

# THE Cross SECTION

A Monthly Publication of the High Plains Underground Water Conservation District No. 1

Volume 21—No. 1

"THERE IS NO SUBSTITUTE FOR WATER"

January, 1975



Governor Dolph Briscoe addresses the January meeting of the Water Resource Conservation and Development Task Force, at which time he endorsed the Task Force's proposed "Short-Range Program for the Conservation and Development of

Texas Water Resources". Seated to the Governor's left are General James Rose, Task Force Chairman, and Senator Kent Hance of Lubbock.

## 1975 Election Results Announced

The Board of Directors of the High Plains Underground Water Conservation District No. 1 declared the results of the District's January 14 election to be official during their initial meeting of the year, January 20. Votes were canvassed and two Directors and 14 County Committeemen were elected to new terms.

Deaf Smith County farmer Billy Wayne Sisson of Hereford was elected to his third two-year term as Director of Precinct 4 (Armstrong, Deaf Smith, Potter and Randall Counties). Sisson was unopposed on the ballot.

### Gober Re-Elected

Webb Gober of Farwell won re-election to his second term. Gober, the Board's Secretary-Treasurer, represents Director's Precinct 3 (Bailey, Castro and Parmer Counties).

Other members of the Board beginning the second year of their present terms are Ray Kitten, Slaton; Chester Mitchell, Lockney, and Selmer Schoenrock, Levelland.

### Officers Elected

During a swearing-in ceremony January 20, Judge William R. Shaver, 140th District Court, administered the oath of office to Sisson and Gober. The other Directors and the District staff witnessed the ceremony.

—continued on page 3... 1975

## Briscoe Accepts Short-Range Proposals of Task Force

Governor Dolph Briscoe met January 8 with the Water Resource Conservation and Development Task Force and announced his endorsement of the Task Force's proposed "Short-Range Program for the Conservation and Development of Texas Water Resources", submitted to him April 16, 1974, for his consideration. He also asked the Task Force to continue serving as it has since December, 1973.

Governor Briscoe again re-emphasized the need for importation of water from outside the State. (See reproduction of his remarks on page 2.) The plan calls for legislation which would authorize the Governor to negotiate with other states to acquire water and to "direct implementing actions by pertinent agencies or political subdivisions of the State to take advantage of any opportunities which may materialize as a result of his discussions with other Governors".

According to the plan reviewed and endorsed by the Governor, its purpose was to set forth in outline form the short-range plan and to "lay a basis for steps which must be taken in the development of the long-range program for conservation and development of Texas' water resources".

Among its many charges, the Task Force, at the Governor's direction, will undertake the development of recommendations with regard to the following:

- 1) Actions needed to obtain and maintain appropriate Federal Government participation in water resource conservation and development in Texas.
- 2) Means of assuring efficient use of the State's available water resources, including multiple use of water and elimination or control of wasteful practices and conditions.
- 3) Effective control of water pollu-

tion and reuse of waste water to the extent feasible.

- 4) Programs for future movement of developed surface water resources to areas of water need, including recommendations for methods of financing such movement.
- 5) Consideration of advance acqui-

—continued on page 3... BRISCOE

## 1974 Decline Maps Released

The 1974 cost-in-water depletion, income-tax-allowance, decline maps and water depletion information for individual land parcels are now available at the District's Lubbock office, 1628 15th Street.

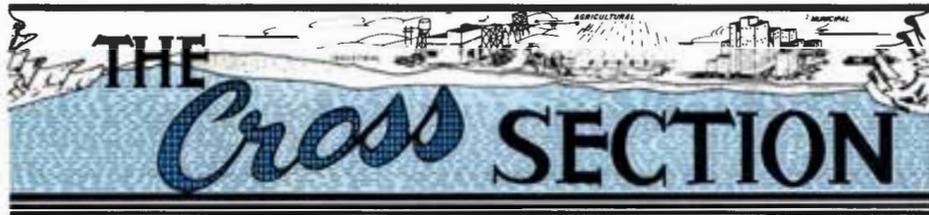
Maps are being furnished this year for Armstrong, Cochran, Crosby, Deaf Smith, Hale, Hockley, Lubbock, Lynn, Potter and Randall Counties. Price per map will remain \$7.50.

Computerized decline data will be available for Bailey, Castro, Floyd, Lamb and Parmer Counties at the cost of \$5 per parcel.

Information necessary to determine the decline for the above-mentioned counties is as follows: 1) taxpayer's agent's name and address, 2) landowner's name, address and social security number, 3) account number and 4) the legal description of the land.



Directors for 1975 are, seated, Ray Kitten, President, and Selmer Schoenrock, Vice President. Standing are Billy Wayne Sisson, Member; Chester Mitchell, Member, and Webb Gober, Secretary-Treasurer.



## Statement by Governor Briscoe to Task Force

On January 8, Governor Dolph Briscoe addressed the Water Resource Conservation and Development Task Force and formally accepted its recommended "Short-Range Program for the Conservation and Development of Texas Water Resources". (See story on page 1.) His remarks to the Task Force follow.

Thank you, General Rose, and ladies and gentlemen, particularly the members of the Task Force. Certainly it is a great pleasure for me to meet with you today. A little over a year ago we started this Task Force. You have, after much hard work, prepared and transmitted to me a recommended short-range action program for guiding water development in the near future, here in the State of Texas. I have carefully reviewed that program, reviewed it with General Rose, and I fully accept today your recommendations. Now, I think we might take the next serious step to implement that program. We need your continued help as we move forward; therefore, I ask that you continue to serve on this Task Force and that this Task Force remain in existence to implement the plans that you have forwarded to me.

Today, we are on the threshold of a new beginning in the Legislature and the Administration—the beginning of water development here in this State. We have the cooperation of the Lieutenant Governor in the preparation of these plans and in carrying them out, cooperation that extends to the Speaker of the House.

As we moved throughout the campaign throughout this State in recent months, I was impressed once again with the place water problems have in all areas and in all parts of this great State of ours, the tremendous importance of water development to the future of every area of Texas, every segment of our economy. And I am more convinced than ever before of the wisdom of the course that you have charted to get water development moving, to continue its development here in this great State.

So, today, I want to thank each of you as members of this Task Force for

the work which you have accomplished in the months since I asked you to serve with me in this, what I consider to be, one of the very major, most effective efforts of my first term. And I want to say once again with you the priorities that I believe must guide this State in developing and using water resources to the benefit of all the people of Texas. I also want to discuss with you the future of the Task Force in the Administration as we work with the new Legislature, as we confront new demands on our water resources that are becoming more and more apparent each day and each month that go by.

Good cooperation has existed between this Task Force and the Governor's Energy Council in meeting the energy needs of Texas, not just through today, but in meeting those needs for the future. You have done a job to be very proud of, and this morning I want to express my pride in the work that each of you has done. By bringing together your combined knowledge and experience, you have prepared and you are acting upon a Statewide program for conservation and development of water resources here in the State of Texas. Now we have a short-range action program that blueprints our course as we plan the actions required for the long term. For these documents and for the whole range of the fine work you have done, both individually and together, I want to thank you and I am very grateful.

I think, too, that as we look to the future, I want to emphasize once again, as I did at our first meeting, the importance of meeting the water needs of the water-deficit areas of this State, by bringing water from outside the State in order to meet those needs. And, certainly, I think that once again we recognize that not only is it necessary, but it must be done, and it must be done as soon as possible, even though there are those who say it can't be done, I think it is a goal that we must meet and one that we can meet. So, again, thanks to you for the job you have done. General, thanks to you, and to each of you as members of this Task Force for a job well done. Thank you.

### A MONTHLY PUBLICATION OF THE HIGH PLAINS UNDERGROUND WATER CONSERVATION DISTRICT NO. 1

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#### BOARD OF DIRECTORS

##### Precinct 1

(CROSBY, LUBBOCK and LYNN COUNTIES)  
Ray Kitten, President \_\_\_\_\_ Slaton

##### Precinct 2

(COCHRAN, HOCKLEY and LAMB COUNTIES)  
Belmer H. Schoenrock, Vice President \_\_\_\_\_ Levelland

##### Precinct 3

(BAILEY, CASTRO and PARMER COUNTIES)  
A. W. Gober, Secretary-Treasurer \_\_\_\_\_ Farwell

##### Precinct 4

(ARMSTRONG, DEAF SMITH, POTTER and RANDALL COUNTIES)  
Billy Wayne Sisson \_\_\_\_\_ Hereford

##### Precinct 5

(FLOYD and HALE COUNTIES)  
Chester Mitchell \_\_\_\_\_ Lockney

#### COUNTY COMMITTEEMEN

##### Armstrong County

Guy Watson, 1977 \_\_\_\_\_ Wayside  
C. D. Rogers, 1977 \_\_\_\_\_ Wayside  
Bill Heisler, 1977 \_\_\_\_\_ Wayside  
Charles Kennedy, 1979 \_\_\_\_\_ Rt. 1, Happy  
Cordell Mahler, 1979 \_\_\_\_\_ Wayside

##### Bailey County

Doris Wedel, Secretary  
H&R Block, 224 W. 2nd, Muleshoe  
Eugene Shaw, 1977 \_\_\_\_\_ Rt. 1, Muleshoe  
Adolph Wittner, 1977 \_\_\_\_\_ Star Rt., Baileyboro  
Jessie Ray Carter, 1977 \_\_\_\_\_ Rt. 5, Muleshoe  
Marshall Head, 1979 \_\_\_\_\_ Rt. 3, Muleshoe  
Harold Layton, 1979 \_\_\_\_\_ Rt. 2, Morton

##### Castro County

Garnett Holland, Secretary  
City Hall, 120 Jones St., Dimmitt  
Jackie Clark, 1977 \_\_\_\_\_ Rt. 1, Box 33, Dimmitt  
Joe Nelson, 1977 \_\_\_\_\_ Box 73, Dimmitt  
Bob Anthony, 1977 \_\_\_\_\_ Rt. 5, Dimmitt  
Anthony Acker, 1979 \_\_\_\_\_ Rt. D, Nazareth  
Glenn Odum, 1979 \_\_\_\_\_ Rt. 4, Box 136, Dimmitt

##### Cochran County

W. M. Butler, Jr., Secretary  
Western Abstract Co., 108 N. Main Ave., Morton  
Dan Keith, 1976 \_\_\_\_\_ Route 1, Morton  
H. H. Rosson, 1976 \_\_\_\_\_ Route 1, Morton  
Danny Key, 1976 \_\_\_\_\_ Star Route 2, Morton  
Jessie Clayton, 1978 \_\_\_\_\_ 706 S. Main, Morton  
Robert Yeary, 1978 \_\_\_\_\_ Route 2, Morton

##### Crosby County

Clifford Thompson, Secretary  
1628 15th Street, Lubbock  
W. O. Cherry, 1976 \_\_\_\_\_ Lorenzo  
E. B. Fullingim, 1976 \_\_\_\_\_ Lorenzo  
M. T. Darden, 1978 \_\_\_\_\_ Lorenzo  
Donald Aycock, 1978 \_\_\_\_\_ Lorenzo  
Alvin Morrison, 1978 \_\_\_\_\_ Lorenzo

##### Deaf Smith County

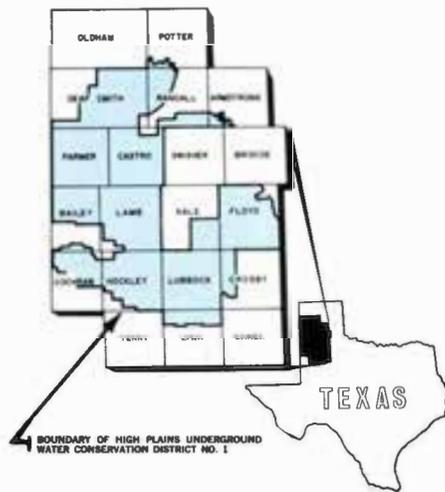
B. F. Cain, Secretary  
County Courthouse, 2nd Floor, Hereford  
James E. Higgins, 1977 \_\_\_\_\_ 200 Star St., Hereford  
Garland Solomon, 1977 \_\_\_\_\_ Rt. 5, Hereford  
W. L. Davis, 1977 \_\_\_\_\_ Box 312, Hereford  
Bill Cleavinger, 1979 \_\_\_\_\_ Rt. 1, Hereford  
George Ritter, 1979 \_\_\_\_\_ Rt. 5, Hereford

##### Floyd County

Don Grantham, Secretary  
Farm Bureau, 101 S. Wall Street, Floydada  
Malvin Jarboe, 1976 \_\_\_\_\_ Route 4, Floydada  
Connie Bearden, 1976 \_\_\_\_\_ Route 1, Floydada  
M. M. Smitherman, 1976 \_\_\_\_\_ Silverton Star  
Route, Floydada  
Joe Cunyus, 1978 \_\_\_\_\_ Lockney  
Fred Cardinal, 1978 \_\_\_\_\_ Route 4, Floydada

**NOTICE:** Information regarding times and places of the monthly County Committee meeting can be secured from the respective County Secretaries.

Applications for well permits can be secured at the address shown below the respective County Secretaries name, except for Armstrong and Potter Counties; in these counties contact Carroll Rogers and W. J. Hill, respectively.



##### Hale County

J. B. Mayo, Secretary  
Mayo Ins., 1617 Main, Petersburg  
Clint Gregory, Jr., 1976 \_\_\_\_\_ Box 98, Petersburg  
Henry Scarborough, 1976 \_\_\_\_\_ Route 2, Petersburg  
Homer Roberson, 1976 \_\_\_\_\_ Box 250, Petersburg  
Henry Kveton, 1978 \_\_\_\_\_ Route 2, Petersburg  
Gaylord Groce, 1978 \_\_\_\_\_ RFD, Petersburg

##### Hockley County

Jim Montgomery, Secretary  
809 Austin Street, Levelland  
Ewel Exum, 1976 \_\_\_\_\_ Route 1, Ropesville  
Douglas Kauffman, 1976 \_\_\_\_\_ 200 Mike, Levelland  
Billy Ray Carter, 1976 \_\_\_\_\_ Route 5, Levelland  
J. E. Wade, 1978 \_\_\_\_\_ Route 2, Levelland  
Jimmy Price, 1978 \_\_\_\_\_ Route 3, Levelland

##### Lamb County

Calvin Price, Secretary  
620 Hall Avenue, Littlefield  
Gene Templeton, 1976 \_\_\_\_\_ Star Route 1, Earth  
W. W. Thompson, 1976 \_\_\_\_\_ Star Route 2, Littlefield  
Donnie Clayton, 1976 \_\_\_\_\_ Box 276, Springlake  
Billy J. Langford, 1978 \_\_\_\_\_ Box 381, Olton  
Edward Fisher, 1978 \_\_\_\_\_ Box 67, Sudan

##### Lubbock County

Clifford Thompson, Secretary  
1628 15th Street, Lubbock  
Glenn Blackmon, 1976 \_\_\_\_\_ Route 1, Shallowater  
Andrew (Buddy) Turnbow, 1976 \_\_\_\_\_ Route 5,  
Box 151 B, Lubbock  
Alex Bednarz, 1976 \_\_\_\_\_ Route 1, Slaton  
Dan Young, 1978 \_\_\_\_\_ 4607 W. 14th St., Lubbock  
Clifford Hilbers, 1978 \_\_\_\_\_ RFD, Idalou

##### Lynn County

Clifford Thompson, Secretary  
1628 15th Street, Lubbock  
O. R. Phifer, Jr., 1976 \_\_\_\_\_ New Home  
S. B. Rice, 1976 \_\_\_\_\_ Route 1, Wilson  
W. R. Steen, 1976 \_\_\_\_\_ Route 2, Wilson  
Orville Maeker, 1978 \_\_\_\_\_ Route 1, Wilson  
Freddie Kieth, 1978 \_\_\_\_\_ New Home

##### Parmer County

Johnnie D. Horn, Secretary  
Horn Insurance Agency, Bovina  
Troy Christian, 1977 \_\_\_\_\_ Rt. 1, Farwell  
Joe Moore, 1977 \_\_\_\_\_ Box J, Lazbuddie  
Dalton Caffey, 1977 \_\_\_\_\_ 15th St., Friona  
Floyd Reeve, 1979 \_\_\_\_\_ Box 1196, Friona  
Ralph Roming, 1979 \_\_\_\_\_ 809 Ridgela Dr., Bovina

##### Potter County

Henry W. Gerber, 1977 \_\_\_\_\_ Rt. 1, Amarillo  
Jim Lane, 1977 \_\_\_\_\_ Box 87, Bushland  
Albert Nichols, 1977 \_\_\_\_\_ Rt. 1, Box 491, Amarillo  
F. G. Collard, 1979 \_\_\_\_\_ Rt. 1, Box 433, Amarillo  
W. J. Hill, 1979 \_\_\_\_\_ Box 53, Bushland

##### Randall County

Mrs. Louise Tompkins, Secretary  
Farm Bureau, 1714 Fifth Ave., Canyon  
Harry LeGrand, 1977 \_\_\_\_\_ 4700 S. Bowie, Amarillo  
Joe Albracht, 1977 \_\_\_\_\_ Box 81, Bushland  
Leonard Batenhorst, 1977 \_\_\_\_\_ Rt. 1, Canyon  
Bill Dugan, 1979 \_\_\_\_\_ Rt. 2, Box 30, Happy  
John F. Robinson, 1979 \_\_\_\_\_ 1002-7th St., Canyon

## ABANDONED WELL TAKES LIFE

Readers of *The Cross Section* have, for years, been made aware of the hazards of uncovered, abandoned irrigation wells and of the State statute and District rule which require the proper capping of such wells. And, we are still happy to report that no lives have been lost in this area due to a well owner's neglect or a child's curiosity.

However, recent incidents in Dade County, Florida, have caused that county to pass an ordinance requiring the covering of abandoned wells. The father of a young boy who lost his life a year ago in one of Florida's "you-pick-'em" fields was responsible for getting the county ordinance passed. And, according to *The Miami Herald*, he has recently brought suit against the well owner involved in the incident.

A more recent case involved a young girl who, in December, 1974, fell into a well, in the same county, which had not been covered. Her life was saved. And, as a result of the tragic incident, vegetable field owners have been urged to post signs recommending that children not be allowed to pick crops in the fields with their parents.

These events, however happy the endings may be, should renew our interest in converting all of these potential death traps into safe abandoned well sites.

# TWO DIRECTORS RE-ELECTED TO BOARD FOR 1975-1977

## BILLY WAYNE SISSON

Billy Wayne Sisson of Hereford was re-elected to his third consecutive two-year term on the Board of Directors of the High Plains Underground Water Conservation District No. 1 on January 14. Sisson, immediate past President of the Board, was unopposed.

Representing District Director's Precinct 3 (Armstrong, Deaf Smith, Potter and Randall Counties), Sisson served as a Deaf Smith County Committeeman six years prior to his first election to the Board.

Born at Tahoka in 1930, Sisson moved with his family to Littlefield and farmed with his father until his graduation from Littlefield High School in 1948. A 1953 graduate of McMurry College in Abilene with a degree in physical education, the Director played varsity football for four years.

In 1950, following a year of service in the U.S. Army, Sisson married DeAun LaNoe Kinkler of Littlefield. They have two daughters, Shalyn, 19, and Shavon, 11. Shalyn is a sophomore child psychology major at Baylor University in Waco.

Farming on his own since 1959, the Director now farms 2,700 acres of grain sorghum and wheat, maintains 26 irrigation wells, four grassed waterways and two tailwater return systems. He believes in participating in the conservation practices supported by the District as being beneficial to preserving the area's water supply for the future.

He invests in return systems and grassed waterways because he has found them to be beneficial in saving water and energy, and he knows that he will realize profits within a couple of years of his original investment. In a few words, he has found success in practicing water conservation.

Sisson is a fine example of the District's creed, "Dedicated to the principle that water conservation is best effectuated through public education." He has served the District and its residents well by spreading the water conservation message wherever he goes, and *The Cross Section*, in behalf of the Water District, is pleased to welcome Mr. Sisson to another two years on its governing board.



BILLY WAYNE SISSON



Judge William R. Shaver, left, of the 140th District Court, issues the oath of office to two newly-elected Directors, Billy Wayne Sisson and Webb Gober. Sisson and Gober represent Director's Precincts 4 and 3, respectively, and will serve two-year terms.

### 1975... continued from page 1

Following the swearing in, the Board re-convened and elected officers for 1975.

Kitten was elected President; Schoenrock, Vice President, and Gober, Secretary-Treasurer.

#### County Committeemen

Fourteen County Committeemen were elected from Director's Precincts 3 and 4. These men will serve four-year terms, all to expire in January of 1979. They are:

#### ARMSTRONG

Charles Kennedy, Happy  
Cordell Mahler, Wayside

### BRISCOE... continued from page 1

sition of lands to preserve lands and landrights needed for future reservoirs and water conveyance routes.

6) *Appropriate additional actions needed to arrange for obtaining water from outside the State to supplement the water supplies that can be developed within Texas as necessary to meet fully the State's anticipated long-range water needs.*

7) Review of institutional structures, authority, responsibilities and functions of State agencies and political subdivisions as may be appropriate to improve conservation and management of the State's water resources.

Regarding the importation and movement of water, the short-range action program includes the following policy statements.

*In seeking sources of water from outside its boundaries, Texas must recognize the need to work out fair and equitable arrangements with the exporting area.*

*The importation of water to Texas from other States is imperative. A viable, long-range project for water importation must be achieved. The importation of water should be predicated on the timely development of water resources in Texas. Plans to import water to Texas must proceed concurrently with full development of*

#### BAILEY

Marshall Head, Muleshoe  
Harold Layton, Morton

#### CASTRO

Anthony Acker, Nazareth  
Glenn Odom, Dimmitt

#### DEAF SMITH

Bill Cleavinger, Hereford  
George Ritter, Hereford

#### PARMER

Floyd Reeve, Friona  
Ralph Roming, Bovina

#### POTTER

F. G. Collard, Amarillo  
W. J. Hill, Bushland

#### RANDALL

Bill Dugan, Happy  
John F. Robinson, Canyon

*Texas' own water resources. The Governor, with assistance from State agencies, will assume leadership in this action area.*

*The Legislature should empower the Governor to negotiate contracts with other states for the acquisition of water from outside Texas.*

*The Governor will support enabling legislation allowing those areas into which water must be imported to create master water districts.*

*Because of the recent drastic changes in the food situation in the United States and throughout the world, which, in the opinion of many, points inevitably to an impending 'food crisis' and because of the critical balance of trade situation affecting the economic stability of this nation, the Governor will initiate an immediate economic evaluation and reassessment of the water importation problems in areas of Texas and such studies will be made on a continuing day-to-day basis, with emphasis on dissemination of the facts developed to the people of Texas.*

The paper made the following statements concerning the groundwater resources of the State.

*To assure the most effective means of developing and conserving the groundwater resources of Texas. Development and use of the total water resources of the State in the best interest of the people of Texas requires management of ground and surface*

—continued on page 4... BRISCOE

## WEBB GOBER

Webb Gober, Farwell, was recently re-elected to a second term on the Water District's Board of Directors by the voters of Bailey, Castro and Parmer Counties (District Director's Precinct 3). The Parmer County farmer has also been re-elected by his fellow Board members to serve as Secretary-Treasurer for the coming year.

