

Ed Archuleta has served as General Manager for the El Paso Water Utilities Public Service Board since 1989. Under his management, the utility has been recognized regionally and nationally for leadership in conservation, reclamation, and management. From 1974 to 1989, Ed worked for the City of Albuquerque in various positions including Assistant Director/Operations, Public Works Department. Prior to that, he planned and designed water and wastewater projects for a multinational consulting engineering firm in Iowa and a regional firm in Albuquerque. Ed earned bachelor's and master's degrees in civil engineering from New Mexico State University, and a Master of Management Degree from the University of New Mexico. He is a registered Professional Engineer in Texas, New Mexico, and Iowa. Ed is a member of the American Water Works Association, the Water Environment Federation, and the National and Texas Societies of Professional Engineers. He is Chairman of the American Water Works Association Research Foundation, a trustee of the Association of Metropolitan Water Agencies, and an American Academy of Environment Engineers Diplomat. His civic involvement includes service or past service on the boards of United Way, Paso del Norte Health Foundation, Rotary Club, El Paso Home Builders Association, and El Paso Symphony.



HOW A LARGE MUNICIPALITY PLANS TO MEET ITS FUTURE WATER SUPPLY NEEDS

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ABSTRACT

The City of El Paso, through its Water Utility, provides water and sewer services to approximately 700,000 people in the Greater El Paso metropolitan area. The area is growing at a rate of over three percent per year and has enormous challenges in being able to meet its future water needs.

The City is located in the Chihuahuan Desert, an area that receives approximately eight inches of rainfall per year. Managing water is further complicated by jurisdictional issues involving three states and two nations, all with different laws and regulations.

There are several competing interests for water including irrigation, municipal, recreational, and environmental needs. Providing for and balancing the needs is a major challenge.

However, El Paso Water Utilities has over the years done a considerable amount of water planning and has executed that planning. The Utility has a well-defined, diversified, strategic business plan along with capital, operating, and financial plans.

The paper will describe the means, methods, and cost ramifications of meeting water supply and water quality requirements for the foreseeable future.

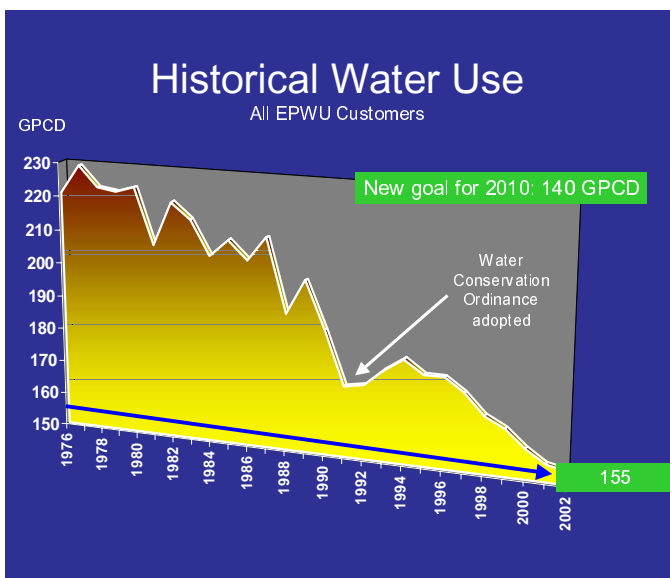
Editor's Note: The following PowerPoint presentation was given by Mr. Archuleta at the conference.



