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EDWARDS AQUIFER AUTHORITY GENERAL MANAGER'S REPORT

January 2004

inside

BOARD ELECTS NEW OFFICERS

BY: GREGORY M. ELLIS, GENERAL MANAGER

Last month, the Edwards Aquifer Authority directors elected the following officers for 2004: Mr. Douglas R. Miller, District 9 (Comal/Guadalupe counties), as Chairman; Mr. Rafael Zendejas, District 5 (Bexar County) as Vice Chairman; Mr. Hunter Schuehle, District 12 (Medina County), as Treasurer; and Dr. Levi Jackson, III, District 2 (Bexar County), as Secretary. Mr. W. Bailey Barton, District 11 (Hays/Caldwell counties), was also selected as the At-Large Member to the Executive Committee.

This year marks the retirement of Board Chairman Michael Beldon. Chariman Beldon was elected to lead the original EAA board in 1995 and has held that position ever since. Under his leadership, this organization was able to adopt and enforce permitting rules, demand management and critical period rules, and storage tank rules. He helped bring very diverse interests to consensus. He often told me that he wasn't a "water guy," but he proved that he could hold his own with any of the region's long-time water warriors. I can say with certainty that this agency would not be where it is today without Mike Beldon.

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Doug Miller
Chairman



Rafael Zendejas
Vice Chairman



Hunter Schuehle
Treasurer



Levi Jackson III, Ph.D.
Secretary



W. Bailey Barton
At-Large

Editor: Margaret Garcia

Graphic Design: Ileana R. Aleman

The General Manager's Report is published monthly.

Our Mission:

The Authority is committed to manage and protect the Edwards Aquifer system and work with others to ensure the entire region of a sustainable, adequate, high quality, and cost effective supply of water, now, and in the future.

Edwards Aquifer Optimization Program

by John Hoyt, Program Manager - Aquifer Science

The basic description and purpose of the Edwards Aquifer Optimization Program (EAOP) is repeated in the following paragraph to provide background information for new readers and to provide a reference for the regular reader. Subsequent paragraphs provide information relevant to the specific report month.

The Edwards Aquifer Authority (the Authority) has undertaken the Edwards Aquifer Optimization Program (EAOP), a comprehensive program for the study and management of the Edwards Aquifer. The EAOP includes a series of seventeen interrelated, mission-directed biologic and hydrogeologic research studies known as the Optimization Technical Studies or OTS. The OTS are designed to evaluate potential technical options for increasing the amount of water stored in the Edwards Aquifer and identify various methods for optimizing the amount of water available for withdrawal. Data and information obtained from the OTS will provide aquifer managers with the tools necessary to make scientifically-sound decisions to benefit aquifer users and preserve the environment supported by the aquifer, including the Comal and San Marcos Springs and downstream aquatic habitats.



On December 16, 2003, the board approved the following OTS related items:

1. A one year renewal of a contract between the Authority and BIO-WEST, Inc. for comprehensive and critical period monitoring to evaluate the effects of variable flow on biological resources in the Comal and San Marcos springs aquatic ecosystems. The renewal for 2004 will be the second and final one-year renewal that is allowed by the contract. Under the contract, BIO-WEST performs quarterly biologic monitoring in support of the development of the Authority's Habitat Conservation Plan. The contract work scope also outlines procedures for conducting additional monitoring events if critically low or critically high flows occur in the aquatic ecosystems.
2. Continued participation, through 2004, in a cooperative agreement between the Authority and the U.S. Department of Agriculture – Natural Resource Conservation Service (NRCS) for the evaluation of woody species best management practices in relation to water quality and quantity studies on watersheds in the Government Canyon and Honey Creek State Natural Areas. The original agreement is for eight years, ending in 2006, and requires annual board approval to continue funding for the preceding year. The primary focus of the study is to evaluate woody species best management practices relative to enhancing water quality and increasing aquifer recharge in rangeland watersheds.
3. A contract between the Authority and HydroGeoLogic, Inc. for the construction of a management module for the Edwards Aquifer MODFLOW model. The MODFLOW model is currently under-construction by the U.S. Geological Survey and is scheduled to be completed in June 2004. The purpose of the management module project is to design, write, and test a new module that will enable MODFLOW to simulate a variety of water resource management scenarios, achieving optimal computational efficiency and minimizing the need for manipulating large MODFLOW input data sets.

