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Long-Term Ground-Water Levels and Transmissivity in the Blackstone River Basin, Northern Rhode Island

Scientific Investigations Report 2006–5295

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Contents

Plates

In pocket

Figures

Tables

Conversion Factors, Datums, and Abbreviations

Multiply	By	To obtain
	Length	
foot (ft)	0.3048	meter (m)
inch (in.)	2.54	centimeter (cm)
mile (mi)	1.609	kilometer (km)
	Area	
square mile (mi^2)	2.590	square kilometer (km^2)
	Volume	
gallon (gal)	3.785	liter (L)
	Flow rate	
inch per year (in/yr)	2.54	centimeter per year (cm/yr)
cubic foot per second (ft^3/s)	.6464	million gallons per day (Mgal/d)
foot per day (ft/d)	.3048	meter per day (m/d)
foot per year (ft/yr)	.3048	meter per year (m/yr)
	Transmissivity	
foot squared per day (ft^2/d)	.09290	meter squared per day (m^2/d)

Vertical coordinate information is referenced to the National Geodetic Vertical Datum of 1929 (NGVD 1929). Altitude, as used in this report, refers to distance above the vertical datum.

Horizontal coordinate information is referenced to the North American Datum of 1983 (NAD 83).

Transmissivity: The standard unit for transmissivity is cubic foot per day per square foot times foot of aquifer thickness [(ft^3/d)/ft^2]ft. In this report, the mathematically reduced form, foot squared per day (ft^2/d), is used for convenience.

ABF	Aquatic Base Flow
ET	evapotranspiration
GWSI	Ground-Water Site Inventory
RIGIS	Rhode Island Geographic Information System
RIWRB	Rhode Island Water Resources Board
USGS	U.S. Geological Survey

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Abstract

Ground water provides about 7.7 million gallons per day, or 28 percent of total water use in the Rhode Island part of the Blackstone River Basin. Primary aquifers in the basin are stratified glacial deposits, composed mostly of sand and gravel along valley bottoms. The ground-water and surface-water system in the Blackstone River Basin is under stress due to population growth, out-of-basin water transfers, industrialization, and changing land-use patterns. Streamflow periodically drops below the Aquatic Base Flow standard, and ground-water withdrawals add to stress on aquatic habitat during low-flow periods.

Existing hydrogeologic data were reviewed to examine historical water-level trends and to generate contour maps of water-table altitudes and transmissivity of the sand and gravel aquifer in the Blackstone River Basin in Rhode Island. On the basis of data from four long-term observation wells, water levels appear to have risen slightly in the study area during the past 55 years. Analysis of available data indicates that increased rainfall during the same period is a likely contributor to the water-level rise. Spatial patterns of transmissivity are shown over larger areas and have been refined on the basis of more detailed data coverage as compared to previous mapping studies.

Introduction

The Blackstone River flows 46 mi from its headwaters near Worcester, Massachusetts, the third largest city in New England, to the head of Narragansett Bay at Providence, Rhode Island, the second largest city in New England. About 126,600 people live in the Rhode Island part of the Blackstone River Basin (U.S. Census Bureau, 2000), and the population increased about 3.4 percent from 1990 to 2000. In addition to population growth, water transfers out of the basin, commercial and industrial growth, and changing land-use patterns have led to greater water use and stress on the water resources of the basin (Barlow, 2003). Ground water is an important source of water supply in the Rhode Island part of the Blackstone River Basin, providing about 7.7 Mgal/d, or 28 percent of total water use (Barlow, 2003). The U.S. Geological Survey (USGS), in cooperation with the Rhode Island Water Resources Board (RIWRB), is studying ground-water availability in the basin to help prepare for future population growth and increased water demand. This report focuses on the ground-water resources of the Blackstone River Basin in Rhode Island with a compilation and analysis of aquifer transmissivity and ground-water-level data. The results of this study can be used in developing water-resource management plans.

Purpose and Scope

This report presents an analysis of ground-water resources in the Rhode Island portion of the Blackstone River Basin. Spatial and temporal trends in ground-water levels, expressed as the altitude of the water table above the National Geodetic Vertical Datum (NGVD) of 1929, are analyzed and mapped. Available transmissivity data are used to compile a contour map that updates previous maps (Johnston and Dickerman, 1974a,b) and presents a broader regional view of transmissivity of the sand and gravel aquifer.

Previous Investigations

Water use and availability in the lower Blackstone River Basin, including the parts of the basin in both Rhode Island and Massachusetts, were documented by Barlow (2003). Ground water is withdrawn for private use and public water-supply use within the basin. An average of 2.12 Mgal/d of ground water was withdrawn for public supplies in the Rhode Island part of the Blackstone River Basin in 1995–1999 (Barlow, 2003, table 4). An additional 2.14 Mgal/d of ground water is estimated to supply private use, both domestic and commercial (Barlow, 2003, table 5, subtracting known surface water withdrawals). In 2003–2004, parts of the basin experienced low-flow conditions, with streamflow periodically dropping below the Aquatic Base Flow standard (ABF) (U.S. Fish and Wildlife Service, 1981). Withdrawals at wells have been shown to deplete streamflow, exacerbating effects on aquatic habitat during periods of low streamflow (Barlow, 2003).

Previous investigations have examined ground-water resources in part of the Blackstone River Basin in Rhode

Island. Johnston and Dickerman examined ground-water availability and quality in the Branch River subbasin (1974a) and the eastern part of the Blackstone River Basin (1974b). Information from those reports was used in this study, in addition to information from the USGS Ground-Water Site Inventory (GWSI) database in the National Water Information System (*http://waterdata.usgs.gov/nwis/*), and unpublished well logs recorded by private drilling companies and by the USGS.

Description of the Study Area

The study area is the Blackstone River Basin in Rhode Island (fig. 1 and plate 1), which has a drainage area of 140 mi^2; the entire Blackstone River Basin has a drainage area of 474 mi^2 in Rhode Island and Massachusetts. Nine towns are in the Rhode Island part of the basin: Burrillville, Central Falls, Cumberland, Glocester, Lincoln, North Smithfield, Pawtucket, Smithfield, and Woonsocket (fig. 1). Land-surface altitudes in the Rhode Island part of the basin range from sea level at the outlet of the basin to 804 ft in the southwestern part of the basin. Topography is dominated by narrow river valleys bordered by relatively steep hills. The Blackstone River was once known as the "hardest working river in America," a reference to the many dams powering mills along the river.

The largest tributary to the Blackstone River in Rhode Island is the Branch River, which is formed by the confluence of the Clear River and the Chepachet River in the town of Burrillville. The Branch River has a drainage area of 91 mi^2, or 65 percent of the Blackstone River Basin in Rhode Island. The Branch River joins the Blackstone River in the northeastern corner of North Smithfield, about 1 mi upstream from Woonsocket. The only other major tributary to the Blackstone River with drainage area in Rhode Island is Abbot Run, which joins the Blackstone River at the border between Cumberland and Central Falls, less than 2 mi upstream from the Seekonk River. Abbott Run has a drainage area of 28 mi^2, or 20 percent of the Blackstone River Basin in Rhode Island.

Land Use and Water Use

Land in the basin is mostly forested (53 percent), with the remainder composed of residential areas (19 percent), water/wetlands (14 percent), urban/industrial areas (9 percent), and agricultural lands (5 percent). Geospatial data describing land use, surface geology, and surface-water occurrence were compiled for this study.

All of the towns in the basin are at least partly supplied with water from public water-supply authorities. Water is withdrawn from a few surface-water reservoirs and from ground-water wells throughout the basin to meet water demands. Although the sand and gravel aquifer is the source of most ground-water supplies, till and bedrock deposits do supply ground water to numerous private wells. Barlow (2003) reported that surface-water and ground-water withdrawals in the Rhode Island part of the Blackstone River Basin averaged 27.7 Mgal/d during 1995–1999, with ground-water withdrawals constituting 7.7 Mgal/d or 28 percent of the total.

Hydrogeology

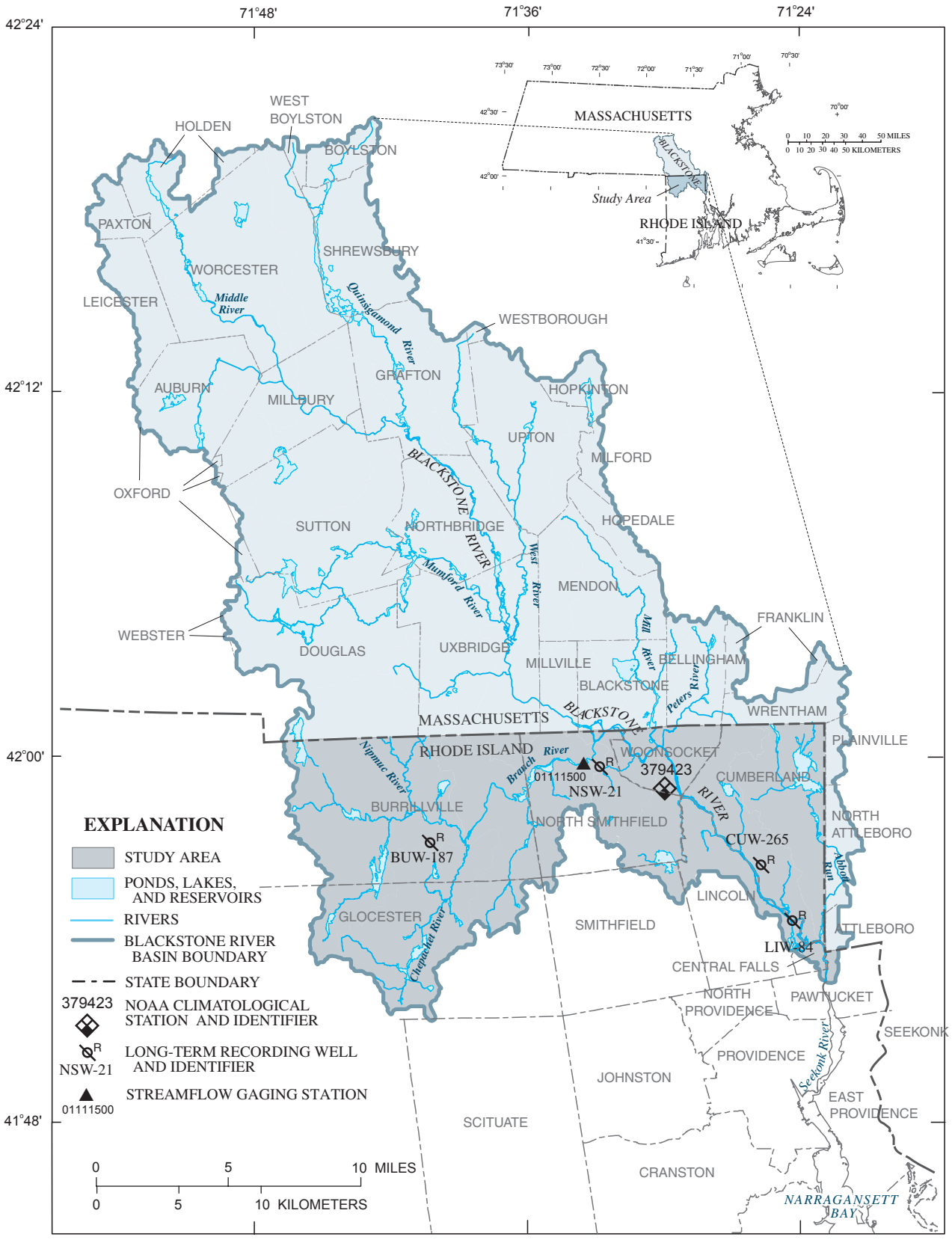
Unconsolidated stratified glacial deposits underlie 30 percent of the Blackstone River Basin in Rhode Island; the remainder of the basin has exposed bedrock (2 percent), till (64 percent), or open water (4 percent) at the land surface. The irregularly shaped valleys are filled with stratified glacial deposits ranging in grain size from clay to gravel. Coarse-grained sand and gravel form the primary aquifer deposits, which are thin, discontinuous, and unconfined (plate 1).

Due to high aquifer permeability and short ground-water travel distances to streams, typically less than 3,000 ft, water withdrawals from the sand and gravel aquifer can cause relatively rapid flow reductions in nearby streams. Although the sand and gravel aquifer is the principal source of ground-water supplies, small withdrawals also are made from wells in till and bedrock areas, generally from private wells supplying a single home or business.

The RIWRB has published a map of ground-water reservoirs, which are the parts of the state's sand and gravel aquifers that have the greatest potential for supplying ground water, a saturated thickness of 40 ft or greater, and a transmissivity of 4,000 ft^2/d or greater (Rhode Island Statewide Planning Program,1979; Rhode Island Department of Environmental Management, 1991).

Precipitation

Precipitation in the basin increased from 1949 to 2003, but averaged 46 in/yr, based on records at the National Oceanographic and Atmospheric Administration (NOAA) climatological station 379423 in Woonsocket, Rhode Island (fig. 1). Evapotranspiration (ET) can be estimated from streamflow records for the Branch River streamflow-gaging station at Forestdale, R.I. (USGS station 01111500), which represents 91 mi^2, the largest unregulated part of the Blackstone River Basin in Rhode Island. Streamflow at the Forestdale, R.I. station averages 25.9 in/yr based on mean annual streamflow from 1941 through 2003. If the difference between precipitation and streamflow is assumed to be lost to ET, then ET equals 20.1 in/yr, or 44 percent of precipitation, for the Branch River Basin. Recharge to the aquifer in the Branch River Basin is 19.0 in/yr, or 41 percent of precipitation, based on a hydrograph separation estimate of base flow at the Forestdale station from 1941 to 2003.



Base from the National Resource Conservation Service
12-digit HUC base map, 1:24,000, 2001
Projection: Rhode Island State Plane
1983 North American datum

Figure 1. Blackstone River Basin and study area, northern Rhode Island.

Data Compilation

For this study, hydrogeologic data were compiled from previously published studies. A comprehensive literature search was conducted to find hydraulic conductivity, aquifer thickness, and ground-water-level data. The data were then formatted and organized in a database for ease of access and analysis. The Appendix contains the hydrogeologic data on which the mapping and analysis were based.

Ground-Water Levels

A contour map of the altitude of the water table in the sand and gravel aquifer was constructed on the basis of 726 water-level measurements made in wells (plate 1). The water levels were measured from 1900 to 2003 at various times of the year. In cases where water levels were measured more than once at a single well, the measurements were averaged.

Because the water table is close to the land surface throughout the Blackstone River Basin and the aquifer is unconfined, it is assumed that ground water is hydraulically connected to surface water. Therefore, altitudes of surface-water bodies such as streams, ponds, and reservoirs were used to map the altitude of the water table. The altitudes of surface-water bodies and stream reaches were estimated from geospatial data obtained from the Rhode Island Geographic Information System (RIGIS). Altitudes at 15,815 surface-water points were obtained in this manner and used to contour the water-table altitude.

Long-term, detailed, water-level records were compiled for four observation wells (RI-LIW-84, RI-CUW-265, RI-NSW-21, and RI-BUW-187) screened in the stratified glacial deposits (fig. 1). Periodic water-level measurements from the 1940s through 2003, obtained from the GWSI database, were used to develop time series of water-table altitudes for these wells (fig. 2).

Transmissivity

Transmissivity (T) is a variable that expresses the ability of an aquifer to transmit water and indicates the suitability of an aquifer as a water-supply source. For this study, transmissivity values were determined by estimating saturated thickness (b) and hydraulic conductivity (K) from information in drilling logs. Drilling log records were obtained from previously published reports (Johnston and Dickerman, 1974a,b,c), from the GWSI database, and from unpublished water-well logs on file at the USGS Massachusetts-Rhode Island Water Science Center. The drilling logs contained 69 different descriptions of soil class/lithology. Each described lithology was placed in one of six categories and assigned a K value (table 1) based on earlier studies (Dickerman and Bell, 1993; Dickerman and others, 1990; Dickerman and others, 1997; Johnston and Dickerman, 1974a,b; Rosenshein and others, 1968). Silt, clay, till, and bedrock were assumed to have very low K of less than 10^{-4} ft/d and were assigned a value of zero when calculating transmissivity. Observed saturated intervals were recorded and T values were calculated using equation 1 below. In cases in which drilling logs did not indicate a water level, saturated thickness was calculated using a water-table altitude estimated from the contours shown on plate 1.

$$T = \sum_{i=1}^{n} b_i K_i \qquad (1)$$

where n = number of lithologic units,
i = lithologic unit indicator,
b_i = saturated thickness of unit *i,* and
K_i = hydraulic conductivity of unit *i.*

Equation 1 sums up the contribution to aquifer transmissivity from each permeable layer encountered when drilling a well. Values from 533 wells in the basin were used to construct a map of transmissivity of the sand and gravel aquifer. Transmissivity values greater than 50 ft^2/d are plotted on plate 2. Forty-eight percent of the transmissivity values were based on data from the Johnston and Dickerman studies (1974a,b,c).

Table 1. Lithologic categories and assigned hydraulic conductivity values in the Blackstone River Basin, northern Rhode Island.

[<, less than]

Lithologic category	Hydraulic conductivity, in feet per day
Silt, clay, till, and bedrock	$<10^{-4}$
Silty sand	10
Fine to medium sand	50
Medium to coarse sand	100
Sand and gravel	200
Coarse gravel	400

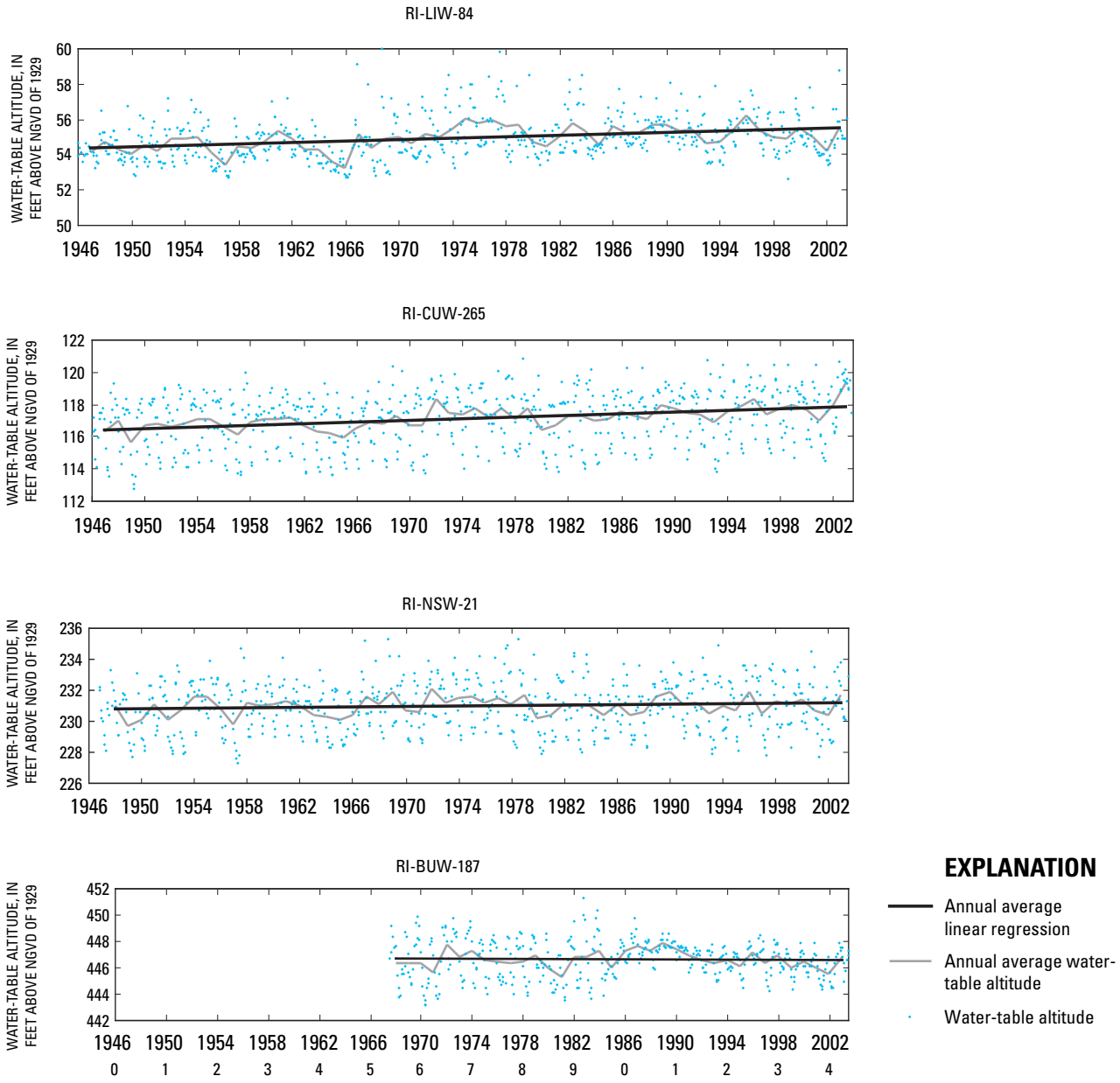


Figure 2. Water-table altitudes for the 1940s through 2003 in wells RI-LIW-84, RI-CUW-265, RI-NSW-21, and RI-BUW-187, Blackstone River Basin, northern Rhode Island.

Ground-Water Levels and Transmissivity in the Blackstone River Basin in Northern Rhode Island

The water-level and transmissivity data were analyzed for spatial and temporal trends. The findings are discussed below with emphasis on their relation to water-supply availability.

Ground-Water Levels

The water level at any point in an aquifer can change over time. Periodic changes in ground-water levels occur in response to seasonal variations in precipitation and evapotranspiration. Other factors that can affect ground-water levels include changes in land use, ground-water and surface-water withdrawals, and wastewater disposal.

Changes in water levels in long-term observation well RI-NSW-21 give an example of typical seasonal patterns (fig. 3) for the period 1947 to 2003. Water levels in the aquifer are lowest during the late summer and early fall and highest during the early spring. Well RI-NSW-21 has an annual average water-level fluctuation of 3.6 ft, which is typical of wells in stratified glacial deposits.

Spatial Patterns

Water levels in the sand and gravel aquifer are higher in the western part of the study area where land-surface altitudes also are high. The highest ground-water levels in the study area, more than 700 ft above NGVD 1929, are near Burlingame Reservoir in the town of Glocester. The lowest ground-water levels, less than 100 ft above NGVD 1929, are near Central Falls, where the Blackstone River empties into the Seekonk River.

Water-table altitudes are affected by altitudes of nearby streams. Local patterns show that water-table altitudes decrease as ground water moves from ridge tops to valley bottoms. Near streams and lakes, water-table altitudes are nearly the same as surface-water altitudes.

Long-Term Trends

Water-table altitudes have risen in the study area from the 1940s through 2003; three of the four long-term observation wells in the basin show increasing altitudes and the fourth shows no trend (fig. 2). Annual average altitudes in wells CUW-265, LIW-84, and NSW-21 rose from the 1940s to 2003 by 1.1, 1.4, and 0.4 ft, respectively, whereas the altitude in BUW-187 declined 0.1 ft between 1968 and 2003. Well NSW-

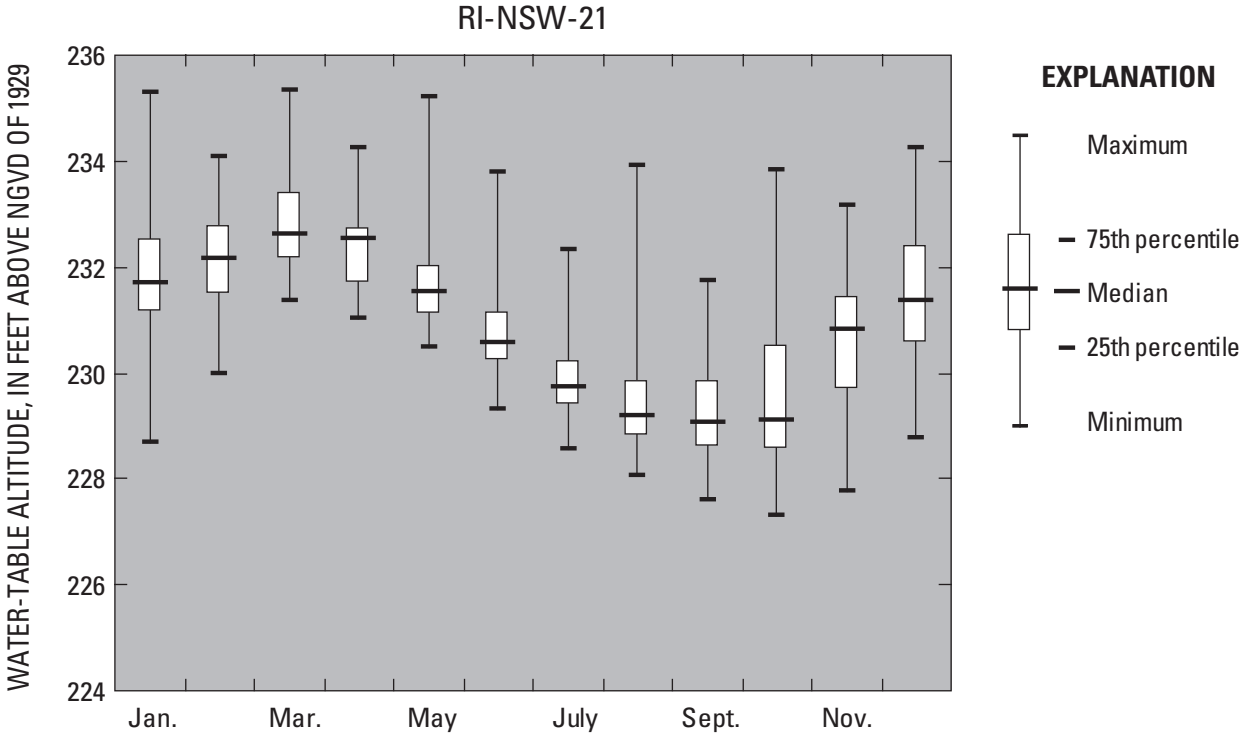


Figure 3. Seasonal changes in the altitude of the water table in North Smithfield well 21 (RI-NSW-21) for the 1940s through 2003, Blackstone River Basin, northern Rhode Island. Well location shown on figure 1 and plate 1.

21 is reported to have been affected by pumping for domestic water supplies from 1947 to 1980 (Socolow and others, 2005).

Data describing land-use change, water withdrawals, evapotranspiration, and wastewater disposal during the past 60 years are insufficient to determine how these factors affected the altitude of the water table. A likely explanation for rising water-table altitudes is the precipitation increase in the Rhode Island part of the Blackstone River Basin (fig. 4). At climatological station 379423 in Woonsocket, R.I., the only long-term station in the basin, annual precipitation increased by about 11 in. from 1949 to 2003 (fig. 4) on the basis of a linear-trend fit to annual precipitation data (National Climate Data Center, 2003). Other stations within 20 mi of the basin also show increased annual precipitation. Station 376698 in Providence, R.I., showed a change of +1.2 in. from 1949 to 2001; station 198367 in Taunton, Mass., showed a change of +7.8 in. from 1949 to 1993; and station 199316 in West Medway, Mass., showed a change of +7.6 in. from 1957 to 2000, based on linear-trend fits to annual precipitation data (National Climate Data Center, 2003). These long-term increases in Blackstone River Basin precipitation are further supported by streamflow records from 1929 to 2000 for the Blackstone River at the Woonsocket, R.I., (USGS station 01112500), which show an increase in streamflow of about 18 percent (Robinson and others, 2003).

The annual precipitation increase of about 11 in. recorded at Woonsocket would be expected to raise the ground-water level in the unconfined aquifers of the basin. A rough estimate of the expected ground-water-level rise caused by an increase in recharge can be obtained from a modification of the solution to Forchheimer's equation (Bear, 1972, eq. 8.2.26):

$$m' = N'L^2/8Kh_0 \quad (2)$$

where m' = change in ground-water level at ground-water divide (L),
N' = change in recharge rate (L/T),
L = distance between drainages (L),
K = hydraulic conductivity (L/T), and
h_0 = height of drainage stage above the bottom of the aquifer (L).

Substituting $N' = 0.92$ ft/yr (under the assumption that all additional precipitation goes to recharge), $L = 2{,}430$ ft (an estimate of average distance between drainage streams obtained by dividing the basin area by 1.361×10^{10} mi, the total length of stream centerlines in the study area), $K = 100$ ft/d (an estimate of average hydraulic conductivity based on the transmissivity data discussed above), and $h_0 = 40$ ft (an estimate of aquifer thickness below streams) yields

$$m' = 0.5 \text{ ft.} \quad (3)$$

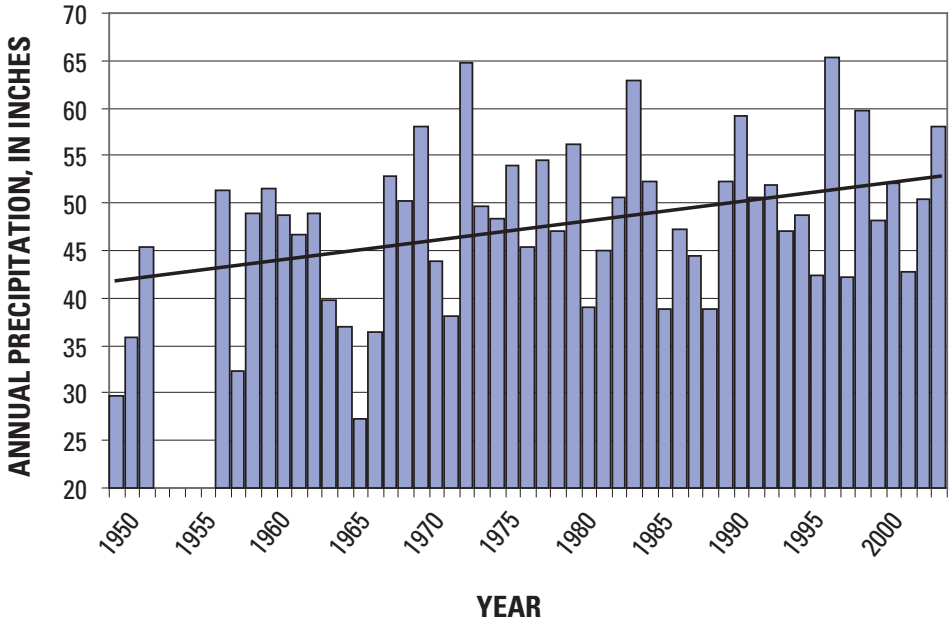


Figure 4. Annual precipitation at climatological station 379423 in Woonsocket, Rhode Island for 1949–2003. Straight line is the linear regression line. Location of station shown on figure 1 and plate 1.

