112	104	109	80.2	26
N 9983	09-02-87	MGTY	404404	734202	107.39	99	91	96	69.6	24
N 9984	09-02-87	UPGL	404251	734046	78.00	60	51	56	45.8	8
N 10035	10-01-87	UPGL	404338	733715	77.22	56	48	53	28.2	22
				RECENTLY SEWERED SUBURBAN AREA						
N 1197	10-13-87	UPGL	404453	733239	116.05	69	64	69	49.3	17
N 8888	09-28-87	UPGL	404703	733056	174.49	111	106	111	94.4	14
N 8984	10-19-87	UPGL	404452	733446	104.00	52	47	52	36.2	13
N 9078	10-05-87	UPGL	404324	733422	83.62	65	60	65	31.3	31
N 9079	10-07-87	UPGL	404508	733024	118.85	70	65	70	52.3	15
N 9222	10-14-87	UPGL	404351	733327	92.53	46	40	45	35.9	7
N 9354	10-05-87	UPGL	404539	733501	117.97	89	84	89	47.1	39
N 9451	10-14-87	UPGL	404414	733253	97.48	42	36	41	36.8	2
N 9917	09-17-87	UPGL	404524	733251	124.79	76	68	73	53.4	17
N 9918	09-21-87	MGTY	404435	733057	111.70	77	70	75	48.3	24
N 9919	09-17-87	UPGL	404535	733146	136.27	84	76	81	64.5	14
N 9920	09-21-87	MGTY	404607	733021	145.95	89	81	86	71.5	12
N 9924	09-29-87	UPGL	404320	733056	77.10	45	37	42	27.6	12
N 9925	09-23-87	UPGL	404325	733220	86.03	51	44	49	34.1	12
N 9926	09-23-87	MGTY	404718	733150	168.18	130	122	127	87.2	37
N 9927	09-22-87	UPGL	404631	733118	161.68	94	86	91	85.1	3
N 9928	09-22-87	UPGL	404624	733215	145.21	86	77	82	67.1	12
N 9933	09-29-87	MGTY	404718	733000	178.97	115	106	111	98.2	10
N 9938	09-16-87	UPGL	404526	733335	124.40	80	72	77	53.5	21
N 9939	09-16-87	UPGL	404435	733343	105.05	74	66	71	41.2	28
				UNSEWERED SUBURBAN AREA						
S 24771	07-27-87	UPGL	404820	731603	141.08	127	117	127	86.5	36
S 29778	07-27-87	MGTY	404710	732640	195.17	168	158	168	120.0	43
S 45207	08-04-87	UPGL	405132	731814	163.42	146	134	144	102.3	37
S 45208	07-09-87	UPGL	405005	732337	183.45	137	123	133	107.5	21
S 45210	07-07-87	UPGL	404945	731745	128.27	109	97	107	67.4	35

Table 2.--Well-construction data on network wells and hydrogeologic characteristics at time of sampling (continued)

Well number	Date sampled	Aquifer	Latitude	Longitude	Altitude	Well depth	Screen depth Top	Screen depth Bottom	Depth to water	SDBWT
				UNSEWERED SUBURBAN AREA (continued)						
S 45594	08-13-87	UPGL	404920	731509	102.37	85	73	83	54.1	24
S 46283	07-21-87	UPGL	404823	732118	273.09	239	225	235	204.0	26
S 47220	07-09-87	UPGL	404759	732516	175.32	92	79	89	67.0	17
S 48375	07-22-87	UPGL	404755	732442	136.40	79	64	69	60.1	6
S 50513	07-16-87	UPGL	405100	731526	92.94	61	57	61	47.3	12
S 64313	08-05-87	UPGL	404659	732020	89.20	30	25	30	19.7	8
S 64314	08-05-87	UPGL	404818	731716	99.94	60	55	60	42.5	15
S 64316	07-15-87	UPGL	404746	732219	159.91	63	58	63	50.6	10
S 64318	07-13-87	UPGL	404737	732516	--	60	55	60	43.6	14
S 64319	07-28-87	UPGL	404623	732539	110.00	45	40	45	38.1	4
S 65602	07-15-87	UPGL	405030	731806	145.81	96	91	96	74.5	19
S 65607	07-16-87	UPGL	405003	731552	137.72	102	97	102	88.1	11
S 68762	08-06-87	UPGL	404932	732437	158.50	86	79	84	67.0	14
S 74286	07-21-87	MGTY	404750	732253	154.07	115	107	112	81.2	28
S 75456	07-27-87	UPGL	404859	731940	229.52	203	195	200	156.8	41
				AGRICULTURAL AREA						
S 51566	06-17-87	UPGL	405716	724133	72.34	89	76	86	58.0	23
S 51567	06-16-87	UPGL	405653	724225	79.73	92	79	89	63.8	20
S 51568	06-10-87	UPGL	405808	723854	54.08	70	58	68	44.2	19
S 51571	08-18-87	UPGL	405805	724037	86.25	108	95	105	78.6	21
S 51572	06-11-87	UPGL	405651	723929	32.58	43	31	41	18.8	17
S 51575	06-17-87	UPGL	405544	724118	24.71	34	22	32	6.8	20
S 51576	06-17-87	UPGL	405559	724252	57.99	69	56	66	39.0	22
S 51577	06-10-87	UPGL	405630	724420	80.38	95	83	93	62.0	26
S 51578	07-29-87	UPGL	405721	724537	109.40	126	114	124	97.1	22
S 51581	08-17-87	UPGL	405722	723420	27.43	45	32	42	20.5	17
S 51582	07-29-87	UPGL	405853	723539	61.08	84	72	82	53.9	23
S 51587	06-09-87	UPGL	405809	723709	57.32	80	66	76	46.7	25
S 51588	06-16-87	UPGL	405634	723805	34.61	60	47	57	24.8	27
S 51589	06-18-87	UPGL	405701	723610	24.85	43	30	40	16.2	19
S 52383	06-22-87	UPGL	405542	724453	59.85	64	51	61	36.1	19
				UNDEVELOPED AREA						
S 34742	06-30-87	UPGL	405038	724147	67.56	97	82	92	46.5	40
S 46544	07-06-87	UPGL	405139	724324	102.71	107	103	107	77.2	28
S 47755	06-23-87	UPGL	405136	724645	59.74	58	45	55	28.6	21
S 48584	06-24-87	UPGL	405139	723850	86.37	89	75	86	66.8	14
S 48946	06-30-87	UPGL	405121	724906	45.00	45	31	41	10.8	25
S 54886	06-29-87	UPGL	405241	723818	59.04	55	51	55	41.0	12
S 73807	07-01-87	UPGL	405102	724506	108.75	100	95	98	84.0	12
S 73811	06-29-87	UPGL	405014	724657	83.47	85	80	85	57.0	26
S 74293	06-25-87	UPGL	405017	724950	83.37	71	67	71	53.6	15
S 74294	06-24-87	UPGL	405213	724808	57.58	36	32	36	21.6	12
S 74295	06-29-87	UPGL	405046	724727	68.90	56	52	56	39.8	14
S 74301	07-01-87	UPGL	405330	724438	107.32	109	105	109	70.0	37
S 74307	07-02-87	UPGL	405131	724030	89.52	86	82	86	59.9	24
S 86583	07-30-87	UPGL	405106	725009	--	41	36	41	18.3	20
S 86584	07-30-87	UPGL	404949	725039	51.15	46	41	46	24.6	19

Table 3.--Inorganic and organic chemical constituents for which water samples were analyzed

[NWQL = National Water Quality Laboratory, NCDH = Nassau County Department of Health Laboratory]

Inorganic-chemical constituents analyzed by NCDH	
Alkalinity, total	Manganese, dissolved
Ammonia nitrogen, total	Methylene blue active substance
Arsenic, dissolved	Mercury, total
Barium, dissolved	Nitrate nitrogen, total
Boron, dissolved[a]	Nitrite nitrogen, total
Cadmium, dissolved	Phosphorus, total
Calcium, dissolved	Phosphorus, ortho, total
Chloride, total	Potassium, total
Chromium, dissolved	Selenium, dissolved
Copper, dissolved	Silica, dissolved
Fluoride, total	Silver, dissolved
Hardness, as CaCO3	Sodium, total
Iron, dissolved	Sulfate, total
Lead, dissolved	Total dissolved solids
Magnesium, dissolved	

Volatile organic compounds	
Analyzed by NWQL and NCDH	*Analyzed by NWQL only*
Benzene	Chloroethane
Bromoform	2-Chloroethyl vinyl ether
Carbon tetrachloride	Chloromethane
Chlorobenzene	Dibromochloromethane
Chloroform	1,2-Dibromoethylene
Dichlorobromomethane	1,2-Dichlorobenzene
1,1-Dichloroethane	1,3-Dichlorobenzene
Ethylbenzene	1,4-Dichlorobenzene
Tetrachloroethylene PCE	Dichlorodifluoromethane
Trichloroethylene TCE	1,2-Dichloroethane
Toluene	1,1-Dichloroethylene
1,2-*trans*-Dichloroethylene	1,2-Dichloropropane
1,1,1-Trichloroethane	*cis*-1,3-Dichloropropene
1,1,2-Trichloroethane	*trans*-1,3-Dichloropropene
Trichlorofluoromethane[b]	1,3-Dichloropropene
Xylene	Methyl bromide
	Methylene chloride
	Styrene
	1,1,2,2-Tetrachloroethane
	Vinyl chloride

Pesticides (Analysis done by NWQL unless otherwise noted)	
Organochlorine Insecticides	*Organochlorine Insecticides (cont'd)*
Aldrin	Methoxychlor
Chlordane	Mirex Perthane
DDD	Toxaphene
DDE	
DDT	
Dieldrin	*Organophosphorus Insecticides*
Endosulfan	
Endrin	Diazinon
Gross polychlorinated biphenyls (µg/L as PCB)	Ethion
Gross polychlorinated napthalenes (µg/L as PCN)	Malathion
Heptachlor	Methyl parathion
Heptachlor epoxide	Methyl trithion
Lindane	Parathion
	Trithion

[a] Analyzed by NWQL only

[b] Analyzed by NCDH only

Table 3.--Inorganic and organic chemical constituents for which water samples were analyzed (continued)

Pesticides (cont'd)

Triazine Herbicides	*Chlorophenoxy-acid Herbicides*
Alachlor	2,4-D
Ametryn	2,4-DP
Atrazine	Silvex
Cyanazine	2,4,5-T
Metolachlor	
Metribuzin	*Carbamate Pesticides* [c]
Prometone	
Prometryn	Aldicarb
Propazine	Aldicarb Sulfoxide
Simazine	Aldicarb Sulfone
Simetryn	Carbofuran
Trifluralin	3-Hydroxycarbofuran
	Oxamyl
	Carbaryl
	Methomyl

Semi-volatile compounds
(methylene chloride extraction)

Base/Neutral-Extractable	*Base/Neutral Extractable (cont'd)*
Acenaphthene	Fluorene
Acenaphthylene	Hexachlorobenzene
Anthracene	Hexachlorobutadiene
Benzo(a)anthracene	Hexachlorocyclopentadiene
Benzo(b)fluoranthene	Hexachloroethane
Benzo(k)fluoranthene	Indeno (1,2,3-cd) pyrene
Benzo(g,h,i)perylene	Isophorone
Benzo(a)pyrene	Naphthalene
4-Bromophenyl phenyl ether	Nitrobenzene
n-Butyl benzyl phthalate	*N*-Nitrosodimethylamine
bis(2-Chlorethoxy methane)	*N*(B (B -Nitrosodi-*n*-propylamine
bis(2-Chloroethyl) ether)	*N*(B (B -Nitrosodiphenylamine
bis(2-Chloroisopropyl) ether	Phenanthrene
2-Chloronaphthalene	Pyrene
4-Chlorophenyl phenyl ether	1,2,4-Trichlorobenzene
Chrysene	
Dibenzo(a,h) anthracene	*Acid Extractable*
1,2-Dichlorobenzene	
1,3-Dichlorobenzene	4-Chloro-3-methylphenol
1,4-Dichlorobenzene	2-Chlorophenol
Diethyl phthalate	2,4-Dichlorophenol
Dimethyl phthalate	2,4-Dimethylphenol
Di-***n***-butyl phthalate	2,4-Dinitrophenol
2,4-Dinitrotoluene	2-Methyl-4,6-dinitrophenol
2,6-Dinitrotoluene	2-Nitrophenol
Di-***n***-octylphthalate	4-Nitrophenol
bis (2-Ethylhexyl) phthalate	Pentachlorophenol
Fluoranthene	Phenol

[c] Analyzed by Suffolk County Department of Health Services laboratory.

Table 4.--Major inorganic-ion concentrations and field constituent values in water samples from network wells

[mg/L, milligrams per liter; µS/cm, microsiemens per centimeter at 25 degrees Celsius; <, less than; --, no data]

Well number	Silica, total (mg/L SiO_2)	Calcium, dissolved (mg/L as Ca)	Magnesium, dissolved (mg/L as Mg)	Sodium dissolved (mg/L as Na)	Potassium, dissolved (mg/L as K)	Alkalinity (lab mg/L as $CaCO_3$)	Sulfate (mg/L as SO_4)	Chloride, dissolved (mg/L as Cl)	Fluoride, total (mg/L as F)	Nitrogen, nitrate total (mg/L as N
				LONG-TERM SEWERED SUBURBAN AREA						
N 9057	10.7	21.9	3.5	11	3.6	8	35	32.4	<0.2	8.70
N 9803	8.8	19.0	3.3	29	3.8	14	25	48.8	<0.2	6.50
N 9914	7.6	28.2	6.4	24	2.4	34	47	39.2	<0.2	5.20
N 9940	10.5	14.4	2.7	9.0	3.9	9	23	12.4	<0.2	5.81
N 9941	9.1	18.5	5.7	22	5.0	7	31	31.6	<0.2	11.0
N 9942	11.7	19.0	3.2	30	3.1	18	36	45.4	<0.2	5.48
N 9943	10.2	27.6	8.8	83	3.8	28	44	143	<0.2	4.41
N 9944	13.2	21.6	4.1	31	4.8	11	47	50.1	<0.2	6.38
N 9945	8.7	18.1	3.7	17	1.9	17	38	30.9	<0.2	4.42
N 9946	15.6	12.1	3.2	10	3.3	14	37	15.6	<0.2	1.86
N 9947	22.0	21.2	12.3	11	2.1	40	43	27.0	<0.2	4.93
N 9948	18.0	77.4	14.2	32	24.7	370	<5.0	45.6	0.2	<0.01
N 9949	10.3	35.0	6.7	16	0.8	64	45	24.6	<0.2	3.85
N 9959	4.6	4.2	0.8	12	1.0	33	8.0	9.9	<0.2	<0.01
N 9962	6.2	28.9	3.2	11	2.9	50	29	16.2	<0.2	4.69
N 9979	21.0	37.8	13.2	17	2.4	26	48	74.5	<0.2	14.0
N 9982	20.1	25.7	7.2	17	1.7	18	43	34.5	<0.2	5.05
N 9983	19.1	24.8	4.9	13	1.4	16	38	24.2	<0.2	6.36
N 9984	13.5	22.8	2.6	21	2.5	12	27	33.4	<0.2	6.45
N 10035	5.2	9.3	2.4	24	1.3	24	11	29.0	<0.2	4.19
				RECENTLY SEWERED SUBURBAN AREA						
N 1197	12.6	21.9	3.2	23	5.6	11	33	36.2	<0.2	10.0
N 8888	13.1	16.3	2.8	28	4.4	11	29	37.9	<0.2	8.91
N 8984	4.0	8.6	2.3	12	1.4	21	16	22.7	<0.2	2.71
N 9078	8.2	11.8	3.0	8.0	3.3	9	28	9.0	<0.2	3.39
N 9079	5.1	28.7	4.7	56	3.9	59	26	114	<0.2	2.27
N 9222	12.5	14.2	2.2	10	3.9	4	25	14.5	<0.2	6.24
N 9354	15.6	19.6	3.3	28	4.8	15	36	29.2	<0.2	9.82
N 9451	14.9	28.2	2.2	16	3.7	10	41	32.4	<0.2	4.89
N 9917	6.0	24.8	3.3	29	2.1	42	22	64.7	<0.2	0.16
N 9918	6.6	7.8	2.0	6.0	2.2	4	<5.0	12.1	<0.2	4.51
N 9919	12.9	19.9	4.1	31	5.3	6	26	50.9	<0.2	14.0
N 9920	4.6	15.1	2.6	43	4.0	21	34	45.1	<0.2	7.70
N 9924	9.2	20.2	2.3	47	4.3	23	27	69.8	<0.2	5.25
N 9925	13.8	23.3	2.9	43	6.5	8	31	64.9	<0.2	11.0
N 9926	4.2	6.3	2.3	11	1.6	7	7.0	26.6	<0.2	1.50
N 9927	15.5	21.6	2.6	21	6.9	2	24	25.0	<0.2	18.0
N 9928	15.9	17.3	3.1	23	8.2	3	24	24.5	0.5	20.0
N 9933	12.8	15.5	2.6	10	0.9	19	26	8.0	<0.2	2.65
N 9938	8.6	13.1	7.3	36	1.9	8	26	70.8	<0.2	3.96
N 9939	11.4	12.0	3.2	14	4.0	2	26	20.5	<0.2	8.95
				UNSEWERED SUBURBAN AREA						
S 24771	10.2	8.6	5.1	20	2.2	34	13	18.5	<0.2	6.46
S 29778	7.5	6.6	4.7	6.0	1.5	23	8.0	13.2	<0.2	2.94
S 45207	12.5	14.1	3.7	14	3.2	14	19	12.6	<0.2	7.63
S 45208	19.9	24.1	9.2	32	3.2	19	29	34.9	<0.2	24.0
S 45210	18.0	23.5	10.1	9.0	1.5	31	37	10.2	<0.2	12.0