(continued on next page)

4. The selection of Todd Engineers as a consultant to conduct an analysis of recharge and recirculation. Recharge and recirculation is a concept of optimizing a water resource using an infrastructure that could include recharge dams, storage reservoirs, pipelines and other water storage and conveyance structures. The General Manager will negotiate a contract with Todd Engineers and return to the Research and Technology Committee and board with a proposed contract to include a work scope, schedule and budget.

In addition to the OTS-related items discussed above, the following OTS-related studies are currently underway or have been completed:

- Texas wild-rice reproduction
- Comprehensive and Critical Period Monitoring Program to Evaluate the Effects of Variable Flow on Biological Resources in the Comal and San Marcos Springs Ecosystems
- Cagle's Map Turtle instream flow and habitat requirements (completed)
- Edwards Aquifer computer model development
- Karst aquifer modeling research (AWWARF study)
- Improved aquifer parameter estimation for computer model in-put data sets (completed)
- Edwards Aquifer freshwater/saline water interface studies
- Hydrologic budget analysis of Medina Lake and Diversion Lake for the North Medina County Flow Path Study
- Electromagnetic survey in the vicinity of Seco Sinkhole (completed)
- Analysis of structural controls on the Edwards and Trinity Aquifers interface in the Camp Bullis Quadrangle and surrounding area (completed)
- Analysis of structural controls on the Edwards and Aquifers interface in the Helotes Quadrangle
- Tracer testing of aquifer flowpaths at Comal and San Marcos springs
- Leona Formation geophysical survey (completed)
- Development of updated methods for calculating recharge to the Edwards Aquifer (Blanco and Nueces River basins completed)
- Statistical Analysis of Hydrologic Data (completed)
- Evaluation of augmentation methodologies in support of in-situ refugia at Comal and San Marcos springs
- Edwards Aquifer fracture/conduit study
- Range management – paired watershed study at Honey Creek and Government Canyon State Natural areas
- Range management – augmenting aquifer recharge through brush management

If you have questions regarding the studies listed above, please call John Hoyt, Aquifer Science.- Program Manager.



Real-time Precipitation Gauging System

by Earl Parker, Program Manager – Investigations and Monitoring

The Authority operates 65 “real-time” precipitation gauges that transmit data to the Authority office every 6 minutes. The rain gauges are generally located over the Edwards Aquifer Recharge Zone and Drainage Area. Acquired data are used in aquifer recharge calculations, precipitation enhancement program evaluations, and a variety of research projects.

December 2003 rainfall totals, as recorded by the real-time gauging system, indicates that only very light precipitation was recorded in several portions of the gauging system area. The highest measurement of just over 0.5 inches of rainfall was recorded in western Real County with smaller amounts recorded in several other monitoring stations to the east and separately at a few stations in Bandera County. Light precipitation was also recorded in the far eastern portion of the monitoring area in southern Hays County and eastern Comal County.

If you have questions on the Authority’s real-time precipitation gauging system, please call Mr. Earl Parker, Program Manager - Investigations and Monitoring.

Aquifer Management Fees

by Brock Curry, Program Manager – Administration

As of December 31, the Authority has collected a total of \$9,314,950 in non-agricultural aquifer management fees, slightly over 100% of the amount budgeted for 2003. Delinquent fees as of December 31 total \$12,466 and represent less than 1% of total non-agricultural fees. The Authority will issue invoices for 2004 non-agricultural aquifer management fees in early January.