Equation 2 produces a calculated ground-water-level rise of 0.5 ft, which would occur halfway between two drainages (streams). Moving from a ground-water-level high toward a drainage, the ground-water-level rise would lessen and be zero at the drainage. The calculated rise of 0–0.5 ft accounts for a part of the observed ground-water-level rises of 0 to 1.4 ft. So the observed ground-water-level rise is likely due in part to increased precipitation, but other factors are also probably contributing. More detailed study would be needed to confirm this hypothesis.

Uncertainty in Water Levels

Water levels were contoured for stratified glacial deposits in the study area (plate 1). Contours were initially produced with an automated routine and then checked and manually modified. Uncertainty in the water-table altitudes shown on the plate is due to the varied timing of the measurements, measurement errors, variations in water-table altitude with well depth, changes caused by pumping, and interpolation errors. Because water levels have risen over time, older measurements will tend to underestimate the current levels. Measurements were made during different seasons of the year, which adds further variability. The variation of water levels over time at one location is illustrated by measurements at well RI-NSW 21. Based on 685 water-level measurements taken from the 1940s through 2003 (fig. 3), the difference between maximum and minimum individual values is 8.0 ft and the difference between maximum and minimum monthly mean values (March–September) is 3.7 ft.

Further assessment of uncertainty can be made by comparing water levels measured in closely spaced wells. There are 298 pairs of water-level measurements made at varying times in wells less than 100 ft apart horizontally. Levels measured less than 100 ft apart horizontally in the same aquifer are expected to agree quite closely, for example with a difference of less than 3 ft, unless there is nearby ground-water pumping, the wells are in steep terrain, or the wells are screened at different depths. For each of the 298 well pairs, water levels were subtracted from each other, yielding 298 differences. The average water-level difference is 15.5 ft and the standard deviation is 24.7 ft. Using these differences as an indication of uncertainty in water levels suggests that the actual level can be expected to vary from the mapped level, at any point, by 15 ft (plate 1).

Movement of Ground Water

Ground water in the study area flows towards major streams and rivers, which occupy regional topographic lows. The direction of ground-water flow, inferred from the contours of the altitude of the water table, is indicated by black arrows on plate 1. Ground water generally discharges to streams, ponds, and wetlands unless flowing to a pumped well. Exceptions to this pattern may be found locally where a stream crosses a transition to more permeable aquifer sediments, causing the stream to lose water to the aquifer and ground water to flow away from the stream. No such transitions are seen on plate 1, in part because the spatial scale is too coarse to show such local effects.

Transmissivity

For a given aquifer thickness, transmissivity is controlled by lithology. Sand and gravel deposits generally have higher transmissivity than fine-grained stratified glacial deposits, till deposits, or bedrock. Estimated transmissivity values in the study area range from near zero to more than 25,000 ft^2/d. Of the total of 553 transmissivity values, 152 (28 percent) are less than 50 ft^2/d. Transmissivity values less than 50 ft^2/d are mainly in areas where bedrock or till is at the land surface. Statistics for the 390 transmissivity values in the sand and gravel aquifer are shown in table 2.

Table 2. Descriptive statistics for transmissivity values in the sand and gravel aquifer, Blackstone River Basin, northern Rhode Island.

[<, less than]

Statistic	Transmissivity, in feet squared per day
Count	390
Mean	4,420
Minimum	<50
10^{th} percentile	200
25^{th} percentile	1,000
Median	2,990
75^{th} percentile	6,690
90^{th} percentile	10,980
Maximum	22,650

Transmissivity values greater than approximately 1,400 ft^2/d "represent good aquifers for water well exploitation" (Freeze and Cherry, 1979, p. 60). Of the 357 transmissivity values in the sand and gravel aquifer greater than 50 ft^2/d, 74 percent of the values are greater than 1,400 ft^2/d.

Spatial patterns of transmissivity are predominately controlled by the thickness of stratified glacial deposits. The greatest transmissivity values are seen in the valleys of the Branch, Chepachet, Nipmuc, and Blackstone Rivers, where deep sand and gravel deposits are found (plate 2) and where wells may induce infiltration from surface-water bodies. Transmissivity values greater than 10,000 ft^2/d are seen in every town in the study area except Smithfield, within which no transmissivity measurements were made within the study area, and which has very little area with stratified glacial deposits. Based on the contours on plate 2, the stratified glacial deposits in about 22 mi^2, or 16 percent of the study area, have transmissivity values greater than 1,000 ft^2/d.

Although plates 1 and 2 do not show contours of water-table altitude or transmissivity in areas of till and bedrock, ground water is present in these areas. Areas of till and bedrock generally have lower transmissivity values and well yields, but some water-supply wells are located in these areas to serve small communities, small businesses, or private households. This study does not include an analysis of till and bedrock areas and should not be used to infer transmissivity values or ground-water levels for such areas.

Because the transmissivity map in this study is based on most of the same data used by Johnston and Dickerman (1974a,b) to construct their transmissivity maps, there are many similarities between the maps. Of the 533 transmissivity values used to construct plate 2, 48 percent, or 256 values, were also used by Johnston and Dickerman. Differences between plate 2 and the 1974 maps include the display of transmissivity point data, display of the entire Rhode Island part of the Blackstone River Basin, and modified transmissivity contours in those areas where additional transmissivity data were available. Areas of high transmissivity (greater than 5,000 ft^2/d) on plate 2 differ somewhat from the ground-water reservoirs identified by the state of Rhode Island (Rhode Island Statewide Planning Program,1979; Rhode Island Department of Environmental Management, 1991). Along the Blackstone River in the southern part of Cumberland and in the Chepachet River valley, the new map shows less extensive areas of high transmissivity. In other parts of the basin, such as near the Pascoag and Wilson Reservoirs, the areas of high transmissivity are more extensive than the previously mapped ground-water reservoirs.

Summary

This study of ground-water resources in the Rhode Island portion of the Blackstone River Basin was performed in cooperation with the Rhode Island Water Resources Board. Spatial and temporal trends in ground-water levels are presented, and transmissivity data are compiled into a contour map that presents a more regional view of aquifer transmissivity than do previous maps.

Ground-water levels rose in the study area from 1947 to 2003. Water levels are known to decline locally near pumping wells, but these declines are limited in areal extent by the narrow geometry of the sand and gravel aquifers and the proximity of surface water to most wells in the study area. The measured increase in precipitation rate, about 11 inches per year from 1949 to 2003 in Woonsocket, R.I., is likely a contributor to the observed water-level increases. Data from four wells with long-term water-level records have good temporal detail, but because long-term data are available from only a small number of wells in the study area, it is not known if water levels have risen throughout the watershed.

Transmissivity is greatest in areas of thick sand and gravel deposits, which typically occur in stream valley bottoms. Some high-transmissivity wells are seen in areas not previously identified by the state of Rhode Island as ground-water reservoirs. Other areas show lower transmissivity than the previously mapped ground-water reservoirs. The contours in plate 2 and wells listed in the Appendix give more detailed and more accessible information about transmissivity than has previously been available for the Blackstone River Basin in Rhode Island.

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Glossary

aquifer An underground formation of earth, sand, gravel, or porous stone that yields significant quantities of water to wells or springs.

base flow The water in streams and rivers that has come from ground-water discharge. During periods of little or no precipitation, typically all the water in a stream is base flow.

confined aquifer An aquifer that is covered by a layer of impermeable material, such as rock or clay, so that the water level in a well rises above the top of the aquifer.

evapotranspiration The movement of water from the land surface to the atmosphere. The word is formed by combining "evaporation," meaning the conversion of water from fluid to vapor, and "transpiration," meaning the release of water vapor to the atmosphere by plants.

transmissivity A measure of the ability of an aquifer to transmit water; indicates the suitability of an aquifer as a water source. Units are length squared/time, for instance feet squared per day.

unconfined aquifer An aquifer not covered by an impermeable layer in which the water table forms the upper boundary. At the water table the pressure of the water equals the pressure of the atmosphere.

unconsolidated Refers to loose materials such as sand, gravel, and clay that are not cemented together, as opposed to solid rock.

Appendix. Hydrogeologic Data for the Blackstone River Basin, Northern Rhode Island

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.

[ft, feet; ft^2/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft^2/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
BLW 069	no	435	Jul-49	12	—	50	—	202	Upper Branch Project Book, R.I. Office
BUW 001	yes	453	Jun-42	14	—	28	—	273	Upper Branch Project Book, R.I. Office
BUW 002	yes	453	Jun-42	9	—	45	—	285	Upper Branch Project Book, R.I. Office
BUW 003	yes	448	Apr-44	15	—	40	—	387	Upper Branch Project Book, R.I. Office
BUW 004	yes	385	Sep-44	10	1,500	40	—	40	Upper Branch Project Book, R.I. Office
BUW 005	yes	375	Sep-44	10	2,350	57	—	57	Upper Branch Project Book, R.I. Office
BUW 006	yes	370	Sep-44	10	3,700	28	—	28	Upper Branch Project Book, R.I. Office
BUW 007	yes	375	Sep-44	9.4	16,240	—	—	50	Upper Branch Project Book, R.I. Office
BUW 009	yes	375	Oct-44	8.4	10,980	—	—	46.4	Upper Branch Project Book and GWSI
BUW 011	yes	368	Oct-46	10	7,300	50	—	50	Upper Branch Project Book, R.I. Office
BUW 014	yes	375	Oct-46	6.5	5,700	—	—	55	Upper Branch Project Book, R.I. Office
BUW 015	yes	375	Nov-46	6.2	1,940	—	—	55	Upper Branch Project Book, R.I. Office
BUW 016	yes	375	Nov-46	6.5	8,350	—	—	51	Upper Branch Project Book, R.I. Office
BUW 018	yes	380	Mar-47	2	15,600	—	—	41	Upper Branch Project Book, R.I. Office
BUW 021	no	393.58	Jun-47	8.9	<50	—	—	15	USGS Well Schedule, R.I. Office and GWSI
BUW 022	no	345	—	20.00	<50	2.0	—	185.0	USGS Well Schedule, R.I. Office
BUW 023	no	385	Oct-45	15.00	<50	6.0	—	112.0	USGS Well Schedule, R.I. Office
BUW 024	no	330	—	28.00	<50	4.0	—	170.0	USGS Well Schedule, R.I. Office
BUW 025	no	388	Oct-43	18.00	<50	15.0	—	170.0	USGS Well Schedule, R.I. Office
BUW 026	yes	278	Jun-47	0.00	2,800	14.0	—	290.0	USGS Well Schedule, R.I. Office
BUW 027	yes	285	—	—	1,200	6.0	—	250.0	USGS Well Schedule, R.I. Office
BUW 030	no	365	Jun-47	10.00	1,800	—	—	28.0	USGS Well Schedule, R.I. Office

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft^2/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft^2/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
BUW 032	no	450	Jun-47	7.00	<50	—	—	21.0	USGS Well Schedule, R.I. Office
BUW 033	no	447	Jun-47	6.45	<50	—	—	13.0	USGS Well Schedule, R.I. Office
BUW 034	yes	370	Jul-47	13.04	<50	—	—	11.3	USGS Well Schedule, R.I. Office
BUW 036	no	400	Jun-47	15.00	<50	—	—	18.0	USGS Well Schedule, R.I. Office
BUW 037	yes	322	Nov-47	12.98	604	16.0	—	57.0	USGS Well Schedule, R.I. Office
BUW 038	no	390	Apr-05	18.00	<50	54.0	—	160.0	USGS Well Schedule, R.I. Office
BUW 039	no	430	May-45	8.00	<50	5.0	—	200.0	USGS Well Schedule, R.I. Office
BUW 040	yes	340	Apr-05	15.00	<50	6.0	—	500.0	USGS Well Schedule, R.I. Office
BUW 041	no	372	Jun-47	4.72	<50	—	—	7.0	USGS Well Schedule, R.I. Office
BUW 042	no	372	Jun-47	5.16	<50	5.5	—	5.5	USGS Well Schedule, R.I. Office
BUW 043	no	394	Jun-47	5.90	<50	—	—	14.0	USGS Well Schedule, R.I. Office
BUW 044	no	391	Jun-47	11.54	<50	—	—	11.5	USGS Well Schedule, R.I. Office
BUW 045	yes	284	Jun-47	10.74	<50	9.5	—	9.5	USGS Well Schedule, R.I. Office
BUW 047	yes	275	—	—	2,800	14.0	—	150.0	Upper Branch Project Book, R.I. Office
BUW 048	yes	260	Jun-47	5.00	1,200	—	—	11.0	Upper Branch Project Book, R.I. Office
BUW 049	yes	270	Apr-05	5.00	11,000	60.0	—	200.0	Upper Branch Project Book, R.I. Office
BUW 050	yes	265	Jun-42	20.00	500	—	—	25.0	Upper Branch Project Book, R.I. Office
BUW 052	yes	390	Jun-47	22.00	<50	—	—	30.0	USGS Well Schedule, R.I. Office
BUW 053	no	412	Jun-47	5.77	<50	—	—	10.5	USGS Well Schedule, R.I. Office
BUW 054	yes	280	Oct-67	15	220	—	—	16.1	Upper Branch Project Book and GWSI
BUW 055	no	376	Jun-47	15.80	<50	—	—	17.5	USGS Well Schedule, R.I. Office
BUW 056	no	393	Jun-47	13.02	<50	—	—	20.2	USGS Well Schedule, R.I. Office

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft²/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft²/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
BUW 057	yes	380	Jun-47	10.90	<50	—	—	9.3	USGS Well Schedule, R.I. Office
BUW 059	yes	372	Jun-47	14.96	<50	13.6	—	13.6	USGS Well Schedule, R.I. Office
BUW 062	yes	327	Jun-47	20.00	1,400	27.0	—	135.0	Upper Branch Project Book, R.I. Office
BUW 063	no	375	Jun-47	13.50	<50	15.0	—	15.0	USGS Well Schedule, R.I. Office
BUW 066	yes	327	Jul-40	1.5	—	—	—	50	USGS Well Schedule, R.I. Office
BUW 069	yes	330	—	—	10,000	50	—	202	Upper Branch Project Book and GWSI
BUW 072	yes	320	Sep-49	18.4	—	—	—	21.5	USGS Well Schedule, R.I. Office
BUW 076	no	532	Sep-10	24	—	20	—	206	USGS Well Schedule, R.I. Office
BUW 079	yes	365	Sep-49	46	—	125	—	165	USGS Well Schedule, R.I. Office
BUW 081	no	608	May-55	2.52	—	—	—	8.7	Upper Branch Project Book, R.I. Office
BUW 082	no	591	May-55	13.80	—	—	—	18.4	Upper Branch Project Book, R.I. Office
BUW 083	no	592	Sep-52	18	—	47	—	120	Upper Branch Project Book, R.I. Office
BUW 084	no	578	Jan-54	12	—	50	—	100	Upper Branch Project Book, R.I. Office
BUW 085	no	705	Jan-25	20	—	—	—	500	Upper Branch Project Book, R.I. Office
BUW 086	yes	418	Oct-60	6.56	—	—	—	12.1	Upper Branch Project Book, R.I. Office
BUW 087	yes	425	Oct-60	12.4	—	—	—	28.2	Upper Branch Project Book, R.I. Office
BUW 088	yes	425	Oct-60	5.9	—	—	—	12.5	Upper Branch Project Book, R.I. Office
BUW 089	yes	432	Oct-60	9.16	—	—	—	15.4	Upper Branch Project Book, R.I. Office
BUW 090	yes	425	Oct-60	5.35	—	—	—	10.3	Upper Branch Project Book, R.I. Office
BUW 091	no	435	Oct-60	7.39	—	12.2	—	12.4	Upper Branch Project Book, R.I. Office
BUW 092	no	452	Oct-60	10.38	—	11	—	17.4	Upper Branch Project Book, R.I. Office
BUW 093	no	430	Oct-60	4.1	—	9.6	—	9.6	Upper Branch Project Book, R.I. Office

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft²/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft²/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
BUW 094	yes	382	Oct-60	11.43	—	—	—	15.9	Upper Branch Project Book, R.I. Office
BUW 095	yes	368	Oct-60	5.28	—	—	—	9.3	Upper Branch Project Book, R.I. Office
BUW 096	yes	371	Oct-60	4.92	—	—	—	7.2	Upper Branch Project Book, R.I. Office
BUW 097	yes	428	Oct-60	13.69	—	—	—	19.9	Upper Branch Project Book, R.I. Office
BUW 098	no	385	Oct-60	9.46	—	15.3	—	15.3	Upper Branch Project Book, R.I. Office
BUW 099	yes	415	Oct-60	16.63	—	21.9	—	21.8	Upper Branch Project Book, R.I. Office
BUW 100	yes	402	Oct-60	10.77	—	—	—	14.7	Upper Branch Project Book, R.I. Office
BUW 101	yes	390	Oct-60	6.02	—	—	—	9.8	Upper Branch Project Book, R.I. Office
BUW 103	yes	392	Oct-60	20.74	—	24.4	—	24.4	Upper Branch Project Book, R.I. Office
BUW 105	yes	390	Oct-60	22.77	—	25.06	—	25.06	Upper Branch Project Book, R.I. Office
BUW 106	yes	398	Jan-47	28	—	42	—	130	Upper Branch Project Book, R.I. Office
BUW 107	yes	385	Oct-60	3.05	—	—	—	7.2	Upper Branch Project Book, R.I. Office
BUW 108	yes	405	Oct-64	7.79	—	14.3	—	144	Upper Branch Project Book, R.I. Office
BUW 111	yes	345	Oct-60	10.99	—	—	—	15.4	Upper Branch Project Book, R.I. Office
BUW 112	yes	350	Oct-60	6.25	—	—	—	10.5	Upper Branch Project Book, R.I. Office
BUW 113	yes	350	Oct-60	9.05	—	—	—	14.2	Upper Branch Project Book, R.I. Office
BUW 114	yes	352	Oct-60	18.47	—	—	—	22.9	Upper Branch Project Book, R.I. Office
BUW 115	yes	345	Oct-60	11.05	—	—	—	15	Upper Branch Project Book, R.I. Office
BUW 116	no	695	Nov-60	40.09	—	18	—	150	Upper Branch Project Book, R.I. Office
BUW 117	no	545	Nov-60	7.58	—	—	—	16.9	Upper Branch Project Book, R.I. Office
BUW 124	yes	580	Nov-60	11.27	1,466	18.6	—	18.6	Upper Branch Project Book and GWSI
BUW 125	yes	615	Mar-60	2.95	—	10.9	—	10.9	Upper Branch Project Book, R.I. Office

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft²/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft²/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
BUW 126	no	620	Nov-60	7.52	—	13.1	—	13	Upper Branch Project Book, R.I. Office
BUW 129	yes	460	Nov-60	4.33	—	—	—	13.8	Upper Branch Project Book, R.I. Office
BUW 130	yes	615	Nov-60	6.4	—	14.1	—	14.1	Upper Branch Project Book, R.I. Office
BUW 131	no	568	Jan-52	14	—	29	—	158	Upper Branch Project Book, R.I. Office
BUW 134	yes	450	Nov-60	2.99	—	—	—	16.8	Upper Branch Project Book, R.I. Office
BUW 137	no	480	Jan-55	18	—	19	—	145	Upper Branch Project Book, R.I. Office
BUW 138	yes	442	Nov-60	15.43	—	—	—	20.8	Upper Branch Project Book, R.I. Office
BUW 139	yes	448	Nov-60	10.45	—	13.4	—	13.4	Upper Branch Project Book, R.I. Office
BUW 142	yes	400	Nov-60	1.9	—	—	—	8.4	Upper Branch Project Book, R.I. Office
BUW 149	yes	327	Jul-58	4.7	3,565	34	—	295	Upper Branch Project Book, R.I. Office
BUW 153	no	390	May-61	0.58	—	—	—	9.1	Upper Branch Project Book, R.I. Office
BUW 154	yes	370	May-61	20.82	—	—	—	24.9	Upper Branch Project Book, R.I. Office
BUW 158	yes	313	May-61	3.85	—	—	—	6.9	Upper Branch Project Book, R.I. Office
BUW 159	yes	341	May-61	5.86	—	12.8	—	12.8	Upper Branch Project Book, R.I. Office
BUW 160	yes	330	May-61	6.22	—	—	—	10.5	Upper Branch Project Book, R.I. Office
BUW 162	yes	339	May-61	8.85	—	14.3	—	14.3	Upper Branch Project Book, R.I. Office
BUW 163	yes	341	May-61	9.40	—	—	—	24.2	Upper Branch Project Book, R.I. Office
BUW 166	yes	341	May-61	8.95	—	—	—	16.0	Upper Branch Project Book, R.I. Office
BUW 170	yes	299	May-61	8.53	—	—	—	13.0	Upper Branch Project Book, R.I. Office
BUW 172	yes	340	May-61	7.45	—	—	—	16.3	Upper Branch Project Book, R.I. Office
BUW 174	no	391	May-61	6.34	—	—	—	15.2	Upper Branch Project Book, R.I. Office
BUW 175	yes	312	May-61	13.42	—	21.0	—	21.0	Upper Branch Project Book, R.I. Office

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft²/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft²/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
BUW 177	no	351	May-61	2.07	—	—	—	12.4	Upper Branch Project Book, R.I. Office
BUW 178	no	398	May-61	2.85	—	—	—	12.1	Upper Branch Project Book, R.I. Office
BUW 183	yes	491	May-61	9.33	—	14.2	—	14.2	Upper Branch Project Book, R.I. Office
BUW 184	yes	455	May-61	14.17	—	—	—	21.3	Upper Branch Project Book, R.I. Office
BUW 185	yes	491	May-61	15.66	—	20.7	—	20.7	Upper Branch Project Book, R.I. Office
BUW 186	no	501	May-61	6.69	—	14.4	—	14.4	Upper Branch Project Book, R.I. Office
BUW 187	yes	462	May-61	13.35	—	19.8	—	19.8	Upper Branch Project Book, R.I. Office
BUW 188	yes	343	May-61	11.20	6,000	—	—	17.7	USGS Well Schedule, R.I. Office
BUW 189	no	512	May-61	6.56	<50	—	—	17.7	USGS Well Schedule, R.I. Office
BUW 190	no	401	May-61	6.06	788	—	—	10.0	USGS Well Schedule, R.I. Office
BUW 191	no	441	May-61	7.94	<50	—	—	14.9	USGS Well Schedule, R.I. Office
BUW 192	no	404	May-61	3.65	<50	—	—	17.8	USGS Well Schedule, R.I. Office
BUW 193	no	425	May-61	2.87	<50	—	—	8.6	USGS Well Schedule, R.I. Office
BUW 194	no	400	May-61	3.44	<50	—	—	11.5	USGS Well Schedule, R.I. Office
BUW 196	yes	330	May-05	21.00	<50	8.0	—	8.0	USGS Well Schedule, R.I. Office
BUW 197	yes	369	May-61	9.52	1,076	—	—	14.9	USGS Well Schedule, R.I. Office
BUW 198	yes	413	May-61	12.62	1,356	—	—	19.4	USGS Well Schedule, R.I. Office
BUW 200	no	506	May-05	5.00	<50	12.0	—	100.0	USGS Well Schedule, R.I. Office
BUW 201	no	500	May-05	38.00	<50	18.0	—	48.0	USGS Well Schedule, R.I. Office
BUW 203	no	479	May-61	6.86	<50	14.7	—	14.7	USGS Well Schedule, R.I. Office
BUW 204	yes	415	Dec-61	11.08	1,464	—	—	18.4	USGS Well Schedule, R.I. Office
BUW 205	yes	392	May-61	3.95	2,150	—	—	14.7	USGS Well Schedule, R.I. Office

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft²/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft²/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
BUW 206	yes	390	May-61	7.89	1,402	—	—	14.9	USGS Well Schedule, R.I. Office
BUW 207	yes	360	—	—	8,000	40.0	—	375.0	USGS Well Schedule, R.I. Office
BUW 208	yes	372	—	—	16,000	80.0	—	205.0	USGS Well Schedule, R.I. Office
BUW 209	yes	368	May-61	4.80	1,280	—	—	11.2	USGS Well Schedule, R.I. Office
BUW 210	yes	360	May-61	9.88	904	—	—	14.4	USGS Well Schedule, R.I. Office
BUW 211	no	528	May-05	6.00	<50	12.0	—	105.0	USGS Well Schedule, R.I. Office
BUW 212	no	535	May-61	12.69	<50	—	—	17.0	USGS Well Schedule, R.I. Office
BUW 213	yes	355	May-61	3.13	934	—	—	7.8	USGS Well Schedule, R.I. Office
BUW 214	yes	390	May-61	20.75	1,350	27.5	—	27.5	USGS Well Schedule, R.I. Office
BUW 215	yes	340	May-61	3.35	1,030	—	—	8.5	USGS Well Schedule, R.I. Office
BUW 216	yes	380	May-61	22.14	1,272	—	—	28.5	USGS Well Schedule, R.I. Office
BUW 217	yes	363	May-61	8.43	674	—	—	11.8	USGS Well Schedule, R.I. Office
BUW 218	no	352	Jun-61	5.16	<50	—	—	17.9	USGS Well Schedule, R.I. Office
BUW 221	no	375	May-61	7.38	<50	20.6	—	20.6	USGS Well Schedule, R.I. Office
BUW 222	yes	465	Apr-05	80	4,000	100	—	268	USGS Well Schedule, R.I. Office
BUW 223	yes	408	May-61	7.77	926	—	—	12.4	USGS Well Schedule, R.I. Office
BUW 224	yes	425	May-61	15.21	1,038	—	—	20.4	USGS Well Schedule, R.I. Office
BUW 225	yes	440	May-61	19.95	790	—	—	23.9	USGS Well Schedule, R.I. Office
BUW 226	no	495	May-61	6.06	<50	23.1	—	23.1	USGS Well Schedule, R.I. Office
BUW 228	yes	324	—	—	5,500	55.0	—	215.0	USGS Well Schedule, R.I. Office
BUW 229	no	462	—	—	2,500	30.0	—	90.0	USGS Well Schedule, R.I. Office
BUW 230	no	485	May-61	2.74	<50	—	—	18.4	USGS Well Schedule, R.I. Office

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft²/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft²/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
BUW 231	no	645	May-61	7.40	<50	17.0	—	17.0	USGS Well Schedule, R.I. Office
BUW 232	no	570	May-61	8.41	<50	13.9	—	13.9	USGS Well Schedule, R.I. Office
BUW 233	no	534	May-61	5.32	<50	24.0	—	24.0	USGS Well Schedule, R.I. Office
BUW 234	no	575	May-61	7.39	<50	19.4	—	19.4	USGS Well Schedule, R.I. Office
BUW 235	no	603	May-61	4.39	<50	—	—	13.1	USGS Well Schedule, R.I. Office
BUW 236	no	622	May-61	3.83	<50	19.8	—	19.8	USGS Well Schedule, R.I. Office
BUW 238	no	525	May-61	5.99	<50	13.8	—	13.8	USGS Well Schedule, R.I. Office
BUW 239	no	522	May-61	5.18	1,024	10.3	—	10.3	USGS Well Schedule, R.I. Office
BUW 240	no	540	May-61	4.52	<50	13.6	—	13.6	USGS Well Schedule, R.I. Office
BUW 241	no	456	May-61	14.53	914	—	—	19.1	USGS Well Schedule, R.I. Office
BUW 243	no	557	May-61	2.37	<50	12.0	—	12.0	USGS Well Schedule, R.I. Office
BUW 244	no	468	May-61	4.82	<50	15.9	—	15.9	USGS Well Schedule, R.I. Office
BUW 246	yes	325	—	—	5,600	56.0	—	133.0	USGS Well Schedule, R.I. Office
BUW 247	yes	320	—	—	8,000	80.0	—	170.0	USGS Well Schedule, R.I. Office
BUW 248	no	440	Apr-05	20.00	<50	17.0	—	117.0	USGS Well Schedule, R.I. Office
BUW 249	no	596	Oct-61	7.36	<50	—	—	10.6	USGS Well Schedule, R.I. Office
BUW 250	no	715	Oct-61	7.59	<50	—	—	25.0	USGS Well Schedule, R.I. Office
BUW 251	no	590	—	40.00	<50	85.0	—	145.0	USGS Well Schedule, R.I. Office
BUW 252	no	583	Oct-61	9.01	<50	—	—	24.0	USGS Well Schedule, R.I. Office
BUW 253	yes	390	Oct-61	5.07	486	—	—	7.5	USGS Well Schedule, R.I. Office
BUW 254	no	445	Oct-61	12.75	<50	—	—	18.8	USGS Well Schedule, R.I. Office
BUW 255	yes	463	Oct-61	3.34	672	—	—	6.7	USGS Well Schedule, R.I. Office

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft^2/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft^2/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
BUW 256	no	525	Oct-61	9.41	<50	—	—	11.0	USGS Well Schedule, R.I. Office
BUW 257	no	534	Oct-61	5.69	<50	—	—	10.6	USGS Well Schedule, R.I. Office
BUW 258	no	543	Oct-61	6.69	<50	—	—	14.5	USGS Well Schedule, R.I. Office
BUW 259	no	475	Oct-61	7.97	<50	—	—	17.6	USGS Well Schedule, R.I. Office
BUW 260	no	413	Oct-61	5.92	<50	—	—	10.6	USGS Well Schedule, R.I. Office
BUW 261	no	505	—	22.00	<50	25.0	—	120.0	USGS Well Schedule, R.I. Office
BUW 262	no	436	Oct-61	12.87	<50	—	—	14.0	USGS Well Schedule, R.I. Office
BUW 263	no	329	Oct-61	9.05	<50	—	—	16.8	USGS Well Schedule, R.I. Office
BUW 265	no	422	Oct-61	9.15	<50	—	—	16.0	USGS Well Schedule, R.I. Office
BUW 266	no	400	Oct-61	12.19	<50	—	—	22.0	USGS Well Schedule, R.I. Office
BUW 267	no	305	Dec-61	9.05	<50	—	—	13.5	USGS Well Schedule, R.I. Office
BUW 268	yes	285	Dec-61	18.77	166	—	—	19.6	USGS Well Schedule, R.I. Office
BUW 269	no	711	—	30.00	<50	40.0	—	500.0	USGS Well Schedule, R.I. Office
BUW 273	no	702	Nov-61	15.36	<50	—	—	17.8	USGS Well Schedule, R.I. Office
BUW 274	no	607	May-05	6.00	<50	8.0	—	350.0	USGS Well Schedule, R.I. Office
BUW 275	no	543	Dec-61	3.08	<50	—	—	13.7	USGS Well Schedule, R.I. Office
BUW 279	yes	392	Oct-67	14.89	862	—	—	19.2	USGS Well Schedule, R.I. Office
BUW 280	yes	385	Aug-67	10.00	6,200	—	—	56.0	USGS Well Schedule, R.I. Office
BUW 284	yes	377	May-68	2	2,600	15	—	15.7	Upper Branch Project Book and GWSI
BUW 292	yes	323	Nov-66	65.00	—	75.0	—	230.0	USGS Well Schedule, R.I. Office
BUW 293	yes	320	Mar-65	70.00	—	100.0	—	140.0	USGS Well Schedule, R.I. Office
BUW 295	yes	317	Mar-63	20.00	—	70.0	—	210.0	USGS Well Schedule, R.I. Office