Long-Term Water Resource Plan

- Conservation
- Reclaimed Water
- River Water
- Groundwater
- Desalination
- Importation

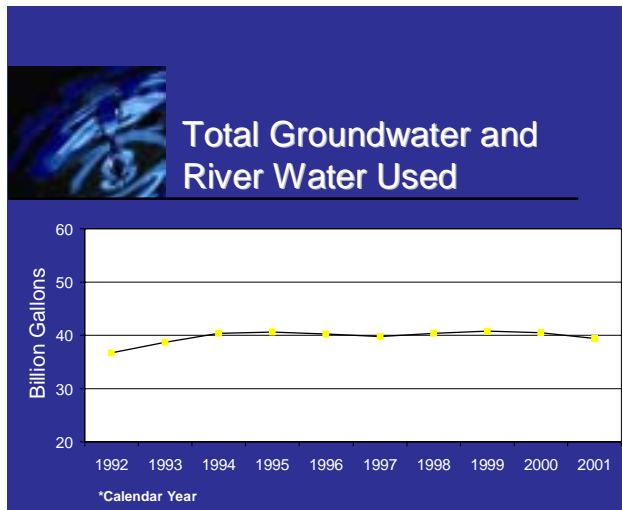
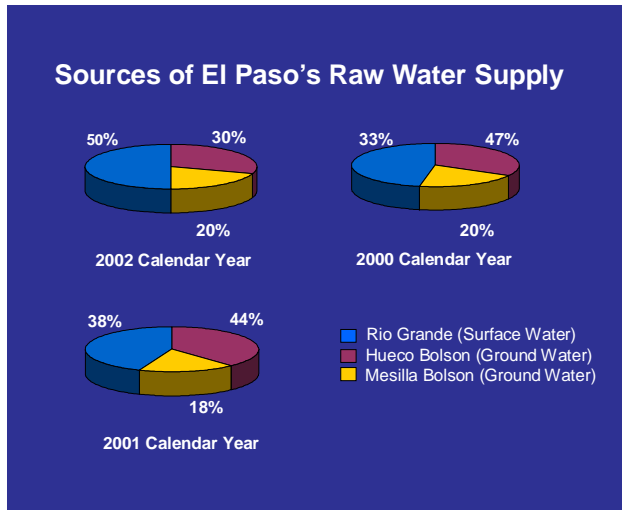
As our population grows and our service area expands, we must find additional sources of water. Our long-term water resource plan calls for a diversified portfolio which includes conservation, reclaimed water, river water, groundwater, desalination, and the eventual importation of water from areas beyond El Paso.



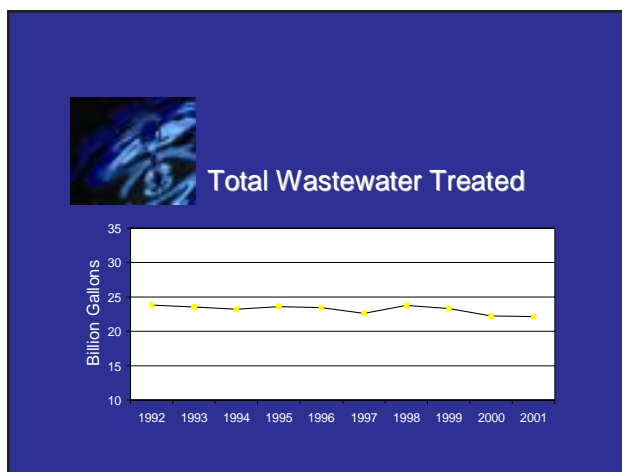
Conservation – Consumption

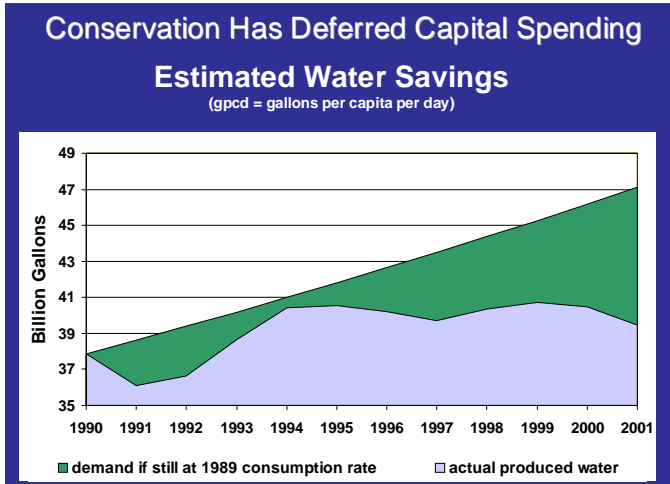
Per person consumption dropped from 159 gallons per day in 2000 to 155 in 2001, and we are on track for meeting our goal of 140 gallons per day by 2010. This is largely due to the water conservation ordinance, which was adopted in 1991, and our water conservation program, which is one of the most aggressive in the nation.