Born in Frederick, Oklahoma, in 1918, Gober was a member of the District's Parmer County Committee from 1966 to 1973. He moved with his parents to the Farwell area in 1925, and in 1946 he took over the operation of his present farm, nine miles north-east of Farwell.

Before he began farming on his own, however, he attended Texas Tech University, majoring in agricultural education. He also served for three years in the U.S. Navy. The Director presently irrigates 480 acres of milo, wheat and grain sorghum.

Gober and his wife, Irene, are the parents of four children. Jerald, the oldest son, received a masters degree in business at Texas Tech University and is employed by an insurance firm in Dallas. Their daughter, Kathryn, and son, Alan, are both juniors at Texas Tech. Another son, Dale, a Texas Tech agricultural engineering graduate, farms with his father.

A concerned farmer, the Director is held up by his constituents as an example to follow. He is conscientious in his own farming practices and urges others to follow the example that he and other conservation farmers have attempted to achieve.

Gober is a strong believer in groundwater basin management on the local level, and has vowed to work toward retaining water resource development in the hands of those who benefit the most from wisely managing the remaining water supply.

The District is very pleased that Mr. Gober is returning for another two years on its Board of Directors and that he will continue to serve as Secretary-Treasurer for 1975.



WEBB GOBER



The Honorable Bill Clayton of Springlake, Speaker of the Texas House of Representatives, addresses the January 8 meeting of the Governor's Water Resource Conservation and Development Task Force in the Senate Chambers of the State Capitol in Austin. Seated beside the speaker's podium are,

left to right, Henry Graeser, Water Utilities Director, Dallas; David Brune, Trinity River Authority of Texas; General James Rose, Task Force Chairman; Senator Kent Hance, Lubbock, and Walter Wells, Brazos River Authority. Task Force members are seated in the center of the photograph.

BRISCOE . . . continued from page 3

waters as integrated resources. The unique characteristics of aquifers in various parts of the State make it evident that criteria and objectives to achieve such management can be most effectively developed through local management entities.

Groundwater provides a large share of the water needed to meet present and future water requirements in Texas. In areas of the State where the efficiency of groundwater use can be improved or where pumping of groundwater is causing present or potential problems (such as land subsidence, salt water intrusion, or unacceptable depletion of resources) responsible authorities in these areas should be encouraged to undertake such management of their groundwater resources as may be necessary to improve efficiency of use and to avoid or correct problems. The Texas Water Rights Commission and the Texas Water Development Board should provide additional recommendations for more effective regulation, management, and utilization of the State's available groundwater resources.

#### Seward Appointed TWDB Assistant Executive Director

The Texas Water Development Board (TWDB) recently named Lewis B. Seward as Assistant Executive Director, effective December 1, 1974. Harry Burleigh, TWDB Executive Director, noted in the appointment that Seward would also retain his title and duties of Principal Engineer-Project Development.

A registered professional engineer in Texas, Seward has been with the TWDB since 1963.

#### TWCA Convention Set For February 26-28

The 31st Annual Texas Water Conservation Association Convention will be February 26 through 28 at the Sheraton Crest Hotel in Austin.

Major addresses will be by Governor Dolph Briscoe, Lieutenant Governor Bill Hobby, Speaker of the House Bill Clayton and Land Commissioner Bob Armstrong. An award will also be presented to the State's Outstanding Water Leader of 1974.

# THE Cross SECTION

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"THERE IS NO SUBSTITUTE FOR WATER"

February, 1975

## Dollars and Sense

With the increased pressure on the producer's dollar (costs of farm equipment and services are skyrocketing while farm produce is experiencing a softening market), it makes more sense now than ever before to take a long, hard look at your water costs. As the accompanying article (this page) indicates, pumping groundwater is expensive and will likely cost even more during the 1975 crop season. A natural gas supplier official estimated a two cents per 1,000 cubic feet increase in natural gas for each month of this year (with a corresponding increase in electricity).

Utilizing ever drop of groundwater which you have paid to lift from beneath the ground will lower your total cost. The rather common practice of throwing up a border at the end of the field to hold back applied water—for sufficient time to assure desired penetration at the head—can prevent escape of the tailwater. However, the large accumulations behind the border could be considered waste, since most of the excess is lost to deep percolation or evaporation—and often damages crops at the lower end of the fields. Roughly, the amount of water involved can be estimated at 20 percent of the total volume your well produces.

The dollars and *sense* of a return system that can reapply water for which you have already paid are

—continued on page 4 . . . DOLLARS

## District to Occupy New Facility Soon

*The Cross Section* wishes to publicly notify its readers of the new address of the High Plains Underground Water Conservation District No. 1. In early March the District will move from its headquarters of the past 21 years, 1628 15th Street, to 2930 Avenue Q.

Since October, 1953, the District has rented office space at the 15th Street location. With the increasing number and enlarged scope of the District's groundwater conservation programs, the Board of Directors recognized the need for more space and voted in 1974 to purchase the property at 30th Street and Avenue Q and to construct a new facility.

The District's office hours will remain the same—8 a.m. to 5 p.m., Monday through Friday.



In the aerial photo above can be seen four playa lake modifications in a lake bottom. These farmers realize the value of reclaiming runoff water and the energy savings involved in

pumping irrigation water from a lake pump as compared to an irrigation well. (District Photograph)

### Irrigation Wells Costly

## ENERGY REQUIREMENTS LOW FOR TAILWATER AND LAKE PUMPS

By ARLAND D. SCHNEIDER  
and LEON NEW\*

As fuel costs increase, the lower energy requirements of tailwater and playa lake systems provide additional incentive for their use. Although future energy costs are unknown, they are more likely to increase than to decrease from their present high prices. Sixty-five percent of the irrigation wells on the Texas High Plains are powered by natural gas. Because of low polluting characteristics, natural gas is a premium fuel, and future demand will likely continue to exceed the supply. Thus, it is wise to use irrigation water which requires minimal amounts of energy to pump.

Past studies provide sufficient field data to analyze the energy costs for pumping irrigation water on the Texas High Plains. A detailed study of irrigation pumps and power units was conducted by Texas Tech University from 1964 to 1968. Tailwater return systems and playa lake pump installations have been extensively studied by water conservation district personnel, government agencies and others. Pump and power unit efficiency data presented in these studies can be combined with current energy prices to compare energy costs for pumping water from irrigation wells, tailwater return pits

and playa lakes. These energy costs will not likely be applicable to specific pumping installations, but they do provide relative cost comparisons and make good planning guides.

### Pumping Costs for Irrigation Wells

Researchers at Texas Tech University determined that the average efficiency of 46 engines powering irrigation wells and using natural gas fuel was 19.8 percent. Right angle gear drives have been tested to transfer power at approximately 95 percent efficiency. These efficiencies were used in determining irrigation well fuel costs in this comparison. Energy costs per acre-foot of water were calculated for various total dynamic heads (TDH) when natural gas costs 65 cents per thousand cubic feet (Mcf). Total dynamic head is the sum of all head components that oppose water movement and create pressure which the pump must overcome. The head components include pumping lift, friction loss in suction and discharge pipes, and the discharge pressure like that required for sprinkler irrigation or pumping uphill. For an open discharge pump, the discharge pressure is zero. Pipe friction in the column pipe is so small that TDH is nearly equal to the pumping lift.

Energy costs are shown in Figure 1 (page 4) for TDH of 100, 200, 300 and 400 feet. These cost comparisons illustrate how energy requirements and fuel costs increase when TDH becomes larger and pump and power units decrease in efficiency. With this information, the energy cost increases from \$1.61 per acre-foot at 75 percent pump efficiency and 100 feet of TDH to \$10.74 per acre-foot at 45 percent pump efficiency and 400 feet of TDH. Energy costs increase directly as the total dynamic head increases. For example, the amount of energy used when pumping against 400 feet of TDH is twice that when pumping against only 200 feet of TDH.

Energy costs are less when pumps are highly efficient. Figure 1 shows how fuel costs increase for pumps ranging from 45 to 75 percent efficiency. In the Texas Tech study, the average efficiency of the 46 natural gas-powered pumps was 57 percent. New pumps properly selected and matched to irrigation wells should be 70 to 80 percent efficient. Older, worn pumps that do not match well conditions are likely to be even less efficient than the minimum 45 percent used in Figure 1. In this case, irrigation well

—continued on page 3 . . . ENERGY



**A MONTHLY PUBLICATION OF THE HIGH PLAINS UNDERGROUND WATER CONSERVATION DISTRICT NO. 1**

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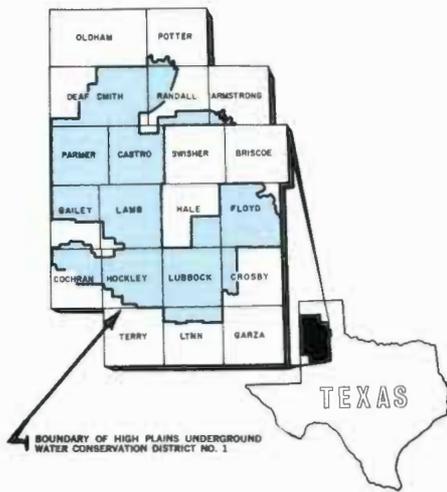
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**1974 RAINS LEAVE SOIL PROFILE WET**

by O. H. NEWTON, O. C. WILKE,  
 CHARLES W. WENDT\*

The data collected during the 1974-1975 fall and winter soil moisture survey for 14 South Plains counties show that an excellent supply of soil moisture is present. Even the drier soils need no more than four inches to rewet the top five feet, while a major portion of the area needs less than 2.5 inches.

The drier sector was found to be in a narrow band extending from the vicinity of Sundown northeastward to the Smyer area. This means that no more than average amounts of rainfall between now and planting time will add adequate moisture to wet the soil and provide an excellent soil moisture condition for planting crops this spring. The soil moisture requirement chart shown on this page defines those areas that need certain amounts of water to rewet the soil layers to a depth of five feet.

*Purpose and Significance of the Soil Moisture Survey*

The primary purpose of the annual fall and winter soil moisture survey is to determine the average amount of moisture that is held in the top five feet of South Plains soils. This in turn provides a basis for estimating the need for and the amount of preplant irrigation required to rewet the soil and give the farmer the best chance for a profitable crop.

During the early years of South Plains irrigation, it was found that better crops could be produced if the soil was wet prior to spring planting. Years of crop production have not produced a substitute method and the need for a well saturated soil profile prior to planting still holds.

Until recent years, farmers could only guess at the amount of water

needed to wet the soil, but, with modern techniques, it has been possible to make a reliable estimate of additional pre-season water needs. *Farmers who irrigate in excess of that which is needed probably will lose money and valuable water and those having sandy soils could lose nutrients which may be leached out of the soil.*

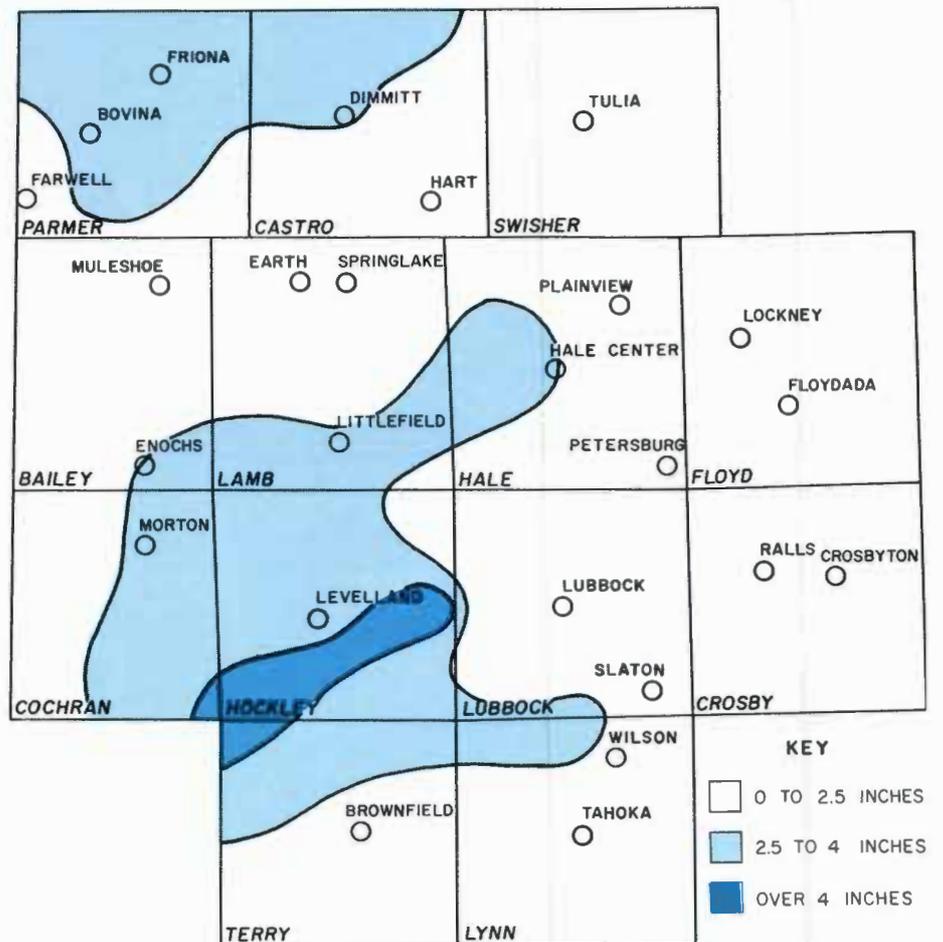
*The Effect of Rainfall and Past Season Irrigation*

It was undoubtedly not long after man started planting and cultivating crops that he became aware of the importance of soil moisture at planting time and during the growing season. Since that time he has devised ways of holding the moisture in the soil and adding moisture by irrigation. It is possible to irrigate fields and produce crops without rainfall. *However, since the cost of irrigation is increasing and water supplies are diminishing, it is imperative that we take advantage of water provided by rain or snow to conserve irrigation water and decrease the cost of production.*

During the past several years, the South Plains has experienced extremes in soil moisture conditions during the spring planting season and, in most cases, the crops have responded. The crop yield has shown the importance of wet soils early in the season. 1973 and 1974 were the most recent examples of wet and dry soils early in the season. Certainly, there are many factors that influence production, but, without adequate soil moisture at the right time, yields are reduced.

A good soil moisture supply at planting time is the result of several factors. Rain at the right time and in adequate amounts heads the list. Significant rains as far back as the late summer of the previous year often

—continued on page 3... 1974



INCHES OF MOISTURE NEEDED TO REWET THE TOP FIVE FEET OF SOIL

**NOTICE:** Information regarding times and places of the monthly County Committee meeting can be secured from the respective County Secretaries.

Applications for well permits can be secured at the address shown below the respective County Secretary's name, except for Armstrong and Potter Counties; in these counties contact Carroll Rogers and W. J. Hill, respectively.

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start the accumulation of moisture in the soil, but more important are the fall and early winter rains.

A negative factor that may be highly important is the loss of soil moisture through late season crops. During certain years (as in the fall of 1973) when late summer and early fall rains occur, it might seem that much of this moisture would carry through the winter, but this may not happen. As in 1973, as well as other years in the past, a late killing freeze occurred which allowed field crops and weeds to continue to extract moisture from the soil well beyond the last rain periods.

**Current Evaluation and Outlook**

In review, we can look back on the 1974 crop production as a near disaster due to several factors. First, there was a very low level of available soil moisture during the spring. This was indicated by the survey made during the preceding fall and winter.

Second, the spring and early summer was hot and dry with only about three quarters of an inch of rain per month through June and temperatures that ranged as high as 100 degrees in May. Third, the weather turned wet and cool in July and continued into the fall. Fifteen or more inches fell in most areas during August, September and October. Although all of these factors were negative in their effect on the 1974 season, the last factor will have a positive effect on the coming season.

Heavy late summer and early fall rains wet the soil and, because of cool and damp late fall conditions and a near average killing freeze date, a major portion of this moisture remained in the soil. Since an extremely small percent of the soil moisture is lost during the colder winter months, it is still present as has been determined by the recent soil moisture survey.

Since the soils of the South Plains have a large amount of stored water, producers should consider two factors before starting the pumps for preplant irrigations. The first is the probability of getting enough rain to wet the surface layers of the soil and provide a moist seedbed for planting. These probabilities are shown in the table below.

The second factor is the cost of energy and labor which could be saved by not preirrigating. The high available moisture conditions found over a high percent of the area this year offer the best opportunity the area has had in some time to forego the standard preplant irrigation and still have a high probability of getting crops off to a good start.

**Favorable Seedbed Moisture Needed**

We all know of the concern of farmers to have adequate moisture at planting time for crop establishment. The deeper moisture currently stored will not provide seedbed moisture, but

it will provide a base whereby only a small amount of rain or irrigation will be required to wet the surface layers.

This means that in most cases only one to two inches of rain or a light irrigation will be adequate to establish an excellent soil moisture condition that will germinate seeds and carry the young crops through the early stages of growth.

*If a producer is considering no pre-irrigation, he should keep his tillage practices at a minimum so as not to lose stored soil moisture. (See related story on this page.)*

**Probabilities of Spring Rainfall**

The probability of spring rains is also an important consideration for the farmer as he applies a preplant irrigation. It may be true that we cannot be sure that the coming season will produce above- or below-normal precipitation, but seasonal trends are reliable.

The chance for rain does increase rather rapidly starting the last few days of March and continuing well into May. If farmers are to take advantage of this rainfall, they must have room to store the water. This means that the soil must be unsaturated if it is to store even a part of the spring rains.

Rainfall records at Lubbock have been examined and a 55-year period subjected to computer analysis to determine the rainfall probability from March 20 to May 31. A table showing the percent probability for rainfall is presented at the bottom of this page.

\*The authors are O. H. Newton, Advisory Agricultural Meteorologist, National Weather Service for Agriculture, Lubbock; O. C. Wilke, Assistant Professor of Agricultural Engineering, Texas A&M University Agricultural Research and Extension Center, Lubbock, and Charles W. Wendt, Associate Professor of Soil Physics, Texas A&M Agricultural Research and Extension Center.

**Increased Tillage Operations May Cost Money and Waste Valuable Water**

At a time when natural resources and money are extremely scarce, farmers must become aware of ways to stretch what supplies of either that remain. One of the more popular ideas of late is minimum- or no-tillage farming, which has been proven to cut down on man hours, energy consumption and maintenance of farm machinery and will save and put to valuable use the soil moisture available for planting.

Research at various High Plains experiment stations has shown that high yields of cotton and grain sorghum can be maintained with minimum tillage and less irrigation water.

**Study Conducted in 1972**

According to Charles W. Wendt, Associate Professor of Soil Physics at the Texas Agricultural Experiment Station (TAES), Texas A&M University Agricultural Research and Extension Center, Lubbock, a study was conducted by the TAES in 1972 which compared three types of tillage operations: 1) shed, disk, bed; 2) shred, disk, chisel (12 inches deep), bed, and 3) shed, disk, moldboard (eight inches to 10 inches deep), bed. Those findings follow.



This tailwater pit captures runoff irrigation water, keeping it from escaping into the bar ditch, and recirculates it back over the land for other irrigations, thus, saving energy, groundwater and money. (District Photograph)

ENERGY... continued from page 1

fuel costs will be significantly greater.

**Costs for Pumping Water from Playa Lakes**

Playa lake pumps often serve the dual purpose of pumping irrigation tailwater and rainfall runoff. To utilize a large portion of runoff water before it evaporates, it is often advantageous to pump at rates of 1,000 gallons per minute or more.

The pumping lifts and flow rates of playa lake pumps will normally require 30 horsepower or more. As a result, propane or natural gas engines are efficient power units for lake pumps. The energy cost for natural gas-powered lake pumps is only a fraction of that for most irrigation wells in the Texas High Plains.

For this energy cost comparison, playa lake pumping installations delivered 1,200 gallons per minute against 40 feet of discharge lift. Further assumptions are that water was pumped 3/8 mile through 10-inch, high pressure, plastic PVC pipe. Natural gas was the same as for irrigation wells.

For the conditions assumed, Figure 1 shows that maximum energy cost is \$1.80 per acre-foot for pumping playa lake water. When pump efficiency is 55 percent or greater, energy costs less than \$1.50 per acre-foot. Since lake pumps can be easily inspected and repaired, pump efficiency can be easily maintained above 55 percent.

**Pumping Costs for Tailwater Return Systems**

Tailwater return pumps are usually located near the lower end of irrigated fields. Pumping lifts are normally only 15 to 25 feet. Return pipelines are often 1/4 to 1/2 mile long and should be sized to keep friction head losses low. Since pumping lifts are low, the pump horsepower requirements are also low. As a result, electric motors are popular and efficient power units for tailwater return systems. Energy costs for irrigation tailwater return pumps should be less than that for irrigation wells on the Texas High Plains.

For this fuel cost comparison, tailwater pumps are considered to lift water 20 feet. Another assumption is that water is returned 1/2 mile in an 8-inch, low pressure, plastic pipe. Because of typically long return pipelines, pipe friction head is normally a large portion of the TDH opposing water movement by tailwater return pumps. Energy costs were calculated based upon delivering 600 gallons per minute with a centrifugal pump powered by electric motor that is 80 percent efficient. Electricity costs are based upon 1.86 cents per kilowatt-hour (KWH).

This comparison indicates that, as pump efficiency decreases from 75 to 45 percent, energy costs for pumping tailwater increase from 92 cents to \$1.53 per acre-foot (Figure 1). Although electricity costs more per unit of energy than natural gas, low pump-

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—continued on page 4... ENERGY

**PERCENT PROBABILITY FOR RAINFALL (equal to or greater than amount stated)**

Rainfall (inches)	Time Intervals				
	3-21/4-20	3-21/4-30	3-21/5-10	3-21/5-20	3-21/5-31
1.0	39	57	77	90	94
1.5	23	40	61	81	87
2.0	14	28	50	69	80
2.5	9	19	40	59	70
3.0	5	14	31	48	62
3.5	3	9	24	39	54
4.0	2	6	19	32	47

**ENERGY . . . continued from page 3**

ing lifts of tailwater return systems enable irrigation runoff water to be reclaimed at low energy and investment costs.

In the past, tailwater or playa lake pumps powered by natural gas engines have offered the lowest cost irrigation water on the Texas High Plains. The economic advantage of tailwater and lake pumps increases as the well pumping lift increases. This comparison shows that the pumping lift of wells must be less than 100 feet before energy costs are comparable to those of tailwater return systems. Only a limited number of irrigation wells on the High Plains now lift water from such shallow depths. Pumping depths of 200 to more than 400 feet are much more common.

As the water table of the Ogallala aquifer gradually drops, pumping lifts increase. Pumping lifts of tailwater and playa lake pumps are more stable. Energy requirements increase only when pump and power unit efficiencies decrease.

The values of Figure 1 will become outdated as energy costs change. Any cost value taken from any pumping condition curve can be easily updated using the following formulas.

For natural gas-powered irrigation wells and lake pumps:

$$\text{Updated Cost} = \frac{\text{Figure 1 value} \times \text{Current natural gas cost per Mcf}}{65 \text{ cents per Mcf}^{**}}$$

For electric-powered tailwater pumps:

$$\text{Updated Cost} = \frac{\text{Figure 1 value} \times \text{Current electricity cost per KWH}}{1.86 \text{ cents per KWH}}$$

Updated costs should be representative since future natural gas engine and electric motor efficiencies are not likely to be significantly different from those used to determine energy costs in this study.

