



In cooperation with
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Ground-Water Quality in the Mohawk River Basin, New York, 2006

By Elizabeth A. Nystrom

Open-File Report 2008-1086

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

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DIRK KEMPTHORNE, Secretary

U.S. Geological Survey
Mark D. Myers, Director

U.S. Geological Survey, Reston, Virginia 2008

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Conversion Factors, Datum, Abbreviated Water-Quality Units, and Acronyms

Multiply	By	To obtain
Length		
centimeter (cm)	0.3937	inch (in.)
foot (ft)	0.3048	meter (m)
Area		
acre	0.004047	square kilometer (km ²)
square mile (mi ²)	2.590	square kilometer (km ²)
Volume		
liter (L)	0.2642	gallon (gal)
gallon (gal)	3.785	liter (L)
Flow rate		
gallon per minute (gal/min)	0.06309	liter per second (L/s)
inch per year (in/yr)	25.4	millimeter per year (mm/yr)
Radioactivity		
picocurie per liter (pCi/L)	0.037	becquerel per liter (Bq/L)

Temperature in degrees Celsius (°C) may be converted to degrees Fahrenheit (°F) as follows:
 $^{\circ}\text{F}=(1.8\times^{\circ}\text{C})+32$

Vertical coordinate information is referenced to the North American Vertical Datum of 1988 (NAVD 88).
 Horizontal coordinate information is referenced to the North American Datum of 1983 (NAD 83).
 Altitude, as used in this report, refers to distance above the vertical datum.

Abbreviated water-quality units used in this report:

micrograms per liter (µg/L)
 milligrams per liter (mg/L)
 microsiemens per centimeter at 25 degrees Celsius (µS/cm at 25 °C)
 platinum-cobalt units (Pt-Co units)

Acronyms used in this report

AMCL	Alternative maximum contaminant level
CFU	Colony-forming units
cICP-MS	Collision/reaction cell inductively coupled plasma-mass spectrometry
ESA	Ethanesulfonic acid
GC-MS	Gas chromatography-mass spectrometry
GPS	Global positioning system
GWSI	Ground-Water Site-Inventory
HPLC-MS	High-performance liquid chromatography-mass spectrometry
ICP-AES	Inductively coupled plasma-atomic emission spectrometry
ICP-MS	Inductively coupled plasma-mass spectrometry
ICP-OES	Inductively coupled plasma-optical emission spectrometry
LC-MS	Liquid chromatography-mass spectrometry
MCL	Maximum contaminant level
MTBE	Methyl <i>tert</i> -butyl ether
NWQL	USGS National Water Quality Laboratory
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
OGRL	USGS Organic Geochemistry Research Laboratory
PERC	Tetrachloroethene
POC	Principal organic contaminant
PVC	Polyvinyl chloride
SDWS	Secondary drinking water standards
THM	Trihalomethane
TTHMs	Total trihalomethanes
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey
VOC	Volatile organic compound

Ground-Water Quality in the Mohawk River Basin, New York, 2006

By Elizabeth A. Nystrom

Abstract

Water samples were collected from 27 wells from August through November 2006 to characterize ground-water quality in the Mohawk River Basin. The Mohawk River Basin covers 3,500 square miles in central New York; most of the basin is underlain by sedimentary bedrock, including shale, sandstone, and carbonates. Sand and gravel form the most productive aquifers in the basin. Samples were collected from 13 sand and gravel wells and 14 bedrock wells, including production and domestic wells. The samples were collected and processed through standard U.S. Geological Survey procedures and were analyzed for 226 physical properties and constituents, including physical properties, major ions, nutrients, trace elements, radon-222, pesticides, volatile organic compounds, and bacteria.

Many constituents were not detected in any sample, but concentrations of some constituents exceeded current or proposed Federal or New York State drinking-water quality standards, including color (1 sample), pH (2 samples), sodium (11 samples), chloride (2 samples), fluoride (1 sample), sulfate (1 sample), aluminum (2 samples), arsenic (2 samples), iron (10 samples), manganese (10 samples), radon-222 (12 samples), and bacteria (6 samples). Dissolved oxygen concentrations were greater in samples from sand and gravel wells (median 5.6 milligrams per liter [mg/L]) than from bedrock wells (median 0.2 mg/L). The pH was typically neutral or slightly basic (median 7.3); the median water temperature was 11°C. The ions with the highest concentrations were bicarbonate (median 276 mg/L), calcium (median 58.9 mg/L), and sodium (median 41.9 mg/L). Ground water in the basin is generally very hard (180 mg/L as CaCO₃ or greater), especially in the Mohawk Valley and areas with carbonate bedrock. Nitrate-plus-nitrite concentrations were generally higher samples from sand and gravel wells (median concentration 0.28 mg/L as N) than in samples from bedrock wells (median < 0.06 mg/L as N), although no concentrations exceeded established State or Federal drinking-water standards of 10 mg/L as N for nitrate and 1 mg/L as N for nitrite. Ammonia concentrations were higher in samples from bedrock wells (median 0.349 mg/L as N) than in those from samples from sand and gravel wells (median 0.006 mg/L as N). The trace elements with the highest concentrations were strontium (median 549 micrograms per liter [µg/L]), iron (median 143 µg/L), boron (median 35 µg/L), and manganese (median 31.1 µg/L). Concentrations of several trace elements, including boron, copper, iron, manganese, and strontium, were higher in samples from bedrock wells than those from sand and gravel wells. The highest radon-222 activities were in samples from bedrock wells (maximum 1,360 pCi/L); 44 percent of all samples exceeded a proposed U.S. Environmental Protection Agency drinking water standard of 300 pCi/L. Nine pesticides and pesticide degradates were detected in six samples at concentrations of 0.42 µg/L or less; all were herbicides or their degradates, and most were degradates of alachlor, atrazine, and metolachlor. Six volatile organic compounds were detected in four samples at concentrations of 0.8 µg/L or less, including four trihalomethanes, tetrachloroethene, and toluene; most

detections were in sand and gravel wells and none of the concentrations exceeded drinking water standards. Coliform bacteria were detected in six samples but fecal coliform bacteria, including *Escherichia coli*, were not detected in any sample.

Introduction

The Federal Clean Water Act Amendments of 1977 require that States monitor and report biennially on the chemical quality of surface water and ground water within their boundaries (U.S. Environmental Protection Agency, 1997, Section 305(b)). In 2002, the U.S. Geological Survey (USGS), in cooperation with the New York State Department of Environmental Conservation (NYSDEC), developed a program to evaluate ground-water quality throughout the major river basins in New York State on a rotating basis. The work parallels the NYSDEC Rotating Intensive Basin Study program, which evaluates surface-water quality in two or three of the 14 major river basins in the State each year. The ground-water quality program began in 2002 with a pilot study in the Mohawk River Basin (Butch and others, 2003). Sampling was completed in the Chemung River Basin in 2003 (Hetcher-Aguila, 2005); the Lake Champlain and Susquehanna River Basins in 2004 (Nystrom, 2006; Hetcher-Aguila and Eckhardt, 2006); and the St. Lawrence (Nystrom, 2007a), Delaware (Nystrom, 2007b), and Genesee River Basins (Eckhardt and others, 2007) in 2005. In 2006, ground water was sampled in the Mohawk River Basin, Niagara River Basin, Allegheny River Basin, Lake Erie tributaries, and western Lake Ontario tributaries. The Mohawk River Basin study, the subject of this report, entailed collection of 13 samples from surficial deposits and 14 samples bedrock, from August through November of 2006.

Purpose and Scope

This report presents the results of the 2006 ground-water quality study in the Mohawk River Basin. It (1) describes the methods of site selection, sample collection, and chemical analysis, and (2) presents the analytical results for physical properties, major ions, nutrients, trace elements and radionuclides, pesticides, volatile organic compounds (VOCs), and bacteria. Information about the sampled wells and results of the analyses are presented in tables A1 through A9, by constituent type, at the end of the report.

Hydrogeologic Setting

The Mohawk River Basin covers about 3,500 mi² in central New York State (fig. 1). It encompasses parts of 14 counties, including all of Montgomery County, most of Schoharie and Schenectady Counties, parts of Herkimer, Hamilton, Fulton, Greene, Oneida, Saratoga, and Albany Counties, and small parts of Lewis, Madison, Otsego, and Delaware Counties. The Mohawk River is a major tributary to the Hudson River; the major tributaries to the Mohawk River are the Schoharie and West Canada Creeks (fig. 1). The Erie Canal was built along the Mohawk River as a major corridor for cargo transport; it was begun in 1817 and completed in 1825. Modernizations moving much of the canal into the river channel were completed in 1918 and the canal was renamed the New York State Barge Canal; currently the canal is used mostly for recreation. The Mohawk River Basin contains three major reservoirs (fig. 1): the Schoharie Reservoir, which diverts water out of the basin as part of New York City's water-supply system; Hinckley Reservoir, which provides drinking water to the Utica area, and Delta Reservoir.



Base from U.S. Geological Survey digital data, 1983, 1:100,000
 Universal Transverse Mercator projection
 Zone 18

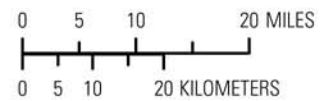


Figure 1. Hydrologic and geographic features and location of the Mohawk River Basin in Central New York.

