GG
05/07/09
Item No. 22

A RESOLUTION 2009-05-07-0015R

SUPPORTING THE SAN ANTONIO WATER SYSTEM
2009 WATER MANAGEMENT PLAN

WHEREAS, in 1998, the San Antonio City Council (the "City Council"), acting upon the recommendation of the San Antonio Water System (the "System") Board of Trustees (the "Board"), endorsed the 50-Year Water Resource Plan ("1998 Plan") of the System; and

WHEREAS, in connection with the endorsement of the 1998 Plan and subsequent approval in 2000 of a multi-year funding mechanism to implement the plan, the City Council established a requirement that the System periodically review the 1998 Plan and make necessary adjustments in response to new policies, changing circumstances, and new technologies; and

WHEREAS, in 2005, the San Antonio Water System Board of Trustees reviewed the 1998 Plan and adopted the Water Resource Plan 2005 Update (the "2005 Update"); and

WHEREAS, the staff of the System has recently completed a comprehensive review and analysis of the System's water supply plan and prepared the 2009 Water Management Plan Update (the "2009 Plan") to amend the System's water supply plan; and

WHEREAS, the staff of the System has completed an extensive public presentation of the 2009 Plan and received public comments in connection with that plan; and

WHEREAS, the System's 2009 Water Management Plan attached hereto as Attachment I has been prepared by the System's staff and reflects the objectives, methodology, analysis, and recommendations of the staff and public with regard to the System's water resource plan; and

WHEREAS, the staff of the San Antonio Water System briefed the San Antonio City Council in "B" Session on April 15 regarding the 2009 Plan; and

WHEREAS, the San Antonio Water System Board of Trustees has approved the San Antonio Water System 2009 Water Management Plan Update, which is consistent with the policy objectives of the San Antonio City Council; now, therefore:

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF SAN ANTONIO:

SECTION 1. That the San Antonio Water System 2009 Water Management Plan Update attached hereto as Attachment I and incorporated herein for all purposes is hereby supported and is consistent with the policy objectives of the City.

SECTION 2. That the City Council will consider rate requests in the future that may result from the 2009 Plan and make its decision based upon the rate case rationale for each future request.

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SECTION 3. If any part, section, paragraph, sentence, phrase or word of this resolution is for any reason held to be unconstitutional, illegal, inoperative or invalid, or if any exception to or limitation upon any general provision herein contained is held to be unconstitutional, illegal, invalid or ineffective, the remainder of this resolution shall nevertheless stand effective and valid as if it had been enacted without the portion held to be unconstitutional, illegal, invalid or ineffective.

SECTION 4. This Resolution shall become effective immediately upon the passage by eight (8) votes of the City Council and if passed upon fewer than eight (8) votes after the tenth (10th) day after passage.

PASSED AND APPROVED this 7th day of May, 2009.

MAYOR
PHIL HARDBERGER

ATTEST:

City Clerk

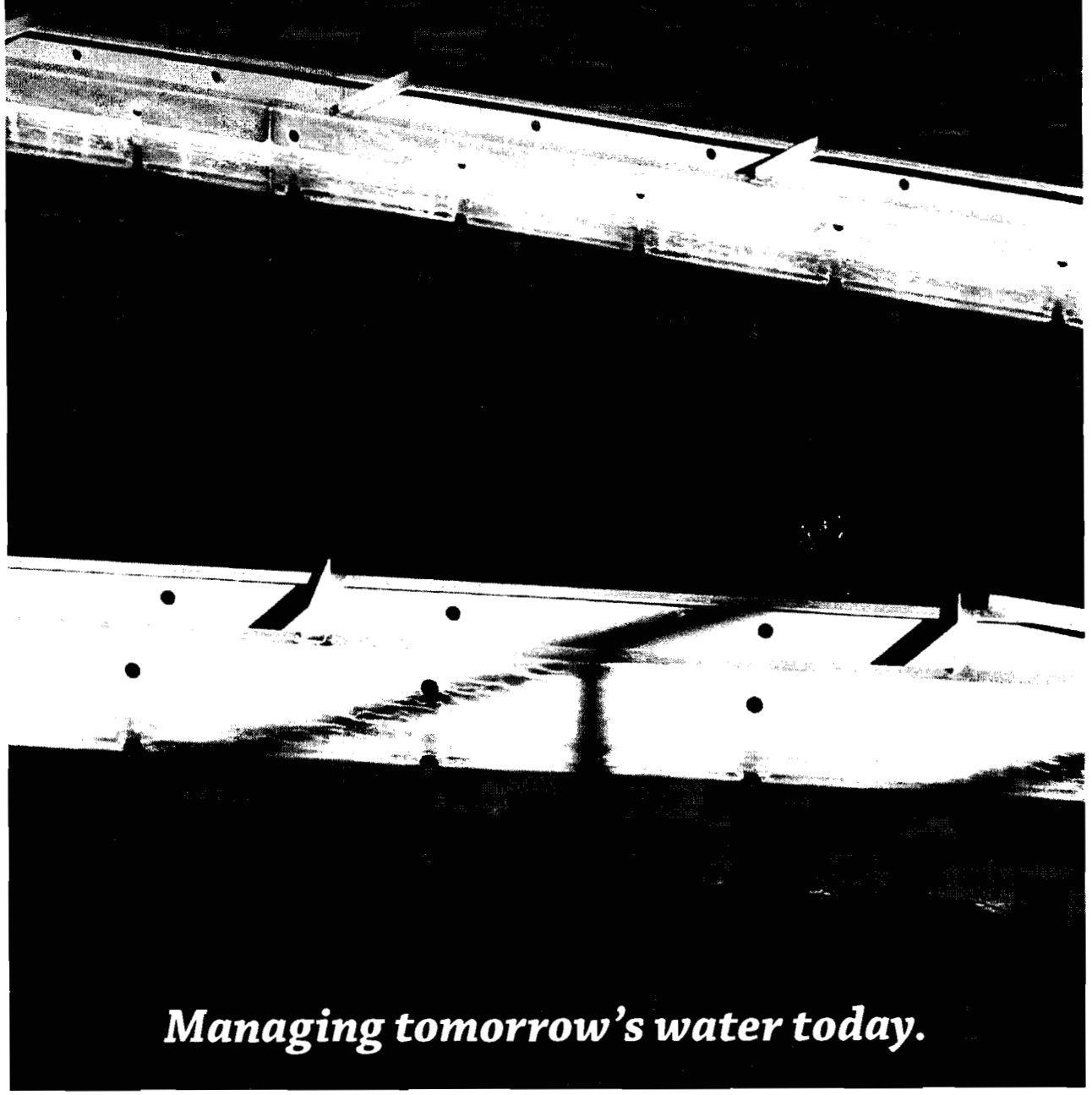
Approved as to Form:

for **City Attorney**

Attachment I

San Antonio Water System

2009 Water Management Plan Update



Managing tomorrow's water today.

