



Project Summary

Protocol for Establishment of a Ground Water Management and Protection Plan

Local officials can provide the impetus for the establishment of a management program for water-supply aquifers. This report provides information on the development of a management plan for a specific aquifer in Oklahoma. The report outlines specific major steps that were taken to accomplish the task. The approach should be transferable to other areas of the country.

This Project Summary was developed by EPA's Robert S. Kerr Environmental Research Laboratory, Ada, OK, to announce key findings of the research project that are fully documented in a separate report of the same title (see Project Report ordering information at back).

Introduction

This research project was designed to develop a protocol for the development and implementation of a plan for protecting, developing and managing aquifers. The initial step for the study was to establish an association, which was made up of a representative from each general purpose local unit of government within the production/recharge area of the aquifer. The group, hereafter referred to as the Association, had the responsibility for the project design, consultant selection, policy direction, plan selection and program implementation for the research project.

Technical guidance for the project was gained from a technical committee made up of a technical or professional representative from each local government represented on the Association, and the U.S. Environmental Protection Agency Project Officer. This group met on a regular basis to review the technical progress of the project and to advise the project manager in areas where assistance was needed.

The final administrative activity of the Association was to establish an Advisory

Committee, made up of representatives of national water resource agencies, state agencies and other water-related groups outside the aquifer area. The purpose of the committee was to provide technical input that would enhance the transferability of the results of the study to other areas of the country.

A detailed work plan was developed to guide the project to its successful completion. The work categories and approach for completion included:

Physical Characteristics of the Aquifer

- Assemble and synthesize existing data.
- Develop and implement data storage and retrieval system.
- Construct aquifer definition wells.
- Collect and analyze data.
- Maintain interagency communication.

Background Water Quality

- Assemble and synthesize existing data.
- Establish a ground-water monitoring system.
- Construct water quality monitoring wells.
- Collect and analyze data.
- Maintain interagency communication.

Present and Future Water Uses

- Assemble and synthesize existing data.
- Develop and implement a municipal records system.
- Inventory existing wells.
- Modify existing wells.
- Maintain interagency communication.

Modeling

- Develop criteria for model selection.
- Select model.
- Establish model, enter data and determine critical parameters.
- Calibrate model.

Public Participation Program

- Identify objectives.
- Identify "public."

- Select appropriate techniques.
- Conduct program.
- Management Plan
- Technical considerations.
- Institutional factors.
- Environmental factors.
- Interagency coordination.
- Reports
- Progress reports.
- Protocol report.
- Technical report.

The tasks outlined were performed by the staff of the Association, consultants, personnel from the State Water Resources Board, State Department of Health, or National Center for Ground-Water Research.

Results

The major accomplishments of this study include:

- Development of a uniform municipal record-keeping and data collection system. This system provides a uniform means to collect data on municipal water wells and place this data into a computerized data system. It provides a cost savings to municipalities through close monitoring of well fields, charting well efficiencies and elimination of major breakdowns through early detection of problems.
- Development of a suggested oil and gas ordinance for consideration and use by cities and towns located on the aquifer. This ordinance was developed with the cooperation of the state oil and gas regulatory agency as an additional step toward protecting the aquifer from contamination which would result from oil/gas drilling, development and production, or subsurface injection of liquids.
- Identification of a water-quality problem involving high levels of chromium, selenium, arsenic and uranium. Gamma ray logging tools and other test procedures are being used to attempt to delineate areas of uranium mineralization. Various methods for mitigating these problems are being explored. Also, multi-depth monitoring wells have been installed to give data on water quality at various depths in the aquifer.
- Examination of the pollution potential from various manmade sources of contamination. The sources include oil-field activities, urban runoff, pits, ponds, and lagoons, and septic tanks.
- Definition of management objectives for the aquifer. A protocol flow chart was developed to guide agencies through the evaluation process. See Figure 1.