How a Large Municipality Plans to Meet Its Future Water Supply Needs

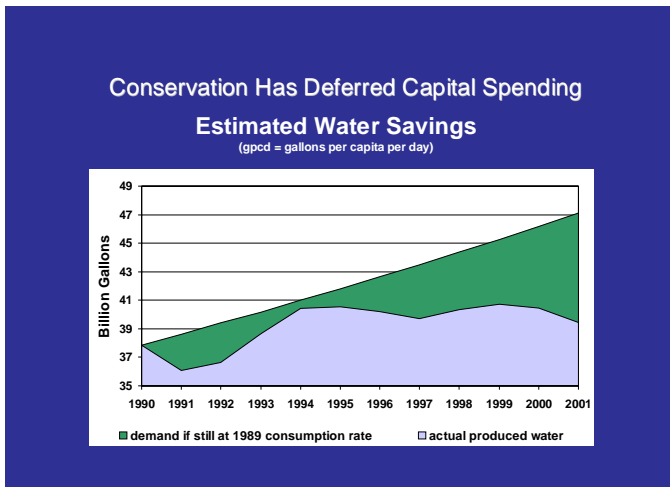


Because of proactive water conservation, the amount of water pumped by El Paso has remained relatively uniform over the past 10 years.

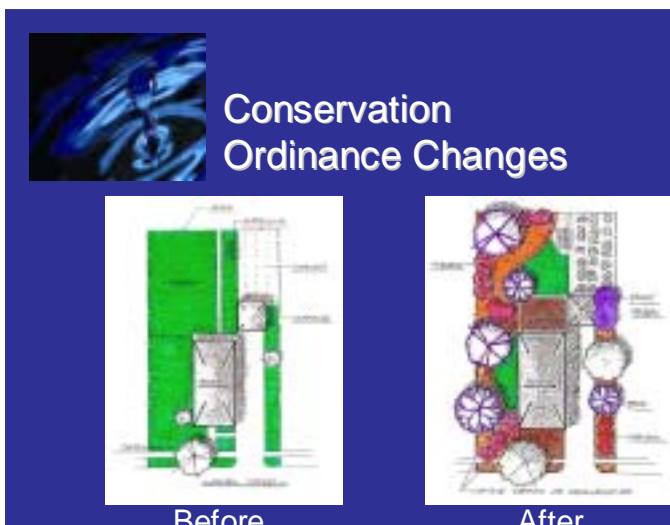




Water conservation in the form of time-of-day and day-of-week watering has dramatically reduced demand.



Over 10 years we estimate that we have saved more than \$300 million in avoided capital costs.



Conservation – Programs
 Education and incentives are key components of the conservation program, and one of the most popular programs this year is the turf replacement rebate. This program rebates \$1.00 for each square foot of established grass that is replaced with water-efficient landscape materials.




1 Billion Gallons Saved in 2001

- Turf Replacement Rebate
- Washing Machine Rebate
- Refrigerated Air Conditioning Rebate
- Evaporative Cooler Restrictor Clamps
- Showerhead Replacement Program







By far one of the most effective indoor conservation programs has been the showerhead replacement program. We have distributed over 200,000 showerheads and last year saved a billion gallons of water. Other popular programs include the \$200 washing machine rebate, the \$300 refrigerated air conditioning rebate, and the evaporative cooler restrictor clamps, which restrict the flow of water through the units' bleed-off line. Restrictor clamps are free to customers who request them.