As of December 31, the Authority has collected \$198,251 from agricultural users based on 99,125 acre-feet of groundwater used in 2002. The amount of revenue collected represents 99% of the 2003 budgeted revenue for agricultural aquifer management fees. In mid-December, staff issued groundwater use report forms to all authorized pumpers. Agricultural users are required to submit these reports along with payment for groundwater used in 2003. These reports are due January 31, 2004.

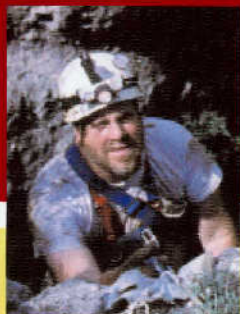
Status Report on Water Conservation Studies

by Rick Illgner, Program Manager – Groundwater Management Strategies

The Authority received an annual status report on three research projects to promote water conservation and efficient use of the Edwards Aquifer conducted for the Authority and San Antonio Water System by the Texas Agricultural Experiment Station of Uvalde. The three research projects are: “Juniper & Live Oak Water Use”, “Crop Coefficients for Improved Water Use”, and “Drip Irrigation Strategies.” The studies are a three-year research project that was initiated in 2003 and will commence in 2005.

For more information on any of these studies contact Rick Illgner, Program Manager – Groundwater Management Strategies.

Valdina Farm Sinkhole — Photo by Kurt Menking.



Inside the Edwards Aquifer

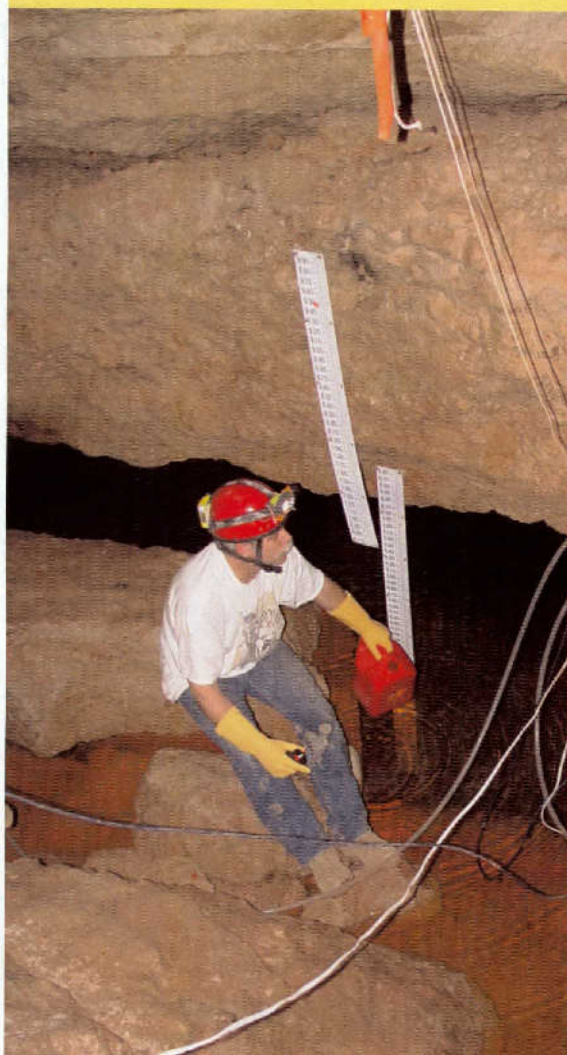
with Geary M. Schindel, P.G., Chief Technical Officer

Notes from the Underground

Well it's a new year and I thought I would take the opportunity to discuss aquifer conditions as well as the status of our San Marcos tracer test program. As many folks have noted, we had a very dry fall. Rainfall for November and December 2003 was recorded from one to two inches below normal from Uvalde to Hays counties. Aquifer levels have continued to decline from the highs experienced last summer. We experienced good rainfall in the region over the 2003 summer months but the fall has been dryer than average. However, demand on the aquifer is reduced during the fall as temperatures moderate and plants and grasses become dormant. Moderate temperatures and dormant vegetation also helps to maximize recharge to the aquifer for the precipitation that does fall in the contributing and recharge zones. However, if dry conditions present through the 2004 winter and spring months, aquifer levels will start to decline more rapidly in March through June when agricultural and municipal demand will greatly increase, most likely pushing aquifer levels to below normal conditions. If dry conditions persist into summer 2004, Demand Management Conditions could be reached in either late spring or summer. For a review of aquifer levels and springflow conditions, please see the graphs in this GM report.