**CONCLUSIONS**

In the Texas High Plains the energy cost for water pumped by tailwater or playa lake pumps is normally only a fraction of the energy cost for water pumped from irrigation wells. The surface pumps offer a significant economic advantage even when compared to an irrigation well with a pumping lift of only 100 feet. The amount of energy required to pump water from irrigation wells increases as the pumping lift increases. Thus, the energy cost for pumping most well water will

be at least two to three times greater than that for pumping from tailwater pits and playa lakes.

**REFERENCES**

Power Requirements and Efficiency Studies of Irrigation Pumps and Power Units. Agricultural Engineering Department, Texas Technological College, Lubbock, Texas, September 1, 1968. 79 pp.

The Irrigation Tailwater Return Systems Handbook. High Plains Underground Water Conservation District No. 1, Lubbock, Texas. (Draft in preparation.)

\*Agricultural Engineer, USDA Southwestern Great Plains Research Center, Bushland, and Area Irrigation Specialist, Texas Agricultural Extension Service, Lubbock, respectively.

\*\*The 65-cent figure is low. During the printing of this issue, the cost rose to 75 cents per Mcf and is expected to rise to more than \$1 per Mcf during the next year or two.

**DOLLARS . . . continued from page 1**

becoming extremely obvious. If you have already invested \$10 per acre-foot (energy costs only) to lift your groundwater, an additional cost of only \$1.50 to reuse the water (tailwater return system energy costs only) would seem infinitely preferable to additional pumping of groundwater at \$10 per acre-foot.

As a typical example, an irrigator wishing to apply six inches of effective irrigation to 160 acres of land must pump 96 acre-feet of groundwater (with no tailwater returned), with an energy cost (at \$10 per acre-foot) of \$960. With a tailwater return system, he could probably reduce his pumping to approximately 80 acre-feet for a primary cost of \$800, with an additional tailwater return energy cost of \$24 for a total energy cost of \$834, a savings of \$136 for each six-inch irrigation.

The fall season of 1974, one of the wettest of record, filled the playas to near capacity and saturated the soil profile for spring planting. Doesn't it make sense to take advantage of the readily available moisture and preserve the valuable groundwater in storage? The money you save when preparing your land will go a long way toward installing a lake pump or tailwater pit for summer irrigation.

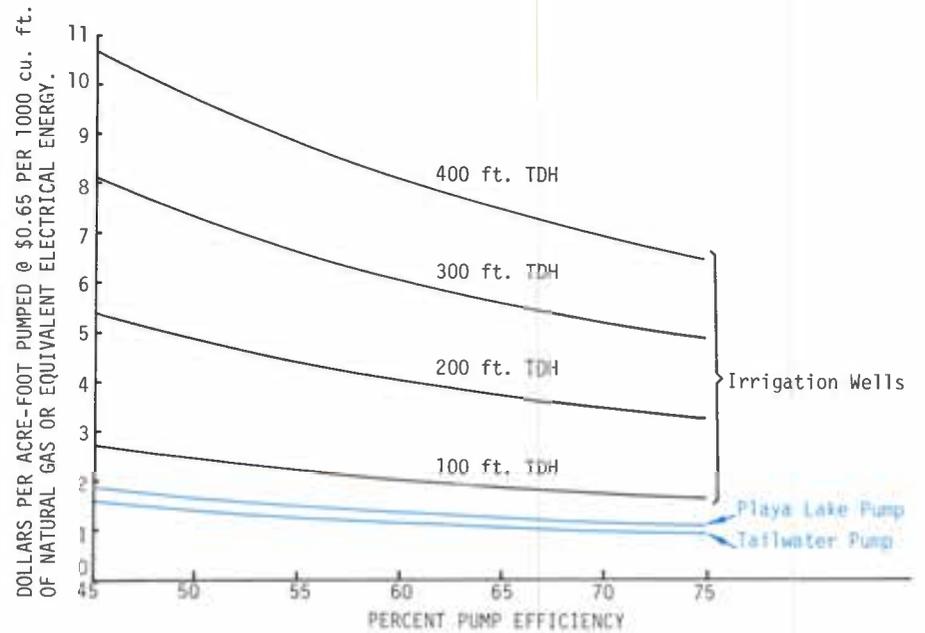


Figure 1. Representative energy costs per acre-foot for tailwater and playa lake pumps and for irrigation wells with different pumping heads.

**INCREASED . . . continued from page 3**

the moldboarded plots (4,076 pounds of grain per acre).

These data suggest that, if the farmers did not harvest the crops so as to create plow soles or hard pans that would require chiseling or moldboarding to break up, they might save the cost of such operations and still receive maximum yields.

It is realized that there are other considerations such as weed problems that would cause the producer to consider more intensive tillage operations; but, if such problems do not exist, a savings in stored soil moisture with no decreases in yield may be realized by eliminating more expensive chiseling and moldboarding operations.

**Adequate Moisture Available**

It should be pointed out that there was adequate moisture for germination of the crops at three to four inches in the plots which were shredded, disked and bedded prior to the rains while the rains were necessary to provide moisture for germination in the other treatments. Thus, producers which have planting equipment with the capability or which can be modified to plant three to four inches below the top of the bedded soil could be assured of obtaining a stand with stored moisture in the area with limited tillage.

**Moisture Patterns Similar**

The area which was irrigated received limited irrigation and was planted at a later date. The moisture

prior to planting followed the same pattern as the dryland. The more the area was tilled, the more moisture was lost. Yields of cotton were not affected by limited tillage but were decreased by moldboarding. In general, grain sorghum yields were not affected by tillage except in areas where no tillage was done prior to planting which decreased grain sorghum yields 1,300 pounds of grain per acre.

**Research Summarized**

In summary, the research indicates the following:

- 1) If perennial weeds or hard pans due to harvesting under wet conditions are not a problem, a shred-disk-bed operation is adequate to assure maximum yields. Adequate moisture for crop establishment would exist with this tillage practice at three to four inches if the producer has the equipment to plant at this depth.
- 2) If the land is moldboarded or chiseled in addition to the shred-disk-chisel operation, the land will need to be irrigated, or rainfall will be necessary in order to establish the crops. Based on water applications at the Lubbock Station in 1972, one to two million acre-feet of water would be required for preirrigation if the irrigated land in the Texas High Plains is moldboarded or chiseled and if rainfall is not received.

# THE Cross SECTION

A Monthly Publication of the High Plains Underground Water Conservation District No. 1

Volume 21—No. 3

"THERE IS NO SUBSTITUTE FOR WATER"

March, 1975



Water District Directors Chester Mitchell, Webb Gober, Ray Kitten and Selmer Schoenrock and Manager Frank Rayner inspect the District's new office headquarters building at 2930 Avenue Q prior to accepting the keys to the facility on March 19. The District office is now relocated at the new site, following 21 years at the 1628 15th Street address. (See related photograph on page 4.)

## CLAYTON DISCUSSES WATER IMPORTATION

Speaker of the Texas House of Representatives Bill Clayton, Springlake, addressed the annual meeting of Water, Incorporated, February 15 in Amarillo and, in his presentation, explained his belief that water importation to the High Plains is inevitable. His speech is reprinted below.

*There is an air of urgency among some people today. It's not a panic, nor a fatalistic kind of urgency, but rather a calm comprehension of facts with the solid conviction to do something about them.*

*Now I'm talking in general terms because this urgency involves all spectrums of life. It includes what we've been discussing here today.*

*Now you say, how can our water problems involve the world? I'll answer that by saying that when you throw a rock into a pond it causes ripples that eventually reach to the bank. Now, the size of that rock certainly determines how big a splash it will make. And that's why I say our water problems here in West Texas cause big ripples, because we have the largest of all rocks to throw—food production.*

*You can't help but think it's a bit ironic that after a century of rapid industrialization we should suddenly discover ourselves in a world where our greatest economic power lies in our agriculture.*

*Not until last year did we have a president come out and tell us to pro-*

*duce as much as we could—and that, instead of getting money for NOT producing, we would be given incentives for producing.*

*It seems that within the last two years, everyone is saying we are in a food crisis. It's been reported that there is hardly a month's supply of grain in storage. If something occurred to bring a sudden halt to all food production in the United States, in just a few days there would be no fresh milk, no red meat or eggs, no chickens, and the supply of canned and condensed milk would run out. Now, for the first time, our shoppers in the supermarkets are understanding that food shortages hit the pocketbook harder than any single factor in the cost of living.*

*That is also ironic. For, in fact, this world has been in a food crisis for at least the past 25 years. It is all too easy to listen to television commentators tell us that thousands of children are dying of starvation in Latin America, Africa, Asia—and even in this country.*

*In the past we were comforted by the fact that we were giving away our surpluses to underdeveloped nations, but now we are faced with the dilemma that our nation has shortages, too.*

*We no longer think of our food production as a "do good" service to the third world, but as a prime commodity in the world trade market.*

—continued on page 2... CLAYTON

## BOARD ACCEPTS NEW OFFICE BUILDING

The Board of Directors of the High Plains Underground Water Conservation District No. 1, at its March 19 meeting, officially accepted the keys to the District's new office headquarters at 2930 Avenue Q in Lubbock. Architect Bill Cox and Ludwig Teinert, contractor, were present for the ceremony.

Several years of planning the design of the facility and saving the funds for purchase of the property, construction and other professional fees were culminated by a groundbreaking ceremony July 11, 1974.

At that time, Board President Billy Wayne Sisson stressed that the cost of the land, building and landscaping and all other necessary fees were pre-budgeted with funds on hand and would be paid for without additional taxes or bond sales, and that there would be no liens or other incumbrances against the physical plant.

### Funding Detailed

Funding was provided by five years' interest on time deposits, ceilings on salaries and certain expenses, the use of grants to supplement the working functions of the District—all without ever raising the District's tax rate or borrowing additional monies.

The 8,000-square-foot building will house all well records and related data, a reference library, a 30-foot by 40-foot board room (featuring sound-projection equipment), a photography re-

production laboratory and a water quality analysis laboratory.

District Manager Frank Rayner noted that the new headquarters will facilitate the efficiency and effectiveness of the District's many groundwater conservation and management programs. He also noted that the new building would provide meeting, research and educational facilities for the activities of other water groups, professional, educational, economic and private institutions, and for the general public.

## Directors Visit West Texas Solons During TWCA Meeting

Three members of the Water District's Board of Directors visited their legislators in Austin February 26 and were welcomed with discussions of pending and future water legislation which will affect the High Plains farmer.

Directors Ray Kitten, Selmer Schoenrock and Chester Mitchell, and Ross Goodwin of Muleshoe, past President of the Board, visited with Bill Clayton, Speaker of the House of Representatives; Senator Kent Hance of Lubbock, and State Representatives E.

—continued on page 3... DIRECTORS



The Honorable Bill Clayton, Speaker of the Texas House of Representatives, meets with Directors of the High Plains Water District, February 26 in the Speaker's Capitol office. From left, are Ross Goodwin of Muleshoe, past President and Member of the Board; Chester Mitchell, Member; Clayton; Ray Kitten, Board President, and Selmer Schoenrock, Vice President.



A MONTHLY PUBLICATION OF THE HIGH PLAINS UNDERGROUND WATER CONSERVATION DISTRICT NO. 1

2930 Avenue Q, Lubbock, Texas 79405

Telephone 762-0181

REBECCA CLINTON, Editor

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District Office at Lubbock

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- Don Smith \_\_\_\_\_ Geologist
- Don McReynolds \_\_\_\_\_ Geologist
- Tony Schertz \_\_\_\_\_ Draftsman
- Fred Cowart \_\_\_\_\_ Draftsman
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**BOARD OF DIRECTORS**

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(CROSBY, LUBBOCK and LYNN COUNTIES)

Ray Kitten, President \_\_\_\_\_ Slaton

**Precinct 2**

(COCHRAN, HOCKLEY and LAMB COUNTIES)

Selmer H. Schoenrock, Vice President \_\_\_\_\_ Levelland

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Billy Wayne Sisson \_\_\_\_\_ Hereford

**Precinct 5**

(FLOYD and HALE COUNTIES)

Chester Mitchell \_\_\_\_\_ Lockney

**COUNTY COMMITTEEMEN**

**Armstrong County**

- Guy Watson, 1977 \_\_\_\_\_ Wayside
- C. D. Rogers, 1977 \_\_\_\_\_ Wayside
- Bill Heisler, 1977 \_\_\_\_\_ Wayside
- Charles Kennedy, 1979 \_\_\_\_\_ Rt. 1, Happy
- Cordell Mahler, 1979 \_\_\_\_\_ Wayside

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Doris Wedel, Secretary

H&R Block, 224 W. 2nd, Muleshoe

- Eugene Shaw, 1977 \_\_\_\_\_ Rt. 1, Muleshoe
- Adolph Wittner, 1977 \_\_\_\_\_ Star Rt., Baileysboro
- Jessie Ray Carter, 1977 \_\_\_\_\_ Rt. 5, Muleshoe
- Marshall Head, 1979 \_\_\_\_\_ Rt. 3, Muleshoe
- Harold Layton, 1979 \_\_\_\_\_ Rt. 2, Morton

**Castro County**

Garnett Holland, Secretary

City Hall, 120 Jones St., Dimmitt

- Jackie Clark, 1977 \_\_\_\_\_ Rt. 1, Box 33, Dimmitt
- Joe Nelson, 1977 \_\_\_\_\_ Box 73, Dimmitt
- Bob Anthony, 1977 \_\_\_\_\_ Rt. 4, Dimmitt
- Anthony Acker, 1979 \_\_\_\_\_ Rt. D, Nazareth
- Glenn Odom, 1979 \_\_\_\_\_ Rt. 4, Box 136, Dimmitt

**Cochran County**

W. M. Butler, Jr., Secretary

Western Abstract Co., 108 N. Main Ave., Morton

- Dan Keith, 1976 \_\_\_\_\_ Route 1, Morton
- H. H. Rosson, 1976 \_\_\_\_\_ Route 1, Morton
- Danny Key, 1976 \_\_\_\_\_ Star Route 2, Morton
- Jessie Clayton, 1978 \_\_\_\_\_ 706 S. Main, Morton
- Robert Yeary, 1978 \_\_\_\_\_ Route 2, Morton

**Crosby County**

Clifford Thompson, Secretary

1628 15th Street, Lubbock

- W. O. Cherry, 1978 \_\_\_\_\_ Lorenzo
- E. B. Fullingim, 1976 \_\_\_\_\_ Lorenzo
- M. T. Darden, 1978 \_\_\_\_\_ Lorenzo
- Donald Aycock, 1978 \_\_\_\_\_ Lorenzo
- Alvin Morrison, 1978 \_\_\_\_\_ Lorenzo

**Deaf Smith County**

B. F. Cain, Secretary

County Courthouse, 2nd Floor, Hereford

- James E. Higgins, 1977 \_\_\_\_\_ 200 Star St., Hereford
- Garland Solomon, 1977 \_\_\_\_\_ Rt. 5, Hereford
- W. L. Davis, 1977 \_\_\_\_\_ Box 312, Hereford
- Bill Cleavinger, 1979 \_\_\_\_\_ Star Rt., Wildorado
- George Ritter, 1979 \_\_\_\_\_ Rt. 5, Hereford

**Floyd County**

Don Grantham, Secretary

Farm Bureau, 101 S. Wall Street, Floydada

- Malvin Jarboe, 1976 \_\_\_\_\_ Route 4, Floydada
- Connie Bearden, 1978 \_\_\_\_\_ Route 1, Floydada
- M. M. Smitherman, 1976 \_\_\_\_\_ Silvertown Star Route, Floydada
- Joe Cunyus, 1978 \_\_\_\_\_ Lockney
- Fred Cardinal, 1978 \_\_\_\_\_ Route 4, Floydada

**NOTICE:** Information regarding times and places of the monthly County Committee meeting can be secured from the respective County Secretaries.

Applications for well permits can be secured at the address shown below the respective County Secretary's name, except for Armstrong and Potter Counties; in these counties contact Carroll Rogers and W. J. Hill, respectively.



- Hale County**  
J. B. Mayo, Secretary  
Mayo Ins., 1617 Main, Petersburg  
Clint Gregory, Jr., 1976 \_\_\_\_\_ Box 98, Petersburg  
Henry Scarborough, 1976 \_\_\_\_\_ Route 2, Petersburg  
Homer Roberson, 1976 \_\_\_\_\_ Box 250, Petersburg  
Henry Kveton, 1978 \_\_\_\_\_ Route 2, Petersburg  
Gaylord Groce, 1978 \_\_\_\_\_ RFD, Petersburg
- Hockley County**  
Jim Montgomery, Secretary  
609 Austin Street, Levelland  
Ewel Exum, 1976 \_\_\_\_\_ Route 1, Ropesville  
Douglas Kauffman, 1976 \_\_\_\_\_ 200 Mike, Levelland  
Billy Ray Carter, 1976 \_\_\_\_\_ Route 5, Levelland  
J. E. Wade, 1978 \_\_\_\_\_ Route 2, Levelland  
Jimmy Price, 1978 \_\_\_\_\_ Route 3, Levelland
- Lamb County**  
Calvin Price, Secretary  
620 Hall Avenue, Littlefield  
Gene Templeton, 1976 \_\_\_\_\_ Star Route 1, Earth  
W. W. Thompson, 1976 \_\_\_\_\_ Star Route 2, Littlefield  
Donnie Clayton, 1976 \_\_\_\_\_ Box 276, Springslake  
Billy J. Langford, 1978 \_\_\_\_\_ Box 381, Olton  
Edward Fisher, 1978 \_\_\_\_\_ Box 67, Sudan
- Lubbock County**  
Clifford Thompson, Secretary  
1628 15th Street, Lubbock  
Glenn Blackmon, 1976 \_\_\_\_\_ Route 1, Shallowater  
Andrew (Buddy) Turnbow, 1976 \_\_\_\_\_ Route 5, Box 151 B, Lubbock  
Alex Bednarz, 1976 \_\_\_\_\_ Route 1, Slaton  
Dan Young, 1978 \_\_\_\_\_ 4607 W. 14th St., Lubbock  
Clifford Hilbers, 1978 \_\_\_\_\_ RFD, Idalou
- Lynn County**  
Clifford Thompson, Secretary  
1628 15th Street, Lubbock  
O. R. Phifer, Jr., 1976 \_\_\_\_\_ New Home  
S. B. Rice, 1976 \_\_\_\_\_ Route 1, Wilson  
W. R. Steen, 1976 \_\_\_\_\_ Route 2, Wilson  
Orville Maeker, 1978 \_\_\_\_\_ Route 1, Wilson  
Freddie Kieth, 1978 \_\_\_\_\_ New Home
- Parmer County**  
Johnie D. Horn, Secretary  
Horn Insurance Agency, Bovina  
Troy Christian, 1977 \_\_\_\_\_ Rt. 1, Farwell  
Joe Moore, 1977 \_\_\_\_\_ Box J, Lazbuddie  
Dalton Caffey, 1977 \_\_\_\_\_ 15th St., Friona  
Floyd Reeve, 1979 \_\_\_\_\_ Box 1196, Friona  
Ralph Roming, 1979 \_\_\_\_\_ 809 Ridglea Dr., Bovina
- Potter County**  
Henry W. Gerber, 1977 \_\_\_\_\_ Rt. 1, Amarillo  
Jim Lane, 1977 \_\_\_\_\_ Box 87, Bushland  
Albert Nichols, 1977 \_\_\_\_\_ Rt. 1, Box 491, Amarillo  
F. G. Collard, 1979 \_\_\_\_\_ Rt. 1, Box 433, Amarillo  
W. J. Hill, 1979 \_\_\_\_\_ Box 53, Bushland
- Randall County**  
Mrs. Louise Tompkins, Secretary  
Farm Bureau, 1714 Fifth Ave., Canyon  
Harry LeGrand, 1977 \_\_\_\_\_ 4700 S. Bowie, Amarillo  
Joe Albracht, 1977 \_\_\_\_\_ Box 81, Bushland  
Leonard Batendorst, 1977 \_\_\_\_\_ Rt. 1, Canyon  
Bill Dugan, 1979 \_\_\_\_\_ Rt. 2, Box 30, Happy  
John F. Robinson, 1979 \_\_\_\_\_ 1002-7th St., Canyon

CLAYTON... continued from page 1

With our national deficit at 51 billion dollars and climbing, the President has said an agricultural trade surplus is now necessary to help offset this nation's international balance of trade.

Agriculture exports were worth \$17 billion last year and \$22 billion the year before, which prevented further devaluation of the dollar and balance of trade.

And by the Middle East oil example, we have all seen how a scarcity of a much-needed product can be a force in foreign policy.

In the High Plains of Texas alone, we have the potential to become one of the major breadbaskets of the world.

At last count, this area produced 67 percent of the cotton in Texas, and over 10 percent of the nation's. Seventy-two percent of the state's wheat came from here, or about 4 percent of the nation's production. Thirty-seven percent of the cash receipts from farm marketing were from our area, and this does not include cattle.

These figures are lower than the normal average because of the severe drought in the area in this past year. According to Texas Water Development Board figures, 5.7 million more acres of land could be irrigated in the High Plains area. That's 34 percent of the state's irrigable land.

It's now common to hear predictions that say almost seven million more acres will be necessary to meet the food and fiber needs of just this hemisphere in the next 25 years.

On the world level, the New York Times reported these figures not too long ago: almost 10,000 persons die every day from malnutrition and starvation, and with food production declining and population increasing, the world will be hard put to feed itself by 1980, and that's only five years away. About 70 percent of the children in less developed countries are undernourished. And it has been reported that half the children in the less developed Latin American countries never reach their sixth birthday. It's all too evident that the stork has passed the plow.

Well, I could stand here all day and present devastating statistics to you. But they're nothing new. We've had predictions that this was coming for years.

You know, this is really going to sound ironic, but there was a book written in 1967 that was entitled, "Famine, 1975". I can remember reading that book and thinking, well, that's not too far off, but maybe we'll do something before it really happens.

In that book, William and Paul Paddock write that "before the end of the 1970's, the interplay of power and politics will be based on who is starving and who is not, who has extra food to send to others, and who has not. Food will be the basis for power". This will be, then, an era which the United States can dominate—if we as a nation accept the challenge.

And that is the crucial question. From past political history we have seen all too often that we put off today what we should have done yesterday.

The words of economist Kenneth Galbraith rang true when he said,

"Nothing in our economic policy is so engrained as our tendency to wait and see if things do not improve by themselves."

It is undoubtedly a fact learned from experience that the best lesson to learn from disasters is to prepare people for them, but there are too many occasions in human history where people have not learned anything from disasters at all, particularly in planning and preparing for some similar occurrences.

I think some people are beginning to realize this today. That is why I say that I sense a kind of urgency to do something.

Just this past November, the world's experts and leaders congregated in Rome for a World Food Conference—the first ever to be assembled. There was much rhetoric tossed about but very little accomplished. However, it was a start. We have started to confront realities.

And on the national level, I think people are beginning to understand the vital role of the farmer.

Here we've been organized to prevent disasters in our area for years. We've been warning federal as well as state officials that a water crisis and ultimately a food crisis could be as devastating as any energy crisis, and possibly more so.

And finally they're listening. We have come to realize that land is the most valuable of our world's resources and we must work at ways to further explore the potential development of it. Water, a transportable resource, is a means of achieving this.