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Executive Summary

Introduction

On February 23, 2009, the Water Resource Task Force submitted its draft proposal to the SAWS Board of Trustees for their consideration. The SAWS Board of Trustees considered the proposals and underscored the need for public and regional input into the *2009 Water Management Plan*. Staff was directed to begin the public outreach effort and gather public input and comments. On April 20, 2009, following completion of the public outreach effort (more than 85 public hearings and presentations to a wide variety of community advisory, stakeholder groups, and elected officials), the SAWS Board of Trustees reconvened to consider comments provided and make any necessary modifications to the plan. This report summarizes the planning methodology, population planning, water demand planning, evaluation of water supply, analysis of potential water supply projects available, and finally, the course of action that SAWS will pursue over the next five years to meet the needs of our community for the next 50 years.

Basis for the Revision of SAWS Water Supply Plans

In the past three years since the completion of the *2005 Water Resource Plan Update*, significant change has occurred that will impact SAWS water resource planning. The fundamental driving forces behind the need to update the *2005 Water Resource Plan* were the following:

- **Edwards Aquifer Authority Enabling Act Changes** – Senate Bill 3 (2007 Texas Legislative Session) changed the maximum pumping limits from 400,000 acre-feet (AF) per year to 572,000 AF. Junior/Senior and interruptible pumping limitations were removed and were replaced with a new statutory Demand Management/Critical Period Management (DM/CPM) regime.

- **Population** – The 2005 population projections did not incorporate the housing boom that occurred in 2005, 2006, and 2007. In addition, more recent population models were used to refine the previous plan projections.

- **Technical Work** – SAWS has completed considerable feasibility and design work on a number of water supply projects providing a more comprehensive outline of the implementation requirements and costs.

- **Economic** – Additional detail is known about current construction costs and economic conditions affecting the cost of proposed water supply projects. SAWS has developed a consistent method of completing cost opinions to allow comparison between water supply projects.

- ***Acquire additional Edwards Aquifer Permits*** – The Edwards Aquifer permit market matured with the passage of Senate Bill 3 (2007) and the re-issuance of final permits by the EAA. SAWS will participate in this market to acquire additional aquifer pumping rights in an amount of 2,000 acre-feet a year through 2014.

- ***Phase I of Brackish Groundwater Desalination*** – A wellfield will be developed in southern Bexar County in the Wilcox Aquifer. The treatment plant will be located on the Aquifer Storage and Recovery (ASR) property and will initially treat 11,800 acre-feet per year. The treatment plant will be designed to accommodate additional upgrades and technologies. In the future, once the science of desalination has been proven to concerned citizens, production may be added in Wilson and Atascosa Counties to expand the supply, treatment, and use of brackish groundwater from those sources. Possible brine injection locations to be considered include southern Bexar and/or Wilson counties.

- ***Aquifer Storage and Recovery (ASR)*** – If a drought of severity and duration similar to the drought of the 1950s ("drought of record") recurs with the worst year occurring in 2014, the existing and proposed supply sources will not be able to fully meet the identified demand. The ASR facility will contribute stored water to address this shortfall. The ASR began operations as a seasonal storage reserve but has transitioned its role to that of a long-term storage facility. Reflecting that change in operational philosophies, SAWS will be commissioning a thorough modeling effort and studies to definitively determine the ultimate holding capacity of the ASR. The Task Force, through much analysis and deliberation, has recommended that the System set aside the ASR for use only during extreme droughts, corresponding to existing EAA Stage III and Stage IV drought periods. In order to maximize the supply available during hydrologically favorable periods, SAWS will initiate a hydrogeologic study to determine the optimal maximum storage volume and percent of recovery at the existing ASR facility considering current operational strategies. SAWS will initiate an additional study to identify other potential ASR sites and the required operational management aspects associated with each site.

- ***Ocean Desalination*** – SAWS will begin a feasibility study to identify potential sites, pipeline routes, permitting requirements, construction challenges, and partnership opportunities. Even though Ocean Desalination remains the most expensive proposed source of new water resources, serious study will provide some certainty and firmness to cost estimates for more informed consideration in future Water Management Plans.

- ***Integration Pipeline*** – Co-locating the brackish groundwater desalination treatment plant on the ASR site poses operational challenges. A pipeline will

- ***Aquifer Storage and Recovery (ASR)*** – A repeat of the worst year of the drought of record in 2034 would result in a 16,000 acre-foot permitted supply gap. Previously stored water from the ASR facility will be used to meet this shortfall.

- ***Recharge and Recirculation*** – Preliminary evaluation of the recently-released report by Todd Engineers, "Recharge & Recirculation: Phase III & IV Report," indicates that some components identified in the report may have merit for further study and possible implementation. The yield of such a project is undetermined at this time.

Long Range Program (2035-2060) – In the latter portions of the planning horizon, SAWS has identified a permitted supply gap of 141,000 acre-feet in the worst year of a repeat of the drought of record (2060). Over 65,000 acre-feet of that gap will be addressed through actions undertaken in the Short- and Mid-Range Programs. The remainder, approximately 75,600 acre-feet, will be met through:

- ***Additional Aquifer Storage & Recovery*** – SAWS carries excess inventory in the water resources portfolio to account for the Edwards permit during critical period withdrawal reductions. Additional storage of permitted water supplies could provide the ability to manage the Edwards Aquifer during dry periods resulting in the postponement of an additional large supply project beyond the year 2060. As such, an additional ASR facility may be constructed during this period.

