THE HISTORY OF THE CREATION OF THE

BARTON SPRING/EDWARDS AQUIFER CONSERVATION DISTRICT

BY:

Tom Stinson, President
Precinct Two (Manchaca)
First Elected Board of Directors

January 1989

INTRODUCTION

This District, the Barton Springs/Edwards Aquifer Conservation District, has evolved after years of untiring efforts by many individuals dedicated to aquifer protection. There were at least six serious legislative efforts to create water laws for this area dating from 1937 to 1985, but none of them became law, not until August 1987.

The intent of this history is to summarize and document the events that led to the creation of this conservation District. This history is not intended to be an official part of the first annual report that will be filed as required by the District's bylaws. The purpose in compiling this history is for the future use of anyone who may be interested in the facts as I hope to relate and tabulate them.

Dr. Kent Butler was the most important person in the District's creation. He was and is exceedingly well qualified (see attachment 1) by his education, work experience, organizational skills, ability to coordinate small and large city officials (see attachment 2) and manage the project of District creation to fruition. Dr. Butler was the instigator of contracts, the coordinator of process through the Water Commission Hearings and the key person who knew exactly whom to write, visit, or call at every critical juncture. $228,304.97 in funds passed through his company to the city of Buda, where all bills were sent and paid. Dr. Butler earned a handsome fee for his work (see attachment 3) and, in my opinion, he was not overpaid, because without him, the District's creation would have been another aborted effort. I make these statements after having read or scanned ten shelf feet of District documentation on file at the legal firm of Bickerstaff, Heath and Smiley (B.H.&S.) in Austin, Texas.

OVERVIEW OF EARLY KEY EVENTS

In 1984, Dr. Butler obtained a six month contract from the "small cities" for him to proceed with the creation of an underground water District to protect their only source of water. These monies are not part of the District's official organizational costs, but that is exactly what they were spent for.

Also, in 1984 the City of Austin became interested in the protection of the Edwards aquifer (see attachment 4) and the District.

On August 1, 1985, the small cities and the City of Austin passed and signed a Resolution confirming their joint interests (see attachment 5.) Travis County, on December 17, 1988 also signed and approved a Resolution in support of the District's creation (see attachment 6.) Again, the work of Dr. Butler is seen in a letter (see attachment 7) to Anne

Cooper, Texas Representative District 47. Finally, the second contracts between the "Cities" and Butler, and between Butler and Bickerstaff, Heath and Smiley (Caroom) are executed (see attachment 8) and amended by B.H.&S. (see attachment 9.)

A pattern is established of increased support by governments, small and large, and increased need for more funds to coordinate the District's creation. While support grows, the opposition to the District's creation begins to surface.

THE TEXAS WATER COMMISSION HEARINGS

The work of the second most important individual to the District's creation now surfaces in the Applicants Written Agreement dated May 6, 1986 to the Texas Water Commission by Douglas G. Caroom, State Bar #03832700 (see attachment 10.) Mr. Caroom, formerly Chief of the Environmental Protection Division of the Texas Attorney General's Office, now becomes the field general for the creation battle and Dr. Butler takes on the role of expert witness under oath. Before these legal efforts could take place, the ante was upped in contract #3 (see attachment 11) of March 21, 1986 for $70,800 more dollars and in April for an additional $100,000 from the City of Austin (see attachments 12-17.) Those opposed to the District's creation under Chapter 52 of the Texas Water Code are rich and determined, but, they are fragmented. The Hearings initially delineate the boundaries of the District during which phase Mr. Caroom barters away some of the Western Hill Country opposition. Mr. Gary Bradley solicits the help of Texas Representative Terrell Smith to attempt to delay the process by proposing to broaden the District (see attachment 18) to include the Northern Edwards. Dr. Butler and Mr. Caroom show that Northern Edwards Aquifer, like the segment to the South of the Barton Springs segment, have separate geological identity and need separate management. After furtner hearings, The Texas Water Commission issues their final order creating the Barton Springs/Edwards Aquifer Conservation District subject only to voter approval at the May General Election of 1987.

TEMPORARY BOARD OF DIRECTORS

The small cities and the City of Austin nominate temporary board members. Mr. Caroom's law firm offices become the office of the District and he becomes the de facto District manager. The Board makes a verbal agreement to use the services of Bickerstaff, Heath and Smiley during a board meeting. The earliest written contract for legal service is signed a

year later between these same principals.

The Texas legislature, in the persons of Senator Barrientos and Representatives Smith and Cooper, takes a renewed interest in creating the District by law rather than Chapter 52. The temporary board and many other proponents are unsure of the voter's approval. There is lots of interaction at the legislative level which finally results in the passage of Senate Bill #988 in the 70th Legislature. This Bill also requires a Confirmation Election by the voters. Senate Bill #988 changes the funding source from an ad valorem tax to a water use fee. It further limits the proposed District's borrowing and land use powers. Representative Cooper adds an escape provision so that Hays County or other separate parts of the District can withdraw after three years.

The temporary board now chooses August 1987 for a confirmation election. They created, but did not fund, an entity to promote the District's creation before the voters. Over $10,000 was raised, collected, and disbursed by Texan's for Aquifer Protection (TAP) (see attachment 19.) Records are on file in the District's office to show these funds. Mr. Caroom writes a contract for the election services to be provided by the City of Austin. This contract provides that if the election is "for", then the new District will pay for the election, but if the election "fails", the cities will pay the election costs. The main provision of the Election Services Agreement is that the organizational costs of the small cities will be repaid by the District in two years and to the City of Austin in three years if the voters approve the District in the August 1987 election. Failing approval by the voters, all of the contributions are nonrefundable. Few of the electorate realized the ramifications of this election; and it can be stated that almost no one realized that the District was $325,000 in debt for organizational costs on that hot, dry, Saturday, August 8, 1987, when 4% of the registered voters approved the District by a four out of five ratio. The District has no money, office, staff, equipment, rules, bylaws, or history of another fee-based districts to follow. The Temporary Board contracts with Mr. Hada (temporary Board President) to assume the duties of part-time manager (see attachment 20.) One of his first actions is a thank you letter (see attachment 21) which shows a list of District supporters.

It is not the intent of this report to fault the temporary board or anyone connected with the District's early months. When I consider that they started from administrative zero, I feel that second guessing what should have been done and in what order, is unfair and unproductive to anyone not in the same position. Part of my reason for this history is to

give any other fee-based districts the facts so they can hope to proceed more effectively.

The temporary board was in office eighteen months. The confirmation election occurred half way through their "watch" and none of them were elected as Directors in May of 1988. Some of their names can be found on attachment 22 which is included to show how much support there was for a District.

BETWEEN ELECTIONS

The bill for the confirmation election from the City of Austin to the District was $29,501. Austin moved these funds to pay this amount on September 20, 1988 over thirteen months after the August 8, 1987 election. The temporary board also contracted with Austin to conduct the May 7, 1988 election for Board members. This election cost $16,738. The District was divided into five precincts of equal racial balance, but unequal precinct populations. Two of the elected Directors had to reside in Austin, as required by SB #988. All Directors had to own property within their precincts.

The first Proposed Budget (see attachment 23) was made in November 1987. There was no history from which to develop this budget and it was changed several times before the first fiscal year ended.

No water use fees were paid until February of 1988. The District operated on borrowed money. The City of Austin made three payments of approximately $30,166 each and the well fee payers paid roughly an equal amount. Six of the largest water users in the District sued the District's legal standing and over $30,000 of their payments were in "escrow" and not available in the 1st FY. Water use fees were set at 25¢ per 1000 gallons of water pumped, measured at the well head; but, before the rules, permits, and invoices could be issued the fee was lowered to 15¢ per 1000 gallons by the temporary board. The elected board raised the fee to 25¢ in August 1988, the last month of the first year of operation. The city of Austin thus paid about $26,000 more than their 40% share of the District's budget so they were entitled by SB #988 to receive a rebate.

In February and March of 1988, two staff and a secretary were hired. Office space was leased, equipment purchased, and improved management began to establish the District. The temporary board held twice monthly meetings on the first and third Monday evenings at 7:00 p.m. These meetings were often attended by opponents and the curious rather than those wishing to offer constructive aid or help.

THE ELECTED BOARD

Most of the elected board members met each other for the first time at the swearing in which was at the 18th floor offices of B.H.&S. on San Jacinto and First Street in Austin. Controversy continued over the necessity of a run-off election. The newly elected began their work in earnest. New well standards were worked out after much compromise. The finances of the District were examined closely for validity. An Audit was ordered and a new budget of almost $500,000 was adopted for the second year.

(See attachment 24) Vol I, No. 16 of the Austin Weekly Analysis dated July 27, 1987 gives some insight into the political/ecological scene just before the District's confirmation election. I have included this as one of hundreds of articles written in the areas newspapers and periodicals.

Finally, a disclaimer . . . I am no expert on these matters in total . . . but, like some of the past folks I have, for a time, become an instrumental player in the drama of people learning how to manage a mutual resource (underground water) to its best advantage. The work has just begun. Help is needed to record the past, and work to shape the future.

Afterthought: It is said that military histories are always written by the winners. This campaign was civil rather than military but it was a hard fought conflict and this history is offered by a survivor who yet hopes to graduate to the winner class.

Tom Stinson
January 5, 1989

ATTACHMENT #1

KENT SCOTT BUTLER

SPECIAL CONSULTANT

Personal:

Married, 2 children

Education:

Ph.D. in Land Resources, University of Wisconsin at Madison, minor in law, 1977.

M.S. in Water Resources Management, University of Wisconsin at Madison, 1976.

B.A. in Environmental Sciences, University of Wisconsin at Madison, 1973.

Current Position:

Director, Planning Division, Jones and Neuse, Inc., Austin, Texas.

Associate Professor, Graduate Program in Community and Regional Planning, School of Architecture and Planning, University of Texas at Austin.

Recent Research Experience:

Principal Investigator, Municipal utility districts and urban growth: an assessment of the impacts of MUDs on small and medium-sized cities in Texas. Supported by the Hogg Endowment for Urban Governance, 1984-1985.

Principal Investigator, Wimberly Community Planning Study. Preparation of maps and report delineating suitable development and service areas, and review of options for municipal incorporation, 1984.

Principal Investigator, Evaluation of urban growth management programs in relation to water resource management: case study of the Edwards Aquifer region of Texas. Supported by the Hogg Endowment for Urban Governance, 1982 - 1984.

Co-principal Investigator, Assessment of the onshore impacts of offshore oil and gas production. Research conducted under the auspices of The Rice Center and supported by the Texas Energy and Natural Resources Advisory Council, 1982 - 1983.

Principal Investigator, Development and shore erosion policies and control programs for state and local governments. Supported by U.S. Department of Commerce, Sea grant College Program, 1981 - 1983.

Co-Principal Investigator, Collection and synthesis of socioeconomic data on Texas barrier islands ecosystems. Supported by U.S. Department of Interior, Fish and Wildlife Service, and Willdan Associates, 1979 - 1980.

Principal Investigator, Implementation of workable land use guidance techniques by Texas coastal municipalities. Supported by Bureau of Business Research, University of Texas at Austin, 1979.

Co-principal Investigator, Areawide environmental impact assessment for the Austin, Texas north sector growth area. Supported by Capital Area Planning Council, 1979.

Detailed Experience:

City of Missouri City, Texas. Evaluation of utility expansion plans and city policies relating to municipal utility districts, 1985.

City of San Marcos, Texas. Ongoing assistance to city officials developing policies and review procedures for proposed municipal utility districts, 1984 - .

Cities of Buda, Creedmoor, Hays, Mountain City, San Leanna, and Sunset Valley, Texas. Cooperative study program to develop state legislation creating a groundwater management district and conceptual planning for a groundwater recharge enhancement reservoir, 1984 - .

City of Dripping Springs, Texas. Assisted city officials in developing a comprehensive plan and implementing ordinances. 1984.

City of Seguin, Texas. Conducted annexation and land use study, 1984.

City of Pflugerville, Texas. Preparation of comprehensive land use plan and review of subdivision ordinance. 1983 - 1984.

City of Sunset Valley, Texas. Prepared subdivision ordinance and fee ordinance, 1984.

Hays County, Texas. Prepared county health regulations for private sewage facilities and coordinated county initiatives to protect the Edwards Aquifer, 1984.

City of Buda, Texas. Prepared subdivision and zoning ordinance and comprehensive plan. Service as ongoing planning consultant to the city for subdivision and zoning review and community facilities planning, 1983 - .

City of West Lake Hills, Texas. Advised city officials on environmental and land development standards for undeveloped lands within the jurisdictional limits of the city, 1983.

City of Austin, Texas. Organized and participated in the On-Site Wastewater Treatment Seminar, October 13-15, 1983.

Espey, Huston and Associates, Inc., and Texas Energy and Natural Resources Advisory Council. Texas Coal and Lignite: Report to the Legislature and Development of a Community Handbook, 1982.

U.S. Geological Survey, Department of the Interior, and Texas Energy and Natural Resources Advisory Council. Conducted a two-day practical workshop for planners, developers, and engineers to demonstrate the utility of earth science and water resource data in addressing land development issues, 1981.

City of Austin, Texas, Parks and Recreation Department. Preliminary master plan for a 150-acre regional park on the Barton Creek Greenbelt, 1981.

Southwest Williamson County Association, Texas. Organized two conferences on regional resource management and planning, 1980 - 1981.

Developers and landholders in Austin, Texas area. Developed site plans and project feasibility analyses for 400 acres and 500 acres of land in Travis and Hays Counties, 1980 and 1984.

City of Galveston, Texas, Department of Planning and Transportation. Assessment of canal and marina developments on Galveston Island, Texas. Reviewed environmental impacts and developed performance standards as a part of the Comprehensive Ecosystem Plan for West Galveston Island. Supported by City of Galveston, 1979.

U.S. Department of Commerce, Office of Coastal Zone Management. Survey and evaluation of coastal planning and management programs in nine states. 1977.

Bell, Clover, and Port Wing Townships, Wisconsin. Advised city officials and citizen leaders on alternative growth management strategies for the south shore of Lake Superior, 1977.

Previous Employment Positions

Project Coordinator, Science Engineering and Technology Program, University of Wisconsin Center for Public Policy and Administration. A joint executive branch-university project to evaluate and recommend ways that the Governor and executive branch administrators can make better use of science and technology resources. Supported by the National Science Foundation, 1978.

Planning Analyst II, Wisconsin Coastal Management Program Office of State Planning and Energy. Coordinated the Shore Erosion-Compensation Study, an analysis of man-induced shore erosion on Wisconsin Great Lakes shores and legal/administrative options for compensation, 1977.

Project Associate, Department of Landscape Architecture, University of Wisconsin. Research on computer-based geographical information systems for resource and land use decision making, with case study of irrigation agriculture in Wisconsin, 1977.

Research Assistant, Coastal Zone Management Task Group, University of Wisconsin Sea Grant College Program. The task group recommended landward coastal boundaries and determined permissible land uses for the Wisconsin coast of Lakes Michigan and Superior, 1975 - 1976.

Research Analyst II, Wisconsin Office of State Planning and Energy, Department of Administration. Designed and developed an updatable statewide inventory of land resource data, including coordination with 34 state, regional, and local agencies, 1975.

Research Assistant, Center for Geographic ANalysis, University of Wisconsin, Institute for Environmental Studies. Conducted research on Great Lakes water quality models, resource carrying capacity, computer-base geographical information system, 1973 - 1975 and 1976 - 1977.

Field Biologist, Student-Originated Studies Program, Princeton University. Member of thirteen-person team that investigated the ecology and hydrology of the New Jersey Pine Barens White Cedar Swamps. Supported by the National Science Foundation, 1971.

Advisory Boards and Commissions

Conference Chairman, "The Edwards Aquifer in the 1980's". Cosponsored by the City of Austin and the University of Texas, School of Architecture, and Planning, May 1985.

Greater Austin-San Antonio Corridor Council, Water Task Force. Appointed to recommend strategies for areawide water resource management, 1984.

Water and Wastewater Commission, City of Austin, Texas. Appointment by the City Council to develop a water and wastewater master plan for the City, review and approve water and wastewater approach main requests, recommend capital improvements for the utility, and recommend changes in ordinances and policies relating to the utility, 1981 - .

Executive Committe, Association of Collegiate Schools of Planning. Elected as South-Central U.S. Region Representative, 1981 - 1983.

American Planning Association, Environmental Planning division. Committee to develop sessions for the Division at the 1983 national meeting (Seattle) and 1984 meeting (Minneapolis) of the APA. Chairman of committee for 1984 meeting.

Onsite Wastewater Treatment Task Force, City of Austin, Texas. Appointment by the City Council to review alternative technologies for onsite wastewater treatment and disposal, develop a monitoring program, and consider revisions to health code, 1982 - .

Editor, Newsletter of the American Planning Association, Texas Chapter, 1982 - .

Coastal Zone Management Advisory Group, Texas Energy and Natural Resource Advisory COuncil. Appointed to serve on task forces relating to ports, beach access, and shore erosion, and to develop recommendation for the 1983 Legislative Session. 1981 - .

Inter-University Sea Grant College Program Research Advisory Council. Appointed to develop research categories and review proposals for each biennium, 1981 - .

Water Quality Review Board, City of Austin, Texas. Appointment by the City Council to design and conduct a research and monitoring program to test the effectiveness of urban stormwater management techniques; and to review water quality control measures proposed by developers in compliance with city ordinances, 1981 - 1982.

Environmental Board, City of Austin, Texas. Appointment by the City Council to review and comment on major public works projects, municipal ordinances and codes, and other matters relating to environmental quality protection. Primary author of the Lake Austin Shoreland Zone development ordinance, 1980 - 1982.

Edwards Aquifer Task Force, City of Austin, Texas. Appointment by the City Council to write subdivision ordinances and site development ordinances for watershed overlying the aquifer recharge area. Primary author of four watershed ordinances, 1980 - 1981.

State Advisory Committee, Wisconsin Integrated Geographic Information Service. A joint university-state agency task group for a statewide land use information system, 1976.

Selected Publications and Presentations

Tri-State Conference on Groundwater in Karst Areas, Lacrosse, Wisconsin. "Local Government's Role in Groundwater Management: The Edwards Aquifer of Central Texas." Cosponsored by states of Minnesota, Wisconsin and Iowa. April 1985.

Butler, K.S. et.al., 1984. Environmental Constraints and Land Use Suitability: Wimberly, Texas. Graduate Program in Community and Regional Planning, School of Architecture, University of Texas at Austin. 37 pp.

Butler, K.S. and D. Myers, 1984. "Boomtime in Austin, Texas: Negotiated Growth Management." Journal of the American Planning Association, 50(3):447-456.

Annual Meeting of the American Planning Association, Texas Chapter, Corpus Christi, Texas. "Coastal and Flood Plain Management." April 1984.

Annual Meeting of the Texas Municipal League and City Planners Association of Texas, Houston, Texas. "What Planners Want from Academia." October 1983.

Selected Publications and Presentations

Wright, S.A., and K.S. Butler, 1983. "Land Use and Economic Impacts of a Beach Nourishment Project." Proceedings of the Third Biennial Symposium on Coastal and Ocean Management (in press), American Society of Civil Engineers, New York.

Gurss, D.E., K.S. Butler, and J. Huber, 1983. "Coastal Erosion Damage Mitigation by Local Government." Proceedings of the Third Biennial Symposium on Coastal Zone Management (in press), American Society of Civil Engineers, New York.

National Meeting of the American Planning Association, Seattle. "Seattle Metro and Environmental Planning: Experience and Evaluation." May 1983.

Annual Meeting of the American Planning Association, Texas Chapter, Galveston, Texas. "The Use of Microcomputers in Planning Operations." April 1983.

Butler, K.S., 1982. "Managing Growth and Groundwater Quality in the Edwards Aquifer Area, Austin, Texas," Public Affairs Comment, (20)1.

King, L., K.S. Butler, et al., 1982. "Future Directions for Sea Grant Social Science Research." Report from a workshop of the National Sea Grant College Program, Sept. 15-17, 1981, College Station, Texas, 26 pp.

Butler, K.S. and V. Parker, 1981. "The Coastal Land Development Process in Texas and the Effects of Environmental Regulation." Texas Business Review, 55 (1): 38 - 42, U.S. Geological Survey, Department of the Interior, and Texas Energy and Natural Resources Advisory Council. Conducted a two-day practical workshop for planners, developers and engineers to demonstrate the utility of earth science and water resource data in addressing land development issues, 1981.

Butler, K.S., et al., 1981. "Austin's Watershed Ordinances: A Comprehensive Analysis." Graduate Program in Community and Regional Planning, School of Architecture, University of Texas at Austin. 128 pp.

City of Austin, Texas. 1980 and 1981. Subdivision and Site Development Ordinances for the Aquifer-related Watersheds of Williamson, Slaughter, Bear, Little Bear, and Onion Creeks. Ord. No. 801218-W, 810212-K, 910319-M, 810507-K, 910413-S, and 810514-T. (K.S. Butler was a primary author, serving on the Edwards Aquifer Task Force, City of Austin).

KRIS-TV, Coastal Bend Region, Texas. "State of the Region: Stormwater Management and Land Use Planning." September 1981.

Parker, V. and K.S. Butler, 1981. "The Coastal Land Development Process in Texas Coastal Areas." Texas Business Review, 55 (4): 177-180.

KUT-Austin and National Public Radio, "The Inquiring Mind," a weekly documentary program. Question-answer discussion titles, "The Shifting Sands: The Erosion of Our Seashores." December, 1981.

Liebow, E.B., K.S. Butler, et.al., 1980. A Socio-economic Characterization Study of the Texas Barrier Islands Ecosystems., Vol I: Synthesis Papers and Vol. II: Data Appendices. U.S. Department of the Interior, Fish and Wildlife Service, Reports FSWOBS-8-/19 and FWS/OBS-80/20. 257 pp. and 548 pp.

Arnold, P. and K.S. Butler, 1980. A Bibliography of Residential Canal and Marina Developments: Biological and Engineering Considerations. Council of Planning Librarians, Chicago, Illinois, 28 pp.

Butler, K.S., K.N. Nichols and R. Quay, 1980. "Managing Barrier Islands: Role of Local Government." Proceedings of the Second Symposium Coastal and Oceans Management 3: 2036-2051, American Society of Civil Engineers, New York, NY.

Parker, V. and K.S. Butler, 1980. "The Coastal Land Development Process: Developers' Plights." Proceedings of the Second Symposium on Coastal and Oceans Management 2: 1010-1025, American Society of Civil Engineers, New York, NY.

Greenwood, M., K.S. Butler and D.S. Thomas. 1980. Feasibility of Compensation for Man-Induced Shore Erosion: Legal and Administrative Options. Wisconsin Coastal Management Program Technical Report Series, Vol 2, Wisconsin Department of Administration.

Coltman, P. and K.S. Butler, 1980. "The Urban South: Hazards in Areas of Rapid Growth." Proceedings of the Sixth Annual Conference on Urban South, Old Dominion University, Norfolk, VA, 24 pp.

Annual meeting of the American Planning Association - Texas Chapter, Ciudad Juarez, Mexico. "Coastal Zone Management in Texas: Current and Future Prospects." May 1980. Also, presentation and panel discussions "Incorporating Environmental Protection into Site Development Planning." May 1980.

Born, S., and K.S. Butler, 1979. State Science, Engineering and Technology Project, Final Report, Center for Public Policy and Administration, University of Wisconsin, prepared for Wisconsin Department of Administration. 23 pp. and appendices.

Butler, K.S., 1978. Irrigation in the Central Sands Region of Wisconsin: Potential and Impacts. Res. Bull. R-1970, University of Wisconsin - Extension, College of Agriculture and Life Sciences, 51 pp.

Butler, K.S., B.H. McCown and W.A. Gates, 1977. "Use of a Computer-Based Resource Data System to Evaluate On-Site Disposal Alternatives." Journal of Soil and Water Conservation 32 (5):214-219.

Butler, K.S. and E.H. Epstein, 1977. Delineating Great Lakes Shorelines. Wisconsin Coastal Management Program Technical Report Series, and University of Wisconsin, Institute for Environmental Studies, Report No. 71, 29 pp.

Selected Publications and Presentations (cont'd)

Butler, K.S., D.S. Thomas, T. DeGroot and M. Greenwood, 1977. Feasibility of Compensation for Man-Induced Shore Erosion: Summary Report. Wisconsin Coastal Management Program Technical Report Series, Vol. 1, Wisconsin Department of Administration. 23 pp.

McCown, B.H., K.S. Butler, and W.A. Gates, 1977. A Resource Data Management System - GRASP: Its Application to the Lake Superior Shorelands. University of Wisconsin, Institute for Environmental Studies, Report #7. 22 pp.

Butler, K.S., B.H., McCown and W.A.Gates, 1977. A Resource Data Management System - GRASP: Use With A Land Resource Database. University of Wisconsin, Institute for Environmental Studies, Report #8, 125 pp.

17th International Conference on Great Lakes Research. Guelph, Ontario. "Boundary Delineation for Coastal Zone Management in Wisconsin." April 1976.

Conference on the Development of the Apostle Islands National Lakeshore. U.S. Department of the Interior, National Prk Service and Northland College. Ashland, Wisconsin. "A Resource Analysis Program for the Shorelands of Lake Superior." June 1976.

Butler, K.S., B. Goldin and T. Kraushopf, 1975. Inventory of Wisconsin Land Resources Data. Wisconsin Office of State Planning and Energy, Department of Administration, 3 Vols, 480 pp. (Updated semi-annually).

Educational Television Network, University of Wisconsin-Extension and Sea Grant College Program. "Great Lakes Water Levels, Regulation Proposals and Shoreline Erosion." March 1975.

Butler, K.S. W.A. Gates and B.H. McCown, 1974. "A Pollution Displacement Model of the Great Lakes System." Proceedings Winter Simulation Conference, 1:172-185, Washington, D.C.

Butler, K.S., M. Fisher and C. Longsorf, 1973. Limnology of Bohall Lake, Minnesota. Final report to University of Minnesota, Lake Itasca Biological Field Station, 82 pp.

Upper Lakes Conference, Canada-United States International Joint Commission Working Group. Sundridge, Ontario. "A Heuristic Model of the Lake Superior Region." February 1973.

Butler, K.S., 1972. Resource Carrying Capacity: A Literature Index and General Bibliography. University of Wisconsin, Institute for Environmental Studies, Working Paper No. 9, 33 pp.

Givnish, T., K.S. Butler, et.al., 1971. Ecology of the New Jersey Pine Barrents White Cedar Swamps. Final Report to the National Science Foundation, Princeton University, 156 pp.

Teaching Experience:

University of Texas at Austin (graduate courses), 1978 - Present

- Applied Techniques of Environmental Analysis
- Environmental Problems and Resources
- Coastal Zone Management
- Environmental Policy and Legislation
- Applied Planning Methods
- Topical Seminar in Environmental Planning
- Water Resources Planning
- Use of Microcomputers in Planning
- Planning Law and Growth Management
- Coordinator, Graduate Student Internship Program.

University of Wisconsin - Madison (short courses and workshops), 1974 - 1977

- Computer Applications in Land Resource Planning
- Acquisition, Manipulation and Mapping Land Resource Data
- Great Lakes Water Quality Planning

SUPPLEMENT TO RESUME
KENT SCOTT BUTLER

President, Kent S. Butler and Associates, Inc., Urban and Environmental Planners, 2720 Bee Cave Road, Austin, Texas, 78746, (512)327-9840.

City of McKinney, Texas. Prepared development agreement between City and developer and conducted a fiscal impact analysis of a large mixed-use development, 1985 - 1986.

First Southwest Development Corporation, Temple, Texas. Subdivision master plant for residential and commercial tract in Temple, 1985 - 1986.

City of Austin, Texas. Mediation between Austin and Dripping Springs on contested annexation proceedings, 1985.

Metro Properties, Inc. Subdivision master plant for residential development in Bastrop County, Texas 1985.

Greater Austin - San Antonio Corridor Commission. 1985 - 1987.

Watershed Ordinance Task Force, City of Austin, Texas. Appointment by City Council to review and prepare a comprehensive land development code development is various watershed areas 1986.

ATTACHMENT #2

Definition of Precinct for this.

June 20, 1985

MEMORANDUM

TO: Councilmembers From Cities Dependent on the Edwards Aquifer

FROM: Kent S. Butler, Ph.D.

RE: CREATION OF AN UNDERGROUND WATER CONSERVATION DISTRICT

Although the proposed Edwards Aquifer district legislation was not enacted during the 69th Session, Chapter 52 of the Texas Water Code provides an administrative procedure to establish an Underground Water Conservation District.

This memo will briefly address the following questions pertaining to the creation of such a district for the Barton Springs Associated Edwards Aquifer:

What is the groundwater law in the State of Texas?
What is a Chapter 52--Underground Water Conservation District?
What are the powers of a Chapter 52 district?
What are the steps to create a Chapter 52 district?

Groundwater Law in the State of Texas

The system of private rights to groundwater in the State recognizes the owner of land as owner of the soil and percolating waters which are part of the soil. Texas common law allows for production of groundwater to whatever extent the landowner desires, so long as the underground water is not withdrawn in a negligent, willfully wasteful or malicious manner. When underground water has been appropriated, the landowner or his tenant or assigns have the right to sell the water to others for use off the land and outside the basin where the underground water was produced, just as they may sell any other type of property. The only generally accepted method of managing the production of groundwater in Texas is by

creation of a water conservation district, either by an act of the State Legislature or by creation of a general law district under Chapter 52 of the Texas Water Code.

The Chapter 52--Underground Water Conservation District ("UWCD")

The "UWCD" is one of the many types of water districts which can be created under the Texas Water Code. Its purpose is the management and conservation of an underground reservoir for the benefit of people who live on the overlying land or depend upon the reservoir for some beneficial purpose.

A UWCD can be created and operated without action by the State Legislature. The laws governing creation and authority of UWCDs are found in Chapters 51 and 52 of the Texas Water Code. Various amendments to Chapter 52 have been made by the Legislature over the past few sessions, the most recent of which were made in the 69th Session [1985]. But these recent amendments are subject to a favorable vote in an election to be held on November 5, 1985.

Powers and Duties of a UWCD

A UWCD may make and enforce rules to provide for the conservation, preservation, protection, recharge, and prevention of waste of the underground reservoir. Among the many powers and duties specified in the statutes are the following:

- Develop comprehensive plans for the most efficient use of underground water and for the control and prevention of waste of underground water (A detailed definition of waste is provided in the Water Code);
- Conduct surveys and research, make determinations of limitations on withdrawals and practicability of recharging the reservoir, and publish plans and information;

- Regulate the production of water from wells and spacing of wells (subject to certain exceptions and limitations), and require permits for water production and the spacing, drilling and equipping of wells;
- Require that records be kept and reports be made of water production, water use, well drilling (including drillers' logs) and equipping and completion of wells;
- Regulate open or uncovered wells or illegal drilling or operation of wells:
- Issue bonds and levy taxes for many purposes, subject to an election to authorize taxation (if necessary) and approval of the TWC.
- Acquire land to erect or construct dams, drain water bodies, and install equipment to recharge the underground reservoir;
- Employ a manager, engineers, geologists, etc., as necessary;

Steps to Create an UWCD

There are three steps required to create an UWCD:

1) Designation of boundaries of the underground reservoir
2) Petition to create an UWCD
3) Election to create an UWCD

A request to designate an underground reservoir may be made by any interested person. The Executive Director of the Texas Department of Water Resources must prepare evidence and testimony relating to the existence, area and characterisics of the reservoir or subdivision thereof. The TWC then must consider the evidence and enter an order either defining and designating the underground reservoir or subdivision thereof, or stating that the evidence does not warrant designation. The boundaries of an underground reservoir may be altered by the TWC as required by future conditions or as justified by factual data.

The procedure for petitioning to create an UWCD is similar to that for a Water Control and Improvement District, as specified in Chapter 51 of the Water Code. The boundaries of the proposed UWCD must be

coterminous with the boundaries of the underground reservoir as previously designated by an order of the TWC. At least 50 persons residing within the boundaries of the proposed district must file a petition for creation with the TWC. After the submittal of evidence and testimony, the TWC holds hearings and makes a determination whether the district is feasible and practicable, a benefit to land in the district, and a public benefit or utility. The TWC then either issues an order proposing to create the district and appoints five temporary directors, or issues an order refusing to grant the petition.

The election to create an UWCD and select a board of directors may be held at the next possible election date following the authorization by the TWC. The temporary directors organize the election according to the precinct method, as specified in Chapter 51 of the Water Code.

Candidates for directors must run at large within the proposed district.

A district may extend into two or more counties. If the vote within any of the precincts or counties in the proposed district is against creation, then such precinct or county is excluded from the district.

SMALL CITIES COUNCIL
Participants and Other Interested Parties

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268-4011 (w-Mon, Kyle)
327-7930 (w-T,W,Th, Austin)
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James Poer
Robert Roach
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Attachment #3

BACKGROUND REPORT ON THE NECESSITY AND BENEFIT OF THE PROPOSED BARTON SPRINGS-EDWARDS AQUIFER CONSERVATION DISTRICT

prepared
for the

TEXAS WATER COMMISSION

by

Kent S. Butler Ph.D.

representing the

City of Austin
City of Buda
City of Hays
Village of San Leanna
City of Sunset Valley

January 22, 1986

INTRODUCTION AND BACKGROUND HISTORY

This report presents data and information on the necessity and benefit of creating the proposed Barton Springs-Edwards Aquifer Conservation District. It is submitted to the Texas Water Commission on behalf of petitioners for the proposed District, which include the municipalities of Austin, Buda, Hays, San Leanna, and Sunset Valley. All of the petitioning municipalities are located over the Edwards Aquifer and within the boundaries of the proposed underground water conservation district.

The report includes a brief background history of efforts to establish a groundwater management program in parts of Hays and Travis Counties, a description of the geologic and hydrologic features of the Aquifer, existing and projected utilization of groundwater in the Aquifer, the rationale for designating the jurisdictional boundaries of the District, an evaluation of the proposed District from a planning perspective, and an evaluation of the economic, administrative and political impact of the creation of the proposed District on the persons and the land within the proposed District.

Background History

In the last few years the petitioners for the proposed Barton Springs-Edwards Aquifer Conservation District have devoted considerable time and effort towards the establishment of a comprehensive, areawide management program for groundwater conservation and utilization. By coordinating their efforts and resources over the past three years, they have been responsible for the adoption of local and state regulations pertaining to drainage, water quality, and public health protection. They successfully

petitioned the Texas Water Development Board to extend the Aquifer Board Orders (31 TAC §§ 33.1--331.11) into the Barton Springs unit of the Edwards Aquifer in Hays County. The Hays County Commissioners Court adopted the revised Requirements for Private Sewage Facilities in 1985 which included special standards for wastewater systems over the Edwards Aquifer Recharge Zone. Several area cities, including Austin, Dripping Springs, and Sunset Valley have adopted special requirements for subdivisions and site developments located over the recharge zone or contributing watershed areas of the Edwards Aquifer.

The petitioning cities also lobbied for the adoption of a bill in the 69th Texas Legislature to create a special water district for the Barton Springs-associated Edwards Aquifer. The proposed special district was to have similar powers and duties as are now authorized for underground water conservation districts under Chapter 52 of the Texas Water Code. The bill was approved by the Senate, but a vote was not taken by the House.

Subsequently, in September 1985, a petition was filed with the Texas Water Commission requesting it to prepare studies, hold hearings, and authorize a confirmation election to create the proposed Barton Springs-Edwards Aquifer Conservation District, in accordance with Chapter 52 of the Texas Water Code, V.A.C.S. (See Figure 1). Endorsement and support for creation of the proposed District has been offered by every State legislator in the affected area, every municipality which depends on the Edwards Aquifer as a water supply, both the Hays and Travis County Commissioners Courts, the Hays Consolidated Independent School District, and dozens of civic and neighborhood organizations within the affected area. The public

hearings to consider the boundaries of the Edwards Aquifer and the necessity and benefit of creating the proposed District have been scheduled for January 27, 1986 before the Texas Water Commission.

GEOLOGIC AND HYDROLOGIC DESCRIPTION OF THE BARTON SPRINGS-ASSOCIATED EDWARDS AQUIFER

The Edwards Aquifer is a complex geologic and hydrologic unit which extends across parts of south central and west Texas. Today, the Aquifer is a series of water-bearing layers of cavernous, fractured and honeycombed limestone which hold and bear large quantities of remarkably clean water. Originally deposited about 100 million years ago as sedimentary layers in a shallow sea, the limestone has been reworked by earthquakes, the dissolving forces of carbonic acid in rainwater, and downward cutting by streams.

The hydrologically discrete Barton Springs unit of the Edwards Aquifer underlies approximately 155 square miles of land in northeastern Hays County and southern Travis County, generally following the Balcones Fault Zone which divides the higher Edwards Plateau from the lower Blackland Prairie (see Figure 2). The northern boundary of the Barton Springs-associated Edwards Aquifer is a no-flow boundary formed by the Colorado River (Town Lake). Water levels in the Edwards Aquifer north and south of the Colorado River decline with increasing proximity to the river. Many springs near or inundated by the river, the largest group of which are known as Barton Springs, discharge from the Edwards Aquifer. The western boundary of the Barton Springs unit (hereafter called the "Aquifer") is the westernmost extent of the Edwards Limestone formations and the Aquifer. The southern boundary of the Aquifer is a groundwater divide. A groundwater divide is a physical feature that separates

water flow in the aquifer. South of this divide, groundwater discharges to San Marcos Springs, about eight (8) miles south of the City of Kyle. The eastern boundary of the Aquifer is locally referred to as the "bad water" line, where water circulation to Barton Springs is decreased substantially. East of the line, as delineated by the petitioning cities and the Texas Water Development Board, the dissolved-solids concentration of the water is greater than 3,000 parts per million. The bad water line is well defined and fairly stable. Leakage from east of the line into the Aquifer is minimal and only detectable during extreme low-flow conditions.

Geology.

The Aquifer is composed of the Cretaceous-aged Edwards Limestone and Georgetown Limestone Formations. These formations dip eastward and strike northward. The limestone is eroded and crops out in the western part of the Aquifer. In the subsurface, the thickness of the limestone formations increases from west to east and from north to south, varying from about 400 feet at the northeastern boundary of the Aquifer to about 450 feet at the southeastern boundary.

Extensive seismic activity during the Miocene epoch created extensive faulting, which today is known as the Balcones Fault Zone, a series of stair-stepped fault blocks with vertical displacements of as much as 200 feet. Many of the larger solution cavities and zones of high porosity in the Aquifer are located along faults. The largest of the faults in this area is the Mount Bonnell Fault, which is generally located along the western limit of the Aquifer. The surface traces of mapped faults in the Edwards Aquifer are generally parallel to the western boundary of the Aquifer and trend northeast.

The Edwards Aquifer is underlain and bound on the west by Cretaceous rocks that are older than those of the Aquifer. These rocks include, from youngest to oldest, the Walnut Formation, which is as much as 60 feet thick, and the Glen Rose Limestone, which is 500 to 900 feet thick. The Walnut Formation yields little or no water in this region and the Glen Rose Limestone yields small quantities of water that is chemically distinct and more saline than water from the Aquifer.

Cretaceous rocks younger than the Edwards Limestone overlie the Aquifer and extend eastward at the land surface. These formations include, from oldest to youngest, the Del Rio Clay and the Buda Limestone. Neither formation is known to yield water in this region. The Del Rio Clay, which is 60 to 75 feet thick, is relatively impermeable and forms an upper confining layer of the Edwards Aquifer.

Hydrology.

The water within the Edwards Aquifer is contained in cavities, fractures, and small pore spaces in the limestone rock, often extending continuously along subsurface faults. Consequently, the Aquifer's hydrologic characteristics are extremely variable. Wells which are drilled through faulted areas and solution cavities may produce sustained flows of as much as several thousand gallons per minute, while other wells which do not penetrate porous zones may not be economical to operate even for domestic purposes. The estimated total volume of water in storage in the Aquifer, during an average year, is 300,000 acre-feet.

The water table in the recharge zone (western half) and central area of the Aquifer is under free water table conditions. But the

confining beds above and below the Edwards Formations on the eastern side of the Aquifer create a zone of artesian conditions. (See Figure 2).

The transmissivities of various portions of the Aquifer are known to vary by as much as four orders of magnitude. While the specific yield of the Aquifer (which is the amount of available water volume in proportion to the total volume of the rock and water in the Aquifer) is very low (approximately 0.014), the hydraulic conductivity of the Aquifer (which is the velocity at which water is transmitted through the Aquifer) is as fast as several thousand feet per day.

Creeks which flow across the area where the Edwards Limestone formations crop out lose much of the surface flow through faults and fractures in the creek beds, thereby recharging the Aquifer. Approximately 85% of the recharge occurs in the beds of main channels of creeks, while the remainder occurs on tributaries to the main channels or through diffuse infiltration. The long-term mean annual rate of recharge to the Aquifer is approximately 36,000 acre-feet per year, or 50 cubic feet per second. The volume of recharge which occurs on each contributing creek has been determined on a regular basis by the U.S. Geological Survey since 1979.

The relative amount of recharge varies widely from creek to creek and over the course of time. Williamson Creek to the north contributes only six percent of the average annual recharge, while Onion Creek to the south contributes more than one-third of the average annual recharge of the entire aquifer. The total annual recharge from all creeks in calendar year 1981, a very wet year, was

approximately 77,000 acre-feet. Conversely, however, there was a 24-month period in the critical drought of 1954-56, during which time there was virtually no recharge to the Aquifer from any surface source.

Barton Springs accounts for approximately 96 percent of the natural discharge from the Aquifer. Measurements of flow at the Springs have been regularly sampled at least since 1917. The average rate of discharge through the Springs currently is approximately 30,000 acre-feet per year, or 40 cubic feet per second. The minimum and maximum measured rates of flow through the Springs are 10 and 166 cubic feet per second, respectively.

Average daily pumpage rates are currently estimated to be 5 to 6 million gallons per day, or 8 to 9 cubic feet per second. Projections on future pumpage rates from the Aquifer are discussed in the following section.

In summary, the Edwards Aquifer is characterized by its relatively small storage volume per unit area, very high flow velocities, and proportionately high rates of natural recharge and discharge. The extreme variations of the Edwards Aquifer in relation to rainfall, runoff, pumpage from wells, and springflow make for a unique and rather sensitive water supply.

CURRENT AND PROJECTED LAND USE, POPULATION AND WATER USE

Land Use and Population.

The proposed District is located entirely within Hays and Travis Counties. It contains the municipalities of Austin, Buda, Hays, Mountain City, Rollingwood, San Leanna, Sunset Valley, and West Lake Hills. While most of the affected land within the corporate limits of the City of Austin is urbanized at medium to high densities in residential and commercial uses, the remaining 80 percent of the District area is either developed at suburban residential densities or remains undeveloped and devoted to ranching or related agriculture.

As of the 1980 Census, there were approximately 85,000 persons living within the proposed District. Since that time, the south Austin metropolitan area has encountered unprecedented rates of suburban development and population growth. Assuming an average annual growth rate of 4 percent since 1980, the current population would be approximately 112,000. The population within the District is projected to continue growing at very rapid rates. Since 1982, seven municipal utility districts have been created within the subject area. The availability of public utilities to much of the suburban fringe areas in south Austin and southern Travis County, the City of Buda, and elsewhere will support significant additional housing and related development along the Austin-San Antonio growth corridor and within the proposed District.

Austin city planners have projected that the population residing within the area over the Aquifer will increase by about 86,000 by the year 2000 (Department of Planning and Growth Management, oral

commun., (1984). This projection was subsequently used to model the effects of future groundwater pumpage on the water table in the Aquifer, and is further described in the section on Water Use.

Water Use.

Almost all water consumed within the boundaries of the Aquifer and within the watersheds of Slaughter, Big Bear, Little Bear and Onion Creeks (comprising approximately three-fourths of the area within the proposed District), is obtained from the Aquifer. Many municipalities, such as Buda, Hays, Mountain City, San Leanna, and Sunset Valley are dependent on the Aquifer as their sole source of drinking water. In addition, several of the Aquifer-dependent municipalities are planning or constructing significant expansions to their water utilities to accommodate residential and commerical developments which are planned or under construction.

The City of Austin benefits from water supplies in the Aquifer, both as a recreational resource (Barton Springs) and a municipal water supply. Annually, more than 300,000 paid attendees visit the Barton Springs swimming pool. Additionally, the natural discharge from Barton Springs contributes to the City's water supply at the Green Water Treatment Plant on Town Lake. During certain months of the year, water is not released from the Highland Lakes, thereby making Barton Springs an important source of freshwater for customers of Austin's water utility in South Austin.

