



Mississippi Private Well Populations

For decades, Mississippians have enjoyed a plentiful groundwater supply, but the time has long since past when each individual home had its own well or cistern. Today, most Mississippians receive their drinking water from public water supplies, which are tested monthly for contaminants. If contaminants are found that exceed allowable levels, the public is notified immediately, and corrective action is taken. While this activity is vital to ensure the continuous, safe water supply we have come to expect, there are still a significant number of Mississippians who depend on private wells for their water.

The Mississippi State Department of Health's (MSDH) Bureau of Public Water Supply, with authorization from the United States Environmental Protection Agency, serves as the regulatory body for the Safe Drinking Water Act in Mississippi. To carry out its role, the MSDH collects county-level data on the percentage of the population served by the county's public water supply systems.

The decennial United States Census included questions on drinking water sources for households through 1990. These questions provided a comprehensive, reliable, and transparent method for calculating the number of people on private wells in any state or county. Since these questions were not included in the 2000 or 2010 censuses and the 1990 results have become outdated, estimating the percentage of state and county populations on private wells has become more challenging. Although census data on population are available and estimates of population served by public water supplies are reported by the Environmental Protection Agency (EPA) Safe Drinking Water Information System¹, attempting to back-calculate the number of private well users with these datasets yields negative estimates. Some of the reasons for these incompatible numbers have been discovered during this research, and other datasets and methods are being explored to more accurately calculate the number of private well users in Mississippi.

Data Collection and Methods

County populations were determined using the United States Census Bureau's 2018 data, which contains county population data for all Mississippi counties. The MSDH performs a capacity development assessment annually for every community public water supply (water system) in Mississippi. MSDH uses the number of connections for a particular water system multiplied by a factor of 2.6 people per connection to determine the number of people being served by that water system. Each water system is designated as being in a particular county, which allows a list of water systems to be generated for each county. Once this list is generated and the population of each water system calculated, a total population served by water systems in each county can be determined.

Inactive water systems may still have an identification number even though they are not in service. People who formerly depended on these inactive water systems are being served by another water system and are included in that water system's population. To determine accurate population numbers served by water systems, the MSDH data was further analyzed, and all water systems classified as inactive (I) were removed from their county's total population served. A margin of error exists for water systems that are identified with one county but serve populations that overlap into adjoining counties. Even though a water system's population served is correct, it may not accurately reflect the population recorded as living in that county.

Not all public water system connections are residential; a substantial fraction of connections are to public buildings, businesses, and places of worship. This is likely to lead to a large overestimate in the Safe Drinking Water Information System of population served by public drinking water systems. An analysis conducted by the Mississippi office of the United States Geological Survey (USGS) found that approximately 15 percent of connections in urbanized counties were nonresidential.

¹Safe Drinking Water Information System (SDWIS) contains information about public water systems and their violations of EPA's drinking water regulations, as reported to EPA by the states.

Although the exact percentage may vary between counties, applying a statewide estimate of 15 percent nonresidential connections will yield a more accurate calculation of the population served by public water supplies. This allows researchers to more accurately estimate the number of individuals by county who may receive their drinking water from a private well.

Results and Discussion

Results from the 2018 census show that 58 counties have populations that are not served by a public water system. The 58 counties are divided into three groups based on the number of people in the county’s population not being served by a public water system. Twenty-eight counties have a population of 1 to 3,000 not being served by a public water system; 23 counties have a population of 3,001 to 10,000 not being served by a public water system; and seven counties have a population of 10,001 and above not being served by a public water system.

It is important to note the actual population of a county using private wells. Considering overall county populations are not the same, it is possible for two counties to have the same or similar percentage but different populations using private wells. Tables 1, 2, and 3 delineate the actual populations that make up the percentages.

Table 1. County and water system populations/percentages of 10,001-plus.

Area	Population on public supply	Population on private well	% of county population on private well
MISSISSIPPI	2,601,702	382,398	12.81
Harrison	159,183	45,844	22.36
Jackson	110,445	31,707	22.31
Hinds	215,084	24,413	10.19
Marshall	16,548	19,071	53.54
Tate	13,693	14,748	51.85
DeSoto	165,211	13,540	7.57
Pearl River	44,139	11,131	20.14

United States Census Data 2018.
Mississippi State Department of Health–Bureau of Public Water Supply Capacity Development Assessment (Fiscal Year 2018).

