

# A Plan to Improve the Planning and Management of Water Supplies in East-Central Illinois: 2015 Update

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This report has been a collaborative, joint effort organized by the Mahomet Aquifer Consortium and numerous other individuals including the following stakeholders:

**Bradley Uken** (Chair): Public, **Jonathon Manuel** (Vice Chair): Soil and Water Conservation Districts, **Susan Adams**: Water Authorities, **Ansel Anderson** and **Paul DuMontelle**: Environment, **Robert Betzelberger**: Small Business, **Frank Dunmire**: Rural Water Districts, **Bob Dickey**: Electric Generating Utilities, **Steve Ison**: Industries, **Evelyn Neavear**: Counties, **Jeff Smith**: Agriculture, **William Smith**: Municipalities, **Steve Wegman**: Water Utilities

Original Report: June 2009 • Updated Report: June 2015

## EXECUTIVE SUMMARY

While east-central Illinois is not facing an immediate water crisis, the East-Central Illinois Regional Water Supply Planning Committee (RWSPC) is driven by a desire to avoid crises that sometimes plague other states and countries. The recent 2012 drought, along with other localized water emergencies, provided many communities in east-central Illinois the opportunity to see the need to protect this most valuable resource. The Committee believes strongly that stakeholders in the region can shape the future, rather than allowing runaway events to take control and crises to occur. A regional plan – a framework for action and a series of action items – provides a means to shape the future.

## ORIGINAL MANDATE

In 2007, the Mahomet Aquifer Consortium (MAC) developed the first of its kind in Illinois, Regional Water Supply Planning Committee. The MAC organized the RWSPC under an Executive Order, which directed the Illinois Department of Natural Resources, in coordination with the Illinois State Water Survey (ISWS) and the Illinois State Geological Survey (ISGS) to engage in regional water supply planning. The regional plan focuses on the Mahomet Aquifer System that underlies a large portion of the planning area together with the surface waters of the major river basins. The focus area geographically includes parts or all of 15 counties in east-central Illinois: Vermilion, Iroquois, Ford, Champaign, McLean, Macon, DeWitt, Piatt, Woodford, Tazewell, Mason, Logan, Menard, Cass, and Sangamon. Finally, the charge of the RWSPC was to examine supply and demand of the Mahomet Aquifer along with the various surface waters and develop a management plan to the year 2050 for the region.

The RWSPC completed *A Plan to Improve the Planning and Management of Water Supplies in East-Central Illinois* in June 2009 and conducted public meetings in 15 communities across the Mahomet Aquifer region. This 2009 report can be found at [www.rwspc.org](http://www.rwspc.org)

## UPDATED PLANNING PROCESS

Since the completion of the 2009 report, the ISWS and ISGS have continued on many fronts to study the aquifer and surface waters. In 2011, ISWS and ISGS published a report entitled *Meeting East-Central Illinois Water Needs to 2050: Potential Impacts on the Mahomet Aquifer and Surface Reservoirs* (Appendix A). This report stated that the areas dependent on the aquifer for water there was no risk through 2050, however those dependent on surface water reservoirs would be at risk for shortages in times of severe drought, i.e. multi-year droughts. While the MAC and RWSPC have continued to work on our action items from that report. One of the action items identified in the 2009 report was that periodic updating needed to occur. With this in mind, MAC asked the RWSPC to begin the updating process of the 2009 report in 2014, with INTERA starting the process on November 1, 2014. The 2009 water management plan was developed over a 3 year period and with considerable effort. Time used for updating this 2015 Report is much shorter. In addition, the budget for updating was also less than the budget for producing the original report, both grant funded by IDNR. It was determined that the RWSPC would only be able to update a portion of the 2009 Report, due to time and funding restraints of the IDNR grant. The RWSPC prioritized the material to be updated, based on observations within the planning area over the past few years. The Committee chose three priority areas to evaluate: 1) irrigation, 2) population change, and 3) public water supply.

Through an open bid process, MAC and the RWSPC selected INTERA Geoscience & Engineering Solutions of Bloomington, Indiana to assist the Committee with the updating process. Over a several months study and much interaction with both the MAC and RWSPC, INTERA provided the two groups with a final report in May 2015. The full INTERA report may be found at [www.rwspc.org](http://www.rwspc.org).

