



MISSISSIPPI DEPARTMENT OF  
ENVIRONMENTAL QUALITY

# Agricultural Chemical Groundwater Monitoring Program

2025

Annual Summary



# MISSISSIPPI AGRICULTURAL CHEMICAL GROUNDWATER MONITORING PROGRAM



## SUMMARY AND RESULTS

2025

MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY

OFFICE OF LAND & WATER RESOURCES

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## INTRODUCTION

More than ninety percent of Mississippi's residents depend on groundwater as their primary source of drinking water. Because such a large portion of the population relies on this resource, protecting groundwater quality is a critical concern for the state. Over time, increasing agricultural activity has raised questions about whether the use of pesticides, fertilizers, and other agricultural chemicals could pose a threat to groundwater supplies. These concerns prompted efforts to better understand and monitor the potential impacts of agricultural practices on groundwater resources across Mississippi.

To address these issues, a proposal to establish an Agricultural Chemical Groundwater Monitoring Program, commonly referred to as AgChem, was developed in 1986. This initiative was supported by a coalition of organizations, including the Delta Council, the Mississippi Farm Bureau, the National Agricultural Chemicals Association, and others with an interest in both agriculture and environmental protection. Their collaborative efforts ultimately led to the passage of Mississippi Senate Bill 2778, which became effective on July 1, 1987. This legislation directed the Mississippi Department of Environmental Quality (MDEQ), then known as the Department of Natural Resources, to develop statewide groundwater quality standards and implement a comprehensive groundwater monitoring program. The bill also authorized the Mississippi Department of Agriculture and Commerce to increase pesticide and fertilizer registration fees to help fund the program and to take corrective action if agricultural chemicals were found to be contaminating groundwater resources.

In the early stages of the program, groundwater sampling focused primarily on shallow drinking water wells located in areas with the highest levels of agricultural activity. These locations were selected to maximize the likelihood of detecting potential impacts from agricultural chemicals. Over time, the scope of the program expanded to include additional regions throughout the state. By 1993, sampling efforts were broadened further to encompass other groundwater sources, such as wells used for irrigation, fish culture, and wildlife management. Flowing artesian wells and natural springs were also included, as these features typically draw from shallow groundwater systems and provide valuable insight into groundwater conditions. Samples collected from drinking water wells were analyzed for more than 100 different pesticides and their associated metabolites.