Table 4.--Major inorganic-ion concentrations and field constituent values in water samples from network wells (continued)

Well number	Silica, total (mg/L SiO_2)	Calcium, dissolved (mg/L as Ca)	Magnesium, dissolved (mg/L as Mg)	Sodium dissolved (mg/L as Na)	Potassium, dissolved (mg/L as K)	Alkalinity (lab mg/L as $CaCO_3$)	Sulfate (mg/L as SO_4)	Chloride, dissolved (mg/L as Cl)	Fluoride, total (mg/L as F)	Nitrogen, nitrate total (mg/L as N
				UNSEWERED SUBURBAN AREA (CONTINUED)						
S 45594	11.5	8.1	3.0	11	1.9	12	14	11.2	<0.2	4.31
S 46283	8.1	1.0	0.5	3.0	0.5	7	<5.0	6.3	<0.2	0.29
S 47220	5.5	<0.1	0.8	5.0	0.4	5	<5.0	2.5	<0.2	0.85
S 48375	6.9	6.5	1.6	70	9.5	39	22	62.1	<0.2	13.0
S 50513	12.1	11.2	4.5	17	3.5	7	27	25.3	<0.2	8.32
S 64313	2.4	11.0	1.0	43	1.8	19	<5.0	60.3	<0.2	0.24
S 64314	5.0	22.1	6.1	154	1.2	54	16	217	<0.2	1.51
S 64316	6.6	17.0	5.8	10	2.8	6	23	33.0	<0.2	7.75
S 64318	6.1	2.2	3.1	16	1.1	8	<5.0	25.4	<0.2	2.00
S 64319	10.8	21.7	5.5	26	5.0	15	21	57.2	<0.2	6.79
S 65602	17.3	26.2	5.1	19	5.7	6	32	26.2	<0.2	23.0
S 65607	15.6	16.0	7.2	23	4.0	7	26	32.2	<0.2	16.0
S 68762	12.0	15.4	3.5	22	1.9	9	20	22.7	<0.2	9.97
S 74286	6.6	1.1	1.3	3.0	0.6	6	<5.0	5.0	<0.2	1.08
S 75456	10.1	4.3	2.8	5.0	0.8	10	6.0	11.8	<0.2	1.74
				AGRICULTURAL AREA						
S 51566	10.5	77.0	12.6	10	4.4	9	140	33.7	<0.2	18.0
S 51567	10.6	76.0	12.2	9.0	2.5	11	150	27.2	<0.2	11.0
S 51568	8.9	60.3	9.2	23	5.2	22	79	54.8	<0.2	17.0
S 51571	9.7	25.3	7.9	11	4.3	9	6.3	28.4	<0.2	11.0
S 51572	12.8	18.5	4.1	22	6.4	20	31	34.8	<0.2	9.91
S 51575	9.2	8.4	1.6	8.0	0.8	32	6.0	8.4	<0.2	<0.01
S 51576	8.0	17.8	5.2	6.0	4.3	7	45	10.6	<0.2	4.73
S 51577	10.4	51.9	10.1	7.0	8.7	7	113	22.2	<0.2	8.91
S 51578	9.3	11.5	4.7	<3.0	1.8	6	37	10.0	<0.2	2.76
S 51581	8.8	31.1	7.9	8.0	3.9	8	114	20.3	<0.2	3.51
S 51582	10.5	41.9	7.7	5.0	3.8	16	80	20.1	<0.2	8.31
S 51587	11.7	33.1	6.5	14	11.0	20	59	23.4	0.5	13.1
S 51588	8.7	49.7	10.1	10	4.5	15	97	24.1	<0.2	11.0
S 51589	6.1	7.0	1.2	21	3.9	8	8.0	37.8	0.3	3.55
S 52383	4.1	7.1	1.4	7.0	4.5	5	<5.0	23.4	0.6	4.96
				UNDEVELOPED AREA						
S 34742	7.4	6.0	2.8	3.0	1.8	9	9.0	7.4	<0.2	1.08
S 46544	9.7	13.2	5.7	<3.0	0.7	4	31	7.4	<0.2	4.31
S 47755	7.7	3.1	1.3	3.0	0.8	5	7.0	11.4	<0.2	<0.01
S 48584	7.1	2.4	1.0	<3.0	0.6	7	<5.0	4.7	<0.2	<0.01
S 48946	9.5	16.9	4.9	9.0	3.3	21	22	16.2	<0.2	6.50
S 54886	4.7	2.9	0.4	54	0.4	5	18	74.0	<0.2	0.32
S 73807	10.0	18.3	4.5	5.0	2.7	5	8.0	19.1	<0.2	0.02
S 73811	8.9	1.7	0.9	<3.0	0.6	8	7.0	4.2	<0.2	0.02
S 74293	11.8	6.0	2.1	8.0	0.9	8	12	8.3	<0.2	3.64
S 74294	5.4	1.9	0.3	33	0.8	15	10	44.7	<0.2	0.09
S 74295	7.3	1.4	0.2	8.0	0.7	7	12	4.4	<0.2	<0.01
S 74301	9.9	3.2	0.8	<3.0	0.6	6	6.0	3.6	<0.2	<0.01
S 74307	6.8	4.2	1.6	20	0.9	4	9.0	36.7	<0.2	0.24
S 86583	9.3	4.0	4.4	5.0	0.9	4	<5.0	11.7	<0.2	5.86
S 86584	10.8	14.0	4.9	<3.0	1.3	4	18	8.1	<0.2	7.70

Table 4.--Major inorganic-ion concentrations and field constituent values in water samples from network wells (continued)

Well number	Nitrogen, nitrite total (mg/L as N)	Nitrogen, ammonia total (mg/L as N)	Phosphorus, total (mg/L as P)	Phosphorus, ortho, total (mg/L as P)	Total dissolved solids (mg/L)	Hardness, total (mg/L as $CaCO_3$)	Specific conductance (field, µS/cm)	pH (field, standard units)	Water temperature (field, deg. C)	Dissolved oxygen (field, mg/L)
				LONG-TERM SEWERED SUBURBAN AREA						
N 9057	0.003	0.08	<0.01	<0.01	162	69	268	5.64	14.2	2.2
N 9803	<0.001	<0.01	0.03	<0.01	175	61	298	5.75	13.7	6.0
N 9914	0.003	<0.01	0.02	<0.01	198	97	364	6.06	14.2	9.6
N 9940	<0.001	<0.01	<0.01	<0.01	107	47	184	5.80	14.0	9.8
N 9941	0.002	0.13	0.02	<0.01	176	70	303	5.35	15.0	2.3
N 9942	0.001	<0.01	0.02	0.01	161	61	199	5.74	15.2	7.2
N 9943	0.004	<0.01	<0.01	<0.01	357	105	694	5.94	15.2	9.1
N 9944	<0.001	<0.01	0.07	<0.01	207	71	356	5.65	14.7	10.3
N 9945	0.002	<0.01	<0.01	<0.01	148	60	257	5.89	14.2	10.4
N 9946	0.002	<0.01	0.02	<0.01	113	43	161	5.52	13.4	4.4
N 9947	<0.001	<0.01	0.08	<0.01	185	104	302	6.32	14.5	2.8
N 9948	0.004	20	0.03	<0.01	478	252	689	6.82	14.8	0.0
N 9949	0.003	<0.01	0.03	<0.01	159	115	334	6.41	14.8	6.0
N 9959	<0.001	<0.01	0.08	<0.01	62	14	105	6.60	14.4	0.2
N 9962	0.009	<0.01	0.02	<0.01	149	85	263	6.34	13.1	7.9
N 9979	0.005	0.05	0.16	<0.01	292	149	517	6.02	13.9	6.8
N 9982	0.002	<0.01	0.07	0.02	183	94	314	6.02	14.7	9.6
N 9983	<0.001	<0.01	0.07	<0.01	163	82	261	5.85	14.2	8.5
N 9984	0.001	<0.01	0.08	0.01	159	68	276	5.58	14.7	9.4
N 10035	<0.001	<0.01	0.03	<0.01	115	33	203	6.25	15.5	1.6
				RECENTLY SEWERED SUBURBAN AREA						
N 1197	<0.001	0.02	0.03	<0.01	187	68	318	5.51	14.2	4.3
N 8888	0.003	<0.01	0.08	<0.01	178	52	287	5.82	14.6	7.8
N 8984	0.022	0.20	0.14	0.07	77	31	190	6.06	14.3	3.3
N 9078	0.002	<0.01	0.13	<0.01	93	42	146	5.78	12.9	6.8
N 9079	0.297	0.19	0.10	<0.01	309	91	569	6.02	15.5	0.0
N 9222	<0.001	<0.01	0.02	<0.01	113	45	177	5.32	12.6	8.8
N 9354	0.004	0.16	0.05	<0.01	191	63	263	5.81	13.9	3.8
N 9451	0.019	<0.01	0.34	<0.01	167	79	279	5.76	14.3	8.0
N 9917	0.003	0.05	0.09	<0.01	189	76	371	6.36	15.0	0.0
N 9918	<0.001	<0.01	0.07	<0.01	59	28	110	5.07	13.7	4.8
N 9919	<0.001	<0.01	0.06	<0.01	216	67	368	5.31	15.9	6.0
N 9920	0.002	0.04	0.03	<0.01	196	48	341	5.80	15.3	3.4
N 9924	<0.001	<0.01	<0.01	<0.01	218	60	393	5.66	15.3	0.5
N 9925	0.006	<0.01	<0.01	<0.01	239	70	395	5.21	14.3	6.0
N 9926	<0.001	<0.01	0.05	<0.01	70	25	130	5.77	13.5	10.0
N 9927	<0.001	<0.01	<0.01	<0.01	198	65	309	5.09	14.7	8.0
N 9928	<0.001	0.02	0.02	<0.01	208	56	330	4.97	14.4	9.8
N 9933	<0.001	<0.01	0.55	<0.01	101	49	163	6.15	14.6	7.2
N 9938	<0.001	<0.01	0.02	<0.01	186	63	360	5.21	16.5	3.8
N 9939	<0.001	<0.01	0.01	<0.01	133	43	222	4.90	14.4	5.6
				UNSEWERED SUBURBAN AREA						
S 24771	0.006	1.20	<0.01	<0.01	128	42	234	6.08	14.5	0.8
S 29778	<0.001	0.10	0.05	<0.01	75	36	128	6.20	11.5	8.6
S 45207	0.003	<0.01	0.06	<0.01	122	50	195	5.97	13.1	8.8
S 45208	0.001	<0.01	0.02	0.01	272	98	452	5.52	13.5	6.4
S 45210	0.004	<0.01	0.01	<0.01	181	100	281	6.57	13.0	10.4
S 45210	0.004	<0.01	0.01	<0.01	181	100	281	6.57	13.0	10.4

Table 4.--Major inorganic ion concentrations and field constituent values in water samples from network wells (continued).

Well number	Nitrogen, nitrite total (mg/L as N)	Nitrogen, ammonia total (mg/L as N)	Phosphorus, total (mg/L as P)	Phosphorus, ortho, total (mg/L as P)	Total dissolved solids (mg/L)	Hardness, total (mg/L as $CaCO_3$)	Specific conductance (field, µS/cm)	pH (field, standard units)	Water temperature (field, deg. C)	Dissolved oxygen (field, mg/L)
				UNSEWERED SUBURBAN AREA (CONTINUED)						
S 45594	<0.001	<0.01	0.02	<0.01	87	33	128	5.41	12.6	8.7
S 46283	<0.001	0.01	0.07	<0.01	26	5	42	5.82	13.9	8.8
S 47220	<0.001	<0.01	<0.01	<0.01	21	4	32	6.07	10.8	10.2
S 48375	0.042	0.75	0.26	0.20	262	23	482	5.79	17.6	0.2
S 50513	0.003	<0.01	0.03	<0.01	142	46	230	5.57	12.9	8.6
S 64313	0.005	0.17	0.05	0.01	133	32	252	6.35	14.1	4.6
S 64314	<0.001	<0.01	0.02	0.02	461	80	886	5.67	13.5	6.0
S 64316	0.003	<0.01	0.08	<0.01	136	66	248	5.43	12.6	9.1
S 64318	<0.001	<0.01	<0.01	<0.01	68	18	127	5.70	12.4	10.6
S 64319	<0.001	<0.01	0.03	<0.01	186	77	330	5.64	12.2	7.1
S 65602	0.002	<0.01	0.20	<0.01	238	86	380	5.31	13.9	7.4
S 65607	0.002	<0.01	0.04	<0.01	200	70	323	5.35	12.2	7.4
S 68762	0.002	<0.01	0.10	0.05	147	53	228	5.46	13.8	6.8
S 74286	<0.001	<0.01	0.07	<0.01	26	8	52	5.90	13.9	10.6
S 75456	<0.001	<0.01	0.07	<0.01	55	22	82	5.90	10.9	11.0
				AGRICULTURAL AREA						
S 51566	0.002	<0.01	<0.01	<0.01	373	244	544	5.85	12.1	9.4
S 51567	0.003	<0.01	<0.01	<0.01	342	240	521	5.81	11.9	10.5
S 51568	0.059	0.25	0.08	<0.01	330	188	512	6.30	12.3	8.9
S 51571	<0.001	0.03	<0.01	<0.01	205	96	382	5.85	12.2	10.2
S 51572	0.032	0.74	0.32	<0.01	193	63	309	5.74	12.2	0.0
S 51575	<0.001	0.28	0.10	<0.01	67	28	102	6.58	13.5	0.5
S 51576	<0.001	<0.01	0.08	<0.01	122	66	191	5.55	11.9	10.0
S 51577	0.001	<0.01	0.01	<0.01	267	171	421	5.45	12.0	10.1
S 51578	0.004	<0.01	0.07	<0.01	91	48	156	6.11	11.4	10.4
S 51581	<0.001	<0.01	<0.01	<0.01	216	110	343	5.98	12.9	10.0
S 51582	0.004	<0.01	0.25	<0.01	216	136	356	6.12	12.1	10.4
S 51587	0.024	0.03	0.07	<0.01	229	109	358	5.90	12.5	9.0
S 51588	0.020	0.38	0.17	0.03	265	166	372	6.10	12.3	6.6
S 51589	0.004	<0.01	—	—	108	22	187	5.12	11.4	2.6
S 52383	0.006	0.07	0.05	0.01	73	23	151	5.23	11.9	8.0
				UNDEVELOPED AREA						
S 34742	<0.001	<0.01	0.01	<0.01	48	27	80	5.83	10.8	10.1
S 46544	<0.001	<0.01	<0.01	<0.01	89	56	156	6.40	11.8	10.8
S 47755	<0.001	<0.01	0.11	0.05	38	13	71	6.67	12.5	7.9
S 48584	0.002	<0.01	<0.01	<0.01	20	10	45	6.58	11.2	10.6
S 48946	0.032	0.27	0.09	0.03	129	62	225	5.95	13.1	3.2
S 54886	<0.001	<0.01	<0.01	<0.01	159	9	321	5.66	12.7	11.2
S 73807	<0.001	<0.01	0.02	<0.01	71	64	101	5.74	11.7	11.1
S 73811	<0.001	<0.01	0.07	<0.01	28	8	47	6.35	10.4	11.4
S 74293	0.001	<0.01	0.09	0.02	70	24	106	5.74	12.2	10.5
S 74294	0.002	<0.01	<0.01	<0.01	105	6	194	5.65	12.5	1.0
S 74295	<0.001	<0.01	<0.01	<0.01	38	4	67	6.04	11.6	11.8
S 74301	0.001	<0.01	0.04	<0.01	28	11	46	6.11	10.7	11.4
S 74307	<0.001	<0.01	<0.01	<0.01	82	17	161	5.89	11.8	11.2
S 86583	<0.001	<0.01	0.25	<0.01	64	28	114	5.89	11.4	10.5
S 86584	<0.001	<0.01	0.03	<0.01	94	55	148	6.26	11.0	11.4

Table 5.--Inorganic trace-element concentrations in water samples from network wells