Jonathan Rogers Plant



Capacity increased from 40-60 MGD as of June, 2002



Jonathan Rogers Plant
 In 1999, we began construction of the Jonathan Rogers Plant expansion. The plant began operating in 1993 with the capacity to treat 40 MGD. The expansion increases the capacity to 60 MGD to serve the additional customers in southeast El Paso and areas beyond the city limits. This project was partially funded by a \$14.9 million EPA grant through the North American Development Bank. Construction was completed this spring.



Haskell Street Plant Reclaimed Water (Phase I) Fall 2003

<ul style="list-style-type: none"> • 4 City Parks (80 MG) Lincoln Park Orchard Park Washington Park Modesto Gomez Park 	<ul style="list-style-type: none"> • 4 Schools (30 MG) Bowie High School Jefferson High School Burleson Elementary Father Yermo School
<ul style="list-style-type: none"> • Other Customers (90 MG) Chamizal National Park Dudley Field El Paso Zoo El Paso Humane Society Evergreen Cemetery 	<p>Ascarate Golf Course (200 MG as Existing Customer)</p> <p>Construction Uses from Plant Standpipe: 4 MG/yr</p> <p>TOTAL (404 MG)</p>

El Paso needs to obtain more water from the river through the conversion of uses as the city continues to urbanize, through supply side conservation, and greater and greater efficiencies in the delivery of river water. This can all be done without impacting the El Paso agricultural community.



Northwest Plant Reclaimed Water Project

- Coronado Golf Course – 170 MG/Year
- 6 City Parks – 65 MG/yr
- 2 Schools – 18 MG/yr
- 5 Additional Schools (fall 2002) – 35 MG/yr
- 2 residential yard meters
- 1 EPWU yard meter
- Construction Water from Plant Standpipe: 2 MG/year

Total 290 MG/year



Fred Hervey & Bustamante Plant Reclaimed Water

Fred Hervey Plant

- Golf Course: 219 MG/year
- El Paso Electric: 980 MG/year
- Ranching/Construction: 8 MG/year
- Aquifer Recharge: 600 MG/year
- Construction Uses from Plant Standpipe: 4 MG/yr

Total 1811 MG/year

Bustamante Plant


- Garment Processing: 120 MG/year
- Median & Commercial Landscaping: 1 MG
- Construction Uses from Plant Standpipe: 2 MG/yr

Total 123 MG/year



Total Reclaimed Water

- 2.628 billion gallons or 6.6% of all water used or 11.9% of all wastewater treated

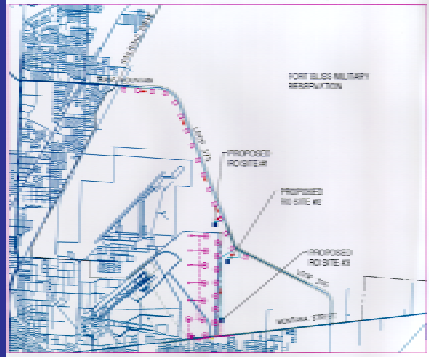


Joint Desalination Project

- Fort Bliss and El Paso Water Utilities to build a 27.5 million gallons per day desalination plant at a cost of \$60-70 million
- Plant is scheduled to go on line in late 2005

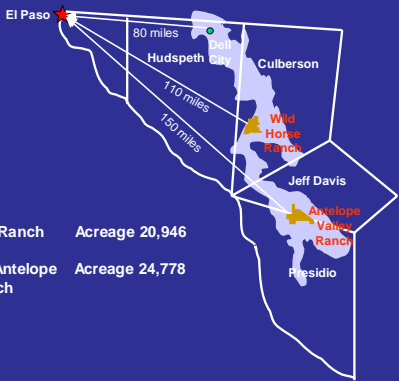
Joint Desalination Project
 Fort Bliss and El Paso Water Utilities are collaborating to build a \$60 million desalination plant. The 27.5 MGD facility will serve the Army post, the East Montana area outside the city limits, and customers in rapidly-growing east El Paso. Using desalinated water enables us to reserve the fresh water portions of the Hueco Bolson for drought protection and emergencies.

