ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 • (217) 782-2829
PAT QUINN, GOVERNOR LISA BONNETT, DIRECTOR

# Fact Sheet

## Illinois Environmental Protection Agency's Groundwater Monitoring for Polychlorinated Biphenyl's in Community Water Supply Wells on a Statewide Basis and in the Mahomet Aquifer

## June 2013

### Introduction

The purpose of this fact sheet is to provide information and the results of sampling for Polychlorinated Biphenyl's (PCBs) in community water supply (CWS) wells on state-wide basis, and specifically in the Mahomet Aquifer System in east-central Illinois. **As of the time of the distribution of this fact sheet, PCBs have never been confirmed to be present in any CWS on a state-wide basis, the Mahomet Aquifer System, or in the Clinton CWS wells.**

### Background on the Illinois Environmental Protection Agency's Groundwater Monitoring Network

The Illinois Environmental Protection Act requires the Illinois EPA to implement a groundwater monitoring network to assess current levels of contamination in groundwater and to detect future degradation of groundwater resources. Further, the Illinois Groundwater Protection Act (IGPA) requires the establishment of a statewide ambient groundwater monitoring network comprised of community water supply CWS wells, non-community water supply wells, private wells, and dedicated monitoring wells. The Interagency Coordinating Committee on Groundwater serves as a groundwater monitoring coordinating council.

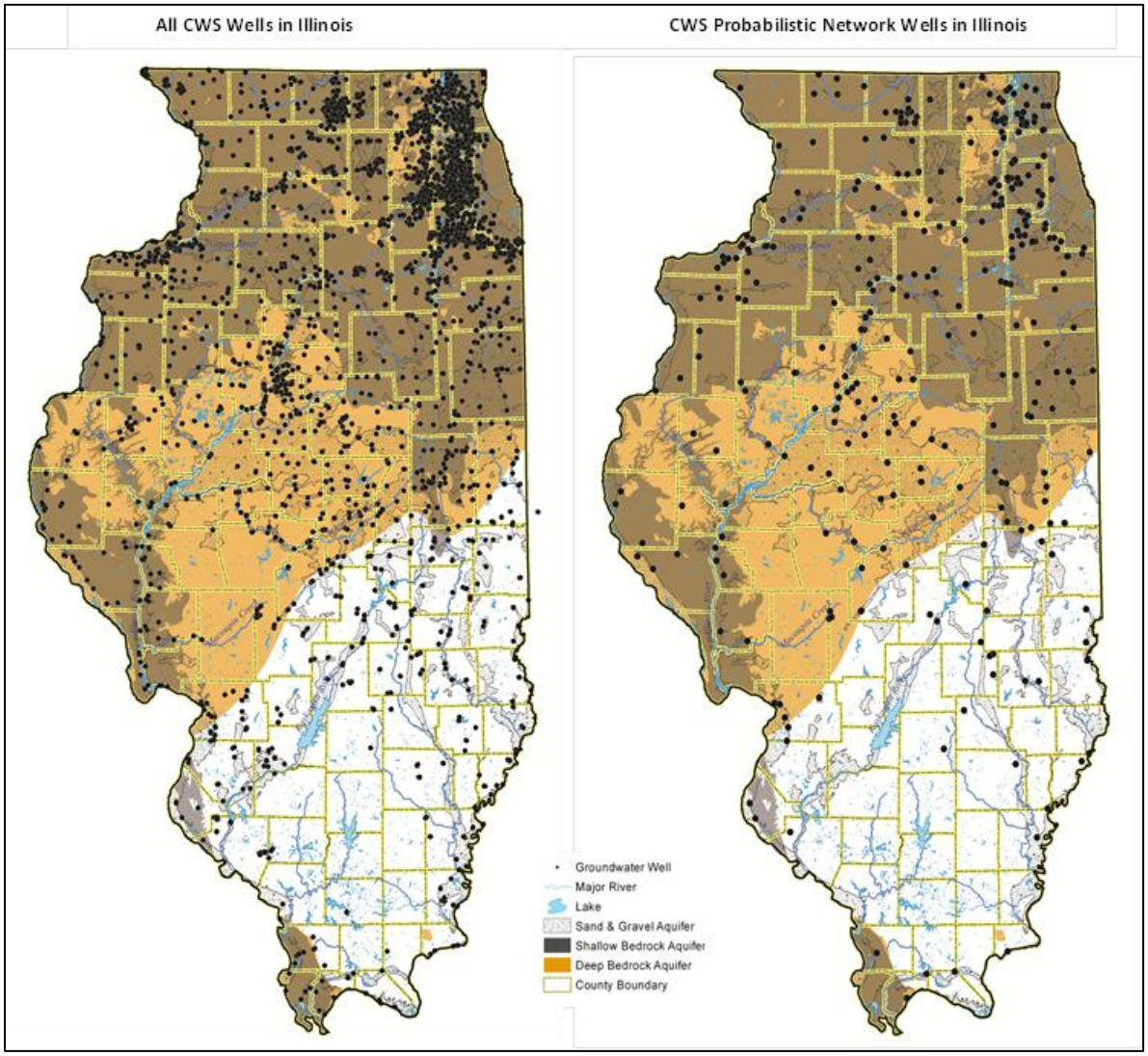
In 1984, Illinois EPA began sampling all the CWS wells across the state for volatile organic chemicals, inorganic chemicals, and on a subset of wells synthetic organic chemicals (SOCs). PCBs are an SOC.