There are four water supply corporations which withdraw water from wells within the Aquifer and proposed District to serve customers in the eastern part of the proposed District, as well as throughout the rest of southeastern Travis and eastern Hays Counties and western

Bastrop and Caldwell Counties. These water supply corporations currently serve approximately 3,000 metered customers, or about 9,000 persons located throughout their service area.

In 1981 the U.S. Geological compiled available data on pumpage and determined the average pumpage rate to be 3,800 acre-feet per year, or 3.4 million gallons per day. On the basis of more recent data compiled by the Texas Department of Water Resources, Texas Department of Health, a survey conducted at the University of Texas in 1984, and an assumed annual rate of increase in pumpage of 5 percent, it is projected that the current level of pumpage is on the order of 5 million gallons per day, serving approximately 25,000 persons and a proportionate amount of commercial and industrial development.

Projected Future Water Demands and Impacts on the Aquifer.

Population increase projection for the year 2000 made by City of Austin planners were used to simulate future groundwater demands and the corresponding effects on water levels in the Aquifer. (Slade and others, 1985). It was assumed that the only areas relying on groundwater supplies in the year 2000 would be San Leanna, Sunset Valley, developments in the Little Bear and Onion Creek watersheds and within the District, and the approximately 9,000 persons served by the water supply corporations. It was also assumed that there would be no management or control of groundwater pumpage within the District. The results of the simulation were quite significant for large areas of the proposed District.

The changes in water levels between the January 1981 conditions and the year-2000 conditions were evidenced by signficant drawdowns

in excess of 125 feet in the far southeastern corner of the District. (See Figure 3). More significantly, a large area in the southwest corner of the proposed District would be dewatered, even during average conditions. This simulation is considered to be a conservative estimate of future conditions because significant additional water demands are likely to be imposed on the Aquifer by water supply corporations to the east of the Aquifer which were not included in the simulation.

POTENTIAL FOR AQUIFER RECHARGE ENHANCEMENT

The construction of runoff-control structures can be very effective for increasing recharge to aquifers. Local governing officials from cities in the proposed District are studying a proposal to build such a structure--a large reservoir or series of reservoirs on Onion Creek near the upstream end of the recharge zone. The reservoir would impound thousands of acre-feet of water during flood flows and could be used for recharge enchancement or as a direct source of water for the area. On the basis of preliminary evaluations and computations, it has been determined that the reservoir could significantly increase recharge volumes if managed for this purpose. Several potential sites have been identified in the reaches of Onion Creek near the western edge of the recharge zone.

There are several unique advantages of constructing such a project on Onion Creek in a location immediately upstream of the recharge zone. The Onion Creek recharge zone is topographically higher than most of the other creeks which cross the Aquifer, thereby enabling any additional recharge water entering through the beds of Onion Creek to elevate water levels throughout the rest of the

Aquifer. (See Figure 4). Channel profiles in the area proposed for the recharge project are quite deep, thereby establishing a highly favorable ratio of volume-to-surface area (which reduces the potential evaporative losses from the reservoir surface).

The drainage area upstream from the Aquifer is sufficiently large (125 square miles) to contribute significant flood flows several times each year. In fact, more than two-thirds of all the stream runoff entering the Onion Creek recharge zone in recent years has passed by the recharge zone and contributed to flood flows further downstream. The natural recharge capacity of Onion Creek is very high (approximately 120 cubic feet per second) which implies that the creek channel can infiltrate significant volumes of flood waters to the Aquifer. By building a runoff-control structure to significantly reduce any peak flows and meter the release of flood waters during off-peak periods, the proportion of recharging waters to bypassing flood flows can be markedly increased.

In a recent report published by Slade and others (1985), the significance of enchanced recharge from an Onion Creek runoff-control structure was simulated. The assumption was made that one-quarter of the mean runoff which normally bypasses the recharge zone on Onion Creek would be converted to recharge.

The normal and the enhanced recharge volumes were inserted into the same computer model that was used to project year 2000 water levels. The changes between the simulated 1981 water levels on the one hand, and the year 2000 water levels with increased pumpage and the recharge enhancement structure in place on the other, were evaluated. The potential enhanced recharge will not only prevent

previously projected dewatering of the southwestern corner of the Aquifer, it will raise the projected water levels as much as about 120 feet along the western boundary of the Aquifer along Onion Creek and about 40 feet along Onion Creek near Buda. (See Figure 5).

It should be noted that the assumptions underlying the recharge/water level simulation are extremely conservative. Conversion of one-half of the Onion Creek flood flows to recharge is a reasonable possibility -- as opposed to the one-quarter conversion simulated. A conversion of one-half of Onion Creek's flood flows could produce a 30% increase in total mean recharge of the Aquifer.

WATER QUALITY CONSIDERATIONS

The Edwards Aquifer is perhaps more sensitive and vulnerable to contamination than any other aquifer in Texas. Recharge areas over the Aquifer are typified by exposed rock surfaces with little or no soil mantel to filter any potential contaminants in surface waters. Rates of infiltration and diffusion of liquids through the Aquifer are possibly faster and more extensive than any other in the State. (Butler, 1983).

Some of the potential sources of contamination include, but are not limited to, the following: discharges from improperly sited or poorly operated sewage treatment facilities; onsite septic tank-drainfield systems and sewage holding tanks in areas of little or no permeable soil; underground or above ground storage facilities used for hydrocarbon or other toxic or hazardous chemicals which may be subject to rupture, leakage or spillage; improper application of agricultural pesticides or herbicides; industrial facilities which use or dispose of hazardous chemicals or solid wastes; municipal or

industrial landfills; waste disposal wells; and nonpoint pollution from urban storm runoff.

Fortunately, there have been very few reported incidents of groundwater contamination in the Aquifer. Those which have occurred were isolated or short-lived. One incident was characterized by unsafe bacterial concentrations within Barton Springs Pool. The pool was routinely closed for a few days after each rainfall event until bacterial concentrations would drop below the minimum safe level. The source of contamination was apparently a leaking sewer which has since been located and repaired. Another set of incidents involved routine testing of water quality in private wells throughout the Aquifer. In a series of 38 wells tested for water quality constituents, the U.S. Geological Survey identified 12 with abnormally high counts of fecal coliform bacterial. In most of these cases, the specific source was not identified, but the bacterial concentrations did not seem to spread to become an areawide concern.

Additional information and data on the water quality of the Edwards Aquifer is presented by Andrews and others (1984).

ECONOMIC FEASIBILITY OF THE DISTRICT

A primary method by which the District is authorized to generate revenues is through ad valorem taxation. In order to determine the probable economic impact of the levy of a tax sufficient to administer the powers and duties of the District and maintain District offices as may be required, the petitioners and their counsel have estimated the necessary expenditures and revenues to carry out the functions of the District. Technical assistance was solicited and received from the Chief Appraisers of the Travis County Appraisal District

and the Hays County Appraisal District. Their preliminary estimation of the assessed value within the District is in excess of $3.0 billion. The petitioners have estimated the necessary expenditures for the District to be approximately $300,000 per year. Consequently, it is feasible that a tax levy in the range of $0.01 per $100 will be sufficient to carry out the functions of the District. (At this tax rate, the assessment on a $100,000 real estate parcel would be $10.00 per year.)

In accordance with §52.059 of the Texas Water Code and the Commissioners' rules, the proposed temporary directors have verified that a proposition for the levy of a maintenance tax will be included on the ballot for the election to create the District.

RATIONALE FOR DELINEATION OF THE DISTRICT BOUNDARIES

The Management Area boundaries and the jurisdictional boundaries of the District have been delineated in accordance with the provisions of §§ 52.023 and 52.024 of the Texas Water Code, V.A.C.S. The petitioners worked closely with hydrologists and engineers in the Texas Water Development Board and attorneys and staff of the Texas Water Commission to determine the most accurate and legally and administratively workable boundary description for the 155-square mile district. This section provides a summary of the rationale for selecting the various boundary segments which encompass the District.

Delineation of the Aquifer Area.

The boundaries of the Aquifer are shown on the Texas Water Development Board's Edwards Aquifer delineation map.

The primary sources of data for delineation of the Aquifer boundaries were as follows:

(1) On the western boundary, recent field geological surveys of the Edwards Limestone formations conducted by the U.S. Geological Survey, with periodic verification provided by the staff of the Texas Water Commission and the University of Texas Bureau of Economic Geology.

(2) On the northern boundary, various previous investigations, all of which designate the Colorado River as the northern limits of the Aquifer.

(3) On the eastern boundary, updated analyses (in 1985) of the chemical quality of various wells in the "bad water" zone of the Aquifer, as interpreted by the staff of the Texas Water Development Board.

(4) On the southern boundary, recent water level surveys in the area of the groundwater divide. Independent field surveys were conducted by the staff of the Edwards Underground Water District and the Texas Water Development Board. Delineations of water level contours were performed by the above referenced staff as well as Dr. Kent Butler. The staff of the U.S. Geological Survey provided technical assistance in selecting an appropriate methodology for delineation of water level contours.

All segments of the Aquifer boundary have been reviewed by the petitioners and other agencies with expertise in the Aquifer geology and hydrology, and there is substantial agreement and support by all parties involved for the boundaries as delineated.

Delineation of the Management Area and District Boundaries

The petitioners have delineated a boundary map and a metes and bounds type description which is approximately coterminous with the

delineated Aquifer boundaries. The District boundary map is shown in Figure 1. A complete set of larger scale maps and the metes and bounds description is on file with the Chief Clerk of the Texas Water Commission.

The criteria for selecting individual District and management area boundary segments included the need to select administratively workable and relocatable line segments which correspond as closely as possible to property boundaries. The types of features selected for boundary segments, in order of priority, were roads, boundary surveys, boundaries of other types of general law units of government, stream channels, and boundaries of individual tax parcels.

The southern portion of the proposed District overlaps with the extreme northern boundaries of the Edwards Underground Water District. After considerable research and discussion among the staff of the Texas Water Development Board, the Board of Directors and General Manager of the Edwards Underground Water District, and the petitioners and their counsel, all parties unanimously agreed that the boundary as shown in Figure 1 is the most technically correct and administratively workable boundary for both Districts. It is understood by all the above referenced parties that an area of overlapping jurisdiction will exist upon the creation of the proposed District, and that such overlap is authorized to occur under the Texas Water Code. However, in December, 1985 the Board of Directors of the Edwards Underground Water District directed their Legislative Committee to draft legislation which will redefine the northern boundary of their district in the same location as the proposed southern boundary of the proposed District. The members of the Texas

Senate and House of Representatives in whose districts the area of overlap occurs have concurred with this boundary resolution and have committed to rectify the overlap in the 70th Session of the Texas Legislature.

The boundaries in the southwestern corner of the proposed District extend to the west of the delineated Aquifer in the area of Onion Creek. The rationale for including this area in the Management Area and the District is to enable the expenditure of funds, acquisition of lands, appropriation of water rights, and letting of construction contracts as necessary to develop the recharge reservoir on Onion Creek, as described more fully in the preceding section and in the report by Slade and others (1985). The area included in the proposed Management Area and District that is outside the Aquifer boundary is the minimum feasible area which can reasonably be specified in accordance with the boundary selection criteria while encompassing the area required for the potential recharge project. After consultation with the staff of the Texas Water Commission and counsel for the applicants, the petitioners respectfully request that the Commission include this area within the Management Area and the proposed District.

THE NECESSITY AND BENEFIT OF THE BARTON SPRINGS-EDWARDS AQUIFER CONSERVATION DISTRICT

The preceding sections have provided technical data and information which justifies the need for and benefits of a comprehensive, areawide program of groundwater management for the Aquifer and a justification of the boundaries of the proposed management area and District, in accordance with Chapter 52 of the Texas Water Code. The District, its proposed boundaries and the management area which it encompasses, will be a feasible and practicable supplement to the existing programs of water resource planning and conservation in this part of Central Texas. One of the most prevailing interests of the people throughout the District is the Aquifer itself and its many functions -- as a sole source of drinking water for many of the communities and individual households, as a reservoir of extremely pure water which replenishes Barton Springs and the pool and which contributes to the drinking water supply of the citizens of south Austin, and which provides a steady flow of clean water to the Colorado River for dilution of wastewater effluent and storm sewage.

The elected leadership in local and state government in th District have recognized that this Aquifer must be managed as single system by virtue of its intrinsic geologic and hydrologi characteristics. They are also fully cognizant of the fact that district created under the auspices of Chapter 52 of the Texas Wat Code is the most viable method of implementing comprehens management, conservation and conjunctive use of the area's gro and surface waters. The Board of Directors of the District have the necessary powers and duties, subject to the approval by

Texas Water Commission and a majority of the voting population within the District, to carry out a plan for management, conservation and conjunctive use.

The rapid rate of growth and the corresponding increases in pumpage of groundwater are placing large areas of the proposed District and future populations at risk in terms of overpumpage and groundwater depletion. Without the use of innovative management strategies and conjunctive use of surface and underground waters the Aquifer area is very likely to experience significant drawdowns in existing wells and failures of shallower wells. There are many workable solutions to the problems of overpumping, but most of them are only made feasible by the powers and duties vested in a water district created under Chapter 52 of the Texas Water Code.

Owners of land within the District should all be aware of the scarcity of water and the finite carrying capacity of this Aquifer to produce sustainable supplies in dry and wet periods alike. Many of the elected leaders in the area are mindful of their obligation to protect the rights of private property through their policies and actions. Officials in the petitioning cities have a unified perspective about their groundwater resources. A key part of that perspective is the need for long-range protection of private property, and the commitment to the economic vitality of the region. These can only be assured with a sustainable, pure supply of drinking water for themselves, their heirs and assigns, and future residents in the region.

The level of vulnerability of this Aquifer to contamination from surface or underground sources is an important reason for the

establishment of a regional entity to coordinate existing programs and rules which are now applied in various portions of the District. While the various city and county criteria and rules pertaining to land development, urban storm drainage, sewage systems, and other factors can provide a significant degree of protection from groundwater contamination, there are many areas over the Aquifer where the criteria and rules are not uniformly applied. The proposed District will serve as an institution which provides the forum for coordinated planning and execution of groundwater quality protection programs.

The Austin-San Antonio Corridor which encompasses the proposed District will experience significant episodes of urban growth and development in the coming years. In each and every such case, the availability of potable water supplies and the impacts of additional allocations of water on existing water customers within the region will be debated. It is essential that both surface and underground waters be managed conjunctively in this region. All available and potential water supplies should be monitored and evaluated to determine how they can be used more prudently and efficiently and to ensure that current users are not jeopardized by planned water projects. The proposed District will be able to perform these functions.

At the present time, groundwater is not being managed or efficiently allocated in this region. A majority of the elected officials in the region have thoroughly considered the necessity and benefit of the powers and duties of an underground water district, and are of the opinion that the proposed District is the proper

mechanism to begin planning, managing and conserving the region's groundwater resources. Based upon the information and analysis presented in this report I concur in their conclusion and recommend that the Commission authorize creation of the proposed District and its submission to the voters for a confirmation election.

Andrews, F. L. Schertz, T. L., Slade, R. M., Jr. and Rawson, J., 1984. Effects of Stormwater Runoff on Water Quality of the Edwards Aquifer Near Austin, Texas. U.S. Geological Survey, Water Resources Investigations Report 84-4124, 50 pp.

Butler, K. S., 1983. Managing Growth and Groundwater Quality in the Edwards Aquifer Area, Austin, Texas. Public Affairs Comment Vol. 29, No. 2, 10 pp.

Slade, R. M., Jr., Linda Ruiz, Diana Slagle, 1985. Simulation of the Flow System of Barton Springs and Associated Edwards Aquifer in the Austin Area, Texas. U.S. Geological Survey, Water Resources Investigations Report 85-4299, 49 pp.

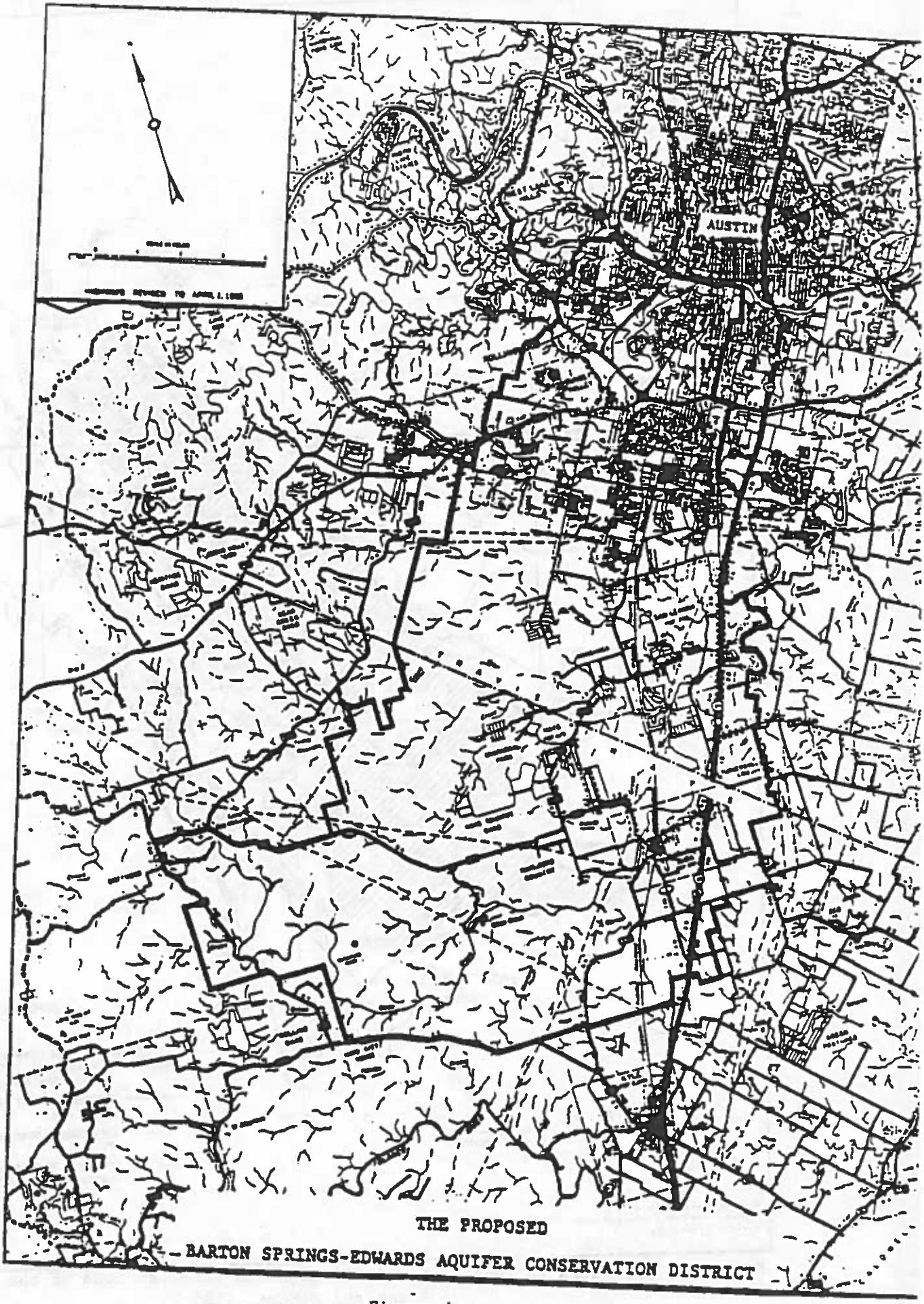
AUSTIN
THE PROPOSED
BARTON SPRINGS-EDWARDS AQUIFER CONSERVATION DISTRICT

Figure 1.

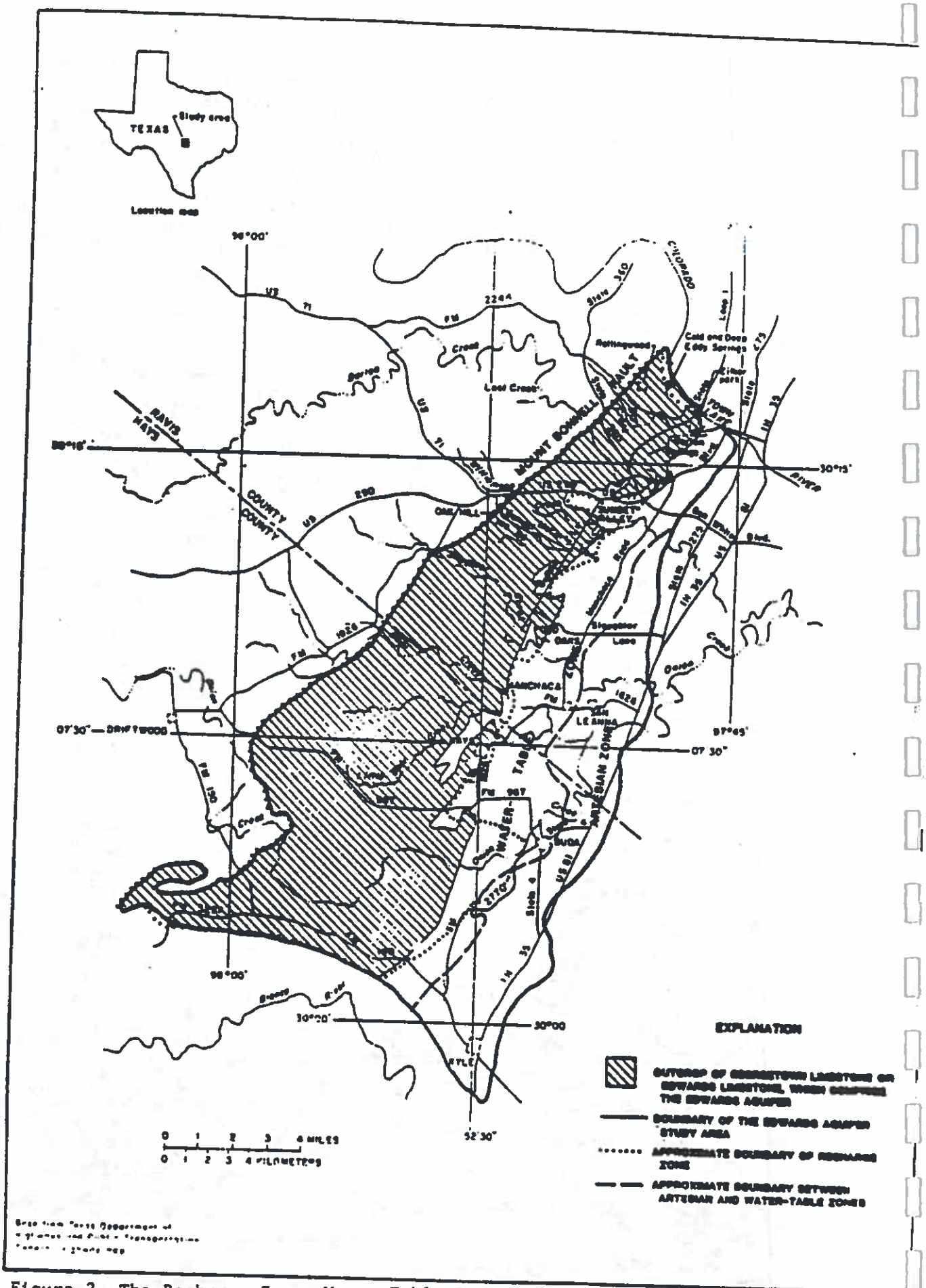

Figure 2. The Recharge Zone, Water Table Zone and Artesian Zone of the Edwards Aquif
(Slade and others, 1985).

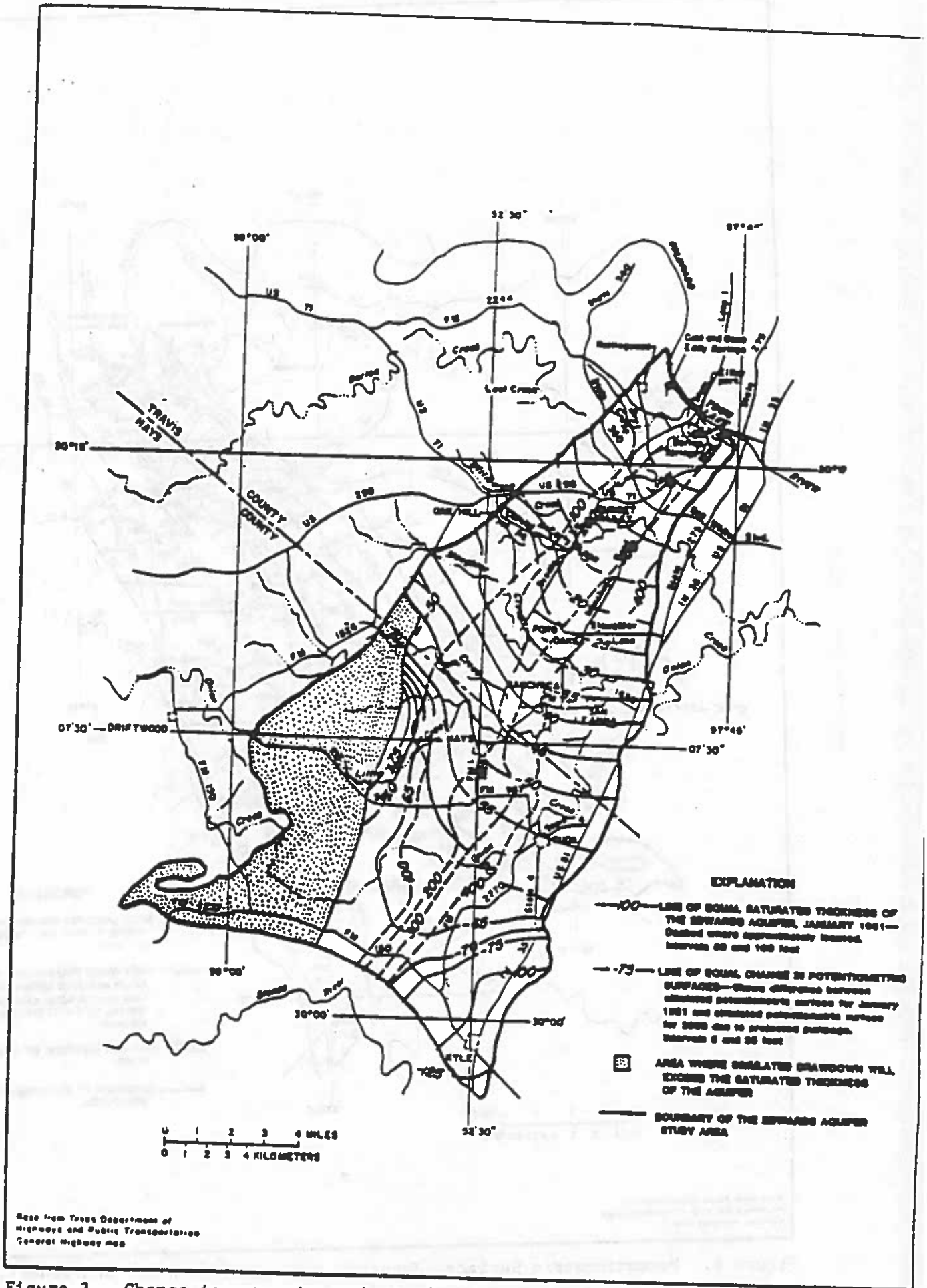

Figure 3.--Change in potentiometric surface between simulations for January 1981 and 2000 due to projected pumpage. (after Slade and others, 1985).

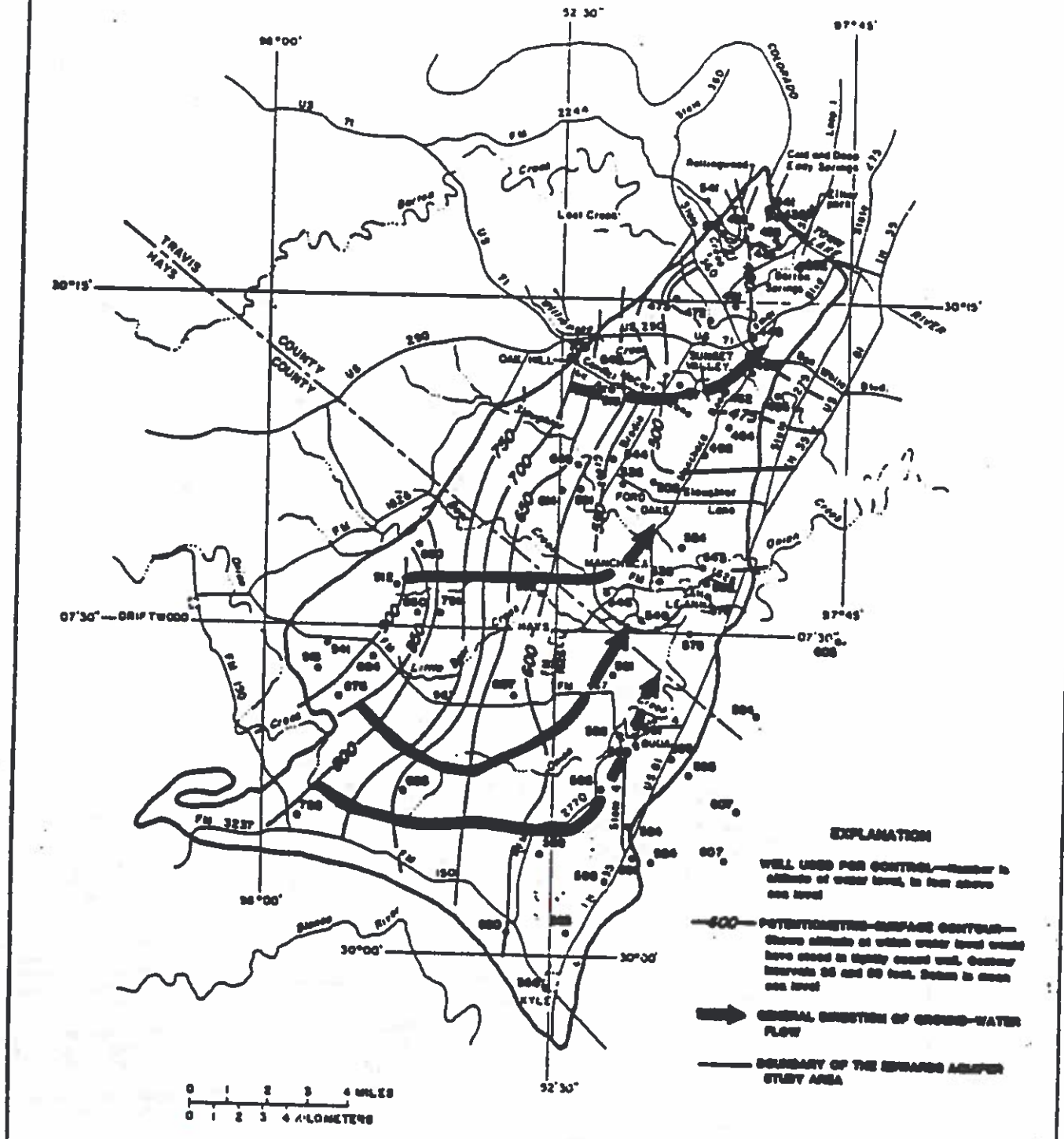

Figure 4. Potentiometric Surface, January, 1981, (after Slade and others, 1985).

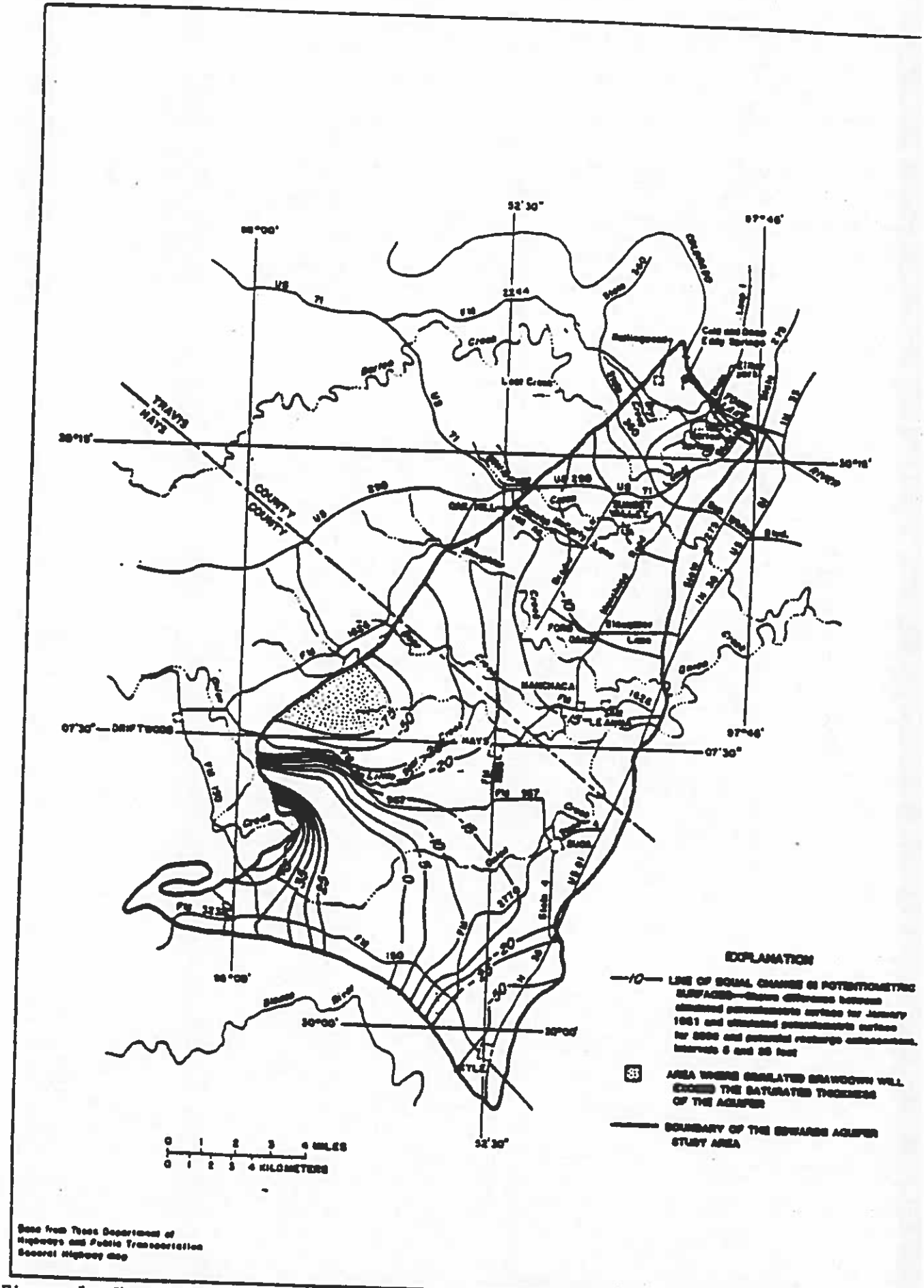

Figure 5. Change in Potentiometric surface between simulations for January 1981 and 2000 with recharge enhancement. (after Slade and others, 1985).

ATTACHMENT #4

MEMORANDUM

TO: Mayor and Councilmembers

FROM: Jorge Carrasco, City Manager

DATE: May 29, 1984

SUBJECT: Protection of Edwards Aquifer

At the end of the City Council hearings in February concerning the protection of the Edwards Aquifer, the City Manager was requested to evaluate the testimony presented and to present for Council consideration any needed changes to existing ordinances and programs.

I am transmitting for Council consideration the attached report prepared by the staff in response to the Council request. The report in summary:

- Identifies the many and complex issues surrounding the protection of the aquifer.
- Recommends the adoption of three specific goals to guide protection of the aquifer.
- Recommends the initiation of a comprehensive management strategy to protect the aquifer and to improve the City's ability to address the many issues resulting from development over the aquifer.
- A staff evaluation of the testimony heard during the Council public hearings.

While the attached report is being presented to Council, no board and commission has been provided copies. After Council review, the staff will present the report to various boards and commissions for input. A final report will be prepared for final Council consideration.

Jorge Carrasco
City Manager

JC:dsc

Attachment

EDWARDS AQUIFER PROTECTION

INTRODUCTION

The City Council requested in February, 1984, that the City staff review the testimony and issues related to the protection of the Edwards Aquifer. The City Manager was further directed to present his recommendations to the Council concerning the protection of the aquifer.

In response to the Council request, representatives from the City Manager's Office, Environmental Resource Management, Public Works, Health, Parks and Recreation and Water and Wastewater met to identify several issues related to the protection of the aquifer.

ISSUES

The protection of the Edwards Aquifer as a natural resource to the community has been the subject of much debate and discussion. Numerous issues surround the best avenue to protect the aquifer as a community resource for the enjoyment and benefit of Austin citizens, both present and future generations. The staff has identified several issues which warrant highlighting as a part of this Council report.

- Sufficient quantitative data does not exist to provide any definitive conclusions about the impact of development over the aquifer and recharge zone. The lack of sufficient data handicaps the City's ability to develop definitive conclusions and to institute appropriate protection systems.

- The lack of sufficient data has produced a continuing debate over the best means to protect the aquifer. The debate centers around density controls versus structural controls as the preferred means of protection. The City has in place both types of protection.

- The City does not have in place a comprehensive strategy to deal with protection of the aquifer. The lack of a comprehensive management strategy has resulted in short term crisis responses.

- No definitive goals exist upon which to judge the City's success or failure in protecting the aquifer. The resulting discussions have therefore been based more on emotions or conjecture rather than the objective evaluation of the City's policies.

- Much of the discussion surrounding the aquifer has centered around the maintenance of flows and water quality at Barton Springs. While the sustained flow and water quality are two important indicators, no real effort has been made to quantify acceptable levels of flows and water quality existing for the springs.

- The strength or effectiveness of existing ordinances has been a subject of public discussion. In the absence of effective monitoring programs, the effectiveness of present ordinances will continue to be suspect in some segments of the community while viewed by others as being cumbersome and unnecessary. The City's present ordinances are relatively new, the oldest ordinance is four years old while the current Lake Austin Ordinance has been in force since 1983. Effective monitoring requires not only an adequate evaluation program, it also requires a reasonable length of time to gain experience with techniques and approaches.

STANDARDS FOR EVALUATION

As noted earlier, no formal goals nor an effective evaluation program exist upon which to base future decisions to protect the aquifer. There is a need to protect the aquifer. There is a need to establish goals to ensure an effective evaluation of the City's ability or inability to respond to concerns about the aquifer.

It is recommended that the following goals be adopted formally by the Council in an effort to establish clear and precise standards upon which to evaluate City policies and procedures to protect the aquifer.

Goal #1

To maintain water quality in the Edwards Aquifer to at least the 1980-83 levels.

During the years 1980 thru 1983, the U.S. Geological Survey systematically sampled streams and wells in the aquifer area as well as Barton Springs. Their data forms a baseline against which to measure trends and changes.

Goal #2

To limit the aquifer pumpage to no more than 5.1 mgd over the 1982 pumpage rate of 3.8 mgd.

No clear standard for an acceptable volume of ground water use has emerged from the discussions with concerned citizens, scientists and staff. Recent and ongoing studies by the USGS will provide the necessary information to develop such a standard. As an interim standard the recommended increase of 5.1 mgd will ensure flow at Barton Springs for all but the historical critical drought period.

Goal #3

To develop a comprehensive aquifer protection program by October, 1985 which encompasses: A comprehensive management program, designed to develop a complete data base for decision-making and an aggressive monitoring/enforcement program, is needed to produce data on which to base future decisions. The expanded program should include:

- Management standards for City owned and/or maintained lands and facilities to achieve water quality and quantity goals;

- Expanded data collection programs;

- Improved city monitoring and enforcement of ordinances and environmental requirements on new construction; and,

- Monitoring programs for existing privately owned and maintained facilities which have potential for water quality problems (e.g. septic tanks, underground chemical storage tanks).

MANAGEMENT STRATEGY

A key element to respond to the challenge of protecting the aquifer requires the City to adopt a pro-active stance in managing the many complex and diverse interests in the area. It is recommended that the following management strategy be adopted by the City to complement the goals to protect the aquifer.

Short Term Strategy (to be implemented by October 1985)

- The City of Austin owns, controls, or has responsibility for large segments of land in the aquifer area. The City should by example take a leadership role in managing its lands to ensure the achievement of the protection goals.

  City owned facilities include such diverse items as fire stations, parks, streets, sewers and libraries. In addition the City is responsible for street sweeping, garbage collection, maintenance of City buildings and operation of a package treatment plant. A major work program element is to (1) inventory existing city facilities and programs which currently exist within the aquifer area; (2) evaluate current operations with regard to their potential impact on the aquifer, and (3) develop modified management standards necessary to protect these sensitive watersheds and the aquifer itself. Acquisition of new lands for City uses and planning for City services should also be designed to be compatible with the Edwards Aquifer goals.

- Current data collection programs include storm water monitoring, geologic mapping and developing an inventory of ecologically important areas. These programs should be continued. The Storm Water Monitoring Program should be expanded to examine effectiveness of different types and different sizes of structural controls as well as land uses not included in the current program. Ground water monitoring should be continued.

  Acceptable contaminant loadings for water leaving structural controls and entering creeks must be determined. Other expanded programs include: (1) field verification by the U.S. Geological Survey of the Edwards Aquifer recharge boundaries; (2) use of remote sensing to monitor construction sites and to determine "as built" impervious cover; and (3) an inventory of culturally and historically valuable areas.

- An improved and aggressive program for inspection, maintenance and enforcement of City Environmental Ordinances must be developed. The City should

institute a more intensive inspection and enforcement program; establish training for inspectors. An audit of City staff capabilities may be needed to identify gaps in expertise.

- The City should develop an inventory, evaluate and institute a management program to identify localized potential sources of pollution from nonpublically owned facilities; i.e. individual septic tanks and other on site disposal systems, storage tanks for gasoline and other hazardous materials. Other public lands (schools, highways) and their management and maintenance should also be assessed. If any potential water quality problems are identified, the City can approach the appropriate jurisdiction for resolution.

- A public education program should be developed to provide information to homeowners and businesses currently located over the Aquifer; prospective builders and buyers; and the general public who utilize City facilities in the aquifer area.

- There is a need to enhance existing ordinances to provide improved data collection and analysis; and protection capability. Two areas where the staff recommends additional ordinance amendments are:

  (1) Insert a requirement for geologic assessment on each new development of more than 10 lots if densities are less than one lot per three acres. This geologic assessment should identify sink holes, springs, seeps, caves, faults and any other locations of recharge or sensitive geology so these can be accommodated during development.

  (2) Develop an "Environmentally Sensitive" zoning category in which there are rigorous standards for underground storage tanks of hazardous materials and other restrictions on industrial and commercial uses which utilize hazardous materials on site.

- The City should institute a program to identify and maintain structural controls to ensure their workability and to achieve desired reduction of contaminent loads from the devices. The cost of maintenance should be borne by the private land owner.

- The storm water monitoring program should be expanded. The program should include remote sensing, monitoring of sites to be developed, filtration media evaluation, evaluation of water hyacinths for nutrient removal and expanded well monitoring in the aquifer.

- Extend the Edwards Board Orders from Hays County line to the northern ETJ (including Williamson County). The City Council has acted to request that the Texas Water Commission to extend board orders to Travis and Williamson County.

  Communities in Hays County are requesting an extension of the Edwards Aquifer Board Orders, which currently apply in the area from Uvalde to Southern Hays County, to include all of Hays County. These Board Orders provide for water quality protection from runoff, wastewater facilities and industrial development. In conjunction with the City's current and the pro-

posed expanded programs for areas inside the City limits and within the ETJ, extension of the Board Orders to Northern Hays County may provide adequate water quality protection to the portion of the Edwards Aquifer which supplies Barton Springs.

- An annual report to the City Council should be prepared to provide a "state of the Edwards Aquifer" report. The report will contain the status of the City's management strategy and any needed corrective actions to ensure the viability of the City's protection efforts.

Long Term Strategy (to be implemented by October 1986)

- The City should pursue the establishment of limitations on ground water pumpage out of the Edwards Aquifer.

  The most direct method for establishing limitations on ground water pumpage is through the formation of an underground water protection district. Recent MUD developments approved by the City will utilize surface water. Until an underground water district is established, other large water users planning to locate in the Aquifer area should be reviewed individually for potential impact on ground water supply.

CONCLUSION

The protection of the Edwards Aquifer requires the establishment of goals and the implementation of an aggressive monitoring and enforcement program. There is a need for the City to enhance its current programs and to develop a consistent data base for decision-making. While sufficient data does not presently exist to draw definitive conclusions about the success or failure of existing programs, there is a need to make a commitment to put into place the needed programs to ensure the City's ability to be pro-active in addressing the many issues which confront the community in protecting an invaluable community resource.