- ***Ocean Desalination*** – Construction and delivery of an ocean desalination project would be anticipated in this timeframe.

- ***LCRA-SAWS Water Project*** – Continue studies in order to obtain additional information for evaluation of the project's contribution to SAWS and regional needs.

- ***Other Water Supplies*** – Construction and delivery of identified supplies from the "Request for Proposals" would be anticipated in this timeframe.

As a whole, these actions will enable SAWS to meet the demands of its service area through the provision of affordable, diversified, and plentiful water supply. The programs identified above provide a suite of options that will meet permitted supply gaps throughout the planning period. In addition, other activities will be on-going throughout all of the Programs and are important to the overall success of the Water Management Plan. These include:

The Task Force consisted of the following members:

- Mr. Robert R. Puente, President/CEO
- Mr. Doug Evanson, Senior V.P. of Finance and Chief Financial Officer
- Ms. Kelley Neumann P.E., Senior V.P., Engineering and Water Resources
- Mr. Greg Flores, V.P. of Public Affairs and Customer Service
- Mr. Steve Kosub, Corporate Counsel, Water Resources
- Mr. Calvin Finch, Director of Water Resources
- Ms. Hope Wells, Corporate Counsel – Water Resources

The Task Force would like to acknowledge invaluable contributions and assistance from a number of SAWS staff. Special recognition is extended to Darren Thompson and Kevin Morrison P.G. for their data analysis, preparation and coordination of all of the Task Force meetings. In addition, Steven Bereyso, Adam Conner, and Lisa Guardiola provided significant support to the Water Resource Task Force review process. The following SAWS staff supported the Task Force in other aspects of the *2009 Water Management Plan*:

- Lance Freeman – Demographics
- Mary Bailey & Stephen Turner – Project Finance
- Karen Guz & Elliot Fry – Conservation
- Gary Guy P.E., Joe Rippole P.E., Adam Eddy P.E., and Meagan Brown,– Project Cost Analysis
- Debra Nicholas, Anne Hayden, & Mario Aguilar – Public Outreach

The following departments contributed to the completion of the 2009 Water Management Plan:

- Water Resources Department
- Communications Department
- Production & Operations Departments
- Legal Department

Basis for the Revision of SAWS Water Supply Plans

In the past three years since the completion of the *2005 Water Resource Plan Update*, significant change has occurred that will impact SAWS water resource planning. The fundamental driving forces behind the need to update the *2005 Water Resource Plan* were the following:

Edwards Aquifer Authority Enabling Act Changes – Senate Bill 3 (2007 Texas Legislative Session) changed the maximum pumping limits from 400,000 acre-feet (AF) per year to 572,000 AF. Junior/Senior and interruptible pumping limitations were removed and were replaced with a new statutory Demand Management/Critical Period Management (DM/CPM) regime.

2. Objectives

The Task Force's primary objective was to re-evaluate all aspects of SAWS water resource planning. This included a review of the water supply options outlined in the *2005 Water Resource Plan Update*, population projections, per capita consumption data and future projections, total demand forecasts, and information learned during the years of exploring supply development options identified in 2005. The Task Force remained committed to the values that guided the development of the 1998 and 2005 Water Resource Plans. In addition, the Task Force re-emphasized SAWS' commitment to providing affordable supplies to the community it serves and responsibly managing the existing portfolio of water resources for the benefit of the ratepayers, the region, and the state.

The Task Force's intention was that the SAWS approach ensures:

- Sufficient supply is provided during even deep drought periods;
- Dependence on more costly supply alternatives is delayed or precluded, if possible, through a re-commitment to sensible conservation;
- Financial impacts to SAWS rate-payers are minimized where possible while meeting existing and future needs in a cost-sensitive manner;
- Long-term use of Non-Edwards Aquifer supplies is promoted, but recognize and participate in the mature regional water market in Edwards pumping rights, and;
- Neighboring communities can rely on SAWS as a trusted, conscientious, and sound manager of regional resources.

3. Methodology

Similar to the *2005 Water Resource Plan Update*, the 2009 Task Force utilized a multi-phased approach to its deliberations. This approach was divided into four phases:

3.1. Phase 1: Review of Population and Demand Projections

Phase 1 consisted of a review of population projection methodologies and their underlying assumptions. Knowledge of population trends is fundamental to the development of the *2009 Water Management Plan*. Population projections from the Texas State Data Center (TSDC), Texas Water Development Board (TWDB), and the Alamo Area Council of Governments (AACOG) incorporating land use assumptions, transportation system developments, and emerging economic trends were used to assign growth in the SAWS service area.

- Bond funds receive a 3% return;
- Water purchase costs were converted to an equivalent annual lease O&M cost and:
- O&M and capital cost inputs for the proposed projects utilized engineering reports prepared by consultants and SAWS staff, historical financial data, and experience gained from project construction and operations to date.

The application of the Annualized Cost Methodology and standardized financial assumptions allowed for a direct comparison of each project, proposal, and prospect contemplated by the Task Force.

Technical Feasibility – This criterion included an assessment of the physical and technical requirements for constructing the project, the infrastructure required to support and distribute water supplied by a project, and the natural resource requirements necessary for a project. Availability of supply and constructability were the primary factors behind the technical feasibility criteria. This factor contributed less-heavily in the *2009 Water Management Plan* when compared to the 2005 Plan – feasibility work since 2005 has answered some of these questions. However, uncertainty remains in several proposals and prospects contemplated by the Task Force.

Diversification – Diversification refers to a project's potential yield of total supplies needed in order to evaluate the contribution of a project to Non-Edwards Aquifer supply.