In 1997, Illinois EPA began implementation of a probabilistic monitoring network of CWS wells. The design of this network was completed in coordination with the United States Geological Survey (USGS), the Illinois State Geological Survey, and the Illinois State Water Survey, with USGS performing the detailed design. The goal of the network is to represent contamination levels in all active CWS wells. The network wells were selected by a random probability-based approach using a 95 percent confidence level (CWS Probabilistic Monitoring Network). The random selection took several variables into account like depth, aquifer type and the presence of aquifer material within 50 feet of land surface to improve precision and accuracy. Illinois EPA used geological well log records and construction log detail to perform this process.

The random selection process included nearly 3,000 CWS wells, resulting in 354 fixed monitoring locations, see Figure 1. Additionally, in order to prevent bias, 17 random groups of 21 wells, with alternates, were selected from all the 354 fixed station wells. To further assure maximum temporal randomization, the samples from each sample period are collected within a three-week timeframe.

This probabilistic network is designed to provide an overview of the groundwater conditions in the CWS wells; provide an overview of the groundwater conditions in the principal aquifers (e.g., sand and gravel, Silurian, Cambrian-Ordovician, etc.); establish baselines of water quality within the principal aquifers; identify trends in groundwater quality in the principal aquifers; and evaluate the long-term effectiveness of the IGPA, Clean Water Act and Safe Drinking Water Act program activities in protecting groundwater in Illinois.

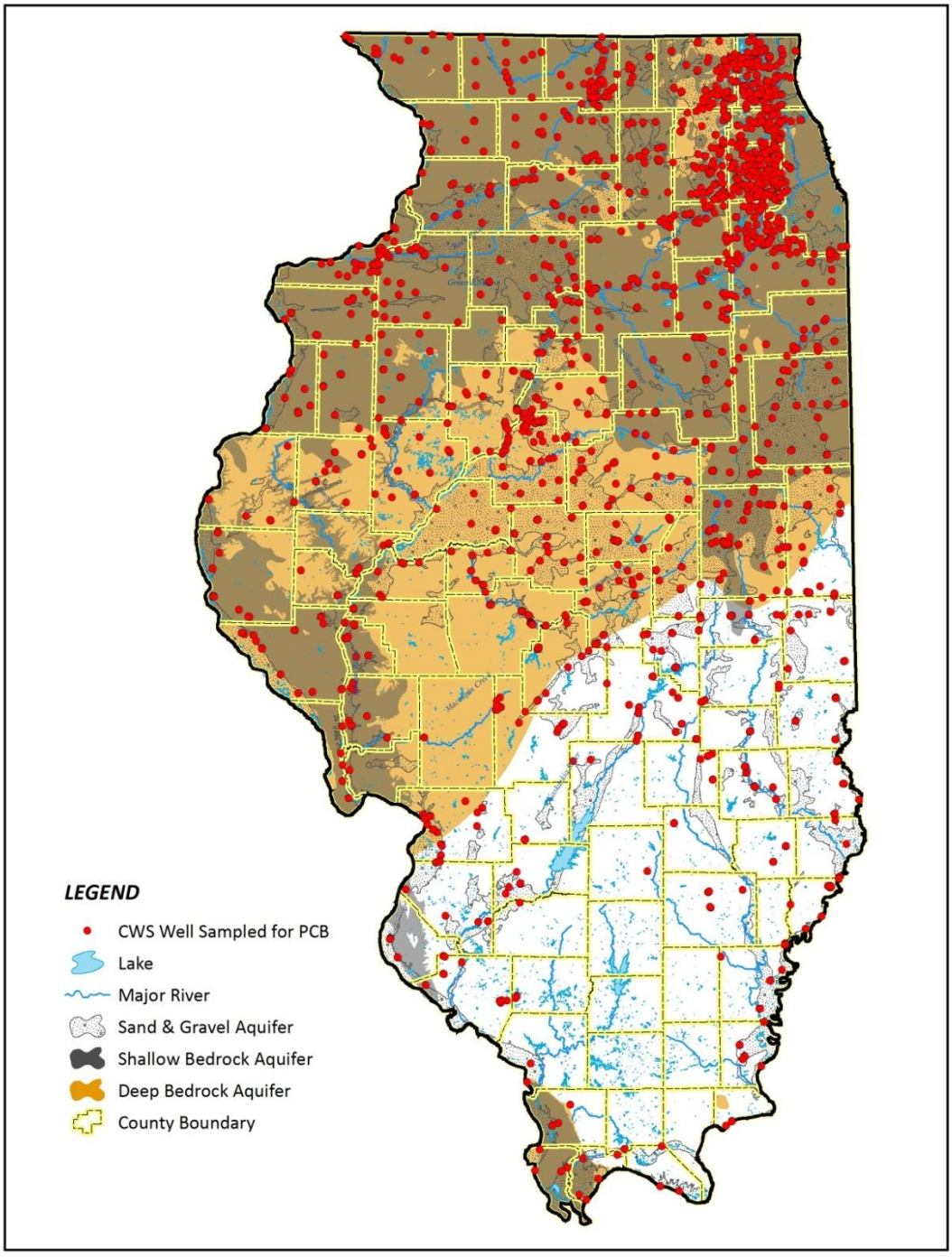
**Figure 1. CWS Wells and Illinois EPA's Ambient CWS Network of Wells**