EXPLANATION

- State park
- Basin boundary
- River



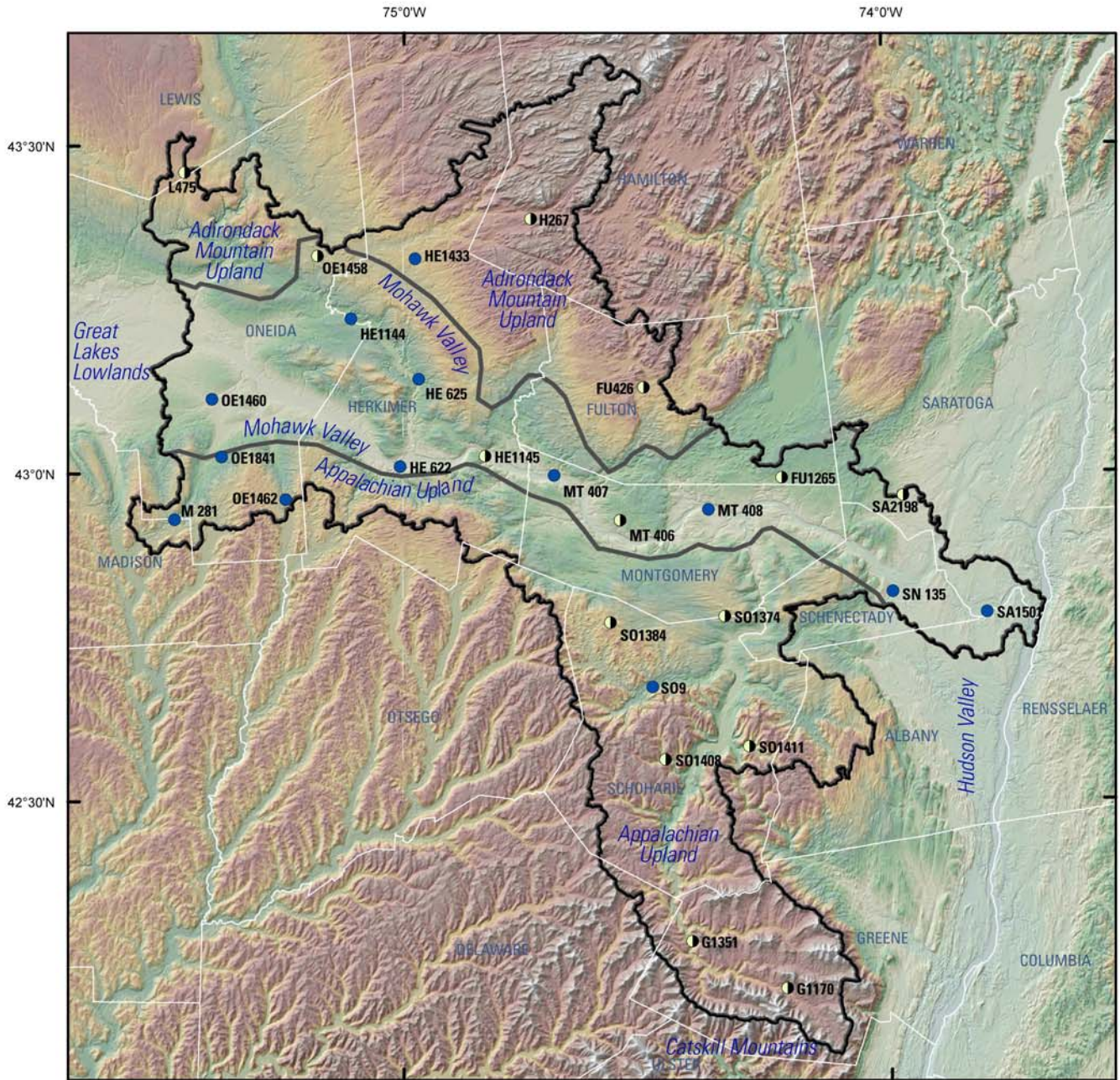
The Mohawk River Basin contains three main physiographic regions (fig. 2); these are (1) the Mohawk Valley, which extends eastward from the Great Lakes Lowland to the Hudson Valley through the center of the basin, (2) the Adirondack Mountain Upland, which spans the northern part of the basin, and (3) the Appalachian Upland, which spans the southern portion of the basin and includes parts of the Catskill Mountains. The highest elevations in the northern part of the (about 3,600 ft above sea level) are in the Adirondack Mountains Upland and the highest elevations in the southern end of the Basin are in the Catskill Mountain area (about 4,000 ft). The areas with the highest elevations also receive the most precipitation; the northern, northwestern, and southern parts of the basin receive more than 50 in/yr (Randall, 1996). Land use (fig. 3) also corresponds to the physiography of the basin; agriculture is concentrated along the Mohawk River and the northern part of Schoharie Creek, and the largest urban centers in the basin, including Utica, Amsterdam, and Schenectady (fig. 1), are within the Mohawk Valley; smaller urban areas in the Appalachian Upland to the south are present in the valleys of the Catskills region. The upland areas of the basin are predominantly forested (Vogelmann and others, 2001). Parts of the Adirondack and Catskill State Parks lie within the basin. The Adirondack State Park, created in 1892, contains about 6 million acres; about 6 percent of which is in the Mohawk River Basin. The Catskill Park was created in 1904 and encompasses about 700,000 acres, about 15 percent of which is in the basin.

Most of the Mohawk River Basin is underlain by sedimentary bedrock (fig. 4). The Mohawk Valley is underlain by shale, sandstone, and carbonate rocks of Upper to Middle Ordovician age (Isachsen and others, 2000). Outcrops of Cambrian rock are present at isolated locations; for example, at Little Falls (fig. 1). The southern part of the basin is underlain by interlayered sandstone and shale of Middle to Upper Devonian age. The northern part of the Basin is underlain by crystalline metamorphic bedrock of Precambrian age consisting mainly of gneisses. Of the bedrock aquifers in the basin, carbonate rocks generally produce the highest yields, and the crystalline bedrock generally has the lowest; the sandstone and shale aquifers generally have low to moderate yields (Hammond and others, 1978).

The surficial material throughout the basin was deposited primarily during the Pleistocene epoch, when the Wisconsin glaciers covered most of the Northeast. Till of low permeability was deposited by glaciers over most of the basin; wells finished in till generally have low yields. Sand and gravel including alluvium, outwash, and ice-contact deposits, form the most productive aquifers in the basin; wells finished in these deposits may yield as much as 1,000 gallons per minute (Phillips and Hanchar, 1996).

Methods of Investigation

The methods used in this study, including well-selection criteria, sampling methods, and analytical methods, were designed to maximize data precision, accuracy, and comparability to other studies. Sample collection and processing were conducted in accordance with standard USGS procedures (U.S. Geological Survey, variously dated). Samples were analyzed at three laboratories--the USGS National Water Quality Laboratory (NWQL) in Denver, Colo., the USGS Organic Geochemistry Research Laboratory (OGRL) in Lawrence Kans., and a New York State Department of Health (NYSDOH)-certified laboratory. All procedures were done in accordance with documented methods.



Base from U.S. Geological Survey digital data, 1983, 1:100,000
 Universal Transverse Mercator projection
 Zone 18

Elevations from National Elevation Dataset, 2005

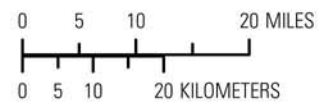
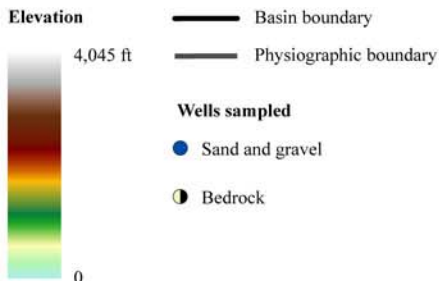
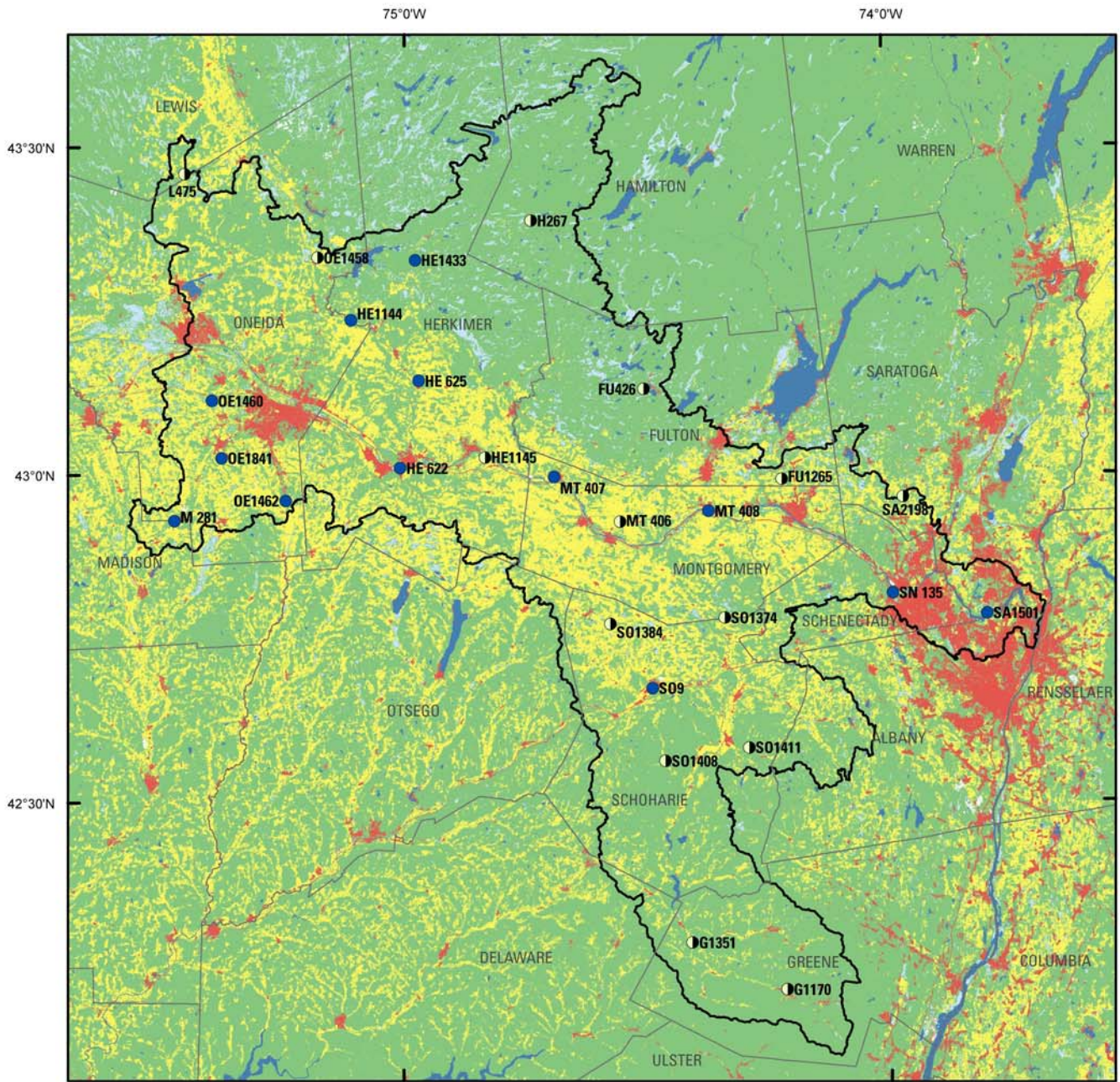


Figure 2. Topography, physiographic regions, and locations of wells sampled in the Mohawk River Basin.

EXPLANATION

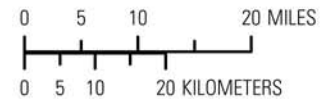




Base from U.S. Geological Survey digital data, 1983, 1:100,000
 Universal Transverse Mercator projection
 Zone 18

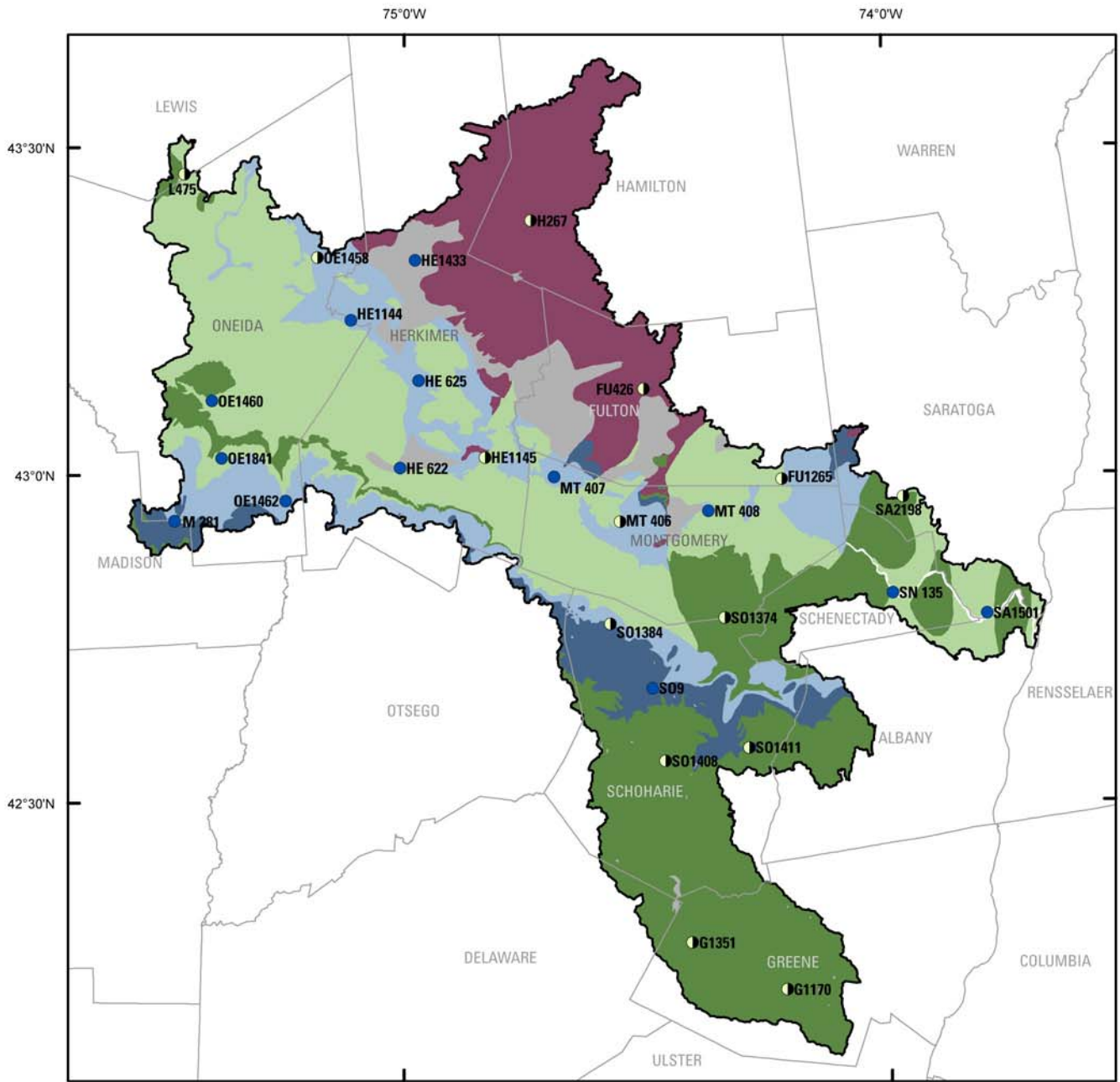
Land cover from Vogelmann and others, 2001

