

May 5, 2009

**TEXAS WATER DEVELOPMENT BOARD  
ADVANCING WATER REUSE IN TEXAS**

**SCOPE OF SERVICES**

**BASIC SERVICES**

**COMPONENT A: TEXAS REUSE HISTORY**

A-1. Component Scope and Objective

This task will confirm and define the anticipated audience, project objectives, and type of information to be included in a report to document historical and current Texas reuse. A project start-up workshop (Workshop No. 1) will be held to obtain input from team members, including the TWDB. Based on results of the workshop, a table of contents for the report will be developed and submitted to the Texas Water Development Board (TWDB) for review and comment.

Deliverable: Draft table of contents for Texas Reuse History document.

A-2. Gather Pertinent Information

This task will identify and gather pertinent information relative to Texas reuse activities. The specific information to be gathered will be determined based on the objectives and scope developed during Workshop #1. Sources of information may include TWDB records, Texas Commission on Environmental Quality (TCEQ) records, U.S. Geological Survey (USGS), and Texas Parks and Wildlife Department (TPWD). It is also anticipated that a survey will be developed in order to obtain specific information from selected reclaimed water providers and/or users. The types of information to be obtained may include (but is not limited to):

- Historical water usage data
- Historical state water plans
- Current regional and state water plans
- Wastewater treatment discharge criteria
- Surface water quality standards
- Stream and reservoir water quality data
- Aquatic life data
- Flow data
- TCEQ authorized direct reuse projects (through 30 TAC 210)
- WaterReuse Foundation National Database

- Other information that may be obtained through surveys of individual providers or users (e.g. usage, cost and rate information, operational and financial challenges, regulatory requirements and challenges, etc.)

As appropriate, data collected as part of this task will be incorporated into a database in a format to be agreed upon by the TWDB. This database can then be used as a foundation for documentation of water reuse projects in the future.

Deliverable: Database information in format to be agreed upon with TWDB

#### A-3. Documentation of Reuse Projects

Based on the information collected in Task A-2, documentation of planned reuse projects in Texas will be developed (both direct and indirect reuse). Specific information to be included will be determined in Workshop #1 but may comprise owner, quantity, and quality of reclaimed water, period of operation, specific uses, cost and rate information, and total quantity of reclaimed water used since operation began. Improvement in treated wastewater quality over the historical period of record will also be documented, as related to increasingly stringent discharge permits and the resulting impact on stream and reservoir quality. To the extent possible, the “drivers” for implementation of historical water reuse projects will be addressed. These drivers may include legislative drivers (e.g. legislative requirements or incentives for planning and/or implementation of reuse projects), hydrologic or water supply drivers (e.g. drought or water shortage conditions), economic drivers, or public policy drivers.

#### A-4. Draft Component A Report

A draft report that documents the history of reuse in Texas will be prepared. The primary audience of this report will be established in Workshop #1, but it is anticipated that this document will be presented in a professional, “glossy” format, similar to Water for Texas 2007. Following completion of the draft document, it will be submitted to the TWDB for review and comment.

Deliverable: Draft Texas Reuse History report

#### A-5. Solicit Input from Other Organizations

The APAI Team will provide support to the TWDB to identify contact persons and solicit review and comments from key organizations, including Texas Water Conservation Association (TWCA), WaterReuse Association (WRA), Water Environment Association of Texas (WEAT), Texas Section of the American Water Works Association (TAWWA), TCEQ and TPWD.

Deliverable: Summary of input from key organizations, in the form of a memorandum.

A-6. Final Component A Report

The report will be finalized utilizing information provided from the organization reviews and incorporating comments from the TWDB. Final deliverables will include electronic and printed copies of the report, as well as electronic copies of any database information developed as part of this component.

Deliverables: Final Texas Reuse History report and final database information

## **COMPONENT B: STATE OF TECHNOLOGY**

B-1. Component Scope and Objective

This task will confirm and define the anticipated audience, sources of information, and component objectives. These objectives will be reviewed and discussed in the project start-up workshop (Workshop No. 1).

B-2. Gather and Review Relevant Information

This task will review literature, reports and other information required to perform the remaining component tasks. The specific information to be gathered will be determined based on the objectives and scope developed during Workshop #1. However, it is anticipated that the information to be gathered will focus on water quality requirements and treatment technologies for specific reclaimed water uses, including indirect reuse. Potential sources of information include (but are not limited to):

- Texas Water Development Board (TWDB) Research and Planning Projects;
- WateReuse Foundation (WRF) Projects;
- American Water Works Association Research Foundation (AWWARF) Projects
- Water Environment Federation Research Foundation (WERF) Projects
- Research performed by key entities (e.g. Singapore Public Utilities Board, Orange County (CA) Water District, Southern Nevada Water Authority, etc.);
- Annual national technical symposiums (e.g. WateReuse Association (WRA), AWWA, WEF)
- National Water Research Institute (NWRI)
- Guidelines developed by other agencies (e.g. U.S. Environmental Protection Agency (EPA) Guidelines for Water Reuse, Australian Guidelines for Water Recycling, etc.)
- State of California Recycled Water Policy
- Key academic institutions (e.g. University of California, Berkeley, Colorado School of Mines, Duke University, University of Texas at Austin, etc.)
- Professional journals

B-3. Identify Beneficial Uses of Reclaimed Water

Beneficial uses of reclaimed water will be identified in this task. A list of those uses identified in Water for Texas 2007 will be developed. A separate listing of other potential uses of reclaimed water will also be prepared.