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft²/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft²/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
BUW 297	yes	333	Nov-66	42.00	—	95.0	—	220.0	USGS Well Schedule, R.I. Office
BUW 298	no	485	Nov-65	33.00	—	80.0	—	142.0	USGS Well Schedule, R.I. Office
BUW 301	yes	355	Nov-68	2.00	300	—	23.5	23.5	Upper Branch Project Book, R.I. Office
BUW 302	yes	330	Nov-68	15.00	6,825	59.5	—	59.5	Upper Branch Project Book, R.I. Office
BUW 303	yes	340	Dec-68	21.00	1,000	—	26.0	26.0	Upper Branch Project Book, R.I. Office
BUW 305	yes	330	Nov-68	25.00	2,500	—	44.0	44.0	Upper Branch Project Book, R.I. Office
BUW 306	yes	320	Dec-68	11.50	8,525	—	68.0	68.0	Upper Branch Project Book, R.I. Office
BUW 307	yes	310	Dec-68	4.50	3,475	—	37.0	37.0	Upper Branch Project Book, R.I. Office
BUW 308	yes	310	—	5.00	2,525	—	26.5	26.5	Upper Branch Project Book, R.I. Office
BUW 309	yes	305	Dec-68	5.00	7,550	—	55.0	55.5	Upper Branch Project Book, R.I. Office
BUW 310	yes	305	Nov-68	5.00	4,075	—	37.5	37.5	Upper Branch Project Book, R.I. Office
BUW 311	yes	305	Nov-68	6.00	4,075	—	38.5	38.5	Upper Branch Project Book, R.I. Office
BUW 312	yes	345	—	—	2,900	—	21.0	21.0	Upper Branch Project Book, R.I. Office
BUW 314	yes	365	Nov-68	10.00	2,275	28.5	—	28.5	Upper Branch Project Book, R.I. Office
BUW 315	yes	375	—	—	4,255	30.7	—	30.7	Upper Branch Project Book, R.I. Office
BUW 316	yes	365	—	—	4,500	30.0	—	30.0	Upper Branch Project Book, R.I. Office
BUW 317	yes	337	Nov-68	4.00	4,950	37.0	—	37.0	Upper Branch Project Book, R.I. Office
BUW 318	yes	337	—	4.00	3,225	—	—	27.0	Upper Branch Project Book, R.I. Office
BUW 320	yes	338	Nov-68	5.00	4,550	—	32.0	32.0	Upper Branch Project Book, R.I. Office
BUW 323	yes	335	Nov-68	4.00	6,725	—	43.0	43.0	Upper Branch Project Book, R.I. Office
BUW 326	yes	335	Nov-68	2.50	4,025	29.5	—	30.2	Upper Branch Project Book, R.I. Office
BUW 328	yes	337	Nov-68	7.00	2,610	—	21.8	21.8	Upper Branch Project Book, R.I. Office

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft^2/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft^2/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
BUW 329	yes	335	Nov-68	5.00	4,300	42.0	—	42.0	Upper Branch Project Book, R.I. Office
BUW 331	yes	337	Nov-68	5.00	5,150	—	41.0	41.0	Upper Branch Project Book, R.I. Office
BUW 333	yes	318	Dec-68	5.00	3,800	—	—	33.0	Upper Branch Project Book, R.I. Office
BUW 334	yes	320	Dec-68	7.00	6,300	49.0	—	49.0	Upper Branch Project Book, R.I. Office
BUW 336	yes	320	Dec-68	6.00	5,600	37.0	—	37.0	Upper Branch Project Book, R.I. Office
BUW 337	no	295	—	—	3,600	—	—	22.0	Upper Branch Project Book, R.I. Office
BUW 338	no	425	Oct-68	5.00	1,850	50.0	—	50.0	Upper Branch Project Book, R.I. Office
BUW 339	yes	373	—	7.00	—	—	—	39.0	Upper Branch Project Book, R.I. Office
BUW 340	yes	338	Jan-68	9.00	3,800	—	40.0	40.0	Upper Branch Project Book, R.I. Office
BUW 341	yes	338	Oct-68	2.00	3,885	—	50.0	50.0	Upper Branch Project Book, R.I. Office
BUW 342	yes	315	Jan-68	5.50	8,175	—	57.5	57.5	Upper Branch Project Book, R.I. Office
BUW 344	yes	320	Nov-68	5.00	5,375	—	42.5	42.5	Upper Branch Project Book, R.I. Office
BUW 350	yes	310	Dec-68	11.50	2,370	—	38.0	38.0	Upper Branch Project Book, R.I. Office
BUW 351	yes	276	May-64	11.00	1,375	38.5	—	43.5	Upper Branch Project Book, R.I. Office
BUW 353	yes	304	May-64	1.50	1,550	35.0	—	40.0	Upper Branch Project Book, R.I. Office
BUW 354	yes	338.4	May-64	12.00	900	27.0	—	37.0	Upper Branch Project Book, R.I. Office
BUW 355	yes	330	Aug-67	1.08	—	—	—	28.0	Upper Branch Project Book, R.I. Office
BUW 364	yes	260	Oct-69	0.00	15,000	75.0	—	415.0	USGS Well Schedule, R.I. Office
BUW 367	no	563	Oct-69	7.00	5,300	60.0	—	115.0	Upper Branch Project Book, R.I. Office
BUW 368	yes	440	—	—	5,500	55.0	—	145.0	Upper Branch Project Book, R.I. Office
BUW 369	yes	450	—	—	5,500	55.0	—	200.0	Upper Branch Project Book, R.I. Office
BUW 371	yes	280	Oct-69	25.00	—	60.0	—	200.0	USGS Well Schedule, R.I. Office

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft²/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft²/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
BUW 374	yes	410	Oct-69	17.74	—	—	—	19.9	Upper Branch Project Book, R.I. Office
BUW 377	no	338	Oct-69	14.04	—	15.2	—	320.0	USGS Well Schedule, R.I. Office
BUW 378	yes	278	Oct-69	6.02	234	—	—	10.7	USGS Well Schedule, R.I. Office
BUW 379	yes	290	Oct-69	21.62	<50	—	—	—	USGS Well Schedule, R.I. Office
CFW 001	yes	65	Apr-45	15	—	35	—	500	Johnston and Dickerman, 1974c
CFW 002	yes	70	Jun-45	30	—	—	—	55	Johnston and Dickerman, 1974c
CFW 003	yes	100	—	—	7,600	—	—	43	Johnston and Dickerman, 1974c
CFW 005	yes	110	Apr-38	37	—	23	—	218	Johnston and Dickerman, 1974c
CFW 009	yes	60	Mar-32	15	—	—	—	24	Johnston and Dickerman, 1974c
CFW 013	yes	90	Jun-46	29	—	—	—	29	Johnston and Dickerman, 1974c
CFW 023	yes	100	—	—	2,150	—	90	90	Johnston and Dickerman, 1974c
CFW 025	yes	48	Jan-58	12	11,400	—	44.5	44	Johnston and Dickerman, 1974c
CFW 030	yes	70	Oct-64	22	1,225	—	—	46	Johnston and Dickerman, 1974c
CFW 031	yes	60	Sep-66	15	200	—	—	30	Johnston and Dickerman, 1974c
CFW 032	yes	40	Oct-66	9	850	—	—	37	Johnston and Dickerman, 1974c
CFW 033	yes	40	Oct-66	8	4,400	—	—	45	Johnston and Dickerman, 1974c
CFW 035	yes	58	—	—	4,600	—	—	42	Johnston and Dickerman, 1974c
CFW 036	yes	40	Oct-66	9	1,950	—	—	32	Johnston and Dickerman, 1974c
CFX 037	yes	60	Nov-64	6	50	—	—	92	Johnston and Dickerman, 1974c
CFX 038	yes	60	Nov-64	4	1,000	—	—	52	Johnston and Dickerman, 1974c
CFX 039	yes	60	Nov-64	0	900	—	77	77	Johnston and Dickerman, 1974c
CFX 040	yes	70	Mar-03	15	2,700	42	—	47	Johnston and Dickerman, 1974c

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft²/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft²/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
CUB 032	yes	60	—	—	2,900	—	—	38	Johnston and Dickerman, 1974c
CUB 045	yes	102	Jul-45	2	2,100	30	—	30	Johnston and Dickerman, 1974c
CUB 526	yes	76	May-05	1	5,250	—	—	74	Johnston and Dickerman, 1974c
CUB 528	yes	76	May-05	1	12,550	—	—	74	Johnston and Dickerman, 1974c
CUB 531	yes	86	May-05	11	7,200	56	—	64	Johnston and Dickerman, 1974c
CUB 532	yes	125	May-05	19	4,130	45	—	50	Johnston and Dickerman, 1974c
CUW 001	yes	65	Aug-45	100	—	90	—	275	Johnston and Dickerman, 1974c
CUW 002	yes	60	Sep-45	6	—	—	—	90	Johnston and Dickerman, 1974c
CUW 003	yes	80	Jul-43	10	6,150	—	—	50	Johnston and Dickerman, 1974c
CUW 005	no	230	May-45	15	<50	6	—	700	GWSI field form
CUW 006	no	245	Sep-45	20	<50	15	—	148	GWSI field form
CUW 007	no	252	Sep-45	22	<50	15	—	133	GWSI field form
CUW 011	yes	80	Jan-44	18	1,200	—	—	30	Johnston and Dickerman, 1974c
CUW 012	yes	200	Aug-46	6	6,000	—	—	36	Johnston and Dickerman, 1974c
CUW 015	no	225	Jan-45	5	900	—	—	14	USGS Well Schedule, R.I. Office
CUW 021	yes	70	—	—	10,050	—	—	54	Johnston and Dickerman, 1974c
CUW 023	yes	80	Aug-52	15	4,400	—	—	26	GWSI-NE
CUW 058	no	190	Jul-46	16	—	—	—	23	Johnston and Dickerman, 1974c
CUW 059	yes	160	—	—	3,900	—	—	26	Johnston and Dickerman, 1974c
CUW 061	yes	140	Aug-70	13	300	—	—	16	Johnston and Dickerman, 1974c
CUW 064	yes	150	Jul-46	7	1,000	—	—	17	Johnston and Dickerman, 1974c
CUW 065	yes	152	Jul-46	18	300	—	—	21	Johnston and Dickerman, 1974c

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft²/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft²/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
CUW 066	yes	152	Jul-37	27	<50	—	—	20	USGS Well Schedule, RI Office
CUW 067	yes	175	Jul-46	7	<50	—	—	9	Johnston and Dickerman, 1974c
CUW 068	yes	175	—	—	4,000	—	—	20	Johnston and Dickerman, 1974c
CUW 069	yes	175	Jul-46	9	150	—	—	10	Johnston and Dickerman, 1974c
CUW 070	yes	150	Jul-46	26	<50	—	—	30	Johnston and Dickerman, 1974c
CUW 073	yes	162	Jul-46	35	600	—	—	38	Johnston and Dickerman, 1974c
CUW 076	no	218	Jul-46	20	<50	—	—	—	USGS Well Schedule, R.I. Office
CUW 079	no	315	Jul-46	19	—	—	—	—	USGS Well Schedule, R.I. Office
CUW 080	no	385	May-21	13	<50	—	—	—	USGS Well Schedule, R.I. Office
CUW 082	no	365	Jul-46	3	300	6	—	6	USGS Well Schedule, R.I. Office
CUW 083	no	330	Aug-46	10.9	<50	—	—	—	USGS Well Schedule, R.I. Office
CUW 084	no	460	May-21	20	<50	—	—	—	USGS Well Schedule, R.I. Office
CUW 086	no	485	Jul-41	13.2	<50	—	—	—	USGS Well Schedule, R.I. Office
CUW 087	no	418	Jul-46	13.24	<50	—	—	—	USGS Well Schedule, R.I. Office
CUW 088	no	418	Jul-46	16.19	<50	—	—	—	USGS Well Schedule, R.I. Office
CUW 089	no	435	Jul-46	4.5	<50	—	—	—	USGS Well Schedule, R.I. Office
CUW 094	yes	210	Jul-46	11.5	1,600	—	—	20	Johnston and Dickerman, 1974c
CUW 095	yes	210	Jul-46	16	400	—	—	18	Johnston and Dickerman, 1974c
CUW 096	yes	212	Jul-46	18	400	—	—	—	USGS Well Schedule, R.I. Office
CUW 097	yes	196	Jul-46	8	1,420	—	—	15	Johnston and Dickerman, 1974c
CUW 100	yes	193	Jul-46	12	2,400	—	—	18	Johnston and Dickerman, 1974c
CUW 101	yes	188	Jul-46	15	800	—	—	18	Johnston and Dickerman, 1974c

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft^2/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft^2/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
CUW 102	no	220	Jul-46	17.7	<50	—	—	—	USGS Well Schedule, R.I. Office
CUW 104	yes	155	Jul-45	25	<50	6	—	110	Johnston and Dickerman, 1974c
CUW 106	no	270	Jul-46	10	<50	—	—	—	USGS Well Schedule, R.I. Office
CUW 107	no	205	Jul-46	15.92	<50	—	—	—	USGS Well Schedule, R.I. Office
CUW 109	yes	185	Jul-46	12.8	620	15.9	—	15.9	USGS Well Schedule, R.I. Office
CUW 110	yes	182	Jul-46	—	5,000	—	—	25	Johnston and Dickerman, 1974c
CUW 113	no	375	Jul-46	9.91	<50	—	—	—	USGS Well Schedule, R.I. Office
CUW 114	no	290	1900	70	<50	—	—	—	USGS Well Schedule, R.I. Office
CUW 116	yes	190	Jul-46	18	2,400	—	—	30	Johnston and Dickerman, 1974c
CUW 120	no	350	Jul-46	0.4	—	1	—	1	USGS Well Schedule, R.I. Office
CUW 121	no	447	Jul-46	90	<50	0	—	0	USGS Well Schedule, R.I. Office
CUW 124	no	288	Jul-46	7.57	<50	—	—	12	USGS Well Schedule, R.I. Office
CUW 125	no	325	Jul-46	14.41	<50	21	—	21	USGS Well Schedule, R.I. Office
CUW 129	no	330	Jul-46	12.88	<50	30	—	30	Johnston and Dickerman, 1974c
CUW 144	yes	190	Jul-46	27	1,200	30	—	30	Johnston and Dickerman, 1974c
CUW 147	no	260	1929	21.2	<50	—	—	29.25	USGS Well Schedule, R.I. Office
CUW 171	yes	225	Jul-46	14	700	—	—	14	Johnston and Dickerman, 1974c
CUW 174	yes	225	Jul-46	14	100	—	—	14	Johnston and Dickerman, 1974c
CUW 218	yes	75	Apr-43	6	8,320	47.6	—	40	Johnston and Dickerman, 1974c
CUW 221	yes	140	Aug-46	10.35	1,010	—	—	15	Johnston and Dickerman, 1974c
CUW 261	yes	165	Aug-46	25	11,000	—	—	100	Johnston and Dickerman, 1974c
CUW 263	yes	160	Apr-05	25	12,000	85	—	510	Johnston and Dickerman, 1974c

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft²/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft²/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
CUW 264	yes	162	Aug-46	30	800	—	—	34	Johnston and Dickerman, 1974c
CUW 265	yes	130	Aug-46	14	1,280	20	—	20	Johnston and Dickerman, 1974c
CUW 286	no	220	Aug-46	8	3,400	—	—	25	Johnston and Dickerman, 1974c
CUW 292	yes	155	Jan-29	16	4,000	36	—	134	Johnston and Dickerman, 1974c
CUW 293	no	140	Aug-46	24	800	—	—	28	Johnston and Dickerman, 1974c
CUW 338	yes	70	Nov-49	9	2,700	—	—	66	Johnston and Dickerman, 1974c
CUW 339	yes	60	Jan-50	9	8,125	—	—	67	Johnston and Dickerman, 1974c
CUW 340	yes	58	Jan-50	5	3,400	—	—	42	Johnston and Dickerman, 1974c
CUW 343	yes	55	Dec-49	3	3,280	—	—	19	Johnston and Dickerman, 1974c
CUW 345	yes	75	Jan-50	4	11,180	—	—	56	Johnston and Dickerman, 1974c
CUW 347	yes	75	—	—	9,750	—	—	55	Johnston and Dickerman, 1974c
CUW 348	yes	68	Aug-50	4	16,000	—	—	75	Johnston and Dickerman, 1974c
CUW 349	yes	67	May-05	4	16,000	—	—	84	Johnston and Dickerman, 1974c
CUW 350	yes	70	Mar-51	9	9,400	—	—	56	Johnston and Dickerman, 1974c
CUW 358	yes	78	Sep-50	12	4,070	—	—	56	Johnston and Dickerman, 1974c
CUW 359	yes	70	Jan-51	9	11,580	—	—	50	Johnston and Dickerman, 1974c
CUW 374	yes	72	—	—	11,400	—	—	71	Johnston and Dickerman, 1974c
CUW 375	yes	55	—	—	6,700	—	—	39	Johnston and Dickerman, 1974c
CUW 378	yes	70	—	—	7,950	—	—	40	Johnston and Dickerman, 1974c
CUW 381	yes	60	May-58	10	9,600	—	—	57	Johnston and Dickerman, 1974c
CUW 385	yes	72	—	—	4,500	—	65	64	Johnston and Dickerman, 1974c
CUW 387	yes	75	Mar-58	11	11,400	—	68	55	Johnston and Dickerman, 1974c

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft^2/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft^2/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
CUW 405	yes	60	Mar-64	3	8,475	—	—	60	Johnston and Dickerman, 1974c
CUW 406	yes	97	May-65	7	3,800	—	64.5	57	Johnston and Dickerman, 1974c
CUW 407	yes	92	Jul-68	1	9,650	—	—	72	Johnston and Dickerman, 1974c
CUW 409	yes	93	Sep-65	9	12,650	—	—	75	Johnston and Dickerman, 1974c
CUW 414	yes	67	Dec-65	9	5,950	—	96	55	Johnston and Dickerman, 1974c
CUW 418	yes	60	Apr-70	9	8,125	69	69	68	Johnston and Dickerman, 1974c
CUW 420	yes	70	Feb-66	12	6,800	—	—	55	Johnston and Dickerman, 1974c
CUW 423	yes	70	Dec-66	15	3,900	—	—	49	Johnston and Dickerman, 1974c
CUW 424	yes	80	Jun-66	20	6,950	89	—	89	Johnston and Dickerman, 1974c
CUW 427	yes	70	Feb-66	5	4,010	—	—	56	Johnston and Dickerman, 1974c
CUW 428	yes	118	Oct-67	1	2,175	49	—	42	Johnston and Dickerman, 1974c
CUW 429	yes	119	Aug-67	2	7,140	51	—	50	Johnston and Dickerman, 1974c
CUW 440	yes	72	Mar-58	8	13,050	—	—	81	Johnston and Dickerman, 1974c
CUW 441	yes	55	Apr-58	11	9,400	—	—	57	Johnston and Dickerman, 1974c
CUW 442	yes	65	Aug-63	7	7,400	—	—	49	Johnston and Dickerman, 1974c
CUW 443	yes	65	Aug-63	8	2,650	—	—	38	Johnston and Dickerman, 1974c
CUW 444	yes	65	Aug-63	8	5,725	—	—	36	Johnston and Dickerman, 1974c
CUW 448	yes	65	Sep-63	7	9,250	—	64	64	Johnston and Dickerman, 1974c
CUW 449	yes	60	Sep-63	3	1,350	—	104	104	Johnston and Dickerman, 1974c
CUW 451	yes	60	Sep-63	5	2,200	—	58	59	Johnston and Dickerman, 1974c
CUW 452	yes	65	Oct-63	4	6,700	—	55.5	55	Johnston and Dickerman, 1974c
CUW 454	yes	65	—	—	4,700	—	31	31	Johnston and Dickerman, 1974c

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft²/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft²/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
CUW 455	yes	65	Oct-63	6	2,900	—	43	35	Johnston and Dickerman, 1974c
CUW 457	yes	65	Oct-63	4	6,700	—	—	48	Johnston and Dickerman, 1974c
CUW 466	yes	50	Oct-63	4	5,900	—	55	50	Johnston and Dickerman, 1974c
CUW 467	yes	60	Oct-63	5	5,400	—	74	64	Johnston and Dickerman, 1974c
CUW 469	yes	60	Oct-63	4	2,800	—	78	78	Johnston and Dickerman, 1974c
CUW 472	yes	97	—	—	3,850	—	78	78	Johnston and Dickerman, 1974c
CUW 473	yes	98	—	—	1,750	—	59	59	Johnston and Dickerman, 1974c
CUW 480	yes	98	Dec-65	14	3,600	—	66	66	Johnston and Dickerman, 1974c
CUW 481	yes	91	Dec-65	9	2,900	—	71	71	Johnston and Dickerman, 1974c
CUW 484	yes	140	Aug-63	12	900	—	53	49	Johnston and Dickerman, 1974c
CUW 485	yes	187	Aug-63	9	4,750	—	117	43	Johnston and Dickerman, 1974c
CUW 486	yes	187	Aug-63	7	9,400	—	63	53	Johnston and Dickerman, 1974c
CUW 487	yes	187	Aug-63	7	6,075	—	46.5	46	Johnston and Dickerman, 1974c
CUW 488	yes	118	Aug-63	2	2,600	—	17	17	Johnston and Dickerman, 1974c
CUW 489	yes	118	Aug-63	2	600	—	18	18	Johnston and Dickerman, 1974c
CUW 490	yes	235	Jul-65	7	1,200	—	66	52	Johnston and Dickerman, 1974c
CUW 492	yes	232	May-65	5	2,400	—	54	54	Johnston and Dickerman, 1974c
CUW 497	yes	120	Sep-68	16	3,000	—	—	40	Johnston and Dickerman, 1974c
CUW 498	yes	125	—	—	8,000	—	—	40	Johnston and Dickerman, 1974c
CUW 499	yes	217	—	—	3,500	36.5	—	36	Johnston and Dickerman, 1974c
CUW 500	no	238	—	—	4,075	36	—	36	Johnston and Dickerman, 1974c
CUW 501	no	186	Jan-68	12	900	20	—	25	Johnston and Dickerman, 1974c

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft²/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft²/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
CUW 504	yes	196	Dec-67	36	575	48	—	53	Johnston and Dickerman, 1974c
CUW 508	yes	197	Dec-67	19	3,150	59	—	64	Johnston and Dickerman, 1974c
CUW 512	yes	197	Nov-67	14	3,950	94	—	95	Johnston and Dickerman, 1974c
CUW 514	yes	197	Dec-67	14	2,425	48	—	54	Johnston and Dickerman, 1974c
CUW 518	yes	165	Apr-65	10	5,000	—	74	74	Johnston and Dickerman, 1974c
CUW 519	yes	165	Apr-65	11	2,300	—	68	68	Johnston and Dickerman, 1974c
CUW 521	no	172	Aug-63	4	4,400	—	70	70	Johnston and Dickerman, 1974c
CUW 522	no	163	—	—	1,750	—	41	41	Johnston and Dickerman, 1974c
CUW 536	yes	60	Sep-66	3	5,270	—	—	54	Johnston and Dickerman, 1974c
CUW 537	yes	60	Sep-66	3	4,400	—	—	60	Johnston and Dickerman, 1974c
CUW 539	yes	80	Sep-66	26	<50	—	—	35	Johnston and Dickerman, 1974c
CUW 540	yes	75	Sep-66	30	550	—	—	57	Johnston and Dickerman, 1974c
CUW 541	yes	75	Sep-66	27	1,150	—	—	50	Johnston and Dickerman, 1974c
CUW 542	yes	80	Sep-66	23	750	—	—	57	Johnston and Dickerman, 1974c
CUW 543	yes	60	Sep-66	3	3,750	—	—	26	Johnston and Dickerman, 1974c
CUW 545	yes	60	—	—	2,750	—	—	81	Johnston and Dickerman, 1974c
CUW 547	yes	75	Aug-56	12	—	—	—	46	Johnston and Dickerman, 1974c
GLW 024	no	625	Jun-47	6.06	—	—	—	18.7	Upper Branch Project Book, R.I. Office
GLW 026	no	522	Jun-47	7.69	—	—	—	9.5	Upper Branch Project Book, R.I. Office
GLW 027	no	510	Jun-47	12.82	—	—	—	18.9	Upper Branch Project Book, R.I. Office
GLW 028	yes	462	Oct-67	15.72	456	—	—	18	Upper Branch Project Book and GWSI
GLW 030	no	522	Jun-47	10.44	—	—	—	20	Upper Branch Project Book, R.I. Office

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft²/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft²/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
GLW 047	no	472	Jun-47	7.88	—	—	—	16	Upper Branch Project Book, R.I. Office
GLW 048	yes	452	Jun-47	14.89	—	—	—	17	Upper Branch Project Book, R.I. Office
GLW 060	no	515	Jun-47	5.55	—	14.2	—	14.2	Upper Branch Project Book, R.I. Office
GLW 061	yes	454	Jun-47	7.06	—	—	—	12.1	Upper Branch Project Book, R.I. Office
GLW 062	yes	438	Jun-47	12.91	—	—	—	19.4	Upper Branch Project Book, R.I. Office
GLW 066	yes	428	Sep-49	15.2	—	—	—	18.6	GWSI
GLW 071	no	458	Sep-49	8	—	24	—	60	GWSI
GLW 072	yes	425	Sep-49	17	—	—	—	19.1	GWSI
GLW 075	yes	445	Sep-49	9.2	—	—	—	14.3	GWSI
GLW 078	no	675	Oct-49	16.68	<50	17	—	17	USGS Well Schedule, R.I. Office
GLW 079	no	617	Aug-61	16.9	<50	—	—	22.8	USGS Well Schedule, R.I. Office
GLW 080	no	509	Oct-49	17.38	<50	19.8	—	19.8	USGS Well Schedule, R.I. Office
GLW 086	yes	515	Jul-61	18.07	<50	—	—	21.7	USGS Well Schedule, R.I. Office
GLW 087	no	525	Oct-49	10.23	<50	11.8	—	11.8	USGS Well Schedule, R.I. Office
GLW 098	no	749	May-61	4.49	<50	18.9	—	18.9	USGS Well Schedule, R.I. Office
GLW 129	yes	500	Sep-68	43	10,400	95	—	130	Upper Branch Project Book, R.I. Office
GLW 130	yes	488	Aug-59	46	8,800	90	—	307	Upper Branch Project Book, R.I. Office
GLW 131	yes	452	Jan-59	30	—	60	—	200	Upper Branch Project Book, R.I. Office
GLW 132	yes	460	Sep-60	18	350	—	—	25	Upper Branch Project Book, R.I. Office
GLW 134	yes	401	May-61	8.48	—	—	—	18.6	Upper Branch Project Book, R.I. Office
GLW 135	yes	396	May-61	16.69	—	—	—	18.71	Upper Branch Project Book, R.I. Office
GLW 136	yes	412	May-61	26.63	—	35	—	350	USGS Well Schedule, R.I. Office

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft^2/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft^2/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
GLW 139	yes	438	May-61	3.68	—	—	—	9.43	Upper Branch Project Book, R.I. Office
GLW 142	yes	395	May-61	3.97	—	—	—	7.12	Upper Branch Project Book, R.I. Office
GLW 144	yes	398	May-61	5.29	—	—	—	15.27	Upper Branch Project Book, R.I. Office
GLW 145	yes	378	May-61	9.77	—	—	—	15.53	Upper Branch Project Book, R.I. Office
GLW 147	yes	372	May-61	18.71	—	—	—	22.75	Upper Branch Project Book, R.I. Office
GLW 150	yes	448	May-61	11.94	—	—	—	16.76	Upper Branch Project Book, R.I. Office
GLW 151	yes	448	May-61	9.68	—	—	—	15.28	Upper Branch Project Book, R.I. Office
GLW 153	no	503	May-61	3.95	—	—	—	12.87	Upper Branch Project Book, R.I. Office
GLW 154	yes	465	May-61	7.64	—	—	—	12.05	Upper Branch Project Book, R.I. Office
GLW 155	no	492	May-61	5.86	—	16.8	—	16.8	Upper Branch Project Book, R.I. Office
GLW 160	yes	442	May-61	16.81	—	—	—	23.74	Upper Branch Project Book, R.I. Office
GLW 162	no	518	May-61	3.44	—	13.02	—	13.02	Upper Branch Project Book, R.I. Office
GLW 163	no	516	May-61	1.6	—	—	—	17.61	Upper Branch Project Book, R.I. Office
GLW 168	no	612	May-61	6.97	—	—	—	22.39	Upper Branch Project Book, R.I. Office
GLW 188	yes	448	May-61	15.58	—	—	—	19.99	Upper Branch Project Book, R.I. Office
GLW 189	yes	455	May-61	20.27	—	—	—	24.76	Upper Branch Project Book, R.I. Office
GLW 198	yes	450	May-61	6.77	—	—	—	11.82	Upper Branch Project Book, R.I. Office
GLW 199	no	552	May-61	3.65	—	—	—	15.41	Upper Branch Project Book, R.I. Office
GLW 200	no	475	May-61	10.38	—	14.2	—	14.2	Upper Branch Project Book, R.I. Office
GLW 201	no	565	May-61	8.17	—	15.59	—	15.59	Upper Branch Project Book, R.I. Office
GLW 207	no	557	May-61	3.09	—	—	—	17.48	Upper Branch Project Book, R.I. Office
GLW 208	no	481	May-61	3.24	—	—	—	11.99	Upper Branch Project Book, R.I. Office

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft²/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft²/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
GLW 210	no	538	May-61	1.89	—	9.41	—	9.41	Upper Branch Project Book, R.I. Office
GLW 211	yes	542	May-61	7.24	—	—	—	12.5	Upper Branch Project Book, R.I. Office
GLW 212	no	693	May-61	4.45	—	—	—	16.9	Upper Branch Project Book, R.I. Office
GLW 213	no	642	May-61	6.16	—	11.22	—	11.22	Upper Branch Project Book, R.I. Office
GLW 214	no	575	May-61	5.53	—	—	—	9.91	Upper Branch Project Book, R.I. Office
GLW 215	yes	505	May-61	11.77	—	—	—	16.59	Upper Branch Project Book, R.I. Office
GLW 216	yes	466	May-61	8	—	—	—	16.1	Upper Branch Project Book, R.I. Office
GLW 217	no	469	May-61	4.89	—	7.98	—	7.98	Upper Branch Project Book, R.I. Office
GLW 219	no	574	May-61	6.89	—	10.07	—	10.07	Upper Branch Project Book, R.I. Office
GLW 220	no	578	May-61	9.26	—	13.37	—	13.37	Upper Branch Project Book, R.I. Office
GLW 223	yes	435	May-61	9.96	—	—	—	13.59	Upper Branch Project Book, R.I. Office
GLW 224	yes	525	May-61	15.24	—	—	—	21.82	Upper Branch Project Book, R.I. Office
GLW 227	no	604	May-61	4.73	—	12.22	—	12.22	Upper Branch Project Book, R.I. Office
GLW 228	no	542	May-61	3.39	—	—	—	15.33	Upper Branch Project Book, R.I. Office
GLW 233	yes	441	May-61	7.48	—	—	—	11.87	Upper Branch Project Book, R.I. Office
GLW 234	no	550	May-61	15.57	—	17.92	—	17.92	Upper Branch Project Book, R.I. Office
GLW 249	no	523	Jul-61	13.29	—	—	—	16.54	Upper Branch Project Book, R.I. Office
GLW 264	yes	476	Jul-61	12.42	—	13.6	—	13.6	Upper Branch Project Book, R.I. Office
GLW 268	no	477	Aug-61	7.2	—	—	—	13.8	Upper Branch Project Book, R.I. Office
GLW 293	yes	378	Oct-67	11.95	730	—	—	15.7	GWSI
GLW 294	no	435	Apr-68	5.00	3,000	90	—	140	Upper Branch Project Book, R.I. Office
GLW 295	yes	448	May-05	8.00	4,700	55	—	175	Upper Branch Project Book, R.I. Office