Figure 3. Land cover and locations of wells sampled in the Mohawk River Basin.



EXPLANATION

- | | |
|-------------------|----------------------|
| Land cover | Basin boundary |
| Water | Wells sampled |
| Developed | Sand and gravel |
| Forest | Bedrock |
| Agricultural | |
| Wetlands | |



Base from U.S. Geological Survey digital data, 1983, 1:100,000
 Universal Transverse Mercator projection
 Zone 18

Geology modified from Fisher and others, 1970

Figure 4. Generalized bedrock geology and locations of wells sampled in the Mohawk River Basin.



EXPLANATION

- | | |
|---------------------------------------|-----------------------|
| Bedrock | Basin boundary |
| Carbonate rock | Basin boundary |
| Shale, sandstone, and carbonate | Wells sampled |
| Shale and sandstone | Sand and gravel |
| Shale | Bedrock |
| Crystalline | |
| Unknown (covered by glacial deposits) | |

Site Selection

Wells were selected to provide sufficient spatial coverage of the basin, with emphasis on areas of greatest ground-water use. Selection also was based on the availability of well-construction data and hydrogeologic information on each well and its surrounding area. The study did not target specific municipalities, industries, or agricultural practices; rather, the 27 wells selected for sampling represented a combination of forested, rural, residential, and agricultural areas. Locations of the wells are shown in figures 2 and 3; the characteristics of the wells sampled and the types of land cover surrounding each well are listed in table A1 (at end of report). The depths and geologic units from which samples were collected, and the numbers of production and domestic wells are summarized below.

Material in which well is completed	Number of wells		
	Production	Domestic	Total
Sand and gravel Depth range: 22.5 - 190 feet	10	3	13
Bedrock Depth range: 75 - 815 feet	2	12	14
Carbonate	1	3	4
Shale	1	3	4
Interlayered sandstone and shale		5	5
Gneiss		1	1
Total no. of wells	12	15	27

Land use within a half-mile radius of most wells was typically forested but other types of land use prevailed at some wells; for example well MT406 represents agricultural land, and well S09 is in a developed are (table A1).

Selection of the 15 domestic wells was based on information from the New York State Department of Environmental Conservation (NYSDEC) Water Well program, which began in 2000. The program requires that licensed well drillers file a report with NYSDEC containing basic information about each well drilled—such as well and casing depth and diameter, yield, and a hydrogeologic log. Inspection of well-completion reports identified about 200 wells as potential sampling sites. The well owners were sent a letter that included a request for permission to sample the well, and a questionnaire about the well. Well owners who granted permission were contacted later by phone to verify well information and arrange a convenient time for sampling.

Of the 12 production wells that were sampled, 11 had been previously sampled in 2002 as part of the initial study for this project. The additional production well was identified through the USGS Ground-Water Site Inventory (GWSI) database. Town officials and (or) water managers were sent letters requesting permission to sample a well, and follow-up phone calls were made to arrange a time for sampling. Well information that was not already in the data base, such as depth, was provided by water managers. The type of aquifer tapped by production and domestic wells was verified through published geologic maps, such as Fisher and others (1970).

Sampling Methods

Ground-water samples were collected from August through November 2006 and processed through standard USGS protocols (U.S. Geological Survey, variously dated). The domestic-well samples were collected from a spigot between the well and pressure tank, where possible, and ahead of any water-treatment system so that they would be representative of the water quality within the aquifer. Production wells were sampled at the spigot or faucet used for collection of raw-water samples by water managers.

One or two wells were sampled per day. Typically, samples were collected through one or more 10-ft lengths of Teflon tubing attached to the garden-hose spigot closest to the well. After the tubing was connected, the well was purged by discharging to waste for at least 20 minutes, or until at least one well-casing volume of water had passed the sampling point. Most of the production wells were pumped for at least 1 hour before sampling, typically at pumping rates of about 100 gal/min. Domestic wells were purged at pumping rates ranging from about 5 to 10 gal/min; wells that had been recently used were purged of amounts less than three well-casing volumes. Notes about the well and surrounding land and land use were taken during well purging, and a global positioning system (GPS) measurement of latitude and longitude was recorded. After the well was purged, water was directed at 1 gal/min or less into a flow-through chamber that contained a meter with temperature, pH, specific conductance, and dissolved-oxygen sensors. Field values were then recorded at regular intervals; sampling began when the values of temperature, pH, specific conductance, and dissolved oxygen concentration had stabilized (U.S. Geological Survey, variously dated).

The flow rate for sampling was adjusted to about 0.5 gal/min or less. The Teflon sampling tube was then disconnected from the multi-probe meter and connected to a sampling chamber consisting of a polyvinyl chloride (PVC) frame and a clear-plastic chamber bag. The sampling chamber was placed on a table with a built-in drain constructed from a plastic box. The Teflon tubing and spigot-attachment equipment were cleaned in the laboratory before each day of sampling with a dilute phosphate-free detergent solution, followed by tap water and deionized water rinses. Equipment for filtration of pesticide samples was rinsed with methanol. A new sampling-chamber bag was used at each site. Samples were collected and preserved in the sampling chamber according to standard USGS methods. Sample bottles for nutrient, major-ion, and some trace-element analyses were filled with water filtered through disposable (one-time use) 0.45- μm -pore-size polyether sulfone capsule filters that were pre-conditioned in the laboratory with deionized water on the day of sample collection. Sample bottles for pesticide analysis were filled with water filtered through baked 0.7- μm -pore-size glass fiber filters. Acid preservation was required for trace element, VOC, and major ion analyses. Acid preservative was added after collection of other samples was completed to avoid the possibility of cross contamination by the acid preservative; for example, samples preserved with nitric acid were acidified after the collection of samples for nutrient analysis. Samples for radon analysis were collected through a septum chamber with a glass syringe according to standard USGS procedures. All samples analyzed by NYSDOH-certified laboratories were collected in bottles provided by the analyzing laboratory. All samples except those for radiochemical analysis were chilled to 4°C or less after collection and shipped by overnight delivery to the designated laboratories.

All but five sampling sites had easy access to a spigot; these five wells (HE622, MT406, SA1501, SN135, and SO9, fig. 2) were production wells and were sampled from taps or hydrants at which water-system personnel routinely collect raw-water samples. At these sites, physical properties were measured by the multisensor meter in a bucket; flow was adjusted to avoid air entrainment. The

syringe for radon-222 sample collection at these sites was inserted directly into the flowing water in the throat of the tap or hydrant to minimize sample exposure to the atmosphere.

Analytical Methods

Samples were analyzed for 226 physical properties and constituents, including inorganic constituents, nutrients, trace elements, radionuclides, pesticides and their degradates, VOCs, and bacteria. Physical properties, namely water temperature, pH, dissolved oxygen, and specific conductance were measured at the sampling site. Analyses for inorganic constituents, nutrients, trace elements, radon-222, pesticides and pesticide degradates, and VOCs were conducted at the USGS NWQL in Denver, Colo.; some additional pesticide and pesticide-degrade analyses were done at the USGS OGRL in Lawrence, Kans. The analyses for total organic carbon, phenolic compounds, and bacteria were done at Friend Laboratory in Waverly, N.Y., a NYSDOH-certified laboratory.

Anion concentrations were measured by ion-exchange chromatography; cation concentrations were measured by inductively coupled plasma-atomic emission spectrometry (ICP-AES), as described in Fishman (1993). Nutrients concentrations were measured through colorimetry, as described by Fishman (1993), and through Kjeldahl digestion with photometric finish, as described by Patton and Truitt (2000). Mercury concentrations were measured by cold vapor-atomic fluorescence spectrometry according to methods described by Garbarino and Damrau (2001). Arsenic, chromium, and nickel concentrations were measured through collision/reaction cell inductively coupled plasma-mass spectrometry (cICPMS) as described by Garbarino and others (2006). Remaining trace-element analyses were done by ICP-AES (Struzeski and others, 1996), inductively coupled plasma-optical emission spectrometry (ICP-OES), and inductively coupled plasma-mass spectrometry (ICP-MS) (Garbarino and Struzeski, 1998). In-bottle digestions for trace-element analyses were done as described by Hoffman and others (1996). Radon-222 concentrations were measured through liquid-scintillation counting (ASTM International, 2006).

Samples for pesticide analyses were processed as described by Wilde and others (2004). Pesticides and pesticide-degradates were analyzed at the NWQL through gas chromatography-mass spectrometry (GC-MS) and high-performance liquid chromatography-mass spectrometry (HPLC-MS) as described by Zaugg and others (1995), Sandstrom and others (2001), and Furlong and others (2001). Acetamide parent compounds and degradation-product analyses were conducted through liquid chromatography-mass spectrometry (LC-MS) at the USGS OGRL according to methods described by Lee and Strahan (2003). The VOC analyses were done through GC-MS by methods described by Connor and others (1998).

Total organic carbon concentration was measured by method SW-846 9060 (U.S. Environmental Protection Agency, 2004), and total phenolic compounds were measured by USEPA method 420.2 (U.S. Environmental Protection Agency, 1983). Bacterial samples were collected in accordance with NYSDEC and NYSDOH protocols, except that the tap from which each water sample was collected was not flame sterilized. Samples were tested for total coliform, fecal coliform, and *Escherichia coli* (*E. coli*) by Standard Methods 9222 B, D, and G (American Public Health Association, 1998). Results for fecal coliform analysis are reported as estimated because the samples could not reach the laboratory within the 6-hour holding time; the remaining samples were processed within holding times. A heterotrophic plate count test (SM 9215 B) also was conducted.