**Statewide Testing of PCBs in CWS Wells**

There are 3,393 active CWS wells in Illinois. Starting in 1985 to the present, 5,328 samples have been collected from 2,032 CWS wells for PCBs on a state-wide basis as shown in Figure 2. **No PCBs have been confirmed to be detected in any of these wells.** This data is available to the public through the Illinois EPA's web page via Drinking Water Watch at: http://www.epa.state.il.us/water/drinking-water-watch/.

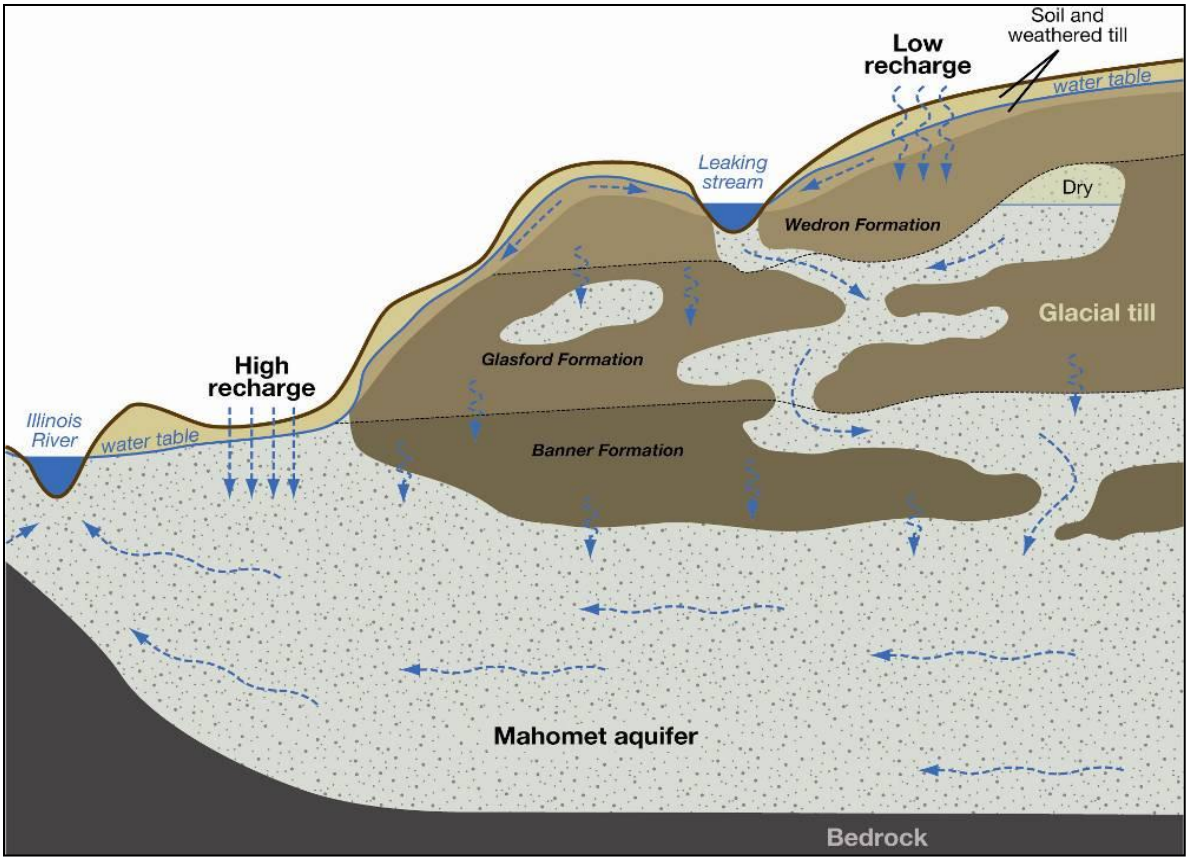
**Figure 2. Map of the CWS Wells Tested for PCBs**



