

**MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF LAND AND WATER RESOURCES
WATER-USE PROGRAM**

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The Mississippi Department of Environmental Quality, Office of Land and Water Resources' (OLWR), Water-Use Program was initiated in 1992 to compile site specific freshwater withdrawal data from Mississippi's aquifers. This withdrawal data represents a measurement of the stress applied to aquifer systems by pumping wells and is one of the critical sets of information used by the OLWR. In order to discharge its responsibilities, the OLWR requires this withdrawal data on an annual basis and withdrawals must be associated with specific wells, specific aquifers, and specific uses. On that basis, it was decided to expand the OLWR efforts to monitor groundwater withdrawals to aid in the Office's ongoing hydrogeologic studies and to aid in water management decisions. The goal of the Water-Use Program is to gather existing withdrawal information from various sources and compile this data into a single database. To track these withdrawals, a computer database (The Mississippi Groundwater Withdrawals Database, MGWD) was created. A hard copy file was also created for each groundwater well identified by the name of its owner that would hold the documentation of the pumpage data that has been compiled.

Initially, the OLWR Permitting Database was used as the source data for the OLWR Water-Use Database. As of 1985, the OLWR Division of Permitting and Monitoring permits all groundwater wells with a surface casing diameter of six inches and greater other than those that withdraw water for domestic purposes. Currently, there are 15,617 groundwater wells in the Permitting Database. These wells can be classified into two basic categories:

- ◆ 11,487 permits are for irrigation or aquaculture wells in the Mississippi Delta that are pumping from the Mississippi River Valley Alluvium.
- ◆ 4,130 permits are for all the other permitted wells in the state, primarily industrial and public water supply wells.

Data pertaining to these 4,130 wells were imported into the Water-Use Database (MGWD). The irrigation and aquaculture wells of the Delta were not initially included in

the scope of the Water-Use Program because of the large number of wells and the lack of an adequate means currently to obtain meaningful site-specific pumpage data.

The OLWR Permitting Database was the source of the following information:

- ◆ site specific well engineering data (date drilled, depths, diameters, status, aquifer, use, location [Lat, Long])
- ◆ well ownership information
- ◆ maximum allowable daily withdrawal (Permitting does not require specific withdrawal data to be reported)

Since the majority of the groundwater wells to be evaluated for pumpage data were public supply wells, it was decided to begin with an examination of the Mississippi Department of Health (MDOH) records. The Bureau of Environmental Health of the Mississippi Department of Health regulates the state's public water suppliers and monitors water quality for specific wells and public water systems. Their records contain engineering data, water quality data, and some limited water withdrawal information. A review of these records was conducted in 1993 and pertinent information was integrated into the OLWR Water-Use files. Selected data was subsequently entered into the MGWD.

In 1994, the OLWR Water-Use Program initiated an annual Water-Use Survey to establish annual collection of groundwater withdrawal data for selected wells. The survey is mailed each year to approximately 2500 well owners and includes a total of approximately 4000 water wells. The survey is timed to be mailed out in the late spring so that the water users being queried will have had time to develop final pumpage data for the previous calendar year. The returned questionnaires are then individually evaluated. If a survey has been filled out incorrectly or incompletely, a staff member contacts the well owner and assists them in correctly completing the survey over the phone. Once the evaluation of the data is completed, the information is entered into the Water-Use Database (MGWD). The annual survey not only aids in the inventorying and identification of groundwater wells, but also enables us to track:

- ◆ annual withdrawals
- ◆ updated well engineering data
- ◆ changes in well ownership
- ◆ changes in well status (active, standby, abandoned, unused, etc.)

Along with the annual survey, staff members are also in the process of correlating the associated well identification numbers pertaining to each individual groundwater well. The identification numbers are:

- ◆ OLWR well Permit number
- ◆ MDOH well number
- ◆ U.S. Geological Survey number
- ◆ the well owner identification number or name
- ◆ NPDES number (Discharge permit number)

In many cases, these well identification numbers have not been satisfactorily correlated in the past which has caused confusion for public agencies as well as the well owners.