One blank sample and two sequential replicate samples were collected for quality assurance in addition to the 27 well-water samples. Nitrogen-purged VOC/pesticide-grade blank water and inorganic-grade blank water supplied by the USGS NWQL were used for an equipment blank; the water was run through a part of the Teflon tubing used for sampling, and water for filtered-water constituents was pumped through cleaned, pre-conditioned filters. Quality assurance samples were acidified in the same manner as environmental samples. No constituents were detected at concentrations above laboratory reporting levels in the blank. The percent-concentration differences from the sequential replicate sample were less than 5 percent for most of the constituents detected in the replicate samples; the largest percent differences were in trace elements whose concentrations were less than or near the reporting level.

Ground-Water Quality

More than half (159) of the 226 constituents or properties for which ground-water samples were analyzed were not detected in any sample at a concentration exceeding laboratory reporting levels (table A2). Concentrations of the 67 constituents and properties that were detected are reported in tables A3 through A9. The concentrations of some constituents are listed in these tables as “estimated” (preceded by letter E); estimated values are typically reported where the detected value is less than the established laboratory reporting levels, or when recovery of a compound has been shown to be highly variable (Childress and others, 1999). Concentrations of some constituents exceeded maximum contaminant levels (MCLs) or secondary drinking water standards (SDWS) set by the U.S. Environmental Protection Agency (USEPA) (U.S. Environmental Protection Agency, 2003) or NYSDOH (New York State Department of Health, 2007). MCLs are enforceable standards for finished water at public water supplies; although they are not enforceable for private homeowner wells, they are presented here as a standard for evaluation of the water-quality results. Secondary drinking water standards typically relate to corrosivity or aesthetic concerns such as taste, odor, or staining of plumbing fixtures and are not enforceable.

Physical Properties

Sample color ranged from < 1 to 20 Pt-Co units; the median was 2 Pt-Co units (table A3). The color of one sample, 20 Pt-Co units, exceeded the NYSDOH MCL and USEPA SDWS of 15 Pt-Co units. Dissolved oxygen concentration ranged from < 0.1 to 12.2 mg/L and was generally greater in samples from sand and gravel wells (median 5.6 mg/L) than in samples from bedrock wells (median 0.2 mg/L). Sample pH ranged from 6.1 to 8.7; the median pH was 7.2 in samples from sand and gravel wells and 7.7 in samples from bedrock wells. The pH of two samples, 6.1 and 8.7, exceeded the USEPA SDWS range for pH, 6.5 to 8.5. Specific conductance ranged from 32 to 2,230 $\mu\text{S}/\text{cm}$ at 25°C with a median of 670 $\mu\text{S}/\text{cm}$ @ 25°C. Water temperature ranged from 8.5 to 14.5°C with a median temperature of 11.0°C.

Major Ions

The anion with the highest concentrations was bicarbonate (tables 1 and A4), with a median concentration of 276 mg/L. The cations with the highest concentrations were calcium (median 58.9 mg/L) and sodium (median 41.9 mg/L). The concentration of sodium in 11 samples exceeded the

USEPA nonregulatory drinking water advisory taste threshold of 60 mg/L; the maximum concentration of sodium was 662 mg/L. The concentration of chloride in two samples, 1,070 and 600 mg/L, exceeded the NYSDOH MCL of 250 mg/L. The concentrations of sodium and chloride were generally higher in samples from bedrock wells than in samples from sand and gravel wells, as shown in table 1, and were elevated in samples from three bedrock wells--G1170, G1351, and SO1374. The concentration of fluoride in one sample, 2.8 mg/L, exceeded the NYSDOH MCL of 2.2 mg/L but did not exceed the USEPA MCL of 4.0 mg/L. The concentration of sulfate in one sample, 451 mg/L, exceeded the USEPA SDWS and NYSDOH MCL of 250 mg/L.

Water hardness in the samples ranged from 23 to 510 mg/L as CaCO₃, and was typically very hard (180 mg/L or more as CaCO₃; Hem, 1985); the median hardness was 230 mg/L as CaCO₃. Nine of the 13 samples from the Mohawk Valley were very hard, whereas, all four samples from the Adirondack Uplands were soft (60 mg/L of CaCO₃ or less). Concentrations of calcium and magnesium (and therefore water hardness), were generally greater in samples from sand and gravel wells than from those from bedrock wells. Alkalinity ranged from 34 to 367 mg/L as CaCO₃, with a median of 226 mg/L as CaCO₃; it was highest in areas with carbonate bedrock and lowest in areas with crystalline bedrock. Residue on evaporation at 180°C, a measurement of total dissolved solids, ranged from 57 to 1,920 mg/L with a median of 409 mg/L; the highest values were in samples from bedrock wells.

Table 1. Drinking water standards and summary statistics for concentrations of major ions in ground-water samples from the Mohawk River Basin, 2006.

[All concentrations in milligrams per liter in filtered water except as noted; --, not applicable; <, less than]

		Drinking Water Standard	No. of Samples exceeding standard	Concentration					
				Sand and gravel aquifers (13 samples)			Bedrock aquifers (14 samples)		
				Minimum	Median	Maximum	Minimum	Median	Maximum
Cations	Calcium	--	--	15.8	63.9	132	5.87	24.8	123
	Magnesium	--	--	1.95	17.0	57.0	1.08	6.14	53.7
	Potassium	--	--	.50	1.29	3.99	.56	1.52	7.38
	Sodium	60 ^a	11	1.48	15.2	73.6	4.12	83.6	662
Anions	Bicarbonate	--	--	55	288	394	41	245	448
	Chloride	250 ^b	2	1.85	27.3	150	.31	65.1	1,070
	Fluoride	2.2 ^b	1	< .1	.1	.5	.1	.4	2.8
	Sulfate	250 ^{bc}	1	4.4	21.5	99.5	< .9	11.9	451
Hardness, unfiltered, mg/L as CaCO ₃				47	300	400	23	85	510
Alkalinity, filtered, mg/L as CaCO ₃				45	236	323	34	201	367
Residue on evaporation, filtered, mg/L				72	334	627	57	509	1,920

^a USEPA Drinking Water Advisory Taste Threshold

^b NYSDOH Maximum contaminant level

^c USEPA Secondary drinking water standard

Nutrients and Organic Carbon

Concentrations of nutrients varied with well depth and aquifer type. Concentrations of nitrate and organic carbon were generally higher in wells finished in sand and gravel than in those finished in bedrock, as shown below in table 2. Concentrations of nitrate ranged from < 0.06 to 2.6 mg/L as N (tables 2 and A5); the median concentration was 0.28 mg/L as N in samples from sand and gravel wells and < 0.06 mg/L as N in samples from bedrock wells. Nitrite was detected in only two sand and gravel wells with a maximum concentration of 0.003 mg/L as N. No concentrations of nitrate or nitrite exceeded established MCLs of the USEPA or NYSDOH (10 mg/L as N and 1 mg/L as N, respectively). Organic carbon was detected in samples from 7 of the 13 sand and gravel wells with a median concentration of 1 mg/L and a maximum of 1.6 mg/L; organic carbon was not detected in any samples from bedrock wells (reporting level 1 mg/L).

Concentrations of ammonia and orthophosphate were generally higher in samples from bedrock wells than in samples from sand and gravel wells. The concentration of ammonia ranged from < 0.010 to 1.88 mg/L as N; the median concentration was 0.349 mg/L as N in samples from bedrock wells and estimated 0.006 mg/L as N in samples from sand and gravel wells. Orthophosphate concentrations ranged from estimated 0.004 to 0.143 mg/L as P; the median concentration in samples from bedrock wells was 0.018 mg/L as P; the median in samples from sand and gravel wells was 0.007 mg/L as P.

Table 2. Drinking water standards and summary statistics for concentrations of nutrients in ground-water samples from the Mohawk River Basin, 2006.

[All concentrations in filtered water except as noted; --, not applicable; <, less than]

	Drinking Water Standard	No. of Samples exceeding standard	Concentration					
			Sand and gravel wells (13 samples)			Bedrock wells (14 samples)		
			Minimum	Median	Maximum	Minimum	Median	Maximum
Ammonia plus organic N, mg/L as N	--	--	< 0.10	0.06	1.2	< 0.1	0.36	2.1
Ammonia, mg/L as N	--	--	< .010	E .006	1.02	.005	.349	1.88
Nitrite plus nitrate, mg/L as N	10 ^{ab}	0	< .06	.28	2.6	< .06	< .06	.6
Nitrite, mg/L as N	1 ^{ab}	0	< .002	< .002	.003	< .002	< .002	< .002
Orthophosphate, mg/L as P	--	--	E .004	.007	.143	.006	.018	.123
Total organic carbon, unfiltered sample, mg/L	--	--	< 1	1	1.6	< 1	< 1	< 1

^a USEPA Maximum Contaminant Level

^b NYSDOH Maximum contaminant level

Trace Elements and Radionuclides

The trace elements present in the highest concentrations were strontium (median 549 µg/L), iron (median 143 µg/L in unfiltered water; 39 µg/L in filtered water), boron (median 35 µg/L), and manganese (median 31.1 µg/L in unfiltered water; 24.0 µg/L in filtered water) (tables 3 and A6). Median concentrations of boron, copper, iron, lithium, manganese and strontium were generally greater

in samples from wells finished in bedrock than in those from wells finished in sand and gravel (table 3). The concentration of aluminum in two samples, 348 and 59 $\mu\text{g/L}$, exceeded the USEPA SDWS range of 50 to 200 $\mu\text{g/L}$. The concentration of arsenic in two samples, 17.8 and 16.4 $\mu\text{g/L}$, exceeded the USEPA MCL of 10 $\mu\text{g/L}$. The concentration of iron in 10 unfiltered and 6 filtered samples exceeded the USEPA SDWS and NYSDOH MCL of 300 $\mu\text{g/L}$; the maximum concentration of iron was 8,190 $\mu\text{g/L}$ in an unfiltered sample. The concentration of manganese exceeded the USEPA SDWS of 50 $\mu\text{g/L}$ in 10 unfiltered and 11 filtered samples and exceeded the NYSDOH MCL of 300 $\mu\text{g/L}$ in 3 filtered samples. No samples exceeded drinking water standards for antimony, barium, beryllium, cadmium, chromium, copper, lead, selenium, zinc, or uranium.

Radon-222 activities in the water samples ranged from 20 to 1,360 pCi/L, with a median of 250 pCi/L. The highest radon activities (600 pCi/L and greater) were in samples from bedrock wells. Radon concentration in drinking water is currently not regulated; however, the USEPA has proposed a two-part standard for drinking water: (1) a 300 pCi/L MCL for areas that do not implement an indoor air radon-mitigation program, and (2) an alternative MCL (AMCL) of 4,000 pCi/L for areas that do (U.S. Environmental Protection Agency, 1999). Activities in 12 of the samples (44 percent) exceeded the proposed MCL; none of the samples exceeded the proposed AMCL.

Pesticides

Nine pesticides were detected in six samples; all were herbicides or their degradates and most were degradates of the triazine and amide broadleaf herbicides atrazine, alachlor, and metolachlor (table A7). Pesticides were detected in samples from four sand and gravel wells and two bedrock wells. Most concentrations were on the order of hundredths or thousandths of micrograms per liter; the highest were metolachlor degradates (maximum 0.42 $\mu\text{g/L}$). The most frequently detected pesticides were atrazine (4 samples), CIAT (2-chloro-4-isopropylamino-6-amino-*s*-triazine, 4 samples), and Metolachlor ESA (3 samples). No pesticide concentrations exceeded established drinking water standards; pesticide degradates are not currently regulated.

