



Calvert County Environmental Commission

Groundwater Resources in Calvert County

1. Where does our drinking water come from?

Calvert County residents rely on water that comes from deep underground--mostly from the Piney Point and Aquia aquifers--for drinking, bathing, flushing toilets, watering lawns, and all other household and commercial uses. The Magothy aquifer, below the Piney Point and Aquia aquifers, underlies the northern half of the county and is currently much less used than the two shallower aquifers. Currently, groundwater withdrawals in Calvert County total 6.3 million gallons per day (MGD), with 3.4 MGD used for public supplies and 2.9 MGD for domestic uses. Even deeper aquifers (Upper Patapsco, Lower Patapsco, and Patuxent) offer other potential groundwater supplies.

2. What is an aquifer?

An aquifer is an underground layer of water-bearing permeable rock, rock fractures, or gravel/sand/silt from which water can be withdrawn using a water well. Aquifers can occur at various depths below the land surface. The top of the water level in an aquifer is called the water table. Aquifers act as huge underground store houses or reservoirs of water.

3. How deep are the aquifers from which the county gets its water?

In Calvert County, the Piney Point aquifer lies between 75 and 230 feet below sea level. The Aquia aquifer is deeper and lies between 100 and 480 feet below sea level. Deeper still is the Magothy aquifer that ranges in depth from about 350 feet below sea level in the northern part of the county to about 640 feet below sea level in central Calvert County at the southern-most extent of this aquifer [OFR 12-02-20 \(md.gov\)](#).

4. Do aquifer levels vary by location, between aquifers, and over time?

Yes. In the Piney Point aquifer, current water levels range from about 30 feet above sea level in the central part of Calvert County to about 20 feet below sea level at Solomons Island. In the Aquia aquifer, current water levels range from about 40 feet below sea level in the northern part of the county to about 150 feet below sea level at Solomons Island. Water levels in the Magothy aquifer range from about 25 feet below sea level in the northern part of the county to about 50 feet below sea level in central Calvert County. [Interactive Water-Level Mapper Tool \(md.gov\)](#)

5. What's known about groundwater quantity and quality under Calvert County?

Quantity:

The Piney Point aquifer has proven to be a reliable, long-term source of groundwater in Calvert County. Water levels remain substantially above the Aquia aquifer levels, particularly surrounding major well fields. Although water levels have declined significantly in the Aquia aquifer over past decades, current trends are stabilizing because groundwater withdrawals in St. Mary's County have been reduced. Projected water demands for domestic uses in Calvert County could be met by increased withdrawals from the Aquia aquifer without reducing water levels below safe levels. Shifting a portion of public-supply withdrawals from the Aquia aquifer to the deeper Patapsco aquifers would result in an increase in available drawdown.

The Magothy aquifer underlies the northern half of Calvert County and is rarely used as a water supply. There are only six permitted users of the Magothy aquifer in the county at this time: Cavalier Country, Northern High School, Shores of Calvert, Shoppes at Apple Green, Swan Farm, and Dunkirk Business Park. There is likely no domestic usage of water from the Magothy aquifer in the county. Since this aquifer is so rarely pumped, long-term sustainability is a less important issue at this time.

Given the limited extent to which the Upper Patapsco and Lower Patapsco aquifers are currently being used in Calvert County, significant groundwater supplies are available. The Lower Patapsco aquifer is being used for public water supply in Prince Frederick and industrial water supply at Cove Point. Both of these deeper aquifers could supplement the Aquia aquifer for larger groundwater users in the future.

The deepest aquifer in Maryland's Coastal Plain, the Patuxent, has not been tapped in Calvert County. Limited data from this aquifer in Charles County suggests that groundwater capacity potential may be less than in the upper (shallower) aquifers.

Quality:

Both the Piney Point and Aquia aquifers have excellent water quality and typically require little if any treatment. Both groundwaters are sodium-bicarbonate types with moderate to relatively high pH (7.0 - 8.5), low total dissolved solids (less than 200 mg/L), and low iron levels (less than 0.5 mg/L). In northern Calvert County, both aquifers can have higher calcium and iron levels, resulting in nuisance problems such as staining and scale formation on plumbing fixtures. In the southern part of the county, the Aquia aquifer contains naturally-occurring arsenic at levels above the U.S. EPA's maximum contaminant level of 10 µg/L.

Not all wells tapping the aquifer have elevated arsenic levels. The Magothy aquifer is a calcium-bicarbonate type with iron levels typically higher (greater than 0.5 mg/L) than in the Piney Point and Aquia aquifers. Information on groundwater quality in the Magothy aquifer under Calvert County is limited because of the scarcity of wells tapping into this aquifer. Groundwater in the Upper Patapsco aquifer (based on analyses of only two wells) has relatively low total dissolved solids (less than 130 mg/L), moderate pH (7.0-7.9), and iron levels as high as 4.9 mg/L. Groundwater in the Lower Patapsco aquifer (based on analyses of only one well) has relatively low total dissolved solids (less than 260 mg/l), high pH (8.7), and relatively low iron levels (0.1 mg/L). Limited data from wells in Charles County suggest that groundwater quality in the deepest Patuxent aquifer is generally good. For more information, check these references.

[OFR 12-02-20 \(md.gov\)](#)

[RI 78 \(md.gov\)](#)

[Arsenic interactive map \(md.gov\)](#)

6. What can County residents do to protect our groundwater resources?

Water conservation should be diligently pursued to avoid declining groundwater levels and to ensure sustainable supplies. While perhaps of more benefit to the shallower water-table aquifers, residents should be careful not to contaminate ground surfaces with common household and garden chemicals, used motor oil, etc. that can leach into the groundwater aquifers. Because

groundwater is the only source of potable water in Calvert County, collection/use of rainwater for watering plants and livestock should be encouraged. Reuse of “gray” water should also be considered to further conserve groundwater supplies.

7. What department or agency is the County will test well water for homeowners?

No department in Calvert County tests well water for homeowners. The Department of Health located in the County Services Building, Prince Frederick, can provide a list of water testing companies to homeowners who are interested in having their well water tested (410-535-5400)

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