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft²/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft²/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
GLW 296	yes	457	May-05	15.00	8,500	100	—	275	Upper Branch Project Book, R.I. Office
GLW 297	no	563	—	30.00	—	104	—	260	Upper Branch Project Book, R.I. Office
GLW 298	yes	242	May-05	8	2,800	—	—	36	GWSI
GLW 299	yes	412	Jun-65	30.00	—	120	—	232	Upper Branch Project Book, R.I. Office
GLW 302	yes	450	Aug-63	30.00	—	100	—	190	Upper Branch Project Book, R.I. Office
GLW 303	yes	461	Nov-64	35.00	—	129	—	175	Upper Branch Project Book, R.I. Office
GLW 304	yes	448	Dec-65	30.00	10,750	125	—	187	Upper Branch Project Book, R.I. Office
GLW 313	no	428	Oct-68	13.90	—	—	—	19.28	USGS Well Schedule, R.I. Office
GLW 316	yes	445	Nov-61	20.00	—	105	—	340	USGS Well Schedule, R.I. Office
GLW 317	yes	440	Sep-68	13.00	—	68	—	220	USGS Well Schedule, R.I. Office
GLW 323	yes	492	Sep-68	37.00	9,600	—	—	85	Upper Branch Project Book, R.I. Office
GLW 325	yes	458	Nov-68	5.00	2,550	—	38	38	Upper Branch Project Book, R.I. Office
GLW 327	yes	432	—	5.00	2,600	—	31	31	USGS Well Schedule, R.I. Office
GLW 328	yes	440	Nov-68	10	1,250	—	47.2	47.2	USGS Well Schedule, R.I. Office
GLW 329	yes	362	Dec-68	5.00	900	59	—	61	USGS Well Schedule, R.I. Office
GLW 330	yes	385	Dec-68	20.00	500	61	—	61	USGS Well Schedule, R.I. Office
GLW 331	yes	385	Dec-68	20.00	200	42	—	42	USGS Well Schedule, R.I. Office
GLW 332	yes	370	Dec-68	10.00	1,700	57	—	57	USGS Well Schedule, R.I. Office
GLW 333	yes	372	Dec-68	10.00	550	40	—	40	USGS Well Schedule, R.I. Office
GLW 338	yes	412	Jun-62	35.00	—	60	—	115	USGS Well Schedule, R.I. Office
LIB 175	yes	75	—	—	3,100	—	—	17	Johnston and Dickerman, 1974c
LIB 331	yes	70	—	—	11,400	—	—	57	Johnston and Dickerman, 1974c

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft²/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft²/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
LIB 333	yes	70	—	—	5,550	—	—	36	Johnston and Dickerman, 1974c
LIB 432	no	78	May-05	3	880	—	7.4	7	Johnston and Dickerman, 1974c
LIB 433	no	79	May-05	3	210	—	6.3	6	Johnston and Dickerman, 1974c
LIW 004	yes	145	Jan-40	30	—	40	—	300	Johnston and Dickerman, 1974c
LIW 005	no	235	Apr-05	25	<50	12	—	378	USGS Well Schedule, R.I. Office
LIW 006	yes	140	Sep-45	59	—	15	—	180	Johnston and Dickerman, 1974c
LIW 020	yes	140	Apr-45	7	—	—	—	10	Johnston and Dickerman, 1974c
LIW 231	no	355	Aug-31	14	—	22	—	22	Johnston and Dickerman, 1974c
LIW 245	yes	315	Apr-46	15	—	25	—	25	Johnston and Dickerman, 1974c
LIW 255	yes	155	May-46	18	—	15	—	71	Johnston and Dickerman, 1974c
LIW 256	yes	155	Jan-43	25	—	55	—	225	Johnston and Dickerman, 1974c
LIW 258	yes	152	Oct-42	29	—	52	—	273	Johnston and Dickerman, 1974c
LIW 262	yes	190	May-46	11	—	18	—	18	Johnston and Dickerman, 1974c
LIW 316	yes	90	Jun-46	30	—	36	—	36	Johnston and Dickerman, 1974c
LIW 317	yes	95	Jun-46	22	—	—	—	36	Johnston and Dickerman, 1974c
LIW 326	yes	170	Jun-46	11	—	—	—	17	Johnston and Dickerman, 1974c
LIW 341	yes	85	Jan-50	11	13,500	127	—	125	Johnston and Dickerman, 1974c
LIW 342	yes	75	Feb-50	12	22,650	136	—	136	Johnston and Dickerman, 1974c
LIW 343	yes	85	Feb-50	10	16,000	—	—	100	Johnston and Dickerman, 1974c
LIW 344	yes	85	—	—	13,800	—	—	108	Johnston and Dickerman, 1974c
LIW 345	yes	85	—	—	16,000	—	—	90	Johnston and Dickerman, 1974c
LIW 346	yes	85	—	—	1,200	—	—	68	Johnston and Dickerman, 1974c

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft²/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft²/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
LIW 350	yes	55	Nov-54	2	3,025	—	—	26	Johnston and Dickerman, 1974c
LIW 351	yes	55	Nov-54	1	4,050	—	—	24	Johnston and Dickerman, 1974c
LIW 353	yes	60	—	—	12,400	—	65	65	Johnston and Dickerman, 1974c
LIW 354	yes	60	—	—	6,750	—	20	120	Johnston and Dickerman, 1974c
LIW 355	yes	60	—	—	5,850	—	137	137	Johnston and Dickerman, 1974c
LIW 371	yes	65	—	—	12,700	—	—	90	Johnston and Dickerman, 1974c
LIW 372	yes	65	—	—	8,400	—	75	75	Johnston and Dickerman, 1974c
LIW 378	yes	65	—	—	14,600	92	—	90	Johnston and Dickerman, 1974c
LIW 379	yes	65	—	—	11,700	77	—	75	Johnston and Dickerman, 1974c
LIW 380	yes	65	Nov-56	9	19,100	72	—	72	Johnston and Dickerman, 1974c
LIW 382	yes	75	Nov-56	8	15,200	52	—	52	Johnston and Dickerman, 1974c
LIW 383	yes	65	Apr-57	6	22,400	—	—	62	Johnston and Dickerman, 1974c
LIW 417	yes	100	Oct-63	8	14,800	—	58	55	Johnston and Dickerman, 1974c
LIW 418	yes	70	May-64	10	5,800	—	—	142	Johnston and Dickerman, 1974c
LIW 419	yes	97	Mar-64	5	7,950	—	—	54	Johnston and Dickerman, 1974c
LIW 420	yes	64	Mar-69	7	16,200	—	—	46	Johnston and Dickerman, 1974c
LIW 429	yes	70	Sep-63	14	1,835	—	—	157	Johnston and Dickerman, 1974c
LIW 434	no	79	May-05	3	900	7.5	—	18	Johnston and Dickerman, 1974c
LIW 437	no	310	Oct-65	20	<50	50	—	190	USGS Well Schedule, R.I. Office
NSA 343	yes	193	Nov-68	6	6,800	—	—	60	Johnston and Dickerman, 1974c
NSA 344	yes	190	Nov-68	6	7,100	—	—	54	Johnston and Dickerman, 1974c
NSA 346	yes	190	Nov-68	5	5,500	—	—	40	Johnston and Dickerman, 1974c

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft²/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft²/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
NSB 213	yes	233	Aug-57	1	550	12	—	22	Johnston and Dickerman, 1974c
NSB 218	yes	230	Sep-57	6	650	19	—	29	Johnston and Dickerman, 1974c
NSB 227	no	223	Sep-57	5	600	26	—	36	Johnston and Dickerman, 1974c
NSB 232	no	262	Oct-57	15	100	17	—	27	Johnston and Dickerman, 1974c
NSB 251	yes	228	Sep-57	25	2,750	—	—	45	Johnston and Dickerman, 1974c
NSB 256	yes	188	Sep-57	9	1,200	35	—	45	Johnston and Dickerman, 1974c
NSB 262	yes	188	Oct-57	7	2,200	51	—	61	Johnston and Dickerman, 1974c
NSB 267	yes	205	Sep-57	2	500	14	—	24	Johnston and Dickerman, 1974c
NSB 273	yes	222	Sep-57	28	2,150	—	—	71	Johnston and Dickerman, 1974c
NSB 281	no	249	Oct-57	10	<50	7	—	17	Johnston and Dickerman, 1974c
NSB 284	yes	235	Oct-57	14	300	20	—	30	Johnston and Dickerman, 1974c
NSW 008	yes	230	Apr-46	22	—	—	—	28	Johnston and Dickerman, 1974c
NSW 010	no	270	Apr-46	2	<50	14	—	14	USGS Well Schedule, R.I. Office
NSW 012	yes	300	Apr-46	9	—	—	—	13	Johnston and Dickerman, 1974c
NSW 013	no	360	Apr-46	7.95	<50	—	—	34	USGS Well Schedule, R.I. Office
NSW 015	yes	330	Apr-46	8	—	—	—	19	Johnston and Dickerman, 1974c
NSW 016	no	310	1925	9	<50	8	—	400	USGS Well Schedule, R.I. Office
NSW 017	no	400	Jul-47	7.82	—	12.4	—	12.4	Upper Branch Project Book
NSW 019	no	320	Nov-39	5	<50	3	—	104	USGS Well Schedule, R.I. Office
NSW 021	yes	239	May-47	7	—	—	—	16	Johnston and Dickerman, 1974c
NSW 023	no	230	Mar-26	16	—	7	—	190	Johnston and Dickerman, 1974c
NSW 032	yes	320	Jan-46	6	—	18	—	124	Johnston and Dickerman, 1974c

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft^2/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft^2/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
NSW 035	yes	270	Oct-41	20	—	38	—	100	Johnston and Dickerman, 1974c
NSW 037	yes	230	Jun-42	6	—	103	—	260	Johnston and Dickerman, 1974c
NSW 038	no	275	Sep-46	4	<50	12	—	163	USGS Well Schedule, R.I. Office
NSW 039	no	230	May-44	13	<50	3	—	160	USGS Well Schedule, R.I. Office
NSW 040	no	245	Jun-46	27	<50	3	—	345	USGS Well Schedule, R.I. Office
NSW 042	no	300	Dec-39	5	<50	14	—	194	USGS Well Schedule, R.I. Office
NSW 043	no	265	Oct-43	40	<50	10	—	160	USGS Well Schedule, R.I. Office
NSW 044	no	285	Dec-45	15	<50	10	—	170	USGS Well Schedule, R.I. Office
NSW 046	no	325	Aug-42	28	<50	4	—	140	USGS Well Schedule, R.I. Office
NSW 047	yes	210	Feb-42	40	—	28	—	186	Johnston and Dickerman, 1974c
NSW 048	yes	275	Jul-45	3	5,400	30	—	125	Johnston and Dickerman, 1974c
NSW 051	yes	245	Aug-41	19	—	—	—	68	Johnston and Dickerman, 1974c
NSW 052	yes	210	Jun-47	1	—	20	—	230	Johnston and Dickerman, 1974c
NSW 058	yes	265	Oct-03	14	—	17	—	139.5	Upper Branch Project Book, R.I. Office
NSW 059	yes	251	Dec-03	15.5	—	17	—	146	Upper Branch Project Book, R.I. Office
NSW 061	no	308	Sep-03	12	—	6	—	88	Upper Branch Project Book, R.I. Office
NSW 062	yes	205	Jun-43	20	—	80	—	132	Johnston and Dickerman, 1974c
NSW 063	yes	205	Jul-44	40	—	18	—	143	Johnston and Dickerman, 1974c
NSW 064	no	280	Mar-47	3	<50	2	—	145	USGS Well Schedule, R.I. Office
NSW 065	no	260	Mar-41	20	7,400	57	—	724	USGS Well Schedule, R.I. Office
NSW 066	no	260	—	0	<50	32	—	160	USGS Well Schedule, R.I. Office
NSW 079	no	380	Jun-47	3.12	<50	4	—	4	USGS Well Schedule, R.I. Office

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft²/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft²/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
NSW 083	yes	270	Jun-47	9	—	14	—	14	Johnston and Dickerman, 1974c
NSW 084	no	410	Jun-47	10	<50	20	—	20	USGS Well Schedule, R.I. Office
NSW 086	yes	400	Jun-47	8.29	<50	—	—	—	USGS Well Schedule, R.I. Office
NSW 087	no	430	Jun-47	5.02	<50	—	—	—	USGS Well Schedule, R.I. Office
NSW 092	no	370	Jun-47	10.48	<50	—	—	13.52	USGS Well Schedule, R.I. Office
NSW 093	no	450	Jun-47	11.69	<50	19	—	19	USGS Well Schedule, R.I. Office
NSW 094	no	450	Jun-47	11.6	<50	—	—	19	USGS Well Schedule, R.I. Office
NSW 097	yes	235	Oct-43	25	—	8	—	96	Johnston and Dickerman, 1974c
NSW 098	yes	247	Jul-37	15	—	21	—	108	Johnston and Dickerman, 1974c
NSW 117	yes	300	Jun-47	23	—	—	—	24	Johnston and Dickerman, 1974c
NSW 118	yes	320	Sep-33	25	—	17	—	172	Johnston and Dickerman, 1974c
NSW 119	no	460	Jun-47	12.67	<50	—	—	15.8	USGS Well Schedule, R.I. Office
NSW 125	yes	280	Mar-40	7	<50	17	—	213	USGS Well Schedule, R.I. Office
NSW 126	yes	338	Jun-47	15.88	—	—	—	17.1	Upper Branch Project Book, R.I. Office
NSW 131	no	303	Jun-47	5.84	—	7.2	—	7.2	Upper Branch Project Book, R.I. Office
NSW 135	no	343	Jun-47	13.64	—	19	—	19	Upper Branch Project Book, R.I. Office
NSW 136	no	302	Jun-47	9.41	—	—	—	16	Upper Branch Project Book, R.I. Office
NSW 138	yes	255	Jun-47	13.01	—	16	—	16	Upper Branch Project Book, R.I. Office
NSW 147	yes	230	Jul-54	3	850	—	—	111	Johnston and Dickerman, 1974c
NSW 158	yes	240	Sep-55	6.6	2,080	17	—	29	Johnston and Dickerman, 1974c
NSW 159	yes	240	Sep-55	6.5	2,900	21	—	21	Upper Branch Project Book, R.I. Office
NSW 165	yes	240	Sep-55	6.5	2,550	26	—	26	Upper Branch Project Book, R.I. Office

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft^2/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft^2/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
NSW 166	yes	240	Sep-55	6.7	3,660	28	—	28	Upper Branch Project Book, R.I. Office
NSW 167	yes	240	Sep-55	7	2,500	29.5	—	29.5	Upper Branch Project Book, R.I. Office
NSW 171	no	307	Dec-61	7.12	—	—	—	22.4	Upper Branch Project Book, R.I. Office
NSW 172	yes	293	Dec-61	5.91	—	—	—	12.7	Upper Branch Project Book, R.I. Office
NSW 173	no	340	Dec-61	11.43	—	—	—	21.6	Upper Branch Project Book, R.I. Office
NSW 175	no	315	Dec-61	8.44	—	18	—	22.5	Upper Branch Project Book, R.I. Office
NSW 176	no	373	Dec-61	7.97	—	14	—	14	Upper Branch Project Book, R.I. Office
NSW 177	no	318	Dec-61	3.6	—	—	—	11	Upper Branch Project Book, R.I. Office
NSW 179	no	302	Dec-61	4.54	—	13.5	—	13.5	Upper Branch Project Book, R.I. Office
NSW 183	yes	255	Dec-61	2.58	704	—	—	6	Johnston and Dickerman, 1974c
NSW 185	yes	260	Dec-61	16.59	—	19	—	22	Upper Branch Project Book, R.I. Office
NSW 191	yes	280	Dec-61	5.6	—	—	—	14.2	Upper Branch Project Book, R.I. Office
NSW 192	yes	282	Dec-61	12.78	—	—	—	20.9	Upper Branch Project Book, R.I. Office
NSW 199	yes	171	—	—	9,600	—	—	41	Johnston and Dickerman, 1974c
NSW 201	yes	171	Nov-61	8	12,550	—	50	50	Johnston and Dickerman, 1974c
NSW 204	yes	171	Jan-61	5	14,500	—	—	50	Johnston and Dickerman, 1974c
NSW 310	yes	240	May-63	4	8,600	—	—	64	Johnston and Dickerman, 1974c
NSW 321	yes	258	Dec-65	46	—	75	—	400	Upper Branch Project Book, R.I. Office
NSW 323	no	264	Nov-62	55	—	65	—	308	Upper Branch Project Book, R.I. Office
NSW 324	yes	265	Nov-63	20	—	71	—	490	Upper Branch Project Book, R.I. Office
NSW 331	yes	265	Nov-68	14	8,100	87	—	87	Upper Branch Project Book, R.I. Office
NSW 332	yes	265	Nov-68	16	8,325	81.5	—	81.5	Upper Branch Project Book, R.I. Office

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft²/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft²/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
NSW 333	yes	308	Nov-68	8	4,050	37.5	—	37.5	Upper Branch Project Book, R.I. Office
NSW 335	yes	245	Nov-68	—	5,700	—	38	38	Upper Branch Project Book, R.I. Office
NSW 336	yes	240	Nov-68	5	10,600	—	70.5	70.5	Upper Branch Project Book, R.I. Office
NSW 337	yes	238	Nov-68	3	7,550	—	—	62.5	Upper Branch Project Book, R.I. Office
NSW 338	yes	272	Nov-68	4	2,400	—	—	36	Upper Branch Project Book, R.I. Office
NSW 341	yes	277	Nov-68	12	3,405	—	41.7	41.7	Upper Branch Project Book, R.I. Office
NSW 342	yes	190	Dec-68	4.5	2,850	23.5	—	23.5	Upper Branch Project Book, R.I. Office
NSW 343	yes	190	Dec-68	6	5,800	60	—	60	Upper Branch Project Book, R.I. Office
NSW 344	yes	190	—	—	7,450	54	—	54	Upper Branch Project Book, R.I. Office
NSW 345	yes	190	—	—	1,420	11.8	—	11.8	Upper Branch Project Book, R.I. Office
NSW 346	yes	190	Dec-68	—	6,000	40	—	40.5	Upper Branch Project Book, R.I. Office
NSW 347	yes	265	Oct-68	19	6,220	—	57.5	57.5	Upper Branch Project Book, R.I. Office
NSW 348	yes	220	Oct-68	6	—	—	—	27	Upper Branch Project Book, R.I. Office
NSW 349	yes	310	Nov-68	62	2,000	—	—	103	Upper Branch Project Book, R.I. Office
NSW 350	yes	260	Nov-68	16	5,675	—	59.5	59.5	Upper Branch Project Book, R.I. Office
NSW 351	yes	248	Dec-68	2	—	—	—	14.5	Upper Branch Project Book, R.I. Office
NSW 352	yes	235	Dec-68	3.6	<50	—	—	49	Upper Branch Project Book, R.I. Office
NSW 353	yes	241	Nov-68	4	850	—	—	47	Upper Branch Project Book, R.I. Office
NSW 356	yes	228	Jan-57	13.5	5,725	—	—	61.5	Upper Branch Project Book, R.I. Office
NSW 357	yes	240	Mar-63	4	6,800	—	—	50	Upper Branch Project Book, R.I. Office
NSW 358	yes	172	Feb-63	2	8,500	—	—	63	Johnston and Dickerman, 1974c
NSX 356	yes	245	May-68	2	3,100	40	—	50	Johnston and Dickerman, 1974c

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft²/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft²/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
NSX 357	yes	270	May-68	1	2,540	62	—	72	Johnston and Dickerman, 1974c
PAB 206	yes	88	Jan-52	16	<50	22	—	32	Johnston and Dickerman, 1974c
PAB 265	yes	88	Jan-52	11	3,850	25	—	36	Johnston and Dickerman, 1974c
PAB 266	yes	82	Jan-52	18	<50	20	—	30	Johnston and Dickerman, 1974c
PAB 268	yes	93	Jan-52	25	1,950	—	—	63	Johnston and Dickerman, 1974c
PAB 621	yes	86	—	—	5,300	66	—	74	Johnston and Dickerman, 1974c
PAB 622	yes	74	Jan-61	18	2,080	37	—	42	Johnston and Dickerman, 1974c
PAB 623	yes	94	Jan-61	30	4,850	50	—	55	Johnston and Dickerman, 1974c
PAW 027	yes	45	Jan-36	25	—	25	—	595	Johnston and Dickerman, 1974c
PAW 050	yes	60	Jan-16	12	—	7	—	400	Johnston and Dickerman, 1974c
PAW 087	yes	95	Nov-39	69	—	57	—	325	Johnston and Dickerman, 1974c
PAX 124	yes	86	—	—	1,640	16.4	—	16	Johnston and Dickerman, 1974c
SMW 096	no	412	Jun-47	16.76	—	—	—	20	Upper Branch Project Book, R.I. Office
SMW 097	no	428	Jun-47	10.58	—	—	—	17	USGS Well Schedule, R.I. Office
WTW 001	yes	215	Jul-46	20	1,800	29	—	29	Johnston and Dickerman, 1974c
WTW 003	no	250	Jan-46	10	<50	10	—	120	USGS Well Schedule, R.I. Office
WTW 004	no	255	Apr-37	10	<50	17	—	128	USGS Well Schedule, R.I. Office
WTW 005	yes	210	May-38	80	6,800	114	—	560	Johnston and Dickerman, 1974c
WTW 006	no	310	Sep-41	9	<50	17	—	72	USGS Well Schedule, R.I. Office
WTW 007	yes	305	Sep-41	20	<50	27	—	217	USGS Well Schedule, R.I. Office
WTW 016	yes	138	Oct-43	2	1,600	10	—	160	Johnston and Dickerman, 1974c
WTW 017	yes	125	Mar-46	—	10,000	50	—	282	Johnston and Dickerman, 1974c

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

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Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft²/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
WTW 018	yes	130	Jun-47	12	13,600	80	—	750	Johnston and Dickerman, 1974c
WTW 029	yes	150	Oct-01	—	15,400	—	—	77	Johnston and Dickerman, 1974c
WTW 030	yes	150	Jun-47	—	17,400	—	—	87	Johnston and Dickerman, 1974c
WTW 031	yes	175	May-37	—	5,000	—	—	—	USGS Well Schedule, R.I. Office
WTW 036	yes	290	—	—	9,000	—	—	—	USGS Well Schedule, R.I. Office
WTW 040	yes	150	Nov-47	—	14,800	—	—	74	Johnston and Dickerman, 1974c
WTW 089	yes	260	Aug-33	23	—	—	—	28	Johnston and Dickerman, 1974c
WTW 097	yes	235	Jun-48	26	—	—	—	28	Johnston and Dickerman, 1974c
WTW 102	yes	165	Jun-48	20	—	—	—	27	Johnston and Dickerman, 1974c
WTW 108	yes	305	Jun-48	14	—	22	—	22	Johnston and Dickerman, 1974c
WTW 109	no	260	Jun-48	17	—	26	—	26	Johnston and Dickerman, 1974c
WTW 114	no	370	Jun-48	4.52	<50	—	—	10	USGS Well Schedule, R.I. Office
WTW 116	no	355	Jun-48	9.95	<50	—	—	24	USGS Well Schedule, R.I. Office
WTW 119	no	315	Jun-48	4.65	<50	—	—	15	USGS Well Schedule, R.I. Office
WTW 123	yes	140	Jun-48	2	—	—	—	6	Johnston and Dickerman, 1974c
WTW 124	no	250	Jun-48	21.27	<50	11	—	102	USGS Well Schedule, R.I. Office
WTW 132	yes	155	Jan-51	13	13,350	64	—	21	Johnston and Dickerman, 1974c
WTW 133	yes	155	Aug-54	8	2,400	—	61	61	Johnston and Dickerman, 1974c
WTW 135	yes	157	Jun-54	8	1,600	—	84	84	Johnston and Dickerman, 1974c
WTW 138	yes	156	Jun-54	10	5,325	—	92.5	92	Johnston and Dickerman, 1974c
WTW 139	yes	156	Jul-54	5	3,950	—	84	84	Johnston and Dickerman, 1974c
WTW 140	yes	120	Jan-54	10	<50	45	46	46	Johnston and Dickerman, 1974c

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft^2/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft^2/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
WTW 143	yes	130	Jul-54	16	6,650	—	72.5	52	Johnston and Dickerman, 1974c
WTW 145	yes	130	Jul-54	13	1,000	39	41	41	Johnston and Dickerman, 1974c
WTW 146	yes	115	Jul-54	6	200	—	29	29	Johnston and Dickerman, 1974c
WTW 148	yes	125	Jul-54	15	6,000	—	55	45	Johnston and Dickerman, 1974c
WTW 149	yes	110	Jul-54	6	2,975	—	38.5	37	Johnston and Dickerman, 1974c
WTW 150	yes	125	Aug-54	13	700	—	27	27	Johnston and Dickerman, 1974c
WTW 151	yes	125	Aug-54	16	200	67	69	69	Johnston and Dickerman, 1974c
WTW 152	yes	110	Aug-54	5	600	—	71	71	Johnston and Dickerman, 1974c
WTW 153	yes	130	Jul-54	16	5,050	—	—	64	Johnston and Dickerman, 1974c
WTW 154	yes	125	Jul-54	16	4,300	—	55	48	Johnston and Dickerman, 1974c
WTW 156	yes	110	—	—	2,100	—	31	31	Johnston and Dickerman, 1974c
WTW 157	yes	130	Nov-57	20	7,800	61	—	58	Johnston and Dickerman, 1974c
WTW 158	yes	125	Oct-57	17	5,800	—	—	46	Johnston and Dickerman, 1974c
WTW 159	yes	160	Nov-55	10	—	—	—	50	Johnston and Dickerman, 1974c
WTW 163	yes	200	Apr-70	28	1,350	—	—	42	Johnston and Dickerman, 1974c
WTW 164	yes	198	Jul-71	22	—	50	—	335	Johnston and Dickerman, 1974c
WTW 165	yes	150	Sep-56	1	—	—	—	—	USGS Well Schedule, R.I. Office
WTW 187	yes	125	Apr-62	12	—	26	—	26	USGS Well Schedule, R.I. Office
WTX 59	yes	156	May-39	5	<50	—	—	92	Johnston and Dickerman, 1974c
WTX 61	yes	163	May-39	13	<50	27	27	27	Johnston and Dickerman, 1974c
WTX 63	yes	158	May-39	10	4,250	—	—	62	Johnston and Dickerman, 1974c
WTX 71	yes	160	May-39	10	<50	44.5	—	52	Johnston and Dickerman, 1974c

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft²/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft²/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
WTX 72	yes	159	May-39	10	<50	—	—	59	Johnston and Dickerman, 1974c
WTX 81	yes	158	Jun-39	20	1,100	61	—	63	Johnston and Dickerman, 1974c
WTX 82	yes	158	Jun-39	9	<50	27	—	30	Johnston and Dickerman, 1974c
WTX 84	yes	157	Jun-39	7	2,105	—	—	56	Johnston and Dickerman, 1974c
WTX 160	yes	141	Mar-61	7	650	—	—	52	Johnston and Dickerman, 1974c
WTX 161	yes	145	Apr-61	9	450	—	—	52	Johnston and Dickerman, 1974c
WTX 162	yes	120	Aug-64	19	5,000	—	69	69	Johnston and Dickerman, 1974c
WTX 166	yes	155	Sep-56	6	6,800	—	—	80	Johnston and Dickerman, 1974c
WTX 168	yes	142	Jun-55	-8	500	2	—	14	Johnston and Dickerman, 1974c
WTX 169	yes	157	Mar-56	3	<50	15	—	25	Johnston and Dickerman, 1974c
WTX 170	yes	165	Mar-56	5	600	11	—	18	Johnston and Dickerman, 1974c
WTX 171	yes	170	Mar-56	5	<50	22	—	32	Johnston and Dickerman, 1974c
WTX 172	yes	170	Mar-56	2	<50	12	—	23	Johnston and Dickerman, 1974c
WTX 173	yes	113	Aug-62	-4	200	4	—	20	Johnston and Dickerman, 1974c
WTX 174	yes	114	Aug-62	-2	<50	9	—	34	Johnston and Dickerman, 1974c
WTX 176	yes	113	Aug-62	-4	600	12	—	27	Johnston and Dickerman, 1974c
WTX 177	yes	121	Feb-63	22	3,000	—	—	60	Johnston and Dickerman, 1974c
WTX 179	yes	121	Mar-63	9	<50	—	—	45	Johnston and Dickerman, 1974c
WTX 180	yes	127	Mar-57	8	500	—	—	45	Johnston and Dickerman, 1974c
WTX 181	yes	133	Mar-63	7	700	37	—	55	Johnston and Dickerman, 1974c
WTX 182	yes	142	Mar-63	10	850	32	—	46	Johnston and Dickerman, 1974c
WTX 183	yes	123	Mar-63	14	<50	—	—	50	Johnston and Dickerman, 1974c

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft²/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft²/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
WTX 184	yes	123	Feb-63	11	<50	—	—	50	Johnston and Dickerman, 1974c
WTX 186	yes	131	—	—	1,975	—	—	50	Johnston and Dickerman, 1974c
WTX 188	yes	125	Apr-62	10	3,900	32	—	38	Johnston and Dickerman, 1974c
WTX 189	yes	140	Aug-72	17	1,870	30	—	36	Johnston and Dickerman, 1974c
WTX 190	yes	125	Aug-72	13	4,600	—	—	60	Johnston and Dickerman, 1974c
WTX 191	yes	125	Aug-72	15	6,800	49	—	59	Johnston and Dickerman, 1974c
WTX 192	yes	140	Aug-72	16	2,150	41	—	46	Johnston and Dickerman, 1974c
WTX 193	yes	120	Sep-72	9	600	18	—	28	Johnston and Dickerman, 1974c
WTX 194	yes	180	Aug-72	22	1,200	—	—	52	Johnston and Dickerman, 1974c
WTX 195	yes	170	Sep-72	9	900	—	—	30	Johnston and Dickerman, 1974c
WTX 197	no	205	Sep-72	10	300	13	—	18	Johnston and Dickerman, 1974c

Long-Term Ground-Water Levels and Transmissivity in the Blackstone River Basin, Northern Rhode Island

By Jack R. Eggleston, Peter E. Church, and Jeffrey R. Barbaro

Abstract

Ground water provides about 7.7 million gallons per day, or 28 percent of total water use in the Rhode Island part of the Blackstone River Basin. Primary aquifers in the basin are stratified glacial deposits, composed mostly of sand and gravel along valley bottoms. The ground-water and surface-water system in the Blackstone River Basin is under stress due to population growth, out-of-basin water transfers, industrialization, and changing land-use patterns. Streamflow periodically drops below the Aquatic Base Flow standard, and ground-water withdrawals add to stress on aquatic habitat during low-flow periods.