Volatile Organic Compounds and Phenolic Compounds

VOCs were detected in samples from four wells—three sand and gravel wells and one bedrock well (table A8). Six VOCs were detected, including, tetrachloroethene, toluene, and four trihalomethanes. Trihalomethanes (THMs) are disinfection byproducts that form when chlorine or bromine are used as disinfectants; they are also used as solvents. The THMs detected were bromodichloromethane, dibromochloromethane, tribromomethane (bromoform), and trichloromethane (chloroform). Three of the four THMs were detected in two samples each, the last was detected in three samples. The median concentration of detected THMs was 0.3 $\mu\text{g/L}$, the maximum was 0.8 $\mu\text{g/L}$. The USEPA and NYSDOH MCLs for total trihalomethanes (TTHMs) is 80 $\mu\text{g/L}$; the maximum TTHMs in the samples was 2 $\mu\text{g/L}$. Tetrachloroethene (PERC), a solvent sometimes used for dry cleaning, was detected in one sample at a concentration of 0.4 $\mu\text{g/L}$; the USEPA and NYSDOH MCLs for tetrachloroethene are 5 $\mu\text{g/L}$. Toluene, a component of gasoline, was detected in two wells at a concentration of 0.2 $\mu\text{g/L}$; it was the only VOC detected in a sample from a bedrock well. The NYSDOH MCL for toluene is 5 $\mu\text{g/L}$, and the USEPA MCL is 1,000 $\mu\text{g/L}$. Phenolic compounds were detected in samples from three wells; the maximum concentration was 13 $\mu\text{g/L}$.

Table 3. Drinking water standards and summary statistics for concentrations of trace elements and radon-222 in ground-water samples from the Mohawk River Basin, 2006.

[<, less than; M, constituent detected but not quantified; --, not applicable. All concentrations are in micrograms per liter except as noted]

	Drinking Water Standard	No. of Samples exceeding standard	Concentration					
			Sand and gravel wells (13 samples)			Bedrock wells (14 samples)		
			Minimum	Median	Maximum	Minimum	Median	Maximum
Aluminum, unfiltered	50-200 ^c	1-2	< 2	< 2	18	< 2	6	348
Antimony, unfiltered	6 ^{ab}	0	< .2	< .2	< .2	< .2	< .2	.4
Arsenic, unfiltered	10 ^a	2	.12	.55	17.8	.06	.40	16.4
Barium, unfiltered	2000 ^{ab}	0	M	58	916	4	100	475
Beryllium, unfiltered	4 ^{ab}	0	< .06	< .06	.03	< .06	< .06	.04
Boron, filtered			4.1	24	125	< 7.0	122	608
Cadmium, unfiltered	5 ^{ab}	0	< .04	< .04	.05	< .04	< .04	.19
Chromium, unfiltered	100 ^{ab}	0	< .60	< .60	.88	< .60	.30	14.8
Cobalt, unfiltered	--	--	.028	.173	.742	.023	.108	.556
Copper, unfiltered	1000 ^c	0	0.6	1.2	4.7	.5	2.8	26.2
Iron, filtered	300 ^{bc}	6	< 6	8	1,240	< 6	72	2,190
Iron, unfiltered	300 ^{bc}	10	< 6	29	1,210	17	208	8,190
Lead, unfiltered	15 ^d	0	< .06	.09	2.13	< .06	.12	2.21
Lithium, unfiltered	--	--	1	5.7	75.7	< .6	43.7	824
Manganese, filtered	50 ^c	11	< .6	10.1	1,960	< .6	37.1	306
Manganese, unfiltered	50 ^c	10	< .6	18.1	2,020	.5	47.8	306
Molybdenum, unfiltered	--	--	< .2	.4	4.5	< .2	2.3	10.4
Nickel, unfiltered	--	--	.24	.76	2.29	.17	1.03	2.48
Selenium, unfiltered	50 ^{ab}	0	< .08	.04	.71	< .08	< .08	.40
Strontium, unfiltered	--	--	30.2	369	2,640	30.0	608	31,100
Zinc, unfiltered	5000 ^{bc}	0	< 2	3	10	< 2	2	16
Radon-222, unfiltered, pCi/L	300 ^e	12	30	420	530	20	130	1,360
Uranium, unfiltered	30 ^a	0	.151	.245	1.52	< .012	.118	1.80

^a USEPA Maximum Contaminant Level

^b NYSDOH Maximum contaminant level

^c USEPA Secondary Drinking Water Standard

^d USEPA Treatment Technique

^e USEPA Proposed Maximum Contaminant Level

Bacteria

Coliform bacteria were detected in samples from six wells (table A9); three of which were sand and gravel wells and three were bedrock wells. The smallest detection was 1 CFU/100 mL and the greatest was too numerous to count. Any detection of coliform bacteria in finished drinking water is considered to be above the MCL. The owners of these six wells were notified of the results upon receipt from the laboratory. Fecal coliform and *E. coli* were not detected in any sample. The

heterotrophic plate count ranged from < 1 CFU/mL to 940 CFU/mL with a median of 4 CFU/mL. The USEPA MCL for the heterotrophic plate count is 500 CFU/mL; this limit was exceeded in one sample (940 CFU/mL).

Summary

Ground-water samples were collected from 13 sand and gravel wells and 14 bedrock wells to characterize the ground-water quality in the Mohawk River Basin. Wells screened in sand and gravel ranged from 22.5 ft to 190 ft deep; the wells completed in bedrock were 75 ft to 815 ft deep and typically tapped shale and sandstone or carbonate rock. Of the 27 wells sampled, 12 were production wells, and 15 were domestic wells. Sample collection and analysis was done through standard USGS procedures and other documented methods. Samples were analyzed for physical properties, major ions, nutrients, trace elements, radon-222, pesticides, VOCs, and bacteria; many constituents were not detected in any sample.

The chemical quality of the samples was generally good, although the concentrations of certain constituents in some samples, including color, pH, sodium, chloride, fluoride, sulfate, aluminum, arsenic, iron, manganese, radon-222 and bacteria exceeded State or Federal drinking water quality standards. Constituents whose concentrations most often exceeded drinking water standards were radon-222 (12 samples with concentrations greater than 300 pCi/L), iron (10 samples with concentrations greater than 300 µg/L), manganese (10 samples with concentrations greater than 50 µg/L), and bacteria (6 samples with detections of coliform bacteria). Two samples had arsenic concentrations that exceeded the USEPA MCL of 10 µg/L. No pesticide or VOC was detected at a concentration exceeding established drinking water standards. Drinking-water quality standards used for comparison included NYSDOH MCLs and USEPA MCLs, SDWS, and drinking water advisories.

Concentrations and frequencies of some constituents that were detected in samples from sand and gravel wells differed from those in samples from bedrock wells; for example, samples from sand and gravel wells had higher concentrations of dissolved oxygen than samples from bedrock wells. Concentrations of other constituents varied by physiographic region and by underlying bedrock type. Water in the Mohawk River Basin is generally hard to very hard, especially in the Mohawk Valley and areas underlain by carbonate bedrock. Three bedrock wells had elevated levels of sodium and chloride (maximum concentrations 662 mg/L and 1,070 mg/L respectively). Nitrate and nitrite concentrations were generally higher in samples from sand and gravel wells than in those from bedrock wells although no concentrations exceeded established drinking-water standards; conversely, ammonia concentrations were higher in samples from bedrock wells than in samples from sand and gravel wells. Concentrations of several trace elements, including boron, copper, iron, manganese, and strontium were higher in samples from bedrock wells than in those from sand and gravel wells. The highest Radon-222 activities were in samples from bedrock wells (maximum 1,360 pCi/L). Nine pesticides and pesticide degradates were detected in four samples from sand and gravel wells and two samples from bedrock wells; most were degradates of atrazine, alachlor, and metolachlor. Most VOC detections were in samples from sand and gravel wells; these included toluene, tetrachloroethene, and four trihalomethanes, none of which exceeded drinking water standards.

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Appendix.

Table A1. Information on wells sampled in the Mohawk River Basin, 2006.

[-- , unknown; Pr, production; Dom, domestic; MHV, Mohawk-Hudson Valley, AKU, Adirondack upland; APU, Appalachian upland; D, developed; F, forested; A, agricultural; W, wetlands and open water; SS, sandstone]

Well number ¹	Date sampled	Well depth, feet below land surface	Casing depth, feet below land surface	Well type	Bedrock type	Physiographic region	Land cover ² , percentage in 0.5 mile radius around well ³						
							D	F	A	W			
Sand and gravel wells													
HE622	9/19/2006	52	--	Pr		MHV	71				7	15	6
HE625	9/25/2006	47	--	Pr		MHV	21	52		27			
HE1144	8/21/2006	36	36	Dom		MHV	61		36			3	
HE1433	8/16/2006	126	126	Dom		AKU	88				12		
M281	9/20/2006	56	--	Pr		APU	1	58		41			
MT407	8/31/2006	68	--	Pr		MHV	30	30		34		5	
MT408	8/15/2006	190	--	Pr		MHV	60		12	18	10		
OE1460	9/20/2006	28	--	Pr		MHV	28	39		28		5	
OE1462	9/6/2006	87	75	Pr		APU	3	78			19		
OE1841	8/24/2006	22.5	22.5	Dom		APU	9	35		56			
SA1501	9/18/2006	30	--	Pr		MHV	11	26	4	59			
SN135	8/9/2006	69	49	Pr		MHV	37		40		14	10	
SO9	11/1/2006	40.25	35.25	Pr		APU	78				9	13	
Bedrock wells													
FU426	8/15/2006	150	76	Dom	Carbonate	AKU	55		45				
FU1265	8/9/2006	300	182	Dom	Carbonate	MHV	23	77					
G1170	8/14/2006	597	118.5	Dom	SS and shale	APU	26	74			1		
G1351	8/14/2006	467	78	Dom	SS and shale	APU	1	69		29		1	
H267	9/14/2006	130	130	Dom	Gneiss	AKU	99				1		
HE1145	8/16/2006	278	40	Dom	Shale	MHV	16	61		16	7		
L475	8/17/2006	75	30	Dom	Shale	AKU	8	24	63			4	
MT406	8/23/2006	815	--	Pr	Shale	MHV	98						
OE1458	8/22/2006	500	--	Pr	Carbonate	MHV	5	31		65			
SA2198	8/7/2006	150	18	Dom	Shale	MHV	11	73		15			
SO1374	8/8/2006	500	--	Dom	SS and shale	APU	54		41		5		
SO1384	8/10/2006	380	239	Dom	Carbonate	APU	47		53				
SO1408	8/10/2006	200	58	Dom	SS and shale	APU	7	75		18			
SO1411	8/8/2006	220	87	Dom	SS and shale	APU	93				7		

¹ FU, Fulton County; G, Green County; H, Hamilton County; HE, Herkimer County; L, Lewis County; M, Madison County; MT, Montgomery County; OE, Oneida County; SA, Saratoga County; SN, Schenectady County; SO, Schoharie County.

² Land cover estimated from the National Land Cover Data set (1992).

³ Totals may not equal 100 percent as a result of rounding.

Table A2. Constituents analyzed for but not detected in ground-water samples from the Mohawk River Basin, 2006.

