

SUSTAINABLE WATER SUPPLIES

in

EAST-CENTRAL ILLINOIS

MAHOMET AQUIFER CONSORTIUM

MEDIA PRESENTATION

“W2 World of Water”

Introduction

ii). Part 1. The Region

iii). Part 2. Water Use

iv). Part 3. Sustainable Water Supplies

The media presentation and supplementary curriculum material also can be accessed on the Mahomet Aquifer Consortium’s website at: <http://www.mahometaquiferconsortium.org/>

SUPPLEMENTARY INFORMATION – READ FIRST

A. Ordering Information

B. Counties of East Central Illinois (Mahomet Aquifer and Surface Water)

C. Additional Water Supply Issues in East-Central Illinois

D. Water Conservation and Curriculum

E. Contacts and Speakers

F. Websites

G. Glossary of Terms

H. Self-guided Study and Self-Guided Answer Key

I. Sustainable Water Quiz and Sustainable Water Quiz Key

J. Illinois State Standards and Assessment Frameworks: Fourth – Eighth Grade

K. Illinois State Standards and Assessment Frameworks: High School

L. “W2 World of Water” Narrative

A. CD Ordering Information: Contact Robbie Berg, Mahomet Aquifer Consortium Project Coordinator 217-493-7407 or earthpartners@hotmail.com

B. Counties of East-Central Illinois: Vermilion, Iroquois, Ford, Champaign, McLean, Macon, DeWitt, Piatt, Woodford, Tazewell, Mason, Logan, Menard, Cass and Sangamon Counties.

C. Additional Water Supply Issues in East-Central Illinois:

- i. Will increasing demand for Mahomet Aquifer water outside of the aquifer pose a challenge to the sustainable supplies of water for communities and industries located over the aquifer?**

Transport of water away from the point of withdrawal requires statutory approval by the General Assembly. For example, Illinois American Water has approval to distribute Mahomet Aquifer groundwater within a 50 mile service area of its wells near Champaign-Urbana. This includes providing water to some communities outside of the aquifer, such as Sydney and Tuscola. Water is pumped from the aquifer near Paxton to the new ethanol plant in Gibson City. LyondellBassell pumps water from the aquifer west of Champaign into the Kaskaskia River to help meet water quality standards at its plant near Tuscola. Decatur has an emergency well field in the Mahomet Aquifer in Dewitt County to supplement its supplies from Lake Decatur during droughts. Some of the options being explored by Springfield and Bloomington include pumping water from the Mahomet Aquifer.

- ii. Is there a need to tighten Illinois water law?**

Under current law, as long as groundwater and surface water withdrawals are used for reasonable purposes, there is no limit to the amount that can be withdrawn. Many states

require permits to be granted for high capacity water withdrawals. Will Illinois take this path?

- iii. **Will Springfield, Bloomington and Decatur increase water supplies sufficiently in a timely manner to be prepared for a return of a severe drought?**

These cities are likely to experience water shortages if a severe drought recurs before water supplies are increased. For Springfield, this could mean stopping electricity production so that Lake Springfield can provide sufficient water for higher priority public water supplies. Water from Lake Springfield currently is used for public water supplies and for cooling purposes at the municipal electric power plants.

- iv. **Can water leaks and wasted water be reduced?**

Typically, about 8 to 20 percent or more of water supplies are classified as “unaccounted for flow”, which means that a large amount of water is lost or wasted every day. Many water distribution systems are old and it is costly to repair them. Eliminating most water leaks would likely result in higher water rates for consumers.

- v. **How should we balance the benefits of building a reservoir and having a secure source of water against the environmental costs of flooding a large area of land?**

It is expensive to construct a reservoir, but if designed appropriately a reservoir can provide a reliable source of water to meet demands for many decades, including periods of severe drought. . A reservoir also can be used for sport and recreation. On the other hand, constructing a reservoir requires a large area of land to be flooded with the possible loss of ecosystems and cultural resources

D. Water Conservation:

The Alliance for Water Efficiency: <http://www.allianceforwaterefficiency.org/>

USEPA Water Sense Program: <http://www.epa.gov/watersense/wereforwater/>

E. Contacts and Speakers:

Contacts/Speakers

Robbie Berg: Project Coordinator, Mahomet Aquifer Consortium

e-mail: earthpartners@hotmail.com

Telephone: 217-493-7407

Mel Pleines: Chair of the Mahomet Aquifer Consortium

e-mail: melpleines@frontier.com

Telephone: 309-678-6544

Brad Uken, Chair of the East-Central Illinois Regional Water Supply Planning Committee

e-mail: brad@ccfarmbureau.com

Telephone: 217- 352-5235

F. Websites:

The Mahomet Aquifer Consortium: <http://www.mahometaquiferconsortium.org/>

The East-Central Illinois Regional Water Supply Planning Committee: <http://www.rwspc.org/>