ANALYSIS OF DATA RELEVANT TO MANAGEMENT OF THE EDWARDS AQUIFER

Introduction

During the week of February 13, 1984, the City Council held three work sessions to discuss the proposed Edwards Aquifer Ordinance. Central to the discussion was a debate concerning the possible effects of the proposed development density restrictions on the sustained flow at Barton Springs, on the quality of recharged water, and the ethnic diversity of metropolitan South Austin. The strengths of the existing ordinances were outlined and data were presented on the theoretical efficiencies of various structural measures for use in mitigating the impacts of urban runoff. This report will discuss the water quantity and quality issues and will not attempt to address the socio-economic/ethnic diversity issue.

Water quality problems are very elusive, especially when a ground water aquifer is involved. The hazards of water pollution are not immediately obvious and in the case of Austin are not nearly as dramatic, for instance, as the catastrophic flood events.

The Nationwide Urban Runoff Program (NURP) adopted, for the purpose of developing a framework for discussing water quality issues associated with urban runoff, a three level definition of the "problem." (EPA, 1983)

1. Impairment or denial of beneficial uses;
2. Water quality criterion violation; and,
3. Local public perception.

Utilizing this framework as a point of departure, the following discussion is intended to restate certain of the data presented at the work sessions in a context that will facilitate the decision making process.

Detailed technical studies of the portion of the Edwards Aquifer in the vicinity of Austin have been undertaken by the Texas Department of Water Resources, (Brune, 1983) and currently by the USGS. The Final Report on the South Austin metropolitan Area of the Edwards Aquifer, prepared by ERM, (City of Austin, 1983) extensively described the physical setting of the Aquifer and outlined the perceived problems, goals, and past, present and future strategies for its protection. This information notwithstanding, there is still considerable debate in the engineering, business and general community of what value the resource known as the Edwards Aquifer represents for the Central Texas community. However, it can be convincingly argued that impairment or denial of Barton Springs for contact recreation and/or impairment or denial of existing production of ground water for domestic, municipal, industrial or irrigational uses would constitute a "problem" in all three categories.

Aquifer Depletion Issue

The contention that the proposed density controls would "necessitate" a proliferation of independently owned wells with the result of drying up Barton Springs in only valid in lieu of adopting a management scheme. Based on TDWR data, a total of 3,800 acre-feet (ac-ft) were pumped out of the Edwards Aquifer during 1982. (Brune, 1983) The Edwards Aquifer does not exist in the "contributing zone" area (264 mi^2) upstream of the recharge zone. Based on the TDWR analysis of the all time minimum discharge from the aquifer 10,000 acre-feet per year (avg. 8.93 MGD) is available, as a sustained yield (all discharges, including Barton Springs) of the Aquifer. (Brune, 1983)

If it is assumed that at the end of the critical drought period it is acceptable to experience a cessation of flow at Barton Springs then: 10,000 ac-ft - 3,800 ac-ft = 6,200 ac-ft still available for pumping on an annual basis.

In the process of designing water supply (surface water) reservoirs various impoundment sizes are considered, each with a cost of construction and maintenance, in order to provide an associated yield based on the critical drought period. For the case of the Edwards Aquifer, the reservoir is already "built." In order to avoid impairment or denial of the resource, pumping must be managed so as to provide for its sustained utility, and water conservation must be instituted during drought periods. The 6,200 acre feet per year still available is approximate. Complete analysis of all the flow duration data at Barton Springs and critical drought periods (water use may double during a drought) is necessary and possible. Then a management plan could be instituted so as to achieve this goal of sustained utility.

Barton Springs as Water Supply Issue

The other "quantity" issue addressed at the work sessions was in regard to the percent of the City of Austin water supply Barton Springs may represent. The yearly average flow through Town Lake is approximately 1,800 cubic feet per second (cfs) and the yearly average flow at Barton Springs is approximately 50 cfs (Slade, 1980-1984). Closer inspection reveals that the large yearly average flow on the Colorado River is due to biasing caused by the large summer releases from Lake Travis. During water year 1981 for the months of October through March the monthly average maximum and minimum flows were 2,487 cfs and 71 cfs respectively, and for April through September, the monthly average maximum and minimum flows respectively were 7,757 cfs and 1,277 cfs (Slade, 1981). A casual review of records of recent years will confirm that 1981 (a "wet" year) reflects the typical seasonal changes in average monthly flowrates. There were 31 days that the flow was less than 100 cfs, during which time Barton Springs averaged 50 cfs. Thus the flow from Barton Springs can constitute a significant portion of the water available in Town Lake to the Green Water Treatment Plant. This data is supported by measured increases in the total dissolved solids concentration of the influent to the Green WTP, which is indicative of ground water (i.e., Edwards water via Barton Springs) (Engineering Science, 1982). Thus, significant changes in the availability of water from Barton Springs could cause impairment of the utility of the Green WTP at certain times of the year, possibly requiring increased releases from Lake Travis, constituting a Category II problem.

Issue of On-Site Sewage Disposals Versus Centralized Sewage Collection Systems

One of the most common fears concerning the Edwards Aquifer is that it will be contaminated by the on-site disposal systems dictated by the economics of low density development. On the other hand, centralized sewage collection systems which can only be economically justified in areas of high density development, have significant exfiltration problems. The predicted contaminent loading due to exfiltration from a central sewage collection system for a 3.0 unit per acre development would be significantly less in BOD and nitrate-nitrogen, but slightly more for coliform bacteria when compared to 0.3 unit per acre development with on-site systems (Espey, 1980). However the high density development will have significantly higher storm runoff loading (Espey, 1980).

Water Quality Issue

The use of Barton Springs for recreation is currently denied after periods of significant recharge due to elevated bacteria counts. This has occurred approximately 25 times a year for the past two years, resulting in closing the pool 50 days each year. Based on USGS data, 12 of 38 wells tested had coliform bacteria counts in excess of 200 colonies per 100 ml. (Slade, 1984). A survey of TDWR data shows several wells with nitrate-nitrogen in excess of the EPA standard of 10 mg. per liter (Brune, 1983).

Thus, there is evidence of a "problem" as defined in the second level of NURP's framework. Note that the water quality at Barton Springs and five test well sites (Slade, 1984) is typically very acceptable as evidenced by the concentrations of dissolved major and minor elements. Dissolved solids, chloride, sulfate, arsenic, barium, cadmium, chromium, copper, iron, lead, manganese, mercury, selenium, silver and zinc and total nitrate nitrogen were less than the maximum contaminant levels or secondary maximum contaminant levels set for public water systems by the U.S. EPA. However, review of 1982 USGS water quality data for Barton Springs shows that the densities of fecal coliform and fecal streptococcal bacteria, specific conductance, and concentration of total nitrate nitrogen varied in response to changes in the quantity of recharge to the Aquifer (Slade, 1984).

In the NURP Final Report (EPA, 1983) it was concluded that pollutant constituents of urban runoff such as heavy metals and coliform bacteria typically exceed EPA water quality criteria and drinking water standards. In some cases, organic priority pollutants also were found to exceed these EPA standards. Unfortunately a ground water aquifer like the Edwards was not studied in the NURP, however the NURP studies do indicate that where water supply intakes are in close proximity to urban stormwater discharges, a serious potential for adverse impacts exists. Because of the rapid movement of water in the Edwards this latter case may exist especially when wells are located in the recharge zone.

Certain basic findings can be made concerning the impervious cover vs. density issue. However, existing data is very difficult to interpret. It defies standard statistical verification, most likely due to a host of unaccounted for variables such as antecedent conditions, rainfall intensity, soil type, slopes, time of year etc.

John Mancini, one of the EPA consultants on the NURP study, stated at the work session that "you would not be able to distinguish a measurable difference in the concentration of pollutants from one quarter acre housing sites, this is residential now, to three acre housing sites." (City of Austin, 1984) Hidden in this statement is that the ¼ acre housing can have a greater amount of pollutants (loading) and greater runoff volume, so the concentrations may not be greater, but certainly the total pollutant loading can be.

Depending on the natural soils and slopes, impervious cover may increase the volume of runoff for a particular rainfall mildly or drastically. However, impervious cover can certainly be an indicator of land use, from which pollutant loading can be predicted. It should be pointed out that the information presented by John Mancini was very carefully qualified by his statement "Nature hasn't read the same text books that we have and therefore, we see a lot of variation at the end of the pipe and we can dream up all sorts of possible causes, but invariably when you try to go after those individual causes, you can't sort them out." (City of Austin, 1984) In other words there is limited validity in transfer of data from site to site, but certain general conclusions about the effects of urbanization can be drawn. In general increased land use will result in increased local pollutant deposition, and the extent to which the effluent quality and quantity change is dependent on a host of site specific factors (as mentioned before) (Kibler, 1982). These factors can and must be analyzed.

It has been noted, by review of USGS data, though not statistically verified, that water quality at the USGS gage on Barton Creek and Highway 360 as well as the USGS gage on Williamson Creek near Oakhill, has been degrading, even since the special watershed ordinances have been in effect (Slade, 1980-1984). Certainly this may be due to some developments that were "grandfathered" i.e. approved prior to adoptions of the ordinances.

Many claims have been made for the high efficiencies of the water quality sedimentation/filtration ponds currently in use. In all cases, literature data has been quoted. The Final NURP study has a list of basins whose removal efficiencies vary. For example removal of total suspended solids varies from zero to 91% (EPA, 1983). The NURP study conclusions were that "wet ponds" (so called because they retain a permanent pool) are very efficient for removal of most pollutant constituents and that other "dry" ponds (typically used in Austin) may not be (EPA, 1983). Actually ponds such as the ones at Barton Square Mall are a developing technology based upon water treatment plant experience, and little is known about their performance under conditions in Austin. Another finding in the NURP study was that grass lined swales can be effective but due to poor design, typically were not (EPA, 1983).

Service Area Issue

The area of the Edwards Aquifer relevant to Barton Springs near Austin is approximately 155 sq. mi. of which 90 sq. mi. is considered to be the recharge zone. It is estimated that the drainage area contributing to the recharge zone is 264 sq. mi. It should be noted that, based on the 1982 Austin 5 mile ETJ, that the Non-Barton Creek Watershed within the ETJ contributing to the

recharge zone is approximately 19 sq. mi. The Non-Barton Creek Watershed within the ETJ in the recharge zone is 36 sq. mi. The data presented at the work sessions assumed City jurisdiction over the whole recharge zone (90 sq. mi.). With 20% in the Barton Creek Watershed and 20% already developed, this leaves approximately 58 sq. mi. for potential City of Austin controlled future development. However assuming that 20% of the 36 sq. mi. over which the City has jurisdiction, is developed, leaves 29 sq. mi. for potential City of Austin controlled future development, or one half of the value presented to Council. Certainly the ETJ may grow, however, the area affected by interim, stringent management, in the Williamson Creek and Lower Creek watersheds will not be as large as outlined in the work sessions.

The City of Austin stormwater monitoring program will help to solve some of the data problems and gaps. However, for the next two years we will not have a sufficient data base necessary to make important management decisions concerning controlling quality problems in the Edwards.

"There remains the overriding, inescapable truth--often cited as compelling excuse for inaction--that long-term records of scientific data do not exist to link urban runoff quality incontrovertibly to downstream damages to receiving water users, or to demonstrate that measures to abate pollution actually will cause improved water quality and improved utility or safety for subsequent beneficial users." (Sonnon, 1983)

Most of the area under scrutiny is in Area V of the Austin Comprehensive Plan. It is therefore an area that can reasonably be regarded as subject to very specific management practices.

ATTACHMENT #5

R E S O L U T I O N

SUBJECT: Creation of an Underground Water Conservation District for the Barton Springs-Associated Edwards Aquifer

WHEREAS, the municipalities of Mountain City, Buda, Hays, San Leanna, Sunset Valley overlie the Barton Springs-Associated Edwards Aquifer, an underground reservoir that provides all of the drinking water supply for these municipalities; and

WHEREAS, the City of Austin partially overlies the Barton Springs-Associated Edwards Aquifer and relies upon the aquifer to sustain the flow of Barton Springs, which in turn contributes to the City's drinking water supply and provides an invaluable resource for water-oriented recreation; and

WHEREAS, the development of land overlying and adjacent to the Barton Springs-Associated Edwards Aquifer is occuring at unprecedented rates and may result in withdrawals that exceed the safe yield of the reservoir; and

WHEREAS, the Barton Springs-Associated Edwards Aquifer is a very finite water resource and is subject to over pumpage unless a comprehensive management program providing for water conservation, regulation of pumpage from wells and prevention of waste and pollution is initiated; and

WHEREAS, the enabling authority for comprehensive management of the Aquifer presently exists under Chapter 52 of the Texas Water Code; and

WHEREAS, the Small Cities Council, an ad hoc association of city officials from the smaller cities overlying the

Edwards Aquifer, has worked diligently for two years to foster comprehensive management of the Barton Springs-Associated Edwards Aquifer to protect drinking water supplies as growth continues in the area; and

WHEREAS, the City Council of the City of Austin has demonstrated a sincere interest in working with the Small Cities Council towards the creation of an underground water conservation district for the Barton Springs-Associated Edwards Aquifer;

BE IT RESOLVED, THAT the municipalities of Austin, Buda, Hays, Mountain City, San Leanna, and Sunset Valley hereby express their united support for the creation of an Underground Water Conservation District under the authorities of Chapter 52 of the Texas Water Code, such district to be specifically charged with the conservation, protection and sustainable use of the Barton Springs-Associated Edwards Aquifer.

BE IT FURTHER RESOLVED, THAT the above referenced municipalities respectfully request that the Texas Water Commission act as expeditiously as possible to designate the boundaries of the Barton Springs-Associated Edwards Aquifer and authorize an election to be held for the creation of such Underground Water Conservation District.

CITY OF MOUNTAIN CITY

_____

Beth Smith, Mayor

ATTEST:

_____

CITY OF BUDA

Peter Stone, Mayor

ATTEST:

CITY OF HAYS

Lamont Ramage, Mayor

ATTEST:

VILLAGE OF SAN LEANNA

Roy Kidd, Mayor

ATTEST:

CITY OF SUNSET VALLEY

Larry Hada, Mayor

ATTEST:

CITY OF AUSTIN

Frank Cooksey, Mayor

ATTEST:

ADOPTED: August 1, 1985

James E. Aldridge
City Clerk

Attachment #6

R E S O L U T I O N

WHEREAS, the County of Travis in the State of Texas, overlies the Barton Springs-Associated Edwards Aquifer, an underground reservoir that provides a drinking water supply for the municipalities of Austin, Sunset Valley, San Leanna, and Creedmoor as well as numerous other entities and households in Travis County; and

WHEREAS, the Barton Springs-Associated Edwards Aquifer provides a sustainable flow to Barton Springs, which provides for the citizens of Travis County an invaluable resource for water-oriented recreation; and

WHEREAS, the development of land overlying and adjacent to the Barton Springs-Associated Edwards Aquifer is occurring at unprecedented rates and may result in withdrawals that exceed the safe yield of the reservoir; and

WHEREAS, the Barton Springs-Associated Edwards Aquifer is a very finite water resource and is subject to over pumpage unless a comprehensive management program providing for water conservation, regulation of pumpage from wells and prevention of waste and pollution is initiated; and

WHEREAS, the enabling authority for comprehensive management of the Aquifer presently exists under Chapter 52 of the Texas Water Code; Therefore be it

RESOLVED, that the Commissioners Court of Travis County, Texas hereby expresses support for the creation of an Underground Water Conservation District under the authorities of Chapter 52 of the Texas Water Code, such district to be specifically charged with the conservation, protection and sustainable use of the Barton Springs-Associated Edwards Aquifer; and be it further

RESOLVED, that the Commissioners Court of Travis County respectfully requests that the Texas Water Commission act

THE STATE OF TEXAS X

COUNTY OF TRAVIS X

I, DORIS SHROPSHIRE, County Clerk and Ex-Officio Clerk of the Commissioners' Court of Travis County, Texas, do hereby certify that the foregoing pages contain a true and correct copy of the following:

RESOLUTION signed and approved on the 17th day of December, 1985 by the Travis County Commissioners' Court and pertaining to the Barton Springs-Associated Edwards Aquifer.

as the same appears on file in my office and of record in Minutes of the Commissioners' Court of Travis County, Texas.

Witness my hand and seal of said Court on this the 24th day of January, 19 86.

DORIS SHROPSHIRE
County Clerk and Ex-Officio
Clerk of the Commissioners'
Court of Travis County, Texas

(SEAL)

By E. Wall Deputy
E. Wall

Attachment #7

November 24, 1985

Honorable Representative Ann Cooper
Texas House of Representatives
P. O. Box 2910
Austin, TX 78769

Dear Ann:

On behalf of the Aquifer Cities Council, I am writing to inform you of the status of the proposed Barton Springs-Edwards Aquifer Conservation District and seek your assistance in the scheduling of hearings before the Texas Water Commission.

In early November the U.S. Geological Survey report titled, "Delineation of the Outcrop of the Edwards Aquifer Hydrologically Associated Wtih Barton Springs in the Austin Area, Texas," was publicly released. This report and map was used by the Texas Water Development Board to prepare their report on the boundaries of the Edwards Aquifer, in accordance with Chapter 52 of the Texas Water Code. The Water Development Board report was then submitted to the Texas Water Commission last week. In this week, the Water Commission staff will review and comment on the report and make their recommendations to the Commission on the scheduling of two public hearings, one on boundaries and one on creation of the district.

The staff of both water agencies have worked very hard and expeditiously to bring the information to the Commission for final review and public input. We are in full support of their findings thus far. The critical concern now is the timing and nature of the public hearings which will be scheduled in the near future.

In the next few days, the Water Commission will be deciding on three major considerations. One is the timing of the hearings. Of course, we are hoping that they will schedule hearings at the earliest possible date. Indeed, we are no longer able to plan for the January date for the confirmation election and are very concerned that we make the April 5 election date.

The second consideration is the fact that two hearings must be held, one on aquifer boundaries and the other on district creation. Given the interrelatedness of these two hearings, it would seem that all interested parties would appreciate the scheduling of both hearings on the same day. We feel that scheduling the hearings on the same day will significantly improve the opportunity for public input as well as expedite the timing of the confirmation election.

The third and most important consideration is whether the Commission itself will conduct the hearings, or whether the Commissioners will refer the matter to a hearing examiner. If it is referred to an examiner, the Commission staff and we have determined that it will not be possible to schedule the confirmation election until the summer of 1986. Of course, should the recommended boundaries of the aquifer be contested by several landowners who are represented by legal counsel, which we hope will not occur, then the Commissioners would have to refer the matter to an examiner.

On the other hand, there are several reasons why the Commissioners might prefer to hold the hearings themselves. First, this is the first groundwater district proposed under the 1985 revisions to the Water Code (H. B. 2), and is a superb example of an aquifer with concise boundaries and essential need for management under a conservation district. We feel that the experience to be gained by these hearings and the public exposure of the revised Water Code at work would be very beneficial for other groundwater-dependent citizens in the State, as well as the Water Commission and the Legislature. Also, the Commission routinely holds hearings themselves on creation of other types of water districts, such as WCIDs and MUDs. Yet another reason for the Commission to hold the hearings is the fact that the Commission's decision is only an enabling one -- the voting public within the district boundaries will still have the chance to express their vote on the benefits and need for the district. In the case of other water districts such as WCIDs and MUDs, the Commission's decision is more significant because the confirmation election is often a perfunctory step in the process.

We respectfully ask you to continue working with us and the Water Commission as we proceed through the administrative procedures of district creation. Your timely assistance in addressing the three matters described above would be appreciated by all the city councils of the cities within the proposed district. (Incidently, the City of Dripping Springs has recently become a "dues paying" participant in the Aquifer Cities Council.) Thank you in advance for your assistance.

Sincerely,

Kent

Kent S. Butler, Ph.D.
Aquifer Cities Council

ATTACHMENT #8

COOPERATIVE AGREEMENT

between the

City of Austin
City of Buda
City of Hays
Village of San Leanna
City of Sunset Valley
and Kent S. Butler, Ph.D.

to contract for professional services
for creation of an Underground Water Conservation District for the Barton Springs-Associated Edwards Aquifer, Hays and Travis Counties, Texas

---

IT IS UNDERSTOOD by all the referenced municipalities (hereafter called Municipalities) which are a party to this Agreement that each Municipality shall actively participate in and commit the necessary resources for a joint planning program (hereafter called Program) for the long-range, sustained utilization of that unit of the Edwards Aquifer (hereafter called Aquifer) associated with Barton Springs and located in northern Hays and southern Travis Counties, Texas.

The Municipalities shall contract with Dr. Kent S. Butler for professional planning services and Dr. Butler, in turn, shall contract with Bickerstaff, Heath and Smiley, Attorneys at Law, for legal services. The planning and legal consultants shall be responsible for the following services: (1) coordination of the Program, which should result in an election to create an Underground Water Conservation District, under the authorities of Chapter 52 of the Texas Water Code, as amended; (2) preparation and submittal of periodic reports to, and organization of monthly meetings with, the Municipalities in furtherance of the Program; (3) representation and presentation of information on behalf of the Municipalities in meetings with officials of local, state, and federal units of government and representatives of various organizations, in furtherance of the Program; (4) service as duly authorized attorney for the Municipalities for purposes of submittal of petitions, presentation of testimony and conducting all other necessary services leading to the scheduling of an election to create an Underground Water Conservation District for the Aquifer. It is understood that Dr. Butler and Bickerstaff, Heath and Smiley will represent a single position on behalf of all Municipalities and not represent individual positions of particular cities in their performance under this contract. It further is understood that Dr. Butler will serve as coordinator for the Program and in such capacity will supervise the services provided by Bickerstaff, Heath and Smiley.

Dr. Butler shall be compensated on a time and materials basis at a rate of $65.00 per hour, such billable time not to exceed fifty-two (52) hours per month, and shall be compensated separately for other direct out-of-pocket expenses at the actual amounts incurred. Bickerstaff, Heath and Smiley shall be compensated in accordance with a

contract between Dr. Butler and Bickerstaff, Heath and Smiley, a copy of which is attached hereto and incorporated herein for all purposes. The billable time and expenses for Bickerstaff, Heath and Smiley shall not exceed ten thousand dollars ($10,000.00) without prior written authorization from the Municipalities. Billings will be submitted at the end of each month for the work performed that month and payment will be due within fifteen (15) days of billing.

The effective commencement date of this Agreement shall be July 15, 1985 and the Agreement shall automatically terminate on or before January 31, 1986, unless the duration of the Program is modified in accordance with the terms specified below.

The City of Buda shall serve as Trustee for the purposes of receiving periodic payments from the Municipalities and making periodic payments to Dr. Butler. The Municipalities shall make regular monthly payments to the City of Buda in the amounts specified below, such payments to be made on or before the 5th day of each month, beginning August 1, 1985 and ending January 31, 1986. The first monthly payment by each Municipality shall include a prorated payment for the one-half month period from July 16 to July 31, 1985. After the Agreement has terminated, the City of Buda shall make a report of receipts and payments and submit the report to the Municipalities.

The regular monthly payment to be paid by each Municipality shall be as follows:

SCHEDULE OF MONTHLY PAYMENTS

Austin	$5,000.00
Buda	846.00
Hays	232.00
San Leanna	232.00
Sunset Valley	370.00
Total	$6,680.00 per month

The Municipalities may expand, reduce, or otherwise modify the scope of work or duration of this Program. Dr. Butler may also request a modification of the scope of work or duration of this Program. In any such case, Dr. Butler shall submit an estimate of the additional cost, if any, that would be incurred because of the modification and shall obtain prior written authorization from the Municipalities to proceed on a time and materials basis. The total budget for this Agreement shall not exceed $43,420.00 without prior written authorization from the Municipalities.

A preliminary timetable for the Program is included as "Appendix A" to this Agreement. Dr. Butler will provide monthly status reports on the progress of the Program to the Municipalities. Any party to this Agreement may terminate upon thirty (30) days notice in writing to other parties. Such termination shall not impair the validity of the Agreement for the remaining parties.

The original Agreement may be executed by the participating cities on multiple copies.

ACCEPTED AND AGREED TO:

Party: City of Austin

By: _____ Date signed: _____
Title:

Party: City of Buda

By: _____ Date signed: _____
Title:

Party: City of Hays

By: _____ Date signed: _____
Title:

Party: Village of San Leanna

By: _____ Date signed: _____
Title:

Party: City of Sunset Valley

By: _____ Date signed: _____
Title:

Party: Kent S. Butler, Ph.D.

By: Kent S. Butler Date signed: August 6, 1985
Title: Consulting Planner

BICKERSTAFF, HEATH & SMILEY

400 WEST 15TH STREET, UNITED BANK TOWER, SUITE 1419, AUSTIN, TEXAS 78701-1648

(512) 472-8021
TELECOPY NO 472-0830

STEVE BICKERSTAFF
C ROBERT HEATH
MARTHA E. SMILEY
THOMAS M. POLLAN
ANN CLARKE SNELL
ANDREW KEVER
CAROLYN E. SHELLMAN
DOUGLAS G. CAROOM
LINDA AAKER
JIMMY ALAN HALL
SUSAN C. GENTZ
ROBIN A. CASEY
ELSE BARLEY-GRAHAM
KATIE BOND
CAROLINE SCOTT
MANUEL O. MÉNDEZ

July 8, 1985

Dr. Kent Butler
1703 Meadowbrook Drive
Austin, Texas 78703

RE: Barton Springs/Edwards Underground District

Dear Kent:

This letter will confirm our prior agreement that the firm of Bickerstaff, Heath & Smiley will represent the small cities council and the City of Austin in connection with efforts to form a Chapter 52 Underground Water Conservation District for the Barton Springs Associated Edwards Aquifer.

The small cities council consists of Buda, San Leanna, Hays, and Sunset Valley. Additionally, the City of Austin will participate in and support the efforts of the council to form the Barton Springs/Edwards Underground District. This firm will serve as legal counsel and representative of these municipalities in this undertaking. To allow for better coordination and efficiency our services will be set up as a subcontract of your contract for professional services with the cities. Execution of your contract by the cities will constitute authority for this firm to represent the cities in this matter. We, of course, will be bound by the maximum billing and notification provisions provided by your contract with the cities.

I will be the attorney in charge of the case and will probably be assisted by Jimmy Alan Hall and Caroline Scott. Should you need information when I am not available, Mr. Hall or Ms. Scott should be familiar with the subject and be able to assist you.

At the present time, we have adopted the following fee structure for those legal services which are contemplated by this agreement:

(1) My time will be billed at $100.00 per hour. The time of other associates will be billed at $65.00-80.00 per hour;

(2) the time of briefing clerks will be billed at $35.00 per hour;

(3) the time of paralegals will be billed at $35.

In addition, we will submit all out-of-pocket expenses incurred for reimbursement.

We try to have a statement in the mail by the 20th of each month and anticipate being paid within 30 days of receipt.

The fee structure set out above was established in January, 1985. It is the policy of our firm to adjust fees in January of each year to reflect current economic conditions. We will notify you in writing if the fee structure stated above is modified in any successive January.

If this arrangement is acceptable to you, please sign the duplicate original provided herein, and return it to us for our records. We look forward to working with you.

Very truly yours,

Douglas G. Caroom

DGC:bas

APPROVED:

_____

Mr. Kent Butler

APPENDIX "A"

Preliminary Timetable

July 15 — Commencement of Cooperative Agreement

August 5 — Monthly meeting and progress report

August 30 — Submittal of petition for district creation

September 9 — Monthly meeting and progress report

September 15 — Texas Water Commission hearing on reservoir boundary designation

October 7 — Monthly meeting and progress report

November 4 — Monthly meeting and progress report

November 15 — Texas Water Commission hearing on district creation

December 2 — Monthly meeting and progress report

January 18 — Confirmation election on district creation

ATTACHMENT #9

ATTACHMENT 9

BICKERSTAFF, HEATH & SMILEY
400 WEST 15TH STREET, UNITED BANK TOWER, SUITE 1418, AUSTIN, TEXAS 78701-1646

(512) 472-8021
TELECOPY NO 472-0830

STEVE BICKERSTAFF
C. ROBERT HEATH
MARTHA E. SMILEY
THOMAS M. POLLAN
ANN CLARKE SNELL
ANDREW KEVER
CAROLYN E. SHELLMAN
DOUGLAS G. CAROOM
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JIMMY ALAN HALL
SUSAN C. GENTZ
ROBIN A. CASEY
ELSE BAILEY-GRAHAM
KATIE BOND
CAROLINE SCOTT
MANUEL O. MÉNDEZ
CHRISTA L. BROWN

September 25, 1985

Dr. Kent Butler
1703 Meadowbrook Drive
Austin, Texas 78703

RE: Barton Springs/Edwards Underground District

Dear Kent:

This letter will constitute an amendment to our letter contract of July 8, 1985, which I have drawn to reflect our discussion and agreement of September 13, 1985. Because of the limited funds available under your existing contract with the client cities, and the necessity that such funds be adequate to cover both anticipated consulting fees and legal fees, we have agreed to impose a limitation upon the legal services which will be rendered and billed under the July 8, 1985, contract.

Without prior notice and your approval, the firm will not perform legal services in connection with the effort to form a Chapter 52 underground water conservation district which would cause the total amount billed for legal services rendered by the firm to exceed $20,580. Neither of us anticipates that the above stated amount will necessarily be adequate to handle all legal services required if the matter is contested to a significant degree. We anticipate, however, that if proceedings are uncontested this should be adequate to get us through the stage of creation of a district by the Texas Water Commission and appointment of the district's temporary board.

Should a contest develop at the administrative level, or it become apparent for any other reason that the above stated level of funding will not be adequate to perform the required legal services, I will notify you in writing of this fact and make every effort to provide as much advance notice as possible.

Other terms and conditions specified by our letter agreement of July 8 remain unchanged. If the foregoing terms properly reflect your understanding of our agreement, as amended, please sign below and return the duplicate original copy of this document to me.

Thank you for your attention to this matter. I look forward to continuing to work with you on the district's formation.

Sincerely,

Douglas G. Caroom

DGC:bas

Kent Butler

ATTACHMENT #10

IN THE MATTER OF THE PETITION FOR CREATION OF THE BARTON SPRINGS-EDWARDS AQUIFER CONSERVATION DISTRICT	$ $ $ $	BEFORE THE TEXAS WATER COMMISSION

APPLICANTS' WRITTEN ARGUMENT

BICKERSTAFF, HEATH & SMILEY
United Bank Tower, Suite 1419
400 West 15th Street
Austin, Texas 78701
(512) 472-8021

DOUGLAS G. CAROOM
State Bar No. 03832700

ATTORNEY FOR APPLICANTS

DATED: May 6, 1986

IN THE MATTER OF THE PETITION FOR CREATION OF THE BARTON SPRINGS-EDWARDS AQUIFER CONSERVATION DISTRICT	$ $ $ $	BEFORE THE TEXAS WATER COMMISSION

APPLICANTS' WRITTEN ARGUMENT

I.

INTRODUCTION AND SUMMARY OF PRIOR PROCEEDINGS

On August 30, 1985, the Applicant Cities (Austin, Buda, Hays, San Leanna, and Sunset Valley) filed a petition for designation of an underground reservoir and creation of an underground water conservation for the Barton Springs Associated Edwards Aquifer (Exhibit 22).[1]

Along with the petition, appropriate filing fees were submitted. The Applicants' August 30, 1985, letter and petition were determined to be sufficient by the Executive-Director of the Texas Water Commission on September 12, 1985 (Exhibit 24), at which time the Commission requested the technical support of the Texas Water Development Board with regard to reservoir boundary delineation.[2]

---

[1]Exhibit 23 is a certification by the Travis County Tax Assessor that at least 50 of the signatures attached to that certificate are property owners listed on the tax rolls of Travis County, Texas. The signatures attached to the Assessor-Collector's affidavit in Exhibit 23 are on pages containing signatures of Travis County residents, showing 191 of the total 267 signatures submitted on August 30.

[2]Between the August 30, 1985, submission of the petition to the Texas Department of Water Resources and September 12 action of the Executive Director, the agency was reorganized into the Texas Water Commission and Texas Water Development Board.

On November 19, 1985, the Texas Water Development Board transmitted to the Texas Water Commission the information requested concerning delineation of boundaries of the Barton Springs subdivision of the Edwards Aquifer (Exhibits 6 and 7). The proposed boundaries of the Aquifer submitted for Commission consideration by the Water Development Board are shown on Exhibit 7. Following submission of reservoir geohydrologic boundaries by the Water Development Board to the Commission, the Applicants developed proposed management area boundaries on December 10, 1985, (Exhibit 32), which were subsequently amended by the Applicants on December 20, 1985, (Exhibit 33).[3]

The management area boundaries submitted by the Applicants generally represented the underground reservoir boundaries suggested by the Water Development Board, depicted in terms of streets, property boundaries, water courses, and boundaries of preexisting governmental entities. In addition to the area overlying the underground reservoir, the Applicants' proposed management area boundary included a "recharge reservoir area" on Onion Creek just upstream of the outcrop of the Edwards limestone in Hays County. The boundaries proposed by the Applicants' December 20 letter were incorporated into the Commission's notice of hearing and published according to statutory requirements (Exhibits 1 and 2). Additionally, notice was

---

[3]As has been discussed, at considerable length, in the Applicants' brief on the nature of the hearing, the applicable statutory provisions in Chapter 52, Texas Water Code, were modified during this time period due to voter approval of the constitutional water bond package, giving effect to the House Bill 2 amendments to Chapter 52. This allowed the submission of management area boundaries.

posted in Hays and Travis Counties in accordance with the requirements of Chapter 51, Texas Water Code (Exhibits 3 and 4).

On January 27, 1986, a hearing was convened by the Texas Water Commission to consider designation of management area boundaries for the Aquifer and creation of the proposed underground district. At that hearing, the Commission took jurisdiction over the matter, received public comment, and designated parties. Favorable public comments on district designation were received from all affected state senators, representatives and county commissioners courts, as well as numerous neighborhood and environmental groups. Adverse comments on district designation and creation were received from some property owners and developers. Parties designated at the January 27 hearing by the Commission included: the Applicants, the Rutherfords, Nash Phillips-Copus, Bill Milburn, Randy Morine Developments, Creedmoor-Maha and Goforth Water Supply Corporations, Justice Bob Shannon, et al., Gary Bradley, as well as the Public Interest Advocate and the Executive Director. The hearing was continued and scheduled before an examiner on February 19, 1986.

At the February 19 hearing, the Examiner considered prehearing briefs on the nature of the hearing, various motions to dismiss and motions for continuance, as well as motions for discovery. The Examiner ruled that a consolidated hearing was appropriate for designation and creation hearings, overruled motions to dismiss and granted motions for discovery and motions for continuance. Additionally, Plum Valley Joint Venture, and the Zimmerman brothers were admitted as parties to the proceeding.

Following February 19, the parties proceeded with discovery which included voluminous documentary production, a 3-day deposition of Raymond Slade (a U.S.G.S. geohydrologist who authored Exhibit 14), an 8-day deposition of Dr. Kent Butler, and a deposition of Mr. Josh Farley (a City of Austin employee responsible for population growth projections relied upon in Exhibit 14). Additionally, various parties proposed the adoption of rules pertaining to creation of underground districts to the Texas Water Commission, and on March 11, 1986, the Commission adopted such rules on an emergency basis. The Commission's rules provided for a bifurcated hearing on boundary designation and creation of the district. Following adoption of rules by the Commission, hearing on the merits on the designation of management area boundaries was scheduled for April 7, 1986. Discovery continued during the interim, as did settlement negotiations with property owners (Zimmerman and Shannon, et al.) in the recharge reservoir area.

An agreement between the Applicants and owners of property in the recharge reservoir area was reached and presented to the Commission on April 2, 1986. Following objections by the other parties to the proceeding, the Commission deferred its consideration of entry of an agreed order reflecting that settlement until April 7. On that date the Commission considered statements by the parties and determined to enter the agreed order, which was subsequently executed April 9.[4] Motions for rehearing on the agreed order adopted by the Commission are currently pending. The significance of the

[4]The agreed order is Exhibit 11; the settlement agreement is Exhibit 34.

Commission's order for purposes of the remainder of the hearing is, at best, uncertain. No evidence was offered by any of the parties with regard to the proposed recharge reservoir project. Any action to exclude the disputed area from the management area would not require that additional notice be given to property owners to continue the hearing. Consequently, the agreed order had no effect upon this hearing.

Additional parties designated prior to convening evidentiary hearings included Protestant Negley/Mackey and the Lower Colorado River Authority as an Intervenor in favor of the application.

In the following written argument, Applicants will discuss (a) legal standards applicable to designation of management area boundaries, (b) the evidence in support of management area boundaries proposed by the Applicants, (c) the positions taken by each of the opponents to the district, including alternate boundaries which may have been proposed by opponents, and (d) the evidence favoring or rebutting the opponents' positions.

The Applicants believe that an objective analysis of the evidence presented in the course of the two-week hearing not only supports, but compels approval of the management area boundaries proposed by the Applicants. Because the nature and extent of the Barton Springs segment of the Edwards Aquifer is thoroughly studied and well understood, and because the Applicants conservatively and objectively attempted to apply the standards of Chapter 52 to that existing body of knowledge in their development of the proposed management area boundaries, very little of substance remains to contest with regard

to the boundary designation. The opponents' objections to the Applicants' proposed boundaries can be generally characterized as either (a) objections to the statutory standards with which the Applicants were attempting to comply, or (b) "nit-picking" concerning the manner in which the Applicants complied with those standards. Neither sort of objection, in the Applicants' view, is particularly meritorious.

II.

THE APPLICABLE LEGAL STANDARDS FOR DESIGNATION OF MANAGEMENT AREA BOUNDARIES

Texas Water Code §52.024 provides the legislatively established standards applicable to designation of management areas. In pertinent part §52.024(a) provides:

> Each management area shall be designated with the objective of providing the most suitable area for the management of the underground water resources of the part of the state in which the district is to be located. To the extent feasible, the management area shall coincide with the boundaries of an underground water reservoir or a subdivision of an underground water reservoir. However, the commission also may consider other factors, including the boundaries of political subdivisions. The size and configuration of a management area shall be appropriate for the performance of the duties provided by Subchapter E of this chapter. (Emphasis added).

Three general guidelines concerning designation of management area boundaries are provided by subsection (a): (1) they should be suitable for management of the underground water resources; (2) they should coincide with the boundaries of an underground water reservoir or subdivision to the extent feasible; and (3) they should be appropriate for performance of the district's duties.

By reference, §52.024 brings into play two additional definitions. The definitions of "underground water reservoir" and "subdivision of an underground water reservoir" are provided by §52.001(5) and (6), respectively, as follows:

> (5) "Underground water reservoir" means a specific subsurface water-bearing reservoir having ascertainable boundaries and containing underground water that can be produced from a well at a rate of 25,000 gallons or more a day.
>
> (6) "Subdivision of an underground water reservoir" means a reasonably definable part of an underground water reservoir in which the underground water supply will not be unreasonably affected by withdrawing water from any part of the reservoir, as indicated by known geological and hydrological conditions and relationships and on foreseeable economic development at the time the subdivision is designated or altered.

Texas Water Commission Rule §293.22, essentially, restates the statutory requirements of Texas Water Code §52.024(a).

Besides the guidelines provided by subsection (a) of §52.024, subsection (c) provides the additional guidance that management area boundaries may be modified by the Commission either due to future conditions or new factual data. Moreover, §52.025 provides additional indirect guidance by indicating that the issues of feasibility, practicability, and benefit to the land in the district are involved during the second phase of hearings, when the Commission considers the management area that has been designated and determines whether to create a district for that area.

From these provisions, the following legal standards, applicable to our proceeding, may be developed:

(1) There must be an underground reservoir

(a) having ascertainable boundaries, and

(b) containing groundwater capable of production at 25,000 gpd or more.

(2) If less than the entire Aquifer is involved, there must be a subdivision of the Aquifer, which is

(a) a reasonably defineable portion of the reservoir,

(b) in which water supplies will not be unreasonably affected by withdrawals from other portions of the reservoir,

(c) "reasonability" of affect may be determined by existing geologic and hydrologic conditions, and by currently foreseeable economic development.

(3) The management area should conform to the reservoir subdivision to the extent feasible, with departures being permitted

(a) to include an area suitable for management of groundwater resources, or

(b) to obtain boundaries more appropriate for performance of the district's duties.

(4) Perfect foresight is not required in designation of reservoir subdivisions; they may be subsequently redefined if necessary.

(5) The question of benefit to the land from inclusion in the management area is of secondary importance to the management area delineation process.

III.

EVIDENCE SUPPORTING DESIGNATION OF THE APPLICANTS' PROPOSED MANAGEMENT AREA

Two issues are involved at this stage: (a) evidence pertaining the location and boundaries of the Aquifer or underground reservoir, and (b) evidence pertaining to the management area boundaries.

Aquifer/Underground Reservoir Delineation

Pursuant to the Texas Water Commission's request, the Texas Water Development Board prepared available evidence relating to the Barton Springs Associated Edwards Aquifer and submitted proposed hydrogeologic boundaries for the Aquifer. Dr. Tommy Knowles, Chief of the Water Availability and Data Uses Division of the Texas Water Development Board, presented this evidence. A partial list of the publications reviewed by Dr. Knowles and his staff is provided by Exhibit 13. It includes publications of the Texas Board of Water Engineers, the Texas Water Development Board, the United States Geological Survey, the University of Texas Bureau of Economic Geology, W. F. Guyton and Associates, and the San Antonio City Water Board. Based upon this information, as well as original work by the Water Development Board staff, and data on file with the agency, Dr. Knowles presented a summary description of the Barton Springs Associated Edwards Aquifer, including proposed boundaries for that Aquifer.

The Edwards Aquifer is a series of limestone beds which are exposed to the land surface in some areas (the recharge area) and buried in other areas. It transmits water readily and contains good quality water. Two limestone formations are involved -- the Edwards limestone and the Georgetown limestone. The Edwards formation is found beneath the Del Rio Clay formation and above the Walnut

formation. Both of these formations are relatively impermeable, thereby confining the Edwards formation hydrologically (Tr. I, pp. 42-44; Exhibit 25, p. 3).

The Edwards formation is characterizied by faults, caverns, fissures, and fractures which vary both vertically and horizontally. The formation generally dips downward towards the east and southeast, (Tr. I, pp. 45-46). The general movement of water within this portion of the Aquifer is towards the east and then to Barton Springs.

Boundaries of the Aquifer,[5] described by Dr. Knowles and shown on Exhibit 7, are as follows:

1. Northern boundary -- the Colorado River;
2. Western boundary -- the updip limit of the Edwards limestone outcrop;
3. Eastern boundary -- the "bad water line" represented by either a 1,000 mg/l or 3,000 mg/l total dissolved solids line;
4. Southern boundary -- a line along a high water/hydrologic divide between Buda and Kyle, running generally along FM 150.

The northern boundary of the Barton Springs Associated Edwards Aquifer is the Colorado River, which acts as a no-flow hydrologic divide between that portion of the Edwards Aquifer north of the river and the portion south of the river. It forms a trough which appears to prevent the movement of water past the river in either direction (Tr. I, p. 57).

The western boundary, shown on Exhibit 7, is the outcrop of the Edwards limestone formation, as recently mapped by the U.S. Geological Survey and shown on Exhibit 8. Much of this western boundary is formed by the Balcones Fault. To the eastern side of the western

---

[5]The term "aquifer" is used synonymously with "underground reservoir" herein.

boundary, groundwater exists in the Edwards formation, which is believed to be as deep as 200 feet thick at the edge of the outcrop (Tr. I, p. 56).

The eastern boundary of the Aquifer is formed by a water quality gradient line. Lines of both 1,000 mg/l and 3,000 mg/l of total dissolved solids (TDS) were presented by Dr. Knowles. Because the definition of a reservoir or aquifer depends upon the formation containing water of usable quality, a water quality gradient line may be appropriately utilized to define its boundary (Tr. I, p. 58). The 1,000 mg/l concentration is the secondary requirement for drinking water under the Safe Drinking Water Act (Tr. I, p. 59). Other uses, e.g. livestock watering, may utilize water with up to 10,000 mg/l TDS. Water having TDS in the 1,000-3,000 mg/l range is considered "slightly saline" and may be utilized for industrial purposes as well as livestock. Id. Dr. Knowles concurred with the Applicants' position that the 3,000 mg/l line could reasonably be utilized as the eastern boundary (Tr. II, pp. 19-20).[6]

The eastern boundary lines shown on Exhibit 7 were produced by the Texas Water Development Board in November, 1985, based upon 68 water analyses (Tr. I, p. 61). Based upon the addition of five data points between November, 1985 and February, 1986, a new eastern boundary line was presented by the Texas Water Development Board as Exhibit 9. Although the two lines are very similar, some differences

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[6]The Applicants' proposed eastern boundary of the management area is based on the 3,000 mg/l line, not only because such water is usable, but also because that line provides an element of conservatism, or extra protection, for any groundwater management program (Tr. III, pp. 165-66).

exist, particularly in Austin between the Colorado River and Ben White Boulevard. Dr. Knowles testified that the eastern boundary line could move in response to pumpage and recharge (Tr. I, pp. 61-62).