USGS parameter code	Compound	Laboratory reporting level
Trace Elements in unfiltered water, micrograms per liter		
71900	Mercury	0.01
01077	Silver	.16
01059	Thallium	.2
Pesticides in filtered water, micrograms per liter		
50470	2,4-D methyl ester	.190
39732	2,4-D	.04
38746	2,4-DB	.02
82660	2,6-Diethylaniline	.006
04038	2-Chloro-6-ethylamino-4-amino- <i>s</i> -triazine	.08
63781	2-Chloro- <i>N</i> -(2,6-diethylphenyl)acetamide	.02
63782	2-Chloro- <i>N</i> -(2-ethyl-6-methylphenyl)acetamide	.02
49308	3-Hydroxy carbofuran	.008
61029	Acetochlor ethanesulfonic acid	.02
61030	Acetochlor oxanilic acid	.02
62847	Acetochlor sulfynilacetic acid	.02
49260	Acetochlor	.006
49315	Acifluorfen	.028
50009	Alachlor ethanesulfonic acid	.02
61031	Alachlor oxanilic acid	.02
62848	Alachlor sulfynilacetic acid	.02
46342	Alachlor	.005
49313	Aldicarb sulfone	.02
49314	Aldicarb sulfoxide	.100
49312	Aldicarb	.15
34253	<i>alpha</i> -HCH	.005
82686	Azinphos-methyl	.050
50299	Bendiocarb	.08
82673	Benfluralin	.010
50300	Benomyl	.022
61693	Bensulfuron	.02
38711	Bentazon	.02
04029	Bromacil	.02
49311	Bromoxynil	.04
04028	Butylate	.004
50305	Caffeine	.018
49310	Carbaryl	.02
82680	Carbaryl	.041
49309	Carbofuran	.016

USGS parameter code	Compound	Laboratory reporting level
Pesticides in filtered water, micrograms per liter--Continued		
82674	Carbofuran	.020
61188	Chloramben methyl ester	.02
50306	Chlorimuron	.032
04039	Chlorodiamino- <i>s</i> -triazine	.04
38933	Chlorpyrifos	.005
82687	<i>cis</i> -Permethrin	.006
49305	Clopyralid	.07
04041	Cyanazine	.018
04031	Cycloate	.01
49304	Dacthal monoacid	.03
82682	DCPA	.003
63778	Dechloroacetochlor	.02
63777	Dechloroalachlor	.02
63779	Dechlorodimethenamid	.02
63780	Dechlorometolachlor	.02
62170	Desulfynil fipronil	.012
39572	Diazinon	.005
38442	Dicamba	.04
49302	Dichlorprop	.03
39381	Dieldrin	.009
61951	Dimethenamid ethanesulfonic acid	.02
62482	Dimethenamid oxanilic acid	.02
61588	Dimethenamid	.02
49301	Dinoseb	.04
04033	Diphenamid	.01
82677	Disulfoton	.02
49300	Diuron	.02
82668	EPTC	.004
82663	Ethalfuralin	.009
82672	Ethoprop	.012
49297	Fenuron	.10
62169	Desulfynilfipronil amide	.029
62167	Fipronil sulfide	.013
62168	Fipronil sulfone	.024
62166	Fipronil	.016
61952	Flufenacet ethanesulfonic acid	.02
62483	Flufenacet oxanilic acid	.02
62481	Flufenacet	.02
61694	Flumetsulam	.04
38811	Fluometuron	.02

USGS parameter code	Compound	Laboratory reporting level
Pesticides in filtered water, micrograms per liter--Continued		
04095	Fonofos	.005
63784	Hydroxyacetochlor	.02
63783	Hydroxyalachlor	.02
64045	Hydroxydimethenamid	.02
63785	Hydroxymetolachlor	.02
50356	Imazaquin	.04
50407	Imazethapyr	.04
61695	Imidacloprid	.020
39341	Lindane	.004
38478	Linuron	.01
82666	Linuron	.035
39532	Malathion	.027
38482	MCPA	.07
38487	MCPB	.10
50359	Metalaxyl	.03
38501	Methiocarb	.034
49296	Methomyl	.070
82667	Methyl parathion	.015
82630	Metribuzin	.028
61697	Metsulfuron	.07
82671	Molinate	.003
61692	<i>N</i> -(4-Chlorophenyl)- <i>N'</i> -methylurea	.04
82684	Napropamide	.007
49294	Neburon	.01
50364	Nicosulfuron	.04
49293	Norflurazon	.02
49292	Oryzalin	.02
38866	Oxamyl	.05
34653	<i>p,p'</i> -DDE	.003
39542	Parathion	.010
82669	Pebulate	.004
82683	Pendimethalin	.022
82664	Phorate	.055
49291	Picloram	.03
82676	Propyzamide	.004
62766	Propachlor ethanesulfonic acid	.05
62767	Propachlor oxanilic acid	.02
04024	Propachlor	.010
82679	Propanil	.011
82685	Propargite	.02
49236	Propham	.030
50471	Propiconazole	.01

USGS parameter code	Compound	Laboratory reporting level
Pesticides in filtered water, micrograms per liter--Continued		
38538	Propoxur	.008
38548	Siduron	.02
04035	Simazine	.005
50337	Sulfometuron	.090
82670	Tebuthiuron	.02
82665	Terbacil	.034
04032	Terbacil	.026
82675	Terbufos	.02
82681	Thiobencarb	.010
82678	Triallate	.006
49235	Triclopyr	.03
82661	Trifluralin	.009
Volatile organic compounds in unfiltered water, micrograms per liter		
34506	1,1,1-Trichloroethane	.1
77652	1,1,2-Trichloro-1,2,2-trifluoroethane	.1
34496	1,1-Dichloroethane	.1
34501	1,1-Dichloroethene	.1
34536	1,2-Dichlorobenzene	.1
32103	1,2-Dichloroethane	.2
34541	1,2-Dichloropropane	.1
34566	1,3-Dichlorobenzene	.1
34571	1,4-Dichlorobenzene	.1
34030	Benzene	.1
34301	Chlorobenzene	.1
77093	<i>cis</i> -1,2-Dichloroethene	.1
34668	Dichlorodifluoromethane	.2
34423	Dichloromethane	.2
81576	Diethyl ether	.2
81577	Diisopropyl ether	.2
34371	Ethylbenzene	.1
50005	Methyl <i>tert</i> -pentyl ether	.2
85795	<i>m</i> -Xylene plus <i>p</i> -xylene	.2
77135	<i>o</i> -Xylene	.1
77128	Styrene	.1
50004	<i>tert</i> -Butyl ethyl ether	.1
78032	Methyl <i>tert</i> -butyl ether	.2
32102	Tetrachloromethane	.2
34546	<i>trans</i> -1,2-Dichloroethene	.1
39180	Trichloroethene	.1
34488	Trichlorofluoromethane	.2
39175	Vinyl chloride	.2

Table A3. Physical properties of ground-water samples from the Mohawk River Basin, 2006.

[mg/L, milligrams per liter; $\mu\text{S}/\text{cm}$ @ 25°C, microsiemens per centimeter at 25 degrees Celsius; (00080), USGS National Water Information System parameter code; <, less than; bold values exceed one or more drinking water standards]

Well number ¹	Color, platinum-cobalt units (00080)	Dissolved oxygen, mg/L (00300)	pH, standard units (00400)	Specific conductance, $\mu\text{S}/\text{cm}$ @ 25°C (00095)	Water temperature, degrees Celsius (00010)
Sand and gravel wells					
HE622	2	7.9	7.2	1,040	9.9
HE625	2	6.9	7.4	366	10.1
HE1144	2	9.1	7.6	283	10.1
HE1433	2	8.6	8.1	106	9.5
M281	< 1	.3	7.2	547	8.9
MT407	8	5.9	7.2	519	9.8
MT408	5	.1	7.1	1,020	11.2
OE1460	2	5.6	7.1	910	13.6
OE1462	10	.3	7.3	749	9.6
OE1841	15	.1	7.3	768	12.3
SA1501	2	.6	7.1	455	12.4
SN135	2	12.2	7.4	443	12.4
SO9	8	.5	6.1	1,100	12.2
Bedrock wells					
FU426	20	2.4	7.9	32	9.8
FU1265	5	.1	7.7	315	11.1
G1170	< 1	.6	8.2	1,940	11.8
G1351	2	.2	8.7	2,230	11.5
H267	2	.2	8.1	84	8.5
HE1145	2	< .1	8.2	714	12.3
L475	8	.1	7.9	685	10.9
MT406	5	5.6	6.6	1,060	9.4
OE1458	2	.4	6.9	466	9.6
SA2198	2	7.8	7.1	475	12.2
SO1374	5	.1	7.1	800	14.5
SO1384	< 1	4.5	7.0	1,170	11.0
SO1408	< 1	.1	7.3	171	11.1
SO1411	2	.1	7.7	670	10.9

¹ FU, Fulton County; G, Green County; H, Hamilton County; HE, Herkimer County; L, Lewis County; M, Madison County; MT, Montgomery County; OE, Oneida County; SA, Saratoga County; SN, Schenectady County; SO, Schoharie County.

Table A4. Concentrations of major ions in ground-water samples from the Mohawk River Basin, 2006.

[mg/L, milligrams per liter; CaCO₃, calcium carbonate; (00900), USGS National Water Information System parameter code; <, less than; E, estimated value; bold values exceed one or more drinking water standards]

Well number ¹	Hardness, filtered, mg/L as CaCO ₃ (00900)	Calcium, filtered, mg/L (00915)	Magnesium, filtered, mg/L (00925)	Potassium, filtered, mg/L (00935)	Sodium, filtered, mg/L (00930)	Acid neutralizing capacity, unfiltered, mg/L as CaCO ₃ (90410)	Alkalinity, filtered, fixed end point, lab, mg/L as CaCO ₃ (29801)
Sand and gravel wells							
HE622	310	97.8	17.0	3.60	68.2	242	243
HE625	190	58.3	10.2	1.07	4.06	184	184
HE1144	140	44.5	7.81	.50	2.58	130	130
HE1433	47	15.8	1.95	.53	1.48	45	45
M281	300	63.5	35.3	1.29	3.89	276	278
MT407	250	63.9	23.2	1.09	11.8	224	236
MT408	340	87.7	29.0	2.84	73.6	284	283
OE1460	350	91.5	29.3	2.09	55.1	294	290
OE1462	330	86.3	28.4	1.18	24.7	199	198
OE1841	380	58.9	57.0	2.33	13.2	322	323
SA1501	230	72.6	11.2	2.38	15.2	210	212
SN135	180	54.8	9.33	1.22	19.6	169	170
SO9	400	132	16.2	3.99	70.4	289	288
Bedrock wells							
FU426	34	9.70	2.39	.89	4.12	34	34
FU1265	120	30.6	10.5	.70	23.4	161	160
G1170	81	26.6	3.67	.87	662	108	108
G1351	23	7.31	1.08	1.27	411	122	120
H267	34	9.21	2.76	.56	6.08	48	47
HE1145	34	5.87	4.67	2.92	139	331	331
L475	51	13.6	4.01	7.38	112	165	166
MT406	420	123	28.5	4.24	51.4	295	293
OE1458	240	72.1	15.7	1.78	5.82	226	226
SA2198	360	106	23.8	2.29	80.6	386	318
SO1374	510	115	53.7	3.73	139	369	367
SO1384	280	67.3	28.3	2.17	86.6	240	240
SO1408	89	23.0	7.61	.70	41.9	176	176
SO1411	71	21.4	4.15	.84	247	309	309

¹ FU, Fulton County; G, Green County; H, Hamilton County; HE, Herkimer County; L, Lewis County; M, Madison County; MT, Montgomery County; OE, Oneida County; SA, Saratoga County; SN, Schenectady County; SO, Schoharie County.