Illinois State Water Survey: <http://isws.illinois.edu/>

Illinois State Geological Survey: <http://isgs.illinois.edu/>

United States Geological Survey: <http://USGS.gov>

Glacial Geology: <http://www.isgs.illinois.edu/research/glacial-geo.shtml/>

The Alliance for Water Efficiency: <http://www.allianceforwaterefficiency.org/>

Springfield's Water Story: http://www.cwlp.com/water_division/water_division.htm

G. Glossary of Terms:

Adequate Water Supply: The provision of a sufficient quantity of water to meet needs.

Aquifer: A saturated geologic formation that can yield economically useful amounts of groundwater to wells, springs, wetlands, or streams.

Aquitard: A geological formation of low permeability adjacent to an aquifer. It may serve as a storage unit for groundwater, although it does not readily yield water.

Bedrock: The solid rock beneath the soil and surficial rock. A general term for solid rock that lies beneath soil, loose sediments, or other unconsolidated material.

Benefit: Something that has a good effect and promotes well being.

Clean Water Supply: The provision of water that meets drinking water standards and is safe to drink.

Climate: The statistical characterization of weather conditions in a region over a period of years.

Climate Variability: Variations in the statistical characterization of climate in a region over time.

Climate Change: A statistically significant change in climate over periods at least 30 years.

Community Water System: A public water system which serves at least 15 service connections used by year-round residents, or regularly serves at least 25 year-round residents.

Conservation: The preservation, care and management of natural and cultural resources.

Cost: The monetary or non-monetary expense or loss paid for providing something.

Dewatering an Aquifer: Removal of water from the upper portion of a confined aquifer.

Discharge: The volume of water that passes a given location within a given period of time.

Domestic Water Use: Water used for household purposes, such as drinking, food preparation, bathing, washing clothes, dishes, vehicles, and dogs, flushing toilets, and watering lawns and gardens.

Drawdown: The difference between the pumping water level and non-pumping water level in a well. For an aquifer system, the difference between the natural condition water level and the water level as influenced by withdrawal of groundwater.

Drought: A long period of extremely dry weather. Drought is an example of climate variability.

Ecosystem: A group of interdependent organisms together with the environment they inhabit and depend on. An aquatic ecosystem is a group of interdependent organisms that live in and around streams, lakes, rivers and wetlands.

Efficiency: The degree to which something is done well without waste.

Evaporation: The process of liquid water becoming water vapor, including vaporization from water surfaces, land surfaces, and snow fields.

Groundwater: Water in the saturated zone occupying saturated pore spaces and fissures. The upper surface of the saturated zone is called the water table.

Groundwater Recharge: The entry of water into the saturated zone of an aquifer. Infiltration of precipitation and its movement to the water table is one form of natural recharge. Also, the volume of water added by this process.

Groundwater Storage: The quantity of water in the zone of saturation.

Headwater: The source and upper reaches of a stream.

Ice Age: Any of several cold periods in the history of the earth marked by episodes of extensive ice sheets alternating with episodes of relative warmth.

Infiltration: The flow of water from the land surface into the subsurface.

Infrastructure: The underlying foundation or basic framework of a system. For a water supply system, infrastructure includes wells, pumps, dams, reservoirs, water towers, pipelines, and water treatment plants.

Irrigation: The controlled application of water for agricultural and other purposes through manmade systems to supply water requirements not satisfied by rainfall.

Monitoring: To observe, measure and report on the status of, for example, water levels over time.

Municipal Water System: A community water system.

Permeability: The ability of a material to allow the passage of a fluid, such as water through rocks. Permeable materials, such as gravel and sand, allow water to move quickly through them, whereas impermeable material, such as clay, does not allow water to flow freely.

Potable Water: Water of a quality suitable for drinking.

Public Water Supply: Water withdrawn by public governments and agencies, such as a county water department, and by private companies that is then delivered to users. Most people's household water is delivered by a public water supplier.

Pumpage: The total volume of water pumped from a source or sources during a unit of time.