You know, if groundwater for agricultural use was not available and the area's crops were produced under dryland conditions, the total economic output of the High Plains would have been reduced by \$1.6 billion in 1967. The economic output of the rest of the state would have been reduced by \$180 million due to the effects of such a cutoff. Equated to 1975 dollars, it would be \$12.8 billion and \$1.45 billion, respectively.

Now, think of the disastrous situation that could face us if we don't find a replacement for our underground water supplies. Texans know that the Ogallala Aquifer will eventually run dry—and they know a long-range water plan must be implemented soon.

I guess the old saying rings true, "It takes a while, but after one dog barks, he eventually finds others to bark with him."

I was looking through some of my old speeches I had given on water, and in one of them I said that big water dreams never hurt anyone. It looks like I was right. While we haven't actually taken the final steps, I think we are making progress.

This year, both the Governor and Lt. Governor have stated plainly that Texas is in dire need of future water supplies and that the importation of water must be actively pursued. Of course, I've always been for this, and you know I'll do everything possible to see the dream I dreamed years ago come true.

I think this unity at the state level is essential if we are to make headway in the next four years. It's true that

—continued on page 4... CLAYTON

# Computer Study Reveals Groundwater Availability In High Plains

A computer study, recently completed by the Texas Water Development Board (TWDB), reveals the amount and location of available groundwater resources in the 45-county area of the Texas High Plains underlain by the Ogallala aquifer. Wayne Wyatt, supervisor of the study, says there are approximately 340 million acre-feet of groundwater in storage in the 35,000-square-mile study area.

The study also shows what many High Plains farmers have already experienced—the supply is very unevenly distributed. Some areas, says Wyatt, are capable of sustaining high irrigation levels through the turn of the century, while other areas should be returning to dryland farming by 2000.

### Water Unevenly Distributed

This uneven distribution, a result of the configuration of the older beds upon which the Ogallala was deposited, shows wide contrast in the study area, but can be coped with.

According to Wyatt and other groundwater experts, it is a physical impossibility for irrigation to totally deplete the aquifer. With the decline in the water table, the well yield decreases and results in less water being taken from storage. This ultimately reduces the rate of depletion to the point that the natural recharge to the aquifer would equal the withdrawals, thereby leaving ample supplies for domestic and livestock needs.

However, the availability of water will not be the drawback to continued irrigation in the area—the drawback will be attributed to the depths from which water will have to be pumped to the surface and the costs of doing so.

### County Tabulations Released

The results of the study, released in January, include county-by-county tabulations of the estimated volume of water in storage and estimates of pumpage by decade periods through the year 2020.

The county totals indicate that the water stored in 1974 will be reduced to 293 million acre-feet in 1980, 242 million acre-feet in 1990, 197 million acre-feet in 2000, 159 million acre-feet in 2010 and 126 million acre-feet in 2020.

Pumpage estimates went from 5.1

million acre-feet in 1970 to 5.4 million acre-feet in 1980, 6.0 million acre-feet in 1990, 5.5 million acre-feet in 2000, 4.8 million acre-feet in 2010 and 4.3 million acre-feet in 2020.

### Conservation Important

Considering that the rate of natural recharge in the area is not more than one inch per surface acre per year, conservation farming is still as important as ever. Wyatt feels that most High Plains farmers are aware of the seriousness of the depletion problem

and are employing many imaginative and costly conservation practices to better utilize their remaining groundwater reserves.

Some of those practices are: measures to better utilize the natural rainfall, such as bench leveling, terracing and contour rows; elimination of waste in irrigation distribution systems by the installation and use of closed pipeline systems; the installation and use of irrigation sprinkler systems; the modification of playa lakes to reduce evaporation and infiltration losses, and the

utilization of water collected in these lakes in their irrigation farming; the installation and use of irrigation tail-water return systems; reduction of the length of and application time of irrigation sets to avoid deep penetration of moisture below the root zone, as well as many others.

Knowing the amount of water in storage and where it lies will help the conservation-minded irrigator to efficiently manage what water he has, thereby adding many years to the area's irrigated economy.

### DIRECTORS . . . continued from page 1

L. Short, Tahoka; Pete Laney, Hale Center, and Phil Cates, Pampa.

### TWCA Convention

In Austin for the Texas Water Conservation Association's (TWCA) thirty-first annual convention, the Board later heard Speaker Clayton address that group on the subject of water importation to West Texas. He said that additional water is needed for nine million acres of irrigable land so that "we can be the breadbasket of the world." He concluded, "Opposition from extremists and the Federal government will not diminish our dreams."

Governor Dolph Briscoe spoke of the work of his Water Conservation and Development Task Force and of the translation of the Task Force's short-range program from plans into reality. Concerning the agricultural role the State must play, he said, "Water is the essential link, and the water program we are implementing today is the key to the kind of Texas we will have in the future."

### TWCA Adopts State Policy

Among the policies adopted by the TWCA was a State policy, also endorsed by the Groundwater Panel. It reads, "We consider that effective control and management of the State's groundwater resources can best be accomplished through establishment, by local option, of local districts for such purposes, and that a general law of Statewide applicability is not necessary or desirable as a means of coping with groundwater management."

In a meeting of the Irrigation Panel, Ross Goodwin was re-elected Vice Chairman of that panel, and, in that office, he will continue to serve as a member of the Association's Board of Directors for another year.



One of the legislators from the High Plains of West Texas taking time to visit with Water District officials was Senator Kent Hance of Lubbock. Standing, left to right, are Ross Goodwin, Muleshoe; Ray Kitten, Slaton; Hance; Selmer Schoenrock, Levelland, and Chester Mitchell, Lockney.



Felix Ryals, Manager of the Panhandle Underground Water Conservation District in White Deer; State Representative Phil Cates of Pampa, Chester Mitchell and Fred Vanderburg, Panhandle Water District Director, review a bill before the House.



Selmer Schoenrock (left) and State Representative E. L. Short, Tahoka, pause outside the House Chambers in the Capitol building in Austin.



Chester Mitchell and Ray Kitten talk with Pete Laney (center), West Texas Representative from Hale Center.

CLAYTON . . . continued from page 2

three fishermen can catch more than twice as many fish when working together in the spirit of cooperation than one alone could.

The Governor's Task Force is to be highly commended for the work it has done in researching the water problems of this state. As you already know, last Wednesday the Task Force issued a draft proposal for a constitutional amendment to double the size of the present Texas Water Development Fund from \$400 million to \$800 million.

I am confident, and I want to relay that confidence to you, that with the sound commitment at the state level, we will see our dream come true before a disaster hits us.

It will take money, more time, and of course, perseverance, but we'll make it. And the world will be better off because of our dedication.

Not too long ago, an article appeared saying that the Texas Water Plan had all us West Texans "mesmer-

ized" by its bigness. That may be so, but we're not, as the article said, waiting around for the Lord's deliverance—although He may provide it.

We're putting our faith in work, dedication and initiative. As the writer, Oscar Wilde, wrote, "We keenly understand that whatever was good enough for our fathers, is not good enough for us."

We know that after many years of developing this land we will not yield to another Dust Bowl, nor will we settle for minimal production capacities. We understand that, of all human resources, the most precious is the desire to improve. And we will do it.

Thoreau, many, many years ago, put it this way, "If you have built castles in the air, your work need not be lost; there is where they should be. Now put foundations under them."

Ladies and Gentlemen, that is our challenge. Let's put the foundations under our dreams, our castles and the needs of our nation.

Thank you.

## Priorities For Consumption of Protein Studied

The following is an excerpt from the February, 1975, issue of *Irrigation Age* magazine.

In a protein-short world, which is the way to go: feed corn or milo to humans directly or process it through a feeder steer?

A ton of corn or milo contains eight percent cereal protein or 160 pounds, points out University of Arizona nutritionist Bruce Taylor. On the other hand, the same 2,000 pounds of grain will finish a 650-pound feeder steer to a choice grade finish weight of 1,056 pounds. The liveweight steer yields 660 pounds of carcass, containing 17 percent beef protein.

When you transpose the 17 percent beef protein into pounds from a 660-pound carcass, you come up with 112 pounds of available protein.

"Compare the two proteins—160 and 112 pounds—and it appears the nod is tilted heavily in favor of cereal, doesn't it?" asks Taylor.

"You've got to go a step further and compare net protein utilization by the human body," he says. He does so by pointing to a net protein utilization scale which gives eggs the highest score, 100. "On this basis, beef protein is 80; corn or milo, 56, which means that a higher proportion of beef protein is assimilated by the human body.

"In fact, if you apply 56 against the

160 pounds of cereal protein available in a ton of grain, you come up with 90 pounds of actual protein available to humans who eat the cereal. Conversely, work the same arithmetic—80 against 112 pounds of beef protein and you come up with an identical availability figure, 90.

"A stand-off," he argues. "Given the choice, I'd rather eat the beef."

## AQUIFER NOT HARMED BY FARM CHEMICALS

The idea that herbicide losses in runoff water are insignificant was once again re-emphasized in January when a group of researchers from Texas, North Carolina, South Carolina, Tennessee, Mississippi and Puerto Rico completed two years of research on the subject.

The results of this research, as well as studies conducted by the High Plains Underground Water Conservation District No. 1 and Texas Tech University, verify that herbicide applied by farmers stays on treated fields and does not wash off with rain, thus being no direct or indirect threat to the aquifer.

### Use of Filters Studied

Considering that rainfall runoff collected in playa lakes is the only known economic source of surface water for use in replenishing the groundwater supply in the High Plains, the District and Texas Tech began tests in 1961 of gravel filters to extract suspended solids from water re-entering the aquifer through a recharge well. According to the May, 1961, issue of *The Cross Section*, the filter extracted about 85 percent of the suspended solids from the surface water before recharging into the ground. The reduction in solids was found to result in less clogging of the underground formation and longer life for the recharge well.

In late 1969 and early 1970, the Texas Tech Water Resources Center

sampled 24 playa lakes in Lubbock County to determine whether or not recharging of water collected in these lakes might be a hazard or cause permanent damage to the quality of water contained in the underlying Ogallala aquifer.

### Water Quality Superior

It was concluded from the study that "the quality of water collected in High Plains playa lakes is generally superior to the quality of water contained in the underlying aquifer in terms of the amount of dissolved solids. The amount of suspended solids, organic materials and microorganisms is subject to wide variations and is highly dependent upon the recent history or treatment of the drainage basin," and from this standpoint, playa lake water is generally inferior to groundwater quality.

However, the report went on to urge that "all levels of government take immediate steps to encourage farmers to recharge playa lake water to the Ogallala by all feasible means", based on the conclusion that playa lake water is of sufficiently good quality that its recharge into the aquifer would not likely be deleterious to the quality of water in the formation.

### Recharge Considered

With the increasing awareness of the decline of the water table, more interest has been focused on finding economically feasible means of utilizing playa lake water.

The District encourages application of playa catchment to the farmland as soon as practical after each rainfall runoff. Any remaining playa water should be recharged to the aquifer where and when possible.



Architect Bill Cox (far left) and Ludwig Teinert, building contractor (third from left) meet with Directors Chester Mitchell, Ray Kitten, Webb Gober, Selmer Schoenrock and Frank Rayner, Manager, for final inspection of the District's new office headquarters. (See related photograph on page one.)

Readers of  
The Cross Section  
should note the  
District's new  
address—  
2930 Avenue Q  
Lubbock, Texas 79405

# THE Cross SECTION

A Monthly Publication of the High Plains Underground Water Conservation District No. 1

Volume 21—No. 4

"THERE IS NO SUBSTITUTE FOR WATER"

April, 1975

## Annual Water Statement, 1974-1975

by DON McREYNOLDS

The annual measurement of depths to water in "observation" wells in the 15 counties within the boundaries of the High Plains Underground Water Conservation District No. 1 began on schedule on January 2 of this year. The enthusiastic beginning was promptly slowed by the almost expected annual "second-day-of-measuring-season" snowfall. However, this only temporarily delayed the measurement of the more than 800 observation wells maintained by the District.

An "observation well" is a well that has been selected and properly documented for inclusion in the annual depth-to-water-level measuring program. All observation wells are privately owned—none are owned by the District. Most of the included wells are producing irrigation or domestic wells whose owners, or their agents, have granted permission for inclusion of their wells in the program.

### Departure from Customary Procedure

This year, all observation wells within the boundaries of the area of responsibility of the District were measured by District personnel. This was a departure from the customary cooperative program with the Texas Water Development Board (TWDB) in Austin.

In past years, approximately one-half of the wells were measured by District personnel and the remainder by TWDB personnel. At the completion of the measuring project, the two groups would exchange the water-level data collected. It was decided that District personnel would measure all the observation wells within District boundaries this year.

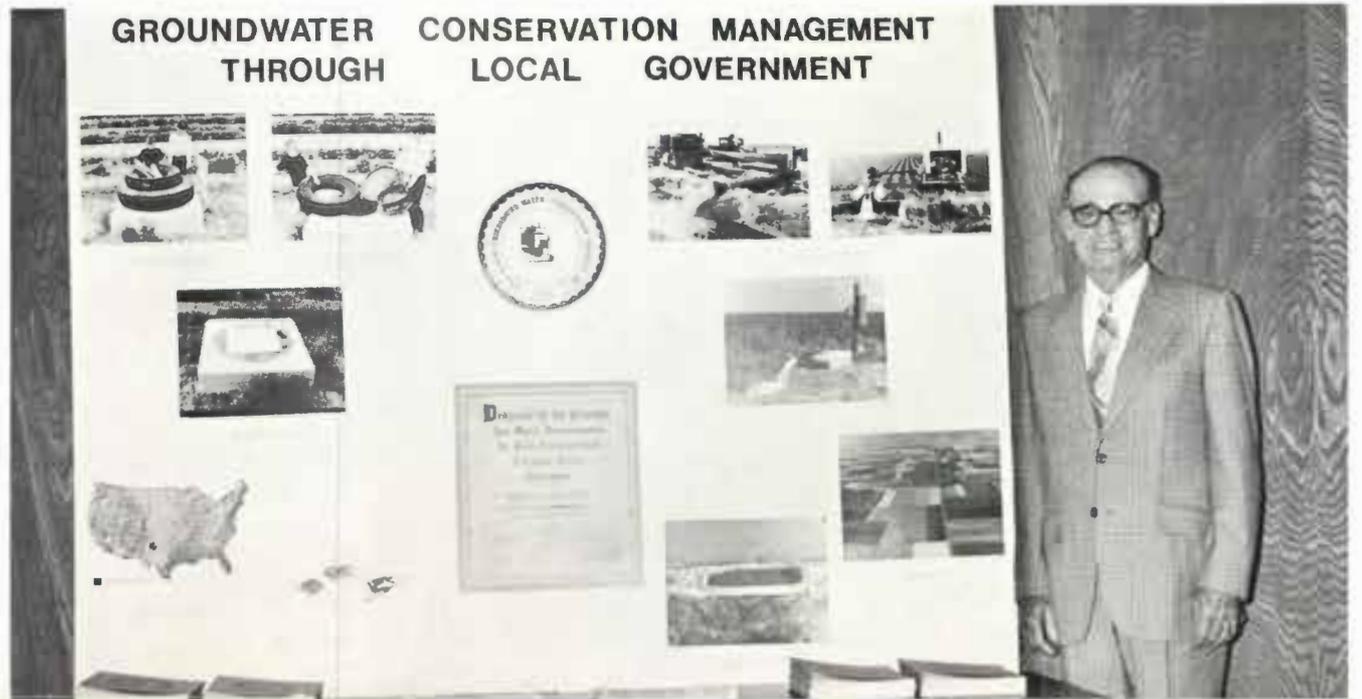
In spite of assuming twice the normal workload for completion of this annual project, the field work was essentially completed by the end of the two-week time period normally required. By the third week of January, the project was completed. The depth-to-water measurements were shared with the TWDB immediately after field work and office tabulation were completed.

### 94 Percent of Wells Successfully Measured

Of the 815 wells listed in the observation well program, approximately 94 percent were successfully measured. However, the six percent of the wells that were not measured were not ignored. Each of these wells was visited and a decision was made as to

—continued on page 3... ANNUAL

## GROUNDWATER CONSERVATION MANAGEMENT THROUGH LOCAL GOVERNMENT



Ray Kitten, President of the Board of Directors, stands beside the display booth maintained by the District at the April 22-24 meeting of the National Conference on Water.

Water officials from across the Nation met in Washington, D.C., at the request of the White House, through the U.S. Water Resources Council. (See story on page 4.)

## District's Federal Power Commission Petition

By FRANK A. RAYNER

In response to a request for a rate adjustment by El Paso Natural Gas Company, the Federal Power Commission (FPC) issued a multi-page order that, in addition to answering the El Paso request, went on to make several other changes in natural gas appropriation, including the natural gas used to power irrigation wells.

Although the El Paso request did not concern itself with the priority of natural gas used for irrigation power, the FPC took it upon itself to downgrade the priority category of natural gas used for irrigation from its former commercial category number two, to the industrial classification of category three, thereby, subjecting natural gas used for irrigation to curtailment in competition with other industrial uses (FPC Opinion Number 697-A, Docket Number RP72-6, December 19, 1974). In its former category, number two, the use of natural gas for irrigation was not subject to curtailment.

In response to the FPC order, several private, public, State and Federal organizations throughout Nebraska, Kansas, Oklahoma, Texas, New Mexico and Arizona filed petitions to stay the FPC rulings, and asking for a reversal of the FPC's irrigation gas declassification. However, General Motors Corporation and San Diego Gas and Electric intervened in support of the FPC order.

As a result of the petitions of intervenors, the FPC ordered a hearing before an FPC Administrative Law Judge, Judge Curtis L. Wagner, Jr. The Washington, D. C., hearing commenced on April 8 and is scheduled for recess by May 2, and, after local hearings, will reconvene in Washington for conclusion.

Because of the unique characteristic of agriculture's use of natural gas, Judge Wagner ordered that, to supplement the Washington, D. C., hearing, local hearings be held in Phoenix, Arizona; Albuquerque, New Mexico, and Lubbock, Texas. The FPC staff attorney, William T. Benham, petitioned the FPC Commissioners to rescind Judge Wagner's order for local hearings, but the Commissioners sustained the Judge's order, and the subject local hearings are tentatively set for May 9 and 10, in Phoenix; May 12 and 13, in Albuquerque, and May 15 and 16, in Lubbock.

The FPC, on April 22, amended its previous order staying the implementation of the curtailment of natural gas used for irrigation energy (as set forth in the FPC order of December 19, 1974) until conclusion of the presently ongoing hearings, by authorizing El Paso Natural Gas Company to initiate curtailment of natural gas for irrigation after 150 days (from April 22, 1975).

Some of the intervenors seeking a

reversal of the FPC order downgrading the priority of natural gas for irrigation are: Plains Irrigation Gas Users Association, John Aiken, Attorney, Hereford; Arizona Public Service Co., Steve Wheeler and Nicholas Powell, Attorneys; Southwestern Natural Gas Consumers, Larry Lamb, Attorney; Pioneer Natural Gas Co., Philip Jordan, Attorney, and El Paso Natural Gas Co., Frank Reifsnider, Attorney.

Intervenors seeking to uphold the FPC ruling downgrading the priority of natural gas for irrigation are: General Motors Corporation, Richard Nolan and Mr. Robinson, Attorneys, and San Diego Gas and Electric, David Pigott, Attorney.

Numerous witnesses have testified during the ongoing hearings. Representatives of several of the State Governor's Offices, State Agricultural Departments, State Attorney General's Offices, U. S. Department of Agriculture representatives, U. S. Congressmen, and many others, including James Valliant, Texas A & M Experiment Station, Halfway, Hale County; Dr. Herbert Grubb, Governor's Office, Texas; Jim Osborne, Texas Tech University, and Robert Carthel, Agricultural Specialist, Pioneer Natural Gas Co.

The District's Board of Directors was briefed on the subject FPC order

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A MONTHLY PUBLICATION OF THE HIGH PLAINS UNDERGROUND WATER CONSERVATION DISTRICT NO. 1

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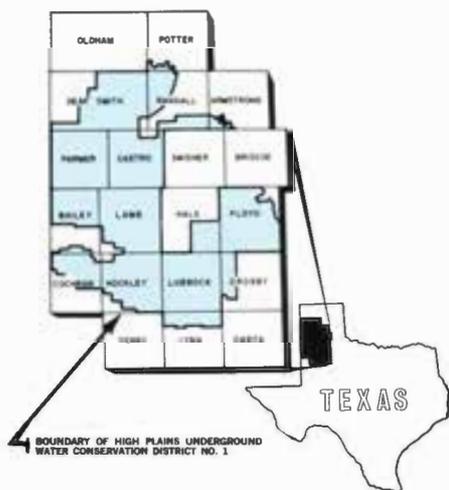
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Formation—the geologic unit that constitutes the High Plains plateau.

Within the District the Ogallala aquifer ranges from a few feet to over 300 feet in thickness and the depth from the land surface to the water table (the top of the aquifer) also ranges from less than 50 to slightly over 300 feet, averaging about 157 feet within the District.

The Ogallala aquifer's favorable hydraulic characteristics—its ability to yield water to wells—are unprecedented. The aquifer has a very high water storage value (specific yield) and a high capacity to transmit water (permeability).

The water in the Ogallala aquifer is also unique in being of a very high quality for such an arid climate. Although classified as hard water, its dissolved mineral content is relatively low, and its quality is in complete compatibility with the soils being irrigated.

It is the favorable saturated thickness, its outstanding hydrologic properties, its excellent quality, combined with the relatively shallow depth to water that allows this "cinderella" aquifer to sustain the mammoth irrigated economy of the High Plains of Texas. There are an estimated 50,000 "large capacity" irrigation wells within the District.

Groundwater Depletion

Like oil and gas, groundwater is being mined in the High Plains area—that is to say that the rate of natural replenishment is greatly exceeded by the rate of pumpage. This condition is resulting in the gradual depletion of the aquifer. However, based upon the known history of the rate of aquifer depletion, future projections of the rate of depletion, as released by the Texas Water Development Board, indicate that there is expected to be sufficient groundwater to sustain a greatly reduced but notable irrigated economy for the ensuing 40 years—if energy is available for groundwater pumpage. As an example, in only two counties within the District, Parmer and Castro Counties, there is a calculated recoverable groundwater supply of approximately 25 million acre-feet beneath the two counties. Within these two counties, the aquifer is projected to be 76 percent depleted by the year 2020 (some 45 years hence) with a remaining groundwater supply of approximately 6 million acre-feet.

Irrigation Well Energy

Recently completed surveys of Parmer and Castro Counties—two of the most extensively irrigated counties in the District (and in Texas)—revealed that 94 and 84 percent, respectively, of the total of 7,006 irrigation wells therein were using natural gas for fuel. Less than one percent of the wells in the subject two counties were powered by liquefied petroleum gas, and ten percent of the irrigation wells were equipped with electric motors.

In areas of the District underlain by shallower lying and thinner aquifer sections, and, correspondingly, smaller capacity wells, the ratio of electric to natural gas powered wells approaches, and sometimes exceeds, the value of one. However, all electric power is presently derived from natural gas fueled thermolectric plants. Therefore, all of the areas' irrigation, municipal, industrial, domestic and stock (excluding windmills) wells are directly or indirectly powered by natural gas or other petroleum fuels.

Energy-Water Conservation Programs

The two District programs directly responsible for the conservation of energy are its well spacing and waste water abatement programs.