**Testing of PCBs in CWS wells using the Mahomet Aquifer**

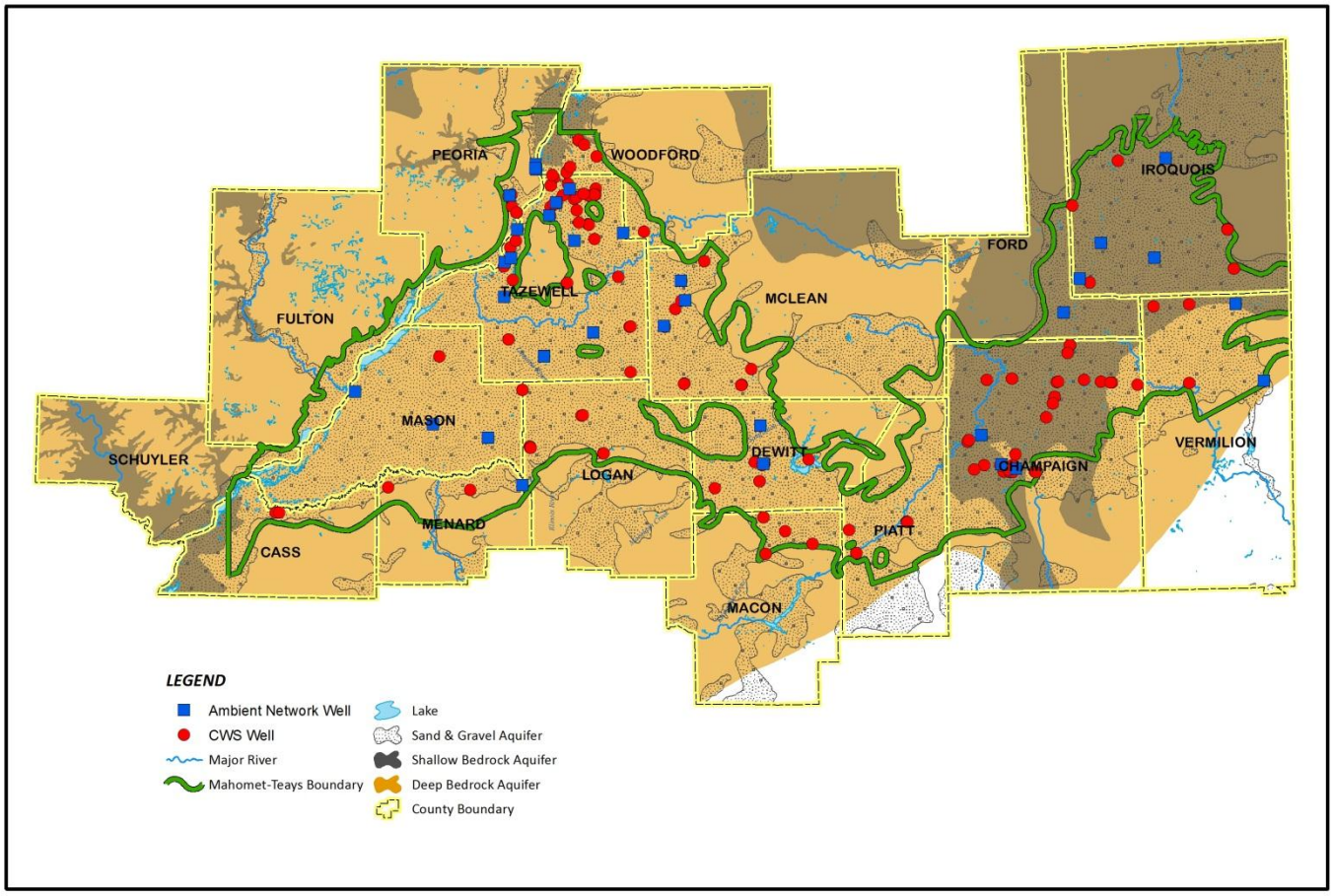
The Mahomet Aquifer occupies a portion of the Teays Bedrock Valley extending across east-central Illinois from the Indiana border near Hoopeston to the Illinois River. The Mahomet Aquifer is comprised of various unconsolidated geologic materials as illustrated in the following conceptual model of the hydrogeology (Figure 3).