San Marcos Springs Tracer Test

On Tuesday, January 6, the Authority, along with its consultant, George Veni and Associates, initiated a series of tracer tests in the San Marcos area as part of the Focused Flowpath task for the Authority's Optimization Technical Studies program. About 70 grams of Phloxine B dye were injected into Rattlesnake Cave; a small sinkhole located about 1.2 miles northeast of San Marcos Springs. South Hays Fire Department assisted with the flushing of dye into the aquifer by providing 2,000 gallons of water from one of their fire trucks. The water was obtained from the Federal Fish Hatchery Well in Hays County. About 1,000 grams of eosine dye was injected in Ezells Cave, located about 3.3 miles southwest of San Marcos Springs. Rattlesnake and Ezells caves were part of a study performed by Dr. Albert Ogden in the early 1980's. However, the Authority has increased the number of sampling locations and sampling frequency for the tests to obtain better resolution of the groundwater flow paths, groundwater velocities, and dye concentrations.



Inside the Edwards Aquifer (continued)

by Geary M. Schindel, P.G., Chief Technical Officer

More than 30 sites are being monitored using activated charcoal detectors or automatic water samples. All of the samples will be processed using the Authority's luminescence spectrometer, a research grade laboratory instrument.

The tracer tests are being performed in cooperation with the City of San Marcos, Water and Waste Water Utility (WWWU) and Aquarena Center located at Texas State University in San Marcos. WWWWU has provided the Authority with access to many of its wells in the area and also provided laboratory space for sample analysis at its surface water treatment plant.

Aquarena Center provided access to the San Marcos Springs complex and arranged for volunteer divers to help place tubing for the automatic water samplers, installed and collected numerous charcoal packets in the springs, and provided work and storage space. We have also experienced excellent cooperation and access to property from numerous businesses and private landowners in the area. In particular, Wonder World Cave has been exceptionally helpful in providing access to their cave for monitoring purposes.

Set up for these complicated tracer tests has been occurring since October 2003 when Veni and Associates performed field work to identify potential injection and monitoring points. Other tasks have included sampling and analysis of water from numerous springs and wells, evaluation of a number of wells and caves as potential injection points, borehole logging of wells in the area, mapping of the geology related to the springs, coordinating access to the many wells, and setting up sampling equipment and analyzing background samples. As data from these tracer tests are obtained, the location and frequency of monitoring can be tailored to the properties of the aquifer, saving time and money.



Tracer testing in the Edwards Aquifer is especially difficult because of the heavy use of the aquifer by public and private water wells. The intent of the tracer tests is to determine the groundwater flow paths and velocities between the injection points and recovery points (wells and springs). Tracer testing is performed using harmless dyes that can impart a color to the well if not carefully designed. We purposely design the tests so that the concentrations in nearby wells are minimized and should be below visual limits. Our luminescence spectrometer has the ability to detect dye concentration in the very low part per trillion range, six orders of magnitude below the visual range.

Results of the San Marcos tracer testing will be reported in future GM reports. I want to again

thank the many Hays County landowners, Wonder World Cave, the City of San Marcos, South Hays Fire Department, and Texas State University for their assistance with this project.

Initial Regular Permits

by Steven D. Walthour, Program Development

The board of directors did not take any action regarding Initial Regular Permits in December.

To date the Authority has issued final decisions on 897 Initial Regular Permit applications representing approximately 82% of all applications filed with the Authority. The Authority has issued 711 permits and denied 186 permit applications. The Authority has issued a total of 501,928 acre-feet of Edwards Aquifer permitted groundwater withdrawal rights per annum. Approximately 198 protested permit applications remain, representing approximately 61,952 acre-feet of Edwards's groundwater withdrawal rights.