With the information from INTERA, the RWSPC began working on completing this 2015 Report. Below are the key findings from the INTERA report, key findings identified by RWSPC, and the action items from the RWSPC.

## KEY FINDINGS OF INTERA REPORT

The INTERA report compared water withdrawals for the three priority areas identified above with the data from the 2009 Report. These modeled numbers found generally good agreement across all water use sectors. Below are specific comments about the three focus areas for the update:

### Power Generation Sector (PG)

- While the two reports differed by 170 million gallons per day (mgd), such withdrawals are all derived from large surface water sources which are returned to the same source.

- The two reports were within 15% of their respective estimates.
- A change in power plant design, opening, and/or shutting down will cause considerable changes in water usage for this sector and continued monitoring should occur.

#### Irrigation and Agriculture Sector (IR & AG)

- Initial comparisons of the two reports found major differences due to overestimation of irrigated acreage and summer precipitation deficiencies in the original report. However, when 2010 data are placed into the model, the estimates correspond accordingly.
- One of the key components of the model for this sector is precipitation, which is extremely difficult to predict, impacting the model a great deal and makes estimating withdrawals for irrigation highly uncertain.
- New reporting requirements for irrigators effective in 2015 will provide better estimates of withdrawals in the future.

#### Public Water Supply Sector (PWS)

- Preliminary comparisons of the two reports show excellent agreement with differences only being 2.2 mgd.
- Improvements to reporting of populations served especially by those utilities serving multiple communities will be beneficial for future planning.
- With the benefit of the 2010 Census, new population projections indicate approximately 71,000 fewer people in the region in 2025 than predicted in the 2009 report. However, these projections are not uniform across the region and some counties may, in fact, exceed previous projections.

### **OTHER KEY FINDINGS**

Since 2009, there have been two water resource projects with the potential to significantly impact water supply in east-central Illinois. Both of these projects are located in the Decatur area—dredging of Lake Decatur and the installation of two horizontal wells by ADM beneath Lake Decatur. In addition, the Drought Subcommittee of RWSPC worked with the Champaign County Regional Planning Commission to develop model ordinances for water emergencies. These three efforts are briefly described below.

Lake Decatur is the water source for the City of Decatur. It was constructed in the 1920s. Like other lakes and reservoirs in humid climates, sedimentation reduces its storage capacity over time. Beginning in 2014, the City of Decatur began a dredging operation to remove this sediment and restore the lake's storage capacity. When completed in 2019, the City expects the storage capacity of Lake Decatur to increase by 30%, which is equivalent to an additional 52 days of water

supply. The dredging project is expected to cost \$91 million and is financed locally via water sales. For more information, see the project fact sheet in Appendix B.

In 2013, ADM installed two horizontal collector wells in the Faries Park property adjacent to their industrial complex and Lake Decatur. The wells are reserved for emergency drought use when Lake Decatur is unable to supply both the City of Decatur and ADM with sufficient water. Each well has a caisson diameter of approximately 18 feet, with depths of approximately 45 and 80 feet below grade and 6 laterals of approximately 150 feet. Capacity is 3.5 mgd for each well.

In the fall of 2011, the Drought Subcommittee was charged with contacting communities in the 15 county region to develop an inventory of existing drought preparedness plans. A number of communities and regional planning agencies were contacted, and it was determined that many communities had emergency plans, but very few had drought preparedness plans. The Drought Subcommittee researched and developed a list of national, state and local drought preparedness plans. Working with Champaign County Regional Planning Commission (CCRPC), a model ordinance was developed. Funding for the CCRPC to develop the model ordinance was provided by Illinois American Water Company. A master list of water suppliers and contacts was developed by the Drought Subcommittee. The model ordinance, along with a copy of the Executive Summary of the 2009 Regional Water Supply Planning Committee report, was sent to water suppliers in the 15 county region.

In addition, the Drought Subcommittee produced a number of newsletters. Two of these newsletters, "East-Central Illinois Water Supplies Vulnerable to Drought of Record" and "Be Prepared Drought Can Be Far More Severe", were used in the State of Illinois 2012 Drought Report.

## **ACTION ITEMS**

While the Committee strongly maintains its support of the 2009 report, it specifically continues to support the framework for action, vision of the future, goal, planning and management standards along with key findings; we have initiated a new list of action items.

The main recommendation is to actively seek stable and adequate funding from local, state, and federal governmental entities along with the private sector to implement the following action items. The action items are numbered, but these numbers do not indicate any priority.