Well Spacing

When groundwater is pumped from a well producing from an unconfined sand and gravel aquifer (the Ogallala aquifer), there is formed around the well a depression in the water table. It is this lowering of the water level in and adjacent to the well that establishes the hydraulic imbalance that causes water to move into the cone of depression and hence into the well. When wells are placed in proximity to each other their individual cones of depression coalesce additively, resulting in less water produced from each well at much greater pumping lifts—hence greater use of energy.

The District's mandatory requirement for adequate spacing between wells—based upon well capacities (the primary factor controlling the cones of depression in the Ogallala aquifer)—is a major program for the conservation of energy, and for the more efficient production of groundwater.

Waste Prevention

Because of the high quality (low dissolved solids) of the Ogallala groundwater, and its complete compatibility with the soil chemistry, continuous annual irrigation of over 50 years has not resulted in any soil damage by precipitation of dissolved salts. This ability of the soil to repeatedly accept the Ogallala groundwater makes it possible to recirculate irrigation runoff water (tailwater) to the fields until all such water is assimilated by the vegetation or the soil mantle. This ability to irrigate without a required tailwater runoff is unique almost only to the High Plains area. Most, if not all, long-term irrigation projects using surface water must provide for drainage of the irrigated land, and in many other comparably large groundwater irrigated areas the quality of the groundwater requires the periodic leaching of the soils by massive doses of applied water. In the High Plains area it is necessary to apply only that amount of water necessary for optimum crop production—leaching by overapplication is unnecessary, and prohibited by the District.

During normal irrigation application, studies have shown that approximately 20 percent (approximately 32 percent in states north of Texas) of the groundwater pumped would escape from irrigated land if such a practice was not in violation of the District's rules. Within the District, State law defines waste as "willfully causing, suffering, or permitting underground water to escape into any river, creek, natural watercourse, depression, lake, reservoir, drain, sewer, street, highway, road, or road ditch, or onto any land other than that of the owner of the well."

The District's program of prohibiting tailwater waste can be credited with salvaging approximately 20 percent of the water needed for adequate irrigation, hence nearly a 20 percent reduction in groundwater pumpage. Since energy requirements for lifting water from the aquifer exceed those required to recirculate such water (after it has once been lifted to the land surface) by a factor of eight, the District's tailwater abatement program could also be credited with a 160 times (8 x 20) saving on that amount of energy that would be required if tailwater recovery was not mandatory within the District.

The two counties (Parmer and Castro) previously cited also contain the largest number of tailwater (and pump) recovery systems per unit area than any comparable area in the United States.

Conservation Education

Throughout its 23-year history, the District has relied heavily upon its creed, "Water Conservation Is Best Accomplished Through Public Education."

Since 98 percent of all groundwater pumped within the High Plains is for irrigation of commercial crops, the District has concentrated its water use efficiency campaign at the water user, the land owner, the irrigator.

As a result of the District's 23 years of numerous and varied educational programs, coupled with that amount of conservation rules enforcement as is necessary—and in large part to the numerous other private foundations, and State and Federally funded soil and water conservation, research and demonstration programs—there has developed a second generation irrigation farmer that has been repeatedly exposed to, and educated in, the many ways of groundwater conservation techniques. Further, since there is a direct relationship of energy conservation to groundwater conservation (groundwater can not be produced without energy), High Plains irrigators, being a large group of very efficient groundwater users, are, conversely, a large body of efficient energy conservers. It is this segment of the High Plains economy that the Nation can ill afford to lose—the conservation-minded farmer. However, if there is natural gas curtailment in the High Plains area, this resource of educated, efficient, and conservative irrigation farmers must soon commence to disintegrate and no succeeding third or other generation of its kind is likely to be forthcoming.

Efficient Irrigation

In the High Plains area there are over 40 years of research and irrigation experience that have unequivocally demonstrated the most efficient irrigation routines for the various crops. This history of applied research has shown that the minimum amount of groundwater—and hence the minimum

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at its public hearing of April 12, and issued the following petition to the FPC, authorizing the Manager to present same before the FPC. The Manager testified at the subject hearings on April 22. Also present at the Washington hearing was the President of the District's Board of Directors, Ray Kitten.

The High Plains Underground Water Conservation District No. 1 (District) respectfully petitions the Federal Power Commission (FPC) to rescind that part of the FPC Opinion Number 697-A, Docket Number RP72-6, of December 19, 1974, downgrading the priority of natural gas used to pump water for irrigation, and reestablish the use of natural gas for irrigation power to its former category of priority number two.

The following background information is submitted to establish the basis for the District's pleading and as a brief review of the need and justification for such pleading.

The District

The High Plains Underground Water Conservation District No. 1 was established by order of the Texas Water Rights Commission in 1951—in conformance with the boundaries of a definable subdivision of the underground water reservoir in the Ogallala Formation—and ratified by popular vote of the electorate on September 29, 1951. The District is an agency of the State of Texas, having been established in conformance with the Underground Water District's enabling act, codified as Chapter 52, Vernon's Civil Statutes of Texas, and ratified by the Texas Legislature in 1953.

The District encompasses all or parts of the following 15 Southern High Plains counties in Texas: Armstrong, Bailey, Castro, Cochran, Crosby, Deaf Smith, Floyd, Hale, Hockley, Lamb, Lubbock, Lynn, Parmer, Potter, and Randall; covering some 8,149 square miles or 5,216,000 acres.

The District is governed by a five-member, elected, Board of Directors, counselled and advised by five elected, County Committeemen representing each of their respective 15 counties in the District. The primary purposes and responsibilities of the District are "... to provide for the conservation, preservation, protection, recharging, and prevention of waste of the underground water of underground water reservoirs or their subdivisions, consistent with the objectives of Article XVI, Section 59,

of the Texas Constitution, underground water conservation districts may be created as provided by this chapter" (Article 52.021 Purpose). However, for the purposes of these pleadings, only those activities of the District directly concerned with energy conservation will be briefly reviewed.

High Plains Physiography

The High Plains is a highly unique, efficient, and prolific agricultural producing area. The Plains physiography and its underlying groundwater-bearing formation, the Ogallala aquifer, are specifically pertinent to these pleadings and will, therefore, require the following brief review.

The Southern High Plains in Texas ranges in elevation from approximately 2,400 feet above mean sea level (msl) near the city of Big Spring, in its southeast extremity, to over 4,800 feet msl south of the Canadian River near the Texas-New Mexico state line. The topography appears flat with local relief of only a few tens of feet, associated with the many playas (wet weather lakes) dotting the Plains. The Plains slope to the southeast at about 10 feet per mile and the only obvious topographic relief are the west, north and east escarpments marking the Plains boundary, and the few reentrant canyons associated therewith.

The Southern High Plains is a high isolated plateau with a semi-arid climate characterized by abundant sunshine and a relatively long growing season (200 days).

Temperatures sometimes vary over a wide range in a short time span, but characteristically the summer days are warm to hot, with cool nights and cold winters, with freezing wintertime temperatures not infrequent.

Precipitation varies from 20 to about 16 inches (southeast to northwest), averaging 18 inches annually.

Soil types range from clay to nearly pure sand, with the loam and sandy loam types predominating. The soil mantle is several feet thick, very easily cultivated, and devoid of indurated rocks.

Underground Water Supplies

Because of the semi-arid climate, characterized by wide ranges in rainfall amounts and patterns, irrigation by groundwater has been established on a mammoth scale elsewhere not similarly duplicated in the United States.

Except for relatively infinitesimal amounts of groundwater produced from two very minor aquifers, the area's entire irrigated economy is dependent upon the groundwater pumped from the Ogallala aquifer.

The Ogallala aquifer is contained in the basal sands and gravels of the Ogallala

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the measurability of the well or the validity of a reported measurement.

This information will be used for further corrections of problems or replacement of observation wells which perennially present measurement difficulty. Updating the documentation of wells and correcting problems in the intervening time between the 1975 and 1976 measuring seasons will be facilitated by these inspections. The most common reasons for a well not being measured include:

1. The well was pumping or there was some indication that the well had been pumped recently.
2. The well was destroyed or, in some other way, was incapable of accepting the steel tape for measurement.
3. There was an unreliable or unreadable water mark on the steel tape.

*Pumping Wells Present Problems*

Probably the most prevalent reason for non-measurement is number one, above. In measuring depths to water in wells, the intent of the procedure is to measure the well's static water level in order to get some indication of the water level of the aquifer penetrated by the well bore.

As a well is being pumped, a cone of depression is produced in the water table. Water surrounding the pumped well normally attempts to flow toward this depression. Under the influence of gravity—particularly in an unconfined aquifer, such as the Ogallala—groundwater attempts to fill these depressed areas and reach a level within the well approximating the water-table level of nearby unpumped areas of the aquifer.

In measuring the depth to water in an observation well, the ideal situation is one in which the well has had sufficient "resting" time to attain static water level, which approximates this depth to the water table. Normally, the observation well has had sufficient resting time, since last being pumped, for static water level to again be attained before measurement in January.

In some areas in which winter wheat

is irrigated, observation wells are often found pumping, or there is some indication of recent pumping. Measuring such wells is avoided because such measurements would present an inaccurate indication of the depth to the water table. Many of the wells for which no measurement in January was recorded fall under this classification.

Reliance upon depth-to-water measurements from such recently pumped wells would give an incorrect indication of excessive decline of the water table since the January, 1974, measurement. Using such data could also give a false indication of a rise in the water table with the subsequent measurement years.

*Vinyl Tags Placed on Well-Head Equipment*

As in past years, a vinyl tag with adhesive backing was secured to the well-head equipment of each measured well. This tag contains the observation well identification number and the measured depth to water in feet below land surface. The owner or operator of the observation well can use this information to judge the yearly change in the water table depth as influenced by pumpage of his well.

For anyone desiring the complete history of water-level information for a particular observation well, the District's Lubbock office maintains the records of each observation well. District personnel will discuss these records at any time and supply information concerning these wells to any interested individual.

*Water-Level Publication Available*

The District has available, in limited quantities, the publication, "Ogallala Aquifer Water-Level Data, With Interpretation, 1965-1974". This publication, available upon request, contains maps showing the locations of observation wells within the District and tabulations of the annual depth-to-water measurements for each of these wells since 1965.

Information from the annual depth-to-water measurements is utilized in preparation of the guidelines for calculating cost-in-water depletion for income tax purposes. Use of the yearly measurements by individuals in deter-

mining a value for depletion claims on income tax returns is not acceptable. The only valid guidelines are the contoured county maps or the parcel claim system approved by the Internal Revenue Service and supplied, for a small fee, as an additional service by the District.

This guideline information is based upon average values, and adjustments are made for water-level rises and account for all previous decline assigned to each well. The amount of actual decline (or apparent rise) and the amount of assigned decline is kept as near as possible to the zero balance difference by these bookkeeping procedures.

*Water-Level Declines Exceed Normals*

An overall view of the depths to water measured in January generally reflects a greater-than-normal annual decline in the water table. These declines, as would be expected, were, for the most part, more dramatically exhibited in areas of greater groundwater storage. Normal yearly increases in depths to water of several feet are expected in these areas.

All or portions of counties which exhibit such declines include Castro, Bailey, Deaf Smith, Lamb, Floyd and Parmer Counties. Areas of marginal water supplies, where a yearly decline of fractions of a foot are the norm, often reported water levels in observation wells to be down one, two or more feet this year.

County	AVERAGE DECLINE OF WATER TABLE	
	Average Decline ft. 1974-1975	Average Annual Decline ft. 1966-1975
Armstrong	0.73	1.51
Bailey	2.46	1.48
Castro	2.99	2.83
Cochran	1.79	0.36
Crosby	3.02	1.53
Deaf Smith	3.22	2.62
Floyd	3.26	2.70
Hale	0.71	1.15
Hockley	2.24	0.34
Lamb	3.80	1.76
Lubbock	3.16	0.95
Lynn	2.06	0.10
Parmer	3.00	3.24
Potter	0.98	1.24
Randall	0.21	1.78

The table, above, "Average De-

cline of Water Table", presents the average decline, by county, for the period from January, 1974, to January, 1975, and the average annual decline for 1966 to 1975. It should be noted that this statistical summary shows that the average decline for 1975 for ten counties within the District exceeded the ten-year averages of these same counties. Often, this 1974-1975 value exceeded the average by one foot or more.

The phenomena responsible for these water-level declines probably include both natural factors and economic considerations. The record productions and crop prices for the 1973 harvest likely encouraged greater planted acreages and heavy cropping during 1974.

Although total precipitation for most reporting stations on the High Plains for 1974 generally equalled or exceeded normals, the natural moisture often was available at least needed periods. As a result, supplementary moisture was provided, where available, by irrigation. A combination of these economic and natural factors contributed to the observed water-level declines.

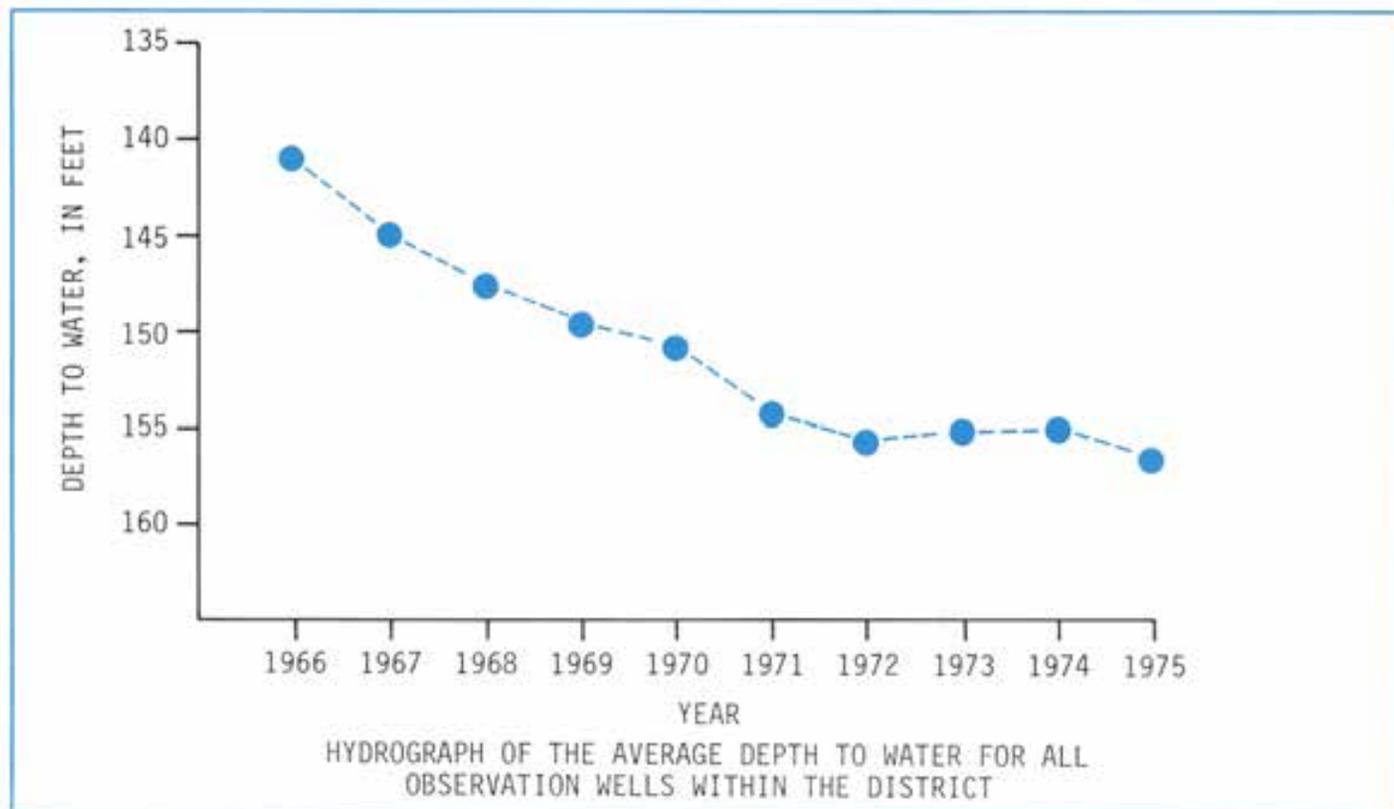
*Water-Level Measurements Tabulated*

The table on page 4, "Summary of Water-Level Measurements", presents the minimum and maximum depths to water as measured in 1966 and 1975. The average depths to water for each county for these two years are also presented in the tables. To give an indication of the data used to reach these average values, the number of wells measured in each county for each year is also listed. It is significant to point out that the average depths to water, as reported in 1975, exceed the average depths to water in corresponding counties in 1966 in all cases.

The graph, below, "Hydrograph of the Average Depth to Water for All Observation Wells Within the District", pictorially presents the decline of the water table within the area of the District. The numerical values on the vertical scale of the graph represent the average depth to water in feet below the land surface. The horizontal portion of the graph represents time, in yearly increments, since 1966.

The slope of the curve of the graph can be interpreted to indicate the severity of the average rate of decline of the water table. A greater slope of the curve indicates higher rates of decline, and, conversely, a lesser slope indicates lower rates. The portion of the curve representing the time period, 1974 to 1975, indicates the departure from normal declines of the previous few years.

In summary, it appears that the water-level measurements collected in January, 1975, indicate relatively heavy groundwater pumpage in 1974. Rates of pumpage undoubtedly increased in some areas during 1974. It is hoped that the decreased or stabilized rates of declines that were noted for some areas indicate an increase in the practice of groundwater conservation measures advocated by the District.



## SUMMARY OF WATER-LEVEL MEASUREMENTS

County	No. of Wells Measured	1966			1975			
		Depth to Water (Feet) Min.	Depth to Water (Feet) Max.	Depth to Water (Feet) Avg.	No. of Wells Measured	Depth to Water (Feet) Min.	Depth to Water (Feet) Max.	Depth to Water (Feet) Avg.
Armstrong	9	106.18	133.89	119.97	9	110.75	155.52	133.54
Bailey	55	17.19	135.08	77.75	57	24.93	158.41	93.38
Castro	43	113.76	253.22	166.59	58	115.26	287.04	189.61
Cochran	40	88.32	184.82	138.87	52	76.84	197.23	142.08
Crosby	10	165.10	205.03	188.49	19	128.74	232.75	193.30
Deaf Smith	44	61.83	300.09	162.93	70	57.94	328.19	181.67
Floyd	64	59.31	283.03	182.64	93	62.00	311.79	204.73
Hale	13	85.26	178.92	129.67	17	78.71	200.37	138.13
Hockley	72	43.90	190.82	125.42	74	44.05	197.60	126.13
Lamb	67	30.62	171.82	108.44	70	36.45	208.14	124.34
Lubbock	87	11.61	187.72	122.65	120	13.46	224.53	131.18
Lynn	29	34.92	146.45	91.34	30	24.45	152.49	90.39
Parmer	43	135.65	315.42	215.22	59	167.42	348.53	250.02
Potter	3	188.23	208.18	198.32	4	195.15	225.24	213.67
Randall	25	94.23	219.68	155.26	30	101.86	239.58	172.09

## National Conference on Water

Ray Kitten, President of the District's Board of Directors, recently returned from the National Conference on Water, held April 22 through 24 in Washington, D.C. (see related photograph on page 1). Objectives of the conference, sponsored by the United States Water Resources Council, were "(1) to examine the role of water in national affairs through 1985 and (2) consider the adequacy of existing and proposed policies and programs in fulfilling this role"

Eight panels composed of water officials, legislators, environmentalists, Federal agencies and members of the general public discussed and exchanged views in an open forum on key water issues of national importance.

The panel dealt with the following issues: (1) Water and Energy, (2) Water and Food and Fiber, (3) Water and Transportation and Commerce, (4) Water and Municipalities and Industry, (5) Water and the Environment and Outdoor Recreation, (6) Flood Damage Reduction, (7) Water Laws, Water Rights and Institutional Arrangements and (8) The Role of Federal, State and Local Governments.

President Gerald R. Ford, in a statement released prior to the conference, said, "Water, even more than food, is basic to our survival...". He continued, "There are, I realize, very different points of view represented in this audience as to what constitutes the best approach to the burning questions of the use, purity and availability of our nation's water supply in the next decade. I have great faith that in your discussions you will all keep in mind the goals you share rather than the different approaches you favor, and that from this Conference there will come a useful sense of what should

and must be done for the good of all our citizens."

A summary of the reports of the panels will be released soon by the Water Resources Council.

## Farmers to Receive Crop Questionnaires

During the last of May, a random sample of some 24,000 Texas farmers will receive a crop acreage questionnaire from Charles E. Caudill, Agricultural Statistician in Charge of the Texas Crop and Livestock Reporting Service, Austin.

This information will be the basis for determining the planted acreage for the State of Texas and for each county. The yearly survey is a cooperative effort of the U. S. Department of Agriculture's Statistical Reporting Service and the Texas Department of Agriculture.

According to Caudill, Texas farmers reported in March that they intended to plant 19 percent less cotton in 1975 than in 1974. They indicated this decrease in cotton acreage will be more than offset by acreage increases of 13 percent for grain sorghum, 22 percent for corn and 45 percent for soybeans, as well as the 16 percent increase in winter wheat seedings last fall.

"Also, it appears a significant acreage will be devoted to sunflowers; therefore, this crop will be included for the first time in 1975 acreage surveys for Texas," he added.

All farmers who receive questionnaires are urged to complete them and return them by mail. Caudill emphasized that all individual reports are confidential and are used only for State and county totals.

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amount of energy—for optimum production can be attained by timely irrigation application (times of peak efficient plant utilization).

The irrigator with a large capacity well(s)—usually equipped with an internal combustion motor fueled by natural gas—can manage his irrigation routines to only irrigate when crop conditions dictate. If he has received some fall and winter moisture, he can delay commencing any preplant irrigation until absolutely necessary, and thereby delay groundwater pumpage, hoping that the researcher's mathematical probability of rainfall is applicable for the given year. As his probability of receiving adequate preplant moisture becomes smaller, he has been able to revert to groundwater pumpage, because the groundwater was in readily available storage, and he knew that natural gas energy would be available when needed.

However, this same irrigator, faced with the nagging possibility of natural gas curtailment, would probably commence pumping his wells at any time natural gas was available, irrespective of the existing soil moisture or crop needs. His attitude would be to wet the soil profile whenever he knew energy was available, and not to take the risk of curtailment when his crops must have the water. Hence, both groundwater and energy conservation could suffer the abuses of excessive and wasteful pumpage, predicated and perpetuated by the uncertainty of the availability of energy when needed. Otherwise he could suffer drastically reduced crop production, or a complete crop failure, should energy be curtailed at critical irrigation times. Therefore, it is apparent that both groundwater conservation and energy conservation are best effected by an uninterruptible supply of natural gas.

### Advantages of Agricultural Energy Use Favorable Climate

The climate of the Southern High Plains—arid, abundant sunshine, with a wide range in temperatures—provides a relatively insect-free environment suitable for growing a wide variety of economically desirable crops requiring a very limited amount of pesticides, and the energy needed to apply same.

### Favorable Soil and Topography

The topography and soil provides for easy cultivation, with a minimum unit expenditure of petroleum energy.

### Good Water Supply

The existence of a highly productive aquifer at relatively shallow depths below the surface permits efficient water production per energy-unit consumption.