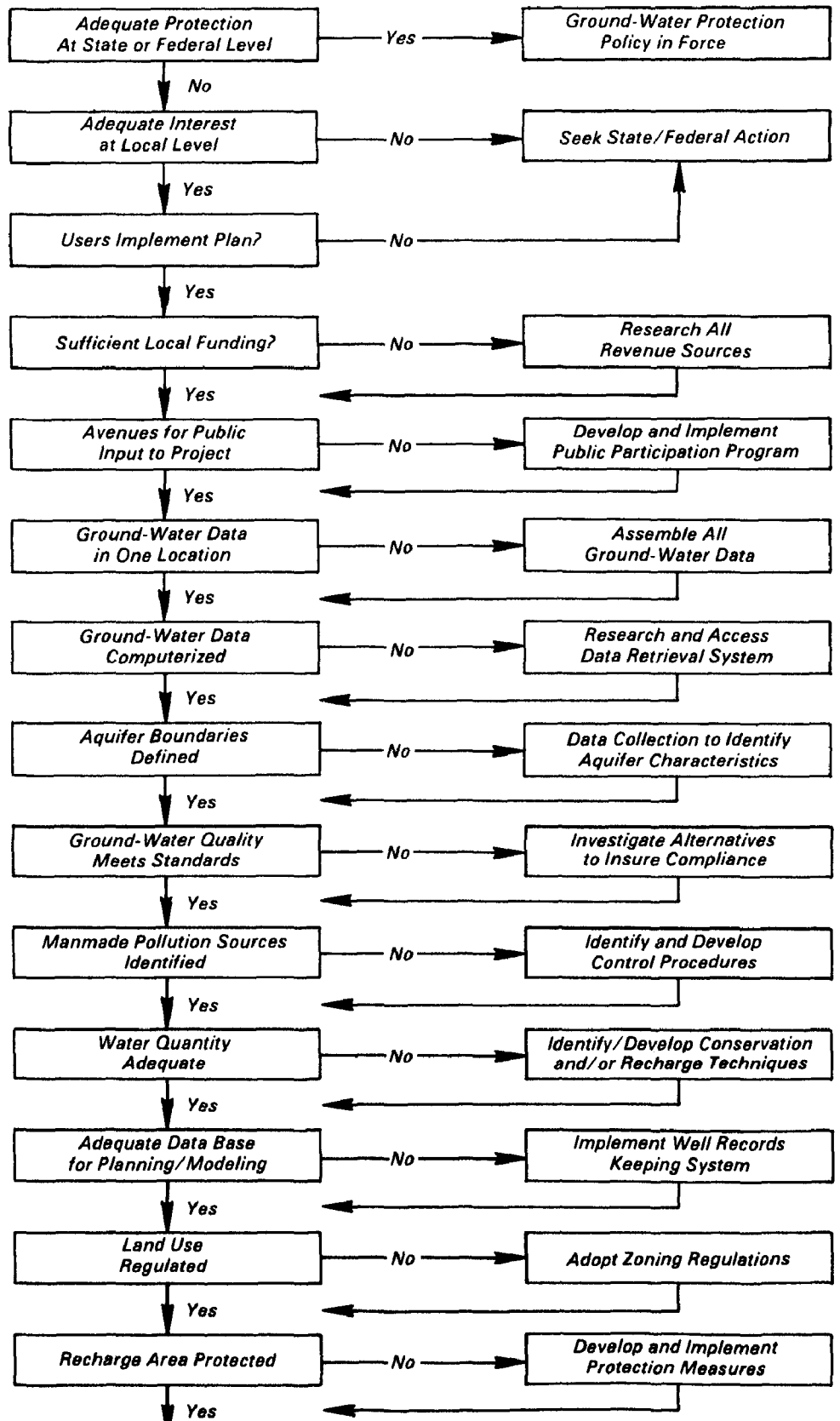


Figure 1. Protocol flowchart. The chart indicates steps to be taken to insure that local aquifers are fully evaluated and adequately protected for future uses. (Continued on next page.)

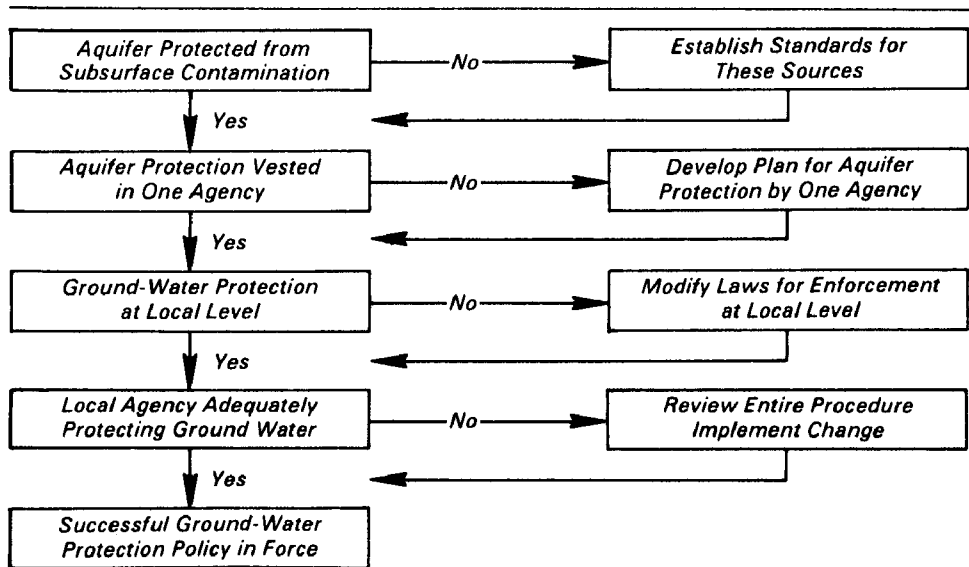


Figure 1. Continued.

Conclusions and Recommendations

The success of an aquifer management plan depends upon the degree of interest the people at the local level have on the resource. Regulation must be acceptable to the users before any plans can be developed or implemented. Therefore, all users of a particular aquifer must be involved in the development of the management plan.

Management of aquifers at the state or federal level should be considered only if local governments are unwilling or unable to manage the resource. Local government, preferably a ground-water district whose boundaries coincide with the aquifer boundaries, should be responsible for management of the aquifer, water quantity as well as water quality. State and federal agencies should provide technical support and maintain specific research efforts related to movement of pollutants in the ground-water environment.

This Project Summary was prepared by staff of The Association of Central Oklahoma Governments, Oklahoma City, OK 73118.

J. T. Thornhill is the EPA Project Officer (see below).

The complete report, entitled "Protocol for Establishment of a Ground Water Management and Protection Plan," (Order No. PB 84-159 292; Cost: \$19.00, subject to change) will be available only from:

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