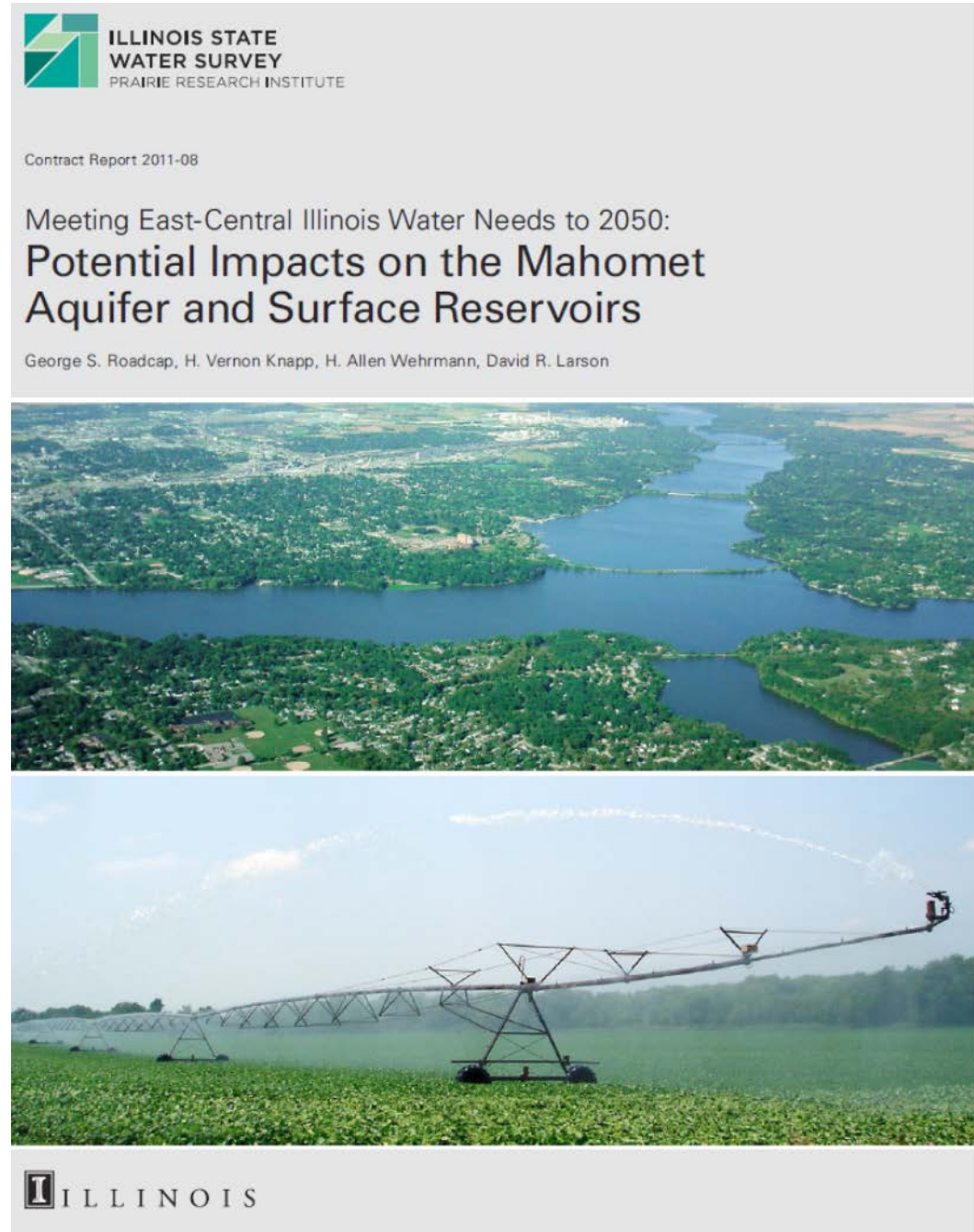
- 1) Work with small water operators through existing partnerships on education and data collection.

