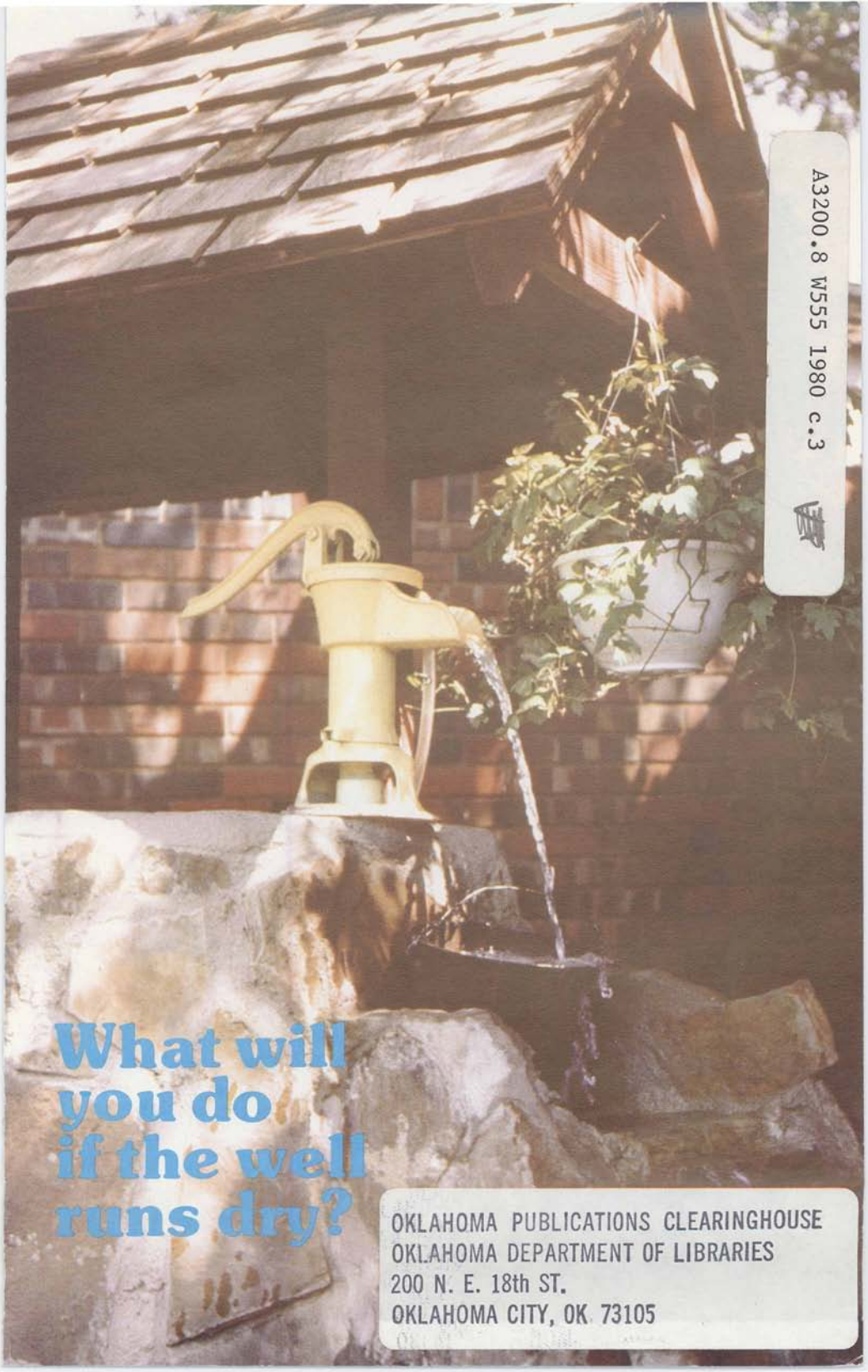

What will you do if the well runs dry?

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What will you do if the well runs dry?

Over 300,000 people in Central Oklahoma depend on the Garber-Wellington Aquifer (ground water) for their daily water supply. Local officials recognize, however, that the future of this precious water supply is in jeopardy unless a plan for its management and protection is developed soon.