Existing hydrogeologic data were reviewed to examine historical water-level trends and to generate contour maps of water-table altitudes and transmissivity of the sand and gravel aquifer in the Blackstone River Basin in Rhode Island. On the basis of data from four long-term observation wells, water levels appear to have risen slightly in the study area during the past 55 years. Analysis of available data indicates that increased rainfall during the same period is a likely contributor to the water-level rise. Spatial patterns of transmissivity are shown over larger areas and have been refined on the basis of more detailed data coverage as compared to previous mapping studies.

Introduction

The Blackstone River flows 46 mi from its headwaters near Worcester, Massachusetts, the third largest city in New England, to the head of Narragansett Bay at Providence, Rhode Island, the second largest city in New England. About 126,600 people live in the Rhode Island part of the Blackstone River Basin (U.S. Census Bureau, 2000), and the population increased about 3.4 percent from 1990 to 2000. In addition to population growth, water transfers out of the basin, commercial and industrial growth, and changing land-use patterns have led to greater water use and stress on the water resources of the basin (Barlow, 2003). Ground water is an important source of water supply in the Rhode Island part of the Blackstone River Basin, providing about 7.7 Mgal/d, or 28 percent of total water use (Barlow, 2003). The U.S. Geological Survey (USGS), in cooperation with the Rhode Island Water Resources Board (RIWRB), is studying ground-water availability in the basin to help prepare for future population growth and increased water demand. This report focuses on the ground-water resources of the Blackstone River Basin in Rhode Island with a compilation and analysis of aquifer transmissivity and ground-water-level data. The results of this study can be used in developing water-resource management plans.

Purpose and Scope

This report presents an analysis of ground-water resources in the Rhode Island portion of the Blackstone River Basin. Spatial and temporal trends in ground-water levels, expressed as the altitude of the water table above the National Geodetic Vertical Datum (NGVD) of 1929, are analyzed and mapped. Available transmissivity data are used to compile a contour map that updates previous maps (Johnston and Dickerman, 1974a,b) and presents a broader regional view of transmissivity of the sand and gravel aquifer.

Previous Investigations

Water use and availability in the lower Blackstone River Basin, including the parts of the basin in both Rhode Island and Massachusetts, were documented by Barlow (2003). Ground water is withdrawn for private use and public water-supply use within the basin. An average of 2.12 Mgal/d of ground water was withdrawn for public supplies in the Rhode Island part of the Blackstone River Basin in 1995–1999 (Barlow, 2003, table 4). An additional 2.14 Mgal/d of ground water is estimated to supply private use, both domestic and commercial (Barlow, 2003, table 5, subtracting known surface water withdrawals). In 2003–2004, parts of the basin experienced low-flow conditions, with streamflow periodically dropping below the Aquatic Base Flow standard (ABF) (U.S. Fish and Wildlife Service, 1981). Withdrawals at wells have been shown to deplete streamflow, exacerbating effects on aquatic habitat during periods of low streamflow (Barlow, 2003).

Previous investigations have examined ground-water resources in part of the Blackstone River Basin in Rhode

Island. Johnston and Dickerman examined ground-water availability and quality in the Branch River subbasin (1974a) and the eastern part of the Blackstone River Basin (1974b). Information from those reports was used in this study, in addition to information from the USGS Ground-Water Site Inventory (GWSI) database in the National Water Information System (*http://waterdata.usgs.gov/nwis/*), and unpublished well logs recorded by private drilling companies and by the USGS.

Description of the Study Area

The study area is the Blackstone River Basin in Rhode Island (fig. 1 and plate 1), which has a drainage area of 140 mi^2; the entire Blackstone River Basin has a drainage area of 474 mi^2 in Rhode Island and Massachusetts. Nine towns are in the Rhode Island part of the basin: Burrillville, Central Falls, Cumberland, Glocester, Lincoln, North Smithfield, Pawtucket, Smithfield, and Woonsocket (fig. 1). Land-surface altitudes in the Rhode Island part of the basin range from sea level at the outlet of the basin to 804 ft in the southwestern part of the basin. Topography is dominated by narrow river valleys bordered by relatively steep hills. The Blackstone River was once known as the "hardest working river in America," a reference to the many dams powering mills along the river.

The largest tributary to the Blackstone River in Rhode Island is the Branch River, which is formed by the confluence of the Clear River and the Chepachet River in the town of Burrillville. The Branch River has a drainage area of 91 mi^2, or 65 percent of the Blackstone River Basin in Rhode Island. The Branch River joins the Blackstone River in the northeastern corner of North Smithfield, about 1 mi upstream from Woonsocket. The only other major tributary to the Blackstone River with drainage area in Rhode Island is Abbot Run, which joins the Blackstone River at the border between Cumberland and Central Falls, less than 2 mi upstream from the Seekonk River. Abbott Run has a drainage area of 28 mi^2, or 20 percent of the Blackstone River Basin in Rhode Island.

Land Use and Water Use

Land in the basin is mostly forested (53 percent), with the remainder composed of residential areas (19 percent), water/wetlands (14 percent), urban/industrial areas (9 percent), and agricultural lands (5 percent). Geospatial data describing land use, surface geology, and surface-water occurrence were compiled for this study.

All of the towns in the basin are at least partly supplied with water from public water-supply authorities. Water is withdrawn from a few surface-water reservoirs and from ground-water wells throughout the basin to meet water demands. Although the sand and gravel aquifer is the source of most ground-water supplies, till and bedrock deposits do supply ground water to numerous private wells. Barlow (2003) reported that surface-water and ground-water withdrawals in the Rhode Island part of the Blackstone River Basin averaged 27.7 Mgal/d during 1995–1999, with ground-water withdrawals constituting 7.7 Mgal/d or 28 percent of the total.

Hydrogeology

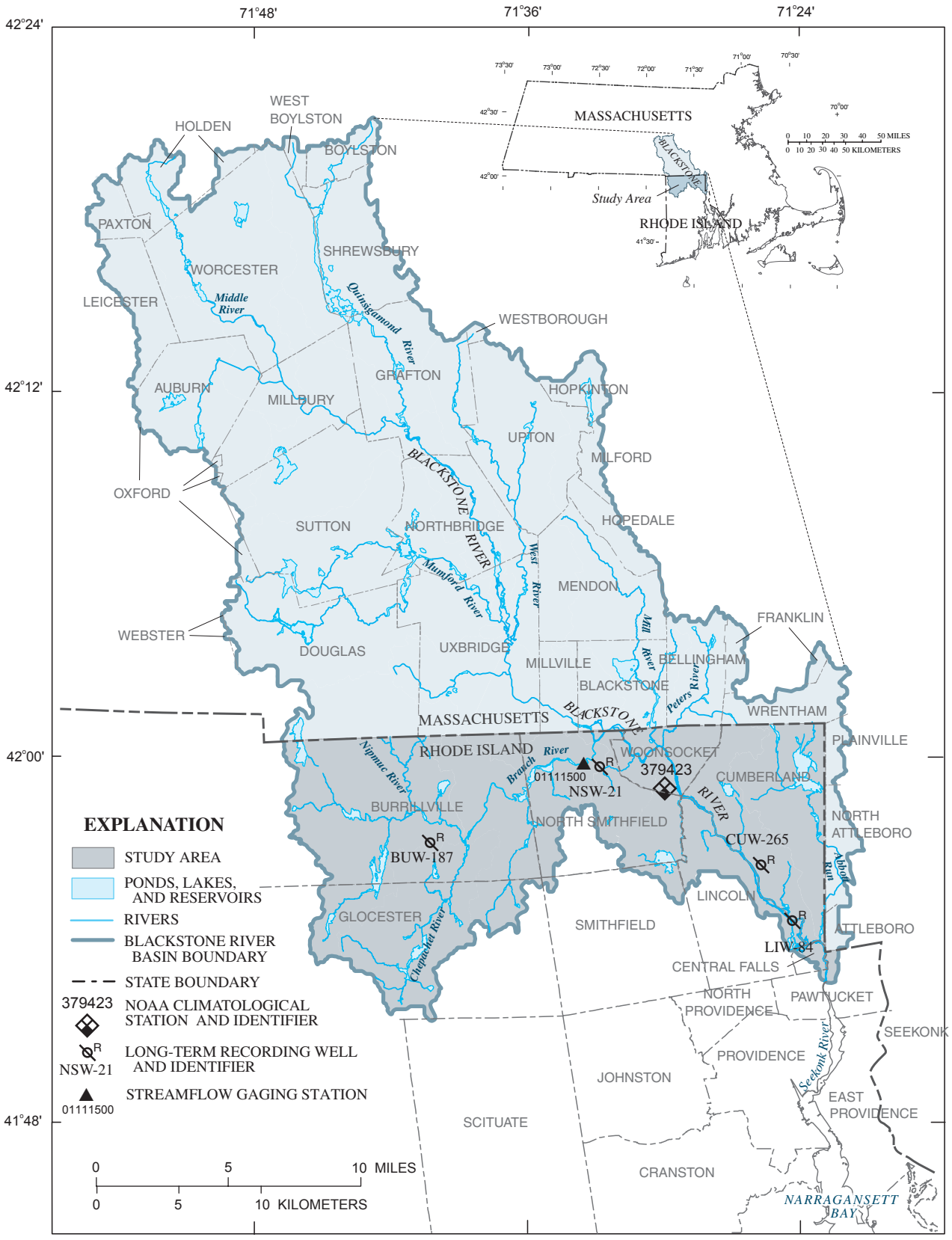
Unconsolidated stratified glacial deposits underlie 30 percent of the Blackstone River Basin in Rhode Island; the remainder of the basin has exposed bedrock (2 percent), till (64 percent), or open water (4 percent) at the land surface. The irregularly shaped valleys are filled with stratified glacial deposits ranging in grain size from clay to gravel. Coarse-grained sand and gravel form the primary aquifer deposits, which are thin, discontinuous, and unconfined (plate 1).

Due to high aquifer permeability and short ground-water travel distances to streams, typically less than 3,000 ft, water withdrawals from the sand and gravel aquifer can cause relatively rapid flow reductions in nearby streams. Although the sand and gravel aquifer is the principal source of ground-water supplies, small withdrawals also are made from wells in till and bedrock areas, generally from private wells supplying a single home or business.

The RIWRB has published a map of ground-water reservoirs, which are the parts of the state's sand and gravel aquifers that have the greatest potential for supplying ground water, a saturated thickness of 40 ft or greater, and a transmissivity of 4,000 ft^2/d or greater (Rhode Island Statewide Planning Program,1979; Rhode Island Department of Environmental Management, 1991).

Precipitation

Precipitation in the basin increased from 1949 to 2003, but averaged 46 in/yr, based on records at the National Oceanographic and Atmospheric Administration (NOAA) climatological station 379423 in Woonsocket, Rhode Island (fig. 1). Evapotranspiration (ET) can be estimated from streamflow records for the Branch River streamflow-gaging station at Forestdale, R.I. (USGS station 01111500), which represents 91 mi^2, the largest unregulated part of the Blackstone River Basin in Rhode Island. Streamflow at the Forestdale, R.I. station averages 25.9 in/yr based on mean annual streamflow from 1941 through 2003. If the difference between precipitation and streamflow is assumed to be lost to ET, then ET equals 20.1 in/yr, or 44 percent of precipitation, for the Branch River Basin. Recharge to the aquifer in the Branch River Basin is 19.0 in/yr, or 41 percent of precipitation, based on a hydrograph separation estimate of base flow at the Forestdale station from 1941 to 2003.



Base from the National Resource Conservation Service
12-digit HUC base map, 1:24,000, 2001
Projection: Rhode Island State Plane
1983 North American datum

Figure 1. Blackstone River Basin and study area, northern Rhode Island.

Data Compilation

For this study, hydrogeologic data were compiled from previously published studies. A comprehensive literature search was conducted to find hydraulic conductivity, aquifer thickness, and ground-water-level data. The data were then formatted and organized in a database for ease of access and analysis. The Appendix contains the hydrogeologic data on which the mapping and analysis were based.

Ground-Water Levels

A contour map of the altitude of the water table in the sand and gravel aquifer was constructed on the basis of 726 water-level measurements made in wells (plate 1). The water levels were measured from 1900 to 2003 at various times of the year. In cases where water levels were measured more than once at a single well, the measurements were averaged.

Because the water table is close to the land surface throughout the Blackstone River Basin and the aquifer is unconfined, it is assumed that ground water is hydraulically connected to surface water. Therefore, altitudes of surface-water bodies such as streams, ponds, and reservoirs were used to map the altitude of the water table. The altitudes of surface-water bodies and stream reaches were estimated from geospatial data obtained from the Rhode Island Geographic Information System (RIGIS). Altitudes at 15,815 surface-water points were obtained in this manner and used to contour the water-table altitude.

Long-term, detailed, water-level records were compiled for four observation wells (RI-LIW-84, RI-CUW-265, RI-NSW-21, and RI-BUW-187) screened in the stratified glacial deposits (fig. 1). Periodic water-level measurements from the 1940s through 2003, obtained from the GWSI database, were used to develop time series of water-table altitudes for these wells (fig. 2).

Transmissivity

Transmissivity (T) is a variable that expresses the ability of an aquifer to transmit water and indicates the suitability of an aquifer as a water-supply source. For this study, transmissivity values were determined by estimating saturated thickness (b) and hydraulic conductivity (K) from information in drilling logs. Drilling log records were obtained from previously published reports (Johnston and Dickerman, 1974a,b,c), from the GWSI database, and from unpublished water-well logs on file at the USGS Massachusetts-Rhode Island Water Science Center. The drilling logs contained 69 different descriptions of soil class/lithology. Each described lithology was placed in one of six categories and assigned a K value (table 1) based on earlier studies (Dickerman and Bell, 1993; Dickerman and others, 1990; Dickerman and others, 1997; Johnston and Dickerman, 1974a,b; Rosenshein and others, 1968). Silt, clay, till, and bedrock were assumed to have very low K of less than 10^{-4} ft/d and were assigned a value of zero when calculating transmissivity. Observed saturated intervals were recorded and T values were calculated using equation 1 below. In cases in which drilling logs did not indicate a water level, a transmissivity value was calculated using a water-table altitude estimated from the contours shown on plate 1.

$$T = \sum_{i=1}^{n} b_i K_i \qquad (1)$$

where n = number of lithologic units,
i = lithologic unit indicator,
b_i = saturated thickness of unit *i,* and
K_i = hydraulic conductivity of unit *i.*

Equation 1 sums up the contribution to aquifer transmissivity from each permeable layer encountered when drilling a well. Values from 533 wells in the basin were used to construct a map of transmissivity of the sand and gravel aquifer. Transmissivity values greater than 50 ft^2/d are plotted on plate 2. Forty-eight percent of the transmissivity values were based on data from the Johnston and Dickerman studies (1974a,b,c).

Table 1. Lithologic categories and assigned hydraulic conductivity values in the Blackstone River Basin, northern Rhode Island.

[<, less than]

Lithologic category	Hydraulic conductivity, in feet per day
Silt, clay, till, and bedrock	$<10^{-4}$
Silty sand	10
Fine to medium sand	50
Medium to coarse sand	100
Sand and gravel	200
Coarse gravel	400

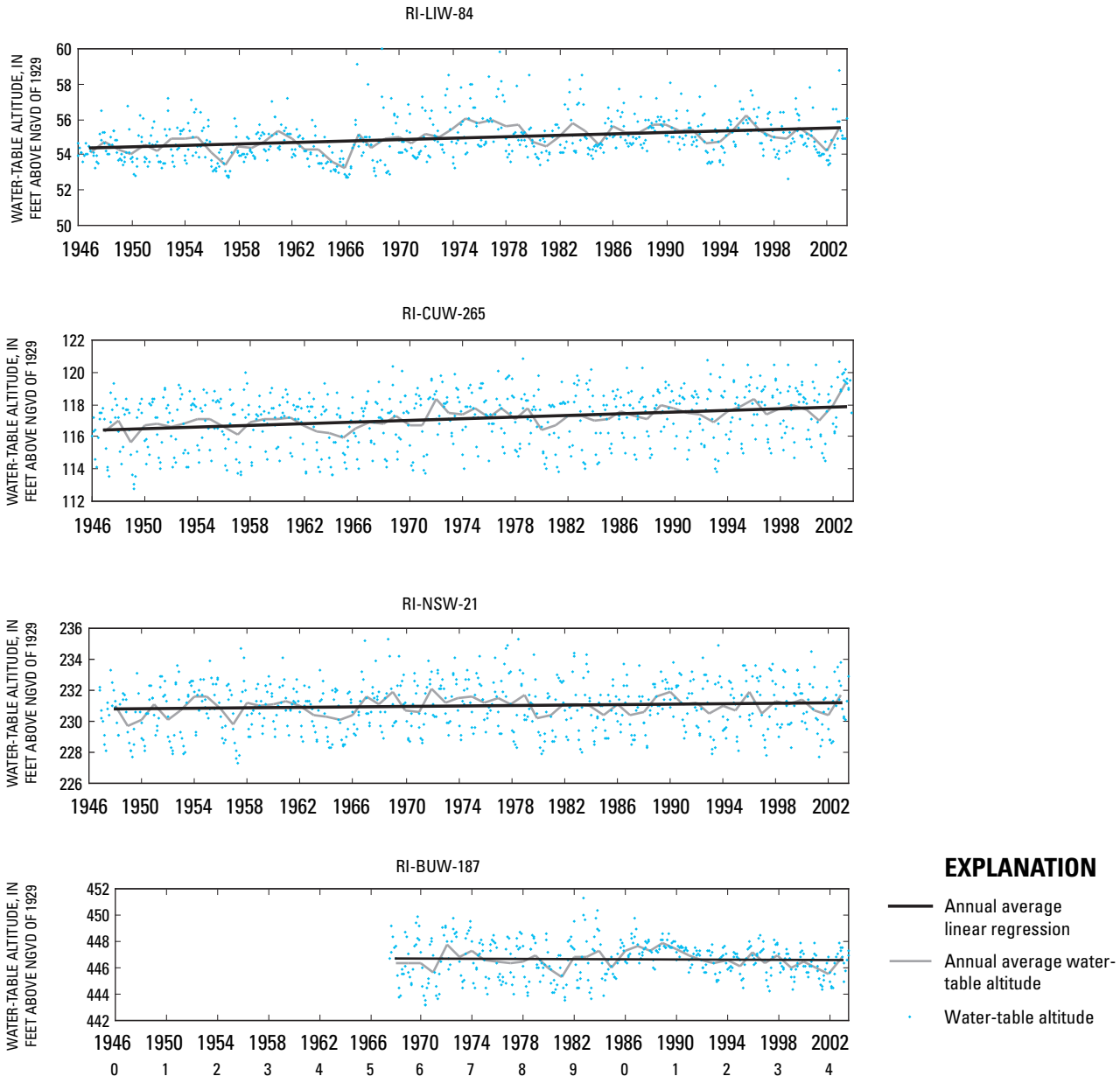


Figure 2. Water-table altitudes for the 1940s through 2003 in wells RI-LIW-84, RI-CUW-265, RI-NSW-21, and RI-BUW-187, Blackstone River Basin, northern Rhode Island.

Ground-Water Levels and Transmissivity in the Blackstone River Basin in Northern Rhode Island

The water-level and transmissivity data were analyzed for spatial and temporal trends. The findings are discussed below with emphasis on their relation to water-supply availability.

Ground-Water Levels

The water level at any point in an aquifer can change over time. Periodic changes in ground-water levels occur in response to seasonal variations in precipitation and evapotranspiration. Other factors that can affect ground-water levels include changes in land use, ground-water and surface-water withdrawals, and wastewater disposal.

Changes in water levels in long-term observation well RI-NSW-21 give an example of typical seasonal patterns (fig. 3) for the period 1947 to 2003. Water levels in the aquifer are lowest during the late summer and early fall and highest during the early spring. Well RI-NSW-21 has an annual average water-level fluctuation of 3.6 ft, which is typical of wells in stratified glacial deposits.

Spatial Patterns

Water levels in the sand and gravel aquifer are higher in the western part of the study area where land-surface altitudes also are high. The highest ground-water levels in the study area, more than 700 ft above NGVD 1929, are near Burlingame Reservoir in the town of Glocester. The lowest ground-water levels, less than 100 ft above NGVD 1929, are near Central Falls, where the Blackstone River empties into the Seekonk River.

Water-table altitudes are affected by altitudes of nearby streams. Local patterns show that water-table altitudes decrease as ground water moves from ridge tops to valley bottoms. Near streams and lakes, water-table altitudes are nearly the same as surface-water altitudes.

Long-Term Trends

Water-table altitudes have risen in the study area from the 1940s through 2003; three of the four long-term observation wells in the basin show increasing altitudes and the fourth shows no trend (fig. 2). Annual average altitudes in wells CUW-265, LIW-84, and NSW-21 rose from the 1940s to 2003 by 1.1, 1.4, and 0.4 ft, respectively, whereas the altitude in BUW-187 declined 0.1 ft between 1968 and 2003. Well NSW-

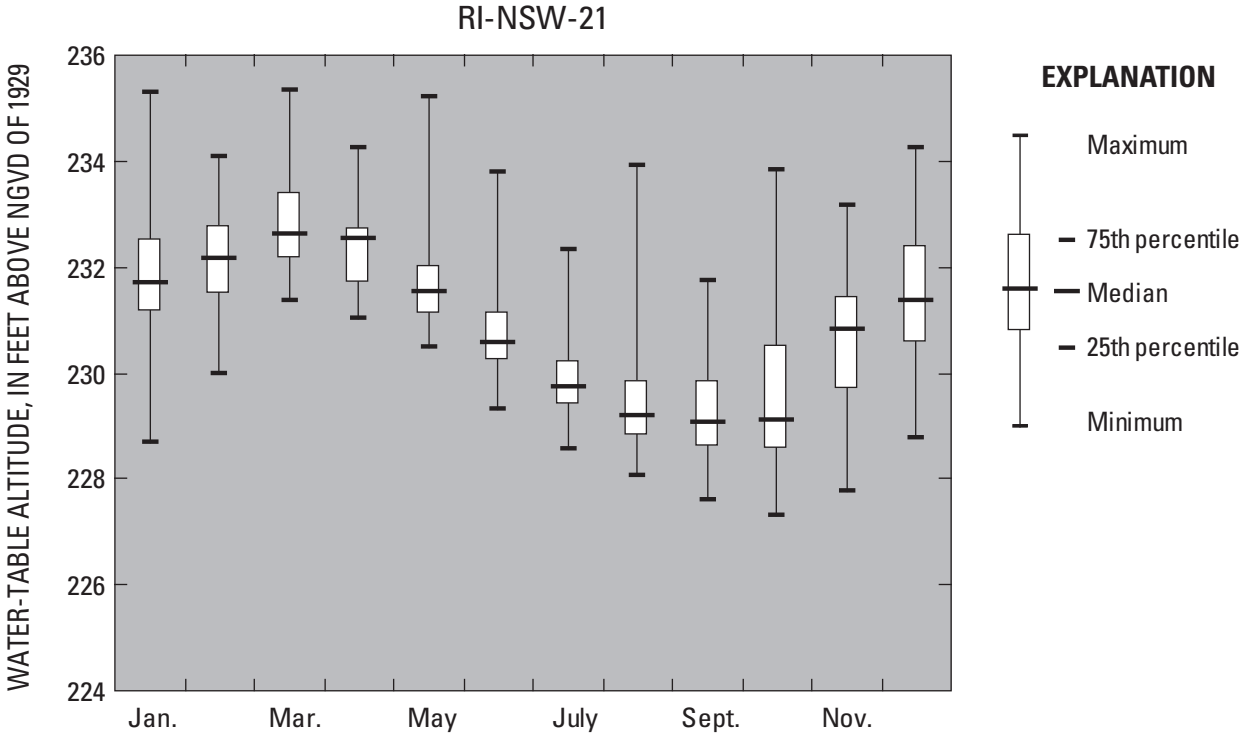


Figure 3. Seasonal changes in the altitude of the water table in North Smithfield well 21 (RI-NSW-21) for the 1940s through 2003, Blackstone River Basin, northern Rhode Island. Well location shown on figure 1 and plate 1.

21 is reported to have been affected by pumping for domestic water supplies from 1947 to 1980 (Socolow and others, 2005).

Data describing land-use change, water withdrawals, evapotranspiration, and wastewater disposal during the past 60 years are insufficient to determine how these factors affected the altitude of the water table. A likely explanation for rising water-table altitudes is the precipitation increase in the Rhode Island part of the Blackstone River Basin (fig. 4). At climatological station 379423 in Woonsocket, R.I., the only long-term station in the basin, annual precipitation increased by about 11 in. from 1949 to 2003 (fig. 4) on the basis of a linear-trend fit to annual precipitation data (National Climate Data Center, 2003). Other stations within 20 mi of the basin also show increased annual precipitation. Station 376698 in Providence, R.I., showed a change of +1.2 in. from 1949 to 2001; station 198367 in Taunton, Mass., showed a change of +7.8 in. from 1949 to 1993; and station 199316 in West Medway, Mass., showed a change of +7.6 in. from 1957 to 2000, based on linear-trend fits to annual precipitation data (National Climate Data Center, 2003). These long-term increases in Blackstone River Basin precipitation are further supported by streamflow records from 1929 to 2000 for the Blackstone River at the Woonsocket, R.I., (USGS station 01112500), which show an increase in streamflow of about 18 percent (Robinson and others, 2003).

The annual precipitation increase of about 11 in. recorded at Woonsocket would be expected to raise the ground-water level in the unconfined aquifers of the basin. A rough estimate of the expected ground-water-level rise caused by an increase in recharge can be obtained from a modification of the solution to Forchheimer's equation (Bear, 1972, eq. 8.2.26):

$$m' = N'L^2/8Kh_0 \quad (2)$$

where m' = change in ground-water level at ground-water divide (L),
N' = change in recharge rate (L/T),
L = distance between drainages (L),
K = hydraulic conductivity (L/T), and
h_0 = height of drainage stage above the bottom of the aquifer (L).

Substituting $N' = 0.92$ ft/yr (under the assumption that all additional precipitation goes to recharge), $L = 2{,}430$ ft (an estimate of average distance between drainage streams obtained by dividing the basin area by 1.361×10^{10} mi, the total length of stream centerlines in the study area), $K = 100$ ft/d (an estimate of average hydraulic conductivity based on the transmissivity data discussed above), and $h_0 = 40$ ft (an estimate of aquifer thickness below streams) yields

$$m' = 0.5 \text{ ft.} \quad (3)$$

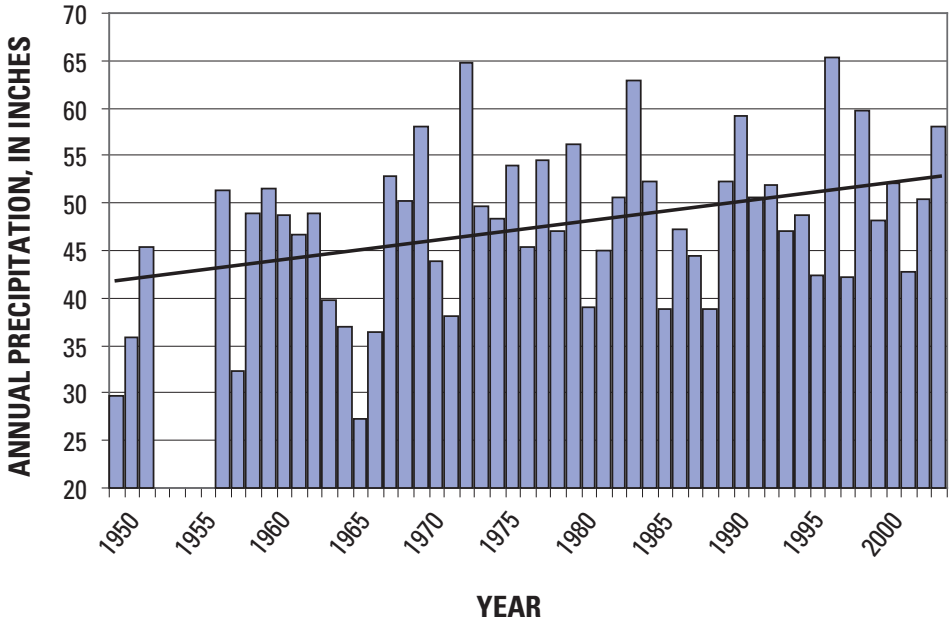


Figure 4. Annual precipitation at climatological station 379423 in Woonsocket, Rhode Island for 1949–2003. Straight line is the linear regression line. Location of station shown on figure 1 and plate 1.

Equation 2 produces a calculated ground-water-level rise of 0.5 ft, which would occur halfway between two drainages (streams). Moving from a ground-water-level high toward a drainage, the ground-water-level rise would lessen and be zero at the drainage. The calculated rise of 0–0.5 ft accounts for a part of the observed ground-water-level rises of 0 to 1.4 ft. So the observed ground-water-level rise is likely due in part to increased precipitation, but other factors are also probably contributing. More detailed study would be needed to confirm this hypothesis.

Uncertainty in Water Levels

Water levels were contoured for stratified glacial deposits in the study area (plate 1). Contours were initially produced with an automated routine and then checked and manually modified. Uncertainty in the water-table altitudes shown on the plate is due to the varied timing of the measurements, measurement errors, variations in water-table altitude with well depth, changes caused by pumping, and interpolation errors. Because water levels have risen over time, older measurements will tend to underestimate the current levels. Measurements were made during different seasons of the year, which adds further variability. The variation of water levels over time at one location is illustrated by measurements at well RI-NSW 21. Based on 685 water-level measurements taken from the 1940s through 2003 (fig. 3), the difference between maximum and minimum individual values is 8.0 ft and the difference between maximum and minimum monthly mean values (March–September) is 3.7 ft.