Risk – Water supply projects are inherently full of a variety of risks. The 2009 Task Force emulated the *2005 Water Resource Plan Update* by evaluating environmental, legislative, and regulatory risks. In addition, the 2009 Task Force evaluated economic risks. Each of these risks has the potential to adversely impact a project in the permitting, design, development, construction, or operational phases of work. Any of these risks may make project implementation difficult or impossible. Environmental risk was defined as a project's impact on resource quality, sustainability, and integrity. Legislative and regulatory risks referred to the possibility of obstruction or facilitation of future water supply projects through state and local surface and groundwater law, rule-making, and regulation. Economic risks include factors such as project development costs, operations and maintenance costs, costs associated with mitigation, construction cost escalation, and costs of distribution system upgrades required for utilization of the resultant supplies in the SAWS system.

3.4. Phase 4: Formulation of Alternate Strategies

Finally, the Task Force contemplated different combinations and arrangements of the various projects, depending on different scenarios envisioned in the Risk

education levels, household size, occupancy rates, location of vacant land, flood plains, and Utility Service Agreements. This model allocates the TWDB County population model projection results to 900 sub-areas called Transportation Analysis Zones (TAZ). This modeling refinement is conducted by the Alamo Area Council of Governments; however, the process, inputs, and outputs are reviewed by many local agencies, which include SAWS staff.

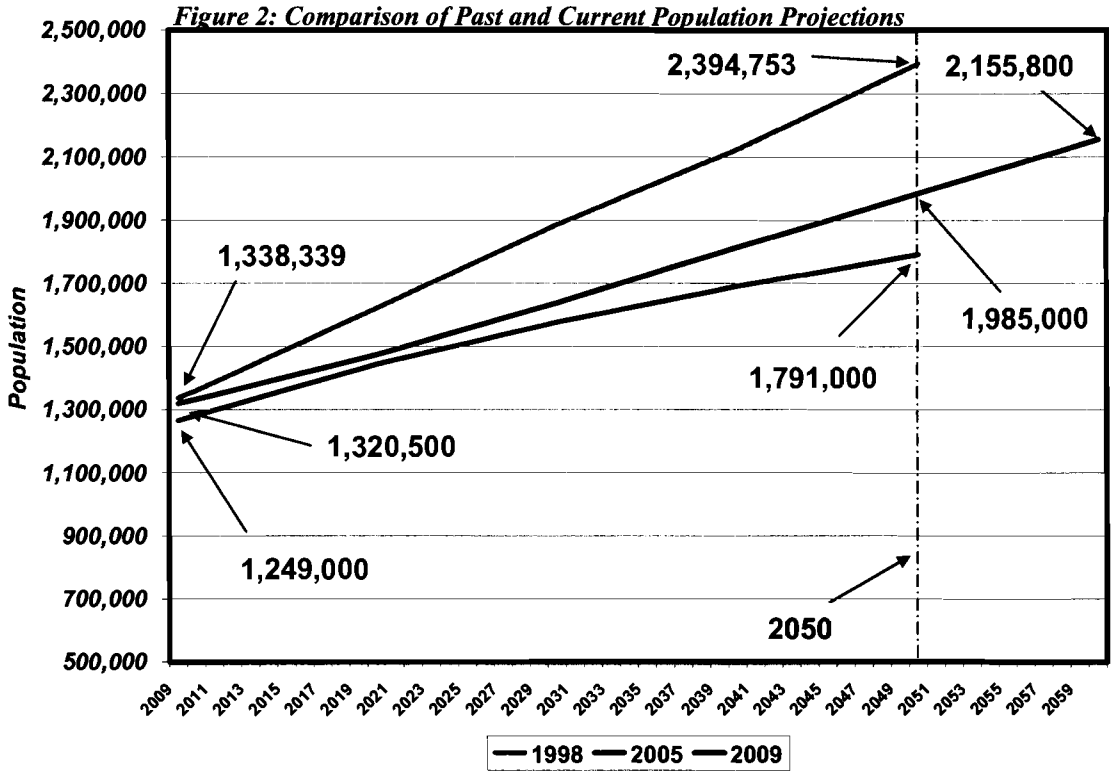
Some portions of the planning area have no TAZ data. Population analysis for these areas is based upon the buildable area, expected density and application of the anticipated build-out time periods. In addition, associated factors, such as planned major thoroughfares, school districts, and nearby development in the area are considered.

In the 2040 – 2060 time frame, all areas in this plan lacked TAZ model projection because transportation planning has not yet been developed for this time period. Therefore, population estimates during this timeframe were based on population trends to date using a least-squares method.

5.2. Population Projections

Population projections for SAWS current certificated areas and the pending CCN expansion applications (identified as green and blue-hatched areas respectively in Figure 1) were developed In a departure from the previous *2005 Water Resource Plan Update*, the Task Force recommended that the *2009 Water Management Plan* address long-range water planning for only SAWS existing certificated areas and the pending CCN expansion applications in order to reduce the burden on ratepayers. Should other water entities desire joint water planning, SAWS remains prepared to work cooperatively in the form of an equitable partnership dedicated to mutually sharing risks and rewards on an as-requested basis.