In considering the development of a common procedure that could be used by local entities across the country to protect and manage their ground water resources, the Central Oklahoma officials discovered a lack of sufficient research data. In order to obtain the information necessary to develop a responsible and universally-appropriate management plan, the elected officials of the Association of Central Oklahoma Governments (ACOG) initiated a research project to provide the necessary data for appropriate ground water decision making. The research is being funded and conducted by the areawide association of local entities in conjunction with the Environmental Protection Agency's (EPA) Robert S. Kerr Research Laboratory in Ada, Oklahoma, through a grant agreement and direct Congressional appropriations.

This project will have a nationwide impact as the first such national research effort to result in the development of a prototype strategy for the management and protection of ground water in the United States. Please read on to find out more about the Garber-Wellington Aquifer and how you can become involved in formulating the strategy for ground water development and protection.

Water is the single most important element of life; no person, plant or animal can exist for any length of time without it. But, area planners and elected officials have predicted that there will be a severe shortage of this precious commodity in Central Oklahoma by the year 2000 unless major efforts are made to develop new water resources and preserve the ones we have.

With this in mind, the local elected officials of Central Oklahoma, through the Association of Central Oklahoma Governments (ACOG), have initiated a major research project to ensure long-term protection and availability of one of the most valuable water resources in this area—the Garber-Wellington Aquifer.

Ground water aquifers store most of the world's fresh water—30 times as much as is stored in all rivers and lakes combined. The earth's surface soaks up rain and snowmelt and stores the water underground amidst grains of soil and in rock crevices that form aquifers. Once an aquifer is contaminated (polluted), it is extremely difficult and expensive to clean up.

The Garber-Wellington Aquifer is estimated to have enough fresh water in storage to fill Lake Thunderbird to its conservation storage level about 700 times. That's some 70 million acre feet of water. The surface area over the Garber-Wellington Aquifer extends from Oklahoma and Cleveland Counties into Logan, Lincoln and Pottawatomie counties and covers 2200 square miles. The aquifer serves as the primary water source for more than 300,000 people.

Local officials feel that the Garber-Wellington Aquifer has the potential to continue providing water for Central Oklahoma's growing population . . . if it is well managed and protected.

Ground water pollutants

Overuse or pollution of ground water is difficult to monitor because the water basin is not visable. The relatively slow movement of ground water can result in pollutants remaining in the aquifer for hundreds or even thousands of years. The movement of poor quality water into fresh water is generally considered a more serious threat to ground water than depletion of the water supplies.

For the most part, the quality of the Garber-Wellington water is excellent. However, maintaining the good quality is complicated by the fact that saltwater underlies all of the reservoir and highly sulphated water bounds it on the west side. Improper placement, construction or production of water wells can cause this saltwater to intrude into the fresh water zones—a phenomenon that is occuring in many coastal areas of the U.S. Other significant pollution potential exists with improper development of oil field water flood activities and improper water well development in areas of the aquifer that are overlain by the sulfate-bearing Hennessey formation (the western quarter of the aquifer). In addition, uncontrolled liquid or solid waste disposal (sewage, oil and gas brine, or domestic, industrial and agricultural waste) in the recharge area of the aquifer poses potential problems.