### Energy Conservation Requirements

The District's mandatory well spacing and tailwater abatement programs are both water and energy conservation measures that are unique to only the groundwater districts in the Texas High Plains. Well spacing and tailwater abatement are not required throughout the remainder of Texas.

### Free Enterprise System

Groundwater in Texas is private property and the irrigation wells, pumps, motors and associated equipment are totally financed by private capital—unlike most surface water irrigation projects, there are no Federal or State financial aid programs for irrigation well development.

The irrigator must also purchase natural gas, electricity or other forms of energy on the free market subject only to his ability to pay for same. However, if the FPC should approve institution of curtailment proceedings, the Texas irrigator would be unfairly subjected to both a controlled and uncontrolled market place; his availability to an energy supply being controlled, and his energy costs let free to rise on the artificially created scarcity of the energy supply.

Such a so-called "controlled" energy policy could (through natural gas curtailment) mean economic ruin to the irrigator, and an end to the free enterprise of groundwater irrigation.

### Drought Insurance

Aside from the increased productivity afforded by irrigation, the stability of agricultural production made possible by groundwater irrigation is one of the major contributions made by the irrigator to the agricultural products consumer, and to our international trade. The near guaranteed production made possible by the nation's vast groundwater irrigated areas is a type of insurance against the hectic and erratic cycles of drought-influenced farming.

The reliability of irrigated farm production stabilizes consumer costs and prevents a feast or famine attitude from dominating the agriculture market. However, if the energy to pump groundwater can not be established as equally reliable as is the groundwater supply, the condition could revert back to a drought situation whereas an energy drought could lead to a water drought, because groundwater could not be pumped as needed to sustain crop production. It is therefore evident that an uninterruptible energy supply for irrigation is the only way to guarantee the production stability of irrigated agriculture.

The large number of efficient and natural resource conservation-minded irrigation farmers established in the High Plains area constitutes a human resource wherein the highest agricultural use can be made of existing energy supplies.

If all of the foregoing factors are considered, and if the National interest in the necessity for irrigated crop production is understood, we believe that the FPC will recognize the desirability of affording every opportunity to permitting the uninterruptible use of natural gas for irrigation pumping, particularly in an area—The High Plains of Texas—wherein efficient energy utilization has been markedly demonstrated.

For these reasons we pray for the return of the allocation of natural gas for irrigation pumpage to its proper and necessary category, category number 2.

Copies of several District publications are submitted with this pleading to provide background information and as examples for the contentions for this pleading.

Adopted by resolution of the Board of Directors of the High Plains Underground Water Conservation District No. 1, April 12, 1975.

Ray Kitten, President  
Selmer Schoenrock, Vice-President  
A. W. Gober, Secretary-Treasurer  
Chester Mitchell, Member  
Billy Wayne Sisson, Member

# THE Cross SECTION

A Monthly Publication of the High Plains Underground Water Conservation District No. 1

Volume 21—No. 5

"THERE IS NO SUBSTITUTE FOR WATER"

May, 1975



District Manager Frank Rayner testifies before the Federal Power Commission (FPC) in Washington, D.C., on April 22. Since April 8, the FPC has heard testimony from 129 witnesses in Washington, Lubbock, Phoenix, Arizona, and Albuquerque, New Mexico.

## 129 Witnesses Testify Before FPC In Natural Gas Priority Case

The idea that deliveries of natural gas for irrigation should be considered an "industrial use" was challenged by High Plains irrigation farmers May 15 and 16, when Federal Power Commission (FPC) Administrative Law Judge Curtis L. Wagner, Jr., held a local hearing in Lubbock.

The order for the hearing was a result of the FPC's December 19, 1974, ruling (Opinion 697-A) that lowered the priority of natural gas for fueling irrigation engines from priority No. 2 (commercial) to priority No. 3 (industrial). According to the FPC's curtailment plan, commercial use is defined as "service to customers engaged primarily in the sale of goods or services including institutions and local, state, and federal government agencies for uses other than those involving manufacturing or electric power generation."

### Definition of Industrial Use

Industrial use is defined as "service to customers engaged primarily in a process which creates or changes raw or unfinished materials into another form or product including the generation of electric power".

Some intervenors questioned the need to make agriculture and industry competitive by placing them in the same category. According to the FPC's plan, agriculture and industry would be curtailed at the same time in the event of shortages.

The FPC's ruling only affects El Paso Natural Gas Company, serving California, Arizona, New Mexico and Texas (with 85 percent of its supply going to California); however, area farmers believe that the final ruling will set precedent and ultimately affect all pipelines in the country. El Paso delivers natural gas across state lines, which is under the jurisdiction of the Federal government through the FPC, but intrastate transfers of natural gas (which are more common in the Texas High Plains) might be jeopardized by failure of the FPC to eventually re-evaluate irrigation's use of natural gas in its overall curtailment plan.

### Review of El Paso Case

In 1971, the FPC ordered all interstate gas lines to prepare curtailment plans in case of future shortages. El Paso's plan was rejected by the FPC. In June, 1974, the Commission issued Order 697, a permanent curtailment plan, which conflicted with El Paso's.

Thus, on December 19, 1974, the

FPC issued Order 697-A, giving opinions on all motions for rehearing and, at the same time, lowering irrigation use in El Paso's curtailment plan.

### Motion for Rehearing Denied

El Paso's motion for a rehearing was denied, but the Commission, on March 21, 1975, scheduled an expedited hearing, as a result of a storm of protest from farm officials, natural gas companies and gas user groups from across the irrigation belt. The hearing was ordered to consider El Paso's "process gas" conclusion, and also to consider petitions for extraordinary relief which may be filed by various irrigation customers seeking to maintain necessary deliveries, in case it is determined that irrigation uses do not fall within the process gas definition and the evidence indicates that they nevertheless should be exempted from curtailment for other reasons.

Process gas is that for which alternate fuels are not technically feasible, as in applications requiring precise temperature controls and precise flame characteristics. For purposes of this definition, the FPC does not consider propane and other gaseous fuels as alternate fuels.

During the Lubbock hearing, called

—continued on page 2... FPC

## Groundwater Reserves Valuable to U.S.

Poor geographic distribution of water is a problem which High Plains irrigation farmers realize and accept daily in their efforts to avail themselves of the groundwater stored in the Ogallala aquifer. However, the problem on a world-wide scale is not easy to realize without some statistics which reveal the size and uneven distribution of the land and bodies of water.

The November - December, 1974, issue of the Johnson Drillers' Journal studied in depth the distribution of the world's water supplies. Some of those figures are reproduced in the summary below.

According to encyclopedic data, the total surface area of the earth is approximately 197 million square miles. Of this total, almost 71 percent—139 million square miles—is covered by oceans, and about 3.4 percent, or 6.9 million square miles, is covered by polar ice caps and glaciers.

### Fresh Water Lakes

Natural fresh water lakes comprise an area of about 330,000 square miles, and natural saline lakes cover 270,000 square miles. These figures respectively correspond to .17 and .14 percent of the surface of the globe. The dry land of the continents and islands represents 25.4 percent of the globe, or an area of about 50 million square miles.

The world's supply of water is estimated, by volume, in the chart in the next column.

BODY OF WATER	VOLUME (Cubic Miles)
Oceans	317 million
Polar ice caps and glaciers on continents	7.3 million
Main root zone (upper three feet)	6 million
Fresh water lakes	30,000
Saline lakes and inland seas	25,000
Atmosphere	3,100
Rivers and streams	280

The groundwater found in the earth's crust to a depth of half a mile is approximately one million cubic miles, in addition to the moisture in the upper three feet of the soil. There exists probably another equal amount in the earth's crust between the depth of one-half and two miles.

The quantity of water found on the land areas constitutes only three percent of the world's water supply—the other 97 percent is in the oceans. Since the conversion of salt water to fresh water is economically infeasible on a large scale, the inland areas will probably continue to receive water from the sea only indirectly.

As for the quantity of fresh water, the great bulk of this resource is not actually available to man. In reality, only about one-eighth of the total can be developed for beneficial use.

Much of the groundwater at depths greater than one-half mile is economically inaccessible at present or is

—cont. on page 4... GROUNDWATER

## Joe R. Carroll Appointed to TWRC

Burke Holman of Houston, recently-appointed member to the Texas Water Rights Commission, asked Governor Dolph Briscoe to withdraw his name from nomination to the Commission on May 23. Holman, appointed by Briscoe on June 28, 1974, to fill the unexpired term of Otha F. Dent, withdrew his name because of opposition to his confirmation in the Senate.

On May 23, Governor Briscoe appointed Joe R. Carroll, a Snyder attorney, to serve the remainder of Dent's term (which expires in February, 1977) and submitted his name to the Senate for advice and consent.

Carroll, a Baylor graduate maintaining a private law practice in Snyder, served under Attorney General Will Wilson as Assistant Attorney General of Texas.

Carroll will join Joe Carter of Sherman and Dorsey Hardeman of San Angelo on the Commission.



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2930 Avenue Q, Lubbock, Texas 79405

Telephone 762-0181

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- M. T. Darden, 1976 \_\_\_\_\_ Lorenzo
- Donald Aycock, 1978 \_\_\_\_\_ Lorenzo
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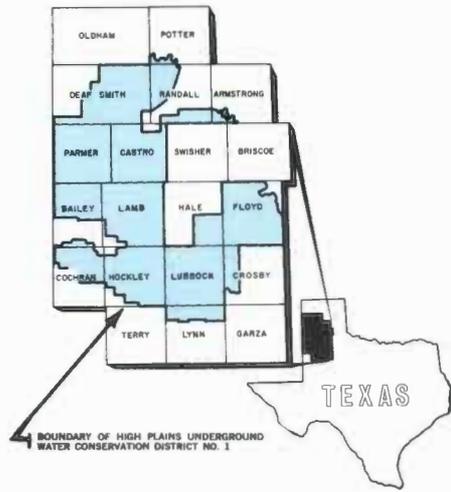
- B. F. Cain, Secretary  
County Courthouse, 2nd Floor, Hereford
- James E. Higgins, 1977 \_\_\_\_\_ 200 Star St., Hereford
- Garland Solomon, 1977 \_\_\_\_\_ Rt. 5, Hereford
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- George Ritter, 1979 \_\_\_\_\_ Rt. 5, Hereford

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- Connie Bearden, 1976 \_\_\_\_\_ Route 1, Floydada
- M. M. Smitherman, 1976 \_\_\_\_\_ Silverton Star Route, Floydada
- Joe Cunyus, 1978 \_\_\_\_\_ Lockney
- Fred Cardinal, 1978 \_\_\_\_\_ Route 4, Floydada

**NOTICE:** Information regarding times and places of the monthly County Committee meeting can be secured from the respective County Secretaries.

Applications for well permits can be secured at the address shown below the respective County Secretary's name, except for Armstrong and Potter Counties; in these counties contact Carroll Rogers and W. J. Hill, respectively.



**Hale County**

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Mayo Ins., 1617 Main, Petersburg
- Clint Mayo, Jr., 1976 \_\_\_\_\_ Box 98, Petersburg
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- Gaylord Groce, 1978 \_\_\_\_\_ RFD, Petersburg

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- Jimmy Price, 1978 \_\_\_\_\_ Route 3, Levelland

**Lamb County**

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- W. W. Thompson, 1976 \_\_\_\_\_ Star Route 2, Littlefield
- Donnie Clayton, 1976 \_\_\_\_\_ Box 278, Springlake
- Billy J. Langford, 1978 \_\_\_\_\_ Box 381, Olton
- Edward Fisher, 1978 \_\_\_\_\_ Box 67, Sudan

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- Dan Young, 1978 \_\_\_\_\_ 4607 W. 14th St., Lubbock
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- S. B. Rice, 1976 \_\_\_\_\_ Route 1, Wilson
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- Orville Maeker, 1978 \_\_\_\_\_ Route 1, Wilson
- Freddie Kieth, 1978 \_\_\_\_\_ New Home

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- Joe Moore, 1977 \_\_\_\_\_ Box J, Lazbuddie
- Dalton Caffey, 1977 \_\_\_\_\_ 15th St., Friona
- Floyd Reeve, 1979 \_\_\_\_\_ Box 1196, Friona
- Ralph Roming, 1979 \_\_\_\_\_ 809 Ridglea Dr., Bovina

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- Henry W. Gerber, 1977 \_\_\_\_\_ Rt. 1, Amarillo
- Jim Line, 1977 \_\_\_\_\_ Box 87, Bushland
- Albert Nichols, 1977 \_\_\_\_\_ Rt. 1, Box 491, Amarillo
- F. G. Collard, 1979 \_\_\_\_\_ Rt. 1, Box 433, Amarillo
- W. J. Hill, 1979 \_\_\_\_\_ Box 53, Bushland

**Randall County**

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- Harry LeGrand, 1977 \_\_\_\_\_ 4700 S. Bowie, Amarillo
- Joe Albracht, 1977 \_\_\_\_\_ Box 81, Bushland
- Leonard Batenhorst, 1977 \_\_\_\_\_ Rt. 1, Canyon
- Bill Dugan, 1979 \_\_\_\_\_ Rt. 2, Box 30, Happy
- John F. Robinson, 1979 \_\_\_\_\_ 1002-7th St., Canyon

FPC...continued from page 1

because of the "unique characteristics of agriculture", Judge Wagner emphasized the fact that the purpose of the hearing was only to consider those two issues arising out of El Paso's motion for a rehearing, and *not* whether to move irrigation back into priority No. 2. Local hearings were also held in Phoenix, Arizona, and Albuquerque, New Mexico, in order to receive farmers' opinions on the curtailment plan.

*Ordered 150-Day Moratorium*

In addition, the commission ordered El Paso "to defer implementation of curtailment of irrigation requirements until a final decision has been issued...", but later ordered El Paso only to defer curtailment for 150 days from April 23, 1975.

According to Wagner, the April hearing in Washington, D.C., and the three field hearings in May attracted 129 witnesses. Agricultural experts traveled to Washington to testify and large numbers of farmers appeared at the local hearings, testifying that, without natural gas, they would be forced to return to dryland farming or go out of business.

On April 22, District Manager

**State Legislatures To Regulate Groundwater**

The legislatures of two states heavily dependent upon groundwater for irrigation and other uses have recently taken steps to further control the rate of withdrawal of the limited resource.

The Nebraska Senate (the sole legislative body in that State) is presently considering a bill providing procedures for the control of groundwater pumpage in "water-short areas". The bill would equally allocate or ration the existing groundwater among all well owners, regardless of the age of the well.

The effect of the measure would be to allow owners of new wells in these critical areas to pump groundwater on an equal basis with older wells.

At press time, the Senate was in its final day of the legislative session and was to review and vote on the measure that day. The June issue of *The Cross Section* will study the bill in detail and relate the outcome of the vote, if one was taken.

*Mississippi Studies Laws*

In Mississippi, the State Legislature will consider laws this session which would regulate groundwater withdrawals for all purposes other than domestic use. The proposed laws would give the State's Board of Water Commissioners the authority to declare as "capacity use areas" those parts of the State where an aquifer is judged to be "in danger of being lost as a source of water".

Designation of a capacity use area may not be made until public hearings are held to determine the extent that the regulations are applicable to an area. After the regulations are set up, all wells in the affected area that withdraw more than 50,000 gallons per day must obtain a permit from the Board of Water Commissioners. The laws provide that, once a permit is issued, it shall be valid "for a period of 10 years or until the need of the capacity use area has diminished".

Frank Rayner appeared before Judge Wagner and presented him with a petition by the District's Board of Directors urging the Commission to reconsider its December ruling.

In Lubbock, 1,451 local residents, mostly irrigation farmers, signed a petition to return irrigation to priority No. 2, 46 witnesses appeared and 10 persons adopted other testimony.

Judge Wagner said he had 14 days from the last day of the hearing in which to write his opinion. The hearing resumed in Washington on May 20. Wagner urged all counsel to the petitioning parties to expedite their memoranda and proposed findings of fact for his consideration, because "the FPC needs to make a decision before the end of the 150-day moratorium."

*Conversion Economically Infeasible*

Testimony at the two-day Lubbock hearing revealed that, in the Texas High Plains, 40 percent of the irrigation pumps depend on natural gas for fuel, and that conversion to gasoline, diesel or electricity would, in the long run, result in a negative return for producers.

Large groups of farmers and area businesses were represented by such groups as the High Plains Underground Water Conservation District No. 1, Plains Cotton Growers Association, Grain Sorghum Producers Association, West Texas Chamber of Commerce, Plains Irrigation Gas Users Association and the Texas Cattle Feeders Association.

Generally, the consensus followed the testimony of Plains Cotton Growers. It urged a reversal of the FPC decision, calling attention to the 50,000 gas-powered irrigation wells in the Panhandle-South Plains area; the fact that many of the underground pipelines serving these wells were paid for by farmers; that no other fuel or fuel distribution system is available to power irrigation engines, and that it would not be economically feasible to use an alternate fuel even if available.

*Curtailment Would Cut Production*

Ray Joe Riley of Hart, past president of Plains Cotton Growers, said, "It is neither physically nor economically feasible to convert irrigation motors to an alternate fuel, and curtailment would mean reverting to dryland farming, which in turn means cutting the yields on area crops by 80 or 85 percent."

Another area of concern was possible financing of crops if the natural gas supply was curtailed. Don Workman, Senior Vice President of the First National Bank at Lubbock, said, "In general, banks could not stay with many of these farmers if their gas were cut off because repayment of loans is based on irrigated production."

Donnie Clayton, Vice President of Citizens State Bank of Earth, said, "We cannot exist without irrigation without economic catastrophe."

Don Anderson of Slaton, Chairman of the Board of Citizens National Bank of Crosbyton, said the ruling could eventually affect bank lending policies.

"More risk is involved when a farmer commits his crop as collateral and must depend on the elements for moisture," Anderson said.

Billy Wayne Sisson of Hereford, Member of the Board of the High

# District Installs Subsurface Drip Irrigation System



WORKMEN INSTALLING SUBSURFACE TUBING



VALVE CONTROL ASSEMBLY FOR IRRIGATION SYSTEM

In an effort to conserve water and to put into practice an excellent conservation technique, the Water District has installed an underground drip irrigation system at its Lubbock headquarters.

James Johnson of Lubbock, installer of the systems, says the District's subsurface drip irrigation system will utilize 20 to 25 percent of the amount of water which would normally be applied under conventional methods—for an 80 percent savings.

"For example, if a conventional sprinkler uses 3,000 gallons of water for an irrigation, the drip system would use only 600 gallons to do the same job," said Johnson.

The 2600 feet of emitter pipe is located three inches below the land surface, the rows are 30 inches apart and the emitters are 36 inches apart.

The District feels that this type system is the most effective conservation program available. According to District Manager Frank Rayner, the minimal water loss to evaporation and deep percolation is a favorable characteristic of the system.



DIGGING DITCH AND LAYING EMITTER TUBING



CIRCLES SHOW EVEN WETTING OF SOIL

## GROUNDWATER . . . cont. from page 1

saline. Thus, less than three percent of the world's water supply is actually usable or accessible. Furthermore, the yearly renewal and continued availability of this relatively minute supply of water depends wholly on precipitation from the water vapor in the atmosphere.

*Groundwater Supply Estimated*

The land area of the United States is a little more than five percent of the total land area of the world. The total groundwater supply in the U.S. is estimated at 53,400 cubic miles in the upper 2,640 feet of the earth's crust.

Precipitation in the 48 contiguous states averages about 30 inches yearly. The total yearly volume is about 1,370 cubic miles. Natural annual recharge of groundwater may average about 25 percent of the precipitation, or about 340 cubic miles of water yearly.

A comparison of the annual recharge with the total estimate of the volume of groundwater in storage to a depth of 2,640 feet reveals that the existing groundwater supply is equivalent to the total of all recharge during the last 160 years.

Thus, the largely exhaustible supply of groundwater is the only reserve this country has, and that supply must be preserved, protected and used beneficially by man.

## DEMAND FOR WATER SURPASSING AVAILABLE SUPPLY

Water, the most precious of all natural resources, serves many purposes, some of which man has grown to take for granted. And, only recently has man become aware that water is a limited resource that should be protected and used wisely.

The article on page 1, "Groundwater Reserves Valuable to U.S.," explains the unevenness of the distribution of

## FPC . . . continued from page 2

Plains Water District, said that, if he was curtailed, he would probably go out of business, taking with him approximately 75 people dependent upon his operation for their livelihood.

Urging that a dependable supply of water is essential to continue to grow the amount of crops necessary to sustain the area's economy, irrigation and economic experts testified as to the costs of conversion to other fuels. A study by Dr. James Osborn of Texas Tech University indicates conversion to gasoline would increase hourly fuel costs 320 percent for 150-horse-power engines. Conversion to propane would increase hourly costs 282 percent.

The annual cost of a 3,000-hour irrigation season on the same 150-horse-power engine would jump from \$3,570 for natural gas to \$15,000 for gasoline and \$13,650 for propane.

land and water over the earth and the inaccessibility of the majority of the available water. This article will attempt to reveal how much water Americans consume daily and for what purposes.

According to the U.S. Geological Survey, 370 billion gallons of water (about eight times the average daily flow of the Mississippi River) are funneled daily through the Nation's water pipes, turbines and irrigation systems. In the past, this supply has been more than adequate, but the demand for water is continuing to grow at an increasing rate and the supply of water is being consumed at a faster rate than it is being replaced.

*1,800 Gallons Consumed Per Person*

Surveys for 1970 show that, after subtracting the 280 billion gallons per day used to turn the turbines of the hydroelectric industry, for each person in the United States, about 1,800 gallons of water per day are used for domestic, industrial, rural and irrigation needs. Daily use is expected to rise to 450 billion gallons in 1980 and 800 billion gallons by 2000.

Domestic activities and the needs of hydroelectric power companies are considered by hydrologists to be non-consumptive uses of water, rather than withdrawal uses, because much of

the water is recycled and used again. However, the process of reusing that water is very costly. The chart below shows the average amounts of water used for five common domestic needs.

DOMESTIC USES OF WATER	
ACTIVITY	AMOUNT OF WATER USED
Flushing a toilet	4 to 6 gallons
Washing dishes	8 to 10 gallons
Washing clothes	20 to 30 gallons
Taking a shower	20 to 30 gallons
Taking a bath	30 to 40 gallons

In the United States, irrigation is the largest consumptive user of water—using some 73 billion gallons per day. California, the state with the largest population and most intensive irrigation system of all the states, withdraws an average of 48 billion gallons per day. Texas withdraws approximately 27 billion gallons per day. However, the practice of recycling irrigation water is becoming more and more popular in the Southwestern states, such as in the Southern High Plains of Texas.