The southern boundary line of the reservoir subdivision is based upon a groundwater divide which has been recognized in numerous studies. While the precise location of the line may be subject to debate, its existence is well recognized. It was recognized by the Legislature and Board of Water Engineers in forming the northern boundary of the Edwards Underground Water District (see Exhibit 6, p. 2 and Exhibit 28). Dr. Knowles testified that in reviewing reports and maps for this testimony he had found twelve published references to a hydrologic divide in existence between Kyle and Buda (Tr. I, p. 70).

References in government publications, particularly those of the U.S.G.S., place the location of the southern boundary of the Barton Springs Associated Aquifer slightly south of Kyle (see e.g., Exhibit 8 and Exhibit 14). This boundary has also been recognized in recent Texas Water Commission publications (see Exhibit 15). Other publications, either expressly or by interpolation of results presented therein, show the hydrologic divide in various locations between Kyle and Buda (see Exhibit 17 for summary). Dr. Knowles testified that the differences in location of the line, shown in various prior studies, could be either (a) due to the line being located at different places in different times, or (b) due to the availability of data which was utilized in the studies (Tr. II, p. 54). Generally, however, Dr. Knowles testified that the hydrologic

dividing line (or zone of high water) would not extend as far north as Onion Creek or any further south than Kyle (Tr. II, pp. 58 and 61).

In the unconfined, or nonartesian, area the surface water divide between the Onion Creek watershed and the Blanco River watershed has a controlling effect on the location of the high water dividing line (Tr. II, pp. 58-59). In the artesian portion of the Aquifer, however, the surface water divide has little influence (Tr. II, p. 59). Mervin Klug, an expert witness for one of the opponents, generally confirmed Dr. Knowles' testimony in this regard (Tr. VII, pp. 170-173), as did Dr. Butler (Tr. IX, pp. 58-59).

The Texas Water Development Board recommendation of the southern boundary line to the Texas Water Commission was made with knowledge and awareness that the southern boundary of the Aquifer was a hydrologic divide, subject to movement based upon pumpage and recharge (see Exhibit 6, p. 2). With full recognition of this fact, however, the Board recommended a southern boundary line for the Aquifer subdivision in the location proposed by the Applicants. Several reasons were presented by Dr. Knowles for this decision:

(1) numerous references to a divide between Kyle and Buda existed in the literature;

(2) Onion Creek provides a substantial portion of the natural recharge for Barton Springs (34%) and, therefore, must necessarily be included within the Barton Springs portion of the Aquifer;

(3) in the nonartesian portion of the Aquifer, the Applicants' proposed Highway 150 divide generally follows the surface water divide between Onion Creek and the Blanco River; and,

(4) an independent analysis of water levels performed by the staff of the Water Development Board in July and August of 1985 confirmed the location of a hydrologic divide line very close to the divide proposed by the Applicants (Tr. I, pp. 69-72; Exhibit 10).

Moreover, Dr. Knowles testified, it has been the policy of the Texas Water Commission in the past to use recognized boundaries such as roads (Highway 150) when designating Aquifer subdivisions and district boundaries of this nature[7] (see generally, Tr. II, pp. 85-87 for Dr. Knowles' summary of the basis for his southern boundary recommendation).

Dr. Butler, the Applicants' expert, concurred with Dr. Knowles' testimony regarding the southern boundary line. He emphasized the significance of the Water Development Board's independent study in the summer of 1985, which confirmed the Applicants' proposed southern boundary (see Exhibit 10). Because the Water Development Board study contained significantly more data than any prior water level mapping effort, and because it was taken under low flow or base streamflow conditions on Onion Creek and the Blanco River uninfluenced by recent rainfall/recharge events, Dr. Butler demonstrated that Exhibit 10's support of the Applicants' proposed southern boundary line was particularly significant (Tr. III, pp. 150-58; Tr. IX, pp. 31-32).

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[7]A review of Exhibit 71, and the Aquifer subdivisions shown thereon, demonstrates the Commission's predilection for subdivision boundaries which appear to follow preexisting boundaries such as county lines, roads, and property boundaries.

Management Area Boundaries

Using the Aquifer boundaries recommended by the Texas Water Development Board (Exhibit 7), the Applicants developed proposed management area boundary lines which approximate the Aquifer (reservoir subdivision) boundaries using streets, highways, property boundaries, preexisting survey lines, creeks, and watercourses. The management area boundaries were developed from Travis and Hays County tax maps and are presented as Exhibit 27. A textual description of those boundaries is provided by Exhibit 26.[8] As may be observed from Exhibit 12 or the Exhibit 38 overlays, the proposed management area boundaries closely approximate the Aquifer boundaries.

The proposed management area boundaries would simplify administration, management and governmental functions of the proposed district because they are readily discernable -- either on the ground or on preexisting government maps. Dr. Knowles, Dr. Butler, and Tom Fox, General Manager of the Edwards Underground Water District, all agreed that visible, locatable boundary lines are the most suitable boundaries for the management area of an underground water district. Moreover, Mr. James Archer and Mr. James Click, Chief Appraisers of the Travis and Hays County Appraisal Districts, each testified that they, or their staff, had reviewed the proposed management area boundaries and determined that they would be suitable for appraisal and taxation purposes. In fact, Mr. Archer testified that the

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[8]Although Exhibits 26 and 27 are intended to be used in a complimentary fashion, Exhibit 27 controls over Exhibit 26 with respect to all direction and distance calls. The direction and distance calls in Exhibit 26 are, by the terms of that document, only approximate.

proposed boundaries were superior to those of some existing water districts in Travis County.

Both Dr. Knowles and Dr. Butler's testimony demonstrate that all of the essential requirements for delineation of the subdivision of an underground reservoir and designation of a management area to allow management of that subdivision have been satisfied:

1. There is an underground reservoir. Dr. Knowles testified that the portion of the Edwards Aquifer reflected in Exhibit 7 (the Barton Springs Associated Edwards Aquifer) has ascertainable boundaries (Tr. I, p. 82). His testimony concerning each of the individual boundaries has been summarized above. Dr. Knowles further testified that wells within the area shown for the Aquifer on Exhibit 7 are capable of production at a rate of 25,000 gallons or more per day (Tr. I, p. 81). Dr. Butler's testimony confirms Dr. Knowles' testimony in both regards (Tr. III, pp. 203-204).

2. The management area boundaries shown on Exhibit 27 coincide to the extent feasible with the boundaries of the Aquifer subdivision and were developed with the objective of obtaining a suitable area for groundwater management (Tr. III, pp. 206-208).

3. Both Dr. Knowles and Dr. Butler testified that the Applicants' proposed management area boundaries provide a suitable area for management of the underground water resources of the part of the State in which the district is located (Tr. II, p. 19; Tr. III, p. 207).

4. Although the southern boundary may fluctuate, such movement will not create such an unreasonable problem that it frustrates or makes groundwater management impractical (Tr. III, pp. 174-175; Tr. IX, pp. 33-36). Dr. Butler testified that (1) the significant thickness of the Aquifer along the southeastern boundary (400-450 feet); (2) the rapid rebound of the artesian water surface following pumping cycles; and (3) the likelihood that comparable future pumping rates will occur both to the north and south of the southern boundary all lend further support to the suitability of designating the management area as presented by the State and the Applicants.

IV.

SUMMARY OF THE OPPONENTS' POSITIONS

The positions of the various opponents to management area boundary designation are stated below, along with a summary of the evidence introduced by each party to support their positions.

Rutherfords

As the Applicants understand it, the Rutherfords' primary position is that the southern boundary of this subdivision of the Aquifer is so indefinite, transitory, or mobile that it renders definition of a subdivision of the Aquifer impossible and, consequently, makes delineation of a management area impossible. In support of this theory, two witnesses were produced. The first witness, Mr. Tony Bagwell, was an economist with expertise in the area of planning and growth management. Mr. Bagwell provided evidence concerning potential future growth patterns of Kyle and San Marcos.

Both of these cities are located south of the proposed southern boundary of the district. Mr. Bagwell projected significant additional water demand to satisfy the projected population growth.

Mr. Ron Hardin, a groundwater hydrologist, presented much of the Rutherfords' technical case. Although Mr. Hardin recognized the existence of a hydrologic divide in the area between Kyle and Buda, he testified that it might move as far north as the Travis County line and as far south as Kyle. Moreover, Mr. Hardin testified, in periods of severe drought, (e.g., during the drought of the 1950's) the hydrologic divide could disappear entirely -- leaving a single gradient of groundwater flow from San Marcos towards Barton Springs.[9]

Upon the basis of this evidence, the Rutherfords argue that the Commission should recognize that a single aquifer (incapable of subdivision) exists. They suggest that the Barton Springs portion of the Aquifer should be added to the jurisdiction of the legislatively established San Antonio-based Edwards Underground Water District.

Creedmoor and Goforth Water Supply Corporations

The Water Supply Corporations propose expansive boundaries for the management area of the Barton Springs Associated Edwards Underground Aquifer. Their proposed boundaries take in considerably more area than requested by the Applicants on the north, south, east, and west. The WSC's proposed boundaries would triple or quadruple the amount of land within the management area.

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[9]Significantly, even if the groundwater divide were to disappear in this fashion, severe management problems would not be presented for the Barton Springs subdivision of the Aquifer. It would be gaining water from the area south of the divide rather than losing it.

On the north, the WSC's propose inclusion of a large portion of the Corporate area of the City of Austin, up to Highway 183. On the west, the WSCs propose including approximately one-half of the contributing zone. This is the portion of the Onion Creek and Barton Creek watersheds extending out to the municipalities of Dripping Springs and Wimberley.

On the south the WSCs propose extending the southern boundary of the management area to the Blanco River. On the eastern side, the WSCs propose including their entire service areas, as well as those of adjacent WSCs.

The rationale for extension of the northern and eastern boundaries is that residents of these areas would benefit from creation of the district. City of Austin residents benefit via Barton Springs and water supply from the Green Water Treatment Plant. WSC service area residents benefit from protection of their aquifer dependent water supplies.

On the south and west, the WSC's rationale is that the boundary should be extended to make district management more effective. The western boundary extension is necessary, in their view, for water quality protection reasons since the runoff from this area ultimately plays a part in recharge of the Aquifer. On the south, the WSCs propose the Blanco River as the extreme southern limit which might be reached by the hydrologic divide. The management area's southern boundary, they propose, should be far enough south to include any possibly foreseeable fluctuation of the hydrologic divide.

Mackey/Negley

The Mackey/Negley protestants propose a modification of the southern boundary management area based upon the surface water divide between the Onion Creek watershed and the Blanco River watershed. Although this divide approximates the Highway 150 line in the water table portion of the Aquifer; the surface watershed divide turns north from Highway 150 at approximately the same point at which the Aquifer goes artesian. The latter point is, coincidently, just west of the Negley Ranch and Mr. Mackey's proposed development. Following the surface watershed divide on its northeasterly turn results in exclusion of virtually all of the Negley property as well as several square miles of land to the east.

Bradley[10]

Mr. Bradley's interest lies primarily with the proposed western boundary of the management area. As reflected by Exhibits 35, 36, and 37, Bradley apparently proposes relocation of the western boundary in the vicinity of his property, by moving the proposed boundary in an easterly direction. No direct evidence in support of this contention was introduced by Bradley.

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[10]Applicants' description of Protestant Bradley's position is recognized as being subject to correction. Protestant Bradley's position appears to change even more frequently than the district's proposed boundaries. Initially, Mr. Bradley personally told the Commission that he was in favor of the district, but against water quality regulation by the district. His attorney subsequently advised the Commission that Mr. Bradley was against the district and wanted to modify the western boundary line. Now, according to the latest statement of position (Tr. IX, pp. 61-62), Mr. Bradley supports taxation and regulation to protect Barton Springs, but wants the boundaries to extend to the western border of the contributing zone -- and further north, south and east -- in order to protect against overpumpage and drawdown. In the final analysis, Applicants are less than certain of Protestant Bradley's current position.

Milburn/Nash Phillips-Copus

No affirmative evidence was introduced by these opponents. Rather, they seem to disagree and find fault with the Applicants' proposal at virtually each step along the way.

V.

ANALYSIS OF THE OPPONENTS' ARGUMENTS

Rutherfords

The Rutherfords' evidence and argument focusing upon the southern boundary have highlighted an area of potential difficulty for the proposed district. Some movement of the hydrologic dividing line on the southern boundary undoubtedly occurs in response to pumpage and recharge. All experts who addressed the subject agreed on this proposition. The question, posed for the Examiner and Commission by the Rutherfords' argument, is whether future conditions could cause the boundary to move to such an extreme amount that it makes the Barton Springs portion of the Aquifer unreasonably susceptible to influence from pumpage outside that subdivision of the Aquifer. This, as the Applicants understand it, is the test imposed by Texas Water Code §52.001(6).

Evidence that some influence may possibly occur due to pumpage outside the proposed management area is abundant. Evidence that such pumpage will have an unreasonable effect within the management area, either now or in the foreseeable future, is virtually nonexistent.

So far as projections in the future are concerned, no evidence regarding future growth established levels of pumpage outside of the proposed management area which would unreasonably affect management

efforts within the management area. In fact, the Rutherfords' expert, Mr. Bagwell, testified that growth in the Buda area might be anticipated to equal or exceed growth in the Kyle area. Using the Rutherfords' line of reasoning, such growth in the Buda vicinity would tend to counter any movement of the hydrologic divide to the north by virtue of pumping in the vicinity of Kyle.

No expert hydrologist testified that current or anticipated pumpage or recharge south of the proposed southern boundary would unreasonably affect or interfere a groundwater management program within the proposed boundaries. Mr. Hardin testified as to some localized effects of pumpage which would be "significant" in his opinion. At no point, however, did Mr. Hardin testify that such pumpage would unreasonably interfere with or frustrate a groundwater management program within the Barton Springs Associated portion of the Aquifer.

On the other hand, Dr. Tommy Knowles, Dr. Kent Butler, and Mr. Tom Fox all agreed that an effective groundwater management program would be possible within the proposed boundaries of the Aquifer subdivision. Such testimony was provided by each with full knowledge that the proposed southern boundary was a hydrologic divide, subject to some movement particularly in the artesian area (Tr. II, pp. 19-20; Tr. IX, pp. 33-36; Tr. VIII, p. 84). Testimony also described the very rapid rebound of the water table following pumping cycles in the artesian zone, as well as the significant thickness and abundance of water in the Aquifer along the proposed southern boundary. These factors support the Applicants' case that pumpage south of the boundary will not unreasonably affect the water supply within the proposed management area. Thus, a preponderance of the

evidence on the issue clearly shows that the Rutherfords' objection concerning the southern boundary is not sufficiently signficant to prevent determination of the existence of a subdivision of the Aquifer or to prevent utilization of the Applicants' proposed southern boundary of the management area.

Creedmoor and Goforth WSCs

The primary problem with the boundaries proposed by the WSCs is that they run contrary to statutory requirements. As indicated above, Texas Water Code §52.024 requires that, "to the extent feasible the management area shall coincide with the boundaries of an underground water reservoir or a subdivision of an underground water reservoir." The WSCs ask the Commission and Examiner to conclude that it is not feasible to follow the Aquifer boundaries in designating the management area. Such a conclusion is contrary to the evidence and the direct testimony of Dr. Tommy Knowles and Dr. Kent Butler. Even the WSC's primary witness agreed that the Applicants' proposed boundaries came closer to following the Aquifer boundaries than those offered by the WSCs (Tr. VII, pp. 97-98).

Perceived benefits to areas not over the Aquifer form the basis for much of the WSC's proposed expansion. As indicated by Dr. Butler's testimony, "area of benefit" is a unworkable criteria, by itself, for designation of management area boundaries. The area of benefit of the proposed district would include the entire City of Austin, much of Travis and Hays County, and most of the Colorado River downstream (Tr. IX, pp. 55-58). Moreover areas of benefit, such as the service areas of the WSCs, are subject to change over time. If the City of Austin provides a surface water supply to the

WSCs (a distinct possibility, recognized by the WSC's own experts, Tr. V, pp. 145-147) such benefits could be greatly reduced or modified. Thus, prudence dictates deference to the legislative guideline requiring management area boundaries which conform to the Aquifer's boundaries to the extent feasible.

Expansion of the management area boundaries to include the contributing watershed on the west, as proposed by the WSCs, does not appear practical. First, it is definitely not a boundary which coincides with the underground water reservoir to the extent feasible. Second, as Dr. Butler testified, although a portion of the Aquifer's recharge comes from this area, pollution from nonpoint sources throughout the area as a whole is, by origin, a surface water pollution problem that can be dealt with most effectively by regulations of the City of Austin and Dripping Springs respective ETJ's (Tr. IX, pp. 63-64). Additionally, Travis and Hays Counties and the Texas Department of Health and the Texas Water Commission already enforce regulations pertaining to point source pollution discharges and private and organized sewage facilities throughout the entire contributing watershed area.

Negley/Mackey

The Mackey/Negley proposal of utilizing the Onion Creek/Blanco River watershed divide as the southern boundary in the artesian portion of the Aquifer is not factually justified. Although that dividing line is within the range of possible fluctuation of the high water divide in the artesian zone, it presents a location very near the northern extreme of that line's fluctuation. Even Mr. Klug, the opponents' expert, agreed that the hydrologic divide, in the

artesian portion of the Aquifer, could move rather readily to the north or south, while the hydrologic divide remained fixed and moved considerably less in the water table portion of the Aquifer (Tr. VII, pp. 171-172). Of the range of fluctuation described by various witnesses for the southern hydrologic divide, Mackey/Negley opponents have selected one considerably toward the northern extreme of the range -- one which coincidently excludes their property.

Dr. Butler testified that it was important from a hydrologic/management point of view to have the Negley Ranch area included within the district, because of its location over the artesian zone and high productive potential (Tr. IX, pp. 58-59). Moreover, Dr. Butler testified, it is reasonable to expect that recharge from the Onion Creek system would continue to flow basically perpendicular to the dip of the strata, or essentially along a line to the east following the extension of Highway 150 as that recharge enters the artesian zone, (Id). This flow pattern, using the Negley proposed boundary, would allow much of the Onion Creek recharge to enter the artesian zone and flow into an area outside of the proposed management area.[11] Slade's report (Exhibit 14) and the Texas Water Development Board water level survey (Exhibit 10) -- the two studies containing the largest number of data points -- both clearly indicate

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[11]The problem with bisection of the tract by the management area's southern boundary was noted during the testimony of Mr. Mackey. While the problem could be solved by inclusion of the entire Negley Ranch within the management area, this is not a solution being proposed by the Applicants. If, however, faced with making a choice between having the entire Negley Ranch in or out of the management area, the Applicants would prefer to have the entire Ranch in. We would note, due to the Negley's party status and participation in the hearing, such a modification of the boundary area would pose no notice problem.

the groundwater gradients and the flow lines extending from Onion Creek in the recharge zone across the Negley Ranch area, thereby supporting the understanding that the subject area is hydrologically in communication with the Barton Springs subdivision of the Aquifer.

Bradley

As noted above, no evidence was introduced by Bradley to support any modifications to the management area boundary on the western side.

Milburn/NPC

Numerous objections were advanced by the Milburn/NPC opponents. Although some are not evidentiary, they will be addressed below:

1. Taxation Without Benefit -- It is objected that many people who do not rely upon the Aquifer for their water supply will be subject to taxation by the district. That disagreement as the significance of the district's benefit is possible may be easily judged by comparison of the Milburn/NPC position with that of the WSCs. Milburn/NPC would, apparently, exclude all of the City of Austin; the WSCs come very close to taking all of the City of Austin into the district's boundaries due to the perceived benefits.

The short answer to this argument, however, is found in Chapter 52. Management area boundaries are <u>not</u> determined by benefits received from the district. Management area boundaries are based, to the extent feasible, on aquifer boundaries. Benefits are involved, pursuant to the provisions of §52.025, in the decision whether or not to create a district -- <u>not</u> in the boundary designation process.

2. A Legislative District -- Milburn/NPC, purport to prefer a legislatively established district to a Chapter 52 district. There are two responses to this contention. First, if they prefer such a

district, they should have worked for, rather than against, the bill to create such a district last session. Second, and more fundamentally, this Commission cannot decline to form a Chapter 52 district on the basis that a legislative district is possible and preferable to a few parties. The Legislature has directed the Commission to either form or disapprove formation of underground water conservation districts on the basis of the criteria set forth in Chapter 52. The Milburn/NPC argument invites the Commission to abdicate its responsibility under Chapter 52 by deferring to the Legislature. Only if the evidence established that management by a Chapter 52 district was not feasible could such a decision by the Commission be justified. No such evidence has been introduced in our proceeding. Rather, Milburn/NPC make the essentially political argument that a legislative district would be better. Because any Commission decision must be ratified by confirmation election, Milburn/NPC will have a proper forum to present their political argument. The forum is not, however, the Commission.

3. Boundary Precision -- With regard management area boundaries, Milburn/NPC developed (in the form of Exhibit 38) a set of boundaries which, in some cases, follow the Aquifer boundary more closely than those proposed by the Applicants in Exhibit 27. The Applicants, however, believe the Examiner is justified in rejecting the Milburn/NPC alternative boundary, and urge him to do so.

On the eastern side, the 3,000 mg/l "bad water line" which serves as a basis for the Aquifer boundary, is not so precisely defined that any particular benefit is achieved by attempting to follow it with a series of many small boundary calls as offered by

Milburn/NPC. As indicated by Exhibit 9, the location of the line can be affected by the addition of one or two additional data points. Moreover, even though the eastern boundary is not readily influenced by pumpage and recharge conditions, such factors may have a modest impact on the eastern boundary and result in some movement of the line. Thus, no purpose would be served by substitution of the Exhibit 38 boundaries.

On the western side, because the outcrop boundary is highly irregular and varied, and because tax parcels in the area are relatively large, it is simply impossible to develop a management area boundary line which does not exclude property that one might desire to include, and vice-versa. In light of this fact, the Applicants' proposed boundary line shown on Exhibit 27 provides a simpler and more workable boundary description (Tr. V, pp. 231-35).[12]

VI.

RESPONSES TO OTHER/NONEVIDENTIARY OBJECTIONS OF THE OPPONENTS

A. Objection to the Legal Adequacy of Proposed Boundaries.

Applicants believe that factual evidence concerning the boundaries proposed by Exhibits 26 and 27 demonstrates that it is possible to ascertain the location of those boundaries and to utilize them for governmental purposes. Moreover, Applicants' review of existing legal authority indicates that such boundaries are more

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[12]Because Exhibit 38 boundaries take in small amounts of land not included within the boundaries, as originally published, opponents would undoubtedly argue the necessity of republication and additional hearings prior to adoption of such boundaries. Applicants believe that such delay, rather than any benefit of increased precision, is the real goal of the Exhibit 38 boundaries.

than adequate for the designation of a management area or creation of an underground water conservation district.

Opponents would, apparently, require an on-the-ground survey of the perimeter of the entire 155 square mile district. Initially, we would note that such requirement is imposed by neither statute nor Commission rule. Commission precedent, in fact, confirms the use of property boundary and survey lines to define underground reservoir subdivision boundaries (see Exhibit 28).

A leading case on boundary requirements for water districts is Lower Nueces River Water Supply District v. Cartwright, 274 S.W.2d 199 (Tex. Civ. App. -- San Antonio 1955, writ ref'd n.r.e.). In that case, the boundaries of a legislatively established water district were determined by the trial court not to close and, therefore, to be inadequate to support the legal existence of a district. On appeal, the Court of Civil Appeals emphasized the liberality which should be accorded boundaries of this nature. Much like legislation, the intent should be ascertained and honored, if at all possible. Corporate boundaries are not construed with the same strictness as those boundaries outlining grants or contracts. 274 S.W.2d at 204. The court ruled, ultimately, that the legislature intended the boundaries to close, and that they did close -- effectively creating a district. Whether particular tracts of land were inside or outside the boundaries of the district was a question which did not affect the validity of the district, per se. Id., at 205. The latter issue might be raised by individual property owners when the district attempted to assess taxes, but would not effect the district's validity. The court specifically indicated

the district boundary lines marked upon a plat were legally adequate. Id., at 205.

Similarly, in 1950 the Texas Board of Water Engineers requested an Attorney General's opinion concerning procedure for designating underground water reservoirs under Article 7880-3c, the statutory predecessor of Chapter 52 of the Water Code. In Opinion V-1060, Attorney General Price Daniel confirmed that survey lines, to the extent they were coterminous with the reservoir, were adequate boundaries. Moreover, he stated, "If your present maps show underground reservoirs in relation to surface grants, it would seem that a satisfactory perimeter description of the reservoir could be worked out from the maps you now have available."

Thus, the type of description presented by the Applicants in Exhibits 26 and 27 for the Commission consideration as management area boundaries have been determined to be legally adequate by both the courts of the State and the Attorney General.

B. Legal Adequacy of Petition

District opponents suggest that the petition (filed as Exhibit 22 in this proceeding) along with the Tax Collector's verification (filed as Exhibit 23) may be legally inadequate. Two alternative arguments are suggested. First, the opponents argue that the modifications to Chapter 52 accomplished by House Bill 2 amendments, which became effective following filing of the petition, rendered the petition inadequate and necessitated the collection of signatures for a new petition based upon the new Chapter 52 language. This issue has been presented to the Examiner previously and discussed at length by the parties' briefs filed in connection with prior

motions to dismiss. In response to this argument, Applicants adopt the arguments and authorities stated in their prior briefs.

Opponents additionally argue that the signatures reflected on the petition should have been verified in some fashion, either by the Commission prior to intiating proceedings, or by the Applicants in the course of this proceeding. Such verification, presumably, should go to the identity of the person signing and the precise location of their property. The opponents' argument is without legal foundation. The standard of review given by the Commission is entirely up to the Commission. Indeed, because the Commission may initiate designation of management areas on its own motion, pursuant to the express terms of Water Code §52.024(a), it would seem impossible for the Commission to create error by honoring any petition it received.

Texas caselaw uniformly supports the proposition that the determination of the adequacy of a petition is the Commission's initial decision, judged by standards the Commission chooses to impose, and subject to review only for arbitrariness. William v. Glover, 259 S.W. 957 (Tex. Civ. App. -- Waco 1924, no writ), presents an analogous situation. In that case, the county judge was required to determine the sufficiency of a petition calling for a special election on school taxes. The court recognized the authority of the judge to determine the sufficiency of the petition and further noted, that since the Legislature had not seen fit to prescribe in detail "how such act shall be performed or evidenced," the county judge had discretion to use any manner of performance of such obligations that would reasonably accomplish the purpose of the law.

In another of the Cartwright cases, Corpus Christi v. Cartwright, 288 S.W.2d 836 (Tex. Civ. App. -- San Antonio 1956, writ ref'd), the court considered the adequacy of a petition to form a water control and improvement district. Under that procedure, now embodied in Chapter 51 of the Water Code, the court noted it was the duty of the county judge to receive the petition and make an order setting the matter down for hearing. "In so doing the county judge acts in an administrative capacity and necessarily must determine the legal sufficiency of the petition." The court noted that, normally, the county judge's evaluation of the petition and decision to schedule a hearing was "final and not subject to review by this court, except on grounds of fraud or gross abuse of discretion . . .." 288 S.W.2d at 838.[13]

Exhibit 24 reflects the Commission's administrative determination that the petition was adequate to invoke its jurisdiction. The decision is an administrative decision made by the Commission, and is no more subject to litigation in this proceeding than the Commission's decision that appropriate filing fees accompany the petition.

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[13]The appellate court went on to declare an exception in the case of WCIDs because the judicial review provision for the county commissioners court decision required a "trial de novo" type review. The exception carved out in the Cartwright case to the general rule, however, has no applicability to Chapter 52 districts. Appeal of the Commission's decisions regarding Chapter 52 districts are governed by the substantial evidence rule, not trial de novo. The Texas Supreme Court in Board of Water Engineers v. Colorado River Municipal Water District, 254 S.W.2d 369 (Tex. 1953), ruled that Article 7880-3c(f), the direct predecessor of Chapter 52's judicial review provision, called for a substantial evidence review -- not trial de novo. Therefore, the rule stated by the San Antonio court in the Cartwright case is completely applicable to the petition pending before the Commission in this proceeding.

C. Boundary Overlap With EUWD

Opponents have made much of the overlap between the proposed management area boundaries and those of the Edwards Underground Water District. Applicants would make two points in response. First, the overlap between districts with similar purposes does not present a legal barrier to district formation. The problem was expressly considered in Lower Nueces River Water Supply District v. Cartwright, supra. In that case the newly formed water supply district overlapped the boundaries of the Jim Wells-Duval Counties Conservation and Reclamation District. Both were legislatively established districts with similar powers. Yet, the court found no legal conflict sufficient to interfere with formation of the second district. 274 S.W.2d at 207-208.

Second, on a practical level, Applicants would emphasize the short-term, transitory nature of the overlap. Tom Fox indicates his willingness, and his Board's, to remedy the overlap problem in the upcoming legislative session.

VII.

CONCLUSION

In the final analysis, Applicants believe that the case presented to the Commission and the Examiner is relatively simple and straightforward. The subdivision of the Edwards Aquifer feeding Barton Springs does exist. It is separated from other portions of the Aquifer which feed San Marcos Springs and Comal Springs by a hydrologic divide (a high water area) just north of Kyle. The northern, eastern, and western boundaries of the Aquifer subdivision are subject to relatively little debate or dispute. The southern

boundary, particularly in the artesian portion of the Aquifer, moves in response to pumpage and recharge conditions. Thus, it is not subject to precise, permanent location.

The general location of the southern boundary, however, is relatively clear. Most authorities agree that it is between Kyle and Buda and, in the nonartesian zone, that it closely approximates the watershed divide between the Blanco River and Onion Creek. The southern boundary proposed by the Applicants through the artesian zone is representative of base flow conditions (as they existed in the summer of 1985) and is based on more water level observations than any other survey conducted in the area. Therefore, it may reasonably be utilized as a management area boundary. The subdivision of the Aquifer (or underground reservoir) provides a suitable boundary for the for the management of groundwater resources. This boundary has been reasonably and objectively depicted by the Applicants' proposed management area boundaries, as shown and described in Exhibits 26 and 27. The proposed management area boundaries are adequate for a district's administrative, management, and governmental functions. To a large extent they are readily identifiable on the ground; to the extent that they also follow property and survey boundaries, they have already been mapped and are suitable for designation as district boundaries in the forthcoming hearing.

Applicants urge the Examiner to propose to the Commission, and the Commission to adopt, the boundaries reflected by Exhibits 26 and 27 as management area boundaries for Barton Springs Associated

subdivision of the Edwards Aquifer.

Respectfully submitted,

BICKERSTAFF, HEATH & SMILEY
United Bank Tower, Suite 1419
400 West 15th Street
Austin, Texas 78701
(512) 472-8021

By: Douglas G. Caroom
DOUGLAS G. CAROOM
State Bar No. 03832700

ATTORNEY FOR APPLICANTS

CERTIFICATE OF SERVICE

I hereby certify that the foregoing Applicants' Written Argument has been filed with the Water Commission and hand-delivered to Mr. Robert Caine, Hearing Examiner, Texas Water Commission, P.O. Box 13087, Austin, Texas 78711-3087 and sent by U.S. mail, postage prepaid to all parties of record on this the 6th day of May, 1986.

Douglas G. Caroom
DOUGLAS G. CAROOM

ATTACHMENT #11

COOPERATIVE AGREEMENT

between the
City of Austin
City of Buda
City of Hays
Village of San Leanna
City of Sunset Valley
and Kent S. Butler and Associates, Inc.

to contract for professional services
for creation of an Underground Water Conservation District
for the Barton Springs-Associated Edwards Aquifer,
Hays and Travis Counties, Texas

I.
Purpose

Pursuant to Article 4413(32c), V.T.C.S., Interlocal Cooperation Act, the Cities of Austin, Travis County, Buda, Hays County, Hays, Hays County, Sunset Valley, Travis County and the Village of San Leanna, Travis County (hereinafter called "Municipalities") enter into this Cooperative Agreement (hereinafter called "Agreement") to actively participate in and commit the necessary resources for a joint planning program (hereinafter called "Program") for the long-range, sustained utilization of that unit of the Edwards Aquifer (hereinafter called "Aquifer") associated with Barton Springs and located in northern Hays and southern Travis Counties, Texas.

II.
Services

The Municipalities shall contract with Kent S. Butler and Associates, Inc., a corporation duly authorized to do business in Texas, (hereinafter called "Butler") for professional planning services and Butler, in turn, shall contract with Bickerstaff, Heath and Smiley, Attorneys at Law (hereinafter called "Bickerstaff"), for legal services to be provided to the Municipalities pursuant to this Agreement. Dr. Kent S. Butler, as agent for Butler, shall act as coordinator in charge of all professional planning services assigned to Butler. The planning and legal consultants shall be responsible for the following services: (1) coordination of the Program, intended to result in an election to create an Underground Water Conservation District (hereinafter called "District"), under the authorities of Chapter 52 of the Texas Water Code, as amended; (2) preparation and submittal of periodic reports to, and organization of monthly meetings with the Municipalities in furtherance of the Program, as well as preparation and presentation of a bi-weekly status report by Butler to the City Council of the City of Austin;

(3) representation and presentation of information on behalf of the Municipalities in meetings with officials of local, state, and federal units of government and representatives of various organizations, in furtherance of the Program; (4) serve as duly authorized attorney and representative for the Municipalities before the Texas Water Commission (TWC) for purposes of submittal of petitions, presentation of testimony and conducting all other necessary services leading to the scheduling of an election to create a District for the Aquifer; this shall not include, however, proceedings or litigation incidental to the TWC program proceedings without prior written authorization.

Neither Butler nor Bickerstaff are authorized to commit any of the Municipalities to the expenditure of funds other than the contract price stated in Paragraphs III and IV herein, for the creation of the District without prior written approval of the Municipalities. The designated representative for the Municipalities, as regards this Agreement, shall be the Small Cities Council Steering Committee. It is understood that Butler and Bickerstaff will represent a unified position on behalf of the Municipalities and not represent individual positions of any particular city in their performance under this contract. It further is understood that Butler will serve as coordinator for the Program and in such capacity will supervise the services provided by Bickerstaff and reimburse Bickerstaff for all fees and expenses incurred in developing the Program out of the payments made to Butler under this Agreement. Bickerstaff shall be solely compensated in accordance with a contract between Butler and Bickerstaff and shall not look to the Municipalities for additional compensation. It is further understood that the role of Butler as coordinator does not, and is not intended to, interfere with the attorney-client relationship between Bickerstaff and each of the Municipalities.

III.
Compensation and Payment

Butler shall be compensated on an hourly rate basis of $75.00 per hour and shall also be compensated for direct out-of-pocket expenses at the actual amounts incurred up to the maximum total budget amount of $70,080.00. Butler shall maintain and provide to each of the Municipalities a weekly, detailed expense account which documents all time and expenses for work performed pursuant to this Agreement. It is further understood by the Municipalities that should the District be created, Butler shall propose and pursue reimbursement of payments made by the Municipalities for services to create the District from the District.

The effective commencement date of this Agreement shall be January 1, 1986 and the Agreement shall automatically terminate on June 30, 1986, unless the duration of the Program is modified in accordance with the terms specified in Paragraph IV below. It

is understood and agreed that the duration of this Agreement shall be from January 1, 1986 until June 30, 1986 even if the total budget of $70,080.00 is expended before June 30, 1986. However, any changes or modifications to the total budget of $70,080.00 for this Agreement shall be made in accordance with Paragraph IV herein.

The City of Buda shall serve as Trustee for the purposes of receiving periodic payments from the Municipalities and making periodic payments to Butler. The Municipalities shall make regular monthly payments to the City of Buda in the amounts specified below, such payments to be made on or before the fifth day of each month, beginning January 1, 1986 and ending June 30, 1986. After the Agreement has terminated, the City of Buda shall make a report of receipts and payments and submit the report to the Municipalities.

The regular monthly payment to be paid by each of the Municipalities shall be as follows:

SCHEDULE OF MONTHLY PAYMENTS

Austin	$ 10,000.00	
Buda	846.00	
Hays	232.00	
San Leanna	232.00	
Sunset Valley	370.00	
Total	$ 11,680.00	per month

IV.

Amendments and Limitations

The Municipalities may enter into amendments to this Agreement to expand, reduce, or otherwise modify the scope of work or duration of this Program. Butler may also request a modification of the scope of work or duration of this Program. In any such case, Butler shall submit an estimate of the additional cost, if any, that would be incurred because of the modification and shall obtain prior written authorization from the Municipalities to proceed on a time and materials basis. The total budget for this Agreement shall not exceed $70,080.00 for the period of January 1, 1986 through June 30, 1986 without prior written authorization from all of the Municipalities. If modifications are proposed which increase the budget of this Agreement, one or more of the Municipalities may contract for those modifications and fund the same even though some Municipalities may decide not to participate in the funding of the modifications. However, in no event shall Butler incur any additional costs or obligate himself to additional expenditures in excess of $70,080.00 without prior written authorization from the Municipalities. The

Municipalities disclaim any and all liability for any costs or amounts incurred or expended in excess of the $70,080.00 if such are incurred or expended without prior written authorization.

V.
Timetable

A preliminary timetable for the Program is included as "Appendix A" to this Agreement. Butler shall furnish the Municipalities with an updated timetable indicating events leading to the confirmation election and corresponding dates. In addition, Butler shall inform the Municipalities of changes in the anticipated dates of events indicated on the timetable.

VI.
Reports

Butler will provide monthly status reports on the progress of the Program to the Municipalities. At the termination date of this Agreement or upon expenditure of all authorized funds, Butler shall present a full status report to the City Councils of Municipalities. In addition, on or about May 29, 1986, Butler shall report to the Councils on the report of the hearing examiner on the designation of the management area (District) boundaries.

VII.
Termination

Any party to this Agreement may terminate its participation in the Agreement upon thirty (30) days notice in writing to the other parties. Such termination shall not impair the validity of the Agreement for the remaining parties or each party's obligation to pay its share of the costs and expenses set forth in Paragraphs III and IV.

The original Agreement may be executed by the participating cities on multiple copies.

ACCEPTED AND AGREED TO:

Party: City of Austin

By: Jorge Carrasco Date Signed 3-21-86

Title:

Party: City of Buda

By: _____ Date Signed _____
Title:

Party: City of Hays

By: _____ Date Signed _____
Title:

Party: Village of San Leanna

By: _____ Date Signed _____
Title:

Party: City of Sunset Valley

By: _____ Date Signed _____
Title:

Party: Kent S. Butler and Associates, Inc.

By: _____ Date Signed _____
Title: Consulting Planner

DG:lm
i:122.ag

DRAFT

SCHEDULING FOR AUGUST 9 ELECTION

DATE	EVENT
Aug. 9	Election
	[30 days review by Dept. of Justice]
July 9	Prefile with Dept. of Justice
	[5 days for prep. of filing]
July 4	Temp. Bd able to Meet & Act
July 3	Motions for Rehearing on Creation Order Due, and Overruled by TWC
	[15 days for Motions for Rehearing on Creation Order]
June 18	TWC holds Creation Hearing and enters Order
	[20 days notice required]
May 29	Publish Notice of Creation Hearing (based on May 26 Order)
	[15 days for Motions for Rehearing on Designation Order]
May 26	TWC Order entered
	[4 days for prep. & sig. of Order]
May 23	TWC Hears Examiners Report & Exceptions
	[21 days for Exceptions & Replies]
May 2	Examiners Report
	[14, not 30, working days for preparation of report]
April 18	Hearing Concludes (Record <u>not</u> left open)
	[two weeks for hearing]
April 7	Designation Hearing Begins

ATTACHMENT #12

KSB KENT S. BUTLER AND ASSOCIATES, INC.
URBAN AND ENVIRONMENTAL PLANNING

2720 Bee Cave Road Austin, Texas 78746 512-327-8612

February 21, 1986

Mr. Adrian Freund, Acting Chief Environmental Officer
City of Austin
Department of Planning and Growth Management
P.O. Box 1088
Austin, Texas 78767

Dear Adrian:

As we previously discussed, our consultant team has significantly increased the level of effort devoted to creation of the Barton Springs-Edwards Aquifer Conservation District in the past several weeks. As a result, we must request an increase in the authorized billing limit for the month of January, 1986. In addition, we are requesting a contract extension beyond January 31 in order to proceed with the district creation process at least until the Texas Water Commission issues an order creating the district and calling for a confirmation election. While the term of our Cooperative Agreement anticipated that the confirmation election would be held in January, 1986, we now know that the earliest possible date that it can be scheduled is the general election date in the second week of August, with November or December elections being distinct possibilities. We anticipate that the hearing process will continue at least through the month of April. As you know, we have significant opposition at the Commissions. Eleven protesting parties, mainly developers and major landowners, have been granted party status by the TWC, in addition to the five applicant municipalities involved in the case. While we hope for an expeditious hearing process and have been successful thus far in receiving very favorable rulings from the TWC, we inevitably will have to devote considerable effort to prevail in this case.

Our additional efforts during the month of January which exceeded the prior authorized contract limits were devoted to the following tasks: (1) significant increases in communication with Texas Water Commission (TWC) staff in anticipation of the TWC hearings; (2) preparation for a contested hearing before the Texas Water Commission Commissioners; (3) additional meetings and responses to inquiries from municipal staff, councilmembers, affected property owners and their legal counsels; (4) delineation and verification of the jurisdictional boundaries of the proposed district; and (5) legal analysis and review of voting precinct boundaries for the confirmation and directors' election.

Our scope of work beyond the January 31 date is, and will continue to be, devoted to the following tasks: (1) legal and technical research; (2) discovery, preparation and production of briefs, other documents, and oral depositions, and other pretrial matters; (3) presentation of the applicants' case at TWC hearings; (4) analysis and delineation of directors' precincts; (5) attendance and technical support at meetings of the cooperating municipalities; and (6) participation in other hearings on proceedings closely related to the creation hearings. It is anticipated that all costs of these tasks are reimbursable by the district once it is created.

Our Cooperative Agreement with the municipalities imposes a limit on billable labor and expenses at $6,680.00 per month unless prior authorization for a larger amount is granted by the municipalities. The Agreement provides for modifications to the scope of work or duration of the program, subject to prior written authorization from the municipalities. The Agreement also authorizes any individual municipality to make modifications or increase its level of support. Such actions are subject to the consent of the other municipalities.

Specifically, we are requesting two modifications to the Agreement. The first is an authorization to bill the City of Austin for additional services rendered through January 31, 1986 which exceed the amount authorized in the original Agreement. I estimate that the net additional cost of services through January 31 is approximately $10,000. The second modification is an extension of the Agreement whereby we will bill the City of Austin on a time and materials basis beginning January 31, 1986 for the scope of services described above, until the date the TWC order creating the district and authorizing the confirmation election becomes final. It is impossible to accurately predict the cost of legal and technical services from February 1 to the date of issuance of the TWC order. I estimate that during active contested proceedings, the cost will be in the range of $10,000 - $15,000 per week. At other times, the cost should not exceed $10,000 - $15,000 per month. If the hearing process moves along smoothly and without substantial requests and cross examinations by the other parties, the cost will be considerably less. On the other hand, if the hearing examiner allows a prolonged hearing with significant numbers of witnesses and testimony and cross examination by the other parties, the costs could just as easily exceed the estimate.

In the attached Amendments to the Cooperative Agreement, we request authorization to bill the City of Austin on a monthly basis. We are requesting authorization to bill each of the other municipalities on a monthly basis for the extension period at the same rate as specified in the original Agreement.

Since the contribution to the program by each of the other municipalities is quite substantial on a per capita basis (approximately $0.75 per capita per month), they are not in a position to increase their monthly level of funding support.

Please review the attached amendments to the Cooperative Agreement and allow the City Manager and City Council to review and approve the document at their earliest convenience. I certainly appreciate your assistance in moving the program along towards the creation election and in responding to this request for modifications to the Agreement.

I am available if you have any questions.

Sincerely,

Kent S. Butler, President
Kent S. Butler and Associates, Inc.