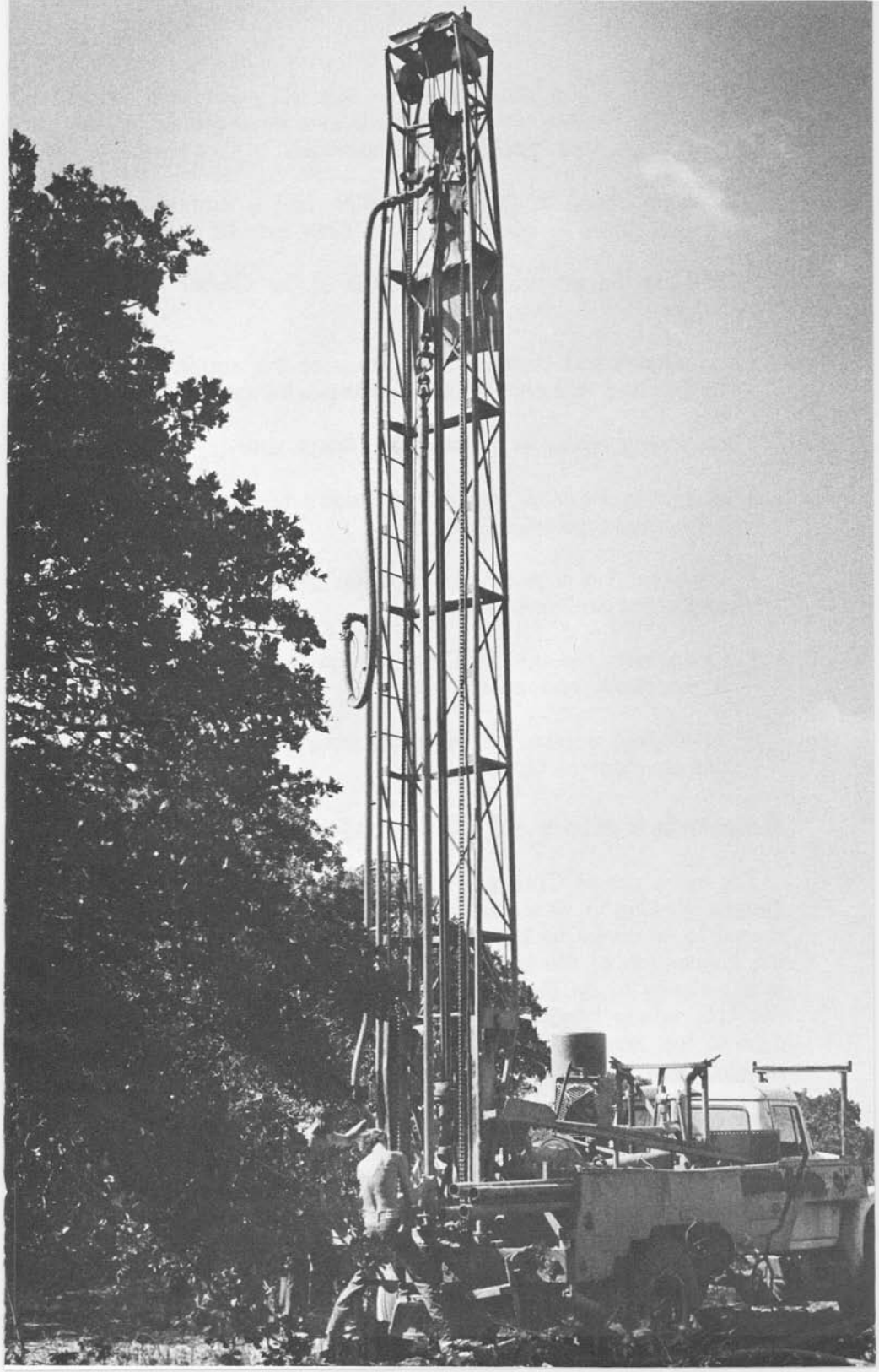
Laws which govern monitoring and regulations of these potential problems vary throughout the United States. They range from an absence of regulation to a law in Arizona that gives the Director of the Department of Water Resources Board power to set per-capita consumption limits for cities in certain areas of the state.

The Garber-Wellington Research Project

Recognizing a vital need for development of a procedure to be used locally and nationally to protect the Garber-Wellington Aquifer and similar ground water supplies throughout the U.S. (some of which have already been virtually destroyed), the local elected officials of ACOG developed and presented a research program to the Oklahoma Congressional delegation in Washington, D.C. to meet this need. With the support and commitment of these Congressional leaders, the Garber-Wellington Research Project is being funded through a direct Congressional appropriation.

The project will have a nationwide impact as the first such research project to result in the development of a prototype strategy for the management and protection of ground water in the United States. Two specific goals are to be accomplished through the Garber-Wellington Research Project:

(1) advance the state-of-the-art in ground water basin management and technology, and



(2) develop a comprehensive plan that will serve as a model for the protection, development and management of the country's vital ground water reservoirs.