Figure 2: Comparison of Past and Current Population Projections



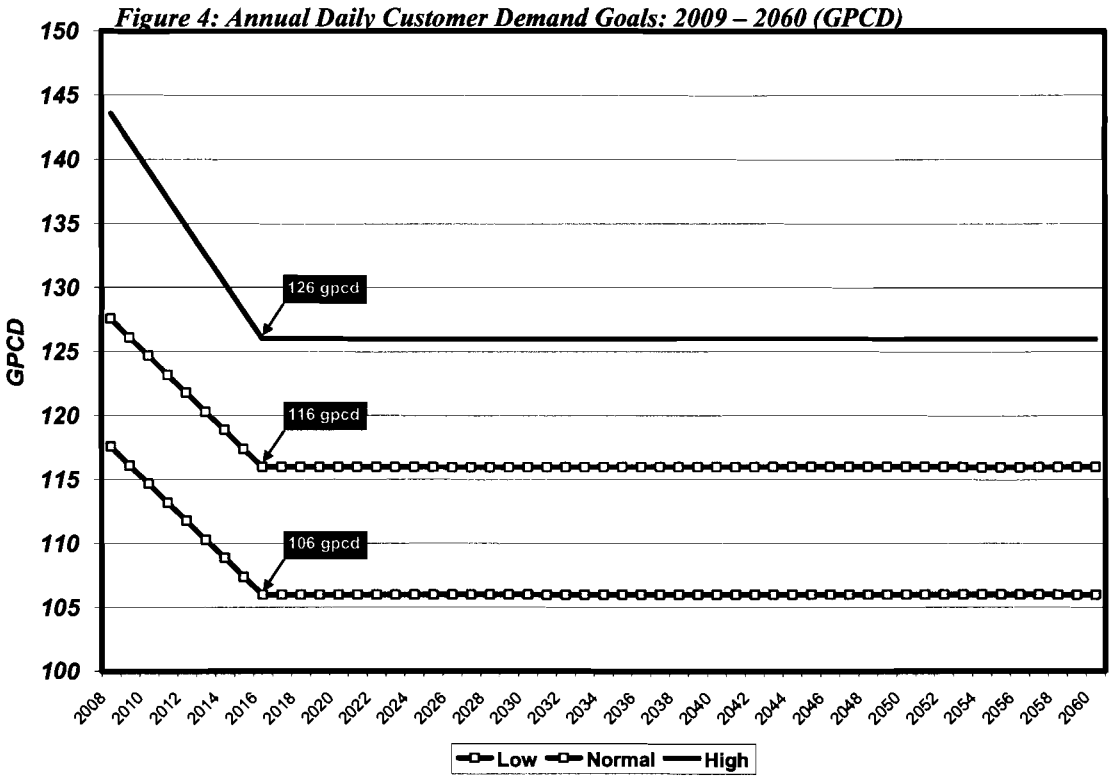
6. Water Demand Planning

Water demand projections were developed by multiplying the SAWS service area population by the respective per capita consumption for each year between 2009 and 2060. The following sections provide a discussion of the assumptions incorporated into the *2009 Water Management Plan* and consider the following:

- Advanced conservation as a vehicle to reduce the need for future costly water supply projects.
- Recent extreme wet and dry years (2007 and 2008 respectively) impacts on gallons per capita per day (GPCD)
- New Drought Management/Critical Period Management (DM/CPM) triggers that were altered during the 2007 session of the Texas Legislature
- A series of drought of record scenarios starting in 2008, 2028 and 2054 to simulate the worst case impact to the Short-, Mid- and Long-Range permitted supply gaps.

The Task Force recognized the challenge of elevating conservation awareness especially in the area of outdoor irrigation management. The Task Force recommitted the System to the goal of 116 gpcd by the end of 2016 in a normal year. Understanding the necessity of education and citizen awareness of water use at all times, and particularly dry years, the Task Force set a goal of 126 gpcd in dry years by 2016 (Figure 4). This recommitment to sensible conservation without interference in the city's growth or its citizens' quality of life will be accomplished through irrigation education, landscape and water use audits, rebates for demonstrable reductions in water use by high-use customers, and increased awareness coupled with vigilant enforcement of existing ordinances. The conversion to Automated Meter Reading (AMR) technology will allow for water use to be tracked by customers and by SAWS in near-real-time, providing an invaluable tool in education, leak detection, and enforcement proceedings.

Figure 4: Annual Daily Customer Demand Goals: 2009 – 2060 (GPCD)



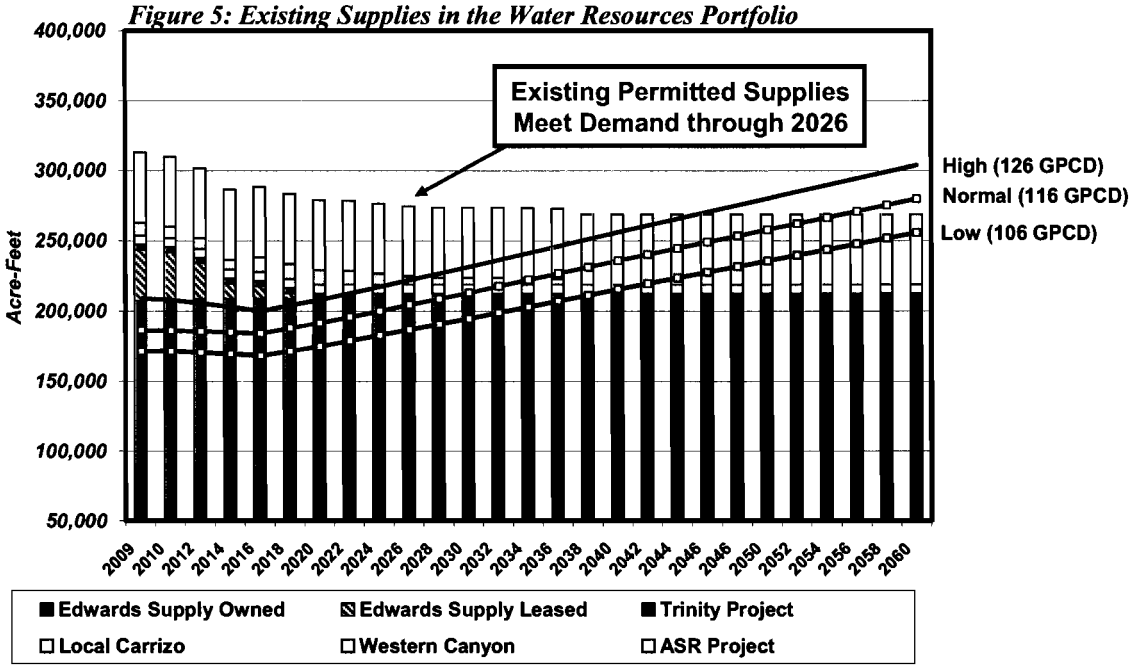
6.2. Drought of Record

SAWS will use the Drought of Record for water planning which is consistent with the Regional Water Plan and State Water Plan.

6.3. Climate Change

Planning for future water resource supply projects should be mindful of potential effects of anthropogenic or natural climate change. To date, climate change prediction for Texas as a whole is somewhat mixed; scaling down to a regional level remains beyond the scope of most accessible models currently available.