KSB/plr

cc: Douglas Caroom
Norman Standerfer

ATTACHMENT #13

KSB KENT S. BUTLER AND ASSOCIATES, INC.
URBAN AND ENVIRONMENTAL PLANNING

2720 Bee Cave Road Austin, Texas 78746 512-327-8612

April 8, 1986

Mr. Jorge Carrasco, City Manager
City of Austin
Austin, TX 78767

Dear Jorge:

I understand that our request for additional funding, pursuant to creation of the Barton Springs-Edwards Aquifer Conservation District, is scheduled for City Council action tomorrow. As you recall, we anticipated that the initial budget authorization would be fully commmitted before the end of March. The first of the hearings before the Texas Water Commission, on the matter of designation of boundaries of the Underground Water Management Area, began Monday, April 7. We are proceeding in accordance with the attached schedule which was submitted as an attachment to our contract with the City.

As we estimated a few weeks ago, the maximum costs associated with the creation of the District would be $10-15,000 per month during periods when depositions or hearings are not in session and $10-15,000 per week when such proceedings are in session. On that basis, we are estimating that the maximum budget required to complete all the proceedings before the Water Commission is $100,000.

I understand the difficulties in justifying budget authorizations for legal proceedings. Nonetheless, we are making timely and substantial progress in the proceedings. Our contract provides for milestones at which points the progress can be evaluated and decisions can be made either to proceed or withdraw from the proceedings. We will respond to the Council's requests on the budget request in whatever manner we can.

I will be an expert witness at the hearing all day tomorrow, but will be ready to attend the Council meeting after 5:30 PM if any councilmember needs to pull the agenda item for further discussion and would like me to be there. Thanks very much for your assistance on this matter.

Sincerely,

Kent S. Butler

Kent S. Butler, Ph.D.

enclosure

9-12-
From Butler
File

MEMORANDUM

TO: Mr Jorge Carrasco, City Manager

FROM: Kent S. Butler, Ph.D.

RE: BARTON SPRINGS-EDWARDS AQUIFER CONSERVATION DISTRICT
BIWEEKLY STATUS REPORT, FOR PERIOD ENDING APRIL 9, 1986

(1) DISCOVERY MOTION

On February 19 a motion for discovery was granted by the hearing examiner for the proposed District. In late February the five applicant municipalities and Kent Butler fulfilled the request for production of all documents in their posession relating to the proposed District. Several City of Austin staff members were required to make a very substantial effort in an extremely short time period, but they were very responsive and satisfied all the discovery requirements. A documents room was set aside at Bickerstaff Heath and Smiley for temporary storage and review of the documents.

(2) DEPOSITIONS

The parties to the hearing deposed Raymond Slade, Josh Farley, and Kent Butler prior to the commencement of the hearing on designation of the boundaries of the Underground Water Management Area. The depositions began on February 28 and were completed on March 24. Attorneys for eight of the parties to the hearing participated in the depositions. Mr. Slade's deposition continued for approximately five days. Mr. Farley's deposition was compoeted in one day. Dr. Butler's deposition continued for two weeks

(3) ADOPTION OF TEXAS WATER COMMISSION RULES PERTAINING TO CREATION OF UNDERGROUND WATER CONSERVATION DISTRICTS

After extensive discussion and proceedings before the hearing examiner and TWC Commissioners about the need for new administrative rules for underground water district creation as a result of the adoption of House Bill 2

(the Omnibus Water Bill) in the 69th Legislature, the parties agreed to go before the TWC and request that rules be adopted. Several of the parties requested that the Commission go through the process of publication, notice and public review of proposed permanent rules prior to continuance of the pending hearing. However, counsel for the applicant cities argued for adoption of emergency rules so that the hearing process could continue on schedule.

On March 11, the TWC adopted emergency rules, effective immediately, thereby allowing the hearing process to continue. In accordance with the statutory provisions, two separate hearings were required--one for designation of the Management Area and the other for determination of the feasibility and benefit of the District. The hearing examiner then adopted a schedule for depositions and hearings, the first hearing to begin on April 7.

(4) HEARING ON THE DESIGNATION OF AN UNDERGROUND WATER MANAGEMENT AREA

On April 7 the hearings on designation of the Underground Water Management Area were initiated. The first hearing is expected to continue until the middle of the week of April 14, as originally projected. Witnesses will include Dr. Tommy Knowles of the TWC, Dr. Kent Butler representing the applicant cities, and witnesses called upon by the attorneys for the other parties.

(5) SEVERANCE OF RECHARGE RESERVIOR AREA FROM DISTRICT

Concerns were raised by landowners in the Onion Creek-Driftwood area about the proposed recharge enhancement reservoir project. Two of the affected landowners were granted party status in the hearing before the TWC. With the concurrence of the steering committee for the applicant cities, the reach of Onion Creek along which a reservoir might be constructed had been included within the boundaries of the proposed District. While such a project had not been formally endorsed or sponsored by the applicant cities, it had been considered as a potentially important option for management of the Aquifer. Such a project could only be carried out by the District if the

affected lands were inside the District; hence, the lands were initially included in the proposed District.

At the January 27 hearing before the TWC, the applicant cities requested that the recharge reservoir area be removed from the proposed District. But the Commissioners ruled that the hearing be continued with the area remaining inside the District. Controversy over the impacts of such a project increased to the point that the applicant cities had to respond to the affected parties in a substantive manner. Steering committee members from the applicant cities and their counsel held two meetings with the concerned landowners, Sierra Club representatives, and Senator Gonzalo Barrientos, who acted as a facilitator. The meetings resulted in the establishment of a framework for an agreement among the interested parties. A draft Agreement was prepared. Between April 1 and 3, the city councils adopted resolutions supporting the signing of the Agreement and it was signed by all parties as of April 4. On April 8, the TWC entered an Order removing the recharge reservoir area from the District for the remainder of the proceedings before the Commission, thereby "ratifying" the Agreement between the parties.

(6) STATUS OF PARTIES TO THE HEARING

There have been a few recent changes in the parties to the hearing. As a result of the above-mentioned Agreement, Judge Bob Shannon and family interests as well as the Zimmerman brothers have withdrawn all opposition to the District.

On April 7 at the prehearing conference, attorney Martha Terry announced that she no longer represented the Goforth Water Supply Corporation. It is possible that the Gorforth WSC will reverse its position and resolve to support the District.

Also on April 7, the hearing examiner allowed the LCRA to intervene in the hearing and be granted party status. The LCRA is on the record in support of the creation of the District, as proposed by the applicant municipalities.

ATTACHMENT #14

April 21, 1986

Mayor Frank Cooksey
City of Austin
P.O. Box 1088
Austin, TX 78767

Dear Mayor Cooksey:

We understand that the City Council will be considering an extension to the budget at the Tuesday afternoon meeting for the Edwards Aquifer District hearing before the Texas Water Commision. Although we are meeting often as a steering committee to monitor the progress of our efforts, we haven't had the same opportunity to meet with you and the Austin councilmembers to let you know of our concerns about water supply in the area.

Our primary concern in pursuing the creation of the District is to make certain that the quantity and quality of water in the aquifer will be protected. We are not trying to control land development by proposing the District, but it is essential that people who will buy homes in the area, as well as those of us who already live here, are assured of an adequate and sustainable water supply. The only available means of managing the aquifer is the creation of this underground water conservation district.

Our cities' contributions are very small compared to those of Austin. We have worked very hard and made monthly payments at the rate of approximately $0.65 per capita for the past eighteen months. The smaller cities could not have pursued this effort had they not united in their efforts and combined their resources. And they certainly wouldn't be able to follow through the hearing without Austin's support. As fellow councilmembers, we want to express appreciation for your past help as we seek your continued support on this extremely important issue.

TWS
From
Buda
City File
9-12-88

Sincerely,

Mayor of Buda

Mayor of Hays

Mayor of San Leanna

Mayor of Sunset Valley

ATTACHMENT #15

Austin City Council
MINUTES

For SPECIAL CALLED MEETING - APRIL 23, 1986 - 4:00 P.M.
4TH FLOOR AUDITORIUM OF THE CENTRAL LIBRARY

Council Chambers, 307 West Second Street, Austin, Texas

Memorandum To:

Mayor Cooksey called to order the special called meeting of the Council, noting the absence of Mayor Pro Tem Trevino.

WORK SESSION

Council held a work session on City Wide Sector Councils, with a-report received by Mr. Mahoney. Marie Gaines had a discussion with Council during the work session concerning Zoning Devinitions and Cycle. The Edwards Aquifer Conservation District was also discussed during the work session.

CITY MANAGER REPORTS

The report on Community Revitalization Committee of the Austin Board of Realtors was postponed to April 24, 1986. Reports were presented on Social Service Agency Funding Policy and Brackenridge Hospital - Second Quarter Report. Emergency Housing Voucher and Windsor Village Library were not presented.

Council did not enter into executive session.

ADJOURNMENT

Council adjourned its meeting at 6:10 p.m.

ATTACHMENT #16

R E S O L U T I O N

WHEREAS, by resolution dated March 13, 1986, the City Council authorized the City of Austin ("City") to enter into a Cooperative Agreement between Kent S. Butler & Associates, Inc. and the cities of Austin, Buda, Hays and Sunset Valley, and the Village of San Leanna ("City of Austin, et. al.") which provided for the hiring of Kent S. Butler & Associates, Inc. for professional planning services and the subcontracting of Bickerstaff, Heath and Smiley for legal services in connection with the creation of an underground Water Conservation District for the Barton Springs-Associated Edwards Aquifer ("District"); and,

WHEREAS, pursuant to said Cooperative Agreement, the City of Austin committed itself to and did appropriate an expenditure of $60,000.00 for the City's share of the services to be provided by Kent S. Butler & Associates, Inc. and Bickerstaff, Heath and Smiley for the creation of the District; and,

WHEREAS, Kent S. Butler & Associates, Inc. has provided and continues to provide its services to the City of Austin, et. al. pursuant to said Cooperative Agreement and has expended all of the monies appropriated, including the $60,000.00 appropriated by the City of Austin; and,

WHEREAS, the creation of the District remains a pending case before the Texas Water Commission, subject to discovery

and hearing procedures, before an election for said District can be called; and,

WHEREAS, in order to continue to provide the City of Austin, et. al. with said professional services, the City of Austin, et. al. and Kent S. Butler & Associates, Inc. must execute an amendment to said agreement authorizing an additional expenditure of $100,000.00 for said services; Now, Therefore,

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF AUSTIN:

1. That the City Manager or his designee be, and is hereby authorized to enter into an agreement amending the Cooperative Agreement between the City of Austin, et. al. and Kent S. Butler & Associates, Inc., which amending agreement is attached hereto as Exhibit "A" and made a part hereof for all purposes; and,

2. That the City of Austin hereby authorizes an additional expenditure of no more than $100,000.00 for the costs and expenses of Kent S. Butler & Associates, Inc., pursuant to the terms of the amending agreement attached hereto as Exhibit "A."

ADOPTED: Apr. 24, 1986. ATTEST: James E. Aldridge
James E. Aldridge
City Clerk

24APR86
MIC:mtc
res 2/MC

AMENDMENT

TO

COOPERATIVE AGREEMENT

Between the
City of Austin,
City of Buda,
City of Hays,
Village of San Leanna,
City of Sunset Valley,
and
Kent S. Butler & Associates, Inc.

A. Pursuant to Section IV of the Cooperative Agreement, the parties agree to the following amendments:

1. Sections III and IV of the Cooperative Agreement are amended to increase the maximum total budget amount from $70,080.00 to $170,080.00.

2. Section III Of the Cooperative Agreement is amended to increase the monthly payment of the City of Austin from $10,000.00 to $33,333.00, and increase the total of the monthly payments from $11,680.00 per month to $35,013.00 per month.

B. All other provisions of the Cooperative Agreement shall remain in full force and effect.

C. The effective commencement date of this Amendment to Cooperative Agreement shall be April 1, 1986.

D. The original Amendment to Cooperative Agreement may be executed by the parties on multiple copies.

ACCEPTED AND AGREED TO:

PARTY: CITY OF AUSTIN

BY:_____ DATE SIGNED:_____

TITLE:_____

EXHIBIT "A"

PARTY: CITY OF BUDA

BY:_____ DATE SIGNED:_____

TITLE:_____

PARTY: CITY OF HAYS

BY:_____ DATE SIGNED:_____

TITLE:_____

PARTY: VILLAGE OF SAN LEANNA

BY:_____ DATE SIGNED:_____

TITLE:_____

PARTY: CITY OF SUNSET VALLEY

BY:_____ DATE SIGNED:_____

TITLE:_____

PARTY: KENT S. BUTLER &
ASSOCIATES, INC.

BY:_____ DATE SIGNED:_____

TITLE:_____
CONSULTING PLANNER

ATTACHMENT #17

CITY OF AUSTIN, TEXAS

ORDINANCE NO. 86 0424-B

AN ORDINANCE AMENDING THE OPERATING BUDGET FOR THE FISCAL YEAR 1985-1986, BY APPROPRIATING $100,000.00 FROM THE GENERAL FUND ENDING BALANCE FOR THE PURPOSE OF PROVIDING FUNDS FOR THE COST OF PROFESSIONAL SERVICES PROVIDED BY KENT S. BUTLER ASSOCIATES ASSOCIATED WITH THE CREATION OF THE EDWARDS AQUIFER CONSERVATION DISTRICT; SUSPENDING THE RULE REQUIRING THE READING OF ORDINANCES ON THREE SEPARATE DAYS; AND DECLARING AN EMERGENCY.

BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF AUSTIN:

PART 1. That the operating budget for the fiscal year 1985-1986 be, and the same is hereby amended by appropriating $100,000.00 from the General Fund ending balance for the purpose of funding the cost of professional services provided by Kent S. Butler Associates associated with the creation of the Edwards Aquifer Conservation District.

PART 2. The need to fund the creation of the Edwards Aquifer Conservation District creates an emergency and an emergency is hereby declared to exist; therefore, the City Council hereby declares that the grave public necessity of providing funds for the purpose of funding the cost of professional services provided by Kent S. Butler Associates constitutes an unusual and unforeseen condition, which could not, by reasonable diligence, thought, and attention, have been included in the original budget for the current fiscal year. Therefore, the rule requiring the reading of ordinances on three separate days is hereby suspended and this Ordinance is hereby passed and adopted as an emergency measure and shall be effective immediately upon its final passage and adoption as provided by the Charter of the City of Austin.

PASSED AND APPROVED §

§

§

April 24, 1986 §

Frank C. Cooksey
Mayor

APPROVED: Paul C. Isham
Paul C. Isham
City Attorney

ATTEST: James E. Aldridge
James E. Aldridge
City Clerk

24APR86
DLG:mtc
9/ORD3

ATTACHMENT #18

Smith wants user fee to fund aquifer district

Plan is second bill filed on water source

By Bill McCann 2-15-87
American-Statesman Staff

A bill that would require the Barton Springs-Edwards Aquifer Conservation District to finance its operation from user fees rather than property taxes was filed Thursday by state Rep. Terral Smith.

The fees would apply to the major users of the aquifer, including large businesses, several cities and two water supply companies, said Smith, R-Austin. Residents of single-family homes served by individual wells would be exempt from the fee, he said.

The district, authorized last year by the Texas Water Commission, is designed to protect the aquifer from overpumping and pollution. The aquifer is a water-bearing geological formation that is a source of drinking water and the source of Barton Springs. The district's boundaries enclosed a 155-square-mile area in southern Travis and northern Hays counties from the Colorado River to Kyle.

A rival bill that proposes a combination of fees and taxes to finance the district was filed last month by state Sen. Gonzalo Barrientos, D-Austin. The Barrientos bill would set a maximum property tax rate of 5 cents per $100 of assessed valuation, would allow the district to impose fines for violation of its rules, and would prohibit the board from adopting land-use regulations in areas already under such controls. State law currently allows a district to charge up to 50 cents per $100 valuation.

The district's temporary board of directors has pledged support for the Barrientos bill, but has voiced opposition to any legislation that would finance the district's operation solely by user fees. Smith had announced in December that he intended to file a bill to prohibit the district from imposing taxes.

Board members said Smith's plan would hurt the district's ability to pay for its operations because the fees could not generate adequate revenue without being set at unreasonably high levels. High user fees could draw a legal challenge, they said.

The board has set an August election of voters within the district's boundaries to seek final approval of the district, approval of a tax of 1 cent per $100 valuation, and election of a permanent board.

The district has received support from many political leaders and communities, including Austin. But it has been publicly opposed by some large landowners and developers concerned about taxes and by possible land-use controls that would duplicate those of Austin or other communities.

While backers of the district say the public strongly supports protecting the aquifer, they acknowledge facing a tough battle convincing voters to approve a tax to pay for it.

Smith called his bill a compromise, which he said would be acceptable to residents.

Smith said his bill includes a safety clause specifying that if the user fees are found to be unconstitutional by the Texas Supreme Court, the district can go back to the voters to seek a property tax of up to 5 cents per $100 valuation.

Under his bill voters would not be asked to confirm the district's creation, Smith said. Instead, the district would be formally established when the legislation is signed by the governor, he said. Voters would be asked to elect a permanent board of directors, however. The temporary board was approved by the Water Commission.

Smith said his bill bars the district from imposing land use controls. It also expands the district boundaries to include areas served by two water supply corporations that get water from the aquifer.

Major water users would be charged based on the size of the pipe used in the water well, on the production capacity of the well, or the amount of water produced. While the bill does not specify a figure, Smith said a fee of 27 cents per 1,000 gallons of water used would raise $300,000 a year to finance the district.

THIS NOTE

Attachment #19

Lenders look for borrowers

But it's a whole new ball game

By Kirk Ladendorf
American-Statesman Staff

Austin bankers say they are now ready, willing and able to extend credit where credit is due. But there's a catch: The banks are seeing many local companies, sapped by a slack economy, become less and less creditworthy.

Austin bankers say they must look harder than ever to find a bankable deal in town. Their loan rejection rate remains high because would-be borrowers are unable to show the profits, cash flows and strong balance sheets required by conservative lenders.

Borrowers, on the other hand, have criticized Austin banks for the past two years, claiming they were either too weak or too meek to make new loans to qualified customers.

The credit crunch, business people claimed, was pinching expansion by healthy companies at a time the city most needed new jobs.

The director of a downtown bank faults the no-risk attitude that bank managers are taking now.

"There is going to have to be some risk-taking, some loosening of credit in this town," he said, "or else we will be in this thing a lot longer and you're going to see more businesses go under."

Some bankers, however, now say that many of those past criticisms were justified, because local institutions were suffering the hangover effects from their binge of real estate lending in the early 1980s. The banks were preoccupied with problem loans and, for some of them, dwindling capital curtailed their capacity to extend new credit.

But most of those past problems are now cured, bankers say.

The recapitalization of First City Bancorporation of Texas and the pending reorganizations of NCNB Texas (formerly First Republic-Bank Corp.) and Texas American Bancshares, have brought in new capital to propel more lending.

In addition, the acquisition of Allied Bancshares by First Interstate Bancorp. of Los Angeles and the merger of Texas Commerce Bancshares into Chemical New York Corp. has bolstered those companies' capital strength.

Not everyone, however, goes along with the bankers' contention that all is well.

Another director at one major downtown bank said he didn't see much lending activity at his institution or in many others in Austin.

"There's all kinds of [illegible]," said the director, who asked that his name not be used. "They have so many bad loans, they are in damage control. Credit is really tough right now. The banks have so much bad experience that business development is almost at a standstill. They are almost afraid to go calling (on potential loan customers)."

Real estate broker Bob Easter said he was turned down by five banks when he tried to finance a relocation service to supplement his real estate sales firm a year ago.

"If we had been dependent on the banks to run our business, we'd be out of business," he said.

Easter went ahead and started the relocation service, financing it from retained profits. He said his real estate firm remains profitable, with sales running at about $8 million a month.

"There is always a bright side to this," Easter said. "I won't need the bankers in the future. I'm going to make sure our company doesn't need them — they weren't there when I needed them."

Some bankers, but not all, argue that Austin really hasn't seen "normal" lending conditions or practices during much of this decade.

See Lenders, D10

Lenders From D1

During the boom years, banks were too liberal in extending credit and took too many risks. Then, under regulatory and economic pressure, they cut off much new lending to pause and lick their wounds.

Only now, some bankers say, are banks back on track as cautious and conservative lenders.

"We got confused as bankers," recalls Guy Bodine, president of NCNB Texas National Bank's Austin operations, of the go-go lending policies during Austin's rapid growth years in the early '80s. "We created an expection in the market that the proper role of the banker was to become the equity partner."

Now that bankers are back on track, Bodine says, they must re-educate their customers about what is a bankable deal in the post-boom economy.

Bankers say the prerequisites for making a business operating capital loan include: experienced management; an ability to stay profitable in a tough market; strong collateral that a bank can liquidate in the event of a default; and a secondary source of repayment. For a small business, the secondary source of repayment is frequently a personal guarantee from the owner whose net worth needs to be large enough to repay the loan personally if the business cannot.

Because solid, bankable business loans are in short supply, local bankers have fallen back on recruiting customers from their competitors, particularly those competitors that are mired in loan problems.

Bodine acknowledges that his bank lost some customers during its well-publicized economic difficulties in the first part of this year, when First RepublicBank Corp. was forced to seek assistance from bank regulators to remain open.

But since the reorganization of First RepublicBank into NCNB on July 31, the bank's loan officers have gone back to playing offense.

Bodine said he has personally made three times as many customer calls since July 31 as he did in the first half of the year.

"We're making a lot of calls on customers and we're starting to call on other banks' customers," Bodine said last week. "We're going to be out looking for (loan) applicants, but we're going to be selective."

Bankers will compete for good loans based on rate and terms, Bodine said, but he doubts they will loosen credit standards much.

Bodine's rival bankers express much the same attitude. Yes, they are out looking for new loans, but they will be insisting on conservative loan standards.

"We have a lot of liquidity in our banks," said Mike Battle, Austin chief executive for First InterState Bancorp. "We are actively in the market in a calling program, but it's requires an awful lot of looking (to find qualified loan prospects)."

Battle glances at a list of loan applications turned down by the bank. The reasons mentioned include: debt loads that are too heavy; insufficient cash flow from business operations (the most frequent reason mentioned); inadequate collateral; and "no secondary source of repayment."

"It is very easy to be an intelligent banker when the economy is in a robust curve," Battle said, "but it is a lot more challenging in these times."

Battle said his bank is making a systematic survey of its lending prospects to identify the pockets of opportunity in town.

Many of the companies that sell to the Central Texas market have seen revenues fall off 20 to 50 percent from the height of the boom, Battle said.

Only the best managers have been able to keep those businesses profitable and healthy, Battle said.

Other businesses, including high-tech firms, that are selling to a national or international markets, are seeing rapid sales growth, Battle said.

"Their growth has been such that they have outstripped their borrowing capacity," Battle said.

First Interstate, as well as many other bankers, are promoting Small Business Administration-backed loans for local businesses that are short on funds. The bank is also promoting a kind of asset-based lending for some businesses that is similar to factoring — where the bank itself controls much of the business' cash flow and carefully monitors business inventories.

Despite an agressive calling effort, Battle expects his bank's business and executive and professional lending to be flat for this year before it begins to grow at a healthy pace in 1989.

Battle said small businesses in Austin are looking for more than a source of credit.

"People are looking for relationships," he said. "Someone who is able to understand the financial needs of the companies for credit and noncredit services."

James Saxton, chairman of Texas Commerce Bank-Austin, said his bank is also looking for solid business loans, but making such loans is not the quickest way to restore the bank to profitability.

A profitable new loan generates only a 1 to 3 percent return for the bank, Saxton said, while restoring a non-performing asset to performing status results in a much greater boost in the bank's earnings.

As a consequence, Saxton said, his bank continues to put heavy emphasis on working with its sizable portfolio of non-performing loans, which stood at $183.3 million on March 31, or 19 percent of the bank's total loans.

Bodine said Austin bankers need to do a better job of educating loan customers about what conservative loan standards are. Banks, he believes, aren't helping anyone when they extend credit to weak borrowers as they did during the boomtimes.

"We lent too much money (in the early 1980s) into a market that didn't have the capacity to absorb it," Bodine said. "We really got away from the basics.

"We have to be willing as bankers to share in the blame for where this town is — for the capacity (in real estate developments and new businesses) that was created that wasn't needed. We have to acknowledge that we made a lot of mistakes."

1. WHAT IS THE BARTON SPRINGS — EDWARDS AQUIFER CONSERVATION DISTRICT?

It is a proposed district which would be established for the purpose of managing and protecting the water in the Edwards Limestone Aquifer associated with Barton Springs. (An aquifer is an underground reservoir which can be used as a water supply.)

The enabling authority for management of the Edwards Aquifer exists under Chapter 52 of the Texas Water Code, which allows the creation of an Underground Water Conservation District to manage and conserve an aquifer for the benefit of people who live on the overlying land or depend upon the Aquifer for their supply.

2. WHY IS THE DISTRICT NECESSARY?

The Edwards Aquifer needs to be managed and protected from two threats: water depletion and pollution.

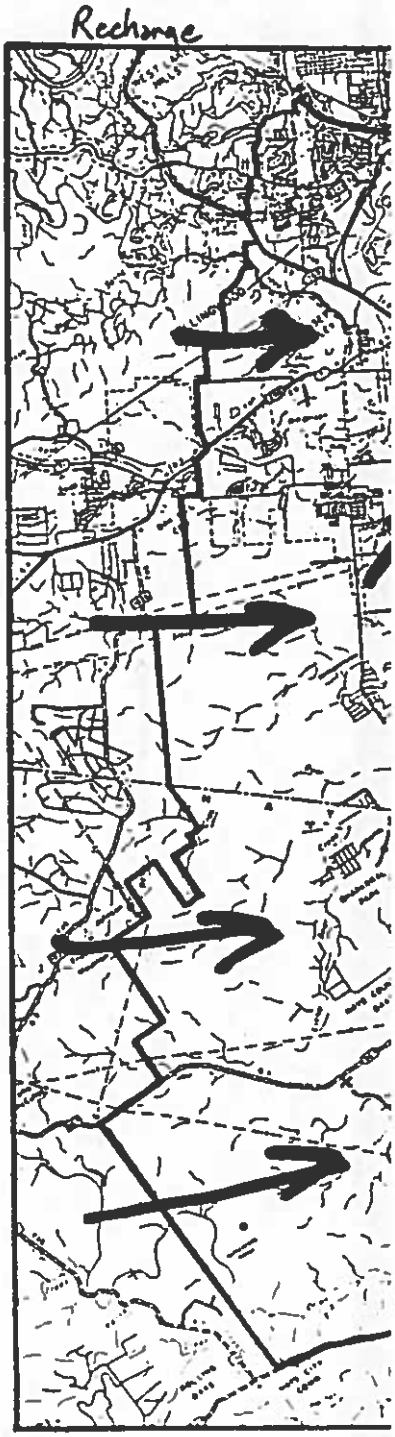
WATER DEPLETION — Suburban development of land overlying and next to the Edwards Aquifer is occurring at unprecedented rates. The population over the Edwards Aquifer is predicted to increase by 86,000 people by the year 2000. Projections of pumpage from the Aquifer indicate that large sections could be dewatered, even under normal rainfall conditions, if unrestricted pumpage is allowed. Without the District or new legislation, no legal mechanism exists to prevent overpumping. The water supply of many thousands of people may be jeopardized.

Barton Springs is fed by the upper 10% of the Edwards Aquifer--this portion will be dewatered first by overpumping. By the year 2000, unregulated pumpage could result in extremely low flow of poor-quality water at Barton Springs, even under non-drought conditions.

POLLUTION — The Edwards Aquifer is a limestone formation. Surface streamflow and overland runoff recharges the Aquifer very rapidly. Very little filtration of the surface water occurs during the recharge process. For this reason the Aquifer is vulnerable to contamination from surface sources of pollution such as domestic and industrial waste and stormwater runoff.

3. WHERE IS THE EDWARDS AQUIFER AND THE PROPOSED DISTRICT?

The accompanying map outlines the approximate boundaries of the Edwards Aquifer associated with Barton Springs. The District would cover the same area as the Aquifer. It includes approximately 155 square miles in northern Hays and southern Travis counties. The Aquifer ranges in thickness from 0 to 450 feet from west to east. Its waters are recharged primarily from stream flow in Onion, Big Bear, Little Bear, Slaughter, Williamson, and Barton creeks.



THE PROPOSED BARTON SPRING

WARDS AQUIFER CONSERVATION DISTRICT

4. WHO SUPPORTS THE CREATION OF THE DISTRICT?

City councils and the board of aldermen from municipalities overlying the Aquifer have adopted resolutions supporting creation of the District. They include Austin, Buda, Hays, Mountain City, San Leanna, and Sunset Valley.

Every Texas legislator whose district overlies the Aquifer has written letters and worked to support the creation of the District. They include Senator Gonzalo Barrientos and Representatives Anne Cooper, Lena Guerrero and Terral Smith.

Many public interest organizations and hundreds of individuals have endorsed the creation of a district, either under the authority of the Texas Water Code (as is now proposed) or by an act of the Legislature. Some of the organizations that have supported a district include the League of Women Voters, Sierra Club, United South Austin, Save Austin Neighborhoods and Environment, Save Bear and Onion Creeks Coalition, Save Barton Creek Association, and We Care Austin.

5. WHAT POWERS AND DUTIES WOULD THE DISTRICT HAVE?

If the persons residing within the area of the proposed District vote to create the district, the elected board of directors may make and enforce rules to provide for the conservation, preservation, protection, recharge, and prevention of waste of the Aquifer.

Specific powers and duties would include the following:

a. develop plans for groundwater use, conservation, and prevention of waste;
b. conduct surveys and research;
c. regulate pumpage of water from wells and require permits for drilling and equipping of wells (with exceptions for low capacity wells);
d. regulate open or uncovered wells or illegal drilling or operation of wells;
e. issue bonds and levy taxes subject to an election by residents within the District;
f. acquire land to build projects to enhance the natural recharge of the aquifer;
g. employ a manager and retain an engineer, geologist or others, as necessary.

A maintenance tax of a couple of cents per one hundred dollars valuation would be necessary to carry out the functions and duties of the District.

6. HOW AND WHEN WOULD THE DISTRICT BE CREATED?

The District would be created through these steps:

1. Residents would petition the Texas Water Commission to designate the boundaries of the Aquifer management area and authorize a confirmation election to be held;
2. The Water Commission would schedule hearings on designation of Aquifer management area boundaries and creation of the District;
3. An election would be held to determine if the District is to be created and, if so, to elect a Board of Directors.

The timetable for accomplishing these tasks is as follows:

Late summer - early fall 1985: Collection of petition signatures and submittal of petition;
Spring - Summer 1986: Hearings before the Texas Water Commission;
January 1987: Confirmation election.

7. FOR MORE INFORMATION, YOU CAN CONTACT THE FOLLOWING:

1. Kent S. Butler, Director of Natural Resource Policy and Programs at the Lower Colorado River Authority: 473-4080
2. Douglas G. Caroom, attorney with Bickerstaff, Heath and Smiley in Austin: 472-8021
3. Texas Water Commission: 463-7830
4. Texas Water Development Board: 463-7847

THE BARTON SPRINGS — EDWARDS AQUIFER CONSERVATION DISTRICT

A PROPOSAL TO CREATE AN UNDERGROUND WATER CONSERVATION DISTRICT IN HAYS AND TRAVIS COUNTIES.

Sponsored by the municipalities of
Austin, Buda, Hays, San Leanna,
and Sunset Valley, Texas
and the Lower Colorado River Authority.

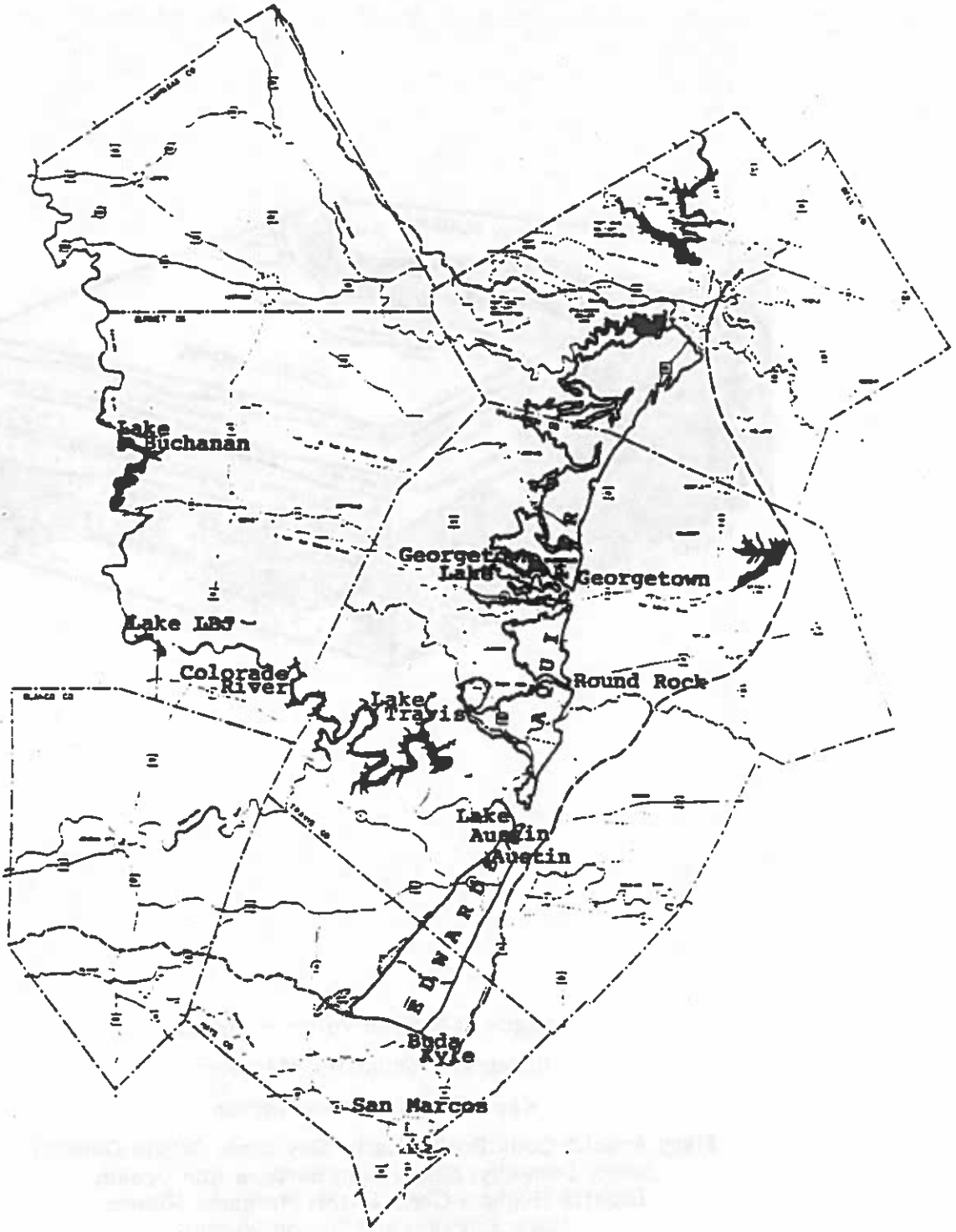
Karen Vosenik

SPEECH OUTLINE

1. Importance of the unique and valuable resource as a high quality water supply & Barton Springs recreation. The interdependence between urban and rural needs and between surface water (river and streams) and ground water (aquifers) should be made. Indicate the fragility of the system at to rapid recharge of the aquifer after rainfall which could carry pollutants. (LWV Study)
2. Need for the district as protection from overpumpage and pollution. Drought brings drawdown of wells as does the lack of conservation. Note that overpumpage not only depletes the supply but affects water quality as poorer quality water from other aquifers is able to move into the Edwards . The bad water line (poor quality water of 3000 or more parts per million total dissolved solids such as sodium chloride, magnesium chloride and others) to the eastern boundary of the aquifer is relatively fixed in Hays County but there is considerable movement of this line near the Colorado River in Travis County. (Butler Paper
3. Grassroots efforts began over three years ago with the small cities totally dependent on the aquifer for a water supply. Legislative effort failed in the last legislative session.
4. Legal aspects of Ch. 52 district vs. legislatively created districts. (Legal Page)
5. The election process. (Election Page)
6. Funding for the district. A low tax rate of 1-2¢/$100, approved by voters at the same time as the district confirmation election would fund the district. The average property owner would pay only $10-20/year. Ch. 52 has a limit of 50¢/$100 and other water districts already established operate at the level of 1-2¢/$100 valuation. Legislation is under consideration to limit the tax to 5¢; none of the other districts have assessed even 5¢ in the past. (Butler paper
7. Powers and functions of the district. (Legal Sheet + Butler Paper)
8. Re-emphasize the need to protect our natural resources for future generations.

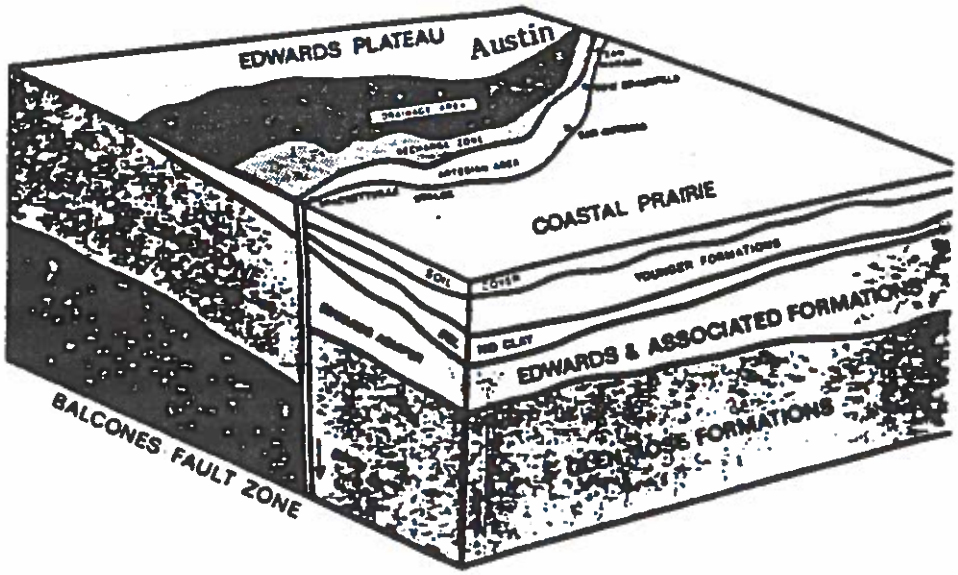
Ask for volunteers, contributions to T.A.P., distribute brochures, offer to speak to other groups.

THE EFFECT OF URBANIZATION ON AUSTIN'S WATER RESOURCES



League of Women Voters - Austin
1011 West 31st Street
Austin, Texas 78705

April, 1984



League of Women Voters - Austin

Resource Committee Members

Karen Haschke, Chairperson

Mary Arnold; Cody Brady; Kathy Davidson; Carole Deuser;
Becky Donnelly; Susan Gilg; Barbara Ann Grove;
Loretta Hughes; Chris Little; Margaret Moore;
Mary Schrage; and Sharon Warner

Background:

The League of Women Voters of the Austin Area adopted a local water study at the annual meeting in May, 1983. Interest was expressed in the short-term and long-term water problems of the Austin area, with emphasis on the quantity and quality of water availability, and on flood control to a lesser degree. The exact focus of the study was left to the discretion of the resource committee. Our purpose is to provide information on the water resources of the Austin area, and to establish local positions on which to act for the protection of these natural resources.

State LWV Position in Brief on Natural Resources:

> Action to achieve measures for the protection, conservation, and development of the State's ground water resources as an integral part of the comprehensive State Water Plan.
>
> Action to achieve conservation and judicious development of land and water resources, the improvement of water and air quality, conservation of energy, and development of public transportation in a manner which assures adequate protection of the environment, improvement of the quality of life, and wise use of our natural resources.

National LWV Position In Brief:

> Action for improvement of quality and for planning and management of water resources to meet regional needs and the national interest.

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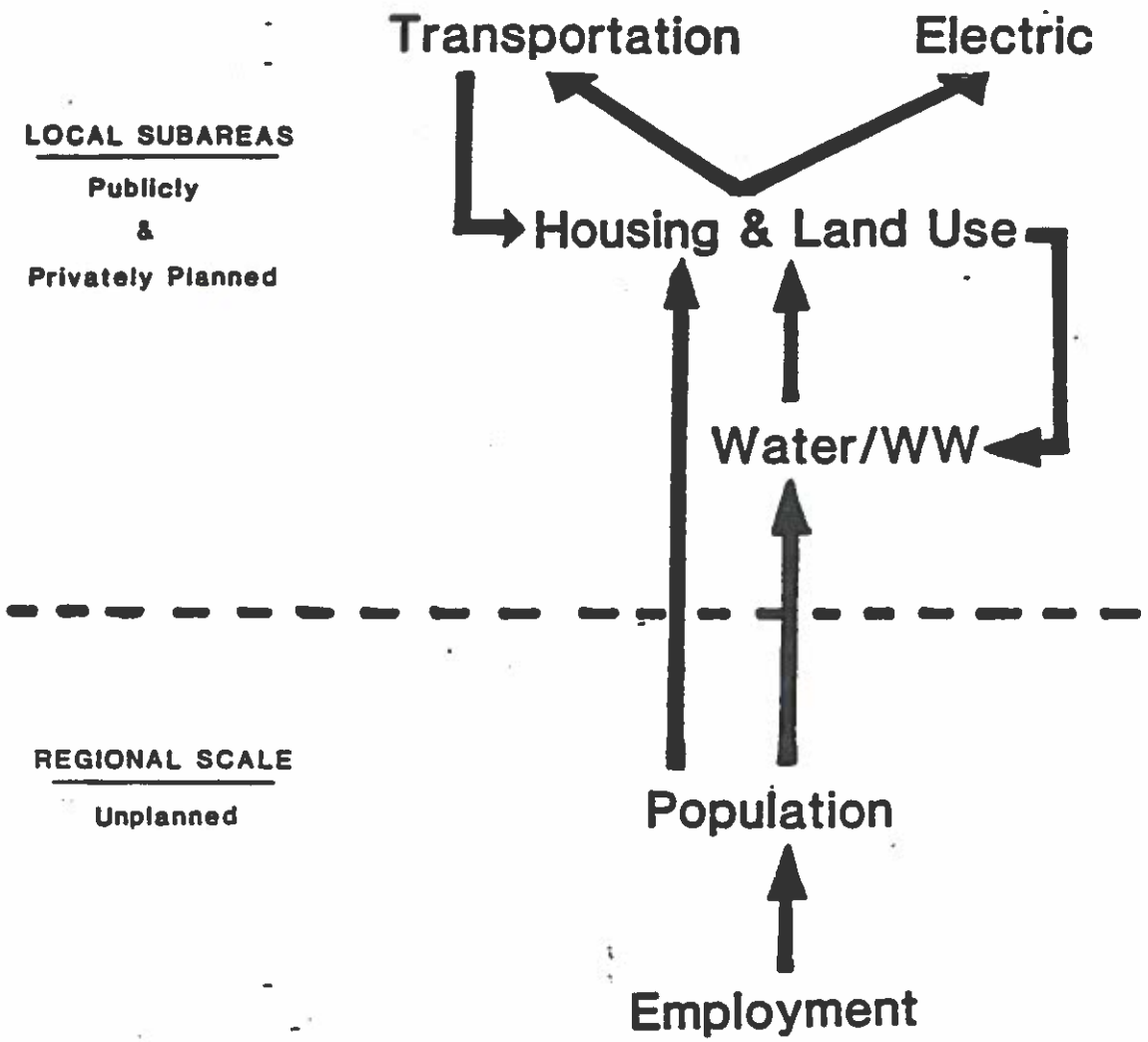
TABLE OF CONTENTS

CROSS RELATIONS in GROWTH PROJECTIONS



DR. DOWELL MYERS
COMMUNITY & REGIONAL PLANNING PROGRAM
University of Texas

I. Introduction

Austin is experiencing unprecedented growth, from a quiet city on the banks of the Colorado River to a technologically-based urban area, spreading from Travis County, north to Williamson County, and south to Hays County, and linked to San Antonio's increasing urbanization by the Interstate 35 corridor. It is generally considered by water officials and environmentalists that Austin's water supply is plentiful compared to other regions of Texas, but what of the future if growth continues, or drought conditions prevail? Can the current supply meet the demands of the city? And finally, can water quality be maintained for both drinking water and recreational purposes?

If high quality water standards are to be maintained it is necessary for citizens to understand (1) water supply; (2) water and wastewater treatment systems; (3) pollution sources; (4) the dangers of water pollution; and (5) what citizens and government can do to prevent pollution of our water resources.