The study began in December, 1979, and is estimated to require four years to complete. Work tasks include

- defining the physical characteristics of the Garber-Wellington Aquifer
- examining and defining the history of the aquifer's water quality and gathering natural pollution information
- determing extent of present and future uses
- evaluating possible impacts of present and potential man-caused pollution sources
- implementing a public participation plan to promote public awareness and involvement
- ascertaining the optimum well design to produce water most economically and energy efficiently
- developing a plan for the protection, development and management of the aquifer

Administration of the project

The members of Congress who appropriated the funds for the Garber-Wellington Research Project visualized the study as a unique opportunity to intimately involve the affected public from the conception of the project to the implementation of its results. It is believed to be the only research project of its magnitude in the U.S. where local public officials, with the input of their citizens, are actually directing the execution of the study and the development of subsequent plans to protect the aquifer.

In order to achieve their objectives and develop an implementable plan, the local governments of ACOG created the *Garber-Wellington Association* (GWA). Membership in the GWA is voluntary and open to all units of local government within the principal water production/recharge area of the aquifer.

The *Garber-Wellington Policy Committee* (GWPC) is the governing body for the GWA and its membership is composed of elected officials from each of the GWA members' local governments. The *Garber-Wellington Technical Committee* (GWTC) was established to serve the technical needs of the project. This committee, composed of technical and professional local entity staffs, reviews and makes recommendations concerning the technical aspects of the project.

These committees direct the development of the project and will make management decisions based on the research conclusions.

Appropriate segments of the work plan have been subcontracted to Engineering Enterprises, Inc., whose staff members serve as technical consultants on the project; the Oklahoma Water Resources Board, which has statutory authority

Greg Wallace, project engineer (left), and Bill Brown, Nichols Hills Water Foreman, test the accuracy of a new acoustical well probe, an innovative, relatively inexpensive device for testing depths to water. The probe uses sound waves to measure the distance between land surface and the standing water level in the well. Use of the new acoustical well probe in the Garber-Wellington study has proven to be very helpful and educational in collection of data on the Garber-Wellington Aquifer and is expected to make a big contribution toward advancing the state-of-the-art in national ground water technology.

for the issuance of water rights and water use permits in the state; and the Oklahoma State Department of Health, which has statutory authority for municipal water quality testing and pollution monitoring.

The National Center for Ground Water Research (NCGWR), a consortium consisting of the University of Oklahoma, Oklahoma State University and Rice University, is performing the initial basic research on ground water quality for the project under a separate grant. EPA's Robert S. Kerr Environmental Research Laboratory in Ada, Oklahoma, is also involved in the study as federal managers of the research.

The drought during the summer of 1980 prompted many water distribution problems throughout Central Oklahoma. It brought present and potential water supply problems to the forefront and caused people to think about how and where they are going to get water in the future. The elected officials of Central Oklahoma have been planning ahead for several years, however, and are working through the Garber-Wellington Research Project to protect one of this area's most vital water supplies and provide a management model for ground water users throughout the U.S.

As initiators and beneficiaries of the project, ACOG serves as the primary contractor in conjunction with EPA to coordinate and manage the over-all research study.

The first phase of the research involved collecting available data from state and federal agencies, and municipal and industrial ground water users to avoid duplicating existing data and, also, to assemble in one place all the information that is available.

Protection and management plan

Making decisions and establishing policies relating to private, municipal, agricultural and industrial uses of water can be difficult. Everyone wants and expects an adequate supply of good-quality water, but in order for that supply to last, actions must be taken to protect it.

The Garber-Wellington Research Project is intended to supply the information necessary for the state and local elected officials of Central Oklahoma to make realistic, fair decisions relating to the development and protection of the Garber-Wellington Aquifer. The management and protection policies, established in this study, are expected to set a precedent for the establishment of similar policies throughout the United States. Without this organized effort to understand and protect the nation's ground water supplies, we could render useless some of our most valuable water resources for hundreds or thousands of years.

The GWA wants your participation

The Garber-Wellington Policy Committee meets the last Thursday of each month at 2:30 p.m. in the ACOG Conference Room, 4801 N. Classen, Suite 200, in Oklahoma City. Anyone who is interested in the project is invited to attend.

If you would like more information or would like to have someone speak to your group or organization about the Garber-Wellington Research Project, contact Odell Morgan, Director of Regional Services, ACOG, 848-8961.