Groundwater Withdrawal Transfers

by Rick Illgner, Program Manager – Groundwater Management Strategies

In December, Authority staff processed 66 partial sales and lease transfers representing 4,412.793 acre-feet in Edwards Aquifer groundwater withdrawal rights. Since the inception of the transfer program, Authority staff has processed 976 partial sales and lease transfers representing 180,695.699 acre-feet of Edwards Aquifer groundwater withdrawal rights. Of the 976 partial sale and lease transfers completed, only 600 are currently active representing 18,312.532 acre-feet. Active transfers include 87 sub-leased transfers representing 18,312.532 acre-feet. In addition, Authority staff did not process any changes of ownership or miscellaneous transfers in December.

Transfer Description	Number of Transfers	Acre-Feet
December (12/1/03 - 12/31/03) Transfers (Partial Sales, Leases, Sub-leases, and RE-sales)	66	4,412.793
December (12/1/03 - 12/31/03) 100% Change of Ownership (Sale of Place of Use) or Miscellaneous Transfers	0	0.000
Total Number of Transfers (Partial Sales, Leases, and Sub-leases, and Re-sales) Completed as of 12/31/03	976	180,695.699
Total Number of Active Transfers (Partial Sales, Leases, Sub-leases, and Re-sales) as of 12/31/03	600	110,709.751
Total Number of Active Sub-leased Transfers as of 12/31/03	87	18,312.532
Total Number of Active Re-sale Transfers as of 12/31/03	96	3,349.392

Transfer forms are located at the Authority's main office located at 1615 N. St. Mary's Street. For more information, contact Naomi Esquivel, Program Associate.

December 2003 Board Meeting

by Margaret Garcia, Program Manager – Public Affairs

Authority Directors Elect Officers: Approve Final Rules to Address Pumping Cap

In addition to electing officers at their regular monthly board meeting held Tuesday, December 16, 2003, the Authority directors also approved final rules to amend the initial regular permit rules. These final rules will help the Authority avoid having to purchase initial regular permits to meet a 450,000 acre-foot permit cap. These final rules will divide initial regular permits into two portions. One portion of the permit, the “Junior Groundwater Withdrawal Right,” can be used by permittees when the Edwards Aquifer is above 665’ above mean sea

level at the J-17 index well (San Antonio pool) and 865’ above mean sea level at the J-27 index well (Uvalde pool). The second portion, the “Senior Groundwater Withdrawal Right,” can be used at any time, but may be subject to water use reductions when the Edwards Aquifer drops below 650’ above mean sea level at the J-17 well and 845’ above mean sea level at the J-27 well.

Authority directors also voted to proportionally adjust all initial regular permits (IRPs) in accordance with the Authority’s final rules. Therefore, all IRPs that became effective on or before January 1, 2004, will be proportionally adjusted under the Authority’s rules and the authorized groundwater withdrawal amounts will be recalculated for Initial Regular Permits for the Year 2004.

In other action, Authority directors approved a contract between the Authority and Daniel B. Stephens & Associates, Inc. (DBS&A) to develop and implement a process to evaluate the availability of additional water supplies from the Edwards Aquifer. Upon completion of the process, EDWARDS AQUIFER AUTHORITY RULES outline a process for the board to permanently adjust the aquifer withdrawal cap, if the additional water supply report recommends that additional water is available.



In addition, Authority directors approved the selection of Todd Engineers to conduct an analysis of recharge and recirculation, and authorized the General Manager to proceed with developing a contract between the Authority and Todd Engineers, to include a scope of work, schedule, and budget. The final contract will then be submitted to the board for final approval.

Lastly, Authority directors approved the renewal of a three-year employment agreement between Mr. Gregory M. Ellis and the Authority. The agreement takes effect January 1, 2004, and expires on December 31, 2007. Ellis has been the General Manager of the Authority since January 1997.