Further assessment of uncertainty can be made by comparing water levels measured in closely spaced wells. There are 298 pairs of water-level measurements made at varying times in wells less than 100 ft apart horizontally. Levels measured less than 100 ft apart horizontally in the same aquifer are expected to agree quite closely, for example with a difference of less than 3 ft, unless there is nearby ground-water pumping, the wells are in steep terrain, or the wells are screened at different depths. For each of the 298 well pairs, water levels were subtracted from each other, yielding 298 differences. The average water-level difference is 15.5 ft and the standard deviation is 24.7 ft. Using these differences as an indication of uncertainty in water levels suggests that the actual level can be expected to vary from the mapped level, at any point, by 15 ft (plate 1).

Movement of Ground Water

Ground water in the study area flows towards major streams and rivers, which occupy regional topographic lows. The direction of ground-water flow, inferred from the contours of the altitude of the water table, is indicated by black arrows on plate 1. Ground water generally discharges to streams, ponds, and wetlands unless flowing to a pumped well. Exceptions to this pattern may be found locally where a stream crosses a transition to more permeable aquifer sediments, causing the stream to lose water to the aquifer and ground water to flow away from the stream. No such transitions are seen on plate 1, in part because the spatial scale is too coarse to show such local effects.

Transmissivity

For a given aquifer thickness, transmissivity is controlled by lithology. Sand and gravel deposits generally have higher transmissivity than fine-grained stratified glacial deposits, till deposits, or bedrock. Estimated transmissivity values in the study area range from near zero to more than 25,000 ft^2/d. Of the total of 553 transmissivity values, 152 (28 percent) are less than 50 ft^2/d. Transmissivity values less than 50 ft^2/d are mainly in areas where bedrock or till is at the land surface. Statistics for the 390 transmissivity values in the sand and gravel aquifer are shown in table 2.

Table 2. Descriptive statistics for transmissivity values in the sand and gravel aquifer, Blackstone River Basin, northern Rhode Island.

[<, less than]

Statistic	Transmissivity, in feet squared per day
Count	390
Mean	4,420
Minimum	<50
10^{th} percentile	200
25^{th} percentile	1,000
Median	2,990
75^{th} percentile	6,690
90^{th} percentile	10,980
Maximum	22,650

Transmissivity values greater than approximately 1,400 ft^2/d "represent good aquifers for water well exploitation" (Freeze and Cherry, 1979, p. 60). Of the 357 transmissivity values in the sand and gravel aquifer greater than 50 ft^2/d, 74 percent of the values are greater than 1,400 ft^2/d.

Spatial patterns of transmissivity are predominately controlled by the thickness of stratified glacial deposits. The greatest transmissivity values are seen in the valleys of the Branch, Chepachet, Nipmuc, and Blackstone Rivers, where deep sand and gravel deposits are found (plate 2) and where wells may induce infiltration from surface-water bodies. Transmissivity values greater than 10,000 ft^2/d are seen in every town in the study area except Smithfield, within which no transmissivity measurements were made within the study area, and which has very little area with stratified glacial deposits. Based on the contours on plate 2, the stratified glacial deposits in about 22 mi^2, or 16 percent of the study area, have transmissivity values greater than 1,000 ft^2/d.

Although plates 1 and 2 do not show contours of water-table altitude or transmissivity in areas of till and bedrock, ground water is present in these areas. Areas of till and bedrock generally have lower transmissivity values and well yields, but some water-supply wells are located in these areas to serve small communities, small businesses, or private households. This study does not include an analysis of till and bedrock areas and should not be used to infer transmissivity values or ground-water levels for such areas.

Because the transmissivity map in this study is based on most of the same data used by Johnston and Dickerman (1974a,b) to construct their transmissivity maps, there are many similarities between the maps. Of the 533 transmissivity values used to construct plate 2, 48 percent, or 256 values, were also used by Johnston and Dickerman. Differences between plate 2 and the 1974 maps include the display of transmissivity point data, display of the entire Rhode Island part of the Blackstone River Basin, and modified transmissivity contours in those areas where additional transmissivity data were available. Areas of high transmissivity (greater than 5,000 ft^2/d) on plate 2 differ somewhat from the ground-water reservoirs identified by the state of Rhode Island (Rhode Island Statewide Planning Program,1979; Rhode Island Department of Environmental Management, 1991). Along the Blackstone River in the southern part of Cumberland and in the Chepachet River valley, the new map shows less extensive areas of high transmissivity. In other parts of the basin, such as near the Pascoag and Wilson Reservoirs, the areas of high transmissivity are more extensive than the previously mapped ground-water reservoirs.

Summary

This study of ground-water resources in the Rhode Island portion of the Blackstone River Basin was performed in cooperation with the Rhode Island Water Resources Board. Spatial and temporal trends in ground-water levels are presented, and transmissivity data are compiled into a contour map that presents a more regional view of aquifer transmissivity than do previous maps.

Ground-water levels rose in the study area from 1947 to 2003. Water levels are known to decline locally near pumping wells, but these declines are limited in areal extent by the narrow geometry of the sand and gravel aquifers and the proximity of surface water to most wells in the study area. The measured increase in precipitation rate, about 11 inches per year from 1949 to 2003 in Woonsocket, R.I., is likely a contributor to the observed water-level increases. Data from four wells with long-term water-level records have good temporal detail, but because long-term data are available from only a small number of wells in the study area, it is not known if water levels have risen throughout the watershed.

Transmissivity is greatest in areas of thick sand and gravel deposits, which typically occur in stream valley bottoms. Some high-transmissivity wells are seen in areas not previously identified by the state of Rhode Island as ground-water reservoirs. Other areas show lower transmissivity than the previously mapped ground-water reservoirs. The contours in plate 2 and wells listed in the Appendix give more detailed and more accessible information about transmissivity than has previously been available for the Blackstone River Basin in Rhode Island.

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Glossary

aquifer An underground formation of earth, sand, gravel, or porous stone that yields significant quantities of water to wells or springs.

base flow The water in streams and rivers that has come from ground-water discharge. During periods of little or no precipitation, typically all the water in a stream is base flow.

confined aquifer An aquifer that is covered by a layer of impermeable material, such as rock or clay, so that the water level in a well rises above the top of the aquifer.

evapotranspiration The movement of water from the land surface to the atmosphere. The word is formed by combining "evaporation," meaning the conversion of water from fluid to vapor, and "transpiration," meaning the release of water vapor to the atmosphere by plants.

transmissivity A measure of the ability of an aquifer to transmit water; indicates the suitability of an aquifer as a water source. Units are length squared/time, for instance feet squared per day.

unconfined aquifer An aquifer not covered by an impermeable layer in which the water table forms the upper boundary. At the water table the pressure of the water equals the pressure of the atmosphere.

unconsolidated Refers to loose materials such as sand, gravel, and clay that are not cemented together, as opposed to solid rock.

Appendix. Hydrogeologic Data for the Blackstone River Basin, Northern Rhode Island

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.

[ft, feet; ft^2/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft^2/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
BLW 069	no	435	Jul-49	12	—	50	—	202	Upper Branch Project Book, R.I. Office
BUW 001	yes	453	Jun-42	14	—	28	—	273	Upper Branch Project Book, R.I. Office
BUW 002	yes	453	Jun-42	9	—	45	—	285	Upper Branch Project Book, R.I. Office
BUW 003	yes	448	Apr-44	15	—	40	—	387	Upper Branch Project Book, R.I. Office
BUW 004	yes	385	Sep-44	10	1,500	40	—	40	Upper Branch Project Book, R.I. Office
BUW 005	yes	375	Sep-44	10	2,350	57	—	57	Upper Branch Project Book, R.I. Office
BUW 006	yes	370	Sep-44	10	3,700	28	—	28	Upper Branch Project Book, R.I. Office
BUW 007	yes	375	Sep-44	9.4	16,240	—	—	50	Upper Branch Project Book, R.I. Office
BUW 009	yes	375	Oct-44	8.4	10,980	—	—	46.4	Upper Branch Project Book and GWSI
BUW 011	yes	368	Oct-46	10	7,300	50	—	50	Upper Branch Project Book, R.I. Office
BUW 014	yes	375	Oct-46	6.5	5,700	—	—	55	Upper Branch Project Book, R.I. Office
BUW 015	yes	375	Nov-46	6.2	1,940	—	—	55	Upper Branch Project Book, R.I. Office
BUW 016	yes	375	Nov-46	6.5	8,350	—	—	51	Upper Branch Project Book, R.I. Office
BUW 018	yes	380	Mar-47	2	15,600	—	—	41	Upper Branch Project Book, R.I. Office
BUW 021	no	393.58	Jun-47	8.9	<50	—	—	15	USGS Well Schedule, R.I. Office and GWSI
BUW 022	no	345	—	20.00	<50	2.0	—	185.0	USGS Well Schedule, R.I. Office
BUW 023	no	385	Oct-45	15.00	<50	6.0	—	112.0	USGS Well Schedule, R.I. Office
BUW 024	no	330	—	28.00	<50	4.0	—	170.0	USGS Well Schedule, R.I. Office
BUW 025	no	388	Oct-43	18.00	<50	15.0	—	170.0	USGS Well Schedule, R.I. Office
BUW 026	yes	278	Jun-47	0.00	2,800	14.0	—	290.0	USGS Well Schedule, R.I. Office
BUW 027	yes	285	—	—	1,200	6.0	—	250.0	USGS Well Schedule, R.I. Office
BUW 030	no	365	Jun-47	10.00	1,800	—	—	28.0	USGS Well Schedule, R.I. Office

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft^2/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft^2/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
BUW 032	no	450	Jun-47	7.00	<50	—	—	21.0	USGS Well Schedule, R.I. Office
BUW 033	no	447	Jun-47	6.45	<50	—	—	13.0	USGS Well Schedule, R.I. Office
BUW 034	yes	370	Jul-47	13.04	<50	—	—	11.3	USGS Well Schedule, R.I. Office
BUW 036	no	400	Jun-47	15.00	<50	—	—	18.0	USGS Well Schedule, R.I. Office
BUW 037	yes	322	Nov-47	12.98	604	16.0	—	57.0	USGS Well Schedule, R.I. Office
BUW 038	no	390	Apr-05	18.00	<50	54.0	—	160.0	USGS Well Schedule, R.I. Office
BUW 039	no	430	May-45	8.00	<50	5.0	—	200.0	USGS Well Schedule, R.I. Office
BUW 040	yes	340	Apr-05	15.00	<50	6.0	—	500.0	USGS Well Schedule, R.I. Office
BUW 041	no	372	Jun-47	4.72	<50	—	—	7.0	USGS Well Schedule, R.I. Office
BUW 042	no	372	Jun-47	5.16	<50	5.5	—	5.5	USGS Well Schedule, R.I. Office
BUW 043	no	394	Jun-47	5.90	<50	—	—	14.0	USGS Well Schedule, R.I. Office
BUW 044	no	391	Jun-47	11.54	<50	—	—	11.5	USGS Well Schedule, R.I. Office
BUW 045	yes	284	Jun-47	10.74	<50	9.5	—	9.5	USGS Well Schedule, R.I. Office
BUW 047	yes	275	—	—	2,800	14.0	—	150.0	Upper Branch Project Book, R.I. Office
BUW 048	yes	260	Jun-47	5.00	1,200	—	—	11.0	Upper Branch Project Book, R.I. Office
BUW 049	yes	270	Apr-05	5.00	11,000	60.0	—	200.0	Upper Branch Project Book, R.I. Office
BUW 050	yes	265	Jun-42	20.00	500	—	—	25.0	Upper Branch Project Book, R.I. Office
BUW 052	yes	390	Jun-47	22.00	<50	—	—	30.0	USGS Well Schedule, R.I. Office
BUW 053	no	412	Jun-47	5.77	<50	—	—	10.5	USGS Well Schedule, R.I. Office
BUW 054	yes	280	Oct-67	15	220	—	—	16.1	Upper Branch Project Book and GWSI
BUW 055	no	376	Jun-47	15.80	<50	—	—	17.5	USGS Well Schedule, R.I. Office
BUW 056	no	393	Jun-47	13.02	<50	—	—	20.2	USGS Well Schedule, R.I. Office

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft²/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft²/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
BUW 057	yes	380	Jun-47	10.90	<50	—	—	9.3	USGS Well Schedule, R.I. Office
BUW 059	yes	372	Jun-47	14.96	<50	13.6	—	13.6	USGS Well Schedule, R.I. Office
BUW 062	yes	327	Jun-47	20.00	1,400	27.0	—	135.0	Upper Branch Project Book, R.I. Office
BUW 063	no	375	Jun-47	13.50	<50	15.0	—	15.0	USGS Well Schedule, R.I. Office
BUW 066	yes	327	Jul-40	1.5	—	—	—	50	USGS Well Schedule, R.I. Office
BUW 069	yes	330	—	—	10,000	50	—	202	Upper Branch Project Book and GWSI
BUW 072	yes	320	Sep-49	18.4	—	—	—	21.5	USGS Well Schedule, R.I. Office
BUW 076	no	532	Sep-10	24	—	20	—	206	USGS Well Schedule, R.I. Office
BUW 079	yes	365	Sep-49	46	—	125	—	165	USGS Well Schedule, R.I. Office
BUW 081	no	608	May-55	2.52	—	—	—	8.7	Upper Branch Project Book, R.I. Office
BUW 082	no	591	May-55	13.80	—	—	—	18.4	Upper Branch Project Book, R.I. Office
BUW 083	no	592	Sep-52	18	—	47	—	120	Upper Branch Project Book, R.I. Office
BUW 084	no	578	Jan-54	12	—	50	—	100	Upper Branch Project Book, R.I. Office
BUW 085	no	705	Jan-25	20	—	—	—	500	Upper Branch Project Book, R.I. Office
BUW 086	yes	418	Oct-60	6.56	—	—	—	12.1	Upper Branch Project Book, R.I. Office
BUW 087	yes	425	Oct-60	12.4	—	—	—	28.2	Upper Branch Project Book, R.I. Office
BUW 088	yes	425	Oct-60	5.9	—	—	—	12.5	Upper Branch Project Book, R.I. Office
BUW 089	yes	432	Oct-60	9.16	—	—	—	15.4	Upper Branch Project Book, R.I. Office
BUW 090	yes	425	Oct-60	5.35	—	—	—	10.3	Upper Branch Project Book, R.I. Office
BUW 091	no	435	Oct-60	7.39	—	12.2	—	12.4	Upper Branch Project Book, R.I. Office
BUW 092	no	452	Oct-60	10.38	—	11	—	17.4	Upper Branch Project Book, R.I. Office
BUW 093	no	430	Oct-60	4.1	—	9.6	—	9.6	Upper Branch Project Book, R.I. Office

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft²/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft²/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
BUW 094	yes	382	Oct-60	11.43	—	—	—	15.9	Upper Branch Project Book, R.I. Office
BUW 095	yes	368	Oct-60	5.28	—	—	—	9.3	Upper Branch Project Book, R.I. Office
BUW 096	yes	371	Oct-60	4.92	—	—	—	7.2	Upper Branch Project Book, R.I. Office
BUW 097	yes	428	Oct-60	13.69	—	—	—	19.9	Upper Branch Project Book, R.I. Office
BUW 098	no	385	Oct-60	9.46	—	15.3	—	15.3	Upper Branch Project Book, R.I. Office
BUW 099	yes	415	Oct-60	16.63	—	21.9	—	21.8	Upper Branch Project Book, R.I. Office
BUW 100	yes	402	Oct-60	10.77	—	—	—	14.7	Upper Branch Project Book, R.I. Office
BUW 101	yes	390	Oct-60	6.02	—	—	—	9.8	Upper Branch Project Book, R.I. Office
BUW 103	yes	392	Oct-60	20.74	—	24.4	—	24.4	Upper Branch Project Book, R.I. Office
BUW 105	yes	390	Oct-60	22.77	—	25.06	—	25.06	Upper Branch Project Book, R.I. Office
BUW 106	yes	398	Jan-47	28	—	42	—	130	Upper Branch Project Book, R.I. Office
BUW 107	yes	385	Oct-60	3.05	—	—	—	7.2	Upper Branch Project Book, R.I. Office
BUW 108	yes	405	Oct-64	7.79	—	14.3	—	144	Upper Branch Project Book, R.I. Office
BUW 111	yes	345	Oct-60	10.99	—	—	—	15.4	Upper Branch Project Book, R.I. Office
BUW 112	yes	350	Oct-60	6.25	—	—	—	10.5	Upper Branch Project Book, R.I. Office
BUW 113	yes	350	Oct-60	9.05	—	—	—	14.2	Upper Branch Project Book, R.I. Office
BUW 114	yes	352	Oct-60	18.47	—	—	—	22.9	Upper Branch Project Book, R.I. Office
BUW 115	yes	345	Oct-60	11.05	—	—	—	15	Upper Branch Project Book, R.I. Office
BUW 116	no	695	Nov-60	40.09	—	18	—	150	Upper Branch Project Book, R.I. Office
BUW 117	no	545	Nov-60	7.58	—	—	—	16.9	Upper Branch Project Book, R.I. Office
BUW 124	yes	580	Nov-60	11.27	1,466	18.6	—	18.6	Upper Branch Project Book and GWSI
BUW 125	yes	615	Mar-60	2.95	—	10.9	—	10.9	Upper Branch Project Book, R.I. Office

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft²/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft²/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
BUW 126	no	620	Nov-60	7.52	—	13.1	—	13	Upper Branch Project Book, R.I. Office
BUW 129	yes	460	Nov-60	4.33	—	—	—	13.8	Upper Branch Project Book, R.I. Office
BUW 130	yes	615	Nov-60	6.4	—	14.1	—	14.1	Upper Branch Project Book, R.I. Office
BUW 131	no	568	Jan-52	14	—	29	—	158	Upper Branch Project Book, R.I. Office
BUW 134	yes	450	Nov-60	2.99	—	—	—	16.8	Upper Branch Project Book, R.I. Office
BUW 137	no	480	Jan-55	18	—	19	—	145	Upper Branch Project Book, R.I. Office
BUW 138	yes	442	Nov-60	15.43	—	—	—	20.8	Upper Branch Project Book, R.I. Office
BUW 139	yes	448	Nov-60	10.45	—	13.4	—	13.4	Upper Branch Project Book, R.I. Office
BUW 142	yes	400	Nov-60	1.9	—	—	—	8.4	Upper Branch Project Book, R.I. Office
BUW 149	yes	327	Jul-58	4.7	3,565	34	—	295	Upper Branch Project Book, R.I. Office
BUW 153	no	390	May-61	0.58	—	—	—	9.1	Upper Branch Project Book, R.I. Office
BUW 154	yes	370	May-61	20.82	—	—	—	24.9	Upper Branch Project Book, R.I. Office
BUW 158	yes	313	May-61	3.85	—	—	—	6.9	Upper Branch Project Book, R.I. Office
BUW 159	yes	341	May-61	5.86	—	12.8	—	12.8	Upper Branch Project Book, R.I. Office
BUW 160	yes	330	May-61	6.22	—	—	—	10.5	Upper Branch Project Book, R.I. Office
BUW 162	yes	339	May-61	8.85	—	14.3	—	14.3	Upper Branch Project Book, R.I. Office
BUW 163	yes	341	May-61	9.40	—	—	—	24.2	Upper Branch Project Book, R.I. Office
BUW 166	yes	341	May-61	8.95	—	—	—	16.0	Upper Branch Project Book, R.I. Office
BUW 170	yes	299	May-61	8.53	—	—	—	13.0	Upper Branch Project Book, R.I. Office
BUW 172	yes	340	May-61	7.45	—	—	—	16.3	Upper Branch Project Book, R.I. Office
BUW 174	no	391	May-61	6.34	—	—	—	15.2	Upper Branch Project Book, R.I. Office
BUW 175	yes	312	May-61	13.42	—	21.0	—	21.0	Upper Branch Project Book, R.I. Office

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft²/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft²/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
BUW 177	no	351	May-61	2.07	—	—	—	12.4	Upper Branch Project Book, R.I. Office
BUW 178	no	398	May-61	2.85	—	—	—	12.1	Upper Branch Project Book, R.I. Office
BUW 183	yes	491	May-61	9.33	—	14.2	—	14.2	Upper Branch Project Book, R.I. Office
BUW 184	yes	455	May-61	14.17	—	—	—	21.3	Upper Branch Project Book, R.I. Office
BUW 185	yes	491	May-61	15.66	—	20.7	—	20.7	Upper Branch Project Book, R.I. Office
BUW 186	no	501	May-61	6.69	—	14.4	—	14.4	Upper Branch Project Book, R.I. Office
BUW 187	yes	462	May-61	13.35	—	19.8	—	19.8	Upper Branch Project Book, R.I. Office
BUW 188	yes	343	May-61	11.20	6,000	—	—	17.7	USGS Well Schedule, R.I. Office
BUW 189	no	512	May-61	6.56	<50	—	—	17.7	USGS Well Schedule, R.I. Office
BUW 190	no	401	May-61	6.06	788	—	—	10.0	USGS Well Schedule, R.I. Office
BUW 191	no	441	May-61	7.94	<50	—	—	14.9	USGS Well Schedule, R.I. Office
BUW 192	no	404	May-61	3.65	<50	—	—	17.8	USGS Well Schedule, R.I. Office
BUW 193	no	425	May-61	2.87	<50	—	—	8.6	USGS Well Schedule, R.I. Office
BUW 194	no	400	May-61	3.44	<50	—	—	11.5	USGS Well Schedule, R.I. Office
BUW 196	yes	330	May-05	21.00	<50	8.0	—	8.0	USGS Well Schedule, R.I. Office
BUW 197	yes	369	May-61	9.52	1,076	—	—	14.9	USGS Well Schedule, R.I. Office
BUW 198	yes	413	May-61	12.62	1,356	—	—	19.4	USGS Well Schedule, R.I. Office
BUW 200	no	506	May-05	5.00	<50	12.0	—	100.0	USGS Well Schedule, R.I. Office
BUW 201	no	500	May-05	38.00	<50	18.0	—	48.0	USGS Well Schedule, R.I. Office
BUW 203	no	479	May-61	6.86	<50	14.7	—	14.7	USGS Well Schedule, R.I. Office
BUW 204	yes	415	Dec-61	11.08	1,464	—	—	18.4	USGS Well Schedule, R.I. Office
BUW 205	yes	392	May-61	3.95	2,150	—	—	14.7	USGS Well Schedule, R.I. Office

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft²/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft²/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
BUW 206	yes	390	May-61	7.89	1,402	—	—	14.9	USGS Well Schedule, R.I. Office
BUW 207	yes	360	—	—	8,000	40.0	—	375.0	USGS Well Schedule, R.I. Office
BUW 208	yes	372	—	—	16,000	80.0	—	205.0	USGS Well Schedule, R.I. Office
BUW 209	yes	368	May-61	4.80	1,280	—	—	11.2	USGS Well Schedule, R.I. Office
BUW 210	yes	360	May-61	9.88	904	—	—	14.4	USGS Well Schedule, R.I. Office
BUW 211	no	528	May-05	6.00	<50	12.0	—	105.0	USGS Well Schedule, R.I. Office
BUW 212	no	535	May-61	12.69	<50	—	—	17.0	USGS Well Schedule, R.I. Office
BUW 213	yes	355	May-61	3.13	934	—	—	7.8	USGS Well Schedule, R.I. Office
BUW 214	yes	390	May-61	20.75	1,350	27.5	—	27.5	USGS Well Schedule, R.I. Office
BUW 215	yes	340	May-61	3.35	1,030	—	—	8.5	USGS Well Schedule, R.I. Office
BUW 216	yes	380	May-61	22.14	1,272	—	—	28.5	USGS Well Schedule, R.I. Office
BUW 217	yes	363	May-61	8.43	674	—	—	11.8	USGS Well Schedule, R.I. Office
BUW 218	no	352	Jun-61	5.16	<50	—	—	17.9	USGS Well Schedule, R.I. Office
BUW 221	no	375	May-61	7.38	<50	20.6	—	20.6	USGS Well Schedule, R.I. Office
BUW 222	yes	465	Apr-05	80	4,000	100	—	268	USGS Well Schedule, R.I. Office
BUW 223	yes	408	May-61	7.77	926	—	—	12.4	USGS Well Schedule, R.I. Office
BUW 224	yes	425	May-61	15.21	1,038	—	—	20.4	USGS Well Schedule, R.I. Office
BUW 225	yes	440	May-61	19.95	790	—	—	23.9	USGS Well Schedule, R.I. Office
BUW 226	no	495	May-61	6.06	<50	23.1	—	23.1	USGS Well Schedule, R.I. Office
BUW 228	yes	324	—	—	5,500	55.0	—	215.0	USGS Well Schedule, R.I. Office
BUW 229	no	462	—	—	2,500	30.0	—	90.0	USGS Well Schedule, R.I. Office
BUW 230	no	485	May-61	2.74	<50	—	—	18.4	USGS Well Schedule, R.I. Office

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft²/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft²/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
BUW 231	no	645	May-61	7.40	<50	17.0	—	17.0	USGS Well Schedule, R.I. Office
BUW 232	no	570	May-61	8.41	<50	13.9	—	13.9	USGS Well Schedule, R.I. Office
BUW 233	no	534	May-61	5.32	<50	24.0	—	24.0	USGS Well Schedule, R.I. Office
BUW 234	no	575	May-61	7.39	<50	19.4	—	19.4	USGS Well Schedule, R.I. Office
BUW 235	no	603	May-61	4.39	<50	—	—	13.1	USGS Well Schedule, R.I. Office
BUW 236	no	622	May-61	3.83	<50	19.8	—	19.8	USGS Well Schedule, R.I. Office
BUW 238	no	525	May-61	5.99	<50	13.8	—	13.8	USGS Well Schedule, R.I. Office
BUW 239	no	522	May-61	5.18	1,024	10.3	—	10.3	USGS Well Schedule, R.I. Office
BUW 240	no	540	May-61	4.52	<50	13.6	—	13.6	USGS Well Schedule, R.I. Office
BUW 241	no	456	May-61	14.53	914	—	—	19.1	USGS Well Schedule, R.I. Office
BUW 243	no	557	May-61	2.37	<50	12.0	—	12.0	USGS Well Schedule, R.I. Office
BUW 244	no	468	May-61	4.82	<50	15.9	—	15.9	USGS Well Schedule, R.I. Office
BUW 246	yes	325	—	—	5,600	56.0	—	133.0	USGS Well Schedule, R.I. Office
BUW 247	yes	320	—	—	8,000	80.0	—	170.0	USGS Well Schedule, R.I. Office
BUW 248	no	440	Apr-05	20.00	<50	17.0	—	117.0	USGS Well Schedule, R.I. Office
BUW 249	no	596	Oct-61	7.36	<50	—	—	10.6	USGS Well Schedule, R.I. Office
BUW 250	no	715	Oct-61	7.59	<50	—	—	25.0	USGS Well Schedule, R.I. Office
BUW 251	no	590	—	40.00	<50	85.0	—	145.0	USGS Well Schedule, R.I. Office
BUW 252	no	583	Oct-61	9.01	<50	—	—	24.0	USGS Well Schedule, R.I. Office
BUW 253	yes	390	Oct-61	5.07	486	—	—	7.5	USGS Well Schedule, R.I. Office
BUW 254	no	445	Oct-61	12.75	<50	—	—	18.8	USGS Well Schedule, R.I. Office
BUW 255	yes	463	Oct-61	3.34	672	—	—	6.7	USGS Well Schedule, R.I. Office

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft^2/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft^2/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
BUW 256	no	525	Oct-61	9.41	<50	—	—	11.0	USGS Well Schedule, R.I. Office
BUW 257	no	534	Oct-61	5.69	<50	—	—	10.6	USGS Well Schedule, R.I. Office
BUW 258	no	543	Oct-61	6.69	<50	—	—	14.5	USGS Well Schedule, R.I. Office
BUW 259	no	475	Oct-61	7.97	<50	—	—	17.6	USGS Well Schedule, R.I. Office
BUW 260	no	413	Oct-61	5.92	<50	—	—	10.6	USGS Well Schedule, R.I. Office
BUW 261	no	505	—	22.00	<50	25.0	—	120.0	USGS Well Schedule, R.I. Office
BUW 262	no	436	Oct-61	12.87	<50	—	—	14.0	USGS Well Schedule, R.I. Office
BUW 263	no	329	Oct-61	9.05	<50	—	—	16.8	USGS Well Schedule, R.I. Office
BUW 265	no	422	Oct-61	9.15	<50	—	—	16.0	USGS Well Schedule, R.I. Office
BUW 266	no	400	Oct-61	12.19	<50	—	—	22.0	USGS Well Schedule, R.I. Office
BUW 267	no	305	Dec-61	9.05	<50	—	—	13.5	USGS Well Schedule, R.I. Office
BUW 268	yes	285	Dec-61	18.77	166	—	—	19.6	USGS Well Schedule, R.I. Office
BUW 269	no	711	—	30.00	<50	40.0	—	500.0	USGS Well Schedule, R.I. Office
BUW 273	no	702	Nov-61	15.36	<50	—	—	17.8	USGS Well Schedule, R.I. Office
BUW 274	no	607	May-05	6.00	<50	8.0	—	350.0	USGS Well Schedule, R.I. Office
BUW 275	no	543	Dec-61	3.08	<50	—	—	13.7	USGS Well Schedule, R.I. Office
BUW 279	yes	392	Oct-67	14.89	862	—	—	19.2	USGS Well Schedule, R.I. Office
BUW 280	yes	385	Aug-67	10.00	6,200	—	—	56.0	USGS Well Schedule, R.I. Office
BUW 284	yes	377	May-68	2	2,600	15	—	15.7	Upper Branch Project Book and GWSI
BUW 292	yes	323	Nov-66	65.00	—	75.0	—	230.0	USGS Well Schedule, R.I. Office
BUW 293	yes	320	Mar-65	70.00	—	100.0	—	140.0	USGS Well Schedule, R.I. Office
BUW 295	yes	317	Mar-63	20.00	—	70.0	—	210.0	USGS Well Schedule, R.I. Office