The Garber-Wellington Association

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Cindy Smith, Data Management Specialist
Jane Sutter, Public Information Officer
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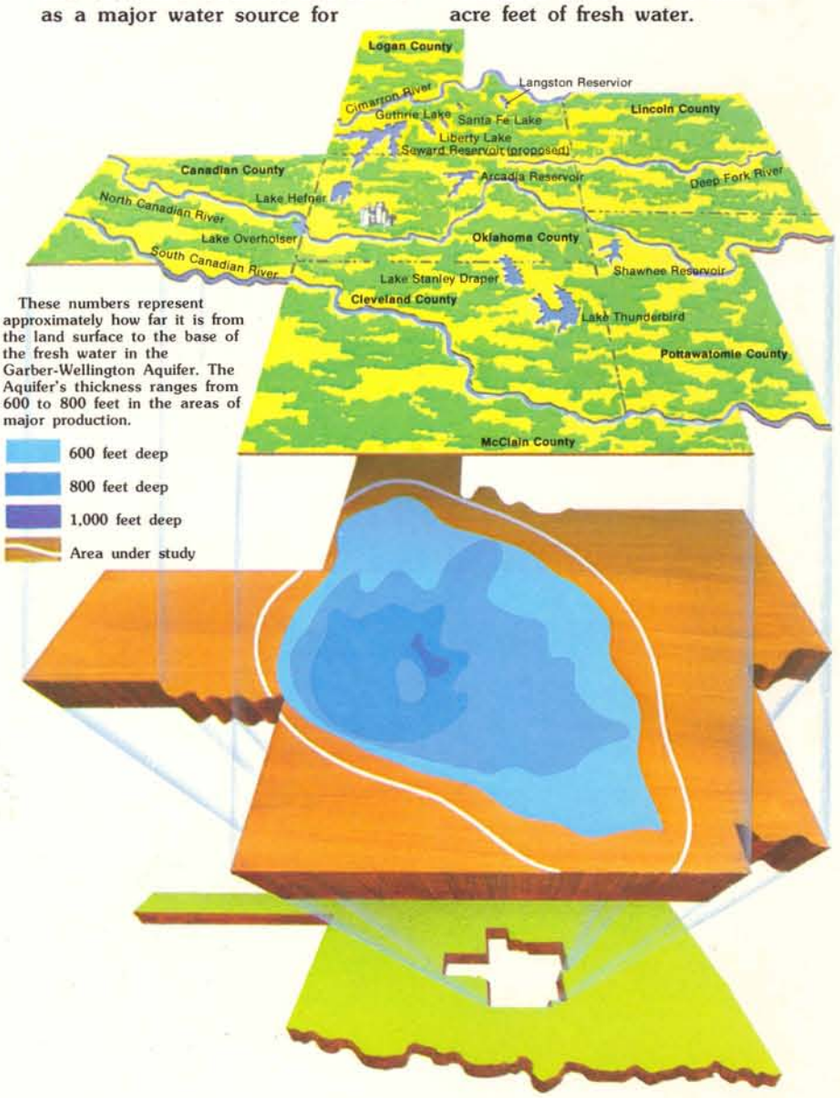
Jerry Thornhill, Project Officer

5,000 copies of this booklet were prepared and distributed at a cost of $1,655.

This booklet was prepared and published by the Garber-Wellington Association and partially financed through grant #CR807131-01-0 from the U.S. Environmental Protection Agency's Ground Water Research Program.

For further information, contact the Association of Central Oklahoma Governments (ACOG), 4801 N. Classen, Suite 200, Oklahoma City, OK 73118, (405) 848-8961.

Garber-Wellington Aquifer

This vast underground water resource, including its recharge area, covers more than 2200 square miles and lies within the boundaries of seven central Oklahoma counties. The presently known most useful part of the aquifer underlies Logan, Oklahoma and Cleveland Counties and serves as a major water source for municipal, industrial, domestic and irrigation uses. Depths of the fresh water in the aquifer range from less than 100 feet on the eastern side to nearly 1000 feet in the down dip area of Midwest City and back up to around 800 feet on the western side. The aquifer is estimated to contain 70 million acre feet of fresh water.