Well Construction Program

by Rick Illgner, Program Manager – Groundwater Management Strategies

For the month of December, Authority staff issued 16 well construction permits. This total includes 3 exempt Edwards Aquifer domestic well permits, 1 non-exempt Edwards Aquifer municipal well permit, 3 well plugging permits, and 9 non-Edwards Aquifer "drill through" permits.

The Authority received 412 well construction applications in 2003 and issued 360 well construction permits. This total includes 2 Edwards Aquifer domestic well reconstruction permits, 99 exempt Edwards Aquifer domestic well permits, 19 exempt Edwards Aquifer domestic/livestock well permits, 12 exempt Edwards Aquifer livestock well permits, 4 non-exempt Edwards Aquifer municipal well permits, 2 non-exempt Edwards Aquifer municipal test well permits, 2 non-exempt Edwards Aquifer industrial well permits, 1 non-exempt Edwards Aquifer industrial/agriculture well permit, 1 non-exempt Edwards Aquifer irrigation well permit, 2 non-exempt Edwards Aquifer industrial well capping permits, 1 "gas pipeline anode installation" permit, 1 pump replacement permit, 38 well plugging permits, and 176 non-Edwards Aquifer "drill through" permits.

Monthly Water Level & Springflow Report

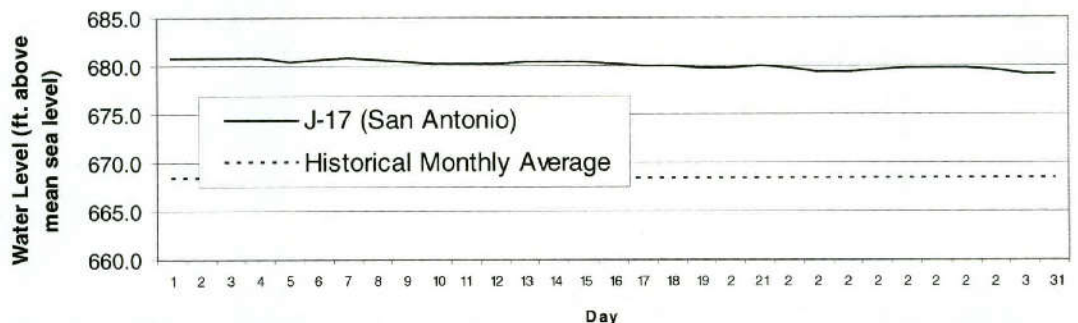
Aquifer levels can be viewed on the Authority's web site at www.edwardsaquifer.org

J-17 (San Antonio) Index Well – December 2003

The J-17 index well level average dropped 1.8 feet from 681.9' above mean sea level (msl) in November to 680.1' msl in December. The December 2003 high of 680.9' is 14.7 feet below the December 2002 high of 695.6' msl.

The J-17 historical monthly average for December is 668.3' msl.

J-17 (San Antonio) Index Well -
December 2003



J-17 (San Antonio) Index Well – Historic Record: 1986-2003

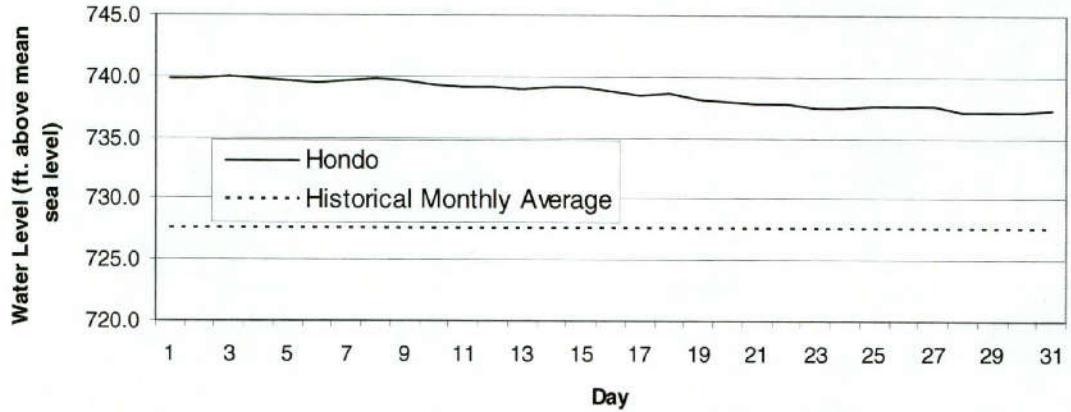
	December 2003	December 2002	Historical Record	
Maximum	680.9	695.6	June 14, 1992	703.3
Minimum	679.2	694.5	June 29, 1990	612.5
Average	680.1	695.0	Dec. (1986-2003)	668.3