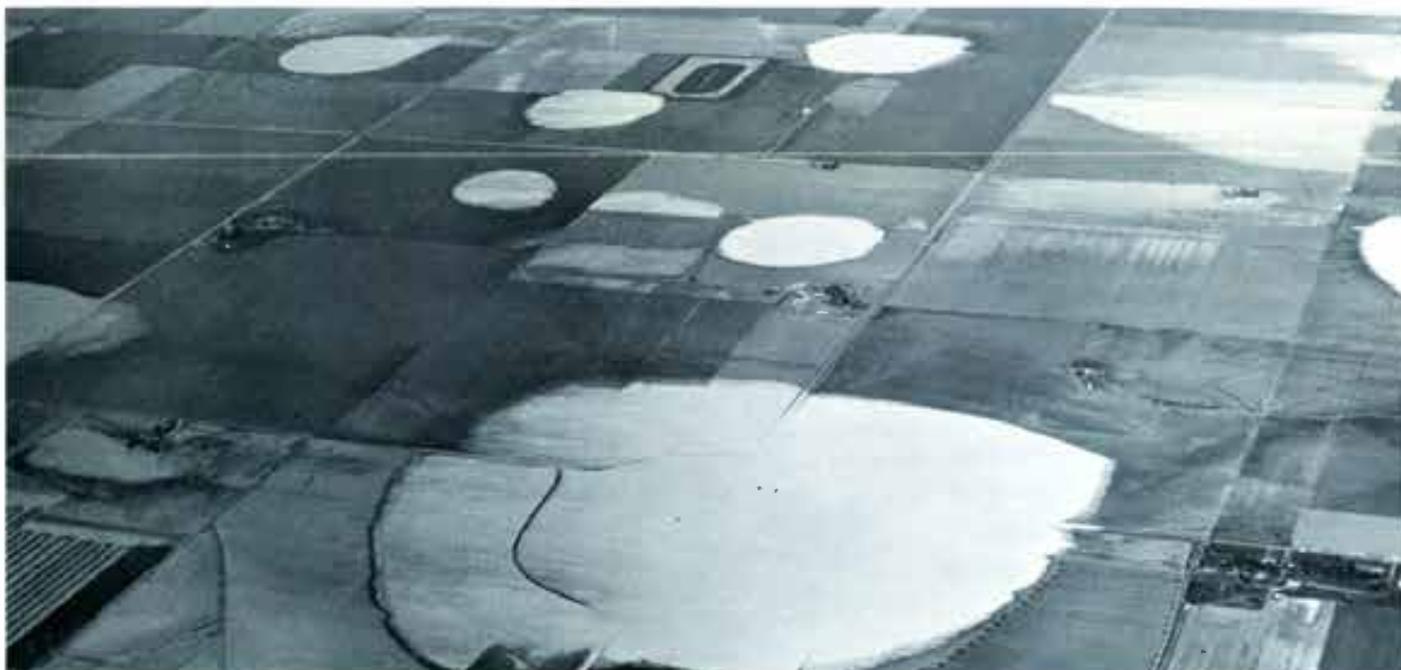
The waste and loss of water from public and irrigation supplies amounts to approximately 20 percent and 17 percent, respectively, of the amount withdrawn. The water is lost before being used, through leaking pipes, mains and irrigation ditches. Water losses in these two categories amount to 30 billion gallons per day.

*Daily Water Use in U.S.*

The following chart reveals the overall daily use of water in the United States, by categories of use.

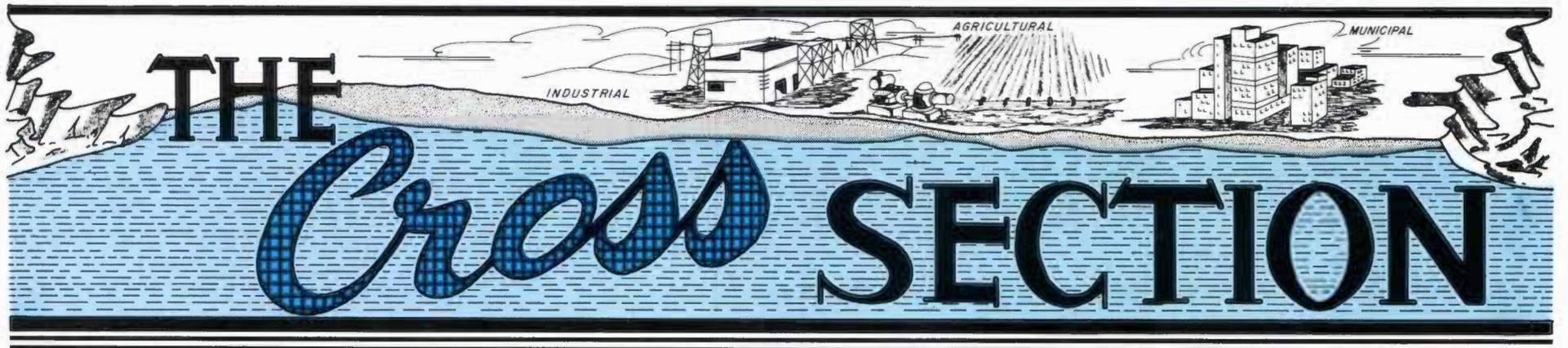
DAILY USE	TOTAL WATER WITHDRAWN (In billions of gallons)
Municipal, domestic and industrial use of public water supplies	27
Rural use (including domestic and livestock)	4
Irrigation	127
Industry (self-supplied, both fresh and saline)	212
<b>TOTAL</b>	<b>370</b>

Considering the increasing demand on the Nation's water supply and the limited amount of water available, High Plains irrigation farmers should continue to practice effective conservation programs. Thus, they will prove to consumptive and non-consumptive users of water that water is much too precious to waste.



PLAYAS FULL AGAIN—Due to recent rains, playa lakes in eastern Hale and western Floyd Counties are filled to capacity. The District urges the farmers on whose property these playas are located to modify the lakes and take advantage of this free and easily accessible supply of water before it evap-

orates. And, considering the skyrocketing costs of fuel for irrigation pumping, doesn't the small investment toward modification make more sense than pumping from the dwindling supply underground?



A Monthly Publication of the High Plains Underground Water Conservation District No. 1

Volume 21—No. 6

"THERE IS NO SUBSTITUTE FOR WATER"

June, 1975



Chester Mitchell of Lockney, Member of the Board of Directors of the High Plains Underground Water Conservation District No. 1, examines a sunflower plant. He planted on April 21 and expects to harvest his 106 acres by the end of August. Mitchell believes that his sunflowers will sell for around 15 cents per pound.

## OILSEED SUNFLOWERS BECOMING POPULAR ON TEXAS HIGH PLAINS

A relatively new short season row crop has gained much attention this year, with as many as 200,000 acres planted to it in the 15 counties comprising the High Plains Underground Water Conservation District No. 1.

That crop, the hybrid sunflower, is readily adaptable to the semi-arid climate of the High Plains. Boasting a tolerance of cold and drought, vigorous growth and considerable resistance to hail and wind, the sunflower can be successfully grown under dryland conditions, as well as with irrigation.

### *Oilseed Potential Seen*

And, according to area researchers, sunflowers have considerable potential in the area as an oilseed crop. The oilseed sunflowers grown in the High Plains are composed of 48 percent oil, which is sold for the production of margarine and cooking and vegetable oils. The sunflower seed, when

crushed, is also a source of protein for livestock feed.

Under normal conditions, 120 days from the date of planting are required to achieve maturity for harvest. According to *Sunflower Production on the High and Rolling Plains of Texas*, publication of Texas A&M University, Texas Agricultural Extension Service and Texas Agricultural Experiment Station, sunflowers can be planted when soil temperatures reach a ten-day average of 50 degrees or more. Sunflowers are expected to flower in 75 to 80 days.

Due to its quick maturity, the sunflower serves well in a double crop system, and is recommended as an emergency cash crop when other crops are lost to hail or drought late in the season.

Another attribute of the quickly growing flower, adaptable to any area where cotton, grain sorghum, corn and soybeans can be grown, is that it demands only about half as much water as feed grains and about the same as cotton.

### *Limited Irrigation Needed*

By planting in the early part of the season (last week of March or the first of April) and receiving normal spring rainfall, a farmer can possibly expect to produce good yields with just one supplemental irrigation. Statistics reveal that a preplant irrigation, plus one or two summer irrigations during the critical growth stages, normally increases yields two to three times over those obtained under dryland production.

—continued on page 3... EPA

—continued on page 2... OILSEED

## EPA Holds Hearing on the Edwards Aquifer

A controversial section of a recently enacted Federal law encompassing groundwater regulatory provisions, the Safe Drinking Water Act, Public Law (PL) 93-523, met its first test in San Antonio, Texas, June 4, less than six months after it was signed into law by President Gerald R. Ford.

Shortly after enactment of PL 93-523, Russell Train, Administrator of the Environmental Protection Agency (EPA), received a petition on behalf of the Sierra Club, the League of Women Voters and Citizens for a Better Environment, all of San Antonio, urging him to designate the Edwards Aquifer as the sole or principal source of drinking water for the San Antonio area. The petition is the first in the Nation qualifying under the groundwater provisions of the Act (Section 1424[e]).

Following the March 6 publication of the notice of receipt of the petition in the *Federal Register*, the date for a public hearing was set. According to George Putnicki, Deputy Regional Administrator, EPA, Region VI, Dallas, the purpose of the public hearing was to "receive the comments, data and views of all interested parties regarding the petition" in order that EPA Administrator Train can make a final determination.

### *Items for EPA Determination*

As a result of the petition, the EPA Administrator is responsible for mak-

ing the following determinations:

- 1) Define the geographically affected area of the aquifer and the zone of influence.
- 2) Define the probable long-range effects on the local economy and plans of local, State and Federal agencies.
- 3) Define the precedent-setting aspects from a national viewpoint.
- 4) Determine views of the populace from cities and rural areas outside the San Antonio SMSA regarding designation.
- 5) Simultaneously, the Administrator must define the procedures for approval or certification of Federally-funded projects, including exemptions where appropriate.

### *Committee Heard 50 Witnesses*

The EPA hearing officers conducting the San Antonio public hearing were Putnicki, Alan Eckert, Assistant General Counsel, Water Quality Division, Washington, D.C., and Ed Hockman, Chief, Groundwater Supply Section, Washington, D.C. During the one-day hearing, the committee heard testimony from more than 50 witnesses.

Under Section 1424(e), better known as the Gonzalez Amendment (named for Henry B. Gonzalez, the San Antonio Congressman who authored it), if an aquifer is designated

as the sole or principal source of drinking water for an area, no commitment for Federal financial assistance may be made to any project in the specified area if the EPA Administrator determines such activity could contaminate the aquifer so as to create a "significant hazard to public health".

According to Putnicki, this does not mean that all Federal assistance programs to the specified area will be eliminated. "To clarify the intent of the Act, this means that Federal funding of projects does not cease when an

## Senate Confirms Carroll's Nomination to TWRC

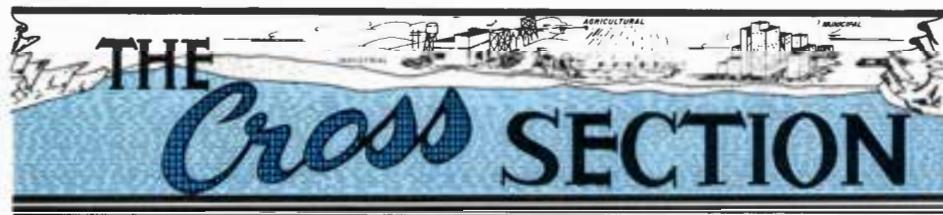
Joe R. Carroll, Snyder attorney and former Assistant Attorney General of Texas, was confirmed by the Senate May 30 as the new member of the Texas Water Rights Commission (TWRC). Carroll will fill the unexpired term of Otha F. Dent, which extends until February 1, 1977.

Carroll, 53, was appointed by Governor Dolph Briscoe on May 23 to replace Burke Holman, who asked the Governor to withdraw his name on that day because of Senate opposition to his confirmation. Briscoe had appointed Holman to Dent's place on the Commission on June 28, 1974.

—continued on page 3... SENATE



JOE R. CARROLL



A MONTHLY PUBLICATION OF THE HIGH PLAINS UNDERGROUND WATER CONSERVATION DISTRICT NO. 1

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|---------------------|-------------------------|
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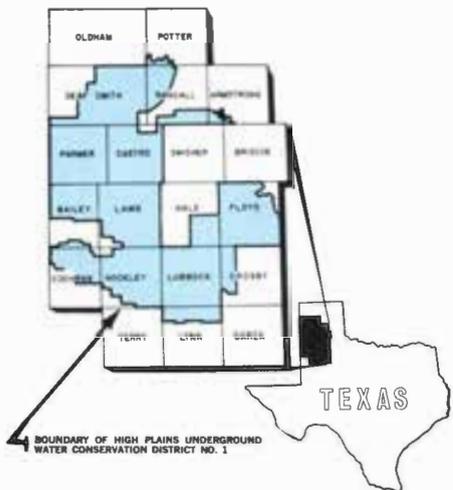
- |                        |                        |
|------------------------|------------------------|
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| W. L. Davis, 1977      | Box 312, Hereford      |
| Bill Cleavinger, 1979  | Star Rt., Wildorado    |
| George Ritter, 1979    | Rt. 5, Hereford        |

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Don Grantham, Secretary

Farm Bureau, 101 S. Wall Street, Floydada

- |                        |                                |
|------------------------|--------------------------------|
| Malvin Jarboe, 1976    | Route 4, Floydada              |
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| M. M. Smitherman, 1976 | Silverton Star Route, Floydada |
| Joe Cunyus, 1978       | Lockney                        |
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| Gaylord Groce, 1978      | RFD, Petersburg     |

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- |                        |                     |
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| Billy Ray Carter, 1976 | Route 5, Levelland  |
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|-------------------------|---------------------------|
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| W. W. Thompson, 1976    | Star Route 2, Littlefield |
| Donnie Clayton, 1976    | Box 276, Springlake       |
| Billy J. Langford, 1978 | Box 381, Olton            |
| Edward Fisher, 1978     | Box 67, Sudan             |

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- |                              |                             |
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| Andrew (Buddy) Turnbow, 1976 | Route 5, Box 151 B, Lubbock |
| Alex Bednarz, 1976           | Route 1, Slaton             |
| Dan Young, 1978              | 4607 W. 14th St., Lubbock   |
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- |                         |                 |
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| W. R. Steen, 1976       | Route 2, Wilson |
| Orville Maeker, 1978    | Route 1, Wilson |
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| Ralph Roming, 1979   | 809 Ridgela Dr., Bovina |

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- |                       |                          |
|-----------------------|--------------------------|
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| Jim Lane, 1977        | Box 87, Bushland         |
| Albert Nichols, 1977  | Rt. 1, Box 491, Amarillo |
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| W. J. Hill, 1979      | Box 53, Bushland         |

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Farm Bureau, 1714 Fifth Ave., Canyon

- |                          |                         |
|--------------------------|-------------------------|
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| Joe Albracht, 1977       | Box 81, Bushland        |
| Leonard Batenhorst, 1977 | Rt. 1, Canyon           |
| Bill Dugan, 1979         | Rt. 2, Box 30, Happy    |
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**FPC AMENDS GAS CURTAILMENT ORDER**

The Federal Power Commission (FPC), following several months of testimony from farmers and agricultural specialists, has amended an order allowing El Paso Natural Gas Company to curtail natural gas for irrigation use.

In early June, the FPC overturned its previous order which permitted El Paso to commence curtailment of natural gas to its irrigation customers in 150 days from April 23, 1975. The new order provides that there shall be no curtailment by El Paso until June 15, 1976, or until the Commissioners rule on the trial (which began on April 8 of this year)—whichever date is the latter.

These rulings follow the December 19, 1974, order which lowered the priority of natural gas for irrigation in El Paso's service area from priority No. 2 (commercial) to priority No. 3 (industrial)—the commercial classification being exempt from curtailment, while industrial use is subject to curtailment.

*Motion for Rehearing Denied*

El Paso's resultant motion for a rehearing was denied, but the Commission, on March 21, 1975, scheduled an expedited hearing to consider El Paso's "process gas" conclusion, and also to consider petitions for extraordinary relief which may be filed by various irrigation customers seeking to

**OILSEED . . . continued from page 1**

Chester Mitchell of Lockney, Member of the Board of Directors of the High Plains Water District, planted 106 of his total 860 acres to sunflowers for the first time this year, with 74 acres under irrigation and the rest dryland.

When asked why he put acreage previously allotted to cotton under sunflower production, he said, "With the current price of cotton, I thought I would try to grow a hearty crop that took no more care or water than cotton, but that would probably make more money."

*Sunflowers May Prove Profitable*

Mitchell said his original investment included \$3.15 per pound (at approximately four pounds per acre) for the

—continued on page 4 . . . OILSEED

maintain necessary deliveries, in case it is determined that irrigation uses do not fall within the process gas definition and the evidence indicates that they, nevertheless, should be exempted from curtailment for other reasons.

Process gas is that for which alternate fuels are not technically feasible, as in applications requiring precise temperature controls and precise flame characteristics. For purposes of this definition, the FPC does not consider propane and other gaseous fuels as alternate fuels. (For more information, see the April and May, 1975, issues of *The Cross Section*.)

*Groups Petition FPC*

As a result of the FPC's December order, a large group of farm officials, natural gas companies and consumer groups from across the irrigation belt protested and petitioned the FPC to reconsider its ruling. Because of the "unique characteristics of agriculture", the Commission ordered Administrative Law Judge Curtis L. Wagner, Jr., to hear the petitions of several organizations and companies representing agricultural users of natural gas. Judge Wagner, in turn, decided to move the trial from Washington, D.C., and to hold local hearings in Lubbock, Phoenix, Arizona, and Albuquerque, New Mexico.

The evidence recorded at these local hearings probably influenced the Commissioners that irrigation farmers would have difficulty receiving financial support from local lending institutions for this year's crop (especially the winter wheat crop) if the 150-day deadline (FPC order of April 23, 1975) were not extended.

*Judge Allowed 30 Days*

The FPC also issued an order allowing Judge Wagner 30 days (rather than 14 days) from the close of the trial record (scheduled to end June 27) in which to write his opinion. The judge also indicated he would allow counsel to petitioning parties 14 days in which to file their briefs in his office (through July 14).

In effect, the new order allows natural gas used for irrigation, as supplied by El Paso Natural Gas Company, to remain in category No. 2

—continued on page 4 . . . FPC



Sunflowers, readily adaptable to any area where cotton, grain sorghum, corn and soybeans can be grown, require less water than feed grains and about the same as cotton. A successful crop under dryland conditions, sunflower yields can be doubled and tripled with a preplant irrigation and one or two summer irrigations.

**NOTICE:** Information regarding times and places of the monthly County Committee meeting can be secured from the respective County Secretaries.

Applications for well permits can be secured at the address shown below the respective County Secretary's name, except for Armstrong and Potter Counties; in these counties contact Carroll Rogers and W. J. Hill, respectively.

## EPA... continued from page 1

area is determined to have a sole or principal source aquifer. The designation of an aquifer simply establishes a review mechanism whereby, if the Agency finds that a project will contaminate the aquifer through a recharge zone so as to create a significant public health hazard, then steps must be taken to ensure environmentally sound designs before Federal funding may proceed."

*Federal Government May Act*

Said Congressman Gonzalez of the Act, "The Safe Drinking Water Act, as a general proposition, recognizes and affirms that the provision of drinking water, and the assurance of its quality, is primarily the task of state and local government. But the Act also recognizes that, where state and local government have been unable or unwilling to perform this task adequately, and where the public health and safety are imperiled as a result, the Federal government may act."

"On the one hand, this law is intended to give Federal support to state and local efforts to protect the Edwards Aquifer and others of a similar nature. On the other hand, the law intends to provide for at least a modicum of assistance, where state and local agencies fail to carry out their responsibilities to protect the quality or safety of the public water supply," he continued.

So, a conflict has arisen as to whether or not the State and/or local government is doing its part to protect the aquifer from contamination. The parties to the petition feel that not enough strong measures have been taken locally to protect the aquifer from contamination, today or in the future, and have asked the Federal government, through the EPA, to interfere in solving what they feel to be a problem.

*Local Agencies Protecting Aquifer*

And, on the other hand, existing local and State agencies, such as the Edwards Underground Water District, the San Antonio City Water Board and the Texas Water Quality Board (TWQB), feel that they have and are taking substantial measures to protect the quality of the water in the Edwards Aquifer.

The Texas Attorney General's office states that a "non-degradation policy should apply to the Aquifer and that no surface activity having a potential for degradation of its water quality should be permitted unless complying



Frank Rayner, Manager of the High Plains Underground Water Conservation District No. 1, testifies before an Environmental Protection Agency (EPA) panel during a June 4 public hearing in San Antonio regarding the possible designation, under the provisions of the Safe Drinking Water Act, of the Edwards Aquifer as the sole source of drinking water for the San Antonio area. Seated are Alan Eckert, hearing officer, and George Putnicki, both EPA officials.

with stringent control and monitoring measures that ensure this potential will not be realized."

While most witnesses seemed to agree that a non-degradation policy is a good idea, those speaking against the aquifer designation pointed out that the landowners of the recharge area should not have the sole responsibility of protecting the aquifer. Said Hugh Yantis, Executive Director of the TWQB, Austin, "The constitutional rights of the landowners of the recharge area cannot be abridged."

Colonel McDonald D. Weinert, General Manager of the Edwards Underground Water District, urged the EPA to not "interfere" with the work being done by the local agencies and quoted his Board of Directors by stating, "...it was the opinion of the Board that all actions necessary to protect the underground reservoir had been taken by State and local agencies, and to recommend that the control of the water resources be left in the hands of these agencies in view of the positive action taken to preserve, protect and prevent pollution of the waters of the Edwards Underground Reservoir."

*Order Adopted by District*

Weinert also explained that the TWQB, the Edwards District and local agencies in the five counties comprising the District developed the first order controlling development over the recharge zone which was issued by the

TWQB on July 21, 1970. Because of changing conditions of development in the area, the TWQB on March 26, 1974, adopted a revised order which provided for much stricter control over construction in the recharge zone.

The order was further amended, and finally accepted by all involved agencies throughout the District area on January 28, 1975. That order, TWQB Order 75-0128-20, was also cited by area county judges, county commissioners and land developers as being adequate.

Siegal Wheatley, attorney for San Antonio Ranch, urged the EPA to make no designation until national standards are developed by the legislation on which the amendment is attached, and that the TWQB order be given time to function properly in conjunction with forthcoming Federal government guidelines and standards.

*Faith Expressed in Local Government*

Representatives of area chambers of commerce, local farmers and area county farm bureaus also reiterated their faith in the work already being done by local and State agencies.

F. J. Spencer, chemist and chemical engineer from Houston, urged that the local people be allowed to achieve local solutions to local problems. "No Federal agency ever cured a problem—it only succeeded in institutionalizing it," he emphasized.

Robert P. Van Dyke, General Manager of the City Water Board of San Antonio, stated in his testimony that the amendment to the Safe Drinking Water Act "seems to completely ignore the fact that the Act calls for the various states to have the primary enforcement responsibility for the Act."

He continued, "The quality of the water here in San Antonio meets or greatly exceeds the standards tentatively established by the EPA under the provision of the new Safe Drinking Water Act. The main artesian body of the Aquifer from which we draw our municipal water supply has not become polluted historically, and the quality, temperature and turbidity of the water withdrawn from it have remained relatively constant through the years."

Van Dyke went on to make several observations. "There is no protection offered to the citizens of San Antonio and those who live over the Edwards Aquifer by Section 1424(e). It only prevents federal funds from being used for projects that might add pollution to contaminate the Aquifer through the recharge zone, but it does absolutely nothing to provide protection to the Aquifer."

"The Texas Water Quality Board Order 75-0128-20 does provide this protection, and it is ably administered by the Texas Water Quality Board and the various counties in conjunction with the Edwards Underground Water District."

"Until it has been proven that its provisions are inadequate to accomplish their intended end, the administering agencies who are legally charged with protection of the Aquifer should be allowed to carry out their responsibilities."