II. Water Supply Sources

Austin's main water supply is the Colorado River to which the city has had senior water rights since 1913. Under the jurisdiction of the Lower River Colorado Authority (LCRA), a seven-dam chain of lakes provide recreation, flood-control, and hydroelectric power generation to the region as well. From Mansfield Dam at Lake Travis, water flows into Lake Austin created by the Tom Miller Dam.

Austin gets a smaller amount of its supply from the Edwards Aquifer groundwater by Barton Springs' natural discharge into Town Lake. For most of the year it is only 5-15% of Town Lake's inflow but can be as much as 80%[1] on some days during the fall-winter months when releases from Mansfield Dam for coastal rice farmers, end. Flow from Barton Springs has been measured periodically since 1894 with an average flow of 32 million gallons per day.

While the Lake Travis watershed[2] of 38,000 square miles is mostly rural and pollution-free Hill Country land, the recharge zone of the portion of the Edwards associated with Barton Springs is 90 square miles of rapidly developing land, which means the aquifer is more vulnerable to becoming polluted.

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[1]According to Mr. Clarence Gilbert, LCRA, exceptions are (1) every two years water is released from Tom Miller Dam to allow Lake Austin to be lowered to kill duckweed and allow dock repair, (2) winter peak electrical demand requires more release from Tom Miller Dam, (3) when the city requests LCRA to release water from Mansfield Dam to flush stagnant water out of Lake Austin or Town Lake.

[2]Interim rules adopted by the Texas Water Development Board in July, 1983, establish water quality management in the Lake Austin and Lake Travis Watersheds. The rules bar direct sewage discharge into the lakes, including tributaries within ten stream miles of the pool levels of the respective lakes until a 2-year study can be conducted to develop an acceptable model for evaluating the impact of treated wastewater discharge into the lakes. Discharges within the ten stream mile area requires secondary treatment and must be discharged to on-channel ponds or storage ponds for land disposal. Beyond ten miles, evaluations are made by the department on a case by case basis. In addition, the board has contracted with the LCRA to study septic tank discharges in the two watersheds.

Recharge to the aquifer and, subsequently, natural discharge or springflow, is affected by amount of rainfall or drought. After rainfall recharge of the aquifer occurs through rocky faults, sinkholes, or seepage through six creekbeds: the Barton, Williamson, Slaughter, Bear, Little Bear, and Onion Creeks and their tributaries. The Edwards is a unique aquifer in that recharge moves very rapidly into the aquifer from runoff over rock or hard clay soils or seepage through thin soils, over the recharge area. In addition, water moves rapidly through the aquifer due to its cavernous nature.

Drilled wells also discharge water from the Edwards Aquifer. At least twenty-five major well fields supplying municipal and industrial usage are within the aquifer area as well as hundreds of privately-owned wells for domestic and agricultural usage. Wells are the sole water source for the growing communities of Kyle, Buda, Sunset Valley, Rollingwood, Creedmoor, San Leanna, and other municipalities and communities. Overpumpage from growth or industrial usage is a risk on these communities' water supply. Natural discharge of springs is affected by pumpage from wells; if the amount of pumpage approaches the amount of mean recharge, springflow at Barton Springs would be subject to a significant reduction in flow.[3]

The occurrence of a groundwater divide near Kyle, Hays County, separates the Edwards Aquifer into two subregions, the San Antonio Region and the Austin Region. These two regions are similar geologically but function independently hydrologically. Since the aquifer is the sole source water supply for the City of San Antonio and other cities along the Interstate 35 corridor, the Texas Legislature and the Texas Water Development Board established the Edwards Underground Water District for the San Antonio Region to protect water quality and increase recharge to the aquifer.

The Austin Region is divided hydrologically at the Colorado River. The southern portion is the source of Barton Springs discharge and runs north from Kyle to the Colorado. The northern portion of the Austin Region extends from the Colorado River through northern Travis, Williamson, and Bell Counties. This area is also affected by increasing urbanization northward from Austin and the cities of Georgetown, Round Rock, Pflugerville, Leander, Cedar Park are also increasing, with neighboring jurisdictions. A study just being completed by the USGS and TDWR will furnish information as to the geology of the area, and water levels and water quality of wells in the northern Austin Region of the Edwards Aquifer.

Several obvious sources of pollution exist for contamination of the aquifer, including runoff and leaking septic tanks[4] but one of the major sources of pollution to the Edwards Aquifer is the privately owned package treatment plants. There were

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[3]Raymond Slade, USGS

[4]Properly built and maintained septic tanks called "On-Site Wastewater Treatment Systems are adequate for maintaining water quality." Dr. Bobby Carlisle, Texas A&M

three such plants south of the Colorado River in 1983; the TDWR is not sure how many plants are north of the Colorado River, simply that there are "many more" than south. The permits must be granted by the TDWR and the amounts of total suspended solids (TSS)[5], Biochemical Oxygen Demand (BOD)[6] and amount of effluent to be dumped must be stated in the permit. However, even when the plants operate within their permit limitations, the water being dumped into the aquifer recharge zone is higher in BOD and TSS than the water currently in the aquifer. The latest available data for the three plants south of the river indicate that over 200,000 gallons of water are dumped each day. The current level of BOD is 10 mg/L and the level of TSS is 15 mg/L in this water as compared to current levels discharged in Barton Springs that average about .4 mg/L BOD and 4 mg/L TSS in the aquifer water. Simply stated, the quality of the water in the Edwards Aquifer is much cleaner than the treated water being put back into the aquifer by the package treatment plants, adding to deterioration of the quality of water in the aquifer.

B. Water Treatment Facilities

From Lake Austin, water reaches the Davis and Ullrich Treatment Plants. From Town Lake, water enters the oldest facility, the Green Treatment Plant. The city is looking toward expanding the present plants or building a fourth plant to pump good quality Lake Travis water to serve rapid development in northwest Travis County.

Base load demand of water is approximately 71 million gallons per day, determined by winter indoor usage when outdoor use is minimal. Base use is increasing yearly, however, with increasing population. Depending on temperature and rainfall, the seasonal load between June and September greatly increases base load.[7] The hot summer of 1980, for example, created a demand for up to 150 million gallons per day. These peak demands approach and often exceed the capacity of the water-wastewater system and if they occur for many days in a row, (1) water pressure to fight fires is not available, (2) some areas of the city may be without water, or (3) equipment failures due to strain on the system are more likely to occur. In 1983 the City Council established the Water Conservation Ordinance to reduce seasonal peak demand by first, voluntary conservation measures; or in a water crisis situation, mandatory compliance.

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[5]Total Suspended Solids - The soil and rock (sand, silt and clay) particles carried in suspension by flowing water. "Total suspended solids" is measured by weighing all of the solids retained on a 0.45 micron filter (one micron = one millionth of a meter, about 0.00003937 inch). Suspended solids fill up reservoirs, interfere with lake and stream biota, and add to water treatment costs.

[6]Biochemical Oxygen Demand (BOD) - The oxygen used in meeting the metabolic needs of microorganisms in water rich in organic matter. Measured in units of milligrams per liter (mg/L.). BOD is important because the microorganisms compete with fish, etc., for the available dissolved oxygen in the water.

[7]Study by Dr. David Maidment, U.T., Department of Civil Engineering

C. Wastewater Treatment Plants

There are two full-scale wastewater treatment plants in Austin: the Govalle Plant built in 1938, and the Walnut Creek Plant built in 1977. Wastewater is carried to these plants underground through an eleven (11) mile, 7-8 foot wide tunnel called the "Crosstown Intercepter" running laterally east to west, intercepting with north to south lines, and depositing wastewater at these plants. The Williamson Creek Plant is a small-scale plant built in 1965 as an interim facility pending completion of the Onion Creek Plant to be constructed by the city. Williamson Creek also serves as a research facility. From the City's current dilemma with the Williamson Creek Plant, it is apparent that the treatment process has not kept ahead of growth and new plants are necessary, as well as improvements to all the plants, in order to maintain a clean water environment in the creeks and Colorado River.

Treatment Process

Treatment of wastewater is basically the same in the Govalle and Walnut Creek Plants. Wastewater enters the plants from the Crosstown Intercepter and passes through a large screen for the removal of large objects and into a sedimentation tank for the primary treatment process. In the primary treatment process, the water remains underground where 35-60% of the solids and material are removed. Secondary treatment (biological treatment) removes up to 80% of the dissolved organic matter as well as nutrients, such as nitrates and phosphates, and is treated with chlorine before being released to ponds. Sludge from the Govalle and Walnut Creek Plants is piped to the oxidation ponds at Hornsby Bend. At the Williamson Creek Plant, the raw wastewater enters the plant and flows through screens to remove large objects and passes through grit chambers where sand and grit settle to the bottom of the tank before flowing into ponds where, in addition to sedimentation, water hyacinths are used to clean the water. The city reports this process to be very effective. There are currently six oxidation ponds at the Williamson Creek Plant. When the Onion Creek Plant is operational, it is planned that these ponds will be used for storm water storage and routed back to the Onion Creek Plant for treatment.

III. POLLUTION SOURCES

Water pollution is generally described as either being point or non-point in origin. With passage of the Federal Clean Water Act of 1972, efforts at cleaning up the water environment focused on point sources, where pollution came from a channel or pipe such as a sewer. Increasingly it has been recognized that control of only point-source pollution will not adequately protect our nation's water resources.

Section 208 of the 1972 Clean Water Act included funds to develop area comprehensive plans to identify non-point pollution. This pollution comes from no single source but is distributed throughout an area. It can result from animal wastes,

herbicides, urban or agricultural runoff, air pollution, construction activities, and leaking septic tanks.

More than half of the pollution in the United States comes from non-point sources. In Environmental Outlook 1980, EPA's Office of Research and Development estimated that the sediment load entering water bodies from non-point sources was 360 times higher than that from the treated point sources; BOD - 5 times higher than treated point sources; nitrogen[8] - 4 times higher; and fecal coliform[9] - 50 times higher. Not all of this contamination is man-made; certain amounts occur naturally. However, undisturbed topographic conditions and open land do impede runoff and accompanying pollution.[10]

A. Runoff in Austin

Most of the water pollution in Austin results from non-point sources. We are fortunate that at the present time there are no significant point discharges to Town Lake or Lake Austin and that problems with toxic chemicals are reported to be minimal.

One relevant document on runoff in Austin is the Nationwide Urban Runoff Program, published in 1982, and jointly funded by EPA and the City of Austin. The NURP study set out to examine both the effects of runoff on Town Lake and Lake Austin and to quantify the stormwater pollutant loads from a medium density development, a low density development, and an undeveloped area. Geology was similar at each of the sites.[11]

The findings were instructive. For similar storms, runoff from Northwest Hills (medium density, residential area) produced pollutant loads per acre of surface that were 5 to 10 times greater than were found in Rollingwood (low density, residential area). Median concentrations of bacteria were twice as high at the Northwest Hills site.

Samples from Turkey Creek (scarcely developed area) showed significantly lower total pollutants than at the more urbanized locations. In this undeveloped area, bacteria concentrations were 30 percent lower than in Northwest Hills. The natural vegetation absorbed more of the rainfall, so total runoff was reduced.

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[8]Nitrogen - One of the important nutrients for aquatic plant growth. Excessive nitrogen, with sufficient phosphorous, accelerates algae growth.

[9]Coliform Bacteria - A measure of the bacteriological quality of water. "Total coliform" refers to all of a class of bacteria that look like the colon bacteria (Escherichia, Aerobacter). Fecal coliform (Escherichia coli) is a more precise test of bacteriological contamination of fecal (sewage) origin. Other related tests such as fecal streptococci, are used to differentiate between waste of human or animal origin.

[10]Marilyn Reeves, "Commentary on Non-Point Source Pollution," LWV, p. 4.

[11]City of Austin and Engineering Science Inc., "Executive Summary of the Final Report Nationwide Urban Runoff Program, Austin, Texas." 1982, p. 5, 7.

Investigations of the lakes involved taking water, sediment, and fish samples. Elevated coliform levels were observed in the lakes after periods of rain and occasionally exceeded water quality standards set for recreation. Effects of short-term pollutants were judged significant. The report concluded, however, that Town Lake remains a viable drinking water source and that urban runoff has not yet significantly decreased the usefulness of the lake; however, costs for chemicals used in water treatment have increased.

Taken as a whole, the data from both Lake Austin and Town Lake are reassuring, in that neither represents a seriously polluted lake. Pollutant levels in runoff samples from both Northwest Hills and Rollingwood are not high enough to cause immediate alarm. While statistically significant differences exist between these two residential areas, both are relatively benign in their runoff characteristics. This is not to say that urban runoff is not or cannot be a major source of water pollution. Samples from downtown Austin, for example, are much more likely to be heavily polluted.

The NURP study suggests that given no other controlling features, the amount of development in an area determines the quantity and quality of stormwater runoff. This runoff then contributes to the ultimate water quality of streams, lakes and aquifers.

The NURP study was limited by a small data base. The conclusions were reinforced by a report on stormwater modeling prepared by the City Watershed Management Division. Using data from Bull, Barton, Shoal and Boggy Creeks, as well as sites from the NURP study, the report developed mathematical relationships (non-linear regression equations) among storm rainfall, runoff, pollutant concentrations and total pollutant loadings. These equations were developed to provide the best description (best fit) of the data available. The report concludes:

> "Within the valid range of the predictive relationships, the stormwater runoff is linearly or geometrically increased with the amount of storm rainfall and the impervious land cover. The pollutant load and/or concentration is proportionally increased with the amount of runoff and impervious cover."[12]

Not all runoff, from all storms, in all locations would necessarily fit these equations. Soil type is a crucial variable. Absorptive soils (sand) may retain significant portions of rainfall whereas tight soils (clay) may reject most moisture that touches their surface. In this case they might be as impervious as parking lots.

Flooding is not necessarily increased by urbanization. There is good evidence that the amount of impervious cover becomes increasingly less significant as the rain

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[12]City of Austin, Watershed Management Division, "Stormwater Quality Modeling for Austin Creeks" 1983, p. 12

becomes harder. At some point, the absorptive capacity of the land is ineffective in substantially reducing the rate of total quantity of runoff.

Even considering the effect of soils, the implications for runoff for the Edwards Aquifer, the Highland Lakes, and Town Lake are obvious and substantial. The potential exists for them to become polluted. In spite of the endless testimony in City Council Chambers over the Edwards Aquifer, this is not a particularly controversial conclusion. The debate in Austin has never been about whether urbanization increases pollution; instead, it centers on how the runoff can be appropriately controlled by watershed ordinances.

1. Watershed Ordinances

Current ordinances protecting certain watersheds from runoff-produced pollutants are incorporated within the subdivision and zoning regulations of the Austin City Code. The first two were the Lake Austin and Watershed Subdivision and Site Development Ordinances enacted in 1978 and revised in 1980 and 1983. Between 1980 and 1982 subdivision ordinances and site-development ordinances were enacted to protect the Barton Creek, Williamson Creek, and the Lower Edwards (Slaughter, Onion, Bear, and Little Bear Creeks) watersheds. Within these ordinances are special requirements for planning and platting, controlled development intensity, stormwater runoff management and water quality protection, and compliance.

All of these ordinances employ combinations of three major methods of water quality protection: impervious cover, density standards, and structural controls.

A more complete description and comparison of the Watershed Ordinances can be found in the paper by Kent S. Butler that has been included in this mailing.

A. Impervious Cover

Impervious cover (rooftops, streets, drives and parking areas) has been related to both rate and amount of runoff and to the pollutant-loading of watersheds. The Lake Austin and the Williamson Creek Ordinances rely on controlling the amount of impervious cover as the primary method of maintaining water quality. Impervious cover is usually regulated according to the slope of the land (less being allowed on steeper slopes) or water quality zones based on proximity to the creeks.

In residential developments of single and two-family dwellings, where well-draining soil types are found, impervious cover control is a very effective method. But in cases of commercial development or in areas where the soil does not absorb water readily (the case for most of Austin) this method becomes much less effective, and ordinances relying primarily on this method for water quality protection are considered the least stringent.

B. Density Controls

The premise behind density controls is simple. If building is restricted by acreage, impervious cover will necessarily be limited. Pollution should then not be increased enough to seriously threaten stream or lake quality. All evidence suggests this method of control will be effectual.

Density is the simplest method to implement, requires no maintenance, and reduces the runoff from major roadways built to serve high density areas and the erosion from construction which can be up to 700 times normal for a given tract of land. This straightforward solution faces formidable opposition by developers and is applied only in the Barton Creek Ordinance which is considered to be the most stringent in Austin.

C. Structural Controls

Structural controls offer the "Best Management Practice" approach and are required to one extent or another in all of the watershed ordinances. Though preliminary evidence suggests they can decrease total pollution, serious issues have to be resolved about whether they remove enough contaminants, who is to inspect them, and perhaps most importantly, how they are to be maintained.

The greatest potential for erosion occurs when land is first disturbed for building, before structures are completed and the land revegetated. Temporary structural controls are put in place to filter the water (for example, hay bales or fabric-like materials called silt fences) or to provide detention (storage) and settling (such as swales, which resemble moats or ponds). These structural controls are also designed to prevent downstream erosion.

Permanent or long-term structural controls are used to control both the quantity and quality of runoff from impervious areas (streets, parking lots, roofs). These controls rely on detention (storage) and settling. Ponds can range from those that simply provide temporary storage to those with elaborate filtration devices. They are generally designed to trap the first 0.5 inches of runoff which contains the greatest concentration of pollutants.

Given proper design and adequate maintenance, these structural controls effectively remove a proportion of the sediment and pollutants from the runoff. Removal efficiency depends on design, the quality of maintenance, and the characteristics of particular pollutants. For instance, non-soluble pollutants such as suspended solids, certain heavy metals, and pesticides which are sorbed onto the sediment particles are more efficiently removed. Soluble pollutants such as nitrates are relatively poorly removed. Floating objects (oil and grease, trash) can be trapped by an appropriate outlet.

A well-known example of a runoff-control pond is the one at Barton Creek Square Mall. Preliminary data are available on the average efficiency of removal of various

pollutants by the pond. About three quarters of the Biochemical Oxygen Demand (BOD), Total Organic Carbon (TOC),[13] Chemical Oxygen Demand (COD)[14], Phosphate and Total Suspended Solids (TSS) are removed. At least half of the metals are removed. Somewhat less than one quarter of the nitrate is removed.[15]

These figures represent only two rainfall events and therefore should not be considered definitive. These relatively high efficiencies should not be reported without noting that the mall management has been reluctant to properly maintain the pond. Silt and dirty sand were removed on February 29, 1984, only after City personnel had privately complained for months and the City Council had formally requested clean-up.

D. Additional Practices

Less dramatic management practices are important in controlling runoff. Periodic and carefully done street sweeping, with vacuum sweepers, is required in several ordinances and probably cannot be overemphasized. Vegetation should be considered when development takes place since it plays an important role in filtering out pollutants. Finally, the City of Austin has already planned and built roads that do not connect with sewers but instead allow the runoff to flow gently off the roads to be slowed and filtered by natural vegetation. This practice is referred to as overland flow.

A water quality monitoring program to assess the effectiveness of these techniques has just begun in Austin. As many as fifteen stations equipped with automated water quality samplers and flow meters will be installed. The results should give us a clearer idea of how well these various structural controls actually work.

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[13]TOC - a measure of the amount of organic matter (carbon) in a sample.

[14]COD - a measure of the readily consumed oxidized portion of the organic matter in a sample.

[15]Letter from James E. Thompson to Richard Ridings and Maureen McReynolds, June 22, 1983.

POLLUTANT SOURCES AND EFFECTS
from "Blueprint for Clear Water"
1982 LWV Education Fund

Category	Pollutants	Major Sources	Environmental Effects
Conventional	Organic wastes	Human and animal sewage, feedlot run off, food processing plants, pulp and paper manufacture	Can introduce disease-causing bacteria & viruses, precluding use for drinking, swimming or shellfish harvesting. Increase biochemical oxygen demand by consuming dissolved oxygen in the bacterial decomposition process. This reduces oxygen available to plant life and limits the kind of fish that can survive. It also sets in motion an anaerobic (without oxygen) decomposition process that leads to the formation of noxious gases such as methane and hydrogen sulfide. These in turn cause algal masses to float, with the net result that the water body turns dark and odorous and is of little esthetic or recreational value.
	Sediment	Agriculture, logging, road building & other construction activities that disturb the land. Dredging harbors & channels is another source of sediment often contaminated with toxic substances.	In suspension, causes turbidity, reducing sunlight penetration and the photosynthetic activity of plants. Suspended solids also interfere with the ability of filter feeding animals to obtain food. On settling, sediment covers bottom habitat, sometimes killing larvae & eggs. Dredged spoil and fill material changes the physical characteristics of aquatic ecosystems.
	Acids	Industrial operations, mine drainage, acid rain	Inhibit the ability of fish to reproduce & threaten the survival of eggs and young fry. Corrode pipes in water supply systems, leaching toxic metals into drinking water.
	Oil and grease	Tanker spills & cleaning operations & accidents in off-shore drilling operations *Roadway runoff	Can foul shorelines & beaches, damaging fish and waterfowl.
	Toxic substances	Heavy metals such as mercury, cadmium, & lead. Organic chemicals such as PCBs, 2,4 D & chloroform	Industrial processes, accidental spills in transportation, surface runoff from land treated with insecticides & herbicides	In large doses, can wipe out populations of finfish, shellfish & other aquatic organisms important in the food chain. With long term exposure at lower concentrations toxic substances & some pesticides can cause cancer, genetic defects & reproductive and behavioral disorders. Many are persistent in the environment, resisting degradation through biological or chemical pathways
	Nonconventional (catch all category for all other pollutants that are neither toxic nor conventional)	Nutrients such as phosphorus & nitrogen	Fertilizers and sewage. Phosphorus is used in many detergents.	Stimulate the growth of plants including algae that consume oxygen when they decay, hastening eutrophication, the process by which waters become oxygen poor & enriched with plant growth. Eutrophication destroys the usefulness of water bodies for fish, recreation & water supply.
		Other non-conventional metals and chemicals include iron, tin, aluminum, chloride & ammonia	A variety of industrial processes	Effects vary.
	Thermal		Power plants	Temperature changes can upset aquatic ecosystems, altering the distribution & abundance of species.
	Radioactive*		Nuclear power plants & research laboratories	Can kill or damage living cells

*Regulation of radioactive discharges by EPA was originally included in the Clean Water Act, but a Supreme Court decision gave the Nuclear Regulation Commission responsibility for regulating most such discharges.

GOVERNMENT AGENCIES INVOLVED IN WATER MANAGEMENT

Agency	concerns and responsibilities	permits
STATE		
Department of Public Water Resources	developing water resources in Texas, maintaining the quality of the water, and assuring equitable water rights to all Texas	Wastewater and Solid Waste Disposal, Water District Creation
Department of Health - Water Hygiene Div.	reviews plans for all new public drinking water systems and must be notified of any alterations in existing systems	
Railroad Commission	regulation of waste disposal by the oil and gas industry	
L.C.R.A. (Lower Colorado River Authority)	controlling and distributing the waters of the Colorado River for irrigation, generation of power, and development of parks. Must approve the installation of new septic tanks and inspection of all septic tanks in the Highland Lakes area.	
COUNTY AND CITY		
Austin-Travis County Health Department Environmental Health Services Division	protection of environment through enforcement of city ordinances, subdivision review, and septic tank inspection outside of incorporated cities and outside LCRA - Highland Lakes Board Order area.	
CITY		
Austin Energy Management Dept.	water conservation and public education about conservation matters	
Environmental Resources Management	reviews subdivisions and land development in sensitive watershed areas, alterations in waterways, and special permits	
Building Inspection Department	issue permits for all new construction and remodeling, including plumbing - enforces zoning ordinances including those which control boat docks and houseboats	new construction and remodeling
Office of Emergency Management	supervises and coordinates programs designed for flood protection and warning	
Planning Department	reviews and makes recommendations for zoning, subdivisions, and special permits; provides staff assistance for Planning Commission	
Public Works Department	inspects drainage facilities and plans watershed management stormwater management flood control facilities bridge maintenance street cleaning	
Water and Wastewater Department	operates three water plants: Green, Davis & Ullrich; operates three wastewater plants: Govalle, Walnut Creek and Williamson Creek; inspects water and wastewater mains installed through subdivision process	

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Credits/Interviews

Mary Arnold - Parks and Recreation Commission

Mary Blundell - City of Austin - Water/Wastewater Department

David Bodenman - Trammel-Crow; Chairperson Citizens Task Force - Lower Watershed Ordinances

Dr. Kent Butler - Water/Wastewater Commission

Bert Cromack - Save Barton Creek Association

Mike Erdmann - Manager of Public Affairs, Water/Wastewater Department

Dean V. Ferguson - Asst. Dir., SWTSU, Edwards Aquifer Research & Data Ctr., San Marcos

George Green - City of Austin, Wastewater Department

Crispin Guzman - City of Austin - Water/Wastewater Department

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Bob King - Office of Natural Resources, Texas Department of Agriculture

Ken Kramer - Sierra Club

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Dr. Taylor Ollman - Protect Lake Travis Association

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Mike Personnette - Office of Conservation Policy, City of Austin

Jay F. Powell - Architect, Windy Cove Resident

Tom Remaley - City of Austin, Senior Staff Engineer, Dept. of Public Works

Phil Savoy - Environmental Board

Frances Schenkkan - Planning Commission

Raymond Slade, Jr. - Hydrologist, U.S.G.S., Water Resource Division

Terral Smith - State Representative

Mr. & Mrs. Jack Strickland - Protect Lake Travis Association

Pete Stone - Mayor, Buda, Texas

Ed Wendler, Jr. - Wells Branch, Developer

BACKGROUND REPORT ON THE NECESSITY AND BENEFIT OF THE PROPOSED BARTON SPRINGS-EDWARDS AQUIFER CONSERVATION DISTRICT

prepared
for the

TEXAS WATER COMMISSION

by

Kent S. Butler Ph.D.

representing the

City of Austin
Cit of Buda
City of Hays
Village of San Leanna
City of Sunset Valley

September 1986

TABLE OF CONTENTS

INTRODUCTION AND BACKGROUND HISTORY

This report presents data and information on the necessity and benefit of creating the proposed Barton Springs-Edwards Aquifer Conservation District. It is submitted to the Texas Water Commission on behalf of applicants for the proposed District, which include the municipalities of Austin, Buda, Hays, San Leanna, and Sunset Valley. All of the petitioning municipalities are located over the Edwards Aquifer and within the boundaries of the proposed underground water conservation district.

The report includes a brief background history, a description of the geologic and hydrologic features of the Aquifer, a discussion for the need for and public benefit derived from the District, and an analysis of the technical and financial feasibility of the District.

On August 31, 1985, a petition was filed with the Texas Water Commission, requesting it to prepare studies, hold hearings, and appoint temporary directors to schedule a confirmation election to create the proposed Barton Springs-Edwards Aquifer Conservation District, pursuant to the provisions of Chapter 52 of the Texas Water Code.

Public hearings to consider the designation of the underground water management area and the necessity and benefit of creating the proposed District began on January 27, 1986 before the Texas Water Commission. The hearing was subsequently assigned to an examiner. The Commission adopted rules requiring a bifurcated hearing on March 11, 1986, and the hearing before the Examiner on management area boundaries began on April 7. On August 11 the Commission held a

hearing and approved the boundaries that had been recommended by the Examiner and the Applicants. An Order was issued on August 15 designating the management area, which is shown in Figure 1. The second and final hearing on the necessity and benefit of creating the District is scheduled to begin September 15, 1986.

This report is submitted in support of a finding by the Commission that the proposed District is needed and serves a public benefit, and is technically and financially feasible. For the purposes of this report, the proposed District is assumed to be the same as the management area designated by the Commission in its Order dated August 15, 1986. In my opinion, presented in the prior phase of hearings, the boundaries of such a district can reasonably be based on the management area defined by the Commission.

Additional information on the geology, hydrology, and criteria for the designation of the Underground Water Management Area is presented in another report by this author entitled "Background Report on the Designation of an Underground Water Management Area for the Barton Springs-Edwards Aquifer," dated April 1986.

THE NEED FOR AND PUBLIC BENEFIT OF THE DISTRICT: WATER QUALITY CONSIDERATIONS

The Edwards Aquifer is perhaps more sensitive and vulnerable to contamination than any other aquifer in Texas. Recharge areas over the Aquifer are typified by exposed rock surfaces with little or no soil mantel to filter any potential contaminants in surface waters. Rates of infiltration and diffusion of liquids through the Aquifer are possibly faster and more extensive than any other in the State (Butler, 1983).

Some of the potential sources of contamination include, but are not limited to, the following: discharges from improperly sited or poorly operated sewage treatment facilities; onsite septic tank-drainfield systems and sewage holding tanks in areas of little or no permeable soil; underground or above ground storage facilities and pipelines used for hydrocarbon or other toxic or hazardous chemicals that may be subject to rupture, leakage or spillage; improper application of agricultural pesticides or herbicides; industrial facilities that use or dispose of hazardous chemicals or solid wastes; municipal or industrial landfills; waste disposal wells; and nonpoint pollution from urban storm runoff.

Fortunately, there have been only a few reported incidents of groundwater contamination in the Aquifer. Those that have occurred were isolated or short-lived. One series of incidents was characterized by unsafe bacterial concentrations within Barton Springs Pool. During 1983 and 1984, the pool was routinely closed for approximately two days after each rainfall recharge event until bacterial concentrations dropped below the minimum safe level. The pool was temporarily closed in this manner approximately twenty-five times a year. The source of contamination was apparently a leaking sewer that has since been located and repaired.

Another set of incidents involved routine testing of water quality in private wells throughout the Aquifer. In a series of thirty-eight wells tested for water quality constituents, the U.S. Geological Survey identified twelve wells with abnormally high counts of fecal coliform bacteria (in excess of 200 colonies per 100 ml. (Slade, 1984)). In most of these cases, the specific source was not

identified. Fortunately, again, the bacterial concentrations did not seem to spread to become an areawide concern.

Notwithstanding the isolated water quality problems presented above, the quality of water in the wells and springs has typically been very acceptable. The necessity and benefit of maintaining and conserving potable and swimmable water supplies is realized by the thousands of individuals who rely on the Aquifer as their daily water supply or as an occasional recreational resource.

The steady contribution of springflow to the base flow of the Colorado River is also significant, particularly during those months when reservoir releases are curtailed, because the dilutional effect of clear, oxygenated spring water discharges on the numerous municipal effluent discharges in the Colorado River below Town Lake is an important benefit for parties downstream even as far as the Gulf Coast. Since 1957, when the Highland Lakes reservoir system was completed, Barton Springs has contributed 10 percent or more of the flow of the Colorado River at Austin for an average of 2.5 months each year (Lockwood, Andrews and Newnam, Inc., 1976).

The sensitivity of the Aquifer and its vulnerability to surface and subsurface pollution has been widely recognized by experts in the field, e.g., Andrews, et al., 1984; Butler, 1983; Edwards Underground Water District, 1981. Thus, in my opinion, the need to protect aquifer water quality is clearly present. Given the District's broad authority under Chapter 52, numerous programs to protect water quality are possible; the degree of public benefit resulting from District programs will be directly related to the success of those programs.

Additional information and data on the water quality of the Edwards Aquifer are presented by Brune and Duffin (1983) and by Andrews and others (1984).

IE NEED FOR AND PUBLIC BENEFIT OF THE DISTRICT: WATER QUANTITY CONSIDERATIONS

Current Water Use. Almost all water consumed within the boundaries of the Aquifer and within the watersheds of Slaughter, Big Bear, Little Bear, and Onion Creeks (comprising approximately three-fourths of the area within the proposed District) is obtained from the Aquifer. Many municipalities such as Buda, Hays, Mountain City, San Leanna, and Sunset Valley are dependent on the Aquifer as their sole source of drinking water. In addition, several of the Aquifer-dependent municipalities are either planning or constructing significant expansions to their water utilities to accommodate residential and commercial developments that are planned or under construction.

The City of Austin benefits from water supplies in the Aquifer, both as a recreational resource (Barton Springs) and a municipal water supply. Barton Springs has been ranked as the fourth largest spring in Texas (Brune, 1975). Annually, approximately 300,000 paid attendees visit the Barton Springs swimming pool (Macias, 1986). Additionally, the natural discharge from Barton Springs contributes to the City's water supply at the Green Water Treatment Plant on Town Lake. Since very little water is released from the Highland Lakesduring certain months of the year, Barton Springs is an important source of freshwater for customers of Austin's water utility in south and central Austin. For example, during 1981, an abnormally "wet" year, there were still thirty-one days in which the release

of water from Lake Travis was less than 100 cubic feet per second, during which time the average discharge from Barton Springs was 50 cubic feet per second (Slade and others, 1983).

There are four water supply corporations that withdraw water from wells within the Aquifer and proposed District to serve customers in the eastern part of the proposed District, as well as throughout the rest of the southeastern Travis and eastern Hays Counties and western Bastrop and Caldwell Counties. These water supply corporations currently serve approximately 3,000 metered customers, or about 9,000 persons located throughout their service area (Littlefield, 1985).

In 1981, the U.S. Geological Survey compiled available data on pumpage and determined the average pumpage rate to be 3,800 acre-feet per year, or 3.4 million gallons per day. (Slade, et al., 1985). On the basis of more recent data compiled by the Texas Water Development Board, Texas Department of Health, a survey conducted at the University of Texas in 1984, and an assumed annual rate of increase in pumpage of 5 percent from 1984 to 1986 within the southern, groundwater-dependent segment of the proposed District, it is estimated that the rate of pumpage in 1984 was 4 million gallons per day and that the current level of pumpage is on the order of 4-5 million gallons per day, serving approximately 20,000 persons and a proportionate amount of commercial and industrial development. (Texas Water Development Board, 1985 and Texas Department of Health, 1984).

As of the 1980 Census, there were approximately 85,000 persons living within the proposed District. Since that time, the south

·stin metropolitan area has encountered unprecedented rates of ; burban development and population growth. Assuming an average annual growth rate of 4 percent since 1980, the current population ould be approximately 112,000. The population within the District is projected to continue growing at very rapid rates.

Projected Future Water Demands and Impacts on the Aquifer. stin city planners have projected that the population residing within the area over the Aquifer will increase by about 86,000 by ne year 2000 (Farley, 1984). This projection was subsequently used model the effects of future groundwater pumpage on the water table in the Aquifer (Slade and others, 1985). It was assumed in the roundwater simulations that the only areas relying on groundwater plies in the year 2000 would be San Leanna, Sunset Valley, developments in the Little Bear and Onion Creek watersheds and within e District, and the approximately 9,000 persons served by the water pply corporations in the eastern part of the proposed District. It was also assumed that there would be no management or control of oundwater pumpage within the District. The results of the mulation were quite significant for large areas of the proposed District. In my opinion, they demonstrate a clear need for underground ter management and conservation.

The changes in water levels between the January 1981 conditions nd the year-2000 conditions were evidenced by significant drawdowns excess of 100 feet in the southeastern corner of the District. ee Figure 2). More significantly, a large area in the southwest orner of the proposed District would encounter severe groundwater pletion, even during average conditions. This simulation is

considered to be a conservative estimate of future conditions because significant additional water demands are likely to be imposed on the Aquifer by water supply corporations to the east of the Aquifer that were not included in the simulation.

The necessity and benefit of conserving the Aquifer as a significant and available water supply is clear for the approximately 20,000 individuals who currently rely on it as their sole source of water. Although not dependent upon the Aquifer as their primary source of domestic water supply, citizens of south and central Austin benefit from the contribution of springflow to the Austin water utility located on Town Lake opposite the mouth of Barton Creek.

Other benefits, unrelated to water supply, also accrue to area residents. The viability of natural discharges at Barton Springs Pool is a measurable and highly valued benefit to the tens of thousands of visitors from locations in and outside of Austin each year (Macias, 1986). While many of these benefits are not limited to the management area, it is my opinion that the residents of the area and lands within the management area as a whole, clearly receive such benefits. The District's conservation and management programs, discussed below, can be of significant benefit in maintaining both the quantity and quality of Barton Springs' flow.

FEASIBILITY AND PRACTICALITY OF THE DISTRICT

Technical Feasibility and Practicality.

Introduction. Under the authorities and requirements of Chapter 52 of the Texas Water Code, the District will have broad powers to manage and conserve groundwater resources. The management area boundaries approved by the Texas Water Commission provide a suitable

a for management of underground resources of the Barton Springs-sociated subdivision of the Edwards Underground Reservoir. The anagement area encompasses the entire recharge zone and the derground reservoir area, thereby enabling the District to manage nd conserve the quantity and quality of groundwater in a omprehensive manner. The District will thus be in a position to velop and implement a technically feasible and practical water onservation and management program.

Options for Managing the Groundwater Resource. There are merous options for groundwater management which might be considered v the District under the authorities of Chapter 52 of the Water de. The highest priority might be given to groundwater management ions which already have widespread public support and can be nstituted on a voluntary basis, or which can be carried out in operation with other local units of government. These options uld include education programs, voluntary water conservation rograms, permitting for purposes of water use inventory and counting, adoption of plumbing code standards for water nservation, and establishment of incentives for efficient water se.

As pumpage rates and capacities increase to levels that may opardize the reliability of the Aquifer as a water supply, then ptions which would be adopted on a mandatory basis should be nsidered. These options would include mandatory water nservation, permitting programs which establish production limits r spacing requirements on new wells, and the like.

Projects that may cost significant sums of money and must be financed by district revenues should be considered as options of a lower priority in the near term and should be thoroughly evaluated before receiving priority attention. Examples of capital-intensive projects would include aquifer recharge enhancement projects and surface water development projects, and any water supply or wastewater treatment project.

Certain efforts should be ongoing, regardless of the priority given to other management alternatives. Such efforts include the prevention of waste (including contamination) and encouragement for the provision of surface water supplies to the area.

The following list includes options for groundwater conservation and management that should be considered by the proposed District.

Education and Information Programs

Schoolroom education
Consumer education
Speaker forums for meetings of public and private organizations
Publication of plans and information on groundwater resources

Monitoring

Water well inventories
Water level surveys
Water quality sampling
Leak detection programs for certain transmission, collection, and storage facilities (such as liquid hydrocarbons and sanitary sewers)

Research

Cooperative research with other agencies and institutions
Water supply and demand forecasting
Determination of allowable limits on withdrawal of groundwater
Research into new and innovative water conservation measures

Conservation

Voluntary household conservation programs
Plumbing code standards for water conservation in new

Plumbing retrofit programs to improve water-use efficiency in existing buildings
Water-conserving landscaping
Water and wastewater reuse and recycling
Conservation-oriented water rate structures
Emergency peak demand rationing
Drought contingency plans with "watch/warning/alert" phases
Agricultural water use conservation (such as brush control)
Technical assistance to political subdivisions, water supply corporations, individual property owners, etc.

Permitting

Universal well registration program
Monitoring and annual reporting of groundwater withdrawals and uses
Establishment of maximum per-capita or per-living-unit-equivalent water usage rates for large capacity wells
Establishment of maximum withdrawal rates over given time periods (with exemptions for certain wells)
Requirements for recordkeeping of drillers' logs, and equipping and completing of new wells
Standards for spacing of new wells to avoid well interference

harge Enhancement

Artificial storage and release of surface water
Short-term flood detention and release
Injection wells

velopment and Delivery of Surface Water

Conjunctive surface water and groundwater use management
Coordination with other water suppliers (cities, river authorities, water supply corporations, etc.)
Purchase, transportation, distribution, and sale of surface or groundwater

Prevention of Waste and Water Quality Control

Water loss reduction plans for water distribution systems
Leak detection and repair programs
Review of sewage collection, treatment, and disposal plans and permits
Well construction and casing standards
Abandoned well capping standards
Review of waste disposal wells, animal feedlot operations, industrial and municipal solid waste disposal facilities
Regulation of high pollution-risk activities
Spill/pollutant containment and clean-up
Coordination with other agencies in carrying out water quality protection programs

Anticipated Water Conservation Program. The following water conservation program outline represents the current thought and intent of applicants for the District. While it is not binding or limiting on any future board of directors, it does represent the concensus of representatives of the applicants for the District at this time.

A. Initial Well Permit Program and Conservation/Regulatory Program. A statutory requirement of the District is the establishment of a well permit program for wells of a 25,000 gallon per day capacity. In order to begin the mandatory program immediately, the board of directors should consider adopting rules pertaining to procedures, administration, and permitting of wells. The board may also adopt interim regulations pertaining to water conservation and pollution prevention, subject to amendment and expansion after the completion of a comprehensive management plan.

B. Data Collection and Development of Comprehensive Management Plan. Two essential elements of the water conservation program are the ongoing collection and evaluation of groundwater data and the development of a comprehensive management plan. The Aquifer has been monitored and studied as extensively and thoroughly as any in the State of Texas (Slade, 1986). Consequently, the District staff should be able to work with other governmental entities to continue those prior data collection programs or to arrange for the District to

assume some of those responsibilities. The development of a comprehensive management plan would serve the essential purpose of integrating the base of knowledge about the groundwater resource into a framework for managing and conserving the resource. Public hearings on the plan should be held to incorporate the needs and concerns of people who reside in or have an interest in property within the District. The management plan should provide a basis for the District's goals and policies, recommend priority programs for conservation and management, and establish criteria for the administration of permitting and other regulatory programs.

C. Examination of Possible Conservation Management and Supply Development Projects. Part of the management plan should include a general analysis of the feasibility, desirability, costs and benefits of different types of capital projects, e.g., surface and/or groundwater supply or recharge enhancement projects. Depending upon the conclusions of the management plan and needs perceived at the time, individual projects may merit more detailed feasibility and cost-benefit studies. If such studies indicate the desirability of specific projects, a future board of the District might endorse a project and request Commission and voter approval of the project. At the present time, however, the applicants have no specific recharge enhancement project in mind, nor do they

specifically intend to promote domestic water supply or wastewater utility service by the District.

Financial Feasibility.

The primary method by which the District is authorized to generate revenues is through ad valorem taxation. In order to determine the probable economic impact of the levy of a tax sufficient to administer the powers and duties of the District and to maintain District offices as may be required, the applicants have estimated the necessary expenditures and revenues to carry out the functions of the District. Technical assistance was solicited and received from Mr. James Archer, Chief Appraiser of the Travis County Appraisal District, and Mr. Jesse Click, Chief Appraiser of the Hays County Appraisal District, and their respective staffs. The 1985 assessed value for land in the management area in Travis County was approximately $2.408 billion. Although specific values for 1986 are not yet available, Travis County valuation overall increased by approximately 30 percent. Estimated current Hays County tax valuation for property in the District in Hays County is approximately $500 million. Therefore, total estimated 1986 values of property in the proposed District is approximately $3.6 billion.

The petitioners have estimated the necessary expenditures for the District to be approximately $300,000 per year. These expenditures include salaries and overhead for a general manager, field and staff, travel, office and other administrative expenses, and techical services contract funds. Consequently, it is feasible that a tax levy in the range of $0.01 or $0.02 per $100 will be sufficient to carry out the functions of the District. (At

a tax rate of $0.01 per $100, the assessment on a $100,000 real estate parcel would be $10.00 per year.)

There are several underground water conservation districts (UWCDs) in Texas that currently levy an ad valorem tax. A survey of UWCDs conducted by the Texas Water Development Board last year identified eleven districts that currently levy ad valorem taxes. Of those eleven districts, seven imposed a tax in excess of $0.01 per $100 (TWDB, 1985).

In accordance with Commission rules, the proposed temporary directors have verified that a proposition for the levy of a maintenance tax will be included on the ballot for the election to create the District.

The feasibility of assessing and collecting a tax within the designated management area boundaries and the proposed District boundaries is well established. In testimony before the Examiner in the management area hearing, the Chief Appraisers of both counties stated that they or their staff reviewed the boundaries and concluded that they were workable for assessment and collection purposes. The Commission also found that the proposed boundaries were adequate for purposes of tax assessment and collection.

On the basis of the preceding information, it is the author's opinion that the District is financially feasible with the levy of a very small ad valorem tax. Additionally, it is noteworthy that the possibility of federal financial assistance will exist during the District's early years. An application was recently filed with Region VI of the Environmental Protection Agency for designation of the Barton Springs-Associated Edwards Aquifer as a "sole-source"

aquifer under the Safe Drinking Water Act. If approved, the District would be eligible to apply for a portion of the $77.5 million in federal matching funds that will be available to local governments for planning and management of sole source aquifers nationwide over the next five years.