[mg/L, milligrams per liter; ug/L, micrograms per liter;
<, less than; --, no data]

Well number	Iron, dissolved (ug/L as Fe)	Manganese, dissolved (ug/L as Mn)	Barium, dissolved (ug/L as Ba)	Boron, dissolved (ug/L as B)	Cadmium, dissovled (ug/L as Cd)	Chromium, dissolved (ug/L as Cr)	Copper, dissolved (ug/L as Cu)	Lead dissolved (ug/L as Pb)	Methylene blue active substances (mg/L)
				LONG-TERM SEWERED SUBURBAN AREA					
N 9057	<50	180	<200	110	<1	<10	<50	<10	<0.02
N 9803	<50	<50	<200	50	<1	<10	<50	<10	<0.02
N 9914	<50	<50	<200	40	<1	<10	<50	<10	<0.02
N 9940	<50	<50	<200	20	<1	<10	<50	<10	<0.02
N 9941	<50	190	<200	130	<1	<10	<50	<10	<0.02
N 9942	<50	<50	<200	60	<1	<10	<50	<10	<0.02
N 9943	<50	<50	<200	60	<1	<10	<50	<10	<0.02
N 9944	<50	<50	<200	60	<1	<10	<50	<10	<0.02
N 9945	<50	<50	<200	50	<1	<10	<50	<10	<0.02
N 9946	<50	<50	<200	20	<1	<10	<50	<10	<0.02
N 9947	390	<50	<200	60	<1	<10	<50	<10	<0.02
N 9948	14,800	2,750	<200	340	<1	<10	<50	<10	<0.02
N 9949	<50	<50	<200	150	<1	<10	<50	<10	<0.02
N 9959	1,580	70	<200	40	<1	<10	<50	<10	<0.02
N 9962	530	<50	<200	50	<1	<10	<50	<10	<0.02
N 9979	190	<50	<200	50	<1	<10	<50	<10	<0.02
N 9982	50	<50	400	70	<1	<10	<50	<10	<0.02
N 9983	<50	<50	<200	80	<1	<10	<50	<10	<0.02
N 9984	<50	<50	<200	60	<1	<10	<50	<10	<0.02
N 10035	<50	<50	<200	50	<1	<10	<50	<10	<0.02
				RECENTLY SEWERED SUBURBAN AREA					
N 1197	150	160	<200	170	<1	<10	<50	<10	<0.02
N 8888	230	120	<200	130	<1	<10	60	<10	<0.02
N 8984	120	<50	<200	60	<1	<10	<50	<10	0.13
N 9078	150	<50	<200	30	<1	40	<50	60	<0.02
N 9079	5,550	19,000	<200	90	<1	<10	<50	<10	<0.02
N 9222	<50	180	<200	70	<1	<10	<50	<10	<0.02
N 9354	910	900	<200	230	<1	<10	<50	<10	<0.02
N 9451	<50	300	<200	80	<1	<10	<50	<10	<0.02
N 9917	7,400	3,500	<200	110	<1	<10	<50	<10	<0.02
N 9918	<50	<50	<200	20	<1	<10	<50	<10	<0.02
N 9919	190	240	<200	110	<1	<10	<50	<10	<0.02
N 9920	850	200	<200	60	<1	<10	<50	<10	<0.02
N 9924	<50	810	<200	80	<1	<10	<50	<10	<0.02
N 9925	<50	480	<200	100	<1	<10	<50	<10	<0.02
N 9926	60	<50	<200	20	<1	<10	<50	<10	<0.02
N 9927	<50	660	<200	80	<1	<10	<50	<10	<0.02
N 9928	<50	1,250	<200	—	<1	<10	<50	<10	<0.02
N 9933	<50	<50	<200	70	<1	<10	60	<10	<0.02
N 9938	<50	110	<200	360	<1	<10	<50	<10	<0.02
N 9939	<50	950	<200	<10	<1	<10	<50	<10	<0.02

Table 5.--Inorganic trace-element concentrations in water samples from network wells (continued)

Well number	Iron, dissolved (ug/L as Fe)	Manganese, dissolved (ug/L as Mn)	Barium, dissolved (ug/L as Ba)	Boron, dissolved (ug/L as B)	Cadmium, dissovled (ug/L as Cd)	Chromium, dissolved (ug/L as Cr)	Copper, dissolved (ug/L as Cu)	Lead dissolved (ug/L as Pb)	Methylene blue active substances (mg/L)
				UNSEWERED SUBURBAN AREA					
S 24771	< 50	< 50	< 200	40	< 1	< 10	< 50	< 10	< 0.02
S 29778	60	< 50	< 200	20	1	< 10	< 50	< 10	< 0.02
S 45207	110	< 50	< 200	40	< 1	< 10	< 50	< 10	< 0.02
S 45208	2,000	210	< 200	150	< 1	< 10	< 50	< 10	< 0.02
S 45210	< 50	< 50	< 200	20	< 1	< 10	< 50	< 10	< 0.02
S 45594	110	< 50	< 200	20	< 1	< 10	< 50	< 10	< 0.02
S 46283	370	70	< 200	10	< 1	< 10	< 50	< 10	< 0.02
S 47220	110	90	< 200	< 10	< 1	< 10	< 50	< 10	< 0.02
S 48375	150	700	< 200	350	< 1	< 10	< 50	< 10	0.02
S 50513	< 50	< 50	< 200	70	< 1	< 10	< 50	< 10	< 0.02
S 64313	< 50	1,090	< 200	< 10	< 1	< 10	< 50	< 10	< 0.02
S 64314	< 50	< 50	< 200	30	< 1	< 10	< 50	< 10	< 0.02
S 64316	< 50	60	< 200	20	< 1	< 10	< 50	< 10	< 0.02
S 64318	< 50	< 50	< 200	< 10	< 1	< 10	< 50	< 10	< 0.02
S 64319	< 50	< 50	< 200	20	< 1	< 10	< 50	< 10	< 0.02
S 65602	< 50	900	< 200	80	3	< 10	< 50	< 10	< 0.02
S 65607	< 50	330	300	70	< 1	< 10	< 50	< 10	< 0.02
S 68762	< 50	< 50	< 200	60	< 1	< 10	< 50	< 10	< 0.02
S 74286	< 50	< 50	< 200	10	< 1	< 10	< 50	< 10	< 0.02
S 75456	< 50	< 50	< 200	< 10	< 1	< 10	< 50	10	< 0.02
				AGRICULTURAL AREA					
S 51566	70	< 50	< 200	90	2	< 10	< 50	< 10	< 0.02
S 51567	90	< 50	< 200	140	< 1	< 10	< 50	< 10	< 0.02
S 51568	380	90	< 200	100	< 1	< 10	< 50	< 10	< 0.02
S 51571	1,850	70	< 200	20	< 1	< 10	< 50	< 10	< 0.02
S 51572	4,300	1,500	< 200	50	< 1	< 10	< 50	< 10	< 0.02
S 51575	4,900	70	< 200	50	< 1	< 10	< 50	< 10	< 0.02
S 51576	90	90	< 200	320	< 1	< 10	< 50	20	< 0.02
S 51577	< 50	270	< 200	90	< 1	< 10	< 50	< 10	< 0.02
S 51578	820	50	< 200	30	< 1	< 10	< 50	< 10	< 0.02
S 51581	1,120	60	< 200	80	< 1	< 10	< 50	< 10	< 0.02
S 51582	< 50	< 50	< 200	80	< 1	< 10	< 50	< 10	< 0.02
S 51587	200	310	200	60	2	< 10	< 50	< 10	< 0.02
S 51588	2,750	170	< 200	260	< 1	< 10	< 50	10	< 0.02
S 51589	1,190	130	< 200	60	2	< 10	< 50	< 10	< 0.02
S 52383	200	120	< 200	50	< 1	< 10	< 50	< 10	< 0.02

Table 5.--Inorganic trace-element concentrations in water samples from network wells (continued)

Well number	Iron, dissolved (ug/L as Fe)	Manganese, dissolved (ug/L as Mn)	Barium, dissolved (ug/L as Ba)	Boron, dissolved (ug/L as B)	Cadmium, dissovled (ug/L as Cd)	Chromium, dissolved (ug/L as Cr)	Copper, dissolved (ug/L as Cu)	Lead dissolved (ug/L as Pb)	Methylene blue active substances (mg/L)
				UNDEVELOPED AREA					
S 34742	<50	<50	<200	10	<1	<10	<50	<10	<0.02
S 46544	<50	<50	<200	20	<1	<10	<50	<10	<0.02
S 47755	70	<50	<200	10	<1	<10	<50	<10	<0.02
S 48584	<50	<50	<200	10	<1	<10	<50	<10	<0.02
S 48946	4,800	<50	<200	30	<1	<10	<50	<10	<0.02
S 54886	<50	<50	<200	10	<1	<10	<50	<10	<0.02
S 73807	<50	<50	<200	10	<1	<10	<50	<10	<0.02
S 73811	<50	<50	<200	<10	<1	<10	<50	<10	<0.02
S 74293	<50	<50	<200	40	<1	<10	<50	<10	<0.02
S 74294	<50	<50	<200	<10	<1	<10	<50	<10	<0.02
S 74295	<50	<50	<200	10	<1	<10	<50	<10	<0.02
S 74301	<50	<50	<200	10	<1	<10	<50	<10	<0.02
S 74307	<50	<50	<200	10	<1	<10	<50	<10	<0.02
S 86583	<50	<50	<200	10	<1	<10	<50	<10	<0.02
S 86584	<50	<50	<200	30	<1	<10	<50	<10	<0.02

[1] The following constituents had no detections above detection limit in network wells (detection limit in parentheses): Arsenic (5 ug/L), Mercury (0.5 ug/L), Selenium (5 ug/L), and Silver (50 ug/L).

Table 6.--Volatile organic-compound concentrations in water samples from network wells

[Analyzed by Nassau County Department of Health Laboratory; < , less than; values are in micrograms per liter (µg/L); --, no data]

Well number	Benzene	Bromoform	Carbon-tetra-chloride	Chloro-benzene	Chloro-form	Bromo-di-chloro-methane	1,1-Di-chloro-ethane	Ethyl-benzene	Tetra-chloro-ethylene	Toluene	*trans*-1, 2-Di-chloro-ethylene	1,1,1-Tri-chloro-ethane	1,1,2-Tri-chloro-ethane	Tri-chloro-ethylene	Tri-chloro-fluoro-methane	Xylene
LONG-TERM SEWERED SUBURBAN AREA																
N 9057	< 3	< 2	< 1	< 3	< 1	< 1	< 5	< 4	< 1	< 3	< 9	< 1	< 2	< 1	< 1	< 6
N 9803	< 3	< 2	< 1	< 3	< 1	< 1	< 5	< 4	< 1	< 3	< 9	< 1	< 2	< 1	< 1	< 6
N 9914	< 3	< 2	< 1	< 4	< 1	< 2	< 5	< 4	< 1	< 3	< 7	< 1	< 1	< 1	< 1	< 6
N 9940	< 3	< 2	< 1	< 4	< 1	< 2	< 5	< 4	< 1	< 3	< 7	< 1	< 1	< 1	< 1	< 6
N 9941	< 3	< 2	< 1	< 4	< 1	< 2	< 5	< 4	< 1	< 3	< 7	1	< 1	< 1	< 1	< 6
N 9942	< 3	< 2	< 1	< 4	< 1	< 2	< 5	< 4	< 1	< 3	< 7	< 1	< 1	< 1	< 1	< 6
N 9943	< 3	< 2	1	< 4	< 1	< 2	< 5	< 4	< 1	< 3	< 7	< 1	< 1	4	< 1	< 6
N 9944	< 3	< 2	< 1	< 4	< 1	< 2	< 5	< 4	3	< 3	< 7	< 1	< 1	2	< 1	< 6
N 9945	< 3	< 2	< 1	< 4	< 1	< 2	< 5	< 4	< 1	< 3	< 7	< 1	< 1	< 1	< 1	< 6
N 9946	< 3	< 2	< 1	< 4	< 1	< 2	< 5	< 4	< 1	< 3	< 7	< 1	< 1	< 1	< 1	< 6
N 9947	< 3	< 2	< 1	< 3	< 1	< 1	< 5	< 4	2	< 3	< 9	< 1	< 2	< 1	< 1	< 6
N 9948	< 3	< 2	< 1	6	< 1	< 2	< 5	< 4	< 1	< 3	< 7	< 1	< 1	< 1	< 1	< 6
N 9949	< 3	< 2	< 1	< 4	< 1	< 2	< 5	< 4	25	< 3	< 7	5	< 1	4	< 1	< 6
N 9959	< 3	< 2	< 1	< 3	< 1	< 1	< 5	< 4	< 1	< 3	< 9	< 1	< 2	< 1	< 1	< 6
N 9962	< 3	< 2	< 1	< 3	< 1	< 1	< 5	< 4	< 1	< 3	< 9	< 1	< 2	< 1	< 1	< 6
N 9979	< 3	< 2	< 1	< 3	4	< 1	< 5	< 4	< 1	< 3	< 9	< 1	< 2	< 1	< 1	< 6
N 9982	< 3	< 2	< 1	< 4	< 1	< 2	< 5	< 4	< 1	< 3	< 7	< 1	< 1	< 1	< 1	< 6
N 9983	< 3	< 2	< 1	< 4	< 1	< 2	< 5	< 4	2	< 3	< 7	< 1	< 1	< 1	< 1	< 6
N 9984	< 3	< 2	< 1	< 4	< 1	< 2	< 5	< 4	< 1	< 3	< 7	2	< 1	< 1	< 1	< 6
N 10035	< 3	< 2	< 1	< 3	< 1	< 1	< 5	< 4	16	< 3	< 9	< 1	< 2	24	< 1	< 6
RECENTLY SEWERED SUBURBAN AREA																
N 1197	< 3	< 2	< 1	< 3	< 1	< 1	5	< 4	< 1	< 3	< 9	19	< 2	5	< 1	< 6
N 8888	< 3	< 2	< 1	< 3	< 1	< 1	< 5	< 4	1	< 3	< 9	5	< 2	1	< 1	< 6
N 8984	< 3	< 2	< 1	< 3	< 1	< 1	< 5	< 4	< 1	< 3	< 9	< 1	< 2	< 1	< 1	< 6
N 9078	< 3	< 2	< 1	< 3	< 1	< 1	< 5	< 4	< 1	< 3	< 9	< 1	< 2	< 1	< 1	< 6
N 9079	210	< 2	< 1	< 3	< 1	< 1	< 5	< 4	< 1	< 3	45	< 1	< 2	12	< 1	12
N 9222	< 3	< 2	< 1	< 3	< 1	< 1	< 5	< 4	< 1	< 3	< 9	3	< 2	< 1	< 1	< 6
N 9354	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
N 9451	< 3	< 2	< 1	< 3	< 1	< 1	< 5	< 4	< 1	< 3	< 9	< 1	< 2	< 1	< 1	< 6
N 9917	< 3	< 2	< 1	< 4	< 1	< 2	< 5	< 4	< 1	< 3	< 7	< 1	< 1	< 1	< 1	< 6
N 9918	< 3	< 2	< 1	< 4	< 1	< 2	< 5	< 4	< 1	< 3	< 7	2	< 1	< 1	< 1	< 6
N 9919	< 3	< 2	< 1	< 4	< 1	< 2	< 5	< 4	89	< 3	< 7	3	< 1	< 1	< 1	< 6
N 9920	< 3	< 2	< 1	< 4	< 1	< 2	< 5	< 4	< 1	< 3	< 7	2	< 1	< 1	< 1	< 6
N 9924	< 3	< 2	< 1	< 3	< 1	< 1	< 5	< 4	< 1	< 3	< 9	1	< 2	< 1	< 1	< 6
N 9925	< 3	< 2	< 1	< 4	< 1	< 2	< 5	< 4	< 1	< 3	< 7	2	< 1	< 1	< 1	< 6
N 9926	< 3	< 2	< 1	< 4	< 1	< 2	< 5	< 4	< 1	< 3	< 7	< 1	< 1	< 1	< 1	< 6
N 9927	< 3	< 2	< 1	< 4	< 1	< 2	< 5	< 4	< 1	< 3	< 7	2	< 1	< 1	< 1	< 6
N 9928	< 3	< 2	< 1	< 4	< 1	< 2	< 5	< 4	8	< 3	< 7	1	< 1	< 1	< 1	< 6
N 9933	< 3	< 2	< 1	< 3	< 1	< 1	< 5	< 4	< 1	< 3	< 9	5	< 2	< 1	< 1	< 6
N 9938	< 3	< 2	< 10	< 4	6	< 2	34	< 4	83	< 3	9	12,000	3	390	< 1	< 6
N 9939	< 3	< 2	< 1	< 4	< 1	< 2	< 5	< 4	14	< 3	12	3	< 1	3	< 1	< 6

Table 6.--Volatile organic-compound concentrations in water samples from network wells (continued)