Figure 5: Existing Supplies in the Water Resources Portfolio



Since 2005, SAWS has brought a number of additional projects online or to near-completion. The following describes projects that are or will soon be online:

- ***Edwards Aquifer Authority Permit*** – The Edwards Aquifer will continue to be the cornerstone of San Antonio's water supply. As of January 1, 2009, SAWS' existing Edwards Aquifer Authority (EAA) permit inventory was 243,700 acre-feet per year consisting of historically-derived permits, leases, and acquisitions. The 2009 Task Force was mindful of potential management and regulatory changes associated with the ongoing Edwards Aquifer Recovery Implementation Program (EARIP) process. The results of the EARIP process could either provide greater availability or significantly reduce the Edwards supply available to SAWS as well as other regional permit holders.

- ***Recycled Water*** – SAWS has been recognized as an innovative national leader in wastewater effluent treatment, recycling, and reuse for irrigation and industry. SAWS has built the nation's largest recycled water delivery system. The Recycled Water project has a capacity of 35,000 acre-feet per year and is now a driver of economic development in San Antonio (Toyota and Microsoft are notable examples). The Recycled Water project also directly benefits the entire region and the natural environment. For example, up to 85,000 acre-feet per year of pumping demand on the Edwards Aquifer has been alleviated through supplying cooling water to CPS Energy electrical generation facilities (50,000 acre-feet of indirect reuse through a bed-and-banks conveyance permit). Recycled water has also been used to convert parks, recreational fields, golf courses, and landscaping from potable to recycled water use and also benefits Salado Creek and other tributaries of the

Storage and Recovery facilities.. This project will provide additional flexibility in the use and management of the ASR facility.

7.2. Permitted Supply Gaps During Repeated Drought of Record

To fully assess future supply gaps during the 50-year planning horizon, the Task Force imposed a repeat of the drought of record on the available supplies during three different points during the planning horizon. Supply was determined during three simulated drought of record periods by quantifying the percentage of SAWS Edwards supply that would have been available if a drought of record similar to that of the 1950's occurred. Current drought triggers established by the 2007 Texas Legislature were taken into consideration. In addition, after 2012, the Edwards regional pumping "floor" utilized for purposes of planning was assumed to be 320,000 acre-feet.

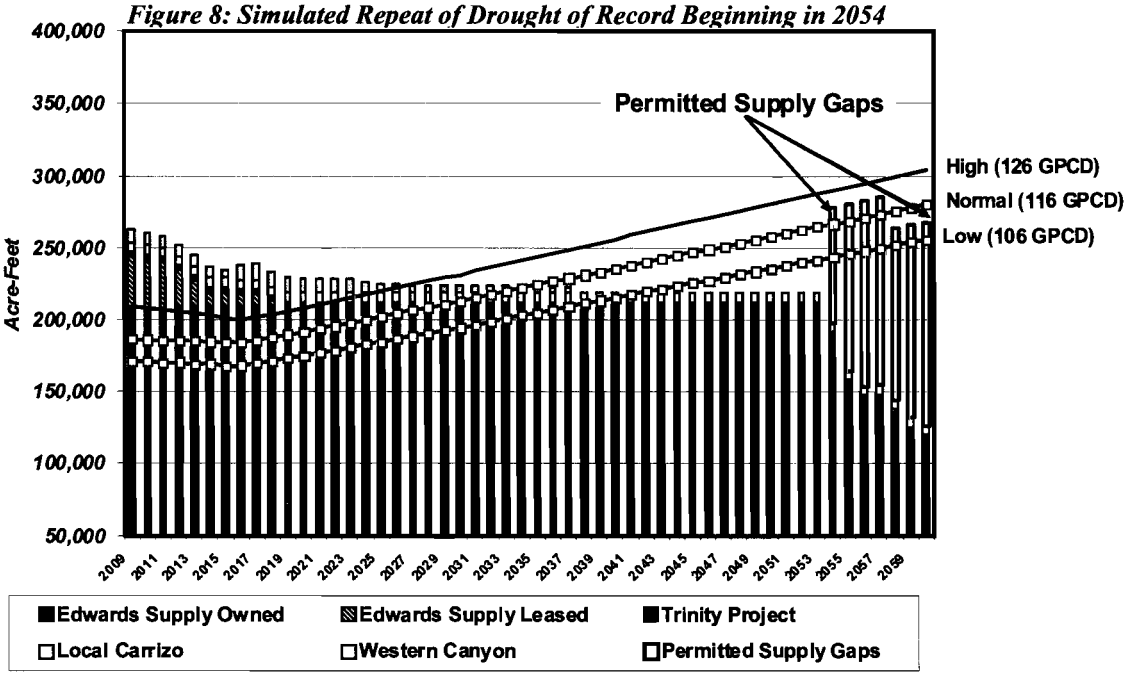
Given the hydrogeologic character and existing demands on the Trinity Aquifer, the Task Force determined that the existing Trinity supplies will be unavailable during a repeat of the drought of record conditions.

Figures 6, 7, and 8 below illustrate the impacts of a simulated drought of record condition with the worst years occurring in 2014, 2036, and 2060. Permitted Edwards, Local Carrizo, Trinity (Oliver Ranch/BSR), Western Canyon, and the Aquifer Storage and Recovery (ASR) as a supply reserve of 50,000 acre-feet are considered to be the available existing supplies.

In Figure 6, the permitted supply gap identified for 2014 is 37,622 acre-feet. Between 2009 and 2011, SAWS has the capacity to meet demands during the early stages of a repeat of the drought of record. Starting in 2011, SAWS would meet demand through the use of the stored ASR supply reserve. That reserve would be depleted in 2013, resulting in permitted supply gaps in 2013-2015.

By 2060 (Figure 8), the permitted supply gap increases to 141,000 acre-feet in the worst year of a repeat of the drought of record.

Figure 8: Simulated Repeat of Drought of Record Beginning in 2054



8. Potential Projects

Provided below is a brief outline and description of the proposed projects to meet the permitted supply gaps identified in the previous section and their status.