- a) Education – as an example, what to look for to determine if pumps are operating properly.
- b) Data – information that would be wise to have to assist in future planning efforts.
- 2) Continue discussion regarding ways to build stakeholder involvement throughout the region.
- 3) Encourage the planning of water supply/drought preparedness, utilizing among other things an existing plan, which can be found at [www.rwspc.org](http://www.rwspc.org).
- 4) Continue periodic reviews and full updates of preceding reports.
  - a) Review of the water withdrawals and water demand estimates in 2017.
  - b) In 2022, conduct a full update of the *Plan to Improve the Planning and Management of Water Supplies in East-Central Illinois*. (As a note, the 2017 and 2022 dates were selected based on access to new data, new census reports and the scheduled water-use report by the United States Geological Survey [USGS]).
- 5) Provide education to private well, water or gas, owners on existing laws and potential sealing procedures.
- 6) Strive to close the data gaps that hinder our better understanding of the aquifer and surface water sources and that, at times, impede planning efforts. Some of the data gaps that need to be addressed were identified by INTERA and include:
  - a) All water demand sectors should report water withdrawals.
  - b) Reporting should be mandatory.
  - c) All water withdrawals should be made public.
  - d) Withdrawals should be accurately reported as withdrawals, not total water produced or used.
  - e) Monthly withdrawals should be reported. Population served should be accurately reported annually.
  - f) Resident population estimates should be projected for the entire water supply planning period.
  - g) Employment populations should be projected for the entire water supply planning period.
  - h) Public water suppliers should report price annually.
  - i) Significant changes (large increases or decreases in annual average) in water withdrawals should be explained.
- 7) Encourage per property water metering/tracking within municipalities and in the rural areas of the region.
- 8) Investigate opportunities for sub-metering at multi-occupied properties such as apartment buildings.
- 9) Promote water conservation on all levels through education, fact sheets and water audits as examples
  - a) Education
    - i) Water systems
      - (1) Mahomet Aquifer

- (2) Surface water
  - (3) Watersheds
  - ii) Opportunities for education should be wide with no particular avenue discouraged.
  - iii) Target audience - general public, elected officials, and youth.
- 10) Stimulate the expanded use of grey water.
  - 11) Encourage more Best Management Practices (BMPs) in infrastructure design.
  - 12) Continue to work with all current partners while fostering new relationships in water planning efforts.

# Appendix A. Illinois State Survey Contract report 2011-08 – “Meeting East Central Illinois Water Needs to 2050: Potential Impacts on the Mahomet Aquifer and Surface Reservoirs”

This report can be downloaded at: <http://www.isws.illinois.edu/pubs/pubdetail.asp?CallNumber=ISWS+CR+2011-08>