SUMMARY AND CONCLUSIONS

The preceding discussion has provided technical data and information that demonstrate the need for and public benefits of a comprehensive, areawide program of groundwater management for the Aquifer and a determination of the technical and financial feasibility of the District, in accordance with Chapter 52 of the Texas Water Code. The District, its proposed boundaries, and the management area that it encompasses will be a feasible and practicable supplement to the existing programs of water resource planning and conservation in this part of Central Texas. One of the most prevailing interests of the people throughout the District is the Aquifer itself and its many functions -- as a sole source of drinking water for many of the communities and individual households, and as a reservoir of extremely pure water, which replenishes Barton Springs and the pool, contributes to the drinking water supply of the citizens of south Austin, and provides a steady flow of clean water to the Colorado River for dilution of wastewater effluent and storm water runoff.

The Board of Directors of the District will have the necessary powers and duties, subject to the approval by the Texas Water Commission and a majority of the voting population within the

District, to carry out a plan for management, conservation, and the conjunctive use.

The rapid rate of growth and the corresponding increases in pumpage of groundwater are placing large areas of the proposed district and future populations at risk in terms of overpumpage and groundwater depletion. Without the use of innovative management strategies and conjunctive use of surface and underground waters, it has been demonstrated that the Aquifer area is very likely to experience significant drawdowns in existing wells and failures of shallower wells. There are many workable solutions to the problems of overpumping, but most of them are only made feasible by the powers and duties vested in a water district created under Chapter 52 of Texas Water Code.

The level of vulnerability of this Aquifer to contamination from surface or underground sources is an important reason for the establishment of the District. The proposed District should serve as an institution that provides the forum for coordinated planning and execution of groundwater quality protection programs among the many state and local governmental entities in the area.

The Austin-San Antonio Corridor, which encompasses the proposed district, is expected by many experts to experience significant urban growth and development in the coming years. As this growth proceeds, the availability of potable water supplies and the impact of additional allocations of water on existing water customers within the region will be debated. It is essential that both surface and underground waters be managed conjunctively in this region. All available and potential water supplies should be monitored and

evaluated to determine how they can be used more prudently and efficiently and to ensure that current users are not jeopardized by planned water projects. The most important anticipated long-term benefits of the District is that the groundwater resource will be conserved and the current high quality and availability of supplies will remain viable as the regional economy continues to grow. The proposed District should be able to perform these functions and to ensure these benefits.

Based upon the information and analysis presented in this report, I conclude and recommend that the Commission find that the District is feasible and practicable, a benefit to land in the District, a public benefit or utility, and authorize creation of the proposed District and its submission to the voters for a confirmation election.

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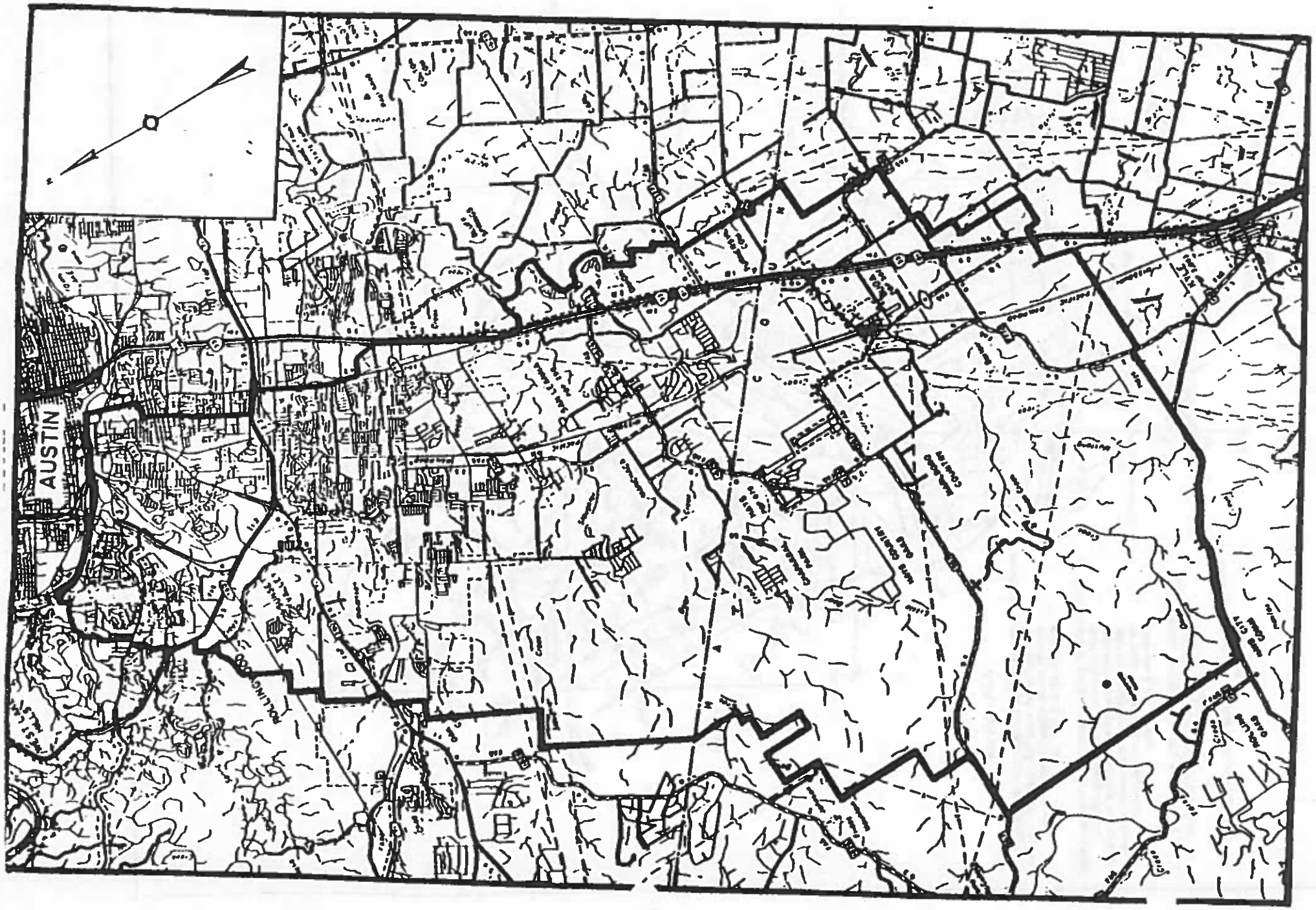
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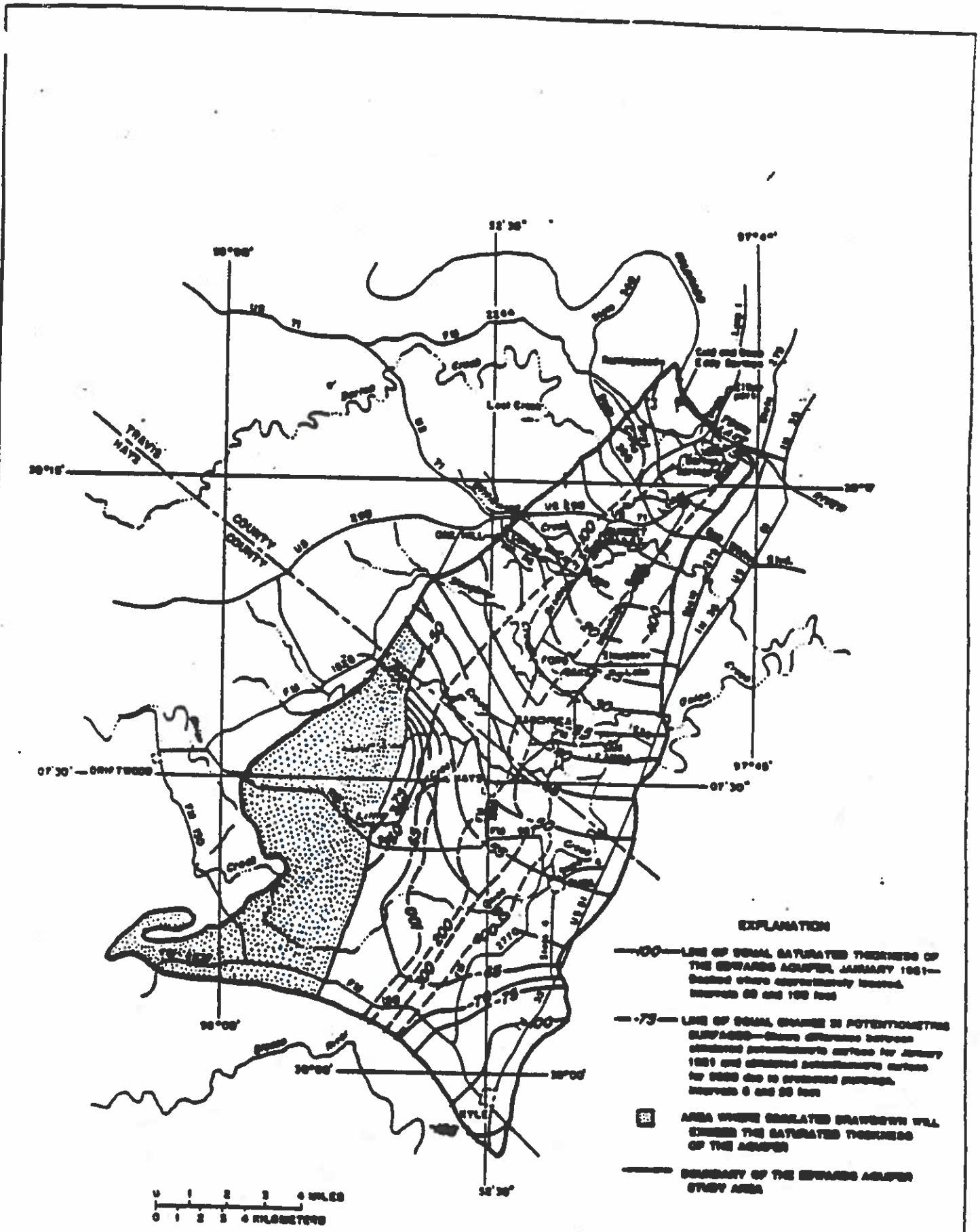
FIGURE 2


EXPLANATION
AREA WHERE SIMULATED DRAWDOWN WILL EXCEED THE SATURATED THICKNESS OF THE AQUIFER
BOUNDARY OF THE EDWARDS AQUIFER STUDY AREA

HEARINGS EXAMINER'S PROPOSAL FOR DECISION
to be presented to the
Texas Water Commission

The Cities of Austin, Buda, Hays, San Leanna, and Sunset Valley have petitioned the Texas Water Commission (Commission) for creation of the Barton Springs-Edwards Aquifer Conservation District (District), pursuant to Chapter 52 of the Texas Water Code, as amended. The petition was filed in conjunction with a request for designation of a management area which would be regulated by the District. The Commission designated the Barton Springs-Edwards Aquifer Management Area by Order No. 86-034 dated August 15, 1986.

Claire Patterson, Attorney, a Commission Hearings Examiner, conducted a public hearing on the matter of the creation of the District on August 25, 1986, and September 15-19, 1986. Robert Caine, Attorney, a Commission Hearings Examiner, began the hearing as to both matters--the request for designation of the management area and the request for creation of the District--on February 19, 1986, after determining that proper notice was given and that the petition was administratively sufficient, pursuant to Chapter 52 of the Texas Water Code, as amended. Mr. Caine subsequently bifurcated the hearing pursuant to 31 TAC §293.22 to allow for consideration of the requests separately. Mr. Caine heard evidence relating only to the designation of the management area. Evidence on the District creation was heard by Ms. Patterson, as previously stated, during the week of September 15-19, 1986.

Hearings Examiner Caine named the following as parties to the proceedings: the petitioners, the Cities of Austin, Buda, Hays, San Leanna and Sunset Valley (represented by Doug Caroom, Attorney); P. R. Rutherford, Jr., Michael G. Rutherford, Sally Bell Rutherford, the Estate of P. R. Rutherford, and the 1973 Rutherford Trust (represented by Ron Freeman, Attorney); Nash Phillips/Copus, Inc. and Bill Milburn Company (represented by Keith Shuley, Attorney); Randy Morine Development (represented by Jeff Hart, Attorney); Creedmoor-Maha Water Supply Corporation and Goforth Water Supply, Inc. (represented by Martha Terry, Attorney); Judge Bob Shannon, Camille Newberry Shannon, and Gatewood Newberry (represented by Pam Giblin and Marc Knisely, Attorneys); Gary Bradley (represented by Lee Biggart, Attorney); the Zimmerman brothers (represented by Rodger Zimmerman, Attorney); Plum Valley Joint Venture (represented by Richard Kammerman, Attorney); Lower Colorado River Authority (represented by Bruce Wasinger, Attorney); Don E. Mackey, Trustee, and William F. Negley (represented by Tom Leonard, Attorney); the Executive Director of the Texas Water Commission (represented

by Wade Russell, Staff Attorney); and the Public Interest Advocate of the Texas Water Commission.

Nash Phillips/Copus, Inc.; Bill Milburn, Inc.; Randy Morine Development, Inc.; Judge Shannon; Ms. Shannon; Mr. Newberry; the Zimmermans; and Plum Valley Joint Venture withdrew their status as parties to the creation phase of the hearing. Mr. Mackey, Trustee and Mr. Negley did not participate in the creation phase of the hearing, but retained party status.

Subchapter B of Chapter 52 of the Texas Water Code, as amended, provides for creation of underground water districts only if the Commission finds that the proposed district is "feasible and practicable, that it would be a benefit to land in the district, and that it would be a public benefit or utility." Tex. Water Code Ann. §52.025.

ISSUES PRESENTED

1. Whether the proposed District is a benefit to the land in the District and a public benefit or utility.

The Examiner recommends that the Commission find that creating the proposed District will be a benefit to the land and a public benefit or utility.

The petitioners propose a three-phase program as follows:

(1) initiation of a well permit program and a conservation/regulatory program;

(2) collection of data for development of a comprehensive management plan; and

(3) evaluation of the possibility of capital intensive projects, such as surface and/or groundwater supply or recharge enhancement projects.

The petitioners have suggested immediate and long-range options, attached hereto as "Exhibit A," for the Board of Directors to consider in performing the functions of the District.

The petitioners believe that creation of the District is necessary to protect and preserve the quantity and quality of water in that portion of the Edwards Aquifer (Aquifer) designated by Commission Ordinance No. 86-034 as the Barton Springs-Edwards Aquifer Management Area. The petitioners propose that the District boundaries and the management area boundaries be coterminous. In establishing their case the

petitioners offered the testimony of Dr. Kent Butler, an expert in growth planning and water resource management, who prepared a report on the necessity and benefit of the District. He testified that approximately 20,000 persons presently utilize the Aquifer for drinking water. The Cities of Buda, Hays, Mountain City, San Leanna, and Sunset Valley rely on the Aquifer as their only source of water; several water supply corporations utilize wells in the Aquifer to supply water to approximately 9,000 persons; and many individual homes throughout the District utilize private wells. In addition, the City of Austin depends on the Aquifer as a recreational resource at Barton Springs, a natural swimming facility which attracts approximately 300,000 people per year. The flow from Barton Springs ultimately contributes to flow in the Colorado River, from which the City of Austin diverts water for municipal and industrial use.

The Aquifer is threatened because a rapidly increasing population in the area will rely on the Aquifer as a water source, potentially depleting the Aquifer. Dr. Butler used population projections furnished by the City of Austin in making his report. According to Josh Farley, an economist in the Planning and Growth Management Office of the City of Austin, who also testified, the population will increase by 86,000 within the proposed District's boundaries by the year 2000. Although Mr. Farley agreed that a recent economic slowdown will have some short-term effect on growth, he believes the population forecast to be reliable as to the year 2000.

Dr. Butler predicts that the increase in growth will in turn create an increased demand for water. The Aquifer has a finite water supply capacity, or safe yield, of somewhere between 8 and 20 million gallons per day (mgd), depending on the existence of drought conditions and other factors. Pumpage at present is 4-5 mgd. From 1984 to 1986 pumpage increased approximately 5 percent. During the period 1981 to 1984, pumpage increased more dramatically by 110 percent, although admittedly 1981 was a wet year and 1984 was a drought year. In any event increases in pumpage will likely continue.

In addition to population projections, Dr. Butler also relied on a report prepared by Raymond M. Slade, Jr.; Linda Ruiz; and Diana Slagle entitled "Simulation of the Flow System of Barton Springs and Associated Edwards Aquifer in the Austin Area, Texas," (Slade report) which was published in August, 1985, by the U.S. Geological Survey (USGS) in cooperation with the City of Austin. The Slade report summarizes a study to "quantify the areal distribution of selected hydraulic properties of the Edwards Aquifer by use of a mathematical model." One aspect

of the Slade report involves analysis of a steady-state simulation of the model which assumes certain conditions in the year 2000, including the projected population. The simulation indicates that the Aquifer will be dewatered in the southwest portion and experience large declines in the southeast by the year 2000.

The protestants believe that the projections of depletion of the Aquifer are premature. They consider the population increase forecasts to be exaggerated, although they presented no evidence to support their allegation. In addition, at the hearing the protestants Goforth Water Supply, Inc. and Creedmoor-Maha Water Supply Corporation (WSCs) challenged the reliability of the Slade report. Dr. James Duke, a hydrology expert who has modeled the Floridan Aquifer in Florida, which is geologically similar to the Edwards, although much larger, testified for the WSCs as to what he believes are flaws in the report. First of all, Dr. Duke thinks the model boundary should have been extended south of the actual boundary, since the exact location of the southern boundary has been subject to debate. Secondly, Dr. Duke questioned the failure of the modeler, Mr. Slade, to use a "weir equation" in computing the model. Dr. Duke believes inclusion of such an equation provides for more reliable calibration, a necessary function of the modeling process.

In rebuttal testimony, Mr. Slade disagreed with Dr. Duke's methodology. Mr. Slade asserted that fixing the model boundary as he did was appropriate for his purposes, and, additionally, that the weir equation was not a necessary component of his model, a less complex model than the one prepared by Dr. Duke on the Floridan Aquifer. Because of Mr. Slade's confidence in his model, and since Mr. Slade's report was prepared independent of the hearing by and for the U.S. Government Survey Office, the Examiner believes that the report's conclusions are of sufficient credibility to give cause for concern about potential adverse conditions caused by continued pumpage of the Aquifer.

The petitioners assert that the District is necessary to preserve the quality of the water in the Aquifer as well as the quantity. Dr. Butler testified that the Aquifer is probably more sensitive to contamination than any other Aquifer because of the high rate of infiltration of surface waters which potentially carry pollutants. However, at present there are few reported instances of groundwater contamination. Existing pollution controls are apparently doing a good job of curtailing pollution. For example, the City of Austin has in effect Ordinance No. 860508, the "watershed ordinance," which includes extensive pollution

abatement controls. Many other governmental entities, in addition to the City of Austin, have jurisdiction to control pollution in the area. (In fact the protestants assert that the district is unnecessary because of the layers of government already in place. Their argument fails because none of the existing regulatory authorities has direct authority to regulate pumpage.) The petitioners envision that the District will monitor and coordinate the existing pollution abatement programs, as well as institute new ones as necessary. Consequently, the District will help to preserve the quality of groundwater.

As the foregoing demonstrates, the District will be a benefit to the land and a public benefit or utility. It is necessary primarily to protect the water supply in the aquifer and secondarily to protect the water quality.

2. Whether the District is feasible and practicable.

The Examiner recommends that the Commission find that the District is feasible and practicable.

The petitioners estimate the annual costs of the District to be approximately $300,000, an amount which includes salaries, office space, and administrative costs. The estimate does not include funds reimbursable to the petitioners as creation costs or any funding of major capital projects. Testimony indicated this estimate comports with the annual expenditures of the existing Edwards Aquifer Underground Water District in the San Antonio region. Protestants' testimony regarding much higher administrative costs appears to the Examiner to be exaggerated.

Chapter 52 provides for generation of needed revenues through ad valorem taxation. The proposed District boundaries include portions of Hays and Travis Counties. (In designating the Barton Springs-Edwards Aquifer Management Area, the Commission considered the suitability of the management area boundaries for the levying of taxes and found the boundaries appropriate.) Tax valuations for Hays County property within the district are approximately $456 million. The 1986 valuations for Travis County are presently estimated to be approximately $3.163 billion, although, as noted in the record, recent newspaper articles reflect the apparent intent of the Travis County Tax Appraisal District to scale down those valuations. Based on those figures, a tax of $.01-.02 per $100 valuation within the District would clearly provide the needed $300,000. Taxes in the $.01-.02 range are comparable to those imposed by other underground water districts.

The protestants argue that the Board of Directors may disregard the petitioners' recommendations with regard to planned activities and may undertake expensive capital projects requiring burdensome taxes. Their concern is based in part on the original intent of the petitioners to plan for a recharge enhancement project. The project was estimated to cost $20-50 million and require taxes as high as $.25 per $100 valuation. That early plan was abandoned, however. Although no one can guarantee what actions the directors will ultimately take, increases in taxation are subject to voter approval (as is creation of the District itself).

In light of the foregoing, the Examiner is of the opinion that the District as proposed by petitioners is technically and financially feasible and practicable.

3. Whether the burdens imposed by creation of the District outweigh the benefits.

The Examiner recommends that the Commission find that the benefits outweigh the burdens.

Certainly the creation of another layer of government, one which has the power to tax, would not be a public benefit if the burdens imposed by creation of the District are so onerous as to outweigh the benefits. The protestants made several arguments regarding inherent inequities in creating the District. First, many of those who live within District boundaries do not rely on the Aquifer as a source of water and do not use Barton Springs as a recreational facility (i.e., no direct personal benefits), but will have to pay taxes. Moreover, many of the people who depend on the Aquifer as a source of water live outside the District boundaries and, consequently, will not be able to vote in District elections. In response, the petitioners agree that taxing those who do not directly benefit and denying voting rights to those who depend on the Aquifer for water services may not be fair; however, the petitioners compare District taxation to school district taxation, where the public benefit gained has been deemed to outweigh the burden.

There is merit in the protestants' arguments. Unfortunately, protection of a natural resource does not come without a price. In the Examiner's opinion, the benefits far outweigh the burdens.

4. Whether the Commission should defer to the State Legislature to create the District.

The Examiner recommends that the Commission create the District, pursuant to its authority under Chapter 52 of the Texas Water Code, as amended.

Gary Bradley, through his attorney, Lee Biggart, asserted that the Legislature should create the District, rather than the Commission, because the Legislature is not limited by the provisions in Chapter 52 of the Texas Water Code, as amended. For example, Section 52.170 allows certain exemptions from the permitting requirements for wells which pump less than 25,000 gallons per day, or serve 10 families or less, or are used in livestock production. The Legislature could avoid such restrictions. In addition, Mr. Bradley believes there is inherent conflict in the proposed District in that Austin's desire to protect Barton Springs is possibly in opposition to the southern portion's desire to protect its domestic and industrial water supply. A district created by the Legislature could include provisions which protect the interests of domestic and industrial users, thereby avoiding the conflict. The petitioners respond by noting that legislation proposed in the 1985 Legislative Session to create the Barton Springs-Associated Edwards Aquifer Underground Water District was defeated. Moreover, the petitioners deny that a conflict between Austin and the southern portion exists.

The petition before the Commission is clearly within the jurisdiction of the Commission. Notwithstanding limitations imposed by Chapter 52, the evidence supports findings necessary for creation of the District. Consequently, a Chapter 52 district is appropriate.

5. Whether the temporary directors nominated by the protestant water supply corporations (WSCs) should be appointed in lieu of those nominated by petitioner.

The Examiner recommends that the Commission find that those persons nominated by petitioners should be appointed as temporary directors.

In submitting the petition for creation of the District, the petitioners also submitted the affidavits of five individuals to serve as temporary directors, as follows: Catherine Sims, Ben Harrison, Wayne R. Ford, Larry G. Hada, and Duwain R. Dumas. These individuals, according to their affidavits, meet the requirements for directors set out in Sections 51.072 and 51.0721 of the Texas Water Code, as amended. They are subject to a confirmation election, according to the precinct method set out in Section 52.102. At the hearing, the WSCs submitted the affidavits of five other individuals who also swear to

have met the statutory qualifications. While the Examiner believes the latter are qualified, the Examiner also believes that, as a practical matter, the individuals whose names were submitted by the petitioners will be more likely to work to achieve the initial goals for the District as set out by the petitioners. As a result, the Examiner recommends that Catherine Sims, Ben Harrison, Wayne R. Ford, Larry G. Hada and Duwain R. Dumas be appointed as temporary directors of the District.

II. ADDITIONAL FACTS

All matters relating to establishing jurisdiction, naming parties, and determining if statutory prerequisites for filing a Chapter 52 petition were addressed prior to bifurcating the hearing into two separate issues. One involved designation of the management area (which resulted in Commission Order No. 86-034 designating the Barton Spring-Edwards Aquifer Management Area), and the other involved creation of the District. Because the proper taking of jurisdiction, the meeting of statutory prerequisites, and the designation of the management area are prerequisites to the creation of the District, at the hearing the Examiner incorporated by reference the prior record into this record, including but not limited to the exhibits, the Examiner's Proposal for Decision, and Commission Order No. 86-034 dated August 15, 1986.

A post-hearing conference was held at the Examiner's request on October 13, 1986, for the purpose of determining a fair allocation of the cost of preparing a transcript of the proceeding. Those parties who participated in the hearing each stipulated that they would pay a proportionate share of the cost. Two parties who were not at the conference and did not participate in the hearing--Mr. Mackey, Trustee, and Mr. Negley--notified the Examiner by letter, through attorney Tom Leonard, of their desire to retain party status, thereby preserving their right of appeal. Consequently, the Examiner recommends that Mr. Mackey, Trustee, and Mr. Negley be assessed one share of the cost, with the other shares being borne equally by the following: the petitioners (one share), the Rutherfords (one share), the Creedmoor-Maha Water Supply, Inc. and Goforth Water Supply Corporations (one share), Gary Bradley (one share), and Lower Colorado River Authority (one share). Since the Executive Director of the Texas Water Commission and the Public Interest Advocate are statutory parties to the proceeding with no right of appeal, they should not be assessed a share of the costs. As per agreement of the parties, Mary Ann Hefner, Chief Clerk of the Texas Water Commission, will order an original and one copy of the transcript for the Commission. Upon notification from

Ms. Hefner, the aforementioned six parties will reimburse the Commission in equal payments.

After a review of the record and for the reasons given above, the Hearings Examiner recommends that the Commission adopt the Findings of Fact and Conclusions of Law included in the attached Order. In addition, the Examiner recommends that the Commission issue the Order granting the petition for creation of the Barton Springs-Edwards Aquifer Conservation District and appointing the temporary directors named therein.

Claire Patterson

Claire Patterson
Hearings Examiner
Texas Water Commission

The following list includes options for groundwater conservation and management that should be considered by the proposed District.

Education and Information Programs

Schoolroom education
Consumer education
Speaker forums for meetings of public and private organizations
Publication of plans and information on groundwater resources

Monitoring

Water well inventories
Water level surveys
Water quality sampling
Leak detection programs for certain transmission, collection, and storage facilities (such as liquid hydrocarbons and sanitary sewers)

Research

Cooperative research with other agencies and institutions
Water supply and demand forecasting
Determination of allowable limits on withdrawal of groundwater
Research into new and innovative water conservation measures

Conservation

Voluntary household conservation programs
Plumbing code standards for water conservation in new construction
Plumbing retrofit programs to improve water-use efficiency in existing buildings
Water-conserving landscaping
Water and wastewater reuse and recycling
Conservation-oriented water rate structures
Emergency peak demand rationing
Drought contingency plans with "watch/warning/alert" phases
Agricultural water use conservation (such as brush control)
Technical assistance to political subdivisions, water supply corporations, individual property owners, etc.

Permitting

Universal well registration program
Monitoring and annual reporting of groundwater withdrawals and uses
Establishment of maximum per-capita or per-living-unit-equivalent water usage rates for large capacity wells
Establishment of maximum withdrawal rates over given time periods (with exemptions for certain wells)
Requirements for recordkeeping of drillers' logs, and equipping and completing of new wells
Standards for spacing of new wells to avoid well interference

Recharge Enhancement

Artificial storage and release of surface water
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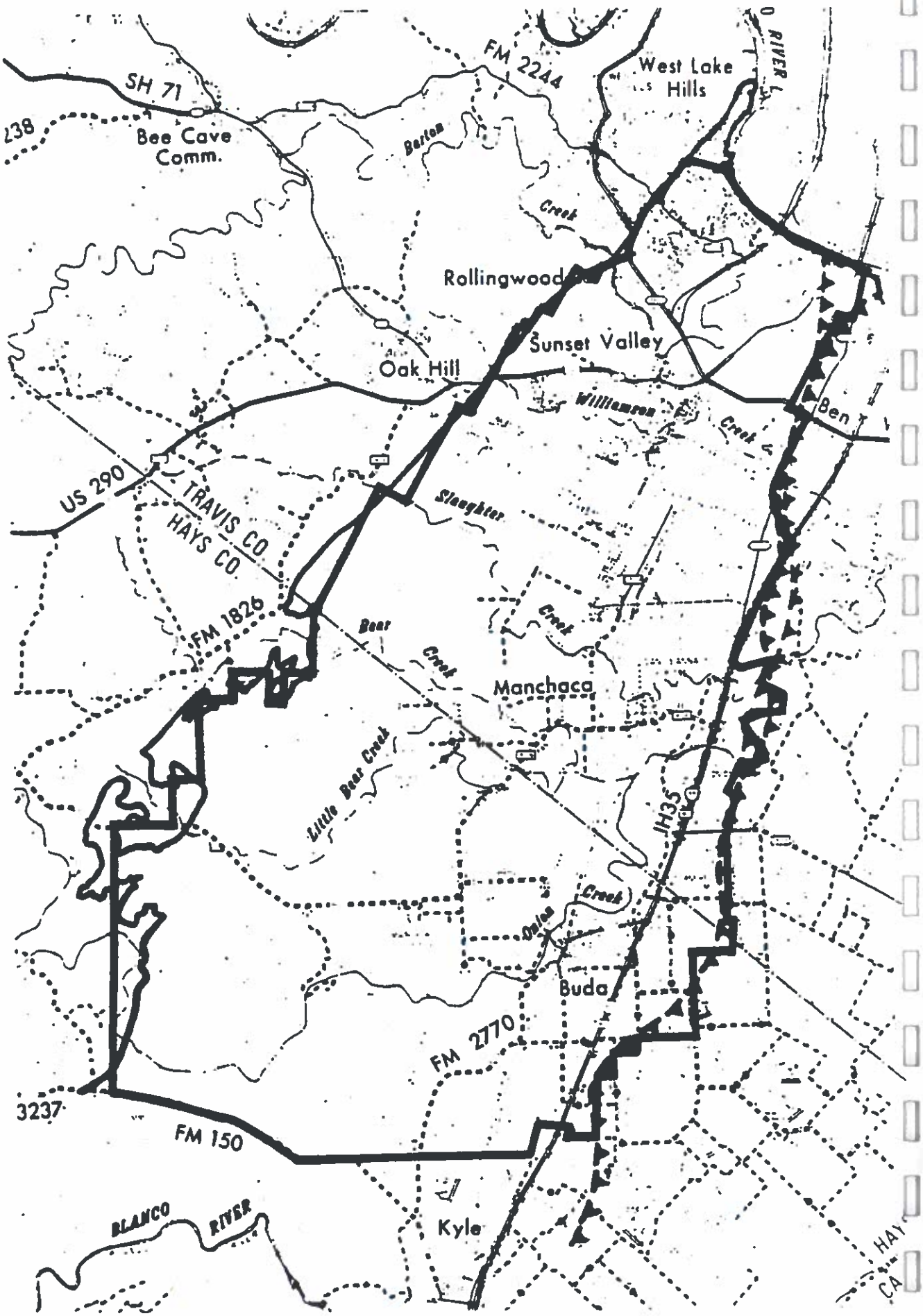
Development and Delivery of Surface Water

Conjunctive surface water and groundwater use management
Coordination with other water suppliers (cities, river authorities, water supply corporations, etc.)
Purchase, transportation, distribution, and sale of surface or groundwater

Prevention of Waste and Water Quality Control

Water loss reduction plans for water distribution systems
Leak detection and repair programs
Review of sewage collection, treatment, and disposal plans and permits
Well construction and casing standards
Abandoned well capping standards
Review of waste disposal wells, animal feedlot operations, industrial and municipal solid waste disposal facilities
Regulation of high pollution-risk activities
Spill/pollutant containment and clean-up
Coordination with other agencies in carrying out water quality protection programs


FM 2244
West Lake Hills
SH 71
238
Bee Cave Comm.
Barton
Creek
Rollingwood
Sunset Valley
Oak Hill
Williamson
Creek
Ben
US 290
TRAVIS CO.
HAYS CO.
Slaughter
Creek
FM 1826
Bear
Creek
Manchaca
Little Bear Creek
IH35
Onion
Creek
Buda
FM 2770
3237
FM 150
BLANCO
RIVER
Kyle

TEXAS WATER COMMISSION

AN ORDER granting the Petition for Creation of the Barton Springs-Edwards Aquifer Conservation District and Appointing Temporary Directors

On , 1986, the Texas Water Commission considered the petition of the Cities of Austin, Buda, Hays, San Leanna and Sunset Valley for creation of the Barton Springs-Edwards Aquifer Conservation District. The petition was presented to the Commission with a Proposal for Decision by Claire Patterson, Attorney, a Commission Hearings Examiner who conducted a public hearing on the matter on September 15-19, 1986, pursuant to Chapter 52 of the Texas Water Code, as amended.

The Hearings Examiner named the following as parties to the proceeding: the petitioners, Cities of Austin, Buda, Hays, San Leanna, and Sunset Valley; Lower Colorado River Authority; the Executive Director of the Texas Water Commission; the Public Interest Advocate of the Texas Water Commission; O. R. Rutherford, Jr.; Michael G. Rutherford; Polly Bell Rutherford; the Estate of P. R. Rutherford; the 1973 Rutherford Trust; Creedmoor-Maha Water Supply Corporation; Goforth Water Supply, Inc.; Gary Bradley; Don E. Mackey, Trustee; and William F. Negley.

After considering the Hearings Examiner's Proposal for Decision and the evidence and argument presented, the Texas Water Commission makes the following Findings of Fact and Conclusions of Law:

FINDINGS OF FACT

1. On August 30, 1985, the Commission received a petition signed by more than 250 property owners within the boundary of the proposed District, requesting the Commission to delineate the boundaries of the Barton Springs-associated Edwards Aquifer, or underground reservoir, and to create an underground water-conservation district for that aquifer.
2. Copies of the petition were duly filed and recorded by the Hays County Clerk and Travis County Clerk.
3. The Travis County Assessor-Collector certified that more than 50 of the petitioners were listed on Travis County tax rolls as property owners.
4. Notice of the public hearing was published on January 6, 1986 and January 13, 1986 in the Austin American-Statesman, a newspaper regularly published in Austin, Travis County, Texas and generally circulated in Travis and Hays Counties, Texas, the counties in which persons reside who may be affected by action taken as a result of the hearing. Additionally, notice was posted in the

Travis and Hays County Courthouses by the County Sheriff, more than 15 days prior to the date of hearing.

5. Notice of the public hearing was mailed on January 2, 1986, by the Chief Clerk of the Texas Water Commission to all parties who may be affected as a result of the hearing and to each person as required by law.

6. A public hearing on the petition referenced in Finding of Fact No. 1 was held on February 19, April 7-11, and April 14-18, 1986, wherein evidence was heard regarding the suitability of a certain area for designation as an underground water management area. By Order No. 86-034 dated August 15, 1986, the Commission designated the Barton Springs-Edwards Aquifer Management Area, a hydrologically discrete subdivision of the underground reservoir (referred to as the Barton Springs-associated Edwards Aquifer, or the "Aquifer") in southern Travis and northern Hays Counties. The Order includes a metes and bounds description of the management area's boundaries.

7. The second phase of the public hearing on the petition in Finding of Fact No. 1 was held on August 25, 1986, and September 15-19, 1986, to determine whether an underground water conservation district should be created to regulate the Barton Springs-Edwards Aquifer Management Area.

8. The District as proposed by petitioners will benefit the land and be a public benefit and utility in that it will perform functions necessary to protect and preserve the quantity and quality of water in the Aquifer. Protective action is necessary because of the following:

a. The Aquifer is depended on as a sole source of water in Hays and Travis Counties. It also serves as a recreational resource at Barton Springs, a natural swimming facility in Austin, Texas, which is widely enjoyed.

b. Based on projections of population growth and pumpage increases, the Aquifer will experience depletion and drawdown by the year 2000 unless pumpage is regulated.

c. The District will regulate pumpage of the Aquifer and implement other means of conservation. Long-range optional goals include constructing recharge enhancement facilities and/or additional surface water supply facilities for supplemental use.

d. The District will serve a secondary purpose of protecting the quality of groundwater by monitoring and coordinating existing water pollution abatement programs and undertaking new ones as necessary.

9. The District as proposed is feasible and practicable.

a. A reasonable cost of performing the District's proposed functions is approximately $300,000 annually, an amount which covers salaries for a general manager and field/office staff, as well as administrative costs, office space, and costs associated with contracting for technical services.

b. The proposed boundaries of the District are coterminous with the management area and are adequate for the purposes of tax assessment and collection.

c. The District will generate funds sufficient to meet the District's expenses by imposing ad valorem taxes of approximately $.01-.02 per $100 valuation of property, an amount which is not unreasonably burdensome.

10. Even though there are inherent inequities in creating the District (e.g., it will tax some persons who receive no direct personal benefit and deny a voting right to some others who depend on the Aquifer), the benefit to the public outweighs the burden.

11. The following persons, whose names were submitted by petitioners to serve as temporary directors, have submitted affidavits which indicate they meet the statutory qualifications to serve: Wayne Ford, a resident of the City of Hays in Hays County, Texas;

Duwain Dumas, a resident of the Village of San Leanna in Travis County, Texas; Larry Hada, a resident of Sunset Valley in Travis County, Texas; Catherine Sims, a resident of the City of Austin in Travis County, Texas; and Ben Harrison, a resident of Onion Creek in Travis County, Texas.

12. The five persons proposed by protestants Goforth/Creedmoor-Maha, who have submitted similar affidavits, are less likely to work to achieve the goals of the district as proposed by petitioners, since their interests are in alignment with those who have protested the creation of the District. Consequently, the temporary directors proposed by petitioners should be appointed.

13. The cost of transcribing the record of the hearing should be assessed to the following entities, in proportions as described: the petitioners, one share; Goforth/Creedmoor-Maha Water Supply Corporations, one share; the Rutherfords, one share; Gary Bradley, one share; Mackey/Negley, one share; and Lower Colorado River Authority, one share.

CONCLUSIONS OF LAW

1. A statutorily adequate petition, as amended, was filed by the petitioners requesting designation of an underground

water management area and creation of the Barton Springs-Edwards Aquifer Conservation District.

2. Proper and legally sufficient notice of the petition and hearing on designation of a management area and creation of the District was provided.

3. The Commission has jurisdiction to hear the petition and consider designation of an underground water management area and creation of the Barton Springs-Edwards Aquifer Conservation District pursuant to the provisions of Chapter 52 of the Texas Water Code.

4. The Barton Springs-Edwards Aquifer Management Area was designated by the Commission's Order of August 15, 1986; it is consistent with the requirements of Chapter 52 and enables the District to perform the functions described in Subchapter E.

5. Creation of the Barton Springs-Edwards Aquifer Conservation District, with boundaries conforming to the Management Area, is feasible and practicable. It benefits the land in the District and would be a public benefit and utility. It is in the public interest and consistent with the goals and objectives of Chapter 52 of the Texas Water Code.

6. The five persons named in Finding of Fact No. 11 are legally qualified to serve as temporary directors of the District.

IT IS THEREFORE ORDERED AS FOLLOWS:

1. The Barton Springs-Edwards Aquifer Conservation District is hereby created and organized as prayed for in the petition, as amended by the petitioners. Its boundaries shall be the same as those of the Barton Springs-Edwards Aquifer Management Area previously designated by the Commission on August 15, 1986.

2. The Barton Springs-Edwards Aquifer Conservation District is created and organized under the provisions of Article XVI, Section 59 of the Texas Constitution and pursuant to the provisions of Chapter 52 of the Texas Water Code, with all the powers, duties, and authority provided by said Chapter 52.

3. A temporary Board of Directors is hereby appointed for the Barton Springs-Edwards Aquifer Conservation District composed of the following members, each of whom is determined by the Commission to be legally qualified to serve as a director of said District: Wayne Ford, a resident of the City of Hays in Hays County, Texas; Duwain Dumas, a resident of the Village of San Leanna in Travis County, Texas; Larry Hada, a resident of Sunset Valley in Travis County, Texas; Catherine Sims, a resident of the City of Austin in Travis County, Texas; and Ben Harrison, a resident of Onion Creek in Travis County, Texas.

4. The foregoing temporary directors shall, as soon as practicable after the date of entry of this Order, execute their official bonds and take their official oath of office, and all such bonds shall be approved by the Board of Directors of the District, and each bond and oath shall be filed with the District and retained in its records.

5. This Order shall in no event be construed as an approval of any proposed agreements or of any particular items in any documents provided in support of the creation petition, nor as a commitment or requirement of the Texas Water Commission in the future to approve or disapprove any particular items or agreements in future applications submitted by the District for Texas Water Commission consideration.

6. The temporary directors are directed to order and organize an election within the boundaries of the District for the purpose of confirming or denying the creation of the District. The temporary directors shall include as part of said election an issue for voter approval of a maintenance tax to support the District, in an amount determined by the directors to be reasonably necessary to support the District's operations, both current operations and those in the foreseeable future.

7. The Chief Clerk of the Texas Water Commission is hereby directed to order one original and one copy of the hearing on the creation of the District conducted by Claire Patterson on September 15-19, 1986, and to assess the cost thereof to parties in proportions as indicated in Finding of Fact No. 13.

Signed the day of , 1986.

TEXAS WATER COMMISSION

Paul Hopkins, Chairman

Ralph Roming, Commissioner

John O. Houchins, Commissioner

ATTEST:

Mary Ann Hefner, Chief Clerk

TEXAS WATER COMMISSION

October 22, 1986

Mr. Doug Caroom, Attorney
Bickerstaff, Heath & Smiley
1419 United Bank Building
Austin, Texas 78701

Re: Petition for Creation of the Barton Springs-Edwards Aquifer Conservation District

Dear Mr. Caroom:

The above-referenced application is set to be considered by the Texas Water Commission at 2:00 p.m. on November 17, 1986, in Room 118 of the Stephen F. Austin State Office Building, 1700 North Congress Avenue, Austin, Texas. Enclosed are copies of the Proposal for Decision and Order which have been recommended to the Commission for approval.

Within ten (10) days after the date of this letter, any party may file exceptions or briefs by delivering the original documents to the Chief Clerk of the Commission. Any replies to exceptions and/or briefs shall be filed in the same manner within twenty (20) days after the date of this letter. Copies of all exceptions, briefs, and/or replies shall be served promptly on all other parties with certification of service furnished to the Chief Clerk of the Commission. Failure to provide copies may be grounds for withholding consideration of the pleadings.

Sincerely,

Claire Patterson

Claire Patterson
Hearings Examiner
Texas Water Commission

CP/lsb

Enclosures

cc: See attached list

SERVICE LIST

Doug Caroom, Attorney
Bickerstaff, Heath & Smiley
1419 United Bank Building
Austin, Texas 78701

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Vinson & Elkins
1700 First City Centre
816 Congress Avenue
Austin, Texas 78703

Martha Terry
Attorney at Law
5750 Balcones Drive, Suite 208
Austin, Texas 78731

Lee Biggart, Attorney
Johnson, Johnson & Biggart
1122 Colorado, Suite 208
Austin, Texas 78701

Tom Leonard, Attorney
Leonard, Marsh, Hurt & Terry
First City Centre
Suite 1280
817 Congress Ave.
Austin, Texas 78701

Bruce Wasinger, Attorney
LCRA
P. O. Box 220
Austin, Texas 78767

Jack Cox, Attorney
Public Interest Advocate
Texas Water Commission

Wade Russell
Staff Attorney
Legal Division
Texas Water Commission

LEGAL BACKGROUND
UNDERGROUND WATER CONSERVATION DISTRICTS

I. **Texas Groundwater Law** -- Underground water is private property, belonging to the owner of the surface of the land. Its use, absent creation of a special district, is totally unregulated, i.e., one property owner may pump out the water from his neighbor's land without any liability or limitation.

II. **Underground Water Districts** -- These are the only vehicle for management and conservation of underground water resources. Two types are possible:

A. Special legislatively created districts -- The area and authority of legislatively created districts are provided specifically by the law creating the district. A confirmation election is required. Legislative districts frequently lack the powers of general law districts.