Fort Bliss/EPWU Joint Desalination Project Facility Location



Congress approved \$7 million in grant funds to El Paso last year. An additional \$7 million has been requested this year. So far, the Congress has also funded \$3.3 million for the military for this project. We will also receive a \$1 million, no-interest loan from the Texas Water Development Board Water Assistance Fund, which will be used for the final design. The plant is scheduled to go on line in 2006.

Location Of El Paso Water Utilities Properties Outside El Paso County



Wild Horse Ranch	Acreage 20,946
Ryan Flat (Antelope Valley) Ranch	Acreage 24,778

Water Rights – Dell City
 The Public Service Board owns several thousand acres of land for the purposes of providing water and water rights and for the protection of our source water. Some of the property is located outside of El Paso County, such as the ranches we own near Valentine and Van Horn. We are working with the underground conservation districts in these areas and plan to one day export water from these ranches to El Paso.

In April, the Public Service Board entered into an \$8.2 million purchase option agreement for water rights in Dell City. A feasibility study is being conducted during the nine-month option period. If the Board is satisfied with the water quality and quantity, and the amounts of water that can be exported, the option will be exercised. Any importation of waters will be done in accordance with the Far West Texas Water Planning Group, a State planning organization.



Land Management—
Revised Policies and
Procedures



While the Public Service Board retains land for water management purposes, it periodically sells parcels of land to developers, the City, and school districts. The Board recently asked staff to examine the policies for selling and managing this property. The study is complete, and we are augmenting our policies to ensure that they lead to reasonable, smart, and sustainable growth in our city.

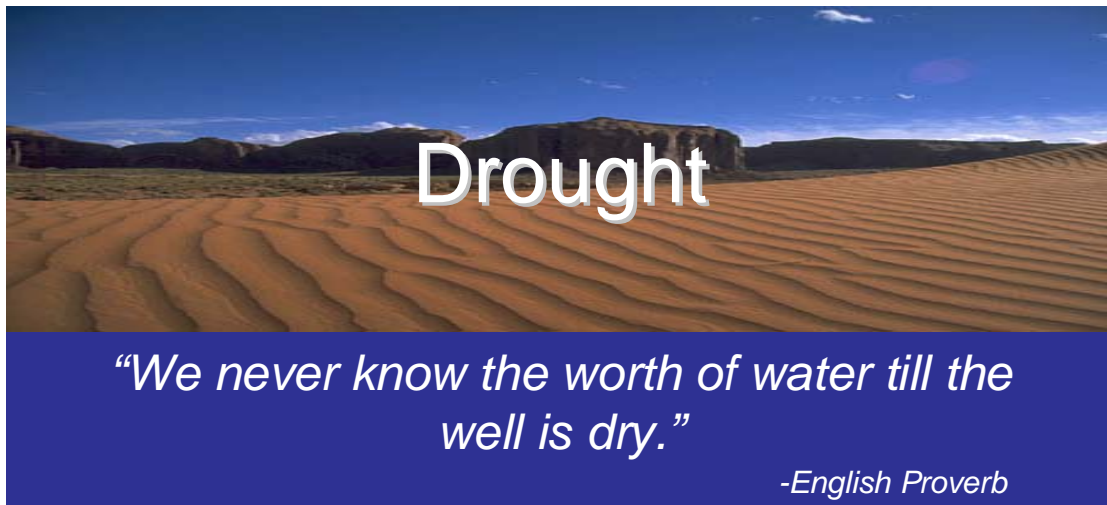
The new policies will enable us to maximize the return on our land assets, while improving the quality of life. We will master plan the land we sell, consistent with the City's and Public Service Board's strategic plans. These will be submitted to the City for approval as binding master plans. We will no longer exclusively sell land to be planned by others.



Bids will no longer be awarded solely based on price. We will factor in the economic opportunities that accompany mixed-use development, and the features that enhance quality of life, such as community centers, parks, trails, and open spaces.

