

Abstract

The hydrogeology of a 446-square-mile area surrounding the Fort Drum Military Reservation in parts of Jefferson, St. Lawrence, and Lewis Counties, N.Y., is presented on six sheets depicting well locations, surficial geology (pl. 2), geologic sections (pl. 3), water-table altitude (pl. 4), bedrock geology (pl. 5), and potentiometric surface of the bedrock aquifer (pl. 6). The report was compiled from published reports and from previously collected geologic and hydrologic data. The reservation encompasses approximately 167 square miles and has an average population of 650. During summer training exercises, however, the population may range from 7,000 to 16,000 requiring ground-water pumping of nearly 4 million gallons per day.

The primary source of water for the base is a confined bedrock aquifer composed of sandstone and limestone units. A surficial water-table aquifer consisting of deltaic sand covers the southern third of the reservation and is tapped by several military supply wells. Yields from bedrock wells on the base range from 150 to 475 gallons per minute; yields from wells screened in the surficial deposits range from 100 to 150 gallons per minute. A thick lacustrine unit of silty clay may restrict ground-water flow between the two aquifers in most areas. The silty clay is absent in the southwestern part of the reservation, and water can readily move downward from the surficial aquifer to recharge the underlying bedrock aquifer.

INTRODUCTION

These maps and geologic sections represent a compilation of geologic and hydrologic data on a 446-square-mile area centered on the Fort Drum Military Reservation. The reservation itself occupies 167 square miles and is underlain by bedrock units that include sedimentary

limestone and sandstone, metamorphic schist and gneiss, and igneous crystalline rock. These units are overlain by surficial deposits of Pleistocene age. The reservation obtains its water supply from 12 drilled wells. Nine tap the confined bedrock aquifer and have yields ranging from 150 to 475 gal/min; the other three tap the surficial sand (water-table) aquifer and have yields ranging from 100 to 150 gal/min. The reservation has a permanent population of about 650, but the population during summer training exercises may range from 7,000 to 16,000. Total rated capacity of the 12 supply wells is approximately 4.2 Mgal/d; withdrawals during training periods often approach 4 Mgal/d.

Purpose and Scope

This report is the result of a study undertaken in 1982 in cooperation with the U.S. Army to investigate the hydrogeology of the Fort Drum Military Reservation and surrounding area. The report (1) summarizes the hydrogeology of the area from available data, (2) provides data necessary for management decisions by military, State, or local water agencies regarding ground-water availability and potential contamination of ground-water supplies, and (3) provides a basis for future detailed ground-water studies.

This report consists of six sheets at 1:48,000 scale depicting location of wells and test holes, surficial and bedrock geology, geologic sections, water-table altitude in the surficial sand aquifer, and potentiometric surface of the bedrock aquifer.