Hondo Index Well – December 2003

The J-17 index well level average dropped 1.8 feet from 681.9' above mean sea level (msl) in November to 680.1' msl in December. The December 2003 high of 680.9' is 14.7 feet below the December 2002 high of 695.6' msl.

The J-17 historical monthly average for December is 668.3' msl.

Hondo Index Well -
December 2003



Hondo Index Well – Historic Record: 1986-2003

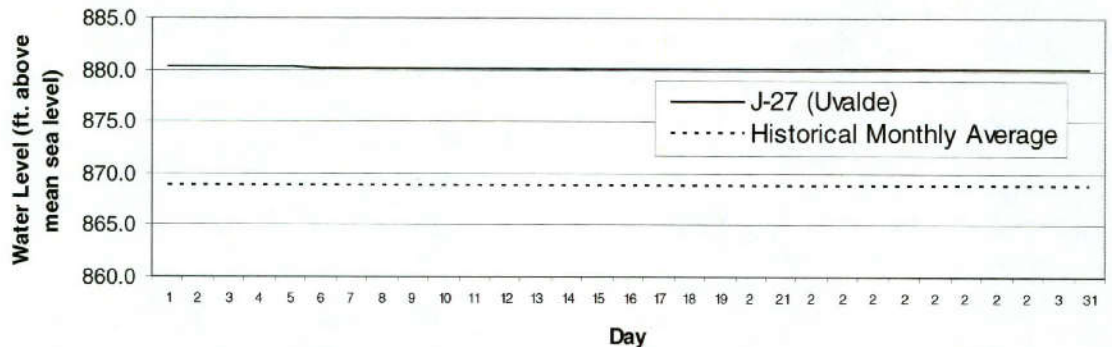
	December 2003	December 2002	Historical Record	
Maximum	740.0	759.1	June 14, 1992	779.0
Minimum	737.1	757.8	June 29, 1990	651.0
Average	738.6	758.3	Dec. (1986-2003)	727.6

J-27 (Uvalde) Index Well – December 2003

The J-27 index well level average rose 0.0 feet from 880.1' msl in November to 880.1' msl in December. The December 2003 high of 880.3' msl is 2.9 feet below the December 2002 high of 883.2' msl.

The Uvalde Well historical monthly average for December is 868.8' msl

J-27 (Uvalde) Index Well -
December 2003



J-27 (Uvalde) Index Well – Historic Record: 1940-2003

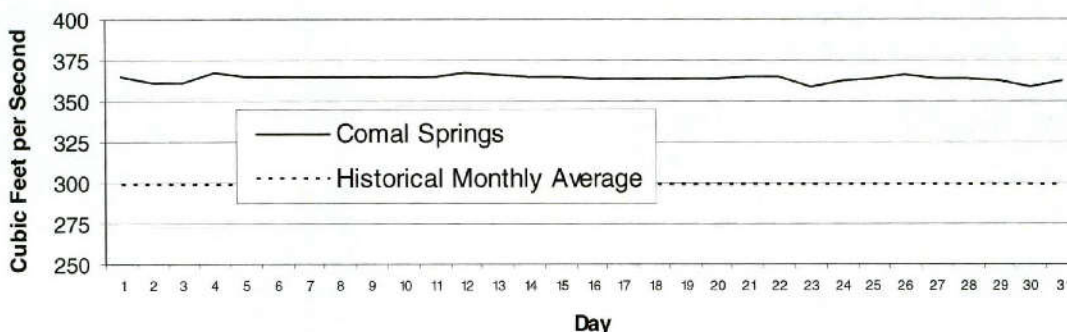
	December 2003	December 2002	Historical Record	
Maximum	880.3	883.2	June 15, 1987	889.0
Minimum	880.0	882.8	April 13, 1957	811.0
Average	880.1	883.1	Dec. (1940-2003)	868.8