Well number	Benzene	Bromoform	Carbon-tetra-chloride	Chloro-benzene	Chloro-form	Bromo-di-chloro-methane	1,1-Di-chloro-ethane	Ethyl-benzene	Tetra-chloro-ethylene	Toluene	*trans*-1, 2-Di-chloro-ethylene	1,1,1-Tri-chloro-ethane	1,1,2-Tri-chloro-ethane	Tri-chloro-ethylene	Tri-chloro-fluoro-methane	Xylene
							UNSEWERED SUBURBAN AREA									
S 24771	< 3	< 2	< 1	< 3	< 1	< 1	4	< 3	1	< 3	< 3	66	< 2	290	< 1	< 4
S 29778	< 3	< 2	< 1	< 3	< 1	< 1	< 4	< 3	25	< 3	< 3	32	< 2	3	3	< 4
S 45207	< 3	< 2	< 1	< 3	< 1	< 1	4	< 3	< 1	< 3	< 3	12	< 2	7	< 1	< 4
S 45208	< 3	< 1	< 1	< 4	< 1	< 1	20	< 5	< 1	< 4	< 4	28	< 1	1	< 1	< 7
S 45210	< 3	< 1	< 1	< 4	< 1	< 1	< 6	< 5	< 1	< 4	< 4	< 1	< 1	< 1	< 1	< 7
S 45594	< 3	< 2	< 1	< 3	< 1	< 1	< 4	< 3	< 1	< 3	< 3	< 1	< 2	< 1	< 1	< 4
S 46283	< 3	< 1	< 1	< 4	< 1	< 1	< 6	< 5	< 1	< 4	< 4	< 1	< 1	< 1	< 1	< 7
S 47220	< 3	< 1	< 1	< 4	< 1	< 1	< 6	< 5	< 1	< 4	< 4	3	< 1	< 1	< 1	< 7
S 48375	< 3	< 1	< 1	< 4	< 1	< 1	< 6	< 5	< 1	< 4	< 4	< 1	< 1	< 1	< 1	< 7
S 50513	< 3	< 1	< 1	< 4	< 1	< 1	< 6	< 5	< 1	< 4	< 4	11	< 1	< 1	< 1	< 7
S 64313	< 3	< 2	< 1	< 3	< 1	< 1	< 4	< 3	< 1	< 3	< 3	< 1	< 2	< 1	< 1	< 4
S 64314	< 3	< 2	< 1	< 3	< 1	< 1	< 4	< 3	< 1	< 3	< 3	< 1	< 2	< 1	< 1	< 4
S 64316	< 3	< 1	< 1	< 4	< 1	< 1	< 6	< 5	< 1	< 4	< 4	< 1	< 1	< 1	< 1	< 7
S 64318	< 3	< 1	< 1	< 4	< 1	< 1	< 6	< 5	< 1	< 4	< 4	< 1	< 1	< 1	< 1	< 7
S 64319	< 3	< 2	< 1	< 3	< 1	< 1	< 4	< 3	< 1	< 3	< 3	< 1	< 2	< 1	< 1	< 4
S 65602	< 3	< 1	< 1	< 4	< 1	< 1	< 6	< 5	< 1	< 4	< 4	4	< 1	< 1	< 1	< 7
S 65607	< 3	< 1	< 1	< 4	< 1	< 1	< 6	< 5	< 1	< 4	< 4	< 1	< 1	< 1	< 1	< 7
S 68762	< 3	< 2	< 1	< 3	< 1	< 1	< 4	< 3	< 1	< 3	< 3	4	< 2	< 1	< 1	< 4
S 74286	< 3	< 1	< 1	< 4	< 1	< 1	< 6	< 5	< 1	< 4	< 4	< 1	< 1	< 1	< 1	< 7
S 75456	< 3	< 2	< 1	< 3	< 1	< 1	< 4	< 3	< 1	< 3	< 3	< 1	< 2	< 1	< 1	< 4
							AGRICULTURAL AREA									
S 51566	< 3	< 2	< 1	< 3	< 1	< 1	< 5	< 7	< 1	< 7	< 9	< 1	< 1	< 1	< 1	< 10
S 51567	< 3	< 2	< 1	< 3	< 1	< 1	< 5	< 7	< 1	< 7	< 9	< 1	< 1	< 1	< 1	< 10
S 51568	< 3	< 2	< 1	< 3	< 1	< 1	< 5	< 7	< 1	< 7	< 9	< 1	< 1	< 1	< 1	< 10
S 51571	< 3	< 2	< 1	< 3	< 1	< 1	< 4	< 3	< 1	< 3	< 3	< 1	< 2	< 1	< 1	< 4
S 51572	< 3	< 2	< 1	< 3	< 1	< 1	< 5	< 7	< 2	< 7	< 9	< 1	< 1	< 1	< 1	< 10
S 51575	< 3	< 2	< 1	< 3	< 1	< 1	< 5	< 7	< 1	< 7	< 9	< 1	< 1	< 1	< 1	< 10
S 51576	< 3	< 2	< 1	< 3	< 1	< 1	< 5	< 7	< 2	< 7	< 9	< 1	< 1	< 1	< 1	< 10
S 51577	< 3	< 2	< 1	< 3	< 1	< 1	< 5	< 7	< 1	< 7	< 9	< 2	< 1	< 2	< 1	< 12
S 51578	< 3	< 2	< 1	< 3	< 1	< 1	< 4	< 3	< 1	< 3	< 3	< 1	< 2	< 1	< 1	< 4
S 51581	< 3	< 2	< 1	< 3	< 1	< 1	< 4	< 3	< 1	< 3	< 3	< 1	< 2	< 1	< 1	< 4
S 51582	< 3	< 2	< 1	< 3	< 1	< 1	< 4	< 3	< 1	< 3	< 3	< 1	< 2	< 1	< 1	< 4
S 51587	< 3	< 2	< 1	< 3	< 1	< 1	< 5	< 7	< 1	< 7	< 9	< 1	< 1	< 1	< 1	< 10
S 51588	< 3	< 2	< 1	< 3	< 1	< 1	< 5	< 7	< 2	< 7	< 9	< 1	< 1	< 1	< 1	< 10
S 51589	< 3	< 2	< 1	< 3	< 1	< 1	< 5	< 7	< 1	< 7	< 9	< 1	< 1	< 1	< 1	< 10
S 52383	< 3	< 2	< 1	< 3	< 1	< 1	< 5	< 7	< 1	< 3	< 9	< 1	< 1	< 1	< 1	< 10

Table 6.--Volatile organic-compound concentrations in water samples from network wells (continued)

Well number	Benzene	Bromoform	Carbon-tetrachloride	Chlorobenzene	Chloroform	Bromodichloromethane	1,1-Dichloroethane	Ethylbenzene	Tetrachloroethylene	Toluene	*trans*-1, 2-Dichloroethylene	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethylene	Trichlorofluoromethane	Xylene
								UNDEVELOPED AREA								
S 34742	< 3	< 2	< 1	< 3	1	< 1	< 5	< 7	< 1	< 3	< 9	< 1	< 1	< 1	< 1	< 10
S 46544	< 3	< 1	< 1	< 4	< 1	< 1	< 6	< 5	< 1	< 4	< 4	< 1	< 1	< 1	< 1	< 7
S 47755	< 3	< 2	< 1	< 3	< 1	< 1	< 5	< 7	< 1	< 3	< 9	< 1	< 1	< 1	< 1	< 10
S 48584	< 3	< 2	< 1	< 3	< 1	< 1	< 5	< 7	< 1	< 3	< 9	< 1	< 1	< 1	< 1	< 10
S 48946	< 3	< 2	< 1	< 3	< 1	< 1	< 5	< 7	< 1	< 3	< 9	< 1	< 1	< 1	< 1	< 10
S 54886	< 3	< 2	< 1	< 3	< 1	< 1	< 5	< 7	< 1	< 3	< 9	< 1	< 1	< 1	< 1	< 10
S 73807	< 3	< 2	< 1	< 3	< 1	< 1	< 5	< 7	< 1	< 3	< 9	< 1	< 1	< 1	< 1	< 10
S 73811	< 3	< 2	< 1	< 3	< 1	< 1	< 5	< 7	< 1	< 3	< 9	< 1	< 1	< 1	< 1	< 10
S 74293	< 3	< 2	< 1	< 3	< 1	< 1	< 5	< 7	< 1	< 3	< 9	< 1	< 1	< 1	< 1	< 10
S 74294	< 3	< 2	< 1	< 3	< 1	< 1	< 5	< 7	< 1	< 3	< 9	< 1	< 1	< 1	< 1	< 10
S 74295	< 3	< 2	< 1	< 3	< 1	< 1	< 5	< 7	< 1	< 3	< 9	< 1	< 1	< 1	< 1	< 10
S 74301	< 3	< 2	< 1	< 3	< 1	< 1	< 5	< 7	< 1	< 3	< 9	< 1	< 1	< 1	< 1	< 10
S 74307	< 3	< 1	< 1	< 4	< 1	< 1	< 6	< 5	< 1	< 4	< 4	< 1	< 1	< 1	< 1	< 7
S 86583	< 3	< 2	< 1	< 3	< 1	< 1	< 4	< 3	< 1	< 3	< 3	< 1	< 2	< 1	< 1	< 4
S 86584	< 3	< 2	< 1	< 3	< 1	< 1	< 4	< 3	< 1	< 3	< 3	< 1	< 2	< 1	< 1	< 4

Table 7A.--Volatile organic compound concentrations in duplicate water samples from 13 network wells

[Analyzed by the National Water Quality Laboratory; Values are in micrograms per liter (µg/L), < less than]

Well number	Benzene	Chloro-form	1,1-Di-chloro ethane	1,2-Di-chloro ethane	1,1-Di-chloro ethy-lene	Tetra-chloro ethy-lene	*trans*-1,2-Di-chloro ethy-lene	1,1,1-Tri-chloro ethane	1,1,2 Tri-chloro ethane	Tri-chloro ethy-lene
					LONG-TERM SEWERED SUBURBAN AREA					
N 9803	<0.2	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.6	<0.2	<0.2
N 9940	<.2	4.1	<.2	<.2	<.2	<.2	<.2	1.5	<.2	<.2
N 9941	<.2	4.3	2.5	<.2	<.2	.5	<.2	2.9	<.2	<.2
N 9982	<.2	.3	<.2	<.2	<.2	1.6	.2	<.2	<.2	.5
N10035	<.2	.5	<.2	<.2	<.2	8.6	2.4	.4	<.2	17
					RECENTLY SEWERED SUBURBAN AREA					
N 8888	<.2	1.0	1.0	<.2	<.2	1.4	<.2	3.4	<.2	.9
N 9354	<.2	<.2	<.2	<.2	<.2	.3	<.2	.7	<.2	.3
N 9924	.4	.3	<.2	<.2	<.2	.7	<.2	1.0	<.2	.2
					UNSEWERED SUBURBAN AREA					
S24771	<.2	<.2	2.0	<.2	8.3	1.6	2.2	85	1.8	120
S29778	<.2	.9	3.8	<.2	5.4	23	2.4	44	<.2	3.1
S45207	<.2	2.2	7.2	.5	3.4	.7	<.2	13	<.2	7.4
S46283	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2
S64314	<.2	2.3	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2

Table 7B.--Volatile organic compounds not detected in duplicate water samples from 13 network wells

[Analyzed by National Water Quality Laboratory; Detection limit for all constituents = 0.2 µg/L]

1,1,2,2-Tetrachloroethane	Chlorodibromomethane
1,2-Dibromoethene (EDB)	Chloroethane
1,2-Dichlorobenzene	Dichlorodiflouromethane
1,2-Dichloropropane	Ethylbenzene
1,3-Dichlorobenzene	Methyl bromide
1,3-Dichloropropane	Methyl chloride
1,4-Dichlorobenzene	Methylene chloride
2-Chloroethyl vinyl ether	Styrene
Bromodichloromethane	Toluene
Bromoform	Vinyl chloride
Carbon tetrachloride	Xylene
Chlorobenzene	*cis*-1,3-Dichloropropene

Table 8.--Organochlorine insecticide concentrations in water samples from network wells

[Values are in micrograms per liter (ug/L); all values are totals;
<, less than; --, no data]

Well number	Chlor-dane	DDD	DDE	DDT	Diel-drin	Endo-sulfan	Hepta-chlor epoxide	Lindane	Meth-oxy-chlor	Per-thane
				LONG-TERM SEWERED SUBURBAN AREA						
N 9057	0.7	<0.01	<0.01	<0.01	0.16	<0.01	0.15	<0.01	<0.01	<0.1
N 9803	<.1	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.1
N 9914	.4	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.1
N 9940	<.1	<.01	<.01	<.01	.04	<.01	.01	<.01	<.01	<.1
N 9941	<.1	<.01	<.01	<.01	.14	<.01	<.01	<.01	<.01	<.1
N 9942	.4	<.01	<.01	<.01	.39	<.01	<.01	<.01	<.01	<.1
N 9943	<.1	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.1
N 9944	<.1	<.01	<.01	<.01	.03	<.01	<.01	<.01	<.01	<.1
N 9945	<.1	<.01	<.01	<.01	.05	<.01	.02	<.01	<.01	<.1
N 9946	<.1	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.1
N 9947	<.1	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.1
N 9948	<.1	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.1
N 9949	<.1	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.1
N 9959	<.1	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.1
N 9962	1.3	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.1
N 9979	<.1	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.1
N 9982	<.1	<.01	<.01	<.01	.01	<.01	<.01	<.01	<.01	<.1
N 9983	<.1	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.1
N 9984	<.1	<.01	<.01	<.01	<.01	<.01	.03	<.01	<.01	<.1
N 10035	<.1	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.1
				RECENTLY SEWERED SUBURBAN AREA						
N 1197	.3	<.01	<.01	<.01	.14	<.01	<.01	<.01	<.01	<.1
N 8888	.2	<.01	<.01	<.01	.05	<.01	<.01	<.01	<.01	<.1
N 8984	.1	<.01	<.01	<.01	.03	<.01	<.01	<.01	<.01	<.1
N 9078	<.1	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.1
N 9079	<.1	<.01	<.01	<.01	.17	<.01	<.01	<.01	<.01	<.1
N 9222	.2	<.01	<.01	<.01	.10	<.01	<.01	<.01	<.01	<.1
N 9354	.3	<.01	<.01	<.01	.13	<.01	<.01	<.01	<.01	<.1
N 9451	1.3	<.01	<.01	<.01	.73	<.01	<.01	<.01	<.01	<.1
N 9917	<.1	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.1
N 9918	<.1	<.01	<.01	<.01	.06	<.01	.01	<.01	<.01	<.1
N 9919	.2	<.01	<.01	<.01	.02	<.01	<.01	<.01	<.01	<.1
N 9920	<.1	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.1
N 9924	.1	<.01	<.01	<.01	.04	<.01	<.01	<.01	<.01	<.1
N 9925	.5	<.01	<.01	<.01	.09	<.01	.03	<.01	<.01	<.1
N 9926	<.1	<.01	<.01	<.01	.02	<.01	.01	<.01	<.01	<.1
N 9927	.4	<.01	<.01	<.01	.07	<.01	.27	<.01	<.01	<.1
N 9928	<.1	<.01	<.01	<.01	.05	<.01	<.04	<.01	<.01	<.1
N 9933	1.1	<.01	<.01	<.01	.18	<.01	<.01	<.01	<.01	<.1
N 9938	<.1	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.1
N 9939	.2	<.01	<.01	<.01	.30	<.01	.09	<.01	<.01	<.1
				UNSEWERED SUBURBAN AREA						
S 24771	<.1	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.1
S 29778	<.1	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.1
S 45207	<.1	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.1
S 45208	.3	<.01	<.01	<.01	.38	<.01	<.01	--	<.01	<.1
S 45210	<.1	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.1

Table 8.--Organochlorine insecticide concentrations in water samples from network wells (continued)