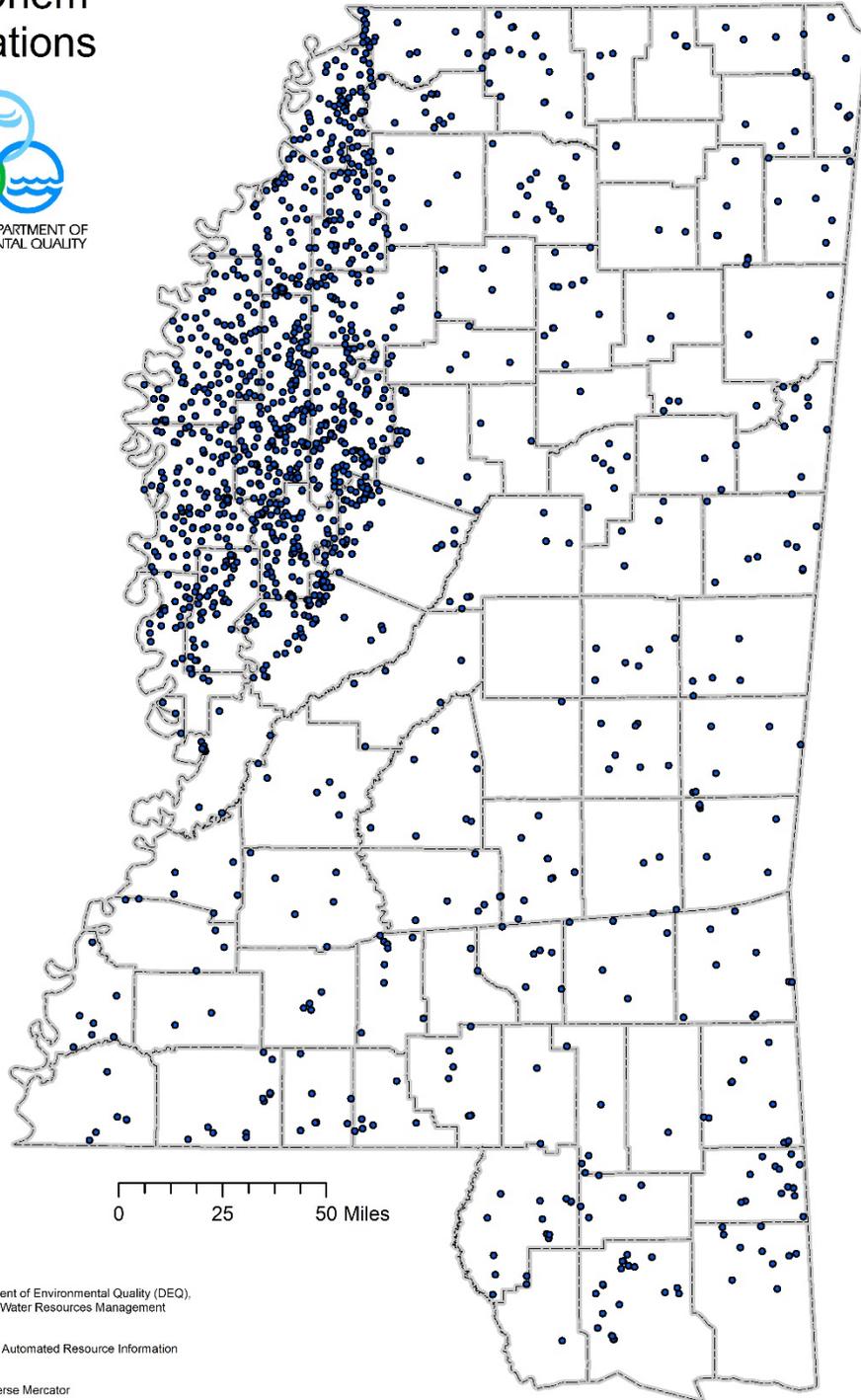
Beyond drinking water supplies, the program also incorporated agricultural water sources across Mississippi. Samples from irrigation systems, fish culture facilities, and wildlife management areas have been collected in all 82 counties, including all 19 counties within the heavily farmed Mississippi Delta region. These samples were analyzed for the same range of pesticides and metabolites as those taken from drinking water wells. During the first 15 years of the program, many samples were also tested for additional substances, including 45 volatile organic compounds and 30 inorganic constituents such as nutrients, residues, and metals. In January 2005, arsenic analysis was added alongside nitrate and phosphate testing. Responding to concerns from poultry growers, testing for inorganic compounds was reinstated in 2012.

Overall, results from the AgChem program indicate that Mississippi's groundwater quality has remained largely unaffected by agricultural activities. Data collected through 2025 show that none of the samples contained agricultural chemicals at concentrations exceeding the Maximum Contaminant Levels established for drinking water by the U.S. Environmental Protection Agency. Among the approximately 30 inorganic constituents analyzed in 2025, manganese, iron, barium, and arsenic were the most frequently detected. These findings suggest that, while ongoing monitoring remains important, Mississippi's groundwater resources continue to be well protected under current agricultural practices and regulatory oversight.

# Ag Chem Locations



- Well
- County



This map produced by the Department of Environmental Quality (DEQ),  
Office of Land & Water Resources, Water Resources Management  
Division on February 14, 2023.

All map data is from the Mississippi Automated Resource Information  
System (MARIS), and MDEQ.

Map Projection: Mississippi Transverse Mercator

The Mississippi Department of Environmental Quality makes no warranties,  
expressed or implied, as to the accuracy, completeness, currency, reliability,  
or suitability for any particular purpose, of the data contained on this map.

## METHODOLOGY

Since there are approximately 60,000 registered pesticide formulations containing one or more of some 700 different active ingredients, it would be prohibitively expensive to analyze for all these compounds. The strategy decided upon by the Mississippi Department of Agriculture and Commerce-Bureau of Plant Industry (MDAC-BPI) and MDEQ to minimize this dilemma was to select a target list of approximately 170 pesticides, metabolites, volatile organic compounds (VOCs), metals, minerals and other inorganics used in common agricultural practices. This approach was patterned after criteria established by the Environmental Protection Agency's (EPA) National Pesticide Survey. Also targeted were some chemicals not necessarily associated with agricultural practices, but of interest to the MDEQ in understanding water quality and characteristics of Mississippi's aquifers.