Table A4. Concentrations of major ions in ground-water samples from the Mohawk River Basin, 2006.—
Continued

[mg/L, milligrams per liter; CaCO₃, calcium carbonate; (00900), USGS National Water Information System parameter code; <, less than; E, estimated value; bold values exceed one or more drinking water standards]

Well number ¹	Bicarbonate ² , filtered, fixed end point, lab, mg/L (29805)	Chloride, filtered, mg/L (00940)	Fluoride, filtered, mg/L (00950)	Silica, filtered, mg/L (00955)	Sulfate, filtered, mg/L (00945)	Residue on evaporation, filtered, mg/L (70300)
Sand and gravel wells						
HE622	296	130	< 0.1	7.22	35.3	531
HE625	224	5.23	E .1	8.03	8.7	201
HE1144	159	4.19	E .1	10.1	10.9	167
HE1433	55	1.85	.1	13.2	4.4	72
M281	339	4.46	.1	8.23	37.1	334
MT407	288	21.7	E .1	8.19	18.7	303
MT408	345	150	.5	15.3	21.5	552
OE1460	354	98.1	E .1	6.21	30.4	453
OE1462	242	65.7	.1	13.2	99.5	463
OE1841	394	35.0	E .1	11.6	54.2	433
SA1501	259	21.9	.2	11.8	19.5	283
SN135	207	27.3	E .1	6.67	18.4	252
SO9	351	141	.1	10.8	60.8	627
Bedrock wells						
FU426	41	.50	E .1	15.4	7.7	57
FU1265	195	2.20	.5	8.88	14.3	194
G1170	132	1,070	.5	6.42	2.4	1,920
G1351	146	600	.6	6.80	< .9	1,130
H267	57	.31	.6	16.5	2.1	71
HE1145	404	20.2	2.8	7.66	12.4	409
L475	203	110	E .1	9.17	8.5	361
MT406	357	110	.3	7.15	101	634
OE1458	276	6.94	.1	10.9	20.5	266
SA2198	388	132	.3	16.2	45.7	620
SO1374	448	13.0	.4	11.0	451	1,070
SO1384	293	150	.5	10.9	80.3	609
SO1408	215	1.00	.2	9.63	11.4	202
SO1411	377	235	.7	8.26	1.8	736

¹ FU, Fulton County; G, Green County; H, Hamilton County; HE, Herkimer County; L, Lewis County; M, Madison County; MT, Montgomery County; OE, Oneida County; SA, Saratoga County; SN, Schenectady County; SO, Schoharie County.

² Bicarbonate values calculated from alkalinity.

Table A5. Concentrations of nutrients and organic carbon in ground-water samples from the Mohawk River Basin, 2006.

[N, nitrogen; P, phosphorus; mg/L, milligrams per liter; (00623), USGS National Water Information System parameter code; <, less than; E, estimated value]

Well number ¹	Ammonia plus organic-N, filtered, mg/L as N (00623)	Ammonia, filtered, mg/L as N (00608)	Nitrate plus nitrite, filtered, mg/L as N (00631)	Nitrite, filtered, mg/L as N (00613)	Ortho-phosphate, filtered, mg/L as P (00671)	Organic carbon, unfiltered, mg/L (00680)
Sand and gravel wells						
HE622	E 0.08	< 0.010	2.60	< 0.002	E 0.004	1
HE625	E .06	E .006	.43	< .002	E .005	< 1
HE1144	E .05	< .010	1.65	E .001	.007	< 1
HE1433	< .10	< .010	.43	< .002	.013	< 1
M281	< .10	E .010	.18	.003	.006	1.3
MT407	E .06	E .006	1.94	< .002	E .005	1
MT408	1.2	1.02	< .06	< .002	.014	< 1
OE1460	< .10	E .006	2.04	< .002	E .004	1.1
OE1462	E .10	.075	< .06	< .002	.007	< 1
OE1841	.17	.175	< .06	< .002	.008	< 1
SA1501	.48	.343	E .04	< .002	.007	1.6
SN135	< .10	< .010	.28	< .002	.143	1.1
SO9	.27	.227	< .06	< .002	E .005	1.1
Bedrock wells						
FU426	< .10	E .005	.15	< .002	.123	< 1
FU1265	.36	.377	< .06	< .002	.084	< 1
G1170	.22	.213	< .06	< .002	.019	< 1
G1351	.37	.351	< .06	< .002	.065	< 1
H267	< .10	.022	< .06	< .002	.039	< 1
HE1145	2.1	1.88	< .06	< .002	.014	< 1
L475	1.9	1.85	< .06	< .002	.007	< 1
MT406	.47	.409	< .06	< .002	.007	< 1
OE1458	.33	.163	< .06	< .002	.006	< 1
SA2198	.50	.479	E .03	< .002	.009	< 1
SO1374	1.6	1.67	< .06	< .002	.035	< 1
SO1384	E .08	.036	.60	< .002	.016	< 1
SO1408	< .10	.029	< .06	< .002	.007	< 1
SO1411	.37	.347	< .06	< .002	.031	< 1

¹ FU, Fulton County; G, Green County; H, Hamilton County; HE, Herkimer County; L, Lewis County; M, Madison County; MT, Montgomery County; OE, Oneida County; SA, Saratoga County; SN, Schenectady County; SO, Schoharie County.

Table A6. Concentrations of trace elements and radionuclides in ground-water samples from the Mohawk River Basin, 2006.

[µg/L, micrograms per liter; (01106), USGS National Water Information System parameter code; <, less than; E, estimated value; M, presence verified but not quantified; bold values exceed one or more drinking water standards]

Well number ¹	Aluminum, unfiltered, µg/L (01105)	Antimony, unfiltered, µg/L (01097)	Arsenic, unfiltered, µg/L (01002)	Barium, unfiltered, µg/L (01007)	Beryllium, unfiltered, µg/L (01012)	Boron, filtered, µg/L (01020)	Cadmium, unfiltered, µg/L (01027)	Chromium, unfiltered, µg/L (01034)
Sand and gravel wells								
HE622	< 2	< 0.2	0.60	200	< 0.06	27	E 0.03	< 0.60
HE625	< 2	< .2	.15	20	< .06	9.8	< .04	E .50
HE1144	18	< .2	.46	3	< .06	E 6.2	< .04	.85
HE1433	4	< .2	.12	M	< .06	E 4.1	< .04	.88
M281	E 1	< .2	.66	58	< .06	20	< .04	< .60
MT407	< 2	< .2	.20	17	< .06	11	< .04	E .33
MT408	E 1	< .2	1.5	916	< .06	125	E .03	< .60
OE1460	< 2	< .2	.21	97	< .06	28	< .04	< .60
OE1462	< 2	< .2	17.8	69	E .03	24	< .04	< .60
OE1841	E 1	< .2	4.0	104	< .06	43	< .04	< .60
SA1501	< 2	< .2	.38	20	< .06	24	.05	E .45
SN135	< 2	< .2	.55	23	< .06	15	< .04	< .60
SO9	< 2	< .2	1.2	100	< .06	49	< .02	< .60
Bedrock wells								
FU426	348	< .2	.41	8	E .04	< 7.0	< .04	14.8
FU1265	49	< .2	4.8	70	< .06	35	< .04	< .60
G1170	59	< .4	16.4	475	< .12	104	< .08	E .30
G1351	5	< .2	6.5	261	< .06	264	E .03	< .60
H267	7	< .2	E .09	4	< .06	E 5.8	< .04	E .38
HE1145	5	< .2	E .07	118	< .06	608	< .04	E .57
L475	< 2	< .2	E .06	95	< .06	76	< .04	E .49
MT406	< 2	< .2	.91	105	< .06	139	< .04	< .60
OE1458	< 2	< .2	E .06	178	< .06	28	.19	E .36
SA2198	23	< .2	.79	171	< .06	76	< .02	< .60
SO1374	10	< .2	9.3	56	< .06	410	E .03	< .60
SO1384	E 2	.4	.20	51	< .06	345	< .04	E .56
SO1408	4	< .2	.39	56	< .06	329	< .04	E .31
SO1411	12	< .2	.14	147	< .06	399	< .04	< .60

¹ FU, Fulton County; G, Green County; H, Hamilton County; HE, Herkimer County; L, Lewis County; M, Madison County; MT, Montgomery County; OE, Oneida County; SA, Saratoga County; SN, Schenectady County; SO, Schoharie County.

Table A6. Concentrations of trace elements and radionuclides in ground-water samples from the Mohawk River Basin, 2006.—Continued

[µg/L, micrograms per liter; (01106), USGS National Water Information System parameter code; <, less than; E, estimated value; M, presence verified but not quantified; bold values exceed one or more drinking water standards]

Well number ¹	Cobalt, unfiltered, µg/L (01037)	Copper, unfiltered, µg/L (01042)	Iron, filtered, µg/L (01046)	Iron, unfiltered, µg/L (01045)	Lead, unfiltered, µg/L (01051)	Lithium, unfiltered, µg/L (01132)	Manganese, filtered, µg/L (01056)	Manganese, unfiltered, µg/L (01055)
Sand and gravel wells								
HE622	0.183	3.6	< 6	E 6	0.15	5.7	E 0.5	< 0.6
HE625	.114	.9	< 6	< 6	.09	1.3	< .6	< .6
HE1144	.113	4.7	< 6	580	2.13	1.9	1.6	18.1
HE1433	E .028	.6	8	150	.07	1.8	2.3	3.8
M281	.270	4.2	23	28	E .03	12.9	10.1	10.1
MT407	.163	1.6	8	29	.13	1.0	E .3	< .6
MT408	.173	2.3	1,230	1,170	.09	75.7	160	149
OE1460	.235	1.0	< 6	E 3	E .06	10.4	< .6	< .6
OE1462	.152	1.0	251	254	.34	10.4	33.0	31.1
OE1841	.240	1.2	1,240	1,210	< .06	18.1	41.8	38.4
SA1501	.742	1.2	E 4	7	.07	4.7	1,960	2,020
SN135	.150	3.2	E 4	E 4	.09	2.6	111	106
SO9	.418	E .8	1,140	1,180	< .06	7.6	349	390
Bedrock wells								
FU426	.389	26.2	81	8,190	.88	E .5	.8	93.7
FU1265	.138	E .5	229	326	.25	.8	50.2	49.9
G1170	.090	6.0	62	273	.46	111	306	306
G1351	E .027	1.2	18	52	E .03	352	12.0	12.1
H267	E .031	2.7	44	66	.13	< .6	23.2	22.0
HE1145	E .023	.7	< 6	19	< .06	824	< .6	E .5
L475	E .033	1.5	389	381	E .03	106	51.1	45.8
MT406	.260	3.0	154	143	< .06	14.5	19.9	18.3
OE1458	.106	3.8	88	84	E .03	9.1	24.0	20.0
SA2198	.556	3.3	< 6	980	2.21	28.0	220	279
SO1374	.378	9.7	2,190	2,150	.54	115	253	277
SO1384	.247	7.6	9	17	.13	38.7	5.3	5.3
SO1408	.109	E .6	39	49	.10	48.7	148	144
SO1411	.060	1.6	419	505	.12	608	97.6	97.5

¹ FU, Fulton County; G, Green County; H, Hamilton County; HE, Herkimer County; L, Lewis County; M, Madison County; MT, Montgomery County; OE, Oneida County; SA, Saratoga County; SN, Schenectady County; SO, Schoharie County.