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft²/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft²/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
BUW 297	yes	333	Nov-66	42.00	—	95.0	—	220.0	USGS Well Schedule, R.I. Office
BUW 298	no	485	Nov-65	33.00	—	80.0	—	142.0	USGS Well Schedule, R.I. Office
BUW 301	yes	355	Nov-68	2.00	300	—	23.5	23.5	Upper Branch Project Book, R.I. Office
BUW 302	yes	330	Nov-68	15.00	6,825	59.5	—	59.5	Upper Branch Project Book, R.I. Office
BUW 303	yes	340	Dec-68	21.00	1,000	—	26.0	26.0	Upper Branch Project Book, R.I. Office
BUW 305	yes	330	Nov-68	25.00	2,500	—	44.0	44.0	Upper Branch Project Book, R.I. Office
BUW 306	yes	320	Dec-68	11.50	8,525	—	68.0	68.0	Upper Branch Project Book, R.I. Office
BUW 307	yes	310	Dec-68	4.50	3,475	—	37.0	37.0	Upper Branch Project Book, R.I. Office
BUW 308	yes	310	—	5.00	2,525	—	26.5	26.5	Upper Branch Project Book, R.I. Office
BUW 309	yes	305	Dec-68	5.00	7,550	—	55.0	55.5	Upper Branch Project Book, R.I. Office
BUW 310	yes	305	Nov-68	5.00	4,075	—	37.5	37.5	Upper Branch Project Book, R.I. Office
BUW 311	yes	305	Nov-68	6.00	4,075	—	38.5	38.5	Upper Branch Project Book, R.I. Office
BUW 312	yes	345	—	—	2,900	—	21.0	21.0	Upper Branch Project Book, R.I. Office
BUW 314	yes	365	Nov-68	10.00	2,275	28.5	—	28.5	Upper Branch Project Book, R.I. Office
BUW 315	yes	375	—	—	4,255	30.7	—	30.7	Upper Branch Project Book, R.I. Office
BUW 316	yes	365	—	—	4,500	30.0	—	30.0	Upper Branch Project Book, R.I. Office
BUW 317	yes	337	Nov-68	4.00	4,950	37.0	—	37.0	Upper Branch Project Book, R.I. Office
BUW 318	yes	337	—	4.00	3,225	—	—	27.0	Upper Branch Project Book, R.I. Office
BUW 320	yes	338	Nov-68	5.00	4,550	—	32.0	32.0	Upper Branch Project Book, R.I. Office
BUW 323	yes	335	Nov-68	4.00	6,725	—	43.0	43.0	Upper Branch Project Book, R.I. Office
BUW 326	yes	335	Nov-68	2.50	4,025	29.5	—	30.2	Upper Branch Project Book, R.I. Office
BUW 328	yes	337	Nov-68	7.00	2,610	—	21.8	21.8	Upper Branch Project Book, R.I. Office

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft^2/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft^2/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
BUW 329	yes	335	Nov-68	5.00	4,300	42.0	—	42.0	Upper Branch Project Book, R.I. Office
BUW 331	yes	337	Nov-68	5.00	5,150	—	41.0	41.0	Upper Branch Project Book, R.I. Office
BUW 333	yes	318	Dec-68	5.00	3,800	—	—	33.0	Upper Branch Project Book, R.I. Office
BUW 334	yes	320	Dec-68	7.00	6,300	49.0	—	49.0	Upper Branch Project Book, R.I. Office
BUW 336	yes	320	Dec-68	6.00	5,600	37.0	—	37.0	Upper Branch Project Book, R.I. Office
BUW 337	no	295	—	—	3,600	—	—	22.0	Upper Branch Project Book, R.I. Office
BUW 338	no	425	Oct-68	5.00	1,850	50.0	—	50.0	Upper Branch Project Book, R.I. Office
BUW 339	yes	373	—	7.00	—	—	—	39.0	Upper Branch Project Book, R.I. Office
BUW 340	yes	338	Jan-68	9.00	3,800	—	40.0	40.0	Upper Branch Project Book, R.I. Office
BUW 341	yes	338	Oct-68	2.00	3,885	—	50.0	50.0	Upper Branch Project Book, R.I. Office
BUW 342	yes	315	Jan-68	5.50	8,175	—	57.5	57.5	Upper Branch Project Book, R.I. Office
BUW 344	yes	320	Nov-68	5.00	5,375	—	42.5	42.5	Upper Branch Project Book, R.I. Office
BUW 350	yes	310	Dec-68	11.50	2,370	—	38.0	38.0	Upper Branch Project Book, R.I. Office
BUW 351	yes	276	May-64	11.00	1,375	38.5	—	43.5	Upper Branch Project Book, R.I. Office
BUW 353	yes	304	May-64	1.50	1,550	35.0	—	40.0	Upper Branch Project Book, R.I. Office
BUW 354	yes	338.4	May-64	12.00	900	27.0	—	37.0	Upper Branch Project Book, R.I. Office
BUW 355	yes	330	Aug-67	1.08	—	—	—	28.0	Upper Branch Project Book, R.I. Office
BUW 364	yes	260	Oct-69	0.00	15,000	75.0	—	415.0	USGS Well Schedule, R.I. Office
BUW 367	no	563	Oct-69	7.00	5,300	60.0	—	115.0	Upper Branch Project Book, R.I. Office
BUW 368	yes	440	—	—	5,500	55.0	—	145.0	Upper Branch Project Book, R.I. Office
BUW 369	yes	450	—	—	5,500	55.0	—	200.0	Upper Branch Project Book, R.I. Office
BUW 371	yes	280	Oct-69	25.00	—	60.0	—	200.0	USGS Well Schedule, R.I. Office

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft²/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft²/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
BUW 374	yes	410	Oct-69	17.74	—	—	—	19.9	Upper Branch Project Book, R.I. Office
BUW 377	no	338	Oct-69	14.04	—	15.2	—	320.0	USGS Well Schedule, R.I. Office
BUW 378	yes	278	Oct-69	6.02	234	—	—	10.7	USGS Well Schedule, R.I. Office
BUW 379	yes	290	Oct-69	21.62	<50	—	—	—	USGS Well Schedule, R.I. Office
CFW 001	yes	65	Apr-45	15	—	35	—	500	Johnston and Dickerman, 1974c
CFW 002	yes	70	Jun-45	30	—	—	—	55	Johnston and Dickerman, 1974c
CFW 003	yes	100	—	—	7,600	—	—	43	Johnston and Dickerman, 1974c
CFW 005	yes	110	Apr-38	37	—	23	—	218	Johnston and Dickerman, 1974c
CFW 009	yes	60	Mar-32	15	—	—	—	24	Johnston and Dickerman, 1974c
CFW 013	yes	90	Jun-46	29	—	—	—	29	Johnston and Dickerman, 1974c
CFW 023	yes	100	—	—	2,150	—	90	90	Johnston and Dickerman, 1974c
CFW 025	yes	48	Jan-58	12	11,400	—	44.5	44	Johnston and Dickerman, 1974c
CFW 030	yes	70	Oct-64	22	1,225	—	—	46	Johnston and Dickerman, 1974c
CFW 031	yes	60	Sep-66	15	200	—	—	30	Johnston and Dickerman, 1974c
CFW 032	yes	40	Oct-66	9	850	—	—	37	Johnston and Dickerman, 1974c
CFW 033	yes	40	Oct-66	8	4,400	—	—	45	Johnston and Dickerman, 1974c
CFW 035	yes	58	—	—	4,600	—	—	42	Johnston and Dickerman, 1974c
CFW 036	yes	40	Oct-66	9	1,950	—	—	32	Johnston and Dickerman, 1974c
CFX 037	yes	60	Nov-64	6	50	—	—	92	Johnston and Dickerman, 1974c
CFX 038	yes	60	Nov-64	4	1,000	—	—	52	Johnston and Dickerman, 1974c
CFX 039	yes	60	Nov-64	0	900	—	77	77	Johnston and Dickerman, 1974c
CFX 040	yes	70	Mar-03	15	2,700	42	—	47	Johnston and Dickerman, 1974c

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft²/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft²/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
CUB 032	yes	60	—	—	2,900	—	—	38	Johnston and Dickerman, 1974c
CUB 045	yes	102	Jul-45	2	2,100	30	—	30	Johnston and Dickerman, 1974c
CUB 526	yes	76	May-05	1	5,250	—	—	74	Johnston and Dickerman, 1974c
CUB 528	yes	76	May-05	1	12,550	—	—	74	Johnston and Dickerman, 1974c
CUB 531	yes	86	May-05	11	7,200	56	—	64	Johnston and Dickerman, 1974c
CUB 532	yes	125	May-05	19	4,130	45	—	50	Johnston and Dickerman, 1974c
CUW 001	yes	65	Aug-45	100	—	90	—	275	Johnston and Dickerman, 1974c
CUW 002	yes	60	Sep-45	6	—	—	—	90	Johnston and Dickerman, 1974c
CUW 003	yes	80	Jul-43	10	6,150	—	—	50	Johnston and Dickerman, 1974c
CUW 005	no	230	May-45	15	<50	6	—	700	GWSI field form
CUW 006	no	245	Sep-45	20	<50	15	—	148	GWSI field form
CUW 007	no	252	Sep-45	22	<50	15	—	133	GWSI field form
CUW 011	yes	80	Jan-44	18	1,200	—	—	30	Johnston and Dickerman, 1974c
CUW 012	yes	200	Aug-46	6	6,000	—	—	36	Johnston and Dickerman, 1974c
CUW 015	no	225	Jan-45	5	900	—	—	14	USGS Well Schedule, R.I. Office
CUW 021	yes	70	—	—	10,050	—	—	54	Johnston and Dickerman, 1974c
CUW 023	yes	80	Aug-52	15	4,400	—	—	26	GWSI-NE
CUW 058	no	190	Jul-46	16	—	—	—	23	Johnston and Dickerman, 1974c
CUW 059	yes	160	—	—	3,900	—	—	26	Johnston and Dickerman, 1974c
CUW 061	yes	140	Aug-70	13	300	—	—	16	Johnston and Dickerman, 1974c
CUW 064	yes	150	Jul-46	7	1,000	—	—	17	Johnston and Dickerman, 1974c
CUW 065	yes	152	Jul-46	18	300	—	—	21	Johnston and Dickerman, 1974c

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft²/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft²/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
CUW 066	yes	152	Jul-37	27	<50	—	—	20	USGS Well Schedule, RI Office
CUW 067	yes	175	Jul-46	7	<50	—	—	9	Johnston and Dickerman, 1974c
CUW 068	yes	175	—	—	4,000	—	—	20	Johnston and Dickerman, 1974c
CUW 069	yes	175	Jul-46	9	150	—	—	10	Johnston and Dickerman, 1974c
CUW 070	yes	150	Jul-46	26	<50	—	—	30	Johnston and Dickerman, 1974c
CUW 073	yes	162	Jul-46	35	600	—	—	38	Johnston and Dickerman, 1974c
CUW 076	no	218	Jul-46	20	<50	—	—	—	USGS Well Schedule, R.I. Office
CUW 079	no	315	Jul-46	19	—	—	—	—	USGS Well Schedule, R.I. Office
CUW 080	no	385	May-21	13	<50	—	—	—	USGS Well Schedule, R.I. Office
CUW 082	no	365	Jul-46	3	300	6	—	6	USGS Well Schedule, R.I. Office
CUW 083	no	330	Aug-46	10.9	<50	—	—	—	USGS Well Schedule, R.I. Office
CUW 084	no	460	May-21	20	<50	—	—	—	USGS Well Schedule, R.I. Office
CUW 086	no	485	Jul-41	13.2	<50	—	—	—	USGS Well Schedule, R.I. Office
CUW 087	no	418	Jul-46	13.24	<50	—	—	—	USGS Well Schedule, R.I. Office
CUW 088	no	418	Jul-46	16.19	<50	—	—	—	USGS Well Schedule, R.I. Office
CUW 089	no	435	Jul-46	4.5	<50	—	—	—	USGS Well Schedule, R.I. Office
CUW 094	yes	210	Jul-46	11.5	1,600	—	—	20	Johnston and Dickerman, 1974c
CUW 095	yes	210	Jul-46	16	400	—	—	18	Johnston and Dickerman, 1974c
CUW 096	yes	212	Jul-46	18	400	—	—	—	USGS Well Schedule, R.I. Office
CUW 097	yes	196	Jul-46	8	1,420	—	—	15	Johnston and Dickerman, 1974c
CUW 100	yes	193	Jul-46	12	2,400	—	—	18	Johnston and Dickerman, 1974c
CUW 101	yes	188	Jul-46	15	800	—	—	18	Johnston and Dickerman, 1974c

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft^2/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft^2/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
CUW 102	no	220	Jul-46	17.7	<50	—	—	—	USGS Well Schedule, R.I. Office
CUW 104	yes	155	Jul-45	25	<50	6	—	110	Johnston and Dickerman, 1974c
CUW 106	no	270	Jul-46	10	<50	—	—	—	USGS Well Schedule, R.I. Office
CUW 107	no	205	Jul-46	15.92	<50	—	—	—	USGS Well Schedule, R.I. Office
CUW 109	yes	185	Jul-46	12.8	620	15.9	—	15.9	USGS Well Schedule, R.I. Office
CUW 110	yes	182	Jul-46	—	5,000	—	—	25	Johnston and Dickerman, 1974c
CUW 113	no	375	Jul-46	9.91	<50	—	—	—	USGS Well Schedule, R.I. Office
CUW 114	no	290	1900	70	<50	—	—	—	USGS Well Schedule, R.I. Office
CUW 116	yes	190	Jul-46	18	2,400	—	—	30	Johnston and Dickerman, 1974c
CUW 120	no	350	Jul-46	0.4	—	1	—	1	USGS Well Schedule, R.I. Office
CUW 121	no	447	Jul-46	90	<50	0	—	0	USGS Well Schedule, R.I. Office
CUW 124	no	288	Jul-46	7.57	<50	—	—	12	USGS Well Schedule, R.I. Office
CUW 125	no	325	Jul-46	14.41	<50	21	—	21	USGS Well Schedule, R.I. Office
CUW 129	no	330	Jul-46	12.88	<50	30	—	30	Johnston and Dickerman, 1974c
CUW 144	yes	190	Jul-46	27	1,200	30	—	30	Johnston and Dickerman, 1974c
CUW 147	no	260	1929	21.2	<50	—	—	29.25	USGS Well Schedule, R.I. Office
CUW 171	yes	225	Jul-46	14	700	—	—	14	Johnston and Dickerman, 1974c
CUW 174	yes	225	Jul-46	14	100	—	—	14	Johnston and Dickerman, 1974c
CUW 218	yes	75	Apr-43	6	8,320	47.6	—	40	Johnston and Dickerman, 1974c
CUW 221	yes	140	Aug-46	10.35	1,010	—	—	15	Johnston and Dickerman, 1974c
CUW 261	yes	165	Aug-46	25	11,000	—	—	100	Johnston and Dickerman, 1974c
CUW 263	yes	160	Apr-05	25	12,000	85	—	510	Johnston and Dickerman, 1974c

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft²/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft²/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
CUW 264	yes	162	Aug-46	30	800	—	—	34	Johnston and Dickerman, 1974c
CUW 265	yes	130	Aug-46	14	1,280	20	—	20	Johnston and Dickerman, 1974c
CUW 286	no	220	Aug-46	8	3,400	—	—	25	Johnston and Dickerman, 1974c
CUW 292	yes	155	Jan-29	16	4,000	36	—	134	Johnston and Dickerman, 1974c
CUW 293	no	140	Aug-46	24	800	—	—	28	Johnston and Dickerman, 1974c
CUW 338	yes	70	Nov-49	9	2,700	—	—	66	Johnston and Dickerman, 1974c
CUW 339	yes	60	Jan-50	9	8,125	—	—	67	Johnston and Dickerman, 1974c
CUW 340	yes	58	Jan-50	5	3,400	—	—	42	Johnston and Dickerman, 1974c
CUW 343	yes	55	Dec-49	3	3,280	—	—	19	Johnston and Dickerman, 1974c
CUW 345	yes	75	Jan-50	4	11,180	—	—	56	Johnston and Dickerman, 1974c
CUW 347	yes	75	—	—	9,750	—	—	55	Johnston and Dickerman, 1974c
CUW 348	yes	68	Aug-50	4	16,000	—	—	75	Johnston and Dickerman, 1974c
CUW 349	yes	67	May-05	4	16,000	—	—	84	Johnston and Dickerman, 1974c
CUW 350	yes	70	Mar-51	9	9,400	—	—	56	Johnston and Dickerman, 1974c
CUW 358	yes	78	Sep-50	12	4,070	—	—	56	Johnston and Dickerman, 1974c
CUW 359	yes	70	Jan-51	9	11,580	—	—	50	Johnston and Dickerman, 1974c
CUW 374	yes	72	—	—	11,400	—	—	71	Johnston and Dickerman, 1974c
CUW 375	yes	55	—	—	6,700	—	—	39	Johnston and Dickerman, 1974c
CUW 378	yes	70	—	—	7,950	—	—	40	Johnston and Dickerman, 1974c
CUW 381	yes	60	May-58	10	9,600	—	—	57	Johnston and Dickerman, 1974c
CUW 385	yes	72	—	—	4,500	—	65	64	Johnston and Dickerman, 1974c
CUW 387	yes	75	Mar-58	11	11,400	—	68	55	Johnston and Dickerman, 1974c

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft^2/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft^2/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
CUW 405	yes	60	Mar-64	3	8,475	—	—	60	Johnston and Dickerman, 1974c
CUW 406	yes	97	May-65	7	3,800	—	64.5	57	Johnston and Dickerman, 1974c
CUW 407	yes	92	Jul-68	1	9,650	—	—	72	Johnston and Dickerman, 1974c
CUW 409	yes	93	Sep-65	9	12,650	—	—	75	Johnston and Dickerman, 1974c
CUW 414	yes	67	Dec-65	9	5,950	—	96	55	Johnston and Dickerman, 1974c
CUW 418	yes	60	Apr-70	9	8,125	69	69	68	Johnston and Dickerman, 1974c
CUW 420	yes	70	Feb-66	12	6,800	—	—	55	Johnston and Dickerman, 1974c
CUW 423	yes	70	Dec-66	15	3,900	—	—	49	Johnston and Dickerman, 1974c
CUW 424	yes	80	Jun-66	20	6,950	89	—	89	Johnston and Dickerman, 1974c
CUW 427	yes	70	Feb-66	5	4,010	—	—	56	Johnston and Dickerman, 1974c
CUW 428	yes	118	Oct-67	1	2,175	49	—	42	Johnston and Dickerman, 1974c
CUW 429	yes	119	Aug-67	2	7,140	51	—	50	Johnston and Dickerman, 1974c
CUW 440	yes	72	Mar-58	8	13,050	—	—	81	Johnston and Dickerman, 1974c
CUW 441	yes	55	Apr-58	11	9,400	—	—	57	Johnston and Dickerman, 1974c
CUW 442	yes	65	Aug-63	7	7,400	—	—	49	Johnston and Dickerman, 1974c
CUW 443	yes	65	Aug-63	8	2,650	—	—	38	Johnston and Dickerman, 1974c
CUW 444	yes	65	Aug-63	8	5,725	—	—	36	Johnston and Dickerman, 1974c
CUW 448	yes	65	Sep-63	7	9,250	—	64	64	Johnston and Dickerman, 1974c
CUW 449	yes	60	Sep-63	3	1,350	—	104	104	Johnston and Dickerman, 1974c
CUW 451	yes	60	Sep-63	5	2,200	—	58	59	Johnston and Dickerman, 1974c
CUW 452	yes	65	Oct-63	4	6,700	—	55.5	55	Johnston and Dickerman, 1974c
CUW 454	yes	65	—	—	4,700	—	31	31	Johnston and Dickerman, 1974c

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft²/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft²/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
CUW 455	yes	65	Oct-63	6	2,900	—	43	35	Johnston and Dickerman, 1974c
CUW 457	yes	65	Oct-63	4	6,700	—	—	48	Johnston and Dickerman, 1974c
CUW 466	yes	50	Oct-63	4	5,900	—	55	50	Johnston and Dickerman, 1974c
CUW 467	yes	60	Oct-63	5	5,400	—	74	64	Johnston and Dickerman, 1974c
CUW 469	yes	60	Oct-63	4	2,800	—	78	78	Johnston and Dickerman, 1974c
CUW 472	yes	97	—	—	3,850	—	78	78	Johnston and Dickerman, 1974c
CUW 473	yes	98	—	—	1,750	—	59	59	Johnston and Dickerman, 1974c
CUW 480	yes	98	Dec-65	14	3,600	—	66	66	Johnston and Dickerman, 1974c
CUW 481	yes	91	Dec-65	9	2,900	—	71	71	Johnston and Dickerman, 1974c
CUW 484	yes	140	Aug-63	12	900	—	53	49	Johnston and Dickerman, 1974c
CUW 485	yes	187	Aug-63	9	4,750	—	117	43	Johnston and Dickerman, 1974c
CUW 486	yes	187	Aug-63	7	9,400	—	63	53	Johnston and Dickerman, 1974c
CUW 487	yes	187	Aug-63	7	6,075	—	46.5	46	Johnston and Dickerman, 1974c
CUW 488	yes	118	Aug-63	2	2,600	—	17	17	Johnston and Dickerman, 1974c
CUW 489	yes	118	Aug-63	2	600	—	18	18	Johnston and Dickerman, 1974c
CUW 490	yes	235	Jul-65	7	1,200	—	66	52	Johnston and Dickerman, 1974c
CUW 492	yes	232	May-65	5	2,400	—	54	54	Johnston and Dickerman, 1974c
CUW 497	yes	120	Sep-68	16	3,000	—	—	40	Johnston and Dickerman, 1974c
CUW 498	yes	125	—	—	8,000	—	—	40	Johnston and Dickerman, 1974c
CUW 499	yes	217	—	—	3,500	36.5	—	36	Johnston and Dickerman, 1974c
CUW 500	no	238	—	—	4,075	36	—	36	Johnston and Dickerman, 1974c
CUW 501	no	186	Jan-68	12	900	20	—	25	Johnston and Dickerman, 1974c

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft²/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft²/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
CUW 504	yes	196	Dec-67	36	575	48	—	53	Johnston and Dickerman, 1974c
CUW 508	yes	197	Dec-67	19	3,150	59	—	64	Johnston and Dickerman, 1974c
CUW 512	yes	197	Nov-67	14	3,950	94	—	95	Johnston and Dickerman, 1974c
CUW 514	yes	197	Dec-67	14	2,425	48	—	54	Johnston and Dickerman, 1974c
CUW 518	yes	165	Apr-65	10	5,000	—	74	74	Johnston and Dickerman, 1974c
CUW 519	yes	165	Apr-65	11	2,300	—	68	68	Johnston and Dickerman, 1974c
CUW 521	no	172	Aug-63	4	4,400	—	70	70	Johnston and Dickerman, 1974c
CUW 522	no	163	—	—	1,750	—	41	41	Johnston and Dickerman, 1974c
CUW 536	yes	60	Sep-66	3	5,270	—	—	54	Johnston and Dickerman, 1974c
CUW 537	yes	60	Sep-66	3	4,400	—	—	60	Johnston and Dickerman, 1974c
CUW 539	yes	80	Sep-66	26	<50	—	—	35	Johnston and Dickerman, 1974c
CUW 540	yes	75	Sep-66	30	550	—	—	57	Johnston and Dickerman, 1974c
CUW 541	yes	75	Sep-66	27	1,150	—	—	50	Johnston and Dickerman, 1974c
CUW 542	yes	80	Sep-66	23	750	—	—	57	Johnston and Dickerman, 1974c
CUW 543	yes	60	Sep-66	3	3,750	—	—	26	Johnston and Dickerman, 1974c
CUW 545	yes	60	—	—	2,750	—	—	81	Johnston and Dickerman, 1974c
CUW 547	yes	75	Aug-56	12	—	—	—	46	Johnston and Dickerman, 1974c
GLW 024	no	625	Jun-47	6.06	—	—	—	18.7	Upper Branch Project Book, R.I. Office
GLW 026	no	522	Jun-47	7.69	—	—	—	9.5	Upper Branch Project Book, R.I. Office
GLW 027	no	510	Jun-47	12.82	—	—	—	18.9	Upper Branch Project Book, R.I. Office
GLW 028	yes	462	Oct-67	15.72	456	—	—	18	Upper Branch Project Book and GWSI
GLW 030	no	522	Jun-47	10.44	—	—	—	20	Upper Branch Project Book, R.I. Office

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft²/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft²/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
GLW 047	no	472	Jun-47	7.88	—	—	—	16	Upper Branch Project Book, R.I. Office
GLW 048	yes	452	Jun-47	14.89	—	—	—	17	Upper Branch Project Book, R.I. Office
GLW 060	no	515	Jun-47	5.55	—	14.2	—	14.2	Upper Branch Project Book, R.I. Office
GLW 061	yes	454	Jun-47	7.06	—	—	—	12.1	Upper Branch Project Book, R.I. Office
GLW 062	yes	438	Jun-47	12.91	—	—	—	19.4	Upper Branch Project Book, R.I. Office
GLW 066	yes	428	Sep-49	15.2	—	—	—	18.6	GWSI
GLW 071	no	458	Sep-49	8	—	24	—	60	GWSI
GLW 072	yes	425	Sep-49	17	—	—	—	19.1	GWSI
GLW 075	yes	445	Sep-49	9.2	—	—	—	14.3	GWSI
GLW 078	no	675	Oct-49	16.68	<50	17	—	17	USGS Well Schedule, R.I. Office
GLW 079	no	617	Aug-61	16.9	<50	—	—	22.8	USGS Well Schedule, R.I. Office
GLW 080	no	509	Oct-49	17.38	<50	19.8	—	19.8	USGS Well Schedule, R.I. Office
GLW 086	yes	515	Jul-61	18.07	<50	—	—	21.7	USGS Well Schedule, R.I. Office
GLW 087	no	525	Oct-49	10.23	<50	11.8	—	11.8	USGS Well Schedule, R.I. Office
GLW 098	no	749	May-61	4.49	<50	18.9	—	18.9	USGS Well Schedule, R.I. Office
GLW 129	yes	500	Sep-68	43	10,400	95	—	130	Upper Branch Project Book, R.I. Office
GLW 130	yes	488	Aug-59	46	8,800	90	—	307	Upper Branch Project Book, R.I. Office
GLW 131	yes	452	Jan-59	30	—	60	—	200	Upper Branch Project Book, R.I. Office
GLW 132	yes	460	Sep-60	18	350	—	—	25	Upper Branch Project Book, R.I. Office
GLW 134	yes	401	May-61	8.48	—	—	—	18.6	Upper Branch Project Book, R.I. Office
GLW 135	yes	396	May-61	16.69	—	—	—	18.71	Upper Branch Project Book, R.I. Office
GLW 136	yes	412	May-61	26.63	—	35	—	350	USGS Well Schedule, R.I. Office

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft^2/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft^2/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
GLW 139	yes	438	May-61	3.68	—	—	—	9.43	Upper Branch Project Book, R.I. Office
GLW 142	yes	395	May-61	3.97	—	—	—	7.12	Upper Branch Project Book, R.I. Office
GLW 144	yes	398	May-61	5.29	—	—	—	15.27	Upper Branch Project Book, R.I. Office
GLW 145	yes	378	May-61	9.77	—	—	—	15.53	Upper Branch Project Book, R.I. Office
GLW 147	yes	372	May-61	18.71	—	—	—	22.75	Upper Branch Project Book, R.I. Office
GLW 150	yes	448	May-61	11.94	—	—	—	16.76	Upper Branch Project Book, R.I. Office
GLW 151	yes	448	May-61	9.68	—	—	—	15.28	Upper Branch Project Book, R.I. Office
GLW 153	no	503	May-61	3.95	—	—	—	12.87	Upper Branch Project Book, R.I. Office
GLW 154	yes	465	May-61	7.64	—	—	—	12.05	Upper Branch Project Book, R.I. Office
GLW 155	no	492	May-61	5.86	—	16.8	—	16.8	Upper Branch Project Book, R.I. Office
GLW 160	yes	442	May-61	16.81	—	—	—	23.74	Upper Branch Project Book, R.I. Office
GLW 162	no	518	May-61	3.44	—	13.02	—	13.02	Upper Branch Project Book, R.I. Office
GLW 163	no	516	May-61	1.6	—	—	—	17.61	Upper Branch Project Book, R.I. Office
GLW 168	no	612	May-61	6.97	—	—	—	22.39	Upper Branch Project Book, R.I. Office
GLW 188	yes	448	May-61	15.58	—	—	—	19.99	Upper Branch Project Book, R.I. Office
GLW 189	yes	455	May-61	20.27	—	—	—	24.76	Upper Branch Project Book, R.I. Office
GLW 198	yes	450	May-61	6.77	—	—	—	11.82	Upper Branch Project Book, R.I. Office
GLW 199	no	552	May-61	3.65	—	—	—	15.41	Upper Branch Project Book, R.I. Office
GLW 200	no	475	May-61	10.38	—	14.2	—	14.2	Upper Branch Project Book, R.I. Office
GLW 201	no	565	May-61	8.17	—	15.59	—	15.59	Upper Branch Project Book, R.I. Office
GLW 207	no	557	May-61	3.09	—	—	—	17.48	Upper Branch Project Book, R.I. Office
GLW 208	no	481	May-61	3.24	—	—	—	11.99	Upper Branch Project Book, R.I. Office

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft²/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft²/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
GLW 210	no	538	May-61	1.89	—	9.41	—	9.41	Upper Branch Project Book, R.I. Office
GLW 211	yes	542	May-61	7.24	—	—	—	12.5	Upper Branch Project Book, R.I. Office
GLW 212	no	693	May-61	4.45	—	—	—	16.9	Upper Branch Project Book, R.I. Office
GLW 213	no	642	May-61	6.16	—	11.22	—	11.22	Upper Branch Project Book, R.I. Office
GLW 214	no	575	May-61	5.53	—	—	—	9.91	Upper Branch Project Book, R.I. Office
GLW 215	yes	505	May-61	11.77	—	—	—	16.59	Upper Branch Project Book, R.I. Office
GLW 216	yes	466	May-61	8	—	—	—	16.1	Upper Branch Project Book, R.I. Office
GLW 217	no	469	May-61	4.89	—	7.98	—	7.98	Upper Branch Project Book, R.I. Office
GLW 219	no	574	May-61	6.89	—	10.07	—	10.07	Upper Branch Project Book, R.I. Office
GLW 220	no	578	May-61	9.26	—	13.37	—	13.37	Upper Branch Project Book, R.I. Office
GLW 223	yes	435	May-61	9.96	—	—	—	13.59	Upper Branch Project Book, R.I. Office
GLW 224	yes	525	May-61	15.24	—	—	—	21.82	Upper Branch Project Book, R.I. Office
GLW 227	no	604	May-61	4.73	—	12.22	—	12.22	Upper Branch Project Book, R.I. Office
GLW 228	no	542	May-61	3.39	—	—	—	15.33	Upper Branch Project Book, R.I. Office
GLW 233	yes	441	May-61	7.48	—	—	—	11.87	Upper Branch Project Book, R.I. Office
GLW 234	no	550	May-61	15.57	—	17.92	—	17.92	Upper Branch Project Book, R.I. Office
GLW 249	no	523	Jul-61	13.29	—	—	—	16.54	Upper Branch Project Book, R.I. Office
GLW 264	yes	476	Jul-61	12.42	—	13.6	—	13.6	Upper Branch Project Book, R.I. Office
GLW 268	no	477	Aug-61	7.2	—	—	—	13.8	Upper Branch Project Book, R.I. Office
GLW 293	yes	378	Oct-67	11.95	730	—	—	15.7	GWSI
GLW 294	no	435	Apr-68	5.00	3,000	90	—	140	Upper Branch Project Book, R.I. Office
GLW 295	yes	448	May-05	8.00	4,700	55	—	175	Upper Branch Project Book, R.I. Office