Table 2. County and water system populations/percentages of 3,001 to 10,000.

Area	Population on public supply	Population on private well	% of county population on private well
Hancock	37,183	9,870	20.98
George	14,832	9,262	38.44
Lamar	54,230	7,144	11.64
Lafayette	47,441	6,933	12.75
Neshoba	22,586	6,783	23.10
Covington	12,381	6,698	35.11
Lincoln	28,378	5,969	17.38
Jones	62,009	5,921	8.72
Marion	19,839	5,230	20.86
Itawamba	18,289	5,219	22.20
Leake	17,511	5,204	22.91
Stone	13,132	4,980	27.49
Lowndes	54,376	4,810	8.13
Greene	8,545	4,800	35.97
Washington	41,431	4,790	10.36
Pike	35,957	4,450	11.01
Smith	12,036	4,042	25.14
Sunflower	22,367	3,614	13.91
Tallahatchie	10,542	3,583	25.37
Benton	4,830	3,482	41.89
Copiah	25,361	3,155	11.06
Newton	18,046	3,139	14.82
Panola	30,872	3,122	9.18

United States Census Data 2018.
Mississippi State Department of Health–Bureau of Public Water Supply Capacity Development Assessment (Fiscal Year 2018).

Table 3. County and water system populations/percentages of 1 to 3,000.

Area	Population on public supply	Population on private well	% of county population on private well
Perry	9,148	2,884	23.97
Wayne	17,579	2,867	14.02
Union	25,851	2,705	9.47
Bolivar	29,244	2,701	8.46
Clarke	13,210	2,618	16.54
Warren	44,453	2,315	4.95
Yazoo	24,933	2,124	7.85
Alcorn	35,179	2,031	5.46
Amite	10,430	2,018	16.21
Walthall	13,029	1,470	10.14
Pontotoc	30,264	1,376	4.35
Noxubee	9,454	1,288	11.99
Lee	83,731	1,202	1.42
Claiborne	7,857	1,093	12.21
Lawrence	11,560	1,083	8.57
Carroll	9,070	1,069	10.54
Quitman	6,397	872	11.99
Winston	17,487	759	4.16
Franklin	7,218	547	7.05
Lauderdale	75,637	518	0.68
Humphreys	8,029	313	3.75
Sharkey	4,151	284	6.41
Leflore	29,094	129	0.44
Coahoma	23,037	117	0.51
Attala	18,383	94	0.51
Issaquena	1,266	73	5.42
Yalobusha	12,432	65	0.52
Montgomery	10,142	31	0.30

United States Census Data 2018.

Mississippi State Department of Health–Bureau of Public Water Supply Capacity Development Assessment (Fiscal Year 2018).

Figure 1 shows each county that has a population of residents served by private wells; the counties are colored according to population range. It is noticeable that North Mississippi has a large population being served by private wells. Marshall, Tate, and DeSoto counties all have over 10,000 residents being served by private wells.

Central Mississippi has one county, Hinds, with a population over 10,000 being served by private wells.

South Mississippi also has a target area of counties with large populations being served by private wells. Harrison, Jackson, and Pearl River counties each have a 10,000-plus population being served by private wells.

All of the Mississippi counties noted in this study should be points of interest to local municipal water systems, local communities, and rural water associations for potential expansion of their water systems. The expansion of a public water system may achieve multiple goals. First, additional customers generate more revenue for the public water system and provide a larger customer base over which to spread costs. Second, the regulatory oversight of public water systems should promote and produce a safer drinking water supply for Mississippi residents.

For more information on private well populations in Mississippi and/or public water supplies, contact one of the following agencies:

**Mississippi State Department of Health
Bureau of Public Water Supply**

P.O. Box 1700
Jackson, MS 39215-1700
(601) 576-7518

**Center for Government and Community Development
Mississippi State University Extension Service**

P.O. Box 9643
Mississippi State, MS 39762
(662) 325-3141

**Mississippi State Department of Health
Division of Onsite Wastewater**

1-855-220-0192
www.healthymms.com/wwapply