Well number	Chlordane	DDD	DDE	DDT	Dieldrin	Endosulfan	Heptachlor epoxide	Lindane	Methoxychlor	Perthane
UNSEWERED SUBURBAN AREA (cont'd)										
S 45594	<.1	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.1
S 46283	<.1	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.1
S 47220	<.1	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.1
S 48375	<.1	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.1
S 50513	.1	<.01	<.01	<.01	.01	<.01	<.01	<.01	<.01	<.1
S 64313	<.1	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.1
S 64314	<.1	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.1
S 64316	<.1	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.1
S 64318	<.1	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.1
S 64319	<.1	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.1
S 65602	<.1	<.01	<.01	<.01	.05	<.01	.03	<.01	<.01	<.1
S 65607	.1	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.1
S 68762	<.1	<.01	<.01	<.01	.03	<.01	<.01	<.01	<.01	<.1
S 74286	<.1	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.1
S 75456	<.1	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.1
AGRICULTURAL AREA										
S 51566	<.1	<.01	.01	<.01	<.01	.01	.01	<.01	<.01	<.1
S 51567	<.1	<.01	<.01	<.01	<.01	<.01	.01	<.01	<.01	<.1
S 51568	<.1	.01	<.01	<.01	.01	.08	<.01	<.01	<.01	<.1
S 51571	<.1	<.01	<.01	<.01	<.01	<.01	.01	<.01	<.01	<.1
S 51572	<.1	<.01	<.01	<.01	.01	.04	<.01	.04	<.01	.1
S 51575	<.1	.25	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.1
S 51576	--	--	--	--	--	--	--	--	--	--
S 51577	<.1	<.01	<.01	<.01	<.01	<.01	.01	<.01	<.01	<.1
S 51578	<.1	<.01	<.01	<.01	<.01	<.01	.01	<.01	<.01	<.1
S 51581	<.1	<.01	<.01	<.01	<.01	<.01	.01	<.01	<.01	<.1
S 51582	<.1	.02	.01	<.01	<.01	<.01	<.01	<.01	.01	<.1
S 51587	<.1	.01	.01	.02	<.01	<.01	<.01	<.01	.02	<.1
S 51588	<.1	.02	<.01	<.01	.01	1.10	<.01	.01	<.01	<.1
S 51589	<.1	<.01	<.01	<.01	.02	.44	<.01	<.01	<.01	<.1
S 52383	<.1	<.01	<.01	<.01	.01	<.01	.01	<.01	<.01	<.1
UNDEVELOPED AREA										
S 34742	<.1	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.1
S 46544	<.1	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.1
S 47755	<.1	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.1
S 48584	<.1	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.1
S 48946	<.1	<.01	<.01	<.01	<.01	.03	<.01	<.01	<.01	<.1
S 54886	<.1	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.1
S 73807	<.1	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.1
S 73811	<.1	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.1
S 74293	<.1	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.1
S 74294	<.1	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.1
S 74295	<.1	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.1
S 74301	<.1	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.1
S 74307	<.1	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.1
S 86583	<.1	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.1
S 86584	<.1	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.1

Table 9A.--Chlorophenoxy-acid herbicide, triazine herbicide, and organophosphorus insecticide concentrations in water samples from network wells

[Values are in micrograms per liter (ug/L); <, less than; --, no data]

Well number	Chlorophenoxy acid herbicides		Triazine herbicides			Organophosphorus insecticides	
	2,4-D	Silvex	Atrazine	Prometone	Simazine	Diazinon	Ethion
			LONG-TERM SEWERED SUBURBAN AREA				
N 9057	<0.01	<0.01	<0.1	<0.1	0.1	<0.01	<0.01
N 9803	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
N 9914	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
N 9940	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
N 9941	<0.01	<0.01	<0.1	<0.1	0.1	<0.01	<0.01
N 9942	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
N 9943	<0.01	<0.01	0.7	<0.1	<0.1	<0.01	<0.01
N 9944	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
N 9945	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
N 9946	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
N 9947	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
N 9948	<0.01	<0.01	<0.1	<0.1	<0.1	--	--
N 9949	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
N 9959	0.02	0.01	<0.1	<0.1	<0.1	<0.01	<0.01
N 9962	<0.01	<0.01	0.2	<0.1	9.6	<0.01	<0.01
N 9979	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
N 9982	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
N 9983	<0.01	<0.01	<0.1	<0.1	<0.1	--	--
N 9984	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
N 10035	<0.01	<0.01	<0.1	<0.1	0.1	<0.01	<0.01
			RECENTLY SEWERED SUBURBAN AREA				
N 1197	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
N 8888	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
N 8984	<0.01	<0.01	<0.1	0.1	<0.1	0.05	<0.01
N 9078	<0.01	<0.01	<0.1	<0.1	1.3	<0.01	<0.01
N 9079	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
N 9222	<0.01	<0.01	<0.1	<0.1	0.1	<0.01	<0.01
N 9354	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
N 9451	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
N 9917	0.03	<0.01	<0.1	<0.1	0.1	<0.01	<0.01
N 9918	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
N 9919	<0.01	<0.01	0.1	<0.1	0.2	<0.01	<0.01
N 9920	--	--	<0.1	<0.1	<0.1	<0.01	<0.01
N 9924	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
N 9925	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
N 9926	--	--	<0.1	<0.1	<0.1	<0.01	<0.01
N 9927	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
N 9928	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
N 9933	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
N 9938	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
N 9939	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
			UNSEWERED SUBURBAN AREA				
S 24771	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
S 29778	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
S 45207	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
S 45208	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
S 45210	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01

Table 9A.--Chlorophenoxy-acid herbicide, triazine herbicide, and organophosphorus insecticide concentrations in water samples from network wells (continued)

Well number	Chlorophenoxy acid herbicides		Triazine Herbicides			Organophosphorus insecticides	
	2,4-D	Silvex	Atrazine	Prometone	Simazine	Diazinon	Ethion
			UNSEWERED SUBURBAN AREA (cont'd)				
S 45594	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
S 46283	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
S 47220	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
S 48375	0.01	<0.01	<0.1	0.1	<0.1	0.08	<0.01
S 50513	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
S 64313	<0.01	<0.01	<0.1	0.1	0.1	0.13	<0.01
S 64314	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
S 64316	<0.01	<0.01	0.1	<0.1	<0.1	<0.01	<0.01
S 64318	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
S 64319	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
S 65602	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
S 65607	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
S 68762	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
S 74286	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
S 75456	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
			AGRICULTURAL AREA				
S 51566	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
S 51567	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
S 51568	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
S 51571	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
S 51572	0.15	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
S 51575	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
S 51576	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
S 51577	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
S 51578	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
S 51581	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
S 51582	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	0.02
S 51587	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
S 51588	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
S 51589	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
S 52383	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
			UNDEVELOPED AREA				
S 34742	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
S 46544	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
S 47755	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
S 48584	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
S 48946	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
S 54886	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
S 73807	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
S 73811	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
S 74293	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
S 74294	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
S 74295	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
S 74301	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
S 74307	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
S 86583	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01
S 86584	<0.01	<0.01	<0.1	<0.1	<0.1	<0.01	<0.01

Table 9B.--Chlorophenoxy-acid herbicides, triazine herbicides, organophosphorus insecticides, organochlorine insecticides, and carbamate insecticides not detected in water samples from network wells

[Detection limits are in micrograms per liter]

Constituent	Detection Limit
CHLOROPHENOXY ACID HERBICIDES	
2,4-DP	0.01
2,4,5-T	.01
TRIAZINE HERBICIDES	
Alachlor	.1
Ametryne	.1
Cyanazine	.1
Metolachlor	.1
Metribuzin	.1
Prometryne	.1
Propazine	.1
Simetryne	.1
Trifluralin	.1
ORGANOPHOSPHORUS INSECTICIDES	
Malathion	.01
Methyl parathion	.01
Methyl trithion	.01
Parathion	.01
Total trithion	.01
ORGANOCHLORINE INSECTICIDES	
Aldrin	.01
Endrin	.01
Polychlorinated biphenyls (PCB)	.1
Polychlorinated naphthalenes (PCN)	.1
Heptachlor	.01
Mirex	.01
Toxaphene	1.0
CARBAMATE INSECTICIDES	
Aldicarb	1.0
3-Hydroxycarbofuran	1.0
Carbaryl	1.0
Methomyl	1.0

Table 10.--Carbamate insecticide concentrations in water samples from network wells

[Values are in micrograms per liter (ug/L)

Well number	Aldicarb sulfoxide	Aldicarb sulfone	Carbofuran	Oxyamyl
	LONG-TERM SEWERED SUBURBAN AREA			
N 9057	<1.0	<1.0	<1.0	<1.0
N 9803	<1.0	<1.0	<1.0	<1.0
N 9914	<1.0	<1.0	<1.0	<1.0
N 9940	<1.0	<1.0	<1.0	<1.0
N 9941	<1.0	<1.0	<1.0	<1.0
N 9942	<1.0	<1.0	<1.0	<1.0
N 9943	<1.0	<1.0	<1.0	<1.0
N 9944	<1.0	<1.0	<1.0	<1.0
N 9945	<1.0	<1.0	<1.0	<1.0
N 9946	<1.0	<1.0	<1.0	<1.0
N 9947	<1.0	<1.0	<1.0	<1.0
N 9948	<1.0	<1.0	<1.0	<1.0
N 9949	<1.0	<1.0	<1.0	<1.0
N 9959	<1.0	<1.0	<1.0	<1.0
N 9962	<1.0	<1.0	<1.0	<1.0
N 9979	<1.0	<1.0	<1.0	<1.0
N 9982	<1.0	<1.0	<1.0	<1.0
N 9983	<1.0	<1.0	<1.0	<1.0
N 9984	<1.0	<1.0	<1.0	<1.0
N 10035	<1.0	<1.0	<1.0	<1.0
	RECENTLY SEWERED SUBURBAN AREA			
N 1197	<1.0	<1.0	<1.0	<1.0
N 8888	<1.0	<1.0	<1.0	<1.0
N 8984	<1.0	<1.0	<1.0	<1.0
N 9078	<1.0	<1.0	<1.0	<1.0
N 9079	<1.0	<1.0	<1.0	<1.0
N 9222	<1.0	<1.0	<1.0	<1.0
N 9354	<1.0	<1.0	<1.0	<1.0
N 9451	<1.0	<1.0	<1.0	<1.0
N 9917	<1.0	<1.0	<1.0	<1.0
N 9918	<1.0	<1.0	<1.0	<1.0
N 9919	<1.0	<1.0	<1.0	<1.0
N 9920	<1.0	<1.0	<1.0	<1.0
N 9924	<1.0	<1.0	<1.0	<1.0
N 9925	<1.0	<1.0	<1.0	<1.0
N 9926	<1.0	<1.0	<1.0	<1.0
N 9927	<1.0	<1.0	<1.0	<1.0
N 9928	<1.0	<1.0	<1.0	<1.0
N 9933	<1.0	<1.0	<1.0	<1.0
N 9938	<1.0	<1.0	<1.0	<1.0
N 9939	<1.0	<1.0	<1.0	<1.0

Table 10.--Carbamate insecticide concentrations in water samples from network wells (continued)

Well number	Aldicarb sulfoxide	Aldicarb sulfone	Carbofuran	Oxyamyl
		UNSEWERED SUBURBAN AREA		
S 24771	<1.0	<1.0	<1.0	<1.0
S 29778	<1.0	<1.0	<1.0	<1.0
S 45207	<1.0	<1.0	<1.0	<1.0
S 45208	<1.0	<1.0	<1.0	<1.0
S 45210	<1.0	<1.0	<1.0	<1.0
S 45594	<1.0	<1.0	<1.0	<1.0
S 46283	<1.0	<1.0	<1.0	<1.0
S 47220	<1.0	<1.0	<1.0	<1.0
S 48375	<1.0	<1.0	1.0	<1.0
S 50513	<1.0	<1.0	<1.0	<1.0
S 64313	<1.0	<1.0	<1.0	<1.0
S 64314	<1.0	<1.0	<1.0	<1.0
S 64316	<1.0	<1.0	<1.0	<1.0
S 64318	<1.0	<1.0	<1.0	<1.0
S 64319	<1.0	<1.0	<1.0	<1.0
S 65602	<1.0	<1.0	<1.0	<1.0
S 65607	<1.0	<1.0	<1.0	<1.0
S 68762	<1.0	<1.0	<1.0	<1.0
S 74286	<1.0	<1.0	<1.0	<1.0
S 75456	<1.0	<1.0	<1.0	<1.0
		AGRICULTURAL AREA		
S 51566	22	20	7.0	<1.0
S 51567	19	24	2.0	<1.0
S 51568	26	32	7.0	<1.0
S 51571	18	23	4.0	<1.0
S 51572	<1.0	<1.0	<1.0	<1.0
S 51575	<1.0	<1.0	<1.0	<1.0
S 51576	6.0	6.0	5.0	<1.0
S 51577	43	61	10	<1.0
S 51578	<1.0	<1.0	<1.0	<1.0
S 51581	11	14	2.0	<1.0
S 51582	13	12	7.0	<1.0
S 51587	4.0	2.0	<1.0	7.0
S 51588	6.0	10	3.0	<1.0
S 51589	<1.0	<1.0	<1.0	<1.0
S 52383	<1.0	<1.0	<1.0	<1.0
		UNDEVELOPED AREA		
S 34742	<1.0	<1.0	<1.0	<1.0
S 46544	<1.0	<1.0	<1.0	<1.0
S 47755	<1.0	<1.0	<1.0	<1.0
S 48584	<1.0	<1.0	<1.0	<1.0
S 48946	1.0	2.0	1.0	<1.0
S 54886	<1.0	<1.0	<1.0	<1.0
S 73807	<1.0	<1.0	<1.0	<1.0
S 73811	<1.0	<1.0	<1.0	<1.0
S 74293	<1.0	<1.0	<1.0	<1.0
S 74294	<1.0	<1.0	<1.0	<1.0
S 74295	<1.0	<1.0	<1.0	<1.0
S 74301	<1.0	<1.0	<1.0	<1.0
S 74307	<1.0	<1.0	<1.0	<1.0
S 86583	<1.0	<1.0	<1.0	<1.0
S 86584	<1.0	<1.0	<1.0	<1.0

Table 11A.--Semivolatile organic compound concentrations in water samples from 24 resampled network wells

[Analyzed by the National Water Quality Laboratory; values are in micrograms per liter; <, less than; well locations shown in fig. 3]

Well number	Date resampled	Di-n-octyl-phthalate	*bis* (2-ethyl-hexyl) phthalate	Naph-thalene
		LONG-TERM SEWERED SUBURBAN AREA		
N 9914	03-31-88	<10	<5.0	<5.0
N 9940	05-10-88	<10	<5.0	<5.0
N 9941	06-02-88	<10	<5.0	<5.0
N 9942	04-06-88	<10	<5.0	<5.0
N 9943	06-03-88	<10	<5.0	<5.0
N 9944	06-08-88	<10	<5.0	<5.0
N 9945	04-07-88	<10	<5.0	<5.0
N 9946	03-31-88	<10	<5.0	<5.0
N 9948	06-07-88	<10	5.0	<5.0
N 9949	06-06-88	<10	<5.0	<5.0
N 9982	04-06-88	<10	<5.0	<5.0
N 9983	06-09-88	<10	<5.0	<5.0
N 9984	07-26-88	<10	<5.0	<5.0
		RECENTLY SEWERED SUBURBAN AREA		
N 9919	07-26-88	<10	<21	<5.0
N 9079	11-28-88	<10	6.0	35
		UNSEWERED SUBURBAN AREA		
S 45594	04-07-88	<10	<5.0	<5.0
S 47220	06-13-88	15	27	<5.0
S 65602	06-14-88	23	<5.0	<5.0
S 50513	06-10-88	<10	<5.0	<5.0
S 68762	06-15-88	<10	<5.0	<5.0
		AGRICULTURAL AREA		
S 51571	05-09-88	<10	<5.0	<5.0
S 51575	05-10-88	<10	12	<5.0
S 51581	05-09-88	<10	<5.0	<5.0
S 51589	04-19-88	<10	<5.0	<5.0
		UNDEVELOPED AREA		
S 74301	06-16-88	<10	<5.0	<5.0

Table 11B.--Semivolatile organic compounds not detected in water samples from 24 resampled network wells

[Analyses by the National Water Quality Laboratory. All values are in micrograms per liter]

Constituent	Detection Limit
1,2,4-Trichlorobenzene	5.0
1,2,5,6-Dibenzanthracene	10.0
1,2-Dichlorobenzene	5.0
1,3-Dichlorobenzene	5.0
1,4-Dichlorobenzene	5.0
2,4,6-Trichlorophenol	20.0
2,4-Dichlorophenol	5.0
2,4-Dimethylphenol	5.0
2,4-Dinitrophenol	20.0
2,4-Dinitrotoluene	5.0
2,6-Dinitrotoluene	5.0
2-Chloronaphthalene	5.0
2-Chlorophenol	5.0
2-Methyl-4,6-dinitrophenol	30.0
2-Nitrophenol	5.0
4-Bromophenylphenylether	5.0
4-Chloro-3-methylphenol	30.0
4-Chlorophenylphenylether	5.0
4-Nitrophenol	30.0
Acenaphthene	5.0
Acenapthylene	5.0
Anthracene	5.0
Benzo(a)anthracene	5.0
Benzo(a)pyrene	10.0
Benzo(b)fluoranthene	10.0
Benzo(ghi)perylene	10.0
Benzo(k)fluoranthene	10.0
Chrysene	10.0
Dimethylphthalate	5.0
Di-*n*-butyl phthalate	5.0
Diethylphthalate	5.0
Fluoranthene	5.0
Fluorene	5.0
Hexachlorobenzene	5.0
Hexachlorobutadiene	5.0
Hexachlorocyclopentadiene	5.0
Hexachloroethane	5.0
Indeno(1,2,3-cd)pyrene	10.0
Isophorone	5.0
N-Nitrosodi-*n*-Propylamine	5.0
N-Nitrosodimethylamine	5.0
N-Nitrosodiphenylamine	5.0
Nitrobenzene	5.0
Pentachlorophenol	30.0
Phenanthrene	5.0
Phenol(C6H-5OH)	5.0
Pyrene	5.0
bis(2-Chloroethoxy)methane	5.0
bis(2-Chloroethyl)ether	5.0
bis(2-Chloroisopropyl)ether	5.0
n-Butylbenzylphthalate	5.0