## Appendix B. Fact Sheet/ Lake Decatur Dredging

### Lake Decatur Basins 1 through 4 Dredging Project Fact Sheet



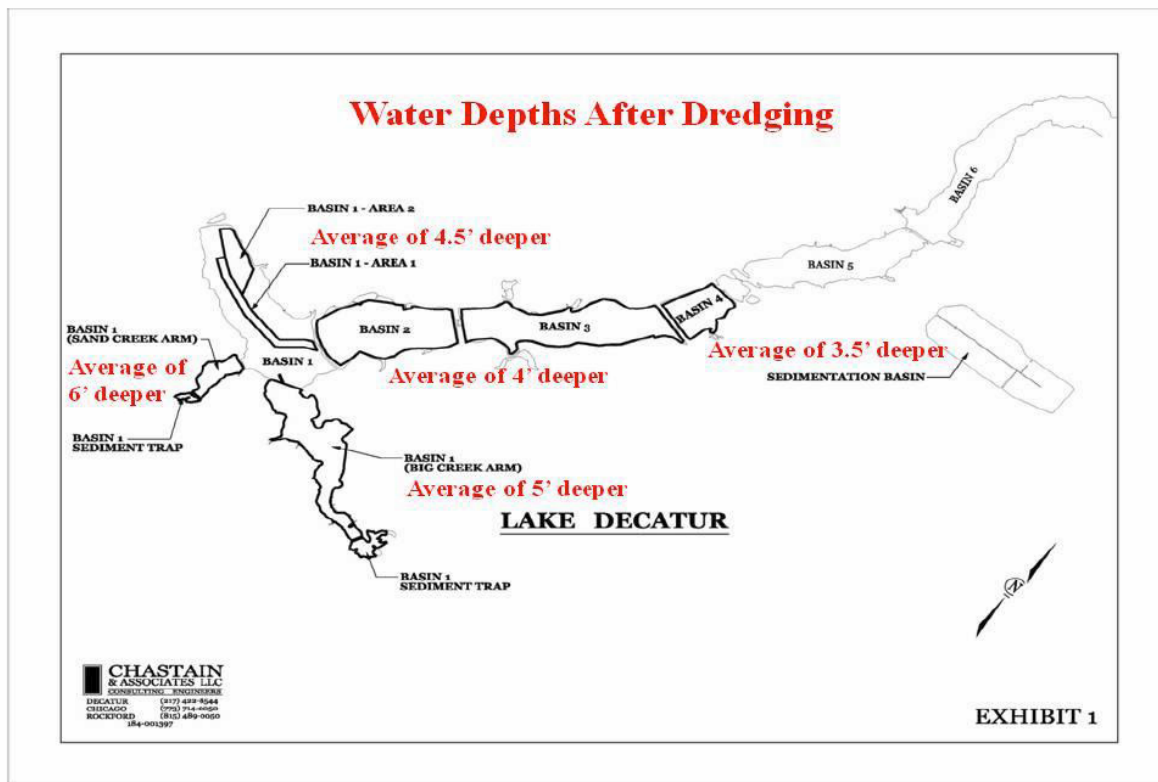
#### Background

Lake Decatur was constructed on the Sangamon River as a public water supply reservoir in 1920-1923. Since then natural and human caused erosion severely reduced the lake's storage capacity. The lake is separated by bridges into six large basins. Basin 5 was reclaimed by dredging in 1993-1994 and Basin 6 in 2004-2011. The dredging of Basins 1 through 4 began in 2014 and will continue through 2019.

#### Project Details

Great Lakes Dredge and Dock Company operates a cutter head suction dredge named "LW" that hydraulically removes Lake Decatur accumulated sediment. The dredge produces a slurry of 10 to 15% sediment and 85 to 90% lake water that is pumped through a 24 inch diameter pipeline and pumping station system to the City's Sedimentation Basin located in Oakley Township east of Basin 5. In the basin, gravity causes the sediment to settle out of the lake water. Clean lake water is then returned from the storage basin to Lake Decatur by an unnamed creek.

The project will increase the lake's storage capacity by 30% or 52 days of additional water supply for our community. This is equivalent to the volume of over 60 Willis (formerly Sears) Tower skyscrapers located in downtown Chicago! Sediment traps will be created in Big Creek and Sand Creek to capture incoming sediment before it reaches the main body of the lake. A sediment trap was previously constructed in Basin 6. Below is a map outlining the areas to be dredged in black with average water depth increases after dredging is completed.





**Schedule**

February 2014	Dredging contract approved by Decatur City Council
March 2014	Contractor begins rehabilitating the Oakley Sedimentation Basin
April 2014	Contractor begins dredging equipment mobilization and assembly
October 2014	Basin 1 dredging begins
2015	Big Creek and Sand Creek dredging begins
2016	Basin 2 dredging begins
2017	Basin 3 dredging begins
2019	Basins 4 and 6 dredging begins
December 2019	Project completion



**Cost & Funding**

Design	\$ 1,132,478
Construction	\$ 89,254,536
Construction Administration	\$ 766,522
Miscellaneous Expenses	\$ 40,000
Total Cost	\$ 91,193,536

The project is funded by the sale of drinking water and raw Lake Decatur water by the City of Decatur and financed through 20 year term bond issuances. Additional funding is provided by the Archer Daniels Midland Company.

**Project Partners**

Owner	City of Decatur, IL
Contractor	Great Lakes Dredge and Dock, Rivers & Lakes Division St. Peters, MO
Major Subcontractor	Terra Contracting Services, Kalamazoo, MI
Design Services & Construction Administration	Chastain & Associates, Decatur, IL
Geotechnical Services	SKS Engineers, Decatur, IL
Primary Regulatory Agencies	U.S. Army Corps of Engineers, Rock Island, IL Illinois Environmental Protection Agency, Springfield, IL

**For More Project Information**

Contact the Water Management Department at (217) 424-2863.

**For More Lake Decatur and Boating Safety During Dredging Information**

Contact the Lake Office at (217) 424-2837.

- Boaters are urged to exercise extreme caution on Lake Decatur.
- Dredge can be contacted on VHF-FM channel 13 and 16.
- Avoid all buoys, dredge equipment and please observe the warning signs on the lake.