**Figure 3. Cross Section of the Mahomet Aquifer**



There are 365 CWS wells using the Mahomet Aquifer System. Starting in 1985 to the present, the Illinois EPA has analyzed 544 samples from 201 CWS wells for PCBs as shown in Figure 4. **No PCBs have been detected in any of these wells.** In addition, a subset of the Illinois EPA's CWS Probabilistic Monitoring Network wells are located in the Mahomet Aquifer (Figure 4). **No PCBs have been detected in any of these wells.**

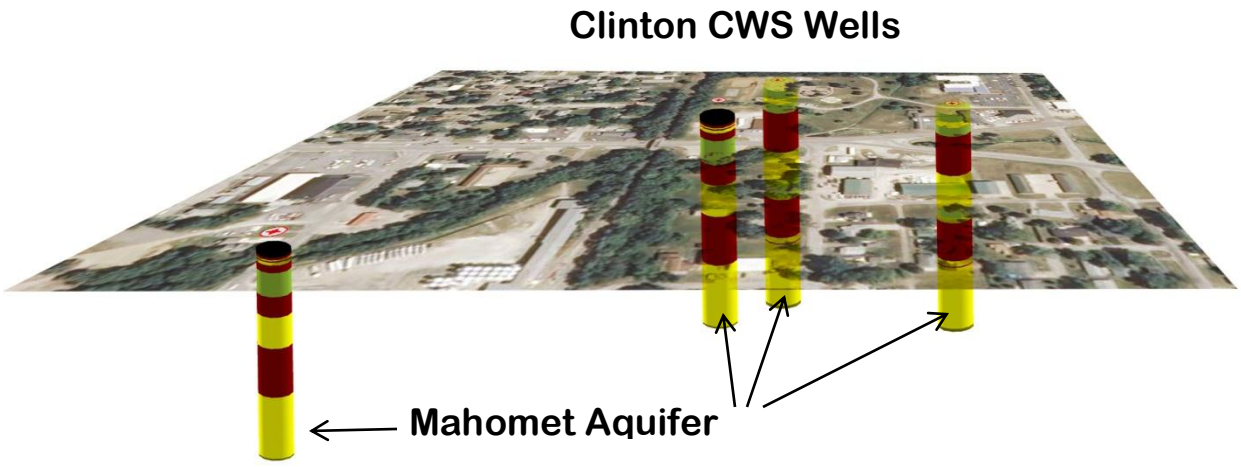
**Figure 4. Map of the CWS Wells Tested for PCBs with a subset of Ambient Network Wells Tested for PCBs in the Mahomet Aquifer**



**Testing for PCB's in Clinton's CWS wells**

There are 4 CWS wells serving Clinton. The Illinois EPA has collected 7 PCB samples since 1991 and **no PCBs have been detected.**

**Figure 5. Map of the Clinton CWS Well Logs Tested for PCBs That Are Using the Mahomet Aquifer**



## Conclusion

In conclusion, the Illinois EPA would like to emphasize the following three main facts:
1) PCBs in a regulated concentration (greater than 50 part per million) aren't being accepted at the Clinton landfill and won't be accepted until the USEPA allows them to be; 2) Landfills are specifically designed to guard against ground seepage of all harmful materials with an engineered liner, consisting of multiple layers of synthetic and natural occurring materials; and 3) In the unlikely event of PCB's ever getting into the ground in the first place, its chemical structure makes it bind to the soil and evaporate from the soil at a faster rate than it would take to reach a community water supply well.

## What's Next

Illinois EPA geologists will continue to sample for PCBs in our CWS Probabilistic Monitoring Network (including the wells in the Mahomet Aquifer). This network statistically represents the overall population of CWS wells on a state-wide basis.