Table 12A.--Major inorganic-ion concentrations and field constituent values in water samples from wells sampled monthly

[Analyzed by the Nassau County Department of Health Laboratory; mg/L, milligrams per liter; µS/cm, microsiemens per centimeter at 25 degrees Celsius; deg C, degrees Celsius; --, no data; well locations shown in fig. 3]

Monthly well	Date sampled	Silica, total, (mg/L-SiO_2)	Calcium dissolved (mg/L as Ca)	Magnesium, dissolved (mg/L as Mg)	Sodium, dissolved (mg/L as Na)	Potassium, dissolved (mg/L as K)	Alkalinity (lab, mg/L as $CaCO_3$)	Sulfate (mg/L as SO_4)	Chloride, dissolved (mg/L as Cl)	Fluoride, total (mg/L as F)
					LONG-TERM SEWERED SUBURBAN AREA					
N 9984	09-02-87	13.5	22.8	2.6	21	2.5	12	27	33.4	<0.2
	01-29-88	12.9	26.7	2.7	25	2.9	12	33	42.1	<.2
	02-23-88	12.9	27.5	3.0	24	--	14	33	48.5	<.2
	03-29-88	12.6	34.8	3.0	30	3.0	16	29	57.6	<.2
	04-25-88	12.5	25.3	2.3	33	3.0	12	31	52.1	--
	05-26-88	12.2	19.5	2.3	31	2.7	14	28	44.5	--
	06-27-88	12.1	21.9	2.6	33	2.8	19	24	51.0	--
	07-26-88	12.2	19.2	2.3	31	2.8	13	27	42.7	<.2
	08-31-88	12.0	21.7	2.3	29	2.7	13	29	44.0	<.2
	09-29-88	12.1	21.9	2.3	30	2.6	10	29	43.5	<.2
	10-27-88	12.2	19.5	2.4	28	2.6	15	32	41.2	<.2
	11-28-88	12.3	21.1	2.3	27	2.5	16	25	48.8	<.2
	12-20-88	11.5	19.0	2.3	24	2.7	17	24	38.3	<.2
					RECENTLY SEWERED SUBURBAN AREA					
N 9939	09-16-87	11.4	12.0	3.2	14	4.0	2	26	20.5	<.2
	10-28-87	11.0	13.7	2.9	19	4.2	5	26	20.5	<.2
	11-23-87	12.0	11.5	3.2	18	4.1	5	25	22.7	<.2
	01-11-88	11.8	15.7	3.1	14	4.4	7	25	22.5	<.2
	01-29-88	11.3	14.1	3.0	17	4.5	2	27	21.5	<.2
	02-23-88	11.6	14.9	3.1	17	--	2	28	22.5	<.2
	03-29-88	11.7	15.4	3.1	17	4.2	3	28	22.3	<.2
	04-25-88	11.4	13.1	2.8	17	4.4	4	26	23.2	--
	05-25-88	11.5	12.7	3.1	15	4.1	4	25	22.7	--
	06-27-88	11.4	12.9	3.1	18	4.1	6	27	20.8	--
	07-28-88	11.4	13.1	3.3	17	4.4	4	27	21.0	<.2
	08-31-88	11.6	13.9	3.0	18	4.4	5	29	23.3	<.2
	09-29-88	11.8	13.1	3.2	19	4.3	2	30	21.4	<.2
	10-27-88	11.9	12.2	3.0	17	4.1	4	33	21.7	<.2
	11-28-88	11.1	13.2	3.0	17	4.1	5	25	25.4	<.2
	12-20-88	11.1	12.1	3.1	17	4.6	4	33	21.8	<.2

Table 12A.--Major inorganic-ion concentrations and field constituent values in water samples from wells sampled monthly (continued)

Monthly well	Date sampled	Silica, total, (mg/L-SiO_2)	Calcium dis-solved (mg/L as Ca)	Magne-sium, dis-solved (mg/L as Mg)	Sodium, dis-solved (mg/L as Na)	Potas-sium, dis-solved (mg/L as K)	Alka-linity (lab, mg/L as $CaCO_3$)	Sulfate (mg/L as SO_4)	Chloride, dissolved (mg/L as Cl)	Fluoride, total (mg/L as F)
					UNSEWERED SUBURBAN AREA					
S 50513	07-16-87	12.1	11.2	4.5	17	3.5	7	27	25.3	<.2
	08-26-87	11.4	13.4	4.6	18	3.5	7	23	24.6	<.2
	09-28-87	11.8	12.7	4.2	18	3.6	6	22	29.0	<.2
	10-30-87	11.0	14.0	4.1	19	3.5	6	23	26.0	<.2
	11-23-87	12.2	11.0	4.3	19	3.6	6	22	26.0	<.2
	01-11-88	10.6	15.8	4.3	16	3.5	7	20	24.5	<.2
	01-28-88	11.7	14.4	4.1	19	3.9	8	25	23.8	<.2
	02-24-88	11.9	14.8	--	17	--	7	21	22.5	<.2
	03-30-88	11.8	15.3	3.7	19	3.3	6	21	21.0	<.2
	04-26-88	11.7	12.6	3.3	19	3.5	8	22	21.0	--
	05-31-88	10.9	12.9	3.8	19	3.6	6	22	22.2	--
	06-29-88	11.5	13.2	3.9	18	3.2	10	24	21.5	--
	07-28-88	11.7	12.7	3.9	16	3.4	6	24	22.3	<.2
	09-07-88	12.0	13.2	3.7	16	3.3	6	23	25.8	<.2
	09-29-88	11.9	12.4	3.8	18	3.2	3	26	20.7	<.2
	10-26-88	11.7	12.1	3.8	18	3.2	10	30	27.1	<.2
	11-29-88	11.5	13.1	3.6	19	3.3	7	22	28.8	<.2
	12-20-88	11.0	9.2	3.0	18	3.2	6	30	20.4	<.2
					AGRICULTURAL AREA					
S 51566	06-17-87	10.5	77.0	12.6	10	4.4	9	140	33.7	<.2
	07-23-87	10.7	75.2	12.2	9.0	4.7	8	117	37.0	<.2
	08-20-87	10.3	22.0	7.5	9.0	4.0	9	130	37.6	<.2
	09-24-87	10.4	71.0	12.5	12	5.2	9	130	35.1	<.2
	10-29-87	9.5	71.0	12.5	12	5.0	9	120	32.5	<.2
	11-24-87	10.7	59.3	13.2	11	4.6	9	120	33.6	<.2
	01-12-88	10.2	94.0	14.3	8.0	4.2	10	126	33.8	<.2
	01-28-88	10.7	83.0	13.9	11	4.6	9	130	33.9	<.2
	02-24-88	10.6	86.2	--	10	--	9	129	35.6	<.2
	03-30-88	10.6	35.9	13.4	11	4.8	9	137	34.5	<.2
	04-26-88	10.4	80.0	12.8	13	4.9	9	134	32.6	--
	05-31-88	9.6	78.0	13.0	10	5.0	10	130	32.7	--
	06-28-88	10.4	23.0	12.8	11	4.8	11	158	31.3	--
	07-27-88	10.4	39.5	13.0	10	5.2	9	133	30.8	<.2
	09-01-88	10.6	81.0	13.3	11	5.1	11	134	35.9	<.2

Table 12A.--Major inorganic-ion concentrations and field constituent values in water samples from wells sampled monthly (continued)

Monthly well	Date sampled	Silica, total, (mg/L-SiO_2)	Calcium, dissolved (mg/L as Ca)	Magnesium, dissolved (mg/L as Mg)	Sodium, dissolved (mg/L as Na)	Potassium, dissolved (mg/L as K)	Alkalinity (lab, mg/L as $CaCO_3$)	Sulfate (mg/L as SO_4)	Chloride, dissolved (mg/L as Cl)	Fluoride, total (mg/L as F)
					AGRICULTURAL AREA (cont'd)					
	09-29-88	10.7	74.0	14.5	12	5.5	8	141	37.4	<.2
	10-26-88	10.8	79.5	13.8	12	5.5	10	144	34.8	<.2
	11-29-88	10.8	84.5	14.3	11	5.2	9	127	38.1	<.2
	12-21-88	10.4	80.5	14.5	11	5.0	9	160	35.6	<.2
					UNDEVELOPED AREA					
S 74294	06-24-87	5.4	1.9	0.3	33	0.8	15	10	44.7	<.2
	08-25-87	4.8	1.7	0.3	35	0.6	13	9	44.4	<.2
	09-24-87	4.9	2.0	0.2	41	0.7	10	8	53.3	<.2
	10-29-87	4.6	2.5	<.1	51	0.8	9	11	68.5	<.2
	11-24-87	5.2	3.8	0.8	66	1.4	6	8	113	<.2
	01-12-88	5.9	12.2	2.4	118	2.0	6	10	196	<.2
	01-28-88	6.0	11.5	2.2	115	2.2	5	20	190	<.2
	02-24-88	6.0	13.3	2.7	112	--	6	22	210	<.2
	03-30-88	5.6	24.6	2.3	97	1.6	5	22	147	<.2
	04-26-88	4.5	1.5	0.4	32	0.6	7	31	18.8	--
	05-31-88	4.1	1.1	0.2	21	0.5	8	19	16.8	--
	06-28-88	3.9	2.1	0.6	27	0.5	7	12	34.7	--
	07-27-88	4.1	5.7	1.4	48	1.1	5	7	81.5	<.2
	09-01-88	4.5	6.8	1.7	61	1.3	9	9	106	<.2
	09-27-88	4.8	5.8	1.7	75	1.5	4	10	124	<.2
	10-26-88	5.1	8.3	1.8	105	1.7	9	19	174	<.2
	11-29-88	4.6	10.5	2.2	82	1.5	6	13	142	<.2
	12-21-88	4.1	5.3	1.3	62	1.2	14	14	84.8	<.2

Table 12A.--Major inorganic-ion concentrations and field constituent values in water samples from wells sampled monthly (continued)

Monthly well	Date sampled	Nitrogen, nitrate total (mg/L as N)	Nitrogen, nitrite total (mg/L as N)	Nitrogen, ammonia total (mg/L as N)	Phosphorus, total (mg/L as P)	Phosphorus, ortho, total (mg/L as P)	Total dissolved solids (mg/L)	Hardness, total (mg/L as Ca CO3)	Specific conductance (field, µS/cm)	pH (field, standard units)	Water temperature (field, deg. C)	Dissolved oxygen (field, mg/L)
					LONG-TERM SEWERED SUBURBAN AREA							
N 9984	09-02-87	6.45	0.001	<.01	0.08	0.01	159	68	276	5.58	14.7	9.4
	01-29-88	6.92	0.001	<.01	0.01	<.01	183	78	307	5.63	13.7	9.0
	02-23-88	5.76	<.001	<.01	0.03	<.01	187	81	314	5.53	14.1	8.8
	03-29-88	6.69	0.002	<.01	0.04	<.01	209	99	344	5.59	14.1	8.8
	04-25-88	6.69	<.001	<.01	0.01	<.01	196	73	330	5.64	14.3	8.8
	05-26-88	5.91	0.002	<.01	0.01	<.01	175	58	307	5.71	14.7	8.4
	06-27-88	6.83	<.001	<.01	0.02	<.01	189	65	318	5.59	14.8	8.8
	07-26-88	6.82	<.001	<.01	0.02	<.01	175	57	316	5.85	15.3	8.4
	08-31-88	7.05	<.001	<.01	0.01	<.01	180	64	307	5.76	14.7	9.0
	09-29-88	6.72	0.002	<.01	0.11	<.01	178	64	304	5.67	14.4	8.8
	10-27-88	6.11	0.001	<.01	0.03	<.01	174	59	282	5.68	13.8	8.6
	11-28-88	5.93	0.001	<.01	0.02	0.01	175	62	284	5.77	14.0	8.4
	12-20-88	5.50	<.001	<.01	0.01	<.01	157	57	271	5.85	13.8	8.4
					RECENTLY SEWERED SUBURBAN AREA							
N 9939	09-16-87	8.95	<.001	<.01	0.01	<.01	133	43	222	4.90	14.4	5.6
	10-28-87	8.55	<.001	<.01	0.02	<.01	139	46	219	5.17	14.1	5.7
	11-23-87	8.54	<.001	<.01	0.02	<.01	138	42	211	5.32	14.0	5.8
	01-11-88	6.70	<.001	<.01	0.14	<.01	132	52	219	5.44	13.6	6.2
	01-29-88	5.68	<.001	<.01	0.01	<.01	126	48	213	5.02	13.4	6.2
	02-23-88	7.65	<.001	<.01	0.05	<.01	138	50	226	4.74	14.0	6.2
	03-29-88	8.13	<.001	<.01	0.06	<.01	141	51	226	4.94	14.1	6.4
	04-25-88	8.12	<.001	<.01	0.05	<.01	137	44	222	4.94	14.1	6.2
	05-25-88	7.36	<.001	<.01	0.01	<.01	130	44	227	5.07	14.0	6.4
	06-27-88	6.93	<.001	<.01	<.01	<.01	133	45	229	4.61	14.7	6.4
	07-28-88	7.17	<.001	0.07	0.03	<.01	133	46	230	5.25	14.7	5.8
	08-31-88	6.79	<.001	<.01	0.01	<.01	137	47	226	5.05	14.6	5.4
	09-29-88	7.50	0.001	<.01	0.16	<.01	139	46	223	5.03	14.0	5.6
	10-27-88	7.02	0.001	<.01	0.03	0.03	137	43	210	5.00	14.0	6.2
	11-28-88	6.71	<.001	<.01	0.02	<.01	132	45	195	5.14	13.9	6.6
	12-20-88	7.75	0.001	<.01	0.01	<.01	140	43	221	5.16	13.8	6.6

Table 12A.--Major inorganic-ion concentrations and field constituent values in water samples from wells sampled monthly (continued)

Monthly well	Date sampled	Nitrogen, nitrate total (mg/L as N)	Nitrogen, nitrite total (mg/L as N)	Nitrogen, ammonia total (mg/L as N)	Phosphorus, total (mg/L as P)	Phosphorus, ortho, total (mg/L as P)	Total dissolved solids (mg/L)	Hardness, total (mg/L as $CaCO_3$)	Specific conductance (field, µS/cm)	pH (field, standard units)	Water temperature (field deg. C)	Dissolved oxygen (field mg/L)
					UNSEWERED SUBURBAN AREA							
S 50513	07-16-87	8.32	0.003	<.01	0.03	<.01	142	46	230	5.57	12.9	8.6
	08-26-87	8.87	<.001	<.01	0.02	<.01	142	52	231	5.39	12.8	10.4
	09-28-87	7.52	<.001	<.01	0.04	<.01	138	49	234	5.43	12.6	9.0
	10-30-87	8.10	<.001	<.01	<.01	<.01	140	52	220	5.53	12.0	8.8
	11-23-87	8.71	<.001	<.01	0.05	<.01	140	45	219	5.62	11.8	8.8
	01-11-88	7.80	<.001	<.01	0.07	<.01	134	57	223	5.67	11.6	8.8
	01-28-88	7.00	<.001	<.01	--	<.01	138	53	219	5.50	11.6	9.0
	02-24-88	8.83	<.001	<.01	<.01	<.01	148	88	220	5.16	11.8	8.8
	03-30-88	9.24	<.001	<.01	0.04	<.01	140	53	224	5.31	11.7	9.2
	04-26-88	10.0	<.001	<.01	0.01	<.01	144	45	217	5.19	12.5	8.8
	05-31-88	8.12	0.002	0.01	<.01	<.01	134	48	241	5.17	13.5	9.0
	06-29-88	7.81	<.001	<.01	0.01	<.01	136	49	213	5.18	12.6	9.0
	07-28-88	7.08	<.001	<.01	0.07	<.01	129	48	222	5.50	13.1	8.6
	09-07-88	6.69	<.001	<.01	0.13	<.01	132	48	207	5.42	12.1	9.0
	09-29-88	6.74	0.001	<.01	0.02	<.01	128	47	211	5.38	12.2	8.8
	10-26-88	5.84	0.001	<.01	0.03	<.01	138	46	219	5.41	11.9	9.0
	11-29-88	5.36	<.001	<.01	0.02	<.01	129	48	218	5.42	11.5	9.0
	12-20-88	4.40	0.006	<.01	0.01	<.01	118	35	190	5.60	11.6	9.0
					AGRICULTURAL AREA							
S 51566	06-17-87	18.0	0.002	<.01	<.01	<.01	373	244	544	5.85	12.1	9.4
	07-23-87	19.0	0.002	<.01	<.01	<.01	355	238	599	5.78	12.3	9.4
	08-20-87	14.0	<.001	0.01	<.01	<.01	289	86	572	6.03	12.3	9.6
	09-24-87	18.0	<.001	<.01	<.01	<.01	361	229	553	5.95	11.9	10.4
	10-29-87	17.2	<.001	<.01	<.01	<.01	344	229	560	6.20	11.6	10.0
	11-24-87	17.0	<.001	<.01	0.02	<.01	331	202	560	5.84	11.7	9.9
	01-12-88	16.0	0.001	<.01	0.05	<.01	368	294	563	6.31	11.3	9.8
	01-28-88	16.0	0.002	<.01	<.01	<.01	363	264	564	6.08	11.0	9.6
	02-24-88	18.0	0.002	<.01	<.01	<.01	362	226	539	5.78	11.1	10.2
	03-30-88	18.0	0.002	<.01	0.01	<.01	332	145	577	5.85	11.3	9.8
	04-26-88	15.7	0.003	<.01	<.01	<.01	363	252	562	5.76	11.7	9.2
	05-31-88	13.0	0.003	<.01	<.01	<.01	342	248	583	5.85	12.9	9.2
	06-28-88	15.0	0.001	<.01	<.01	<.01	324	110	599	5.85	12.6	9.2
	07-27-88	17.4	0.002	0.03	<.01	<.01	325	152	568	5.85	12.8	9.6
	09-01-88	18.6	0.002	<.01	0.03	<.01	380	257	610	5.88	12.3	9.6

