

2.0 Groundwater

Groundwater is a vital natural resource in Washtenaw County. It is used in industry and agriculture, and provides virtually 100% of the drinking water supply in the rural parts of the County.

What is Groundwater?

In the simplest terms groundwater is water that comes from the ground. More specifically, groundwater is water that fills cracks and spaces between particles of soil and rocks. When water fills all the pores and open spaces, it's called the saturated zone. The dividing line between the saturated zone and overlying unsaturated rock or sediment is called the water table. Contrary to what many believe, groundwater doesn't generally consist of underground lakes or streams, but rather fills the irregular space within the rock fractures or between particles of sand, gravel or clay. Then as the water moves through the ground, it dissolves some of the naturally occurring minerals it contacts. These dissolved minerals give the groundwater its chemical characteristics, affecting such things as taste and hardness. The most common dissolved mineral substances are sodium, calcium, magnesium, potassium, chloride, bicarbonate and sulfate.

When surface water percolates from land areas or streams through permeable soils into water-holding rocks that provide underground storage, it is called groundwater recharge

Groundwater Facts...

- ◆ Over 50% of Washtenaw County residents rely on groundwater as their primary source of drinking water.
- ◆ Approximately one-fifth of the earth's fresh water is contained in the Great Lakes basin.
- ◆ Most of Washtenaw County's drinking water comes from drift aquifers.

(Map 1). Groundwater can be recharged from rain water that infiltrates from woodlands and surface water features like wetlands, lakes, and streams. Woodlands, wetlands and floodplains provide a filtering system for groundwater recharge areas. When water bearing soil or rock yield significant amounts of water to wells or springs, it is called an aquifer. An aquifer may be a layer of gravel or sand, a layer of sandstone or limestone, or even a large body of massive rock such as fractured granite. Aquifers can be confined or unconfined. Confined aquifers have water-bearing layers bound by impermeable soil barriers above and below. Water in these aquifers is under pressure; therefore, when a well is installed in a confined aquifer, the water level in the well casing rises above the top of the aquifer. Unconfined aquifers or water table aquifers are the saturated portions of soil profile open to the atmosphere through permeable material located above an impermeable soil barrier.

The primary source for groundwater in Washtenaw County comes from drift aquifers (Map 1). Drift aquifers exist in sand and gravel formations that were deposited during periods of continental glaciation known as the Ice Ages. The drift aquifers exist above the bedrock aquifers. Bedrock aquifers in Washtenaw County are contained in the consolidated sandstone and limestone sedimentary bedrocks that were deposited millions of years ago. The quality of groundwater in the bedrock can vary dramatically from potable drinking water to unusable water that contains high levels of salt, methane gas, hydrogen sulfide, and other dissolved minerals. Bedrock aquifers are typically only explored in Washtenaw County when there is no acceptable drift aquifer present. The most dependable bedrock aquifer in Washtenaw County exists in the western part of the County in the Marshall Sandstone bedrock formations.

Map 1: Drift Aquifer Characteristics and Groundwater Recharge Areas



Washtenaw County:



Legend

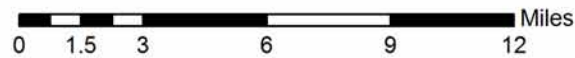
Groundwater Recharge Area

Drift Aquifer Characteristics

Drift generally not an aquifer, may include thin interbedded aquifers at depth.

Drift usually unconfined at or near the surface, generally consists of interbedded aquifers, confining layers and semi-confining layers at depth.

Drift may or may not be an aquifer at or near the surface. Drift generally consists of interbedded aquifers, confining layers and semi-confining layers at depth.



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