Recharge: Water added to the saturated zone, or the process of adding water to the recharge zone. Factors such as precipitation, temperature, land forms, land cover, soil moisture content and depth to water table influence the rate of groundwater recharge.

Recycled Water: Water that is used or can be used more than one time.

Reliable Water Supply: The provision of water that is dependable and uninterrupted.

Reservoir: A pond, lake, or basin, either natural or artificial, for the storage, regulation, and control of water.

River Basin: An area of land drained by a river and its tributaries.

Rule of Reasonable Use: Use of water to meet natural wants and a fair share for artificial wants.

Runoff: That part of the precipitation, snow melt, or irrigation water that appears in uncontrolled surface streams, rivers, drains or sewers.

Sediment: Particles of rock and soil from the land transported downstream in rivers.

Sedimentation: The accumulation of sediment at the bottom of a reservoir that reduces water storage capacity in a reservoir.

Steward: A person whose responsibility it is to take care of something, such as the environment.

Stream: A general term for a body of flowing water; natural water course containing water at least part of the year.

Streamflow: The water discharge that occurs in a natural channel.

Surface Water: Water that is on the Earth's surface, such as in a stream, river, lake, reservoir or wetland.

Sustainability: Meeting the needs of the present generation and ecosystems without compromising the ability of future generations and future ecosystems to meet their own needs.

Sustainability of Water Supplies: The provision of dependable and adequate supplies of clean water to meet the demands of all users "in a manner that can be maintained for an indefinite time without causing unacceptable environmental, economic, or social costs".

Sustainable Water Supply System: An example of a definition of a sustainable water supply system is one that functions in perpetuity; maintains the natural integrity of its waters and protects them from irreparable harm; distributes water equitably to sustain the good health and vitality of the living communities in its surrounding ecosystem; and continually monitors the natural resources it affects.

Thermoelectric Power Plant Water Use: Water used in the process of the generation of thermoelectric power. Nuclear power plants and plants that burn coal and oil are examples of thermoelectric-power facilities.

Vertical Slice of geology: When we take a line across the surface of the earth (a transect) and then look down vertically several hundred feet below that line, we can map how the geology changes vertically and horizontally across the transect. This helps us understand the variations in geology that are important in understanding water resources.

Wastewater: Water that has been used in homes, industries, and businesses that is not for reuse unless it is treated.

Water Availability: The amount of water in rivers, streams, lakes, reservoirs, and aquifers at a given time that is available to be withdrawn.

Water Conservation: Practices that promote the efficient use of water, such as minimizing losses, reducing wasteful use, and protecting availability for future use.

Water Cycle: The circuit of water movement from the oceans to the atmosphere and to the Earth and return to the atmosphere through various stages or processes such as precipitation, interception, runoff, infiltration, percolation, storage, evaporation, and transportation.

Water Demand: The amount of water required by a water user or users at a specific point or area within a water supply system.

Water Distribution System: A group of water mains usually consisting of a network of piping, including transmission and distribution main which is designed to deliver water from water supplies to water users.

Water Resources: Sources of water that are useful, or potentially useful, to humans.

Water Storage: The amount of water in a reservoir, river, stream, lake, pond, aquifer or tank at a specified time.

Water Supply: The amount of water provided to meet water demand.

Water Supply Management: Actions, laws, regulations, strategies, policies etc. to develop the use of water and protect water resources.

Water Supply Planning: The process by which data are collected and processed to assess water demand and water-supply development alternatives.

Water Supply System: Facilities designed to collect, pump, and furnish a supply of water for meeting water demands.

Water Use: Water that is used for a specific purpose, such as for domestic use, irrigation, or industrial processing.

Watershed: The land area that drains water to a particular stream, river, or lake. It is a land feature that can be identified by tracing a line along the highest elevations between two areas on a map, often a ridge.

Well: An artificial excavation put down by any method for the purposes of withdrawing water from aquifers.

Wetland: An ecosystem whose soil is saturated for long periods seasonally or continuously, including marshes, swamps, and ephemeral ponds.

Withdrawal: Water removed from a ground- or surface-water source for use.

H. Self-Guided Study and Answer Key:

I. Sustainable Water Quiz and Sustainable Water Quiz Key:

J. Illinois State Standards and Assessment Frameworks: Fourth – Eighth Grade

K. Illinois State Standards and Assessment Frameworks: High School

L. “W2 World of Water Narrative