Table 12A.--Major inorganic-ion concentrations and field constituent values in water samples from wells sampled monthly (continued)

Monthly well	Date sampled	Nitrogen, nitrate total (mg/L as N)	Nitrogen, nitrite total (mg/L as N)	Nitrogen, ammonia total (mg/L as N)	Phosphorus, total (mg/L as P)	Phosphorus, ortho, total (mg/L as P)	Total dissolved solids (mg/L)	Hardness, total (mg/L as $CaCO_3$)	Specific conductance (field, µS/cm)	pH (field, standard units)	Water temperature (field deg. C)	Dissolved oxygen (field mg/L)
					AGRICULTURAL AREA (cont'd)							
	09-29-88	23.0	0.006	0.02	0.01	<.01	402	244	614	5.82	11.6	9.8
	10-26-88	22.0	0.003	0.01	<.01	<.01	404	255	627	5.85	11.4	9.6
	11-29-88	23.0	0.003	<.01	0.01	<.01	398	270	619	5.90	11.2	9.4
	12-21-88	23.0	0.002	<.01	0.01	<.01	424	260	619	5.79	11.2	9.4
					UNDEVELOPED AREA							
S 74294	06-24-87	0.09	0.002	<.01	<.01	<.01	105	6	194	5.65	12.5	1.0
	08-25-87	0.26	<.001	<.01	0.04	<.01	105	5	191	5.66	12.4	0.9
	09-24-87	0.53	<.001	<.01	<.01	<.01	118	6	226	5.85	12.6	1.4
	10-29-87	0.56	<.001	<.01	<.01	<.01	146	6	284	6.14	12.3	2.2
	11-24-87	0.67	<.001	<.01	0.07	<.01	205	13	408	5.91	12.4	4.5
	01-12-88	3.20	<.001	<.01	0.19	<.01	365	40	604	5.67	11.8	7.8
	01-28-88	2.68	<.001	<.01	--	<.01	362	38	628	5.62	12.3	7.4
	02-24-88	3.51	<.001	<.01	0.03	<.01	388	44	739	5.14	12.3	6.2
	03-30-88	3.69	<.001	<.01	0.02	<.01	320	71	599	5.33	12.9	6.2
	04-26-88	0.26	0.002	<.01	0.01	<.01	95	5	171	5.77	12.7	1.2
	05-31-88	0.57	0.001	<.01	<.01	<.01	70	4	116	5.99	12.7	--
	06-28-88	0.89	<.001	<.01	<.01	<.01	89	8	160	5.75	12.4	2.0
	07-27-88	0.60	<.001	<.01	0.04	<.01	155	20	329	5.82	13.1	4.4
	09-01-88	0.66	<.001	<.01	0.02	<.01	199	24	380	5.59	12.3	5.8
	09-27-88	1.18	0.001	<.01	0.01	<.01	231	21	457	5.62	12.0	8.0
	10-26-88	1.85	<.001	<.01	0.02	<.01	234	28	597	5.46	11.9	9.2
	11-29-88	2.22	<.001	<.01	<.01	<.01	269	35	501	5.47	12.4	8.8
	12-21-88	1.67	0.001	<.01	0.19	<.01	189	19	352	5.82	12.5	8.4

Table 12B.--Inorganic trace-element concentrations in water samples from wells sampled monthly [1]

[Values are in micrograms per liter (ug/L); <, less than, --, no data]

Monthly well	Date sampled	Iron, dissolved	Manganese, dissolved	Barium, dissolved	Boron, dissolved	Cadmium, dissolved	Mercury, dissolved
			LONG-TERM SEWERED SUBURBAN AREA				
N 9984	09-02-87	<50	<50	<200	60	<1	<0.5
	01-29-88	<50	<50	<200	30	<1	<.5
	02-23-88	<50	<50	<200	30	<1	<.5
	03-29-88	<50	<50	<200	40	<1	--
	04-25-88	<50	<50	<200	40	<1	--
	05-26-88	<50	100	<200	40	<1	--
	06-27-88	200	170	<200	40	<1	--
	07-26-88	<50	130	<200	40	<1	--
	08-31-88	<50	190	<200	40	<1	--
	09-29-88	<50	200	<200	40	<1	--
	10-27-88	<50	190	<200	40	<1	--
	11-28-88	<50	160	<200	40	<1	--
	12-20-88	60	110	<200	30	<1	--
			RECENTLY SEWERED SUBURBAN AREAS				
N 9939	09-16-87	<50	950	<200	<10	<1	<.5
	10-28-87	50	960	<200	70	<1	<.5
	11-23-87	60	950	<200	70	<1	<.5
	01-11-88	<50	1,030	<200	70	<1	<.5
	01-29-88	<50	1,000	<200	70	<1	<.5
	02-23-88	<50	990	<200	60	<1	<.5
	03-29-88	<50	1,010	<200	70	<1	--
	04-25-88	<50	970	<200	70	<1	--
	05-25-88	<50	1,010	<200	70	<1	--
	06-27-88	<50	990	<200	70	<1	--
	07-28-88	<50	980	<200	80	<1	--
	08-31-88	<50	930	<200	70	<1	--
	09-29-88	<50	870	<200	70	1	--
	10-27-88	<50	880	<200	80	<1	--
	11-28-88	<50	880	<200	70	<1	--
			UNSEWERED SUBURBAN AREA				
S 50513	07-16-87	<50	<50	<200	70	<1	<.5
	08-26-87	<50	<50	<200	60	<1	<.5
	09-28-87	<50	<50	<200	80	<1	<.5
	10-30-87	<50	70	<200	60	<1	<.5
	11-23-87	<50	<50	<200	60	<1	<.5
	01-11-88	<50	50	<200	50	<1	<.5
	01-28-88	<50	60	<200	50	<1	<.5
	02-24-88	<50	60	<200	50	<1	<.5
	03-30-88	<50	50	<200	60	<1	--
	04-26-88	<50	<50	<200	50	<1	--
	05-31-88	80	90	<200	60	<1	--
	06-29-88	<50	60	<200	50	<1	--
	07-28-88	<50	50	<200	70	<1	--
	09-07-88	<50	<50	<200	40	<1	--
	09-29-88	<50	<50	<200	40	1	--
	10-26-88	50	<50	200	50	<1	--
	11-29-88	<50	<50	<200	40	<1	--
	12-20-88	70	<50	<200	40	<1	--
	12-20-88	70	<50	<200	60	<1	--

Table 12B.--Inorganic trace-element concentrations in water samples from wells sampled monthly [1] (continued)

Monthly well	Date sampled	Iron, dissolved	Manganese, dissolved	Barium, dissolved	Boron, dissolved	Cadmium, dissolved	Mercury, dissolved
			AGRICULTURAL AREA				
S 51566	06-17-87	70	<50	<200	90	2	<.5
	07-23-87	130	<50	<200	--	<1	<.5
	08-20-87	1,120	50	<200	60	<1	<.5
	09-24-87	130	<50	<200	80	<1	<.5
	10-29-87	200	<50	<200	70	<1	<.5
	11-24-87	170	<50	<200	70	<1	<.5
	01-12-88	90	<50	<200	60	<1	<.5
	01-28-88	130	<50	<200	80	<1	<.5
	02-24-88	160	<50	<200	70	<1	<.5
	03-30-88	120	<50	<200	80	<1	--
	04-26-88	430	140	<200	10	<1	--
	05-31-88	290	60	<200	70	<1	--
	06-28-88	150	<50	<200	70	<1	--
	07-27-88	170	<50	<200	60	<1	--
	09-01-88	140	<50	<200	60	<1	--
	09-29-88	100	<50	<200	70	<1	--
	10-26-88	380	<50	<200	80	<1	--
	11-29-88	160	<50	<200	60	<1	--
	12-21-88	150	<50	<200	70	<1	--
			UNDEVELOPED AREA				
S 74294	06-24-87	<50	<50	<200	<10	<1	<.5
	08-25-87	<50	<50	<200	<10	<1	<.5
	09-24-87	<50	<50	<200	10	<1	<.5
	10-29-87	<50	50	<200	20	<1	<.5
	11-24-87	<50	<50	<200	20	<1	<.5
	01-12-88	<50	120	300	30	<1	<.5
	01-28-88	<50	130	<200	30	<1	<.5
	02-24-88	<50	150	500	30	<1	<.5
	03-30-88	<50	100	200	30	<1	--
	04-26-88	310	140	<200	20	<1	--
	05-31-88	70	60	<200	20	<1	--
	06-28-88	<50	<50	<200	20	<1	--
	07-27-88	<50	<50	<200	20	<1	--
	09-01-88	<50	70	<200	20	<1	--
	09-27-88	<50	60	<200	20	<1	--
	10-26-88	<50	70	200	20	<1	--
	11-29-88	<50	50	<200	20	<1	--
	12-21-88	70	<50	<200	20	<1	--

1. The following constituents had no detections above detection limit for the monthly wells (detection limit in parentheses); Arsenic (5 µg/L), Chromium (10 ug/L), Copper (50 µg/L), Lead (10 µg/L), Selenium (5 µg/L), Silver (50 µg/L), Methylene blue-active substances (0.02 milligrams per liter)

Table 12C.--Volatile organic-compound concentrations in water samples from wells sampled monthly

[Analyzed by the Nassau County Department of Health Laboratory; values are in micrograms per liter (µg/L); <, less than --, no data]

Monthly well	Date sampled	Tri-chloro-fluoro-methane	*trans*-1,2-Di-chloro-ethylene	1,1-Di-chloro-ethane	Chloro-form	1,1,1-Tri-chloro-ethane	Carbon-tetra-chlo-ride	Tri-chloro-ethylene	Bromo-di-chloro-methane
				LONG-TERM SEWERED SUBURBAN AREA					
N 9984	09-02-87	<1	<7	<5	<1	2	<1	<1	<2
	01-29-88	--	<7	<6	<1	1	<1	<1	<1
	02-23-88	--	<7	<6	<1	1	<1	<1	<1
	03-29-88	--	<9	<5	<1	2	<1	<1	<1
	04-25-88	<1	<8	<4	<1	2	<1	<1	<1
	05-26-88	<1	<8	<5	<1	1	<1	<1	<1
	06-27-88	<1	<8	<4	<1	1	<1	<1	<1
	07-26-88	<1	<10	<5	<1	1	<1	<1	<1
	08-31-88	<1	<11	<2	<1	<1	<1	<1	<2
	09-29-88	<1	<6	<2	<1	1	<1	<1	<1
	10-27-88	<1	<6	<2	<1	1	<1	<1	<1
	11-28-88	<1	<1	<1	<1	<1	<1	<1	<1
	12-20-88	<1	<1	<1	<1	<1	<1	<1	<1
				RECENTLY SEWERED SUBURBAN AREA					
N 9939	09-16-87	<1	12	<5	<1	3	<1	3	<2
	10-28-87	<1	12	<4	<1	1	<1	2	<1
	11-23-87	<1	14	<4	<1	2	<1	2	<1
	01-11-88	--	<11	<5	<1	<1	<1	<2	<1
	01-29-88	--	7	<6	1	2	<1	2	<1
	02-23-88	--	7	<6	1	2	<1	2	<1
	03-29-88	--	9	<5	<1	1	<1	2	<1
	04-25-88	<1	8	<4	<1	1	<1	<1	<1
	05-25-88	<1	10	<5	<1	1	<1	1	<1
	06-27-88	<1	11	<4	<1	1	<1	1	<1
	07-28-88	<1	10	<5	<1	1	<1	1	<1
	08-31-88	<1	<11	<2	<1	<1	<1	<1	<2
	09-29-88	<1	10	<2	<1	2	<1	2	<1
	10-27-88	<1	9	<2	<1	2	<1	1	<1
	11-28-88	<1	<1	<1	<5	<1	<3	1	<1
	12-20-88	<1	<1	1	1	4	<1	1	<1
				UNSEWERED SUBURBAN AREA					
S 50513	07-16-87	<1	<4	<6	<1	11	<1	<1	<1
	08-26-87	<1	<7	<5	<1	10	<1	<1	<2
	09-28-87	<1	<9	<5	<1	10	<1	<1	<1
	10-30-87	<1	<5	<4	<1	6	<1	<1	<1
	11-23-87	<1	<5	<4	<1	3	<1	<1	<1
	01-11-88	--	<11	<5	<1	3	<1	<2	<1
	01-28-88	--	<7	<6	<1	6	<1	<1	<1
	02-24-88	--	<7	<6	<1	6	<1	<1	<1
	03-30-88	--	<9	<5	<1	5	<1	<1	<1
	04-26-88	<1	<8	<4	<1	4	<1	<1	<1
	05-31-88	<1	<8	<5	<1	5	<1	<1	<1
	06-29-88	<1	<8	<4	<1	4	<1	<1	<1
	07-28-88	<1	<10	<5	<1	3	<1	<1	<1
	09-07-88	<1	<11	<2	<1	3	<1	<1	<2
	09-29-88	<1	<6	<2	<1	3	<1	<1	<1

Table 12C.--Volatile organic compound concentrations in water samples from wells sampled monthly (continued)

Monthly well	Date sampled	Trichlorofluoromethane	*trans*-1,2-Dichloroethylene	1,1-Dichloroethane	Chloroform	1,1,1-Trichloroethane	Carbon tetrachloride	Trichloroethylene	Bromodichloromethane
				UNSEWERED SUBURBAN AREA (CONTINUED)					
	10-26-88	<1	<6	<2	1	2	<1	<1	<1
	11-29-88	<1	<1	<1	<1	2	<1	<1	<1
	12-20-88	<1	<1	<1	<1	2	<1	<1	<1
				AGRICULTURAL AREA					
S 51566	06-17-87	<1	<9	<5	<1	<1	<1	<1	<1
	07-23-87	<1	<4	<6	<1	<1	<1	<1	<1
	08-20-87	<1	<3	<4	<1	<1	<1	<1	<1
	09-24-87	<1	<7	<5	<1	<1	<1	<1	<2
	10-29-87	<1	<5	<4	<1	<1	<1	<1	<1
	11-24-87	<1	<5	<4	<1	<1	<1	<1	<1
	01-12-88	--	<11	<5	<1	<1	<1	<2	<1
	01-28-88	--	<7	<6	<1	<1	<1	<1	<1
	02-24-88	--	<7	<6	<1	<1	<1	<1	<1
	03-30-88	--	<9	<5	<1	<1	<1	<1	<1
	04-26-88	<1	<8	<4	<1	<1	<1	<1	<1
	05-31-88	<1	<8	<5	<1	<1	<1	<1	<1
	06-28-88	<1	<8	<4	<1	<1	<1	<1	<1
	07-27-88	<1	<10	<5	<1	<1	<1	<1	<1
	09-01-88	<1	<11	<2	<1	<1	<1	<1	<2
	09-29-88	<1	<6	<2	<1	<1	<1	<1	<1
	10-26-88	<1	<6	<2	<1	<1	<1	<1	<1
	11-29-88	<1	<1	<1	<1	<1	<1	<1	<1
	12-21-88	<1	<1	<1	<1	<1	<1	<1	<1
				UNDEVELOPED AREA					
S 74294	06-24-87	<1	<9	<5	<1	<1	<1	<1	<1
	08-25-87	<1	<7	<5	<1	<1	<1	<1	<2
	09-24-87	<1	<7	<5	<1	<1	<1	<1	<2
	10-29-87	<1	<5	<4	<1	<1	<1	<1	<1
	11-24-87	<1	<5	<4	<1	<1	<1	<1	<1
	01-12-88	--	<11	<5	<1	<1	<1	<2	<1
	01-28-88	--	<7	<6	<1	<1	<1	<1	<1
	02-24-88	--	<7	<6	<1	<1	<1	<1	<1
	03-30-88	--	<9	<5	<1	<1	<1	<1	<1
	04-26-88	<1	<8	<4	<1	<1	<1	<1	<1
	05-31-88	<1	<8	<5	<1	<1	<1	<1	<1
	06-28-88	<1	<8	<4	<1	<1	<1	<1	<1
	07-27-88	<1	<10	<5	<1	<1	<1	<1	<1
	09-01-88	<1	<11	<2	<1	<1	<1	<1	<2
	09-27-88	<1	<6	<2	<1	<1	<1	<1	<1
	10-26-88	<1	<6	<2	<1	<1	<1	<1	<1
	11-29-88	<1	<1	<1	<1	<1	<1	<1	<1
	12-21-88	<1	<1	<1	<1	<1	<1	<1	<1