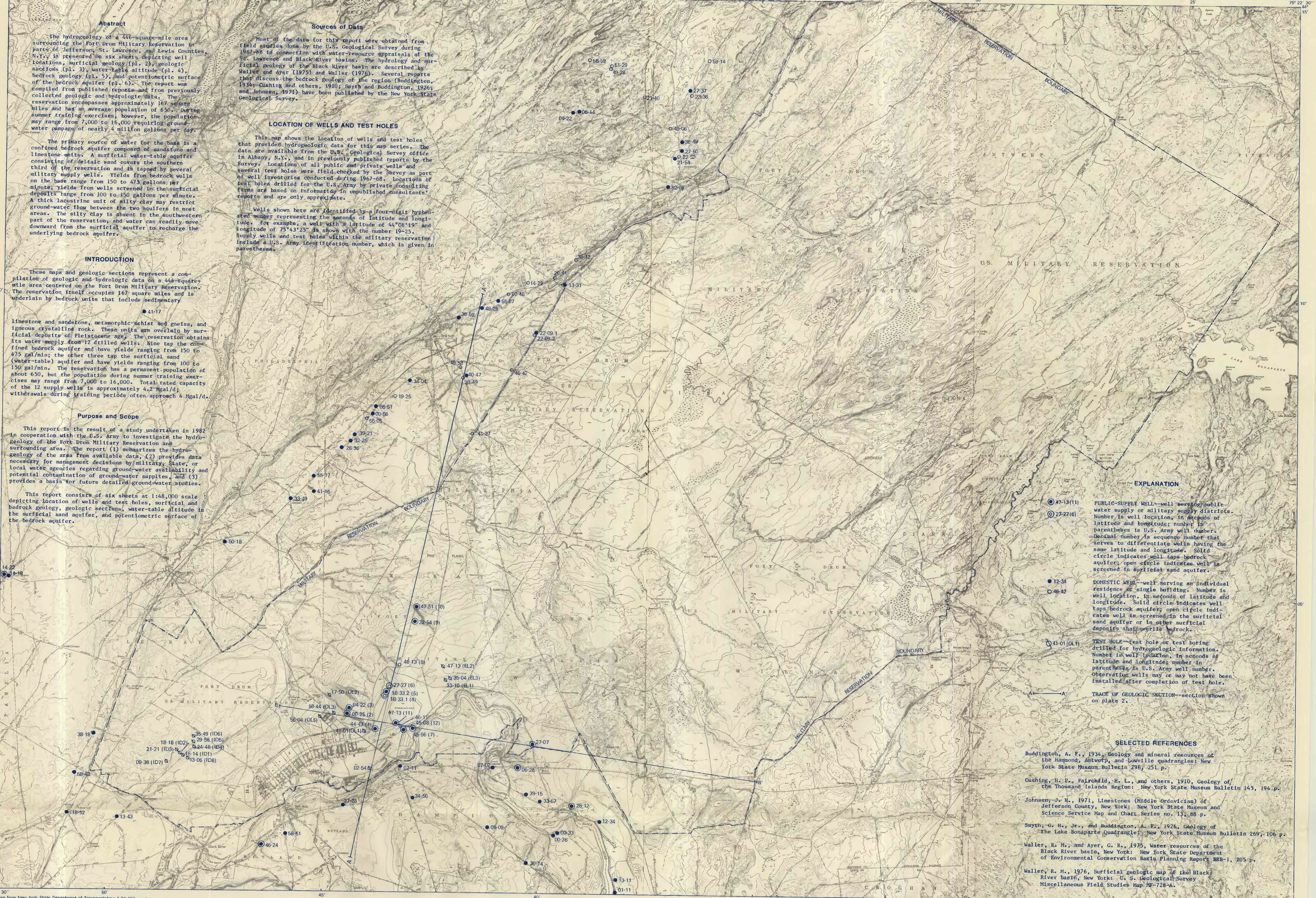
Sources of Data

Most of the data for this report were obtained from field studies done by the U.S. Geological Survey during 1967-68 in connection with water-resource appraisals of the St. Lawrence and Black River basins. The hydrology and surficial geology of the Black River basin are described by Waller and Ayer (1975) and Waller (1976). Several reports that discuss the bedrock geology of the region (Buddington, 1934; Cushing and others, 1910; Smyth and Buddington, 1926; and Johnsen, 1971) have been published by the New York State Geological Survey.

LOCATION OF WELLS AND TEST HOLES

This map shows the location of wells and test holes that provided hydrogeologic data for this map series. The data are available from the U.S. Geological Survey office in Albany, N.Y., and in previously published reports by the Survey. Locations of all public and private wells and several test holes were field checked by the Survey as part of well inventories conducted during 1967-68. Locations of test holes drilled for the U.S. Army by private consulting firms are based on information in unpublished consultants' reports and are only approximate.

Wells shown here are identified by a four-digit hyphenated number representing the seconds of latitude and longitude. For example, a well with a latitude of 44°09'19" and longitude of 75°43'25" is shown with the number 19-25. Supply wells and test holes within the military reservation include a U.S. Army identification number, which is given in parentheses.



Base from New York State Department of Transportation 1:24,000 series
Black River (1980), Defenest (1980), Antwerp (1980), North Wilna (1980),
Natural Bridge (1969), Lake Bonaparte (1968), Natural Dam (1968) 1:24,000 quadrangles

EXPLANATION

PUBLIC-SUPPLY WELL—well serving public water supply or military supply districts. Number is well location, in seconds of latitude and longitude; number in parentheses is U.S. Army well number. Decimal number is sequence number that serves to differentiate wells having the same latitude and longitude. Solid circle indicates well taps bedrock aquifer; open circle indicates well is screened in surficial sand aquifer.

DOMESTIC WELL—well serving an individual residence or single building. Number is well location, in seconds of latitude and longitude. Solid circle indicates well taps bedrock aquifer; open circle indicates well is screened in the surficial sand aquifer or in other surficial deposits that overlie bedrock.

TEST HOLE—test hole or test boring drilled for hydrogeologic information. Number is well location, in seconds of latitude and longitude; number in parentheses is U.S. Army well number. Observing wells may or may not have been installed after completion of test hole.

TRACE OF GEOLOGIC SECTION—section shown on plate 2.

SELECTED REFERENCES

Buddington, A. F., 1934, Geology and mineral resources of the Hammond, Antwerp, and Lowville quadrangles: New York State Museum Bulletin 296, 251 p.

Cushing, H. E., Fairchild, H. L., and others, 1910, Geology of the Thousand Islands Region: New York State Museum Bulletin 145, 194 p.

Johnsen, J. H., 1971, Limestones (Middle Ordovician) of Jefferson County, New York: New York State Museum and Science Service Map and Chart Series no. 13, 88 p.

Smyth, G. H., Jr., and Buddington, A. F., 1926, Geology of the Lake Bonaparte Quadrangle: New York State Museum Bulletin 269, 106 p.

Waller, R. M., and Ayer, G. R., 1975, Water resources of the Black River basin, New York: New York State Department of Environmental Conservation Basin Planning Report BRB-1, 205 p.

Waller, R. M., 1976, Surficial geologic map of the Black River basin, New York: U.S. Geological Survey Miscellaneous Field Studies Map MF-728-A.

Hydrogeology by R.J. Reynolds (1983)

HYDROGEOLOGY OF THE FORT DRUM AREA, JEFFERSON, LEWIS, AND ST. LAWRENCE COUNTIES, NEW YORK
By
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LOCATION OF WELLS AND TEST HOLES