- ***Brackish Groundwater Desalination*** – This project involves the development of a water supply facility with the capacity to treat brackish groundwater to drinking water standards. Brackish groundwater developed close to San Antonio would provide SAWS with a potential new source of water. Research on the sustainability and water quality from the Wilcox Aquifer indicates the project is favorable for development. The initial phase of the project develops water from within Bexar County. Future phases could potentially develop brackish resources in Atascosa and Wilson Counties. Possible brine injection locations to be considered include southern Bexar and/or Wilson counties.

- ***Regional Carrizo*** - The Regional Carrizo Water Supply Project is a long-term water supply project that involves transporting Carrizo Aquifer groundwater from Gonzales County to the Bexar County area via a pipeline in excess of 50 miles in length. Recent studies show the Carrizo Aquifer as a viable water source to secure future water supply needs. The Regional Carrizo Project will assist in diversifying San Antonio's water supply, reducing reliance on existing Edwards Aquifer supplies. SAWS submitted an initial, consolidated permit

- ***Other Alternatives*** - SAWS continues to consider other water supply alternatives such as expansion of the ASR or development of an additional ASR site. Expanded use of recycled water also has the potential to offset future potable demand.

9. Project Analysis

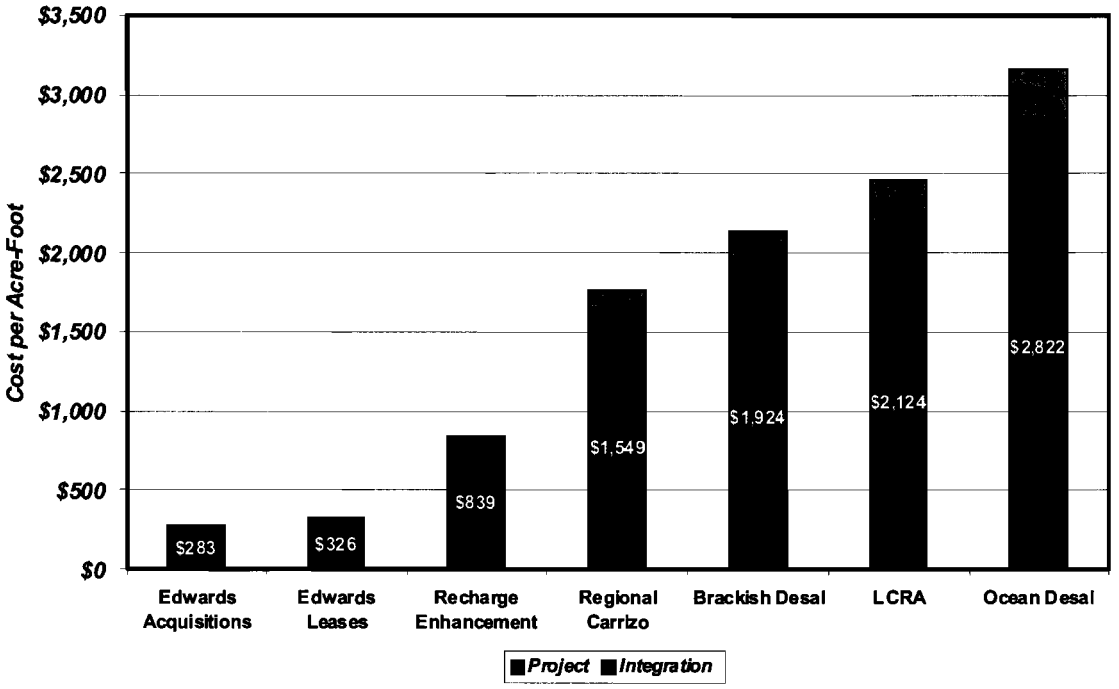
This section outlines the deliberations of the Task Force on the factors examined in Phase 3.

9.1. Economic Efficiency

Cost is one of the key factors that can be used to determine the feasibility of potential and existing projects. The costs of a project have a direct impact on SAWS ratepayers. The Task Force recognized the importance of evaluating each project using identical criteria. To that end, the Annualized Cost Methodology (described in Section 3 (c)) allowed for the direct comparison of each project, proposal, and prospect contemplated by the Task Force, as described in Section 3 (Methodology), Phase 3 (Economic Efficiency).

In Figure 9, costs for each project and proposed project are outlined using this methodology. The Edwards Aquifer Permit and Acquisitions is the least costly project, at $283 per acre-foot per year. The Ocean Desalination prospective project is the most costly, at $3,168 per acre-foot per year.

Figure 9: Annualized Project Cost with System Integration



of supply and the practical, industrial technology and processes necessary to construct and operate the project within the timeframe a water supply is required. Significant feasibility study and design work has been completed to address technical feasibility of the various projects since the *2005 Water Resource Plan Update*.

9.5. Risk

Development of water supply projects is difficult considering the length of time from project concept to construction, the regulatory, legal, environmental, and economic risks. The 2009 Task Force considered all of the above mentioned risks carefully as it reviewed the options within SAWS portfolio in an attempt to identify the most feasible and cost effective projects.

10. Proposals

10.1. Task Force Proposals

After consideration of public input and comments, the SAWS Board of Trustees approved the *2009 Water Management Plan* on May 5, 2009. The plan is divided into three parts: a Short-Range, a Mid-Range, and a Long-Range program to address permitted supply gaps.

Short-Range Program (through 2014) – In the near-term, SAWS will build on its successes and existing certainty while seeking additional certainty in other arenas. The *2009 Water Management Plan* has identified a permitted supply gap of 37,000 acre-feet in the worst year of a repeat of the drought of record (2014). In order to fulfill this supply gap, SAWS staff will:

- ***Maintain the current Edwards Aquifer Inventory of Leases*** – Through 2014, approximately 26,000 acre-feet of EAA permit leases will expire. Staff will maintain this amount (26,000 acre-feet) through renewal or purchase of existing leases or replacement with new leases and purchases.

- ***Acquire additional Edwards Aquifer Permits*** – The Edwards Aquifer permit market matured with the passage of Senate Bill 3 (2007) and the re-issuance of final permits by the EAA. SAWS will participate in this market to acquire additional aquifer pumping rights in an amount of 2,000 acre-feet a year through 2014.