All Public Service Board vacant lands will be categorized. Some will be leased, some will be sold, and others will be held in reserve. Five properties have been identified for immediate master planning. They are in the Artcraft, Canutillo Upper Valley, North Hills, Sean Haggerty and Painted Dunes areas.

A manual outlining the new land management policies and procedures will be available by the end of the year.



DROUGHT

While the threat of public harm from an attack on our water supply is small, conditions suggest that there will be a drought on the river system next year. This would seriously diminish our water supply next summer. The water that we treat in our plants is released from the Elephant Butte reservoir during the irrigation season. We are a customer of the Irrigation District. This year, El Paso will draw half of its water supply from the Rio Grande. Region-wide, 90 percent of the river water is used for agricultural purposes.



There has not been much snow in southern Colorado and northern New Mexico in recent years, and forecasters predict limited snowfall this winter. By the end of this year, the reservoir is expected to be at its lowest level since 1978.

Several of my staff were appointed to a task force, which is refining our drought management plan. This document specifies the events that trigger the three stages of the plan and the associated restrictions.

Drought

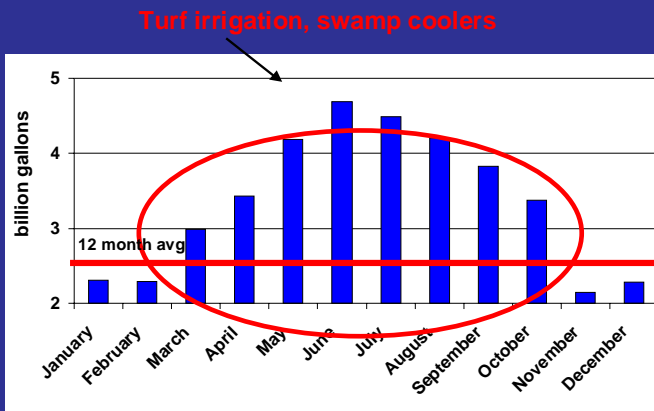


- A high percentage of El Paso's water is used outdoors
- PSB/City have a Drought Management Plan
- It is very likely that next year there will be severe cut backs in outdoor watering
- Drought conditions may persist for several years

Because so much of our water is used for outdoor watering, unless winter brings a tremendous amount of snowfall, it is very likely that next year there will be severe cutbacks in outdoor watering. Also, the drought conditions may persist for several years.

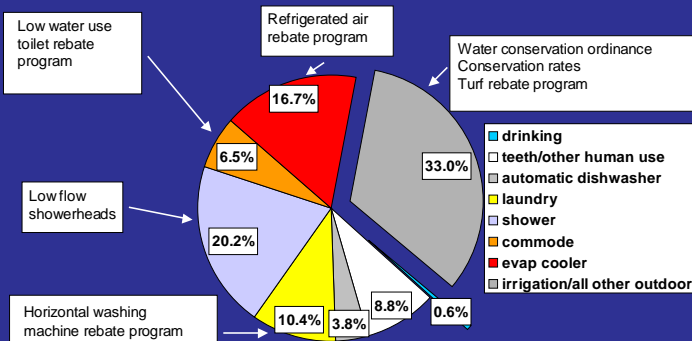
The revised drought management plan will be presented to the Public Working Committee, our citizens advisory group, for review before being presented to the Public Service Board and City Council for approval. With their approval, we anticipate beginning Stage One restrictions this fall.