Comal Springs – December 2003

Comal springflow reached a maximum flow of 367 cubic feet per second (cfs) on December 4th. The minimum flow occurred on December 23rd at 359 cfs.

The December 2003 average was 364 cfs, which was 65.0 cfs above the historical monthly average of 299 cfs.

Comal Springs -
December 2003



Comal Springs Historic Record - 1927-2003

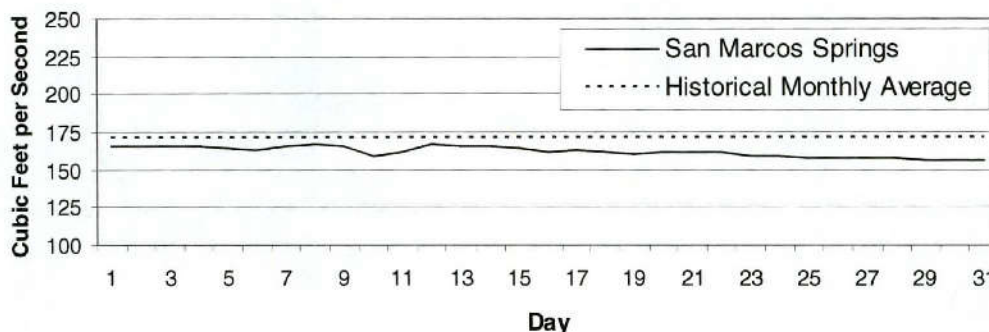
	December 2003	December 2002	Historical Record	
Maximum	367	466	October 14, 1973	534.0
Minimum	359	432	August 8, 1956	0.0
Average	364	448	Dec. (1927-2003)	299.0

San Marcos Springs – December 2003

San Marcos springflow reached a maximum flow of 167 cfs on December 8th. The minimum flow occurred on December 29th at 156 cfs.

The December 2003 average was 162 cfs, which was 8.8 cfs below the historical monthly average of 170.8 cfs.

San Marcos Springs -
December 2003



San Marcos Springs Historic Record - 1956-2003

	December 2003	December 2002	Historical Record	
Maximum	167	352	March 12, 1992	451.0
Minimum	156	318	August 15, 1956	46.0
Average	162	329	Dec. (1956-2003)	170.8



**EDWARDS AQUIFER
AUTHORITY**

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www.edwardsaquifer.org

BE AQUIFER AWARE

CALENDAR OF EVENTS FOR JANUARY & FEBRUARY

JANUARY

Thur. 1/19		Martin Luther King Jr. Day, EAA Offices Closed
Tues. 1/27	11 AM 1 PM 2 PM	Aquifer Management Planning Committee Permits Committee Legislative Committee
Wed. 1/28	11AM 1:30 PM	Finance/Administrative Committee R&T Committee

FEBRUARY

Mon. 2/2	12 PM	Executive Committee
Tues. 2/10	3 PM	Board Meeting, Edwards Aquifer Authority, Conference Center 1615 N. St. Mary's Street, San Antonio, Texas
Tues. 2/24	11 AM 1 PM 2 PM	Aquifer Management Planning Committee Permits Committee Legislative Committee
Wed. 2/25	11AM 1:30 PM	Finance/Administrative Committee R&T Committee

Authority meeting times & dates are subject to change.

Visit our website at www.edwardsaquifer.org for up-to-the minute information on meeting times and dates.