B-4. Review Water Quality Criteria

A summary of established water quality criteria and/or guidelines for specific reclaimed water uses will be provided in this task. Current Texas criteria will be compared to EPA guidelines, criteria and guidelines in other states, as well as key international entities. To the extent possible with available information, differences in these criteria will be documented with respect to their scientific basis, goals and history.

B-5. Identify and Document Treatment Technologies

This task will identify wastewater treatment technologies that can be used to produce reclaimed water suitable for the uses identified in Water for Texas 2007. Treatment technologies appropriate for other potential uses (based on Task B-3) will also be identified. To the extent possible based on available information, each treatment technology will be documented by describing the treatment mechanism, defining the treatment effectiveness for categories of constituents, providing examples of applications of the technology, and providing generalized costs of the technology.

B-6. Identify and Discuss Exemplary Cases of Water Reuse

This task will identify and describe up to ten water reuse programs that involve application of technologies defined in previous tasks. The cases selected will include a range of beneficial uses, including indirect potable use. The cases selected will include applications in Texas as well as other states and international locations. Descriptions will include topics such as background on the program, beneficial uses, treatment technologies, financial considerations, regulatory issues, public relations issues, and any challenges experienced by the program.

B-7. Component B Technical Memorandum

This task will summarize and present the findings of Component B. A draft technical memorandum will be submitted to the TWDB for review and comment. The technical memorandum will be finalized based on comments received from the TWDB. Final deliverables will include electronic and printed copies of the technical memorandum.

Deliverables: Draft and final technical memorandum

## **COMPONENT C: RESEARCH AGENDA- WATER REUSE IN TEXAS**

### **C-1. Component Scope and Objectives**

This task will confirm and define the process for establishing and prioritizing research needs, potential categories of public and private research partners, information needed by the TWDB to advance research on water reuse, and information needed by the state legislature to support advancing research on water reuse. These objectives will be achieved during a workshop (Workshop No. 2) to be held upon completion of Components A and B.

### **C-2. Describe Water Reuse Research Priorities of Other Entities**

This task will describe the water reuse research priorities adopted by other entities over the past 5 years. Examples of other entities to be considered include the WaterReuse Foundation, Water Research Foundation (formerly AWWA Research Foundation), Water Environment Federation Research Foundation, local or regional entities and international organizations. The primary objectives of this task will be to document recent and currently active research projects and determine whether the research is applicable to Texas. This information will then be used to avoid potential duplication of research, and to identify additional research that may be needed to advance water reuse in Texas.

### **C-3. Identify Challenges and Potential Research Topics**

Based on information developed by Components A and B and Task C-2, specific technological, scientific, financial and regulatory challenges associated with water reuse in Texas will be defined. Potential research topics that address these challenges will be identified and described in a format that can be used to initiate the discussion for Workshop No. 3 (see Task C-4 below).

### **C-4. Conduct Water Reuse Research Agenda Workshop**

This task will involve conducting a workshop (Workshop No. 3) to assist in developing water reuse research priorities for Texas. The workshop will cover scientific, technological, financial, regulatory and public awareness aspects of water reuse. Research topics directed specifically at the needs of Texas will be the primary focus of the workshop. However, it is anticipated that a number of the research topics to be identified will also be of national or international interest. The APAI Team will facilitate the workshop over a 2-day period. During the first day, APAI and TWDB team members will focus on development of the specific research topics and prioritization to be included in the Texas water reuse research agenda. The second day will involve a limited group of APAI team members who will focus on summarizing the activities and decisions carried out during the previous day.

C-5. Prepare Draft Technical Memorandum

A draft technical memorandum will be prepared which defines and prioritizes water reuse research needs for Texas. The draft will be submitted to the TWDB for review and comment. A final draft technical memorandum will be prepared that addresses TWDB comments and questions.

Deliverables: Draft and final water reuse research priorities technical memorandum

C-6. Solicit Input from Other Organizations

The APAI Team will provide support to the TWDB to solicit review and comments by volunteer reviewers designated by key organizations, including Texas Water Conservation Association (TWCA), WaterReuse Association (WRA), Water Environment Association of Texas (WEAT), Texas Section of the American Water Works Association (TAWWA), TCEQ and TPWD.

Deliverable: Summary of input from key organizations, in the form of a memorandum.

C-7. Water Reuse Research Agenda Report

A report will be prepared that defines the proposed Texas water reuse research agenda. This document will serve as the key reference for guiding future research and will “prioritize and guide the specific areas of needed research appropriate for the state to integrate into existing research programs and implementation of water reuse in Texas”. Additionally, cost estimates for conducting the identified research activities will be provided for budgeting purposes. A draft report will be provided to the TWDB for review and comment. The report will be finalized based on comments received from the TWDB. Final deliverables will include electronic and printed copies of the final report.

Deliverables: Draft and final copies of the Water Reuse Research Agenda report

**TEXAS WATER DEVELOPMENT BOARD  
ADVANCING WATER REUSE IN TEXAS  
PROJECT TIMELINE**