Water Production by Month



EPWU Residential Water Use and Conservation Initiatives

125 gallons per person per day

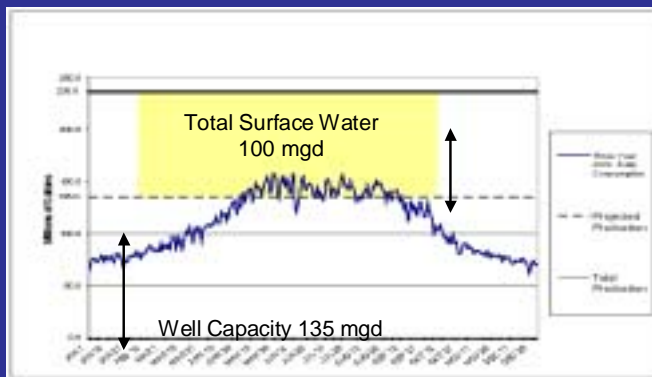




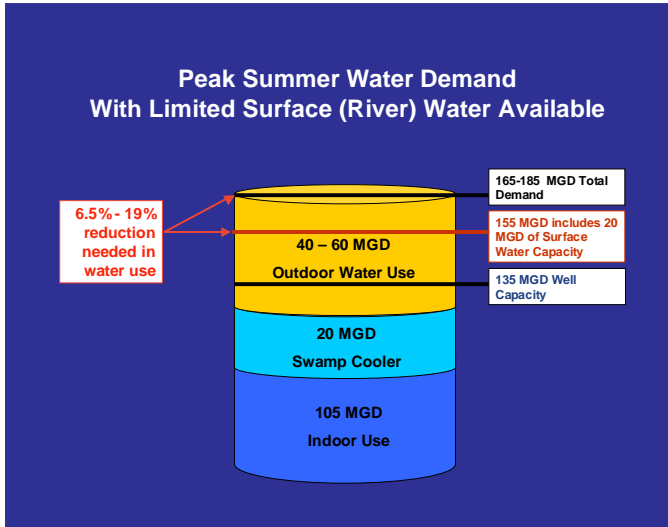
Meeting peak demand with limited surface water and maximum well capacity

- Well capacity of 135 mgd is planned for at the 95% confidence level
- Total well capacity is 145 mgd
- Allowances made for normal downtime for preventive and scheduled maintenance of wells

Three Year AVG. Daily Consumption Compared to 135 MGD Production and 235 MGD Total Production



■ Total Surface Water




Water Quality

El Paso Water meets all state and federal drinking water standards and has a superior rating from the Texas Commission on Environmental Quality. However...

Arsenic

- Arsenic is a naturally occurring substance found in portions of El Paso's drinking water supply
- The average concentration of our water from all sources is about 8 ppb
- Water that comes from wells in the Mesilla Bolson area averages about 16 ppb

Arsenic is a naturally occurring substance found in El Paso's drinking water supply. The average concentration of our water from all sources is about 8 ppb; however, the water that comes from wells in the Mesilla Bolson area averages about 16 ppb.




Arsenic

- EPA standard reduced to 10 parts per billion from 50 parts per billion
- Must comply by January 2006
- Cost of compliance estimated at \$75 million capital and \$4 million annual operating

The U.S. Environmental Protection Agency has reduced the federal standard for arsenic, which was 50 parts per billion for more than 50 years, to 10 parts per billion. Water utilities must comply by January 2006.

We are testing arsenic removal technology at a pilot plant in Canutillo. This is one of our first steps in complying with the regulation. Despite our plan to implement the most cost-effective strategies, we estimate that the cost of compliance may be as high as \$75 million in capital costs and \$4 million in operating costs. This will translate into a 13 percent water rate increase.


Summary



- El Paso has strong conservation programs in place that are seeing measurable results
- Long-term, use of more surface water will help with diminishing groundwater supplies
- El Paso has invested and will continue to invest significantly in reclaimed water as a substitute for non-potable applications i.e. turf irrigation and industrial use

We will continue our leadership in regional and binational planning. Our success depends on cooperation from both the municipal and agricultural sectors.

Summary



- Desalination of brackish groundwater from the Hueco will stretch the groundwater supplies and provide a hedge against drought
- River drought will affect residential and commercial/industrial use, particularly outdoor use. El Paso has a drought management plan in place.
- In the not to distant future, El Paso will have to import water into the City to augment supplies
- Cost of water is going to increase significantly to pay for new and alternative supplies, new regulations such as the arsenic rule and growth/rehabilitation

We will continue to seek grants and low interest loans, but our customers will see their rates increase dramatically in the coming years, primarily due to growth, new regulations, and the development of new supplies.