DIVISION OF WATER

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RESOURCE ASSESSMENT 90-3
PLATE 2A
UPPER BASIN

BEDROCK SYSTEMS

SILURIAN AND DEVONIAN CARBONATE

Limestone, dolomite, and dolomitic limestone. This is the principle bedrock aquifer in the basin and the only bedrock aquifer capable of supporting high-capacity pumpage. Many large-diameter irrigation wells produce 300 to 1000 gpm, but small-diameter domestic wells produce 10 to 30 gpm.

DEVONIAN ANTRIM SHALE

Black shale. The few wells completed in this shale unit produce less than 15 gpm. It is an unlikely source for greater amounts of water.

DEVONIAN AND MISSISSIPPIAN ELLSWORTH SHALE

Shale having limestone or dolomite lenses in the upper part and variably colored shale units in the lower part. The ground-water potential of this unit is not known because major aquifers occur in the overlying, thick unconsolidated deposits; however, shale is not usually productive.

UNCONSOLIDATED AQUIFER SYSTEMS

VALPARAISO MORAINE AQUIFER SYSTEM

The Valparaiso Moraine is a till-capped deposit cored with fine- to medium-grained sand having some gravel lenses. The average thickness of the till cap is 20 feet, but in places the till cap is absent. Aquifer thickness ranges from 18 to 136 feet in the upper basin, but deposits are thinner in the lower basin. Expected high-capacity yields are 100 to 600 gpm, although yields up to 800 gpm are reported. The aquifer system's susceptibility to surface contamination ranges from moderate to high, depending on the thickness of the till cap.

VALPARAISO OUTWASH APRON AQUIFER SYSTEM

This aquifer system, which forms the southern slope of the Valparasio Moraine, is a deposit of fine- to medium-grained sand interbedded with gravel-rich zones and clay lenses. Two characteristic units are shale-rich gravel lenses scattered throughout the apron and a blue silty-clay deposit in central LaPorte County. The outwash apron is more than 100 feet thick near LaPorte and thins southward to about 10 feet over a bedrock high near Lomax. Expected high-capacity yields range from 150 to 600 gpm, although yields up to 1100 gpm are reported in some areas. Because there is no clay-rich cap, the aquifer system is highly susceptible to surface contamination.

KANKAKEE AQUIFER SYSTEM

The Kankakee Aquifer System is an unconfined deposit of fine- to medium-grained sand, which is interbedded with gravel lenses in the tributary valleys. The aquifer system thickness ranges from less than 20 feet where the unit overlies bedrock highs to more than 150 feet in tributary valleys. In the northeast end of the basin the Kankakee Aquifer System grades into the St. Joseph Aquifer System, which contains a high proportion of interbedded gravel. Reported high-capacity well yields typically range from 100 to 1200 gpm, but yields up to 1500 gpm may be obtained in some locations in the upper basin. Due to the absence of clay deposits, the aquifer system is highly susceptible to surface contamination.

EOLIAN SANDS AQUIFER SYSTEM

This aquifer system is a drift complex which contains intratill lenses of sand and gravel and a characteristic blanket of windblown sand on the surface. Aquifers within this system include the surficial sands and intratill sand and gravel lenses. The aquifer units vary in thickness from 4 to 72 feet, but most are in the range of 10 to 30 feet. High-capacity wells have produced up to 1200 gpm, but expected yields range from 100 to 600 gpm. The surficial sand deposits are highly susceptible to contamination, but the intratill deposits are only slightly susceptible.

NAPPANEE AQUIFER SYSTEM

This aquifer system is composed of thin intratill sand and gravel lenses within a thick till deposit. Most of the intratill aquifers are from 3 to 10 feet thick, but a few are more than 30 feet thick. This system may yield 50 to 600 gpm to high-capacity wells. Except for areas where surface sand and gravel are present, this aquifer system is only slightly susceptible to contamination.

MAXINKUCKEE MORAINE AQUIFER SYSTEM

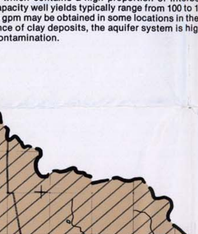
This aquifer system has a complex architecture of thin intratill sand and gravel units within a thick till deposit and locally thick, coarser grained surficial deposits. Most of the aquifers are between 3 and 35 feet thick. High-capacity wells have reported yields up to 1400 gpm, but maximum expected yields are 100 to 600 gpm. The aquifer system is moderately to highly susceptible to surface contamination, depending on local conditions.

HILLTOP AQUIFER SYSTEM

This aquifer system is primarily a sandy gravel deposit interbedded with clay lenses. The aquifer thickness in places exceeds 100 feet. The aquifer may yield 25 to 150 gpm to high-capacity wells. The susceptibility to surface contamination is high where the aquifer system is not overlain by a clay-rich unit.

ST. JOSEPH AND TRIBUTARY VALLEY AQUIFER SYSTEM

Thick sand and gravel deposits characterize this aquifer system in northwestern St. Joseph County, where the aquifer system thickness may exceed 100 feet. The extension of this aquifer system in Kosciusko County is also a coarse-grained deposit, but clay-rich zones are more common. High-capacity wells may produce 500 to 1000 gpm in the Kankakee basin portion of the system. This aquifer system is highly susceptible to surface contamination where clay-rich surface deposits are absent.



STATE OF INDIANA
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF WATER

UPPER KANKAKEE RIVER BASIN

4 MILES
5000 0 5000 10000 15000 20000 FEET
0 1 2 3 4 5 6 KILOMETERS

PLATE 2A. UNCONSOLIDATED AND BEDROCK AQUIFER SYSTEMS