Table 12C.--Volatile organic-compound concentrations in water samples from wells sampled monthly (continued)

Monthly well	Date sampled	1,1,2 Tri-chloro-ethane	Tetra-chloro-ethylene	Bromo-form	Benzene	Toluene	Chloro-benzene	Ethyl-benzene	Xylene
				LONG-TERM SEWERED SUBURBAN AREA					
N 9984	09-02-87	<1	<1	<2	<3	<3	<4	<4	<6
	01-29-88	<3	<1	<1	<3	<4	<4	<5	<6
	02-23-88	<1	<1	<2	<3	<4	<5	<7	<8
	03-29-88	<2	<1	<1	<3	<3	<3	<6	<8
	04-25-88	<1	<1	<1	<3	<3	<4	<8	<9
	05-26-88	<1	<1	<1	<3	<3	<3	<4	<4
	06-27-88	<1	<1	<2	<3	<3	<3	<4	<5
	07-26-88	<2	<1	<2	<3	<4	<4	<4	<5
	08-31-88	<1	<1	<2	<3	<5	<5	<4	<3
	09-29-88	<1	<1	<1	<3	<6	<3	<3	<4
	10-27-88	<1	<1	<1	<3	<6	<3	<3	<4
	11-28-88	--	<1	<1	<1	<1	<1	<1	<1
	12-20-88	--	<1	<1	<1	<1	<1	<1	<1
				RECENTLY SEWERED SUBURBAN AREA					
N 9939	09-16-87	<1	14	<2	<3	<3	<4	<4	<6
	10-28-87	<2	12	<1	<3	<3	<3	<4	<6
	11-23-87	<2	13	<1	<3	<3	<3	<4	<6
	01-11-88	<1	7	<2	<3	<3	<3	<4	<5
	01-29-88	<3	11	<1	<3	<4	<4	<5	<6
	02-23-88	<1	11	<2	<3	<4	<5	<7	<8
	03-29-88	<2	9	<1	<3	<3	<3	<6	<8
	04-25-88	<1	7	<1	<3	<3	<4	<8	<9
	05-25-88	<1	8	<1	<3	<3	<3	<4	<4
	06-27-88	<1	8	<2	<3	<3	<3	<4	<5
	07-28-88	<2	8	<2	<3	<4	<4	<4	<5
	08-31-88	<1	7	<2	<3	<5	<5	<4	<3
	09-29-88	<1	10	<1	<3	<6	<3	<3	<4
	10-27-88	<1	10	<1	<3	<6	<3	<3	<4
	11-28-88	--	7	<1	<1	<1	<1	<1	<1
	12-20-88	--	6	<1	<1	<1	<1	<1	<1
				UNSEWERED SUBURBAN AREA					
S 50513	07-16-87	<1	<1	<1	<3	<4	<4	<5	<7
	08-26-87	<1	<1	<2	<3	<3	<4	<4	<6
	09-28-87	<2	<1	<2	<3	<3	<3	<4	<6
	10-30-87	<2	<1	<1	<3	<3	<3	<4	<6
	11-23-87	<2	<1	<1	<3	<3	<3	<4	<6
	01-11-88	<1	<1	<2	<3	<3	<3	<4	<5
	01-28-88	<3	<1	<1	<3	<4	<4	<5	<6
	02-24-88	<1	<1	<2	<3	<4	<5	<7	<8
	03-30-88	<2	<1	<1	<3	<3	<3	<6	<8
	04-26-88	<1	<1	<1	<3	<3	<4	<8	<9
	05-31-88	<1	<1	<1	<3	<3	<3	<4	<4
	06-29-88	<1	<1	<2	<3	<3	<3	<4	<5
	07-28-88	<2	<1	<2	<3	<4	<4	<4	<5
	09-07-88	<1	<1	<2	<3	<7	<6	<5	<10
	09-29-88	<1	<1	<1	<3	<6	<3	<3	<4
	10-26-88	<1	<1	<1	<3	<6	<3	<3	<4
	11-29-88	--	<1	<1	<1	<1	<1	<1	<1
	12-20-88	--	<1	<1	<1	<1	<1	<1	<1

Table 12C.--Volatile organic-compound concentrations in water samples from wells sampled monthly (continued)

Monthly well	Date sampled	1,1,2 Tri-chloro-ethane	Tetra-chloro-ethylene	Bromo-form	Benzene	Toluene	Chloro-benzene	Ethyl-benzene	Xylene
				AGRICULTURAL AREA					
S 51566	06-17-87	<1	<1	<2	<3	<7	<3	<7	<10
	07-23-87	<1	<1	<1	<3	<4	<4	<5	<7
	08-20-87	<2	<1	<2	<3	<3	<3	<3	<4
	09-24-87	<1	<1	<2	<3	<3	<4	<4	<6
	10-29-87	<2	<1	<1	<3	<3	<3	<4	<6
	11-24-87	<2	<1	<1	<3	<3	<3	<4	<6
	01-12-88	<1	<1	<2	<3	<3	<3	<4	<5
	01-28-88	<3	<1	<1	<3	<4	<4	<5	<6
	02-24-88	<1	<1	<2	<3	<4	<5	<7	<8
	03-30-88	<2	<1	<1	<3	<3	<3	<6	<8
	04-26-88	<1	<1	<1	<3	<3	<4	<8	<9
	05-31-88	<1	<1	<1	<3	<3	<3	<4	<4
	06-28-88	<1	<1	<2	<3	<3	<3	<4	<5
	07-27-88	<2	<1	<2	<3	<4	<4	<4	<5
	09-01-88	<1	<1	<2	<3	<7	<6	<5	<10
	09-29-88	<1	<1	<1	<3	<6	<3	<3	<4
	10-26-88	<1	<1	<1	<3	<6	<3	<3	<4
	11-29-88	--	<1	<1	<1	<1	<1	<1	<1
	12-21-88	--	<1	<1	<1	<1	<1	<1	<1
				UNDEVELOPED AREA					
S 74294	06-24-87	<1	<1	<2	<3	<3	<3	<7	<10
	08-25-87	<1	<1	<2	<3	<3	<4	<4	<6
	09-24-87	<1	<1	<2	<3	<3	<4	<4	<6
	10-29-87	<2	<1	<1	<3	<3	<3	<4	<6
	11-24-87	<2	<1	<1	<3	<3	<3	<4	<6
	01-12-88	<1	<1	<2	<3	<3	<3	<4	<5
	01-28-88	<3	<1	<1	<3	<4	<4	<5	<6
	02-24-88	<1	<1	<2	<3	<4	<5	<7	<8
	03-30-88	<2	<1	<1	<3	<3	<3	<6	<8
	04-26-88	<1	<1	<1	<3	<3	<4	<8	<9
	05-31-88	<1	<1	<1	<3	<3	<3	<4	<4
	06-28-88	<1	<1	<2	<3	<3	<3	<4	<5
	07-27-88	<2	<1	<2	<3	<4	<4	<4	<5
	09-01-88	<1	<1	<2	<3	<5	<5	<4	<3
	09-27-88	<1	<1	<1	<3	<6	<3	<3	<4
	10-26-88	<1	<1	<1	<3	<6	<3	<3	<4
	11-29-88	--	<1	<1	<1	<1	<1	<1	<1
	12-21-88	--	<1	<1	<1	<1	<1	<1	<1

Table 12D.--Volatile organic-compound concentrations in six duplicate water samples from four wells sampled monthly

[Analyzed by the National Water Quality Laboratory; values are in micrograms per liter (µg/L); <, less than; well locations shown in fig. 3]

Well number	Date sampled	Benzene	Bromo-form	Carbon-tetra-chlo-ride	Chloro-benzene	Chloro-ethane	2-Chloro-ethyl vinyl ether	Chloro-form	Methyl-chlor-ide	Chloro-di-bromo-methane
N 9984	11-28-88	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.2	<0.2	<0.2
N 9939	10-27-88	<.2	<.2	<.2	<.2	<.2	<.2	.7	<.2	<.2
	11-28-88	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2
S 50513	08-26-87	<.2	<.2	3.1	<.2	<.2	<.2	6.1	<.2	<.2
	11-29-88	<.2	<.2	<.2	<.2	<.2	<.2	.9	<.2	<.2
S 74294	08-25-87	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2

Well number	Date sampled	Bromo-di-chloro-methane	1,2-Di-chloro-benzene	1,3-Di-chloro-benzene	1,4-Di-chloro-benzene	Di-chloro-di-fluoro-methane	1,1-Di-chloro-ethane	1,2-Di-chloro-ethane	1,1-Di-chloro-ethylene
N 9984	11-28-88	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2
N 9939	10-27-88	<.2	<.2	<.2	<.2	<.2	1.2	<.2	.2
	11-28-88	<.2	<.2	<.2	<.2	<.2	1.0	<.2	.3
S 50513	08-26-87	<.2	<.2	<.2	<.2	<.2	6.7	<.2	1.3
	11-29-88	<.2	<.2	<.2	<.2	<.2	.6	<.2	.2
S 74294	08-25-87	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2

Well number	Date sampled	*trans*-1,2-Di-chloro-ethylene	1,2-Di-chloro-propane	*cis*-1,3-Di-chloro-propene	1,3-Di-chloro-propene	Ethyl-benzene	Methyl bromide	Styrene	Methy-lene chlo-ride
N 9984	11-28-88	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2
N 9939	10-27-88	11	<.2	<.2	<.2	<.2	<.2	<.2	<.2
	11-28-88	4.3	<.2	<.2	<.2	<.2	<.2	<.2	<.2
S 50513	08-26-87	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2
	11-29-88	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2
S 74294	08-25-87	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2

Well number	Date sampled	1,1,2,2-Tetra-chloro-ethane	Tetra-chloro-ethylene	Toluene	1,1,1-Tri-chloro-ethane	1,1,2-Tri-chloro-ethane	Tri-chloro-ethylene	Vinyl chlo-ride	Xylene
N 9984	11-28-88	<.2	.4	<.2	.7	<.2	<.2	<.2	<.2
N 9939	10-27-88	<.2	7.6	<.2	2.0	<.2	1.4	<.2	<.2
	11-28-88	<.2	7.0	.8	2.2	<.2	1.2	<.2	<.2
S 50513	08-26-87	<.2	1.3	<.2	16	<.2	<.2	<.2	<.2
	11-29-88	<.2	.2	<.2	1.9	<.2	<.2	<.2	<.2
S 74294	08-25-87	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2

Table 13A.--Organochlorine-insecticide concentrations in water samples from well sampled monthly in agricultural area

[Values are in micrograms per liter (ug/L); <, less than; --, no data]

Date sampled	DDD	DDE	DDT	Endo-sulfan
06-17-87	<0.01	0.01	<0.01	0.01
07-23-87	.01	.01	.01	.03
08-20-87	<.01	.01	.01	<.01
09-24-87	<.01	.01	.01	<.01
10-29-87	<.01	<.01	<.01	<.01
11-24-87	<.01	.01	.01	<.01
01-12-88	<.01	<.01	<.01	<.01
01-28-88	<.01	<.01	.01	<.01
02-24-88	<.01	.01	<.01	<.01
03-30-88	<.01	<.01	.01	<.01
04-26-88	<.01	<.01	<.01	<.01
05-31-88	<.01	<.01	<.01	<.01
06-28-88	<.01	<.01	.01	<.01
07-27-88	<.01	<.01	.01	<.01
09-01-88	<.01	<.01	.01	<.01
09-29-88	<.01	.01	.01	<.01
10-26-88	--	--	--	--
11-29-88	--	--	--	--
12-21-88	<.01	<.01	.01	<.01

Table 13B.--Carbamate-insecticide concentrations in samples from wells sampled monthly in agricultural and undeveloped areas

[Values are in micrograms per liter (ug/L); well locations are shown in fig. 3]

Well number	Date sampled	Aldicarb sulfoxide	Aldicarb sulfone	Carbofuran	Oxyamyl
		AGRICULTURAL AREA			
S 51566	06-17-87	22	20	7.0	<1.0
	07-23-87	33	31	9.0	<1.0
	08-20-87	35	33	7.0	<1.0
	09-24-87	29	27	8.0	<1.0
	10-29-87	27	27	9.0	1.0
	11-24-87	28	27	9.0	1.0
	01-12-88	28	27	8.0	2.0
	01-28-88	27	25	8.0	2.0
	02-24-88	30	28	8.0	1.0
	03-30-88	25	23	7.0	<1.0
	04-26-88	18	17	8.0	<1.0
	05-31-88	16	16	9.0	<1.0
	06-28-88	15	15	11	<1.0
	07-27-88	16	16	10	<1.0
	09-01-88	20	19	8.0	<1.0
	09-29-88	25	22	7.0	<1.0
	10-26-88	25	25	8.0	<1.0
	11-29-88	21	20	7.0	<1.0
	12-21-88	21	21	8.0	<1.0
		UNDEVELOPED AREA			
S 74294	06-24-87	<1.0	<1.0	<1.0	<1.0
	08-25-87	<1.0	<1.0	<1.0	<1.0
	09-24-87	<1.0	<1.0	<1.0	<1.0
	10-29-87	<1.0	<1.0	<1.0	<1.0
	11-24-87	<1.0	<1.0	<1.0	<1.0
	01-12-88	<1.0	<1.0	<1.0	<1.0
	01-28-88	<1.0	<1.0	<1.0	<1.0
	02-24-88	<1.0	<1.0	<1.0	<1.0
	03-30-88	<1.0	<1.0	<1.0	<1.0
	04-26-88	<1.0	<1.0	<1.0	<1.0
	05-31-88	<1.0	<1.0	<1.0	<1.0
	06-28-88	<1.0	<1.0	<1.0	<1.0
	07-27-88	<1.0	<1.0	<1.0	<1.0
	09-01-88	<1.0	<1.0	<1.0	<1.0
	09-27-88	<1.0	<1.0	<1.0	<1.0
	10-26-88	<1.0	<1.0	<1.0	<1.0
	11-29-88	<1.0	<1.0	<1.0	<1.0
	12-21-88	<1.0	<1.0	<1.0	<1.0

1 The following constituents were not detected (detection limit 1.0 µg/L): Aldicarb, 3-Hydrolycarbofuran, Carbaryl, and Methomyl.

Table 13C.--Organochlorine and organophosphorus insecticides and chlorophenoxy-acid and triazine herbicides not detected in water samples from well sampled monthly in agricultural area

[Constituents are in micrograms per liter]

Constituent	Detection Limit
ORGANOCHLORINE INSECTICIDES	
Aldrin	0.01
Chlordane	.1
Dieldrin	.01
Endrin	.01
Heptachlor	.01
Heptachlorepoxide	.01
Lindane	.01
Methoxychlor	.01
Mirex	.01
Perthane	.1
Polychlorinated biphenyls (PCB)	.1
Polychlorinated naphthalenes (PCN)	.1
Toxaphene	1.0
ORGANOPHOSPHORUS INSECTICIDES	
Diazinon	.01
Ethion	.01
Malathion	.01
Methyl parathion	.01
Methyl trithion	.01
Parathion	.01
Total Trithion	.01
CHLOROPHENOXY-ACID HERBICIDES	
2,4-D	.01
2,4-DP	.01
2,4,5-TP (Silvex)	.01
2,4,5-T	.01
TRIAZINE HERBICIDES	
Alachlor	.1
Ametryne	.1
Atrazine	.1
Cyanazine	.1
Metolachlor	.1
Metribuzin	.1
Prometone	.1
Prometryne	.1
Propazine	.1
Simazine	.1
Simetryne	.1
Trifluralin	.1

1 Detection limit for chlorophenoxy-acid herbicides on 7-27-88 as follows: 2,4-D (0.1), 2,4-DP (0.1), Silvex (0.02), 2,4,5-T (0.02), Detection limit for triazine herbicides on 1-12-88 as follows: Metolachlor (0.2).

2 No triazine herbicide data available for 7-27-88, 10-26-88, 11-29-88, 12-21-88.