B. Underground Water Conservation Districts, or "Chapter 52" Districts, are created under Chapter 52 of the Texas Water Code. Within its boundaries, an underground water conservation district is relatively powerful and in a position to implement conservation programs effectively.

III. Characteristics of Chapter 52 Districts

A. Governance -- The district is controlled by a five-person board of directors, elected from five precincts within the district. No more than two precincts may be within a single city.

B. Purposes -- "Conservation, preservation, recharging, and prevention of the waste of underground water." Preventing "waste" includes preventing pollution of underground waters.

C. Powers and Duties

(1) Rulemaking authority to accomplish purposes.
(2) Requiring permits for all new wells with pumping capacities larger than 25,000 gallons/day.
(3) Research, planning, and education.
(4) Aquifer recharge.
(5) Water supply and/or distribution (surface or groundwater).

D. Financial

(1) Taxation -- operation and maintenance tax for bonded indebtedness, only after approval by voters.
(2) Bonding capabilities -- Revenue or general obligation supported; voter approval required for a tax supported bond.

E. Authorities that Chapter 52 Districts do not have:

(1) General land use control
(2) Taxation, absent voter approval
(3) Authority to prohibit export of water from district
(4) Control over the type of use (e.g., municipal vs. agricultural) of groundwater

ELECTION INFORMATION ON
BARTON SPRINGS EDWARDS AQUIFER CONSERVATION DISTRICT

I. Purposes.

A. Confirmation of Texas Water Commission's creation of a district -- for confirmation a majority vote, within the district as a whole, is required. Any city or county having a majority vote against the district will be automatically excluded.

B. Election of Board of Directors -- five precincts only; two must be in Austin. Temporary directors, appointed by the Texas Water Commission, are automatically on the ballot. Other candidates must file at least 20 days prior to the election. Temporary Directors set date of confirmation election. Tax rate also set for approval by voters

C. Authorization of maintenance tax -- a maintenance tax is required to support the district's day-to-day operations. The level of authorization for that tax will be established by the temporary board of directors and placed on the ballot for voter approval. Only 1-3¢/~~thousand~~ $100 dollars valuation is anticipated to be necessary at this time.

II. Date of Election -- January ~~X~~ 17, 1987 or April 4 or August.

III. Location -- predominately at normal polling places for election precincts within the district boundaries.

Who support the creation of a District?

The Cities of:

- **Austin**
- **Buda**
- **Hays**
- **Kyle**
- **Mountain City**
- **San Leanna**
- **Dripping Springs**
- **Creedmore**

The League of Women Voters
The Sierra Club
United South Austin
Save Barton Creek Association
We Care Austin
Save Onion Creek
Save Bear Creek
Lower Colorado River Authority

POSSIBLE QUESTIONS AND ANSWERS

Under what authority will the Edwards Aquifer Underground Conservation District be established?

The Edwards Aquifer Conservation District must be approved by a majority of the voters in each of five precincts, that comprise the proposed district. If one of the precincts voters do not approve the district by a majority vote then that precinct will not be in the district.

Will there be a tax associated with the District?

Yes. A tax ceiling will be set by an interim board appointed by the Texas Water] Commission. That ceiling will be subject to voter approval at the time of the election to establish the District. The ceiling will be well publicized prior to the election.

Why should a person vote for the District that does not take water from the Aquifer or use Barton Springs Pool?

Protection of future water sources and maintaining natural resources.

How will the District be governed?

Initially, a five member board will be appointed by the Texas Water Commission to call an election and to set the tax ceiling. At the time of the election to confirm the District any person who owns land over the Aquifer can run for a seat on the board in the precinct in which that person owns land. The terms of the board are for two yea. There will be one elected representative from each precinct.

What are the duties of the District?

The function of the District is to protect the water supp;ies within the boundaries of the district. Specifically the District will be able to regulate, through a permitting procedure, wells that are planned to pump water from the Aquifer. Also, the District will have the authority to provide means for additional recharge of the aquife Supplying or distributing water is another permitted activity of the District.

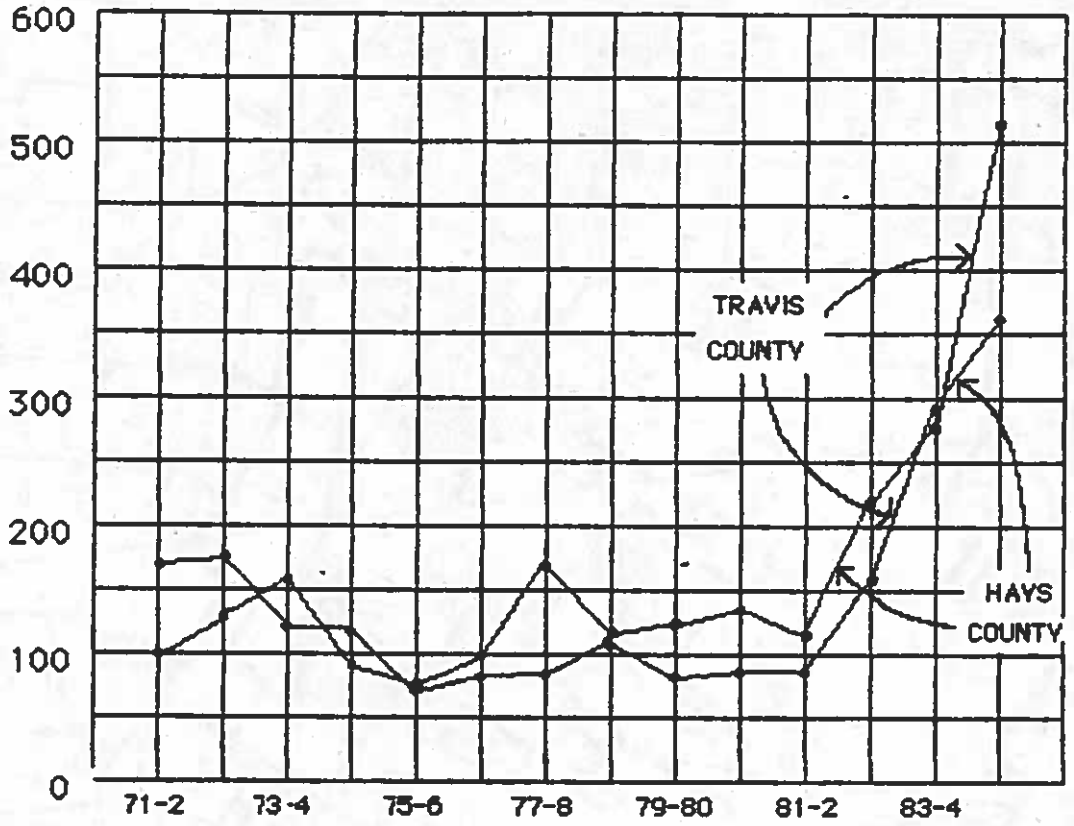
Why is a Conservation District needed?

Currently, the Aquifer is the sole source of drinking water for the cities of Buda, Hays, Mountain City, San Leanna, and Sunset Valley. The City of Austin obtains a ~~ma~~ portion of its water from the release of water from the Aquifer at Barton Springs Barton Springs also provides recreational opportunites for hundreds of thousands of people per year. The area proposed for the Districtis also one of the fastest developing areas in Central Texas. The current estimated population of the area is 112,000 people with a projected population of almost 200,000 by the year 2000. In order to protect the Aquifer from being drained or polluted a review authority needs to be established immediately.

When will the election be held?

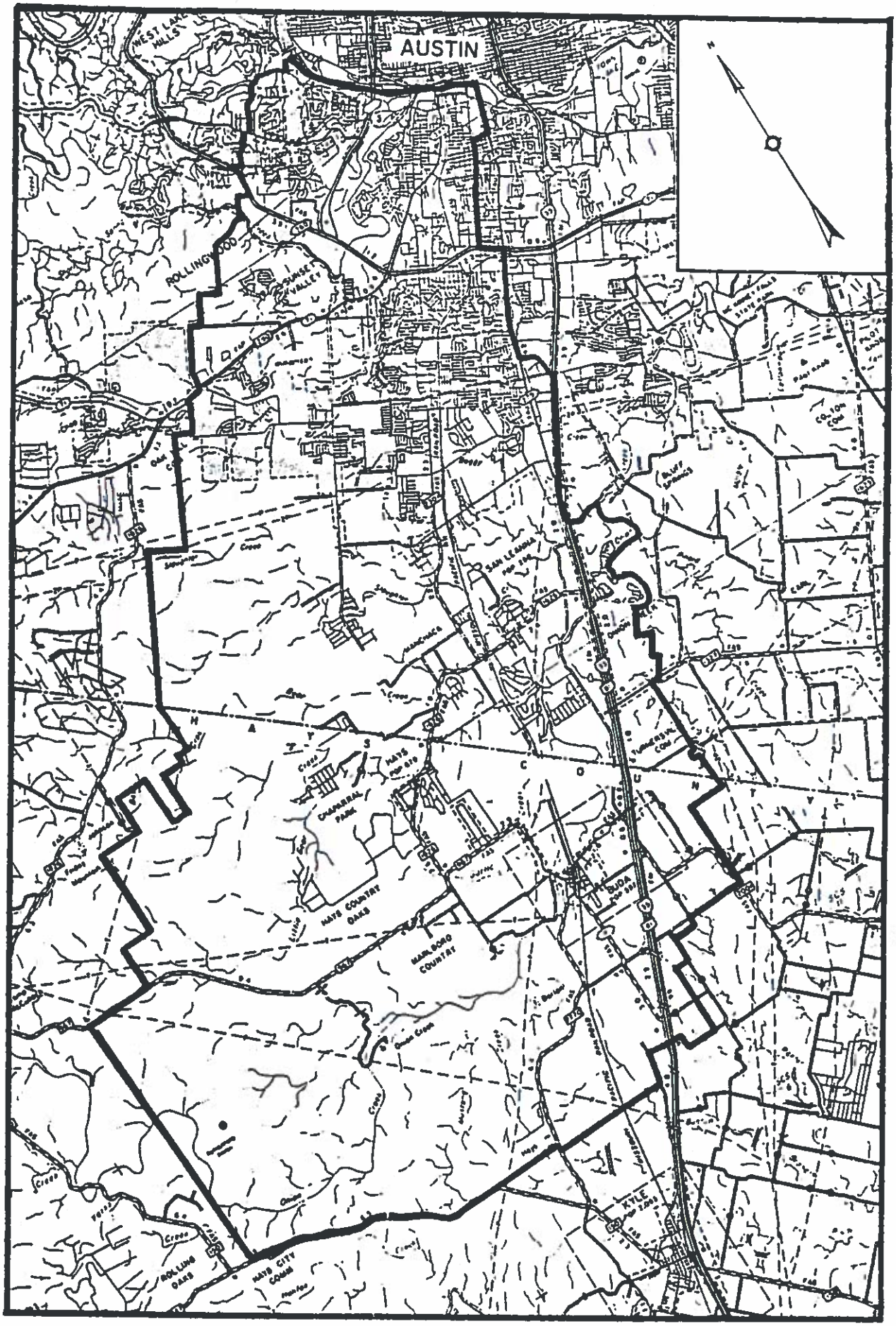
In ~~mid~~ November the ~~Texas Water Commission~~ temporary board is expected to call an election for January 17, 1987, or April

NUMBER OF NEW WELLS DRILLED IN HAYS AND TRAVIS COUNTIES, 1971-72 THROUGH 1984-85



Texas Water Development Board,

Engineering and Reporting Data Services



THE PROPOSED BARTON SPRINGS-EDWARDS AQUIFER CONSERVATION DISTRICT

ATTACHMENT #20

BUSINESS CONSULTANT AND MANAGEMENT AGREEMENT

Agreement made this 31st day of August, 1987, between the Barton Springs-Edwards Aquifer Conservation District, hereinafter referred to as the District, and Larry G. Hada, an individual.

In consideration of the mutual promises herein contained the parties hereto agree as follows:

RECITALS

It is the desire of the District to engage the services of Larry G. Hada to perform for the District consulting services regarding the general, administrative and management functions for the operation of the District as an individual contractor and not as an employee.

It is the desire of Larry G. Hada to consult with the Board of Directors, and to undertake for the District consultation as to the direction of certain functions and the management of the District.

AGREEMENT

Term

1. The respective duties and obligations of the parties hereto shall commence on September 1, 1987, and shall be for a term of ninety days with an option for additional extensions of ninety days each. In the event either party wishes to terminate this agreement at the end of the original ninety-day period, or any successive ninety day extension, this agreement may be terminated by either party giving five (5) days written notice to the other party.

Consultations

2. Larry G. Hada shall make himself available to consult with the Board of Directors at reasonable times concerning matters pertaining to the organization of the administrative staff, the fiscal policy of the corporation, the relationship of the corporation with its employees or with any organization representing its employees, the development of proposals for the Board's consideration, and, in general, concerning any problem of importance concerning the business affairs of the corporation, and shall in addition assist the Board in gathering information.

Advice as to Contracts

3. From time to time, the District may deem it advisable to enter into an agreements relating to the affairs of the District. With regard to said agreements, Larry G. Hada shall assist the corporation in the negotiation of the terms and conditions of the said agreements. Larry G. Hada shall have no power to bind the District to said agreements, without specific authorization from the Board of Directors.

Management Authority of Larry G. Hada

4. In addition to the consultation provided for above, Larry G. Hada shall provide consulting services for the administrative staff of the District. The administrative staff of the District shall be employees of the District, and the District shall have absolute and complete authority to employ, discharge, direct, supervise, and control each and every member of the administrative staff.

Employment of Certified Public Accountants

5. It is understood and agreed by the parties hereto that the services to be performed by Larry G. Hada do not include the auditing of the books of the District, the preparing of any financial statements, the preparing of any tax returns or other documents required to be prepared by any governmental body having jurisdiction to tax, or any other acts or services normally performed by public accountants.

Limited Liability

6. With regard to the services to be performed by Larry G. Hada pursuant to the terms of this agreement, Larry G. Hada shall not be liable to the District, or to anyone who may claim any right due to his relationship with the District, for any acts or omissions in the performance of said services on his part, except when said acts or omissions are due to his willful misconduct or culpable negligence. The District shall hold Larry G. Hada free and harmless from any obligations, costs, claims, judgments, attorney's fees, and attachments arising from or growing out of the services rendered to the District pursuant to the terms of this agreement or in any way connected with the rendering of said services, except when the same shall arise due to the willful misconduct, or culpable negligence of Larry G. Hada, and Larry G. Hada is adjudged to be guilty of willful misconduct or culpable negligence by a court of competent jurisdiction.

Compensation

7. Larry G. Hada shall receive at least monthly from the District a sum for the performance of the services to be rendered

to the corporation pursuant to the terms of this agreement which shall be a flat fee of $2085.00 per month. Compensation shall be deferred as provided in paragraph 10 below.

Minimum Amount of Service

8. Larry G. Hada shall devote a minimum of 20 hours per week to the affairs of the District. Said 20 hours shall not include attendance at Board meetings or other functions undertaken as a part of Larry G. Hada's duties as a member of the Board of Directors. Anything to the contrary notwithstanding, Larry G. Hada shall devote only such time, in excess of said 20 hours per week, to the affairs of the District as he in sole judgment deems necessary. Larry G. Hada may represent, perform services for, and be employed by such additional clients, persons, or companies as he in his sole discretion sees fit.

Reimbursement of Expenses

9. Larry G. Hada shall be entitled to reimbursement for reasonable expenses incurred in performance of his duties for the District under this agreement, such as automobile mileage, office supplies, duplicating, and other expenses normally incurred in work of this nature. Said reimbursement shall not exceed the sum of $500.00 per month, without specific authorization in advance from the Board of Directors. Larry G. Hada shall submit itemized statements of expenses during any particular month by the tenth day of the next succeeding month. Said amount shall be paid by the twentieth day of such latter month.

The Deferment of Payment of Compensation

10. Larry G. Hada understands, in entering into this agreement, that the District is a newly created entity, and at present has no operating funds. He agrees that his compensation will be deferred until such time as the District has collected funds from which he may be paid. The District agrees to pay Larry G. Hada all compensation due as soon as possible. Once funds are available, compensation will be paid on a monthly basis by the tenth day of the month next succeeding any month during which this agreement was in force.

Remedies

11. If any action at law or equity is necessary to enforce or interpret the terms of this agreement, the prevailing party shall be entitled to reasonable attorney's fees, costs, and necessary disbursements in addition to any other relief to which he may be entitled.

Texas Law to Apply

12. This agreement shall be construed under and in accordance with the laws of the State of Texas, and all obligations of the parties created hereunder are performable in Travis County, Texas.

Parties Bound

13. This agreement shall be binding upon and inure to the benefit of the parties hereto and their respective heirs, executors, administrators, legal representatives, successors, and assigns where permitted by this agreement.

Legal Construction

14. In case any one or more of the provisions contained in this agreement shall be for any reason held to be invalid, illegal, or unenforceable in any respect, such invalidity, illegality, or unenforceability shall not effect any other provision thereof, and this agreement shall be construed as if such invalid, illegal or unenforceable provision had never been contained herein.

Prior Agreement Superseded

15. This agreement constitutes the sole and only agreement of the parties hereto and supersedes any prior understandings or written or oral agreements between the parties respecting the within subject matter.

Executed at Austin, Texas, on this 1st day of September, 1987.

BARTON SPRINGS-EDWARDS
AQUIFER CONSERVATION DISTRICT

BY: Duwain Dumas
DUWAIN DUMAS
Vice President

LARRY G. HADA, an individual

By: Larry G. Hada

approved EC

ATTACHMENT #21

ATTACHMENT 21

BARTON SPRINGS-EDWARDS AQUIFER CONSERVATION DISTRICT
1800 San Jacinto Center
98 San Jacinto Blvd.
Austin, Texas 78701-4039
472-8021

September 21, 1987

Gender Firstname Lastname
Address
City State Zip

Dear Sal:

The Board of Directors of the newly confirmed Barton Springs-Edwards Aquifer Conservation District would like to take this opportunity to express our sincere appreciation to you for your assistance and support in the establishment of the District.

The Directors are currently holding organizational meetings on the first and third Mondays of each month at 5:30 p.m. in the offices of Bickerstaff, Heath & Smiley, 98 San Jacinto Blvd., Suite 1800, Austin, Texas 78701.

You are cordially invited to attend and participate in any of these meetings. You may contact me at 472-8021 if you have any questions.

Again, thank you for your support and interest in preserving another of our natural resources.

Barton Springs-Edwards Aquifer
Conservation District
Board of Directors

By: _____
Larry G. Hada, President

LGH:bm

"Thank You" Letter

1. Senator Gonzalo Barrientos
2. Representative Terral Smith
3. Representative Anne Cooper
4. Representative Lena Guerrero
5. Land Commissioner Garry Mauro
6. Roger Duncan
7. LCRA - Freeman
8. USGS - Raymond Slade
9. Edwards Underground Water Conservation District - San Antonio
10. Sierra Club
11. Save Barton Creek
12. Mayor Frank Cooksey
13. Sally Shipman
14. George Humphrey
15. John Trevino
16. Max Nofziger
17. Dan Rogers
18. Adrian Freund
19. Travis County Judge
20. Hays County Judge
21. Mayor, San Leanna
22. Mayor, Buda
23. Mayor, Hays
24. Mayor, Sunset Valley
25. Jorge Carrasco
26. Kent Butler
27. Smoot Carl-Mitchell
28. Jack Goodman
29. Karen Haschke
30. LCRA - Mark Rose
31. Pam Reed, Travis County Commissioner
32. Wayne Ford, Hays County Commissioner

ATTACHMENT #22

SMALL CITIES COUNCIL

Participants and Other Interested Parties

Buda

Peter A. Stone, Mayor
P.O. Box 622
Buda, TX 78610
295-7171 (h)
834-9222 ext. 242 (w)

Eileen Conley
P.O. Box 894
Buda, TX 78610
295-2434 (h)
268-4011 (w-Mon, Kyle)
327-7930 (w-T,W,Th, Austin)
454-7784 (w-Fri, Austin)

Annette Chambers, City Secy.
City Hall
P.O Drawer 1218
Buda, TX 78610-1218
295-6331 (w)

Other Councilmembers:
- David Dickens
- James Poer
- Robert Roach
- Ken Hiscoe

Hays

Lamont Ramage, Mayor
12631 Red Bud Trail
Buda, TX 78610
295-4761 (h)
482-5761 (w-Austin)

(City of Hays, continued)
Wayne Ford
P.O. Box 830
Buda, TX 78610
295-4705 (h)
837-4124 (w-Austin)

Other Councilmembers:
- June Hill 295-3522 (h)
- Jim Turner
- Tiny Walters
- Jim Bjork

Kyle

City Office
P.O. Box 40
Kyle, TX 78640
268-5341

Sandra Martinez, Mayor
P.O. Box 543
Kyle, TX 78640
268-1571 (h)
473-9444 (w-Austin)

Other Kyle Councilmembers:
- Frank Cutler
- Eloise Romo
- Eusebio "Chevo" Pastrano
- Robert McKaskle

Mountain City

Beth Smith, Mayor
116 Cedar Dr.
Buda, Tx 78610
268-4051 (h)

Philip Wilbur
209 Ash Dr.
Buda, TX 78610
268-8881 (h)
396-8403 (w-San Marcos)

Vern Meyer
200 Cedar Dr.
Buda, TX 78610
268-1691 (h)
440-2012 (w-Austin)

Other Councilmembers:
Chuck Pace (h) 268-4041
William C. (Cliff) Banden
268-4371 (h)
477-5931, ext. 463 (w)

San Leanna

Roy "Chip" Kidd, Mayor
11918 Bluebonnet Dr.
Manchaca, TX 78652
282-3215 (h)
892-4160 (w)

Duwain Dumas
Route 5, Box 733
Austin, TX 78748
282-2140 (h)
463-0488/1120(0)

Other San Leanna Councilmembers:
Sarah Nelson 282-3977
Joyce Watts 282-0830 (h)
Janice Caldwell
Jim Gramon
Jim Simpson

Ex Officio Members:
Anne Appenzellar
282-2781(h) 471-3033(w)
Caroline Dowell
282-1141(h) 471-3032(w)

San Leanna City Office
P.O. Box 225
Manchaca, TX 78652

Austin

Frank Cooksey, Mayor
(Mark Hampton, Aide) 499-2250
City Council
P.O. Box 1088
Austin, TX 78767

Adrian Freund
Dept. of Planning and Growth Management
City of Austin
P.O. Box 1088
Austin, TX 78767
448-0944

Other Councilmembers:
Sally Shipman
(Melissa Schenker,Aide)499-2255
Mark Rose
(David Lloyd, Aide) 499-2260
Smoot Carl-Mitchell
(John Hrncir, Aide) 499-2256
Charles Urdy
(Ruby Williams, Aide) 499-2266
John Trevino
(Amelia Rivera, Aide) 499-2264
George Humphrey
(Doug McMurry, Aide) 499-2258

Dripping Springs

Bill Bassett
(Chrmn., Plng. and Zoning Comm.)
P.O. Box 315
Dripping Springs, TX 78620
858-4441

Other Councilmembers:
Terry Garnett
Travis Garnett
"Shot" Glosson
Bob Burk

Sunset Valley

Larry G. Hada, Mayor
8217 Shoal Creek Blvd.
Austin, TX 78758
892-1240 (h)
467-6665 (w)

Municipal Building
2 Lone Oak Trail
Austin, TX 78745
892-1383

Helen Besse
795 Oakdale Drive
Austin, TX 78745
892-0740 (h)
327-6840 (w)

Other Councilmembers:
Frances Underwood
892-0808 (h)
Dan Huebner
Mickie Powers
Cole Corser

Creedmoor

Joseph F. Click, Mayor
City of Creedmoor, Creedmoor Stn.
Creedmoor, TX 78747
243-2202 (h) 397-6400 (w)

Texas Legislature

Sen. Gonzalo Barrientos
(Steve Garcia, Assistant)
P.O. Box 12068, Capitol Station
Austin, TX 78711
475-3731

Rep. Anne Cooper
(Louise Green, Assistant)
Rm. G-47W, Capitol
P.O. Box 2910
Austin, TX 78769
475-2195 (w), 353-0123 (San Marcos)

Rep. Terral Smith
(Dottie Dumas, Assistant)
P.O. Box 2910
Austin, TX 78769
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Rep. Lena Guerrero
(Donna Johnson, Assistant)
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Austin, TX 78769
475-3072

Hays County Commissioners

Dan Campos 268-0681 (w)
Hays County Courthouse
San Marcos, TX 78666
392-2521

Don Rains, County Judge
Rafael Gonzales
Oran "Pug" Rippy
Craig Payne

Travis County Commissioners

Pam Reed
(Janna Zumbrun, Aide) 475-2591
Richard Moya
(Sandra Martinez, Aide) 473-9444

Bob Hontz
Mike Renfro, County Judge

Travis County Courthouse
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462-9966

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480-8300

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472-8021 (w)

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Karen A. Haschke
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Austin, Tx. 78746

ATTACHMENT #23

PROPOSED BUDGET

I. Income

Permit/Usage Fees		180,000.00
City of Austin (40%)		120,000.00
	Total	300,000.00

Pumpage/Permit Fees

Assume Total Pumpage of 900,000,000 Gallons

Rate $\frac{180,000}{900,000}$ = 20 cents per 1000 gallons

Cost to Average Household = 8,000-10,000 gal/mo.
= $1.60-$2.00 /mo.
= $25.00 /yr.

II. Expenses

		Monthly	Annual
A.	**Operation Expenses**		
1.	Office rent, includes receptionist, telephone, janitor, utilities	1,100	13,200
2.	Telephone	200	2,400
3.	Office Supplies	100	1,200
4.	Travel, Gasoline	300	3,600
5.	Printing	200	2,400
6.	Insurance, Auto, Worker's Comp., Liability, Office, Medical	500	6,000
7.	Maintenance, Auto, Computer	200	2,400
	TOTAL	2,600	31,200
B.	**Salaries**		
1.	General Manager	4,000	48,000
2.	Office/Field Technician	2,500	30,000
	TOTAL	6,500	78,000
C.	**Consultants**		
1.	Accountant	400	4,800
2.	Engineer	500	6,000
3.	Attorney	1660	20,000
4.	Directors	400	4,800
	TOTAL	2,960	35,600

D.	Capital Expenditures			
	1.	Auto	300	3,600
	2.	Computer w/programs	450	5,400
	3.	Furniture	200	2,400
		TOTAL	950	11,400
E.	Finance			
	1.	Interest (10% $150,000)	1,250	15,000
	2.	Debt Payment	8,333	100,000
		TOTAL	9,583	115,000
F.	Programs			
	1.	Education	100	1,200
	2.	Research	200	2,400
	3.	Cooperative Programs	100	1,200
		TOTAL	400	4,800
G.	Contingency Fund		2,007	24,000
		GRANT TOTAL	25,000	300,000

Debt Payment

Organizational Expenses

Austin	192,000 + 33,000 =	225,000
Small Cities		15,000
Attorney		60,000
TOTAL		300,000

Repayment Schedule

1st Year	100,000
2nd Year	100,000
3rd Year	100,000
TOTAL	300,000

ATTACHMENT #24

ATTACHMENT #24

AUSTIN
WEEKLY
ANALYSIS

July 27, 1987, Vol. I, No. 16

NEWS IN BRIEF

ENVIRONMENT: The Edwards Aquifer District will probably come into existence with the August 8th election, but should Austin's water ratepayers help foot the bill?
PLANNING: The Planning Commission recently approved a new set of guidelines for shared parking, a concept that planners and designers increasingly will be using.

Environment

Austin Hasn't Decided How To Pay For The New Edwards Aquifer District

Barton Springs has become the symbol of Austin and the motto "Barton Springs Eternal" is the rallying cry for many Austinites. Preserving Barton Springs by limiting pumpage in the southern portion of the Edwards Aquifer has been the goal of neighborhood and environmental activists for several years. This goal will become a reality for many of those activists if the voters of the Southwestern portion of Travis County and the Northern portion of Hays County approve the creation of the Barton Springs/Edwards Aquifer District.

The creation of this district has been a long and involved process. During the negotiations over creation of the District, boundaries have changed, funding mechanisms for operational costs have changed, and the powers of the district have changed.

The creation process has involved two separate hearings in front of the Texas Water Commission and passage of S.B. 988 sponsored by State Sen. Gonzalo Barrientos. Legislation was originally introduced in the 69th Legislature and failed to receive approval from the House. The bill, introduced again in the 70th or most recent legislative session, was changed substantially from the one introduced in the 69th Legislature.

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S.B. 1248 & 988

Under S.B.1248 the district would have been financed with a combination of user fees, well permitting fees, and property taxes. This bill allowed the district to asess up to 25 cents per $100 of valuation. By comparision, the City of Austin has a current tax rate of $0.4073 per $100 valuation.

The new legislation, S.B. 988, provides for user fees which also include the City of Austin. In a letter to Rep. Terral Smith pertaining to the fiscal note on S.B. 988 the user fee is set at $120,000: "2. The City of Austin will pay an annual water use fee of $120,000." Provision is also made for continued funding of the District if the user fee is declared unconstitutional: "If user fee authorized by this section is held unconstitutional by the Texas Supreme Court, the district may levy a property tax...The property tax may be set in an amount of not more than 3 cents for each $100 valuation."

S.B. 1248 envisioned a large public works project in the form of a recharge dam, a dam which would have inundated thousands of acres on Onion Creek and might have had the effect of reducing areas of the Aquifer which have the potential to become dry. "(1) erect, construct, or install dams, levees, wells, pumps, and other equipment and drain or divert surface waters and watercourses as necessary to rehcarge ground-bearing formation;..."

A last minute amendment by Rep. Anne Cooper of Hays County allows a County to be excluded: "The residents of any county area of the district (Hays or Travis) may, on petition of 15 percent of the registered voters within the county area of the district,..to determine whether or not that county area will remain within the district." S.B. 1248 did not contain any such provision.

Recharge Dams And Their Importance To the Edwards Aquifer

The importance of the Onion Creek recharge dams was emphasized by Raymond Slade in a United States Geological Survey (USGS) report, "SIMULATION OF THE FLOW SYSTEM OF BARTON SPRINGS AND ASSOCIATED EDWARDS AQUIFER IN THE AUSTIN AREA, TEXAS". "The reservoir would impound tens of thousands of acre-feet of water and could be used for recharge enhancement or as a direct source of water for the area." The study showed the effect of the recharge dam was to raise projected water levels as much as about 120 feet along the western boundary of the aquifer along Onion Creek and about 40 feet along Onion Creek near Buda.

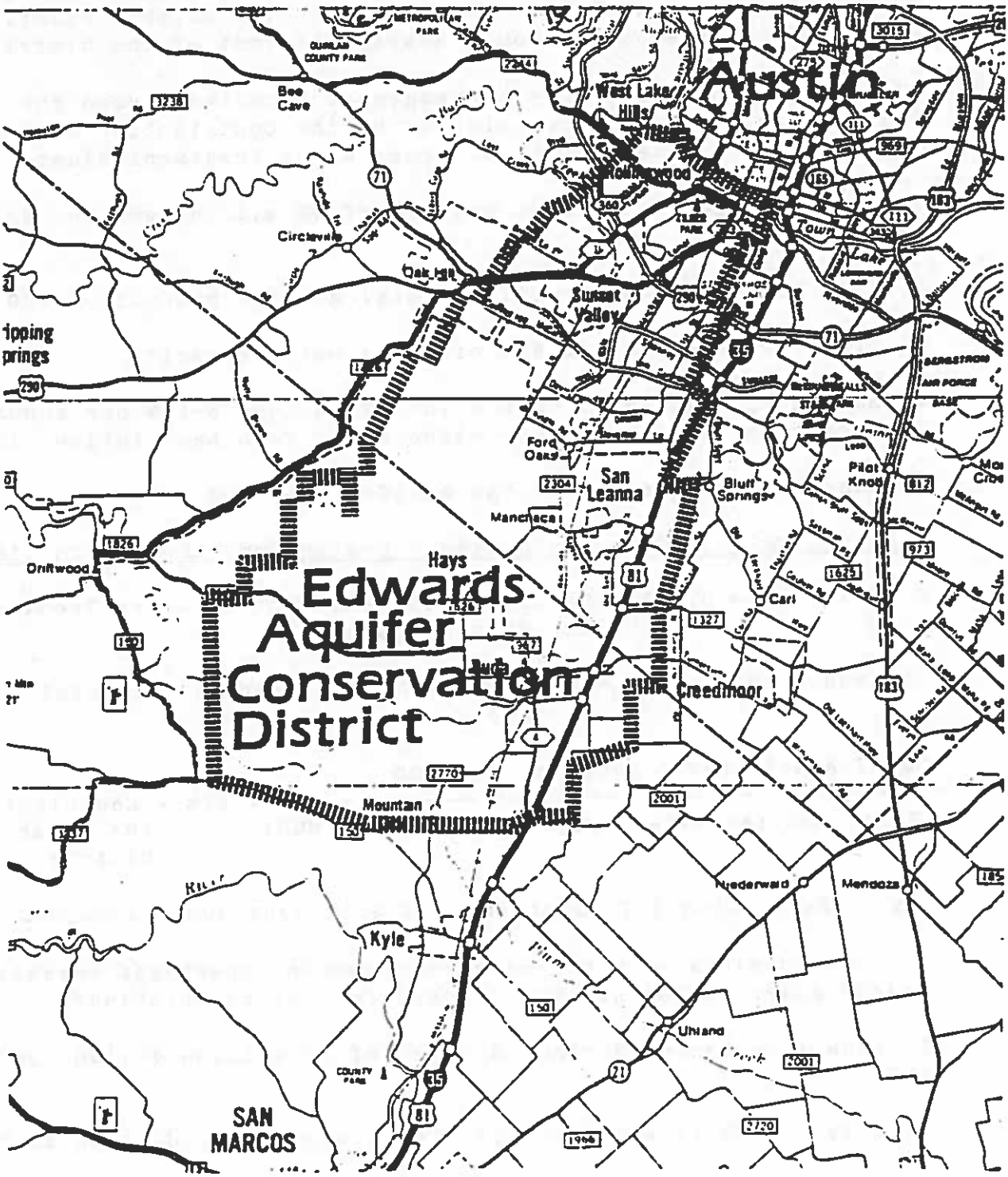
Raising the level of water in portions of the Aquifer helps to insure that sections of groundwater are not pumped dry. The study demonstrates this in maps showing the effects of projected pumpage from the Aquifer in the year 2000. They show that a substantial increase in pumped-out areas will exist if the recharge dam is not present.

There are differences of opinion about the effectiveness of recharge dams on aquifer enhancement, and the construction of dams of this size is always controversial. This dam would flood many acres of valuable land along Onion Creek. Landowners, many of whom were represented in hearings before the Texas Water Commission on the district's creation, violently objected to the condemnation of their land for this purpose.

Although the recharge dam has been removed from the bill, the issue will be revived again at some point in the future. The USGS study, which evaluates the effects of future pumpage, ensures that the issue of recharge dams will resurface in some form and the enabling legislation for the district can easily be amended to such a project.

Calcualation Of The Cost Of Austin's Participation

S.B. 988 allows the board to assess Austin a user fee, for which the City is allowed to appoint two members to the board.



may assess the City of Austin, as a water use fee, each year an amount not to exceed 40 percent of the total funding of the district...". In a report prepared by Dr. Kent Butler which was presented to the TWC in support of this district, the annual operating costs were estimated to be $300,000. Forty percent of that total is the $120,000 referenced in the letter to Rep. Terral Smith.

The City of Austin did an analysis which provides a rationale for estimating the City's financial contribution which is based on the springs as a benefit to the municipal water supply. This analysis assumes that because Barton Springs provides some portion of the raw water supply for the Green Water Treatment Plant, all Austin water ratepayers should assume the cost of the District.

Austin's Planning and Growth Management Department used the following assumptions for calculating the contribution of Barton Springs to raw water inflow of Green Water Treatment Plant:

1. Flow from Barton Springs average of 42 million gallons per day (MGD).

2. City of Austin water utility total average production 100 MGD.

3. Green Treatment Plant 25% of total water capacity.

4. Barton Springs Total inflow into Town Lake 5-15% per annum (The calculations choose the midpoint of Town Lake inflow, 10%.)

5. Non-exempt pumpage from the Aquifer, 3.5 MGD.

<u>Actual Calculations For Austin's Dollar Contribution To District</u>

0.25 x 0.10 = 0.025 = Barton Springs-Portion of Green Treatment Plant Water Supply

100 MGD x .025 = 2.5 MGD = Barton Springs Portion of Total Water Supply

$$\frac{\text{Total Austin Water Usage} = 2.5 \text{ MGD}}{\text{Total Aquifer Water Usage (3 MGD + 2.5 MGD)}} = .45 = 45\% = \text{Contribution to the Edwards District}$$

Water Rate Payment To District: 0.45 x $300,000 = $135,000

Discussions with the Water/Wastewater Department reveals some inaccuracies in the numbers choosen for the calculations.

1. Flow from Barton Springs average of 32 million gallons per day (MGD).

2. City of Austin water Utility total average production 83 MGD.

3. Green Treatment Plant supplies 20% of total water capacity.

4. Barton Springs Total inflow into Town Lake is 4.9% per annum (This figure is based on 32 MGD flow from Barton Springs divided by 644.4 average MGD releases from Lake Austin as reported by the Lower Colorado River Authority. Using an average figure is more consistent with the other figures than a midpoint from a range.

5. Non-exempt pumpage from the Aquifer, 3.5 MGD.

Revised Calculations For Austin's Dollar Contribution To District

0.20 x 0.049 = 0.0098 = Barton Springs Portion Green Plant

83 MGD x .0098 = 0.8134 = Barton Springs Portion of of Total Water Supply

Total Austin Water Usage = 0.8134 MGD
---------- ---------- = 0.21 = 21% Total Of
Aquifer Water Used (3MGD + .8134 MGD) the Edwards Aquifer District

Water Rate Payment To District: 0.21 x $300,000 = $63,000

As the water system expands, the percentage contribution of the Green Water Treatment Plant, which is fixed because there is no more room at the site to expand, will decline. By the year 2000, Green's contribution would decline to 14% of the system, further reducing the payment. The question for the City Council becomes, "As the percentage contributed by Green Water Treatment Plant declines, should the payment to the District decline?"

Proponents of the district suggest that the residents of the Green Water Treatment Plant service area deserve a high quality of water and the preservation of Barton Springs will insure a high quality of water to the residents of Green Service area. Even if the percentage contribution of Green Water Treatment Plant to the total system does decline, the customers served by this plant do not decline. All of this discussion assumes the Water Utility can not treat water in Town Lake to an acceptable standard without the presence of Barton Springs water.

A logical extension of the argument that Austin should pay for high quality inflows into the Colorado River does not stop with the Barton Springs inflow. This argument would force water ratepayers to pay additional dollars for any measurable high-quality inflow to the Colorado that is within the boundaries of the City of Austin.

Recreational Benefits Of The District

The Planning and Growth Management rationale for funding the District also argues that Austinites receive intangible and recreational benefits from Barton Springs. "In recent years, the pool has received approximately 300,000 paid visitors per year. In the minds of many Austin citizens both north and south of the Colorado River, the City has a lot at stake in the continued existence and ensured quality of the Aquifer and springs."

If the District is justified on the basis of recreational or intangible benefits, the funding for the District should come from Austin's General Fund, not the water ratepayers. Funding the District from the General Fund obviates the need to make the case for deriving the benefits of the District from some calculated percentage of the drinking water supply.

The City has not decided if funding for the District should come from the General Fund or water rates. This decision is not an insignificant one. It is much easier for the City to absorb the cost of this District through water rates than the General Fund.

Increasing rates to cover the cost of this District will have an insignificant impact on water rates, and the General Fund is anticipated to have a $41. 8 million shortfall. The estimated cost of $120,000 for this District represents several jobs that could be saved during the next budget process.

Forcing the Austin Water Utility to pay for the cost of the District sets a precedent for the Utility. If the Lower Colorado River Authority maintains a high quality of water in its releases from Lake Austin to Town Lake, which is the primary source of inflow to Town Lake, should Austin water ratepayers assume a percentage of the operating costs of the LCRA?

The Water Utility is also paying for a quantity of water it already owns. Essentially, the Water Utility is entitled to water under the Adjudication of the Lower Colorado. The water that the Water Utility owns is free. Ratepayers pay for operation, maintenance, capital, interest, and a return on investment. Ratepayers do not pay for raw water.

The Edwards/Aquifer District election will probably be sucessful, and the City of Austin will be committed as a result of the passage of S.B. 988 to pay for up to 40% of the operating costs of the district. How the City will pay for it and whether the percentage will remain fixed are unanswered questions.

Planning

Shared Parking Guidelines Will Become More Important As Multi-Use Developments Proliferate

Earlier this year the City of Austin Planning Commission approved a series of guidelines prepared by the City staff that laid out the ground rules for shared parking facilities under the Revised Zoning Ordinance, 13-2, of the City Code. Parking requirements have long been a controversial and expensive part of the development regulations imposed by the City on developers of commercial property. Downtown developers have bristled at the City for restricting the amount of parking they could build, while developers of office and retail outside the CBD have complained about the amount of parking they are forced to build. Parking, or lack thereof, can make or break a development, and shared parking is an attempt to address parking needs by lowering the required parking standards for multi-use or adjoining developments.

What Is Suitable For Shared Parking?

The concept of shared parking presented in the guidelines is parking that can be used to serve two or more individual land uses, thereby allowing the Planning Commission to adjust the total parking requirement for the separate uses on the same or adjoining sites.

The guidelines allow the consideration of shared parking in all zoning districts with the exception of Central Business Distrcit (CBD) or Downtown Mixed Used (DMU). A development within these excepted districts are allowed a reduction in the current parking requirement. They are required to provide no less than 20% and no more than 60% of the normal parking requirement.

Projects to be considered for shared parking must have at least two of the folllowing uses that are functionally and physically related: office, retail, restaurant, cinema, residential, and hotel. The uses must meet minimum criteria in order to share common parking.

USE	CRITERIA
Office	45,000 sq. ft. (gross land area)
Retail	135,000 sq. ft. (gross land area)
Restaurant	5,0000 sq. ft.
Cinema	800 seats
Residential	60 dwelling units
Hotel	240 rooms

Projects that do not meet the criteria can still be considered for shared parking if they can show the appropriateness of shared parking in similar situations. The staff will use site plan characteristics, availability of public transit, adequacy of roads, access, and land uses selected as the primary variables in determining the appropriateness of shared parking.

Lowering Parking Requirements

Proposals for shared parking must use as a minimum City of Austin parking ratios established in 13-2A, the Revised Zoning Ordinance when calculating peak parking requirements for each use. "Reductions in the total parking requirement may be made only to reflect different hours of operation; different hourly, daily, or monthly peak; interaction among land uses; or incentives for use of public transit or carpooling."

An interesting requirement in the guidelines is that any reduction in parking requirements due to use of public transit must be based on firm commitments for the provision of services and incentives for their use. With Capital Metro in a state of flux, and likely to remain that way for the foreseeable future, it is hard to imagine how firm commitments for public transit could be made to developers who in turn could commit the service and incentives for its use to the City.

There are other requirements for proposals for shared parking including:

*Compact spaces not exceeding 25% of the total number of spaces.

*Pedestrian links between the development and the shared parking be designed to have visible relationshops between the use and the parking.

*Required parking for any use must be within 500 feet of the entrance, measured from the closest point of the parking facility with longer distances for hotel and restaurant use if there is a valet parking plan.

*Employee parking is not included in shared parking unless it is available for the use of others at different hours.

Moitoring Shared Parking

The guidelines require that all projects approved for shared parking conduct a follow-up evaluation of the actual utilization of the parking facility. After the monitoring is accomplished, the staff may have the basis on which to modify or change the guidelines by evaluating their performance, a rare occurence in Austin's planning and zoning history.

Each evaluation would have a site plan including the inventroy of all parking provided; an inventory of all uses on the site(s), including square footage, type of business, normal operating hours and unoccupied floor space; an hourly count of vehicles parked on three weekdays and one Saturday; documentation of any existing transit usage or ridesharing programs; an assessment of the adequacy of parking at the peak periods; and recommendations for addressing any deficiencies in parking supply.

The concept of shared parking has already established a beachhead in Austin (Night Hawk #1, several multi-use suburban shopping centers) and it is likely to become more prevalent in the Austin landscape as the push continues for less reliance on the automobile and more on public transit.

It also should be noted that both the City of Austin and Capital Metro are moving, however slowly, towards a comprehensive parking policy for both the downtown area and other commercial centers. That policy, or one proposed by the Austinplan Trasportation Task Group, is likely to become a vital part of the City's comprehensive plan. Shared parking will certainly be included.