An exact location (Latitude and Longitude) is also being collected and stored for each public supply well and wells involved in water resource evaluation studies. With the aid of a Global Positioning Satellite (GPS) system, exact locations can be established in the field and added to the database as the information becomes available. The schedule of the collection of these GPS locations is dependent on the Office's ongoing studies. Currently, the wells with GPS locations are:

- ◆ Wilcox Potentiometric Map Study - 400 wells
- ◆ Public supply wells - 2000 wells
- ◆ MS Gulf Coast area - 250 wells
- ◆ Jackson Metro Area - 70 wells

In addition to collection of current pumpage data for permitted groundwater wells, the OLWR Water-Use Program will include a historical withdrawal profile for each well. The staff has been searching the OLWR Permitting records and the MDOH Public Suppliers records and conducting an extensive publication search to glean any piece of historical information concerning the amount of water that a well was pumping during a particular time period. Some of the sources used to compile these historical profiles are:

- ◆ USGS records
- ◆ USGS publications
- ◆ driller's logs on file at OLWR
- ◆ USGS Well Schedules
- ◆ NPDES discharge monitoring reports
- ◆ state, local, and federal publications and reports
- ◆ US Census data
- ◆ data collected by the staff of the OWLR associated

- with other projects
- ◆ municipal and water association records

To date, the MGWD contains records for approximately 4500 wells with current groundwater withdrawal data. Historical pumping information has been compiled for approximately 1600 of these wells. In some cases this information may date back to the time that a well began operation.

In addition to the process of maintaining and augmenting the MGWD, field studies have been proposed to more accurately determine pumpage by installing operating time totalizers. The OLWR has obtained 200 operating-time totalizers that can be placed on wells to acquire data in those areas in which pumpage data is lacking or to verify reported pumpage data. Most water wells in Mississippi do not have meters and their withdrawals can only be estimated. Additionally, meters must be calibrated regularly to provide accurate information. The proposed field studies would consist of visiting sites and determining the pumping rate of each well using a non-intrusive flowmeter that is owned by the OLWR. An operating-time totalizer would be installed on each well to measure the length of time that the pump operates during a specific time period. Periodic visits to each well site to record information from the time totalizers would be necessary. This will provide more accurate groundwater pumpage data and when compared to the owners' records of water sold, it will provide valuable insight to the well owner concerning the integrity of the water system.

As previously stated, pumpage from the alluvial aquifer for irrigation and aquaculture in the Mississippi Delta is currently not being determined. This is due to the large number of wells used in the Delta, a lack of resources and personnel within OLWR, and a lack of available information from these wells. Plans are under way to incorporate these groundwater withdrawals within the scope of the OLWR Water-Use Program. Several approaches are being considered, including the use of satellite imagery to determine land use and the Department of Agriculture Best Method Practices to determine water use per acre, monitoring electricity used at the well site and converting it into gallons withdrawn, and conducting field studies in localized areas by utilizing flow meters and time totalizers. The results of these field studies could then be applied to the rest of the Delta. Lack of available personnel has been the greatest limiting factor in the implementation of this phase of the program.

Although the primary goal of the OWLR Water-Use Program is to provide the OLWR with current and complete groundwater withdrawal information to support the Office's ongoing hydrogeologic studies and water management

decisions by the MDEQ Permit Board, the program will attempt to eventually compile a historical withdrawal profile for every large capacity water well in the state. Such information could be available to the public and to other state, local, and federal agencies. It is envisioned that this information would not only be available in print but also could be available on the Internet. Given the current capability of computer systems, it will be possible to do

searches of the MGWD to obtain specific information regarding a particular well, wells pumping from a particular aquifer system, or wells located within a particular area. Along with Internet access to the MGWD, publication of an annual report of Groundwater Withdrawals from Mississippi Freshwater Aquifers and reports on specific projects have been planned for the future.