Table A6. Concentrations of trace elements and radionuclides in ground-water samples from the Mohawk River Basin, 2006.—Continued

[µg/L, micrograms per liter; (01106), USGS National Water Information System parameter code; <, less than; E, estimated value; M, presence verified but not quantified; bold values exceed one or more drinking water standards]

Well number ¹	Molybdenum, unfiltered, µg/L (01062)	Nickel, unfiltered, µg/L (01067)	Selenium, unfiltered, µg/L (01147)	Strontium, unfiltered, µg/L (01082)	Zinc, unfiltered, µg/L (01092)	Radon-222, unfiltered, picoCuries per liter (82303)	Uranium, unfiltered, µg/L (28011)
Sand and gravel wells							
HE622	E 0.1	1.96	0.71	651	9	450	0.221
HE625	.3	.31	< .08	197	< 2	530	.210
HE1144	E .2	.76	.11	171	E 1	440	.245
HE1433	.2	.24	E .04	30.2	3	420	.166
M281	1.2	1.42	< .08	963	6	150	1.52
MT407	.2	.53	.23	178	3	270	.322
MT408	4.5	1.06	< .08	2,640	10	30	.364
OE1460	< .2	1.01	E .06	369	E 2	480	.151
OE1462	.9	.75	< .08	1,510	4	40	.579
OE1841	.5	.42	< .08	782	3	70	.314
SA1501	1.0	2.29	< .08	237	< 2	500	.236
SN135	.4	.89	.09	293	4	440	.242
SO9	1.0	.63	.28	549	2	80	.810
Bedrock wells							
FU426	.9	1.06	.40	34.2	11	670	.076
FU1265	4.4	.56	< .08	396	< 2	660	.107
G1170	2.5	2.48	E .10	601	16	770	.070
G1351	5.9	1.21	< .08	434	E 2	110	E .007
H267	3.8	.17	< .08	30.0	< 2	1,360	.104
HE1145	< .2	.38	.13	1,600	< 2	20	< .012
L475	E .1	.34	< .08	705	< 2	20	< .012
MT406	2.7	1.84	< .08	2,090	7	150	1.80
OE1458	2.1	1.40	< .08	614	3	60	.130
SA2198	.8	1.91	E .05	695	3	50	.723
SO1374	10.4	2.23	E .04	5,720	5	110	1.27
SO1384	.5	1.00	.08	31,100	E 2	250	.393
SO1408	.8	.44	< .08	437	E 1	1,020	.471
SO1411	6.3	.84	< .08	417	E 1	80	.201

¹ FU, Fulton County; G, Green County; H, Hamilton County; HE, Herkimer County; L, Lewis County; M, Madison County; MT, Montgomery County; OE, Oneida County; SA, Saratoga County; SN, Schenectady County; SO, Schoharie County.

Table A7. Concentrations of pesticides and caffeine detected in ground-water samples from the Mohawk River Basin, 2006.

[µg/L, micrograms per liter; ESA, ethanesulfonic acid; SA, secondary amide; CIAT, 2-chloro-4-isopropylamino-6-amino-*s*-triazine; OIET, 2-Hydroxy-4-isopropylamino-6-ethylamino-*s*-triazine, OA, oxanilic acid; (04040), USGS National Water Information System parameter code; <, less than; E, estimated value; M, presence verified but not quantified; bold values indicate detections]

Well number ¹	Acetochlor/ Metolachlor ESA SA, filtered, µg/L (62850)	CIAT, filtered, µg/L (04040)	OIET, filtered, µg/L (50355)	Alachlor ESA SA, filtered, µg/L (62849)	Atrazine, filtered, µg/L (39632)	Metolachlor ESA, filtered, µg/L (61043)	Metolachlor OA, filtered, µg/L (61044)	Metolachlor, filtered, µg/L (39415)	Prometon, filtered, µg/L (04037)
Sand and gravel wells									
HE622	< 0.02	< 0.014	< 0.032	< 0.02	< 0.007	< 0.02	< 0.02	< 0.006	< 0.01
HE625	< .02	E .004	< .032	< .02	E .003	< .02	< .02	< .006	< .01
HE1144	< .02	< .014	< .032	< .02	< .007	.02	< .02	< .006	< .01
HE1433	< .02	< .014	< .032	< .02	< .007	< .02	< .02	< .006	< .01
M281	< .02	< .014	< .032	< .02	< .007	< .02	< .02	< .006	< .01
MT407	< .02	< .014	< .032	< .02	< .007	< .02	< .02	< .006	< .01
MT408	< .02	< .014	< .032	< .02	< .007	< .02	< .02	< .006	< .01
OE1460	< .02	E .033	< .032	< .02	.024	< .02	< .02	E .002	< .01
OE1462	< .02	< .014	< .032	< .02	< .007	< .02	< .02	< .006	< .01
OE1841	< .02	< .014	< .032	< .02	< .007	< .02	< .02	< .006	< .01
SA1501	< .02	< .014	< .032	< .02	< .007	< .02	< .02	< .006	< .01
SN135	< .02	E .006	E .005	< .02	.013	.12	< .02	E .003	M
SO9	< .02	< .014	< .080	< .02	< .007	< .02	< .02	< .010	< .01
Bedrock wells									
FU426	< .02	< .014	< .032	< .02	< .007	< .02	< .02	< .006	< .01
FU1265	< .02	< .014	< .032	< .02	< .007	< .02	< .02	< .006	< .01
G1170	< .02	< .014	< .032	< .02	< .007	< .02	< .02	< .006	< .01
G1351	< .02	< .014	< .032	< .02	< .007	< .02	< .02	< .006	< .01
H267	< .02	< .014	< .032	< .02	< .007	< .02	< .02	< .006	< .01
HE1145	< .02	< .014	< .032	< .02	< .007	< .02	< .02	< .006	< .01
L475	< .02	< .014	< .032	< .02	< .007	< .02	< .02	< .006	< .01
MT406	.05	< .014	< .032	.02	< .007	.42	.11	< .006	< .01
OE1458	< .02	< .014	< .032	< .02	< .007	< .02	< .02	< .006	< .01
SA2198	< .02	< .014	< .032	< .02	< .007	< .02	< .02	< .006	< .01
SO1374	< .02	< .014	< .032	< .02	< .007	< .02	< .02	< .006	< .01
SO1384	< .02	E .003	< .032	< .02	.008	< .02	< .02	< .006	< .01
SO1408	< .02	< .014	< .032	< .02	< .007	< .02	< .02	< .006	< .01
SO1411	< .02	< .014	< .032	< .02	< .007	< .02	< .02	< .006	< .01

¹ FU, Fulton County; G, Green County; H, Hamilton County; HE, Herkimer County; L, Lewis County; M, Madison County; MT, Montgomery County; OE, Oneida County; SA, Saratoga County; SN, Schenectady County; SO, Schoharie County.

Table A8. Concentrations of volatile organic compounds and phenolic compounds detected in ground-water samples from the Mohawk River Basin, 2006.

[µg/L, micrograms per liter; (32730), USGS National Water Information System parameter code; <, less than; bold values indicate detections]

Well number ¹	Total Phenolic Compounds, unfiltered, µg/L (32730)	Bromo-dichloro-methane, unfiltered, µg/L (32101)	Dibromo-chloro-methane, unfiltered, µg/L (32105)	Tetrachloro-ethene, unfiltered, µg/L (34475)	Toluene, unfiltered, µg/L (34010)	Tribromo-methane, unfiltered, µg/L (32104)	Trichloro-methane, unfiltered, µg/L (32106)
Sand and gravel wells							
HE622	< 4	0.3	0.7	< 0.1	< .1	0.8	0.2
HE625	< 4	< .1	< .2	< .1	< .1	< .2	< .1
HE1144	< 4	< .1	< .2	< .1	< .1	< .2	< .1
HE1433	< 4	< .1	< .2	< .1	< .1	< .2	< .1
M281	8	< .1	< .2	< .1	< .1	< .2	< .1
MT407	4	< .1	< .2	< .1	< .1	< .2	.1
MT408	< 4	< .1	< .2	< .1	< .1	< .2	< .1
OE1460	< 4	.1	.3	.4	.2	.5	.1
OE1462	< 4	< .1	< .2	< .1	< .1	< .2	< .1
OE1841	< 4	< .1	< .2	< .1	< .1	< .2	< .1
SA1501	< 4	< .1	< .2	< .1	< .1	< .2	< .1
SN135	< 4	< .1	< .2	< .1	< .1	< .2	< .1
SO9	< 4	< .1	< .2	< .1	< .1	< .2	< .1
Bedrock wells							
FU426	< 4	< .1	< .2	< .1	< .1	< .2	< .1
FU1265	< 4	< .1	< .2	< .1	.2	< .2	< .1
G1170	< 4	< .1	< .2	< .1	< .1	< .2	< .1
G1351	< 4	< .1	< .2	< .1	< .1	< .2	< .1
H267	< 4	< .1	< .2	< .1	< .1	< .2	< .1
HE1145	< 4	< .1	< .2	< .1	< .1	< .2	< .1
L475	< 4	< .1	< .2	< .1	< .1	< .2	< .1
MT406	< 4	< .1	< .2	< .1	< .1	< .2	< .1
OE1458	< 4	< .1	< .2	< .1	< .1	< .2	< .1
SA2198	< 4	< .1	< .2	< .1	< .1	< .2	< .1
SO1374	< 4	< .1	< .2	< .1	< .1	< .2	< .1
SO1384	< 4	< .1	< .2	< .1	< .1	< .2	< .1
SO1408	13	< .1	< .2	< .1	< .1	< .2	< .1
SO1411	< 4	< .1	< .2	< .1	< .1	< .2	< .1

¹ FU, Fulton County; G, Green County; H, Hamilton County; HE, Herkimer County; L, Lewis County; M, Madison County; MT, Montgomery County; OE, Oneida County; SA, Saratoga County; SN, Schenectady County; SO, Schoharie County.

Table A9. Bacteria in ground-water samples from the Mohawk River Basin, 2006.

[CFU, colony-forming unit; mL, milliliter; (78943), USGS National Water Information System parameter code; <, less than; E, estimated value; TNTC, too numerous to count; bold values exceed one or more drinking water standards]

Well number ¹	Heterotrophic plate count, unfiltered, CFU/mL (78943)	<i>Escherichia coli</i> , unfiltered, Presence /Absence (50278)	Fecal coliform, unfiltered, CFU/100mL (31625)	Total coliform, unfiltered, CFU/100mL (31501)
Sand and gravel wells				
HE622	< 1	Negative	E < 5	< 1
HE625	2	Negative	E < 5	3
HE1144	140	Negative	E < 5	< 1
HE1433	33	Negative	E < 5	< 1
M281	< 1	Negative	E < 5	< 1
MT407	< 1	Negative	E < 5	Positive*
MT408	35	Negative	E < 5	< 1
OE1460	13	Negative	E < 5	< 1
OE1462	1	Negative	E < 5	< 1
OE1841	23	Negative	E < 5	100
SA1501	< 1	Negative	E < 5	< 1
SN135	250	Negative	E < 5	< 1
SO9	< 1	Negative	E < 5	< 1
Bedrock wells				
FU426	4	Negative	E < 5	< 1
FU1265	< 1	Negative	E < 5	< 1
G1170	15	Negative	E < 5	< 1
G1351	46	Negative	E < 5	< 1
H267	3	Negative	E < 5	< 1
HE1145	77	Negative	E < 5	< 1
L475	70	Negative	E < 5	TNTC
MT406	2	Negative	E < 5	< 1
OE1458	2	Negative	E < 5	< 1
SA2198	110	Negative	< 2*	< 1
SO1374	17	Negative	E < 5	1
SO1384	< 1	Negative	E < 5	25
SO1408	< 1	Negative	E < 5	< 1
SO1411	E 940	Negative	E < 5	< 1

¹ FU, Fulton County; G, Green County; H, Hamilton County; HE, Herkimer County; L, Lewis County; M, Madison County; MT, Montgomery County; OE, Oneida County; SA, Saratoga County; SN, Schenectady County; SO, Schoharie County.

* Processed with defined-substrate technology instead of membrane filtration.