Targeted constituents were chosen based on the following general criteria:

- Physical and chemical properties of pesticides
- Quantity applied in Mississippi
- Pesticides of interest identified in the EPA's National Pesticide Survey
- Data from federal, state and local agencies

Once the parameters were defined, statewide sampling began in earnest. At each AgChem sampling site, the location is precisely captured using a Global Positioning System (GPS) receiver. The sites are photographed and instantaneous data relating to the sample's pH, temperature and conductivity are recorded on site. These cursory water properties are used in conjunction with historical well drillers' logs (when available) to help determine the aquifer from which the sample was drawn.



## 2025 Summary and Results

### Summary

For calendar year 2025, MDEQ sampled 60 wells in support of the AgChem Program. This total sample number was the same as in previous years.

### Results

MDEQ staff collected 60 samples in support of the AgChem Program in 2025. The samples covered 28 counties, from 11 aquifers, and included samples taken from irrigation, fish culture, and wildlife management water wells.

<b>Sample Conditions</b>	<b>Number</b>
Total Samples 2025	60
Counties	28
Agricultural Wells	30
Drinking Water Wells	16
Other Uses	14
Aquifers	11

Section I. Organic Chemical Detects

**2025 Organic Detects**

There were no detects of organic chemicals exceeding the EPA maximum contaminant levels (MCL) in 2025. All chemical detectors listed in the following table were either below MCL or there is no MCL established for that chemical at this time.

<b>Compound</b>	<b>MCL or secondary MCL</b>	<b>2025 Total Detects</b>	<b>2025 Detects Exceeding MCL in Agricultural Wells</b>	<b>2025 Detects Exceeding MCL in Drinking Water Wells</b>
Acifluorfen	NA	0	0	0
Alachlor	2 ug/L	0	0	0
Atrazine	3 ug/L	4	0	0
Atrazine DE	NA	5	0	0
Bentazone	NA	11	0	0
Clomazome	NA	0	0	0
Clothianidin	NA	0	0	0
Chloratranilprole	NA	0	0	0
D 2,4	70 ug/L	7	0	0
Dalapon	200 ug/L	2	0	0
Dicamba	NA	1	0	0
Dinoseb	7 ug/L	0	0	0
Fomesafen	NA	1	0	0
Glyphosate	700 ug/L	0	0	0
Imidacloprid	NA	0	0	0
Methoxychlor	40 ug/L	0	0	0
Metolachlor (Total)	NA	3	0	0
Metribuzin DA	NA	0	0	0
Pentachlorophenol	0 ug/L	1	0	0
Picloram	0.5 ug/L	1	0	0
Prometon	NA	0	0	0
Propanil	NA	4	0	0
Quinclorac	NA	0	0	0
Thiamethoxam	NA	1	0	0
Triclopyr	NA	9	0	0

Section II. Inorganic Chemical Detects

**2025 Inorganic Detects**

The primary inorganic compounds tested in our water samples are listed in the table below. Several compounds listed below were re-established as compounds of interest during 2012 due to their use in the poultry and/or root vegetable industries. Re-testing will take place in 2026 to evaluate these results.

<b>Compound</b>	<b>MCL or secondary MCL</b>	<b>2025 Detects</b>	<b>2025 Detects Exceeding MCL in Agricultural Wells</b>	<b>2025 Detects Exceeding MCL in Drinking Water Wells</b>
Arsenic	0.01 mg/L	26	2	0
Antimony	0.006 mg/L	0	0	0
Barium	2.0 mg/L	50	0	0
Beryllium	0.004 mg/L	0	0	0
Cadmium	0.005 mg/L	0	0	0
Chromium	0.10 mg/L	6	0	0
Copper	1.3 mg/L	6	0	0
Fluoride	4.0 mg/L	10	0	0
Iron	0.30 mg/L	36	26	1
Lead	0.015	5	0	0
Manganese	0.05 mg/L	44	26	1
Mercury	0.002 mg/L	0	0	0
Nitrites	1.0 mg/L	1	0	0
Selenium	0.05 mg/L	6	0	0

## CONCLUSION

Based on results to date, there is no evidence that agricultural compounds are significantly impacting the quality of groundwater in Mississippi. The Mississippi Department of Environmental Quality's AgChem Program continues to receive support from federal, state, and regional authorities in support of its mission to protect the citizens of Mississippi by trying to determine if the agricultural use of pesticides, fertilizers and herbicides may be adversely affecting our groundwater quality. By responding to requests from concerned citizens and continuing to build upon two decades of base-line data, the MDEQ AgChem Program will continue activities related to the protection of the groundwater resources of Mississippi.