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft²/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft²/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
GLW 296	yes	457	May-05	15.00	8,500	100	—	275	Upper Branch Project Book, R.I. Office
GLW 297	no	563	—	30.00	—	104	—	260	Upper Branch Project Book, R.I. Office
GLW 298	yes	242	May-05	8	2,800	—	—	36	GWSI
GLW 299	yes	412	Jun-65	30.00	—	120	—	232	Upper Branch Project Book, R.I. Office
GLW 302	yes	450	Aug-63	30.00	—	100	—	190	Upper Branch Project Book, R.I. Office
GLW 303	yes	461	Nov-64	35.00	—	129	—	175	Upper Branch Project Book, R.I. Office
GLW 304	yes	448	Dec-65	30.00	10,750	125	—	187	Upper Branch Project Book, R.I. Office
GLW 313	no	428	Oct-68	13.90	—	—	—	19.28	USGS Well Schedule, R.I. Office
GLW 316	yes	445	Nov-61	20.00	—	105	—	340	USGS Well Schedule, R.I. Office
GLW 317	yes	440	Sep-68	13.00	—	68	—	220	USGS Well Schedule, R.I. Office
GLW 323	yes	492	Sep-68	37.00	9,600	—	—	85	Upper Branch Project Book, R.I. Office
GLW 325	yes	458	Nov-68	5.00	2,550	—	38	38	Upper Branch Project Book, R.I. Office
GLW 327	yes	432	—	5.00	2,600	—	31	31	USGS Well Schedule, R.I. Office
GLW 328	yes	440	Nov-68	10	1,250	—	47.2	47.2	USGS Well Schedule, R.I. Office
GLW 329	yes	362	Dec-68	5.00	900	59	—	61	USGS Well Schedule, R.I. Office
GLW 330	yes	385	Dec-68	20.00	500	61	—	61	USGS Well Schedule, R.I. Office
GLW 331	yes	385	Dec-68	20.00	200	42	—	42	USGS Well Schedule, R.I. Office
GLW 332	yes	370	Dec-68	10.00	1,700	57	—	57	USGS Well Schedule, R.I. Office
GLW 333	yes	372	Dec-68	10.00	550	40	—	40	USGS Well Schedule, R.I. Office
GLW 338	yes	412	Jun-62	35.00	—	60	—	115	USGS Well Schedule, R.I. Office
LIB 175	yes	75	—	—	3,100	—	—	17	Johnston and Dickerman, 1974c
LIB 331	yes	70	—	—	11,400	—	—	57	Johnston and Dickerman, 1974c

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft²/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft²/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
LIB 333	yes	70	—	—	5,550	—	—	36	Johnston and Dickerman, 1974c
LIB 432	no	78	May-05	3	880	—	7.4	7	Johnston and Dickerman, 1974c
LIB 433	no	79	May-05	3	210	—	6.3	6	Johnston and Dickerman, 1974c
LIW 004	yes	145	Jan-40	30	—	40	—	300	Johnston and Dickerman, 1974c
LIW 005	no	235	Apr-05	25	<50	12	—	378	USGS Well Schedule, R.I. Office
LIW 006	yes	140	Sep-45	59	—	15	—	180	Johnston and Dickerman, 1974c
LIW 020	yes	140	Apr-45	7	—	—	—	10	Johnston and Dickerman, 1974c
LIW 231	no	355	Aug-31	14	—	22	—	22	Johnston and Dickerman, 1974c
LIW 245	yes	315	Apr-46	15	—	25	—	25	Johnston and Dickerman, 1974c
LIW 255	yes	155	May-46	18	—	15	—	71	Johnston and Dickerman, 1974c
LIW 256	yes	155	Jan-43	25	—	55	—	225	Johnston and Dickerman, 1974c
LIW 258	yes	152	Oct-42	29	—	52	—	273	Johnston and Dickerman, 1974c
LIW 262	yes	190	May-46	11	—	18	—	18	Johnston and Dickerman, 1974c
LIW 316	yes	90	Jun-46	30	—	36	—	36	Johnston and Dickerman, 1974c
LIW 317	yes	95	Jun-46	22	—	—	—	36	Johnston and Dickerman, 1974c
LIW 326	yes	170	Jun-46	11	—	—	—	17	Johnston and Dickerman, 1974c
LIW 341	yes	85	Jan-50	11	13,500	127	—	125	Johnston and Dickerman, 1974c
LIW 342	yes	75	Feb-50	12	22,650	136	—	136	Johnston and Dickerman, 1974c
LIW 343	yes	85	Feb-50	10	16,000	—	—	100	Johnston and Dickerman, 1974c
LIW 344	yes	85	—	—	13,800	—	—	108	Johnston and Dickerman, 1974c
LIW 345	yes	85	—	—	16,000	—	—	90	Johnston and Dickerman, 1974c
LIW 346	yes	85	—	—	1,200	—	—	68	Johnston and Dickerman, 1974c

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft²/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft²/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
LIW 350	yes	55	Nov-54	2	3,025	—	—	26	Johnston and Dickerman, 1974c
LIW 351	yes	55	Nov-54	1	4,050	—	—	24	Johnston and Dickerman, 1974c
LIW 353	yes	60	—	—	12,400	—	65	65	Johnston and Dickerman, 1974c
LIW 354	yes	60	—	—	6,750	—	20	120	Johnston and Dickerman, 1974c
LIW 355	yes	60	—	—	5,850	—	137	137	Johnston and Dickerman, 1974c
LIW 371	yes	65	—	—	12,700	—	—	90	Johnston and Dickerman, 1974c
LIW 372	yes	65	—	—	8,400	—	75	75	Johnston and Dickerman, 1974c
LIW 378	yes	65	—	—	14,600	92	—	90	Johnston and Dickerman, 1974c
LIW 379	yes	65	—	—	11,700	77	—	75	Johnston and Dickerman, 1974c
LIW 380	yes	65	Nov-56	9	19,100	72	—	72	Johnston and Dickerman, 1974c
LIW 382	yes	75	Nov-56	8	15,200	52	—	52	Johnston and Dickerman, 1974c
LIW 383	yes	65	Apr-57	6	22,400	—	—	62	Johnston and Dickerman, 1974c
LIW 417	yes	100	Oct-63	8	14,800	—	58	55	Johnston and Dickerman, 1974c
LIW 418	yes	70	May-64	10	5,800	—	—	142	Johnston and Dickerman, 1974c
LIW 419	yes	97	Mar-64	5	7,950	—	—	54	Johnston and Dickerman, 1974c
LIW 420	yes	64	Mar-69	7	16,200	—	—	46	Johnston and Dickerman, 1974c
LIW 429	yes	70	Sep-63	14	1,835	—	—	157	Johnston and Dickerman, 1974c
LIW 434	no	79	May-05	3	900	7.5	—	18	Johnston and Dickerman, 1974c
LIW 437	no	310	Oct-65	20	<50	50	—	190	USGS Well Schedule, R.I. Office
NSA 343	yes	193	Nov-68	6	6,800	—	—	60	Johnston and Dickerman, 1974c
NSA 344	yes	190	Nov-68	6	7,100	—	—	54	Johnston and Dickerman, 1974c
NSA 346	yes	190	Nov-68	5	5,500	—	—	40	Johnston and Dickerman, 1974c

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft²/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft²/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
NSB 213	yes	233	Aug-57	1	550	12	—	22	Johnston and Dickerman, 1974c
NSB 218	yes	230	Sep-57	6	650	19	—	29	Johnston and Dickerman, 1974c
NSB 227	no	223	Sep-57	5	600	26	—	36	Johnston and Dickerman, 1974c
NSB 232	no	262	Oct-57	15	100	17	—	27	Johnston and Dickerman, 1974c
NSB 251	yes	228	Sep-57	25	2,750	—	—	45	Johnston and Dickerman, 1974c
NSB 256	yes	188	Sep-57	9	1,200	35	—	45	Johnston and Dickerman, 1974c
NSB 262	yes	188	Oct-57	7	2,200	51	—	61	Johnston and Dickerman, 1974c
NSB 267	yes	205	Sep-57	2	500	14	—	24	Johnston and Dickerman, 1974c
NSB 273	yes	222	Sep-57	28	2,150	—	—	71	Johnston and Dickerman, 1974c
NSB 281	no	249	Oct-57	10	<50	7	—	17	Johnston and Dickerman, 1974c
NSB 284	yes	235	Oct-57	14	300	20	—	30	Johnston and Dickerman, 1974c
NSW 008	yes	230	Apr-46	22	—	—	—	28	Johnston and Dickerman, 1974c
NSW 010	no	270	Apr-46	2	<50	14	—	14	USGS Well Schedule, R.I. Office
NSW 012	yes	300	Apr-46	9	—	—	—	13	Johnston and Dickerman, 1974c
NSW 013	no	360	Apr-46	7.95	<50	—	—	34	USGS Well Schedule, R.I. Office
NSW 015	yes	330	Apr-46	8	—	—	—	19	Johnston and Dickerman, 1974c
NSW 016	no	310	1925	9	<50	8	—	400	USGS Well Schedule, R.I. Office
NSW 017	no	400	Jul-47	7.82	—	12.4	—	12.4	Upper Branch Project Book
NSW 019	no	320	Nov-39	5	<50	3	—	104	USGS Well Schedule, R.I. Office
NSW 021	yes	239	May-47	7	—	—	—	16	Johnston and Dickerman, 1974c
NSW 023	no	230	Mar-26	16	—	7	—	190	Johnston and Dickerman, 1974c
NSW 032	yes	320	Jan-46	6	—	18	—	124	Johnston and Dickerman, 1974c

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft^2/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft^2/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
NSW 035	yes	270	Oct-41	20	—	38	—	100	Johnston and Dickerman, 1974c
NSW 037	yes	230	Jun-42	6	—	103	—	260	Johnston and Dickerman, 1974c
NSW 038	no	275	Sep-46	4	<50	12	—	163	USGS Well Schedule, R.I. Office
NSW 039	no	230	May-44	13	<50	3	—	160	USGS Well Schedule, R.I. Office
NSW 040	no	245	Jun-46	27	<50	3	—	345	USGS Well Schedule, R.I. Office
NSW 042	no	300	Dec-39	5	<50	14	—	194	USGS Well Schedule, R.I. Office
NSW 043	no	265	Oct-43	40	<50	10	—	160	USGS Well Schedule, R.I. Office
NSW 044	no	285	Dec-45	15	<50	10	—	170	USGS Well Schedule, R.I. Office
NSW 046	no	325	Aug-42	28	<50	4	—	140	USGS Well Schedule, R.I. Office
NSW 047	yes	210	Feb-42	40	—	28	—	186	Johnston and Dickerman, 1974c
NSW 048	yes	275	Jul-45	3	5,400	30	—	125	Johnston and Dickerman, 1974c
NSW 051	yes	245	Aug-41	19	—	—	—	68	Johnston and Dickerman, 1974c
NSW 052	yes	210	Jun-47	1	—	20	—	230	Johnston and Dickerman, 1974c
NSW 058	yes	265	Oct-03	14	—	17	—	139.5	Upper Branch Project Book, R.I. Office
NSW 059	yes	251	Dec-03	15.5	—	17	—	146	Upper Branch Project Book, R.I. Office
NSW 061	no	308	Sep-03	12	—	6	—	88	Upper Branch Project Book, R.I. Office
NSW 062	yes	205	Jun-43	20	—	80	—	132	Johnston and Dickerman, 1974c
NSW 063	yes	205	Jul-44	40	—	18	—	143	Johnston and Dickerman, 1974c
NSW 064	no	280	Mar-47	3	<50	2	—	145	USGS Well Schedule, R.I. Office
NSW 065	no	260	Mar-41	20	7,400	57	—	724	USGS Well Schedule, R.I. Office
NSW 066	no	260	—	0	<50	32	—	160	USGS Well Schedule, R.I. Office
NSW 079	no	380	Jun-47	3.12	<50	4	—	4	USGS Well Schedule, R.I. Office

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft²/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft²/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
NSW 083	yes	270	Jun-47	9	—	14	—	14	Johnston and Dickerman, 1974c
NSW 084	no	410	Jun-47	10	<50	20	—	20	USGS Well Schedule, R.I. Office
NSW 086	yes	400	Jun-47	8.29	<50	—	—	—	USGS Well Schedule, R.I. Office
NSW 087	no	430	Jun-47	5.02	<50	—	—	—	USGS Well Schedule, R.I. Office
NSW 092	no	370	Jun-47	10.48	<50	—	—	13.52	USGS Well Schedule, R.I. Office
NSW 093	no	450	Jun-47	11.69	<50	19	—	19	USGS Well Schedule, R.I. Office
NSW 094	no	450	Jun-47	11.6	<50	—	—	19	USGS Well Schedule, R.I. Office
NSW 097	yes	235	Oct-43	25	—	8	—	96	Johnston and Dickerman, 1974c
NSW 098	yes	247	Jul-37	15	—	21	—	108	Johnston and Dickerman, 1974c
NSW 117	yes	300	Jun-47	23	—	—	—	24	Johnston and Dickerman, 1974c
NSW 118	yes	320	Sep-33	25	—	17	—	172	Johnston and Dickerman, 1974c
NSW 119	no	460	Jun-47	12.67	<50	—	—	15.8	USGS Well Schedule, R.I. Office
NSW 125	yes	280	Mar-40	7	<50	17	—	213	USGS Well Schedule, R.I. Office
NSW 126	yes	338	Jun-47	15.88	—	—	—	17.1	Upper Branch Project Book, R.I. Office
NSW 131	no	303	Jun-47	5.84	—	7.2	—	7.2	Upper Branch Project Book, R.I. Office
NSW 135	no	343	Jun-47	13.64	—	19	—	19	Upper Branch Project Book, R.I. Office
NSW 136	no	302	Jun-47	9.41	—	—	—	16	Upper Branch Project Book, R.I. Office
NSW 138	yes	255	Jun-47	13.01	—	16	—	16	Upper Branch Project Book, R.I. Office
NSW 147	yes	230	Jul-54	3	850	—	—	111	Johnston and Dickerman, 1974c
NSW 158	yes	240	Sep-55	6.6	2,080	17	—	29	Johnston and Dickerman, 1974c
NSW 159	yes	240	Sep-55	6.5	2,900	21	—	21	Upper Branch Project Book, R.I. Office
NSW 165	yes	240	Sep-55	6.5	2,550	26	—	26	Upper Branch Project Book, R.I. Office

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft^2/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft^2/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
NSW 166	yes	240	Sep-55	6.7	3,660	28	—	28	Upper Branch Project Book, R.I. Office
NSW 167	yes	240	Sep-55	7	2,500	29.5	—	29.5	Upper Branch Project Book, R.I. Office
NSW 171	no	307	Dec-61	7.12	—	—	—	22.4	Upper Branch Project Book, R.I. Office
NSW 172	yes	293	Dec-61	5.91	—	—	—	12.7	Upper Branch Project Book, R.I. Office
NSW 173	no	340	Dec-61	11.43	—	—	—	21.6	Upper Branch Project Book, R.I. Office
NSW 175	no	315	Dec-61	8.44	—	18	—	22.5	Upper Branch Project Book, R.I. Office
NSW 176	no	373	Dec-61	7.97	—	14	—	14	Upper Branch Project Book, R.I. Office
NSW 177	no	318	Dec-61	3.6	—	—	—	11	Upper Branch Project Book, R.I. Office
NSW 179	no	302	Dec-61	4.54	—	13.5	—	13.5	Upper Branch Project Book, R.I. Office
NSW 183	yes	255	Dec-61	2.58	704	—	—	6	Johnston and Dickerman, 1974c
NSW 185	yes	260	Dec-61	16.59	—	19	—	22	Upper Branch Project Book, R.I. Office
NSW 191	yes	280	Dec-61	5.6	—	—	—	14.2	Upper Branch Project Book, R.I. Office
NSW 192	yes	282	Dec-61	12.78	—	—	—	20.9	Upper Branch Project Book, R.I. Office
NSW 199	yes	171	—	—	9,600	—	—	41	Johnston and Dickerman, 1974c
NSW 201	yes	171	Nov-61	8	12,550	—	50	50	Johnston and Dickerman, 1974c
NSW 204	yes	171	Jan-61	5	14,500	—	—	50	Johnston and Dickerman, 1974c
NSW 310	yes	240	May-63	4	8,600	—	—	64	Johnston and Dickerman, 1974c
NSW 321	yes	258	Dec-65	46	—	75	—	400	Upper Branch Project Book, R.I. Office
NSW 323	no	264	Nov-62	55	—	65	—	308	Upper Branch Project Book, R.I. Office
NSW 324	yes	265	Nov-63	20	—	71	—	490	Upper Branch Project Book, R.I. Office
NSW 331	yes	265	Nov-68	14	8,100	87	—	87	Upper Branch Project Book, R.I. Office
NSW 332	yes	265	Nov-68	16	8,325	81.5	—	81.5	Upper Branch Project Book, R.I. Office

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft²/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft²/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
NSW 333	yes	308	Nov-68	8	4,050	37.5	—	37.5	Upper Branch Project Book, R.I. Office
NSW 335	yes	245	Nov-68	—	5,700	—	38	38	Upper Branch Project Book, R.I. Office
NSW 336	yes	240	Nov-68	5	10,600	—	70.5	70.5	Upper Branch Project Book, R.I. Office
NSW 337	yes	238	Nov-68	3	7,550	—	—	62.5	Upper Branch Project Book, R.I. Office
NSW 338	yes	272	Nov-68	4	2,400	—	—	36	Upper Branch Project Book, R.I. Office
NSW 341	yes	277	Nov-68	12	3,405	—	41.7	41.7	Upper Branch Project Book, R.I. Office
NSW 342	yes	190	Dec-68	4.5	2,850	23.5	—	23.5	Upper Branch Project Book, R.I. Office
NSW 343	yes	190	Dec-68	6	5,800	60	—	60	Upper Branch Project Book, R.I. Office
NSW 344	yes	190	—	—	7,450	54	—	54	Upper Branch Project Book, R.I. Office
NSW 345	yes	190	—	—	1,420	11.8	—	11.8	Upper Branch Project Book, R.I. Office
NSW 346	yes	190	Dec-68	—	6,000	40	—	40.5	Upper Branch Project Book, R.I. Office
NSW 347	yes	265	Oct-68	19	6,220	—	57.5	57.5	Upper Branch Project Book, R.I. Office
NSW 348	yes	220	Oct-68	6	—	—	—	27	Upper Branch Project Book, R.I. Office
NSW 349	yes	310	Nov-68	62	2,000	—	—	103	Upper Branch Project Book, R.I. Office
NSW 350	yes	260	Nov-68	16	5,675	—	59.5	59.5	Upper Branch Project Book, R.I. Office
NSW 351	yes	248	Dec-68	2	—	—	—	14.5	Upper Branch Project Book, R.I. Office
NSW 352	yes	235	Dec-68	3.6	<50	—	—	49	Upper Branch Project Book, R.I. Office
NSW 353	yes	241	Nov-68	4	850	—	—	47	Upper Branch Project Book, R.I. Office
NSW 356	yes	228	Jan-57	13.5	5,725	—	—	61.5	Upper Branch Project Book, R.I. Office
NSW 357	yes	240	Mar-63	4	6,800	—	—	50	Upper Branch Project Book, R.I. Office
NSW 358	yes	172	Feb-63	2	8,500	—	—	63	Johnston and Dickerman, 1974c
NSX 356	yes	245	May-68	2	3,100	40	—	50	Johnston and Dickerman, 1974c

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft²/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft²/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
NSX 357	yes	270	May-68	1	2,540	62	—	72	Johnston and Dickerman, 1974c
PAB 206	yes	88	Jan-52	16	<50	22	—	32	Johnston and Dickerman, 1974c
PAB 265	yes	88	Jan-52	11	3,850	25	—	36	Johnston and Dickerman, 1974c
PAB 266	yes	82	Jan-52	18	<50	20	—	30	Johnston and Dickerman, 1974c
PAB 268	yes	93	Jan-52	25	1,950	—	—	63	Johnston and Dickerman, 1974c
PAB 621	yes	86	—	—	5,300	66	—	74	Johnston and Dickerman, 1974c
PAB 622	yes	74	Jan-61	18	2,080	37	—	42	Johnston and Dickerman, 1974c
PAB 623	yes	94	Jan-61	30	4,850	50	—	55	Johnston and Dickerman, 1974c
PAW 027	yes	45	Jan-36	25	—	25	—	595	Johnston and Dickerman, 1974c
PAW 050	yes	60	Jan-16	12	—	7	—	400	Johnston and Dickerman, 1974c
PAW 087	yes	95	Nov-39	69	—	57	—	325	Johnston and Dickerman, 1974c
PAX 124	yes	86	—	—	1,640	16.4	—	16	Johnston and Dickerman, 1974c
SMW 096	no	412	Jun-47	16.76	—	—	—	20	Upper Branch Project Book, R.I. Office
SMW 097	no	428	Jun-47	10.58	—	—	—	17	USGS Well Schedule, R.I. Office
WTW 001	yes	215	Jul-46	20	1,800	29	—	29	Johnston and Dickerman, 1974c
WTW 003	no	250	Jan-46	10	<50	10	—	120	USGS Well Schedule, R.I. Office
WTW 004	no	255	Apr-37	10	<50	17	—	128	USGS Well Schedule, R.I. Office
WTW 005	yes	210	May-38	80	6,800	114	—	560	Johnston and Dickerman, 1974c
WTW 006	no	310	Sep-41	9	<50	17	—	72	USGS Well Schedule, R.I. Office
WTW 007	yes	305	Sep-41	20	<50	27	—	217	USGS Well Schedule, R.I. Office
WTW 016	yes	138	Oct-43	2	1,600	10	—	160	Johnston and Dickerman, 1974c
WTW 017	yes	125	Mar-46	—	10,000	50	—	282	Johnston and Dickerman, 1974c

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft²/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft²/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
WTW 018	yes	130	Jun-47	12	13,600	80	—	750	Johnston and Dickerman, 1974c
WTW 029	yes	150	Oct-01	—	15,400	—	—	77	Johnston and Dickerman, 1974c
WTW 030	yes	150	Jun-47	—	17,400	—	—	87	Johnston and Dickerman, 1974c
WTW 031	yes	175	May-37	—	5,000	—	—	—	USGS Well Schedule, R.I. Office
WTW 036	yes	290	—	—	9,000	—	—	—	USGS Well Schedule, R.I. Office
WTW 040	yes	150	Nov-47	—	14,800	—	—	74	Johnston and Dickerman, 1974c
WTW 089	yes	260	Aug-33	23	—	—	—	28	Johnston and Dickerman, 1974c
WTW 097	yes	235	Jun-48	26	—	—	—	28	Johnston and Dickerman, 1974c
WTW 102	yes	165	Jun-48	20	—	—	—	27	Johnston and Dickerman, 1974c
WTW 108	yes	305	Jun-48	14	—	22	—	22	Johnston and Dickerman, 1974c
WTW 109	no	260	Jun-48	17	—	26	—	26	Johnston and Dickerman, 1974c
WTW 114	no	370	Jun-48	4.52	<50	—	—	10	USGS Well Schedule, R.I. Office
WTW 116	no	355	Jun-48	9.95	<50	—	—	24	USGS Well Schedule, R.I. Office
WTW 119	no	315	Jun-48	4.65	<50	—	—	15	USGS Well Schedule, R.I. Office
WTW 123	yes	140	Jun-48	2	—	—	—	6	Johnston and Dickerman, 1974c
WTW 124	no	250	Jun-48	21.27	<50	11	—	102	USGS Well Schedule, R.I. Office
WTW 132	yes	155	Jan-51	13	13,350	64	—	21	Johnston and Dickerman, 1974c
WTW 133	yes	155	Aug-54	8	2,400	—	61	61	Johnston and Dickerman, 1974c
WTW 135	yes	157	Jun-54	8	1,600	—	84	84	Johnston and Dickerman, 1974c
WTW 138	yes	156	Jun-54	10	5,325	—	92.5	92	Johnston and Dickerman, 1974c
WTW 139	yes	156	Jul-54	5	3,950	—	84	84	Johnston and Dickerman, 1974c
WTW 140	yes	120	Jan-54	10	<50	45	46	46	Johnston and Dickerman, 1974c

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft^2/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft^2/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
WTW 143	yes	130	Jul-54	16	6,650	—	72.5	52	Johnston and Dickerman, 1974c
WTW 145	yes	130	Jul-54	13	1,000	39	41	41	Johnston and Dickerman, 1974c
WTW 146	yes	115	Jul-54	6	200	—	29	29	Johnston and Dickerman, 1974c
WTW 148	yes	125	Jul-54	15	6,000	—	55	45	Johnston and Dickerman, 1974c
WTW 149	yes	110	Jul-54	6	2,975	—	38.5	37	Johnston and Dickerman, 1974c
WTW 150	yes	125	Aug-54	13	700	—	27	27	Johnston and Dickerman, 1974c
WTW 151	yes	125	Aug-54	16	200	67	69	69	Johnston and Dickerman, 1974c
WTW 152	yes	110	Aug-54	5	600	—	71	71	Johnston and Dickerman, 1974c
WTW 153	yes	130	Jul-54	16	5,050	—	—	64	Johnston and Dickerman, 1974c
WTW 154	yes	125	Jul-54	16	4,300	—	55	48	Johnston and Dickerman, 1974c
WTW 156	yes	110	—	—	2,100	—	31	31	Johnston and Dickerman, 1974c
WTW 157	yes	130	Nov-57	20	7,800	61	—	58	Johnston and Dickerman, 1974c
WTW 158	yes	125	Oct-57	17	5,800	—	—	46	Johnston and Dickerman, 1974c
WTW 159	yes	160	Nov-55	10	—	—	—	50	Johnston and Dickerman, 1974c
WTW 163	yes	200	Apr-70	28	1,350	—	—	42	Johnston and Dickerman, 1974c
WTW 164	yes	198	Jul-71	22	—	50	—	335	Johnston and Dickerman, 1974c
WTW 165	yes	150	Sep-56	1	—	—	—	—	USGS Well Schedule, R.I. Office
WTW 187	yes	125	Apr-62	12	—	26	—	26	USGS Well Schedule, R.I. Office
WTX 59	yes	156	May-39	5	<50	—	—	92	Johnston and Dickerman, 1974c
WTX 61	yes	163	May-39	13	<50	27	27	27	Johnston and Dickerman, 1974c
WTX 63	yes	158	May-39	10	4,250	—	—	62	Johnston and Dickerman, 1974c
WTX 71	yes	160	May-39	10	<50	44.5	—	52	Johnston and Dickerman, 1974c

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft²/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft²/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
WTX 72	yes	159	May-39	10	<50	—	—	59	Johnston and Dickerman, 1974c
WTX 81	yes	158	Jun-39	20	1,100	61	—	63	Johnston and Dickerman, 1974c
WTX 82	yes	158	Jun-39	9	<50	27	—	30	Johnston and Dickerman, 1974c
WTX 84	yes	157	Jun-39	7	2,105	—	—	56	Johnston and Dickerman, 1974c
WTX 160	yes	141	Mar-61	7	650	—	—	52	Johnston and Dickerman, 1974c
WTX 161	yes	145	Apr-61	9	450	—	—	52	Johnston and Dickerman, 1974c
WTX 162	yes	120	Aug-64	19	5,000	—	69	69	Johnston and Dickerman, 1974c
WTX 166	yes	155	Sep-56	6	6,800	—	—	80	Johnston and Dickerman, 1974c
WTX 168	yes	142	Jun-55	-8	500	2	—	14	Johnston and Dickerman, 1974c
WTX 169	yes	157	Mar-56	3	<50	15	—	25	Johnston and Dickerman, 1974c
WTX 170	yes	165	Mar-56	5	600	11	—	18	Johnston and Dickerman, 1974c
WTX 171	yes	170	Mar-56	5	<50	22	—	32	Johnston and Dickerman, 1974c
WTX 172	yes	170	Mar-56	2	<50	12	—	23	Johnston and Dickerman, 1974c
WTX 173	yes	113	Aug-62	-4	200	4	—	20	Johnston and Dickerman, 1974c
WTX 174	yes	114	Aug-62	-2	<50	9	—	34	Johnston and Dickerman, 1974c
WTX 176	yes	113	Aug-62	-4	600	12	—	27	Johnston and Dickerman, 1974c
WTX 177	yes	121	Feb-63	22	3,000	—	—	60	Johnston and Dickerman, 1974c
WTX 179	yes	121	Mar-63	9	<50	—	—	45	Johnston and Dickerman, 1974c
WTX 180	yes	127	Mar-57	8	500	—	—	45	Johnston and Dickerman, 1974c
WTX 181	yes	133	Mar-63	7	700	37	—	55	Johnston and Dickerman, 1974c
WTX 182	yes	142	Mar-63	10	850	32	—	46	Johnston and Dickerman, 1974c
WTX 183	yes	123	Mar-63	14	<50	—	—	50	Johnston and Dickerman, 1974c

Appendix. Hydrogeologic data for the Blackstone River Basin, northern Rhode Island.—Continued

[ft, feet; ft²/d, feet squared per day; <, less than; NGVD 29, National Geodetic Vertical Datum of 1929; USGS, U.S. Geological Survey; R.I., Rhode Island; GWSI, Ground Water Site Inventory database; —, not available]

Well number	Sand and gravel aquifer	Land-surface altitude, in ft above NGVD 29	Date of water-level measurement	Depth to water, in ft below land surface	Transmissivity, in ft²/day	Depth to bedrock, in ft	Depth to refusal, in ft	Depth of hole, in ft	Source of data
WTX 184	yes	123	Feb-63	11	<50	—	—	50	Johnston and Dickerman, 1974c
WTX 186	yes	131	—	—	1,975	—	—	50	Johnston and Dickerman, 1974c
WTX 188	yes	125	Apr-62	10	3,900	32	—	38	Johnston and Dickerman, 1974c
WTX 189	yes	140	Aug-72	17	1,870	30	—	36	Johnston and Dickerman, 1974c
WTX 190	yes	125	Aug-72	13	4,600	—	—	60	Johnston and Dickerman, 1974c
WTX 191	yes	125	Aug-72	15	6,800	49	—	59	Johnston and Dickerman, 1974c
WTX 192	yes	140	Aug-72	16	2,150	41	—	46	Johnston and Dickerman, 1974c
WTX 193	yes	120	Sep-72	9	600	18	—	28	Johnston and Dickerman, 1974c
WTX 194	yes	180	Aug-72	22	1,200	—	—	52	Johnston and Dickerman, 1974c
WTX 195	yes	170	Sep-72	9	900	—	—	30	Johnston and Dickerman, 1974c
WTX 197	no	205	Sep-72	10	300	13	—	18	Johnston and Dickerman, 1974c