- ***Phase I of Brackish Groundwater Desalination*** – A wellfield will be developed in southern Bexar County in the Wilcox Aquifer. The treatment plant will be located on the Aquifer Storage and Recovery (ASR) property and will initially treat 11,800 acre-feet per year. The treatment plant will be designed to accommodate additional upgrades and technologies. In the future, once the science of desalination has been proven to concerned

expressed interests in the past and others who may be interested in providing water supply partnership opportunities to SAWS.

Mid-Range Program (2015-2034) – In the years between 2015 – 2034, SAWS has identified a permitted supply gap of 81,000 acre-feet in the worst year of a repeat of the drought of record (2034). The Short-Range Program will supply 33,800 acre-feet of that gap. The Mid-Range Program will address the remainder, amounting to 47,538 acre-feet of permitted supply gaps. In order to address this gap, SAWS staff will:

- ***Maintain the current Edwards Aquifer Inventory of Leases*** – Approximately 11,000 acre-feet of leases will expire in this time period. SAWS staff will work to maintain this existing amount (11,000 acre-feet) through either renewal or purchase of expiring leases or replacement with new leases and purchases.

- ***Regional Carrizo, Additional Edwards Permits, or Expanded Brackish Desalination*** – In the 2009 – 2010 timeframe, the contested case process regarding the Regional Carrizo project will be finalized. At that point, SAWS will decide within a short amount of time whether to pursue a pipeline for the amount of the permit, if issued by the Gonzales County Underground Water Conservation District. Development of the Regional Carrizo project is SAWS preferred choice to fill a portion of the mid-term supply gap depending on the outcome of the contested case hearing. Other options in the timeframe of 2015-2034 include an expansion of the Brackish Groundwater Desalination project or acquisition of additional Edwards Aquifer permits. Regardless of the route ultimately chosen in the future, the amount that must be acquired to meet a portion of the identified permitted supply gap is 11,687 acre-feet.

- ***Recharge Enhancement*** – Studies of Recharge Enhancement through the construction of artificial structures on the recharge zone in the Nueces and Guadalupe-San Antonio river basins continue. SAWS plans for construction amounting to a firm yield of 13,451 acre-feet during this timeframe.

- ***Aquifer Storage and Recovery (ASR)*** – A repeat of the worst year of the drought of record in 2034 would result in a 16,000 acre-foot permitted supply gap. Previously stored water from the ASR facility will be used to meet this shortfall.

- ***Recharge and Recirculation*** – Preliminary evaluation of the recently-released report by Todd Engineers, "Recharge & Recirculation: Phase III & IV Report," indicates that some components identified in the report may have merit for further study and possible implementation. The yield of such a project is undetermined at this time.

CPS Energy initiated the use of recycled water for the cooling systems of its power generation plants. Recycled water is a valuable conservation tool and has been included in previous Water Management Plans. Many sources of potable water (Carrizo, Trinity, surface water from Canyon Lake, Edwards, and others) are consumed and then processed through the wastewater treatment plant for use in the recycle system. Optimizing the use of recycled water helps offset the need to develop additional potable water supply projects, while protecting the health of the receiving stream.

Figure 11 illustrates the proposed water supply projects and how they will fill SAWS water supply gaps through 2060 under Stage IV critical period restrictions.

Figure 11: Current and Proposed Water Supply Projects (During Stage IV)

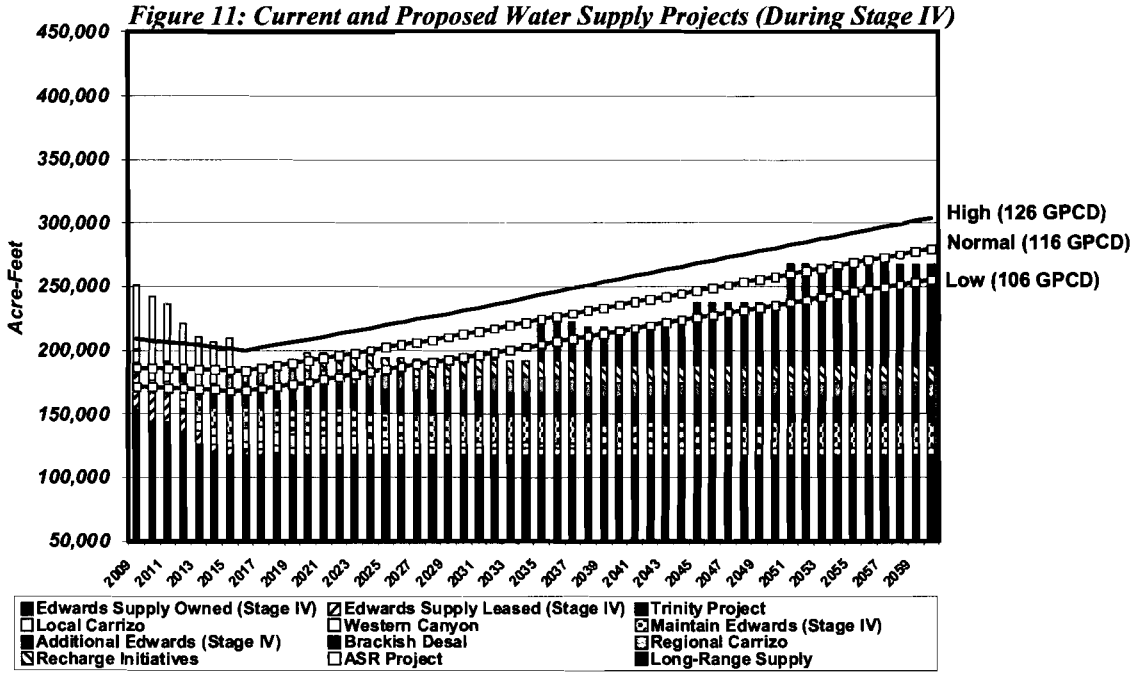


Figure 12 summarizes SAWS water supply plans for the short-term, mid-term, and long-term programs to supply water through year 2060.