He concluded by saying, "The imposition of Section 1424(e) upon the San Antonio area is not needed nor desired. Section 1424(e) of the Act is based upon supposition, and if imposed upon the San Antonio area, it would have extensive adverse effects upon the City and its citizens by impeding both the growth and the expansion of the economy in the San Antonio metropolitan area."

Frank Rayner, Manager of the High

—continued on page 4 . . . EPA



SIEGAL WHEATLEY

## SENATE... continued from page 1

A native of Palestine, Carroll maintains a private law practice with a Snyder firm, Rosser, Carroll and Greene. That law firm has represented the Colorado River Municipal Water District in Big Spring for a number of years.

Following his graduation from the Baylor law school in 1950, Carroll served as County Attorney in East Texas and did legal work in the formative stages of the construction of Lake Palestine and the formation of the Upper Neches River Water District.

In 1957, he joined Attorney General Will Wilson's office and served as head of the Water Pollution Control Division and worked with the Oil, Gas and Water Division until his return to Snyder in 1961.

Since 1963, Carroll has served as City Attorney for Snyder.

Carroll will join Joe Carter of Sherman and Dorsey Hardeman of San Angelo on the TWRC.

## SPECIAL BULLETIN

(See "FPC Amends Gas Curtailment Order", page 2)

In their closing arguments before Judge Wagner on June 26, counsel for the FPC and General Motors Corporation stipulated that natural gas used for irrigation was process gas and, since process gas is a priority No. 2 use, such use is not subject to curtailment. This stipulation is most favorable to the interests of irrigated agriculture in this area and may be very influential in persuading Judge Wagner and the Federal Power Commissioners to reverse the FPC order of December 19, 1974, and reestablish natural gas used for irrigation as priority No. 2.



ROBERT P. VAN DYKE

## Irrigation Not Beneficial to Coastal Bend Area

Efficient irrigation practices are essential in maintaining the current high level of grain sorghum production on the Texas High Plains. However, in another area of the State, the Coastal Bend of South Texas, irrigation is considered by some to be a waste of water.

In an article in the May 18, 1975, issue of *The Corpus Christi Caller Times*, Dr. Tom Longnecker, Research Director, Texas A&M University Agricultural Research and Extension Center at Corpus Christi, is quoted as saying the Coastal Bend's average annual rainfall is more than sufficient to produce that area's grain sorghum crops.

### Heavy Rains Not Beneficial

"The soils in this area soak up moisture very slowly," Longnecker said.

### OILSEED . . . continued from page 2

seed and 55 pounds of anhydrous ammonia per acre. And, he had been told by area farm cooperatives that his dryland crop should produce 500 to 1,000 pounds of seed per acre, and the irrigated crop could produce from 1,800 to 2,200 pounds per acre.

The Director continued, "The only problem that I foresee in producing sunflowers is insects. The head moth can be controlled with insecticide sprays, but no one has found a cure yet for the carrot beetle."

However, according to Dr. Raymond D. Brigham, Oilseed Crops Researcher, Texas Agricultural Experiment Station, Lubbock, "It looks like we are over the hump with the plague of the carrot beetle after this year's early plantings."

When asked why he thought so many farmers had converted so many acres of their farm land to a relatively untested crop, Dr. Brigham attributed the conversion to the fact that the contract price on sunflowers is better than cotton. "The contracts available for sunflowers, coupled with the current price of cotton, have caused many farmers to consider another, more profitable, way to make a living."

Brigham continued, "Sunflowers are a good risk this year because of the available soil moisture at planting and the recent rainfall."

And, now that the crops are up, the researcher urges the farmer to make the following considerations: 1) proper timing of irrigation, 2) control of the head moth with appropriate insecticide applications and 3) a timely and efficient harvest.

Slow rains are the best type for crops here, he added. "Heavy rains aren't as beneficial. If we get a heavy three-inch rain, about half of that will be lost to runoff."

Longnecker said the amount of rainfall received is not nearly as important as *when* it falls. He believes if the rainfall is timely, only about 12 inches would be necessary to produce a crop averaging 3,000 to 4,500 pounds of grain sorghum per acre.

The researcher noted that production of grain in the Coastal Bend has been around those levels in recent years, except for the current season. Irrigation could save crops this year, but on a year-to-year basis irrigation is not feasible because the annual average rainfall of 28½ inches is more than sufficient moisture.

Irrigation, he added, is essential for most vegetable crops, but grain sorghum in the Coastal Bend area does not show the substantial yield increases necessary to make the irrigation of grains economical.

### Soil Conditions Need Research

"It appears that the Coastal Bend soils or climate conditions have limiting factors on grain production," he noted. "These need to be researched and discovered and tested before irrigation is introduced. Irrigation should be the last thing we do."

According to 1973 production figures from the Texas Department of Agriculture, yields on dryland acreage in the Coastal Bend area averaged 3,000 pounds per acre. Irrigated

yields in the Rio Grande Valley average about 3,200 pounds, while irrigation boosts them to an average of about 4,000 pounds per acre.

In low-rainfall areas of South Texas, such as Duval and Webb Counties, the differences between dryland and irrigated yields are more pronounced. Duval's 1973 production from dryland acreage averaged 1,900 pounds per acre, while on the irrigated lands, yields averaged 3,800 pounds. Webb County's dryland yields of 1,200 pounds were bettered by the irrigated yields of about 3,500 pounds.

### Yields Half Those of High Plains

*While irrigation boosts yields in these areas, they still have a maximum limit which is about half of the production the High Plains area of the State gets with irrigation.*

*In 1973, the State's highest production yields on dryland and irrigated land were recorded in Parmer County in West Texas. The county's dryland production averaged about 3,400 pounds per acre, while its irrigated yields averaged 6,800 pounds.*

*If production in the Coastal Bend could be increased at the levels experienced in the High Plains just by irrigation, Longnecker said, irrigation would be feasible.*

*Economically, the yield increases from irrigation in the High Plains, based on 1973 prices, were worth an additional \$120 an acre; while the differences in yields in South Texas were only worth an additional \$8 to \$76 an acre.*

### EPA . . . continued from page 3

Plains Underground Water Conservation District No. 1, stressed in his testimony that he was concerned by the precedent to be set by the EPA in implementing Section 1424(e) prior to adequate definition of several words and terms in the Act. He suggested that Congress should be called upon to adequately define the words and terms used in the Act in lieu of the very broad interpretations of such key words, terms and sections as are being suggested by EPA personnel.

Rayner concluded by emphasizing what others before him had said, "There is not enough money for the Federal government to continue to take over all previous responsibilities of State and local governmental agencies."

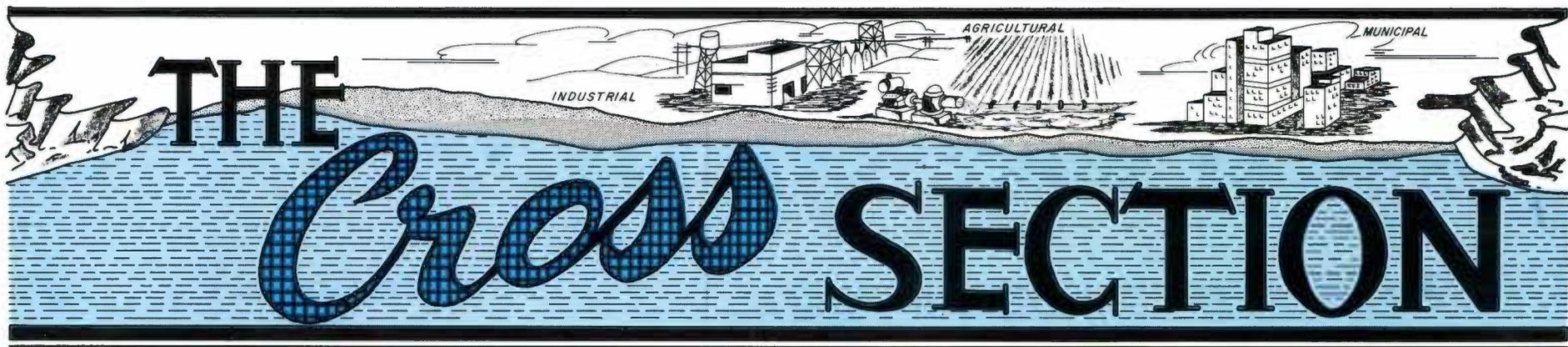
### FPC . . . continued from page 2

until the overall effects of curtailment are considered in more detail by Judge Wagner and, subsequently, as his order is reviewed by the Federal Power Commissioners.

The obvious influence of the testimony presented by those attending the local hearings is a heartening revelation of the benefits of public participation in the deliberation of governmental bureaucracy—in this case, on the Federal level, but just as appropos on the State and local governmental levels. The whole of the irrigation industry owes a profound vote of thanks to those persons who were concerned enough to participate in the FPC hearings.



The wise use of water for irrigation purposes is becoming more and more essential with the decline of the water table. One highly recommended way to conserve and beneficially utilize the groundwater after it is pumped onto the land is to irrigate every other row when irrigating row crops. As shown in the photograph above, a row of standing water will seep into the next row and sufficiently wet the growing crop. The Water District urges all farmers to consider incorporating this and other water conservation practices into their irrigation operation.



A Monthly Publication of the High Plains Underground Water Conservation District No. 1

Volume 21—No. 7

"THERE IS NO SUBSTITUTE FOR WATER"

July, 1975

## FPC Judge Rules Natural Gas Priority Should be No. 2

Federal Power Commission (FPC) Administrative Law Judge Curtis L. Wagner, Jr., issued an initial decision finding on July 24 that natural gas used for irrigation qualifies as "process gas" and should, therefore, be re-classified as a No. 2 priority (commercial), rather than a No. 3 priority (industrial).

Process gas is defined by the FPC as a use for which alternate fuels are not technically feasible.

The decision, if backed by the FPC, will cause El Paso Natural Gas Company to raise the priority of natural gas used by its irrigation customers in its overall curtailment plan. The reclassification makes the possibility of curtailment, in cases of severe shortages of natural gas, less likely and will allow farmers to more easily obtain financial assistance for winter crops, such as wheat.

In making his decision, Judge Wagner said he based his opinions on the economic feasibility of conversion (the high cost of conversion of irrigation wells to other fuels) rather than on the availability of natural gas.

In his statement, Wagner also rejected electricity as an alternate fuel. He added that, if irrigation is to con-

tinue to exist in the area served by El Paso, a continuous supply of water must be provided — thereby requiring an uninterrupted supply of fuel.

Judge Wagner, impressed by the interest of farmers and local citizens in Lubbock, Phoenix, Arizona, and Albuquerque, New Mexico, cited the number of signatures on a petition distributed at the Lubbock hearing and the fact that the farmers left their farming operations during the busiest time of the growing season.

Parties to the petition have 10 days in which to file exceptions to Judge Wagner's decision. The Commission has another 10 days after that in which to initiate a review of its own motion (thereby modifying, concurring in or rejecting Wagner's decision). If no exceptions are filed and no Commission review initiated, the decision will become final.



Irrigation farmers today are faced with rising costs in all facets of their operations, not the least of which is the drilling and equipping of an irrigation well. A little more than a year ago, when the farmer had money to spend, casing and other drilling supplies were practically non-existent. Now, that problem is alleviated, but skyrocketing drilling costs, along with the high price of fuel and the decline of the water table, serve the farmer as a reminder that a new irrigation well is one of his most important investments. (See articles on this page and page 3.)

## IRRIGATION WELL DRILLING COSTS RISING ON HIGH PLAINS

On the High Plains of West Texas, where farmers are doing their best to conserve groundwater as well as dollars invested in the production of that water, the cost of drilling new irrigation wells is increasing.

Drillers say that an average well (16-inch casing, 300 feet deep and equipped with a six- or eight-inch pump), in the areas with a better water supply, now costs around \$13,000.

### Drilling Costs Outlined

Hi-Plains Drilling, Inc., a Lubbock-area drilling company serving a wide area of West Texas, breaks down its charges this way. For example, the cost of drilling a 24-inch hole would be \$5 per foot, the casing (16-inch) would cost \$9.25 per foot and the gravel pack and bailing would total around \$900 to \$1,000.

Some drillers also figure in an additional cost for test pumping. Ed Finley of Hi-Plains Drilling urges farmers to test pump their new wells because of the energy savings to be gained from equipping the well with the appropriate size pump.

### Test Pumping Important

Says Finley, "We think that test pumping should be figured into the cost of a well, because, in only a few days, the test pumping can help the farmer decide the actual capacity of the well and the size of the pump

needed." He said the extra cost would be around \$400.

Bill Cartwright of Green Machinery, Plainview, says that his company charges \$15 per foot to drill an 18-inch hole and to set 16-inch casing. The minimum fee for a high speed bailer is \$300 for one day's bailing and \$25 an hour after that.

A 1971 cost study survey conducted by the District using 1970 prices indicated an average "turn key" well construction cost of approximately \$19.50 per foot. Today's prices for similar installations shows this average per-foot cost has increased to about \$40.

Permits for new wells taken out at the District office reached an all-time high in 1974, coinciding with the casing and pump shortages. However, the drillers are catching up now and the number of permits for new wells and notices of completion of new wells is down in 1975. (See companion story on page 3.)

### Fewer Wells Drilled

Finley gives his reasons for the slowdown. "Farmers aren't drilling as many wells as they did last year because of the weather and a lack of money. Farmers didn't make as much money last year as they did in 1973, and they are getting by the best way they can."

So, considering the costs of drilling and operating a well and the current

economic situation, the Water District encourages farmers to conserve water by operating efficiently and making the best possible use of what they have.

## EPA and the Safe Drinking Water Act

The Environmental Protection Agency (EPA), believed by many groundwater officials to have mislead or "hoodwinked" the U. S. Congress in late 1974 into passage of Public Law (PL) 93-523, the "Safe Drinking Water Act", has begun to show a change of position on a controversial subject which lead to Congress' acceptance of the bill.

(Spokesmen opposing the bill have stated that Congressmen, not fully understanding the implications of the bill but also not wanting to appear to oppose "safe" drinking water, may have voted for it under the pressures of the reports of cancer-related chemical compounds in public drinking water supplies.)

In the Fall of 1974, numerous stories concerning polluted drinking water and the possibility that chloroform in public water supplies might cause cancer in humans convinced Congress that there was a need to get

### Schneider Appointed

#### TWRC Executive Director

The Texas Water Rights Commission (TWRC) on June 30 appointed Robert E. (Bob) Schneider, Director of Public Utilities for the City of Corpus Christi since 1970, as its new Executive Director.

The appointment, effective July 14, fills the position vacated 10 months ago by Gene Richardson, Executive Director since July, 1973.

A member of the Texas Water Conservation Association, the Water Resources Congress and the National Water Resources Association, Schneider, 53, has 30 years of management experience, with the past nine in public service.

Prior to his five years with the City of Corpus Christi, he was General Manager of the Public Utilities Board of the City of Brownsville. There he supervised the electric power production and distribution systems and the water and sewage systems.

Following four years in the Air

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# THE Cross SECTION

A MONTHLY PUBLICATION OF THE HIGH PLAINS UNDERGROUND WATER CONSERVATION DISTRICT NO. 1

2930 Avenue Q, Lubbock, Texas 79405

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 Anthony Acker, 1979 \_\_\_\_\_ Rt. D, Nazareth  
 Glenn Odom, 1979 \_\_\_\_\_ Rt. 4, Box 136, Dimmitt

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 H. H. Rosson, 1976 \_\_\_\_\_ Route 1, Morton  
 Danny Key, 1976 \_\_\_\_\_ Star Route 2, Morton  
 Jessie Clayton, 1978 \_\_\_\_\_ 706 S. Main, Morton  
 Robert Yearry, 1978 \_\_\_\_\_ Route 2, Morton

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 2930 Avenue Q, Lubbock

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 E. B. Fullingim, 1976 \_\_\_\_\_ Lorenzo  
 M. T. Darden, 1976 \_\_\_\_\_ Lorenzo  
 Donald Aycock, 1978 \_\_\_\_\_ Lorenzo  
 Alvin Morrison, 1978 \_\_\_\_\_ Lorenzo

### Deaf Smith County

B. F. Cain, Secretary  
 County Courthouse, 2nd Floor, Hereford

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 Garland Solomon, 1977 \_\_\_\_\_ Rt. 5, Hereford  
 W. L. Davis, 1977 \_\_\_\_\_ Box 312, Hereford  
 Bill Cleavinger, 1979 \_\_\_\_\_ Star Rt., Wildorado  
 George Ritter, 1979 \_\_\_\_\_ Rt. 5, Hereford

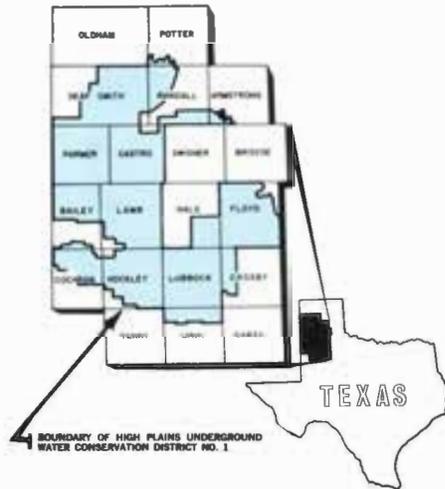
### Floyd County

Don Grantham, Secretary  
 Farm Bureau, 101 S. Wall Street, Floydada

Malvin Jarboe, 1976 \_\_\_\_\_ Route 4, Floydada  
 Connie Bearden, 1976 \_\_\_\_\_ Route 1, Floydada  
 M. M. Smitherman, 1976 \_\_\_\_\_ Silverton Star  
 Route, Floydada  
 Joe Cunyus, 1978 \_\_\_\_\_ Lockney  
 Fred Cardinal, 1978 \_\_\_\_\_ Route 4, Floydada

**NOTICE:** Information regarding times and places of the monthly County Committee meeting can be secured from the respective County Secretaries.

Applications for well permits can be secured at the address shown below the respective County Secretary's name, except for Armstrong and Potter Counties; in these counties contact Carroll Rogers and W. J. Hill, respectively.



### Hale County

J. B. Mayo, Secretary  
 Mayo Ins., 1617 Main, Petersburg

Clint Gregory, Jr., 1976 \_\_\_\_\_ Box 98, Petersburg  
 Henry Scarborough, 1976 \_\_\_\_\_ Route 2, Petersburg  
 Homer Roberson, 1976 \_\_\_\_\_ Box 250, Petersburg  
 Henry Kveton, 1978 \_\_\_\_\_ Route 2, Petersburg  
 Gaylord Groce, 1978 \_\_\_\_\_ RFD, Petersburg

### Hockley County

Jim Montgomery, Secretary  
 609 Austin Street, Levelland

Ewel Exum, 1976 \_\_\_\_\_ Route 1, Ropesville  
 Douglas Kauffman, 1976 \_\_\_\_\_ 200 Mike, Levelland  
 Billy Ray Carter, 1976 \_\_\_\_\_ Route 5, Levelland  
 J. E. Wade, 1978 \_\_\_\_\_ Route 2, Levelland  
 Jimmy Price, 1978 \_\_\_\_\_ Route 3, Levelland

### Lamb County

Calvin Price, Secretary  
 620 Hall Avenue, Littlefield

Gene Templeton, 1976 \_\_\_\_\_ Star Route 1, Earth  
 W. W. Thompson, 1976 \_\_\_\_\_ Star Route 2, Littlefield  
 Donnie Clayton, 1976 \_\_\_\_\_ Box 276, Springlake  
 Billy J. Langford, 1978 \_\_\_\_\_ Box 381, Olton  
 Edward Fisher, 1978 \_\_\_\_\_ Box 67, Sudan

### Lubbock County

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 2930 Avenue Q, Lubbock

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 Andrew (Buddy) Turnbow, 1976 \_\_\_\_\_ Route 5,  
 Box 151 B, Lubbock  
 Alex Bednarz, 1976 \_\_\_\_\_ Route 1, Slaton  
 Dan Young, 1978 \_\_\_\_\_ 4607 W. 14th St., Lubbock  
 Clifford Hilbers, 1978 \_\_\_\_\_ RFD, Idalou

### Lynn County

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 W. R. Steen, 1976 \_\_\_\_\_ Route 2, Wilson  
 Orville Maeker, 1978 \_\_\_\_\_ Route 1, Wilson  
 Freddie Kieth, 1978 \_\_\_\_\_ New Home

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 Horn Insurance Agency, Bovina

Troy Christian, 1977 \_\_\_\_\_ Rt. 1, Farwell  
 Joe Moore, 1977 \_\_\_\_\_ Box J, Lazbuddie  
 Dalton Caffey, 1977 \_\_\_\_\_ 15th St., Friona  
 Floyd Reeve, 1979 \_\_\_\_\_ Box 1196, Friona  
 Ralph Roming, 1979 \_\_\_\_\_ 809 Ridglea Dr., Bovina

### Potter County

Henry W. Gerber, 1977 \_\_\_\_\_ Rt. 1, Amarillo  
 Jim Line, 1977 \_\_\_\_\_ Box 87, Bushland  
 Albert Nichols, 1977 \_\_\_\_\_ Rt. 1, Box 491, Amarillo  
 F. G. Collard, 1979 \_\_\_\_\_ Rt. 1, Box 433, Amarillo  
 W. J. Hill, 1979 \_\_\_\_\_ Box 53, Bushland

### Randall County

Mrs. Louise Tompkins, Secretary  
 Farm Bureau, 1714 Fifth Ave., Canyon  
 Harry LeGrand, 1977 \_\_\_\_\_ 4700 S. Bowie, Amarillo  
 Joe Albracht, 1977 \_\_\_\_\_ Box 81, Bushland  
 Leonard Batenhorst, 1977 \_\_\_\_\_ Rt. 1, Canyon  
 Bill Dugan, 1979 \_\_\_\_\_ Rt. 2, Box 30, Happy  
 John F. Robinson, 1979 \_\_\_\_\_ 1002-7th St., Canyon

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into the business of regulating all public water supplies — groundwater as well as surface water.

Reminded by the National Water Well Association that groundwater supplies more than one-half of the nation's drinking water and, therefore, this great natural resource deserves "recognition" and "protection", the Congress voted to give more broad power to a branch of the Federal bureaucracy already heavily burdened with red tape and regulation-related problems.

### Cancer-Related Deaths Cited

In urging passage of the Safe Drinking Water Act, EPA officials cited cases of mass deaths and epidemics supposedly related to public water supplies, and implied the existence of a direct relationship between cancer and cancer-related deaths and drinking water supplied by the nation's public water systems.

An EPA-funded study by the Environmental Defense Fund (a non-profit environmental action group) in November, 1974, stated that the occurrence of cancer is increasing today in the United States.

The report, entitled, "The Implication of Cancer-Causing Substances in Mississippi River Water", found that the cause of cancer has frequently been traced to carcinogens in the environment. Carcinogens are chemical, physical or biological agents which, when administered to animals or humans, increase the probability of tumors.

In citing industrial, agricultural and municipal wastes discharged daily into the nation's waters as carriers of toxic substances, the report noted that discharges from sewage treatment plants may also be responsible for a variety of carcinogenic substances found in water. It is estimated that more than 1,000 tons of chlorinated organic compounds are discharged by sewage treatment plants into the nation's waterways annually.

### Carcinogens Found in Water

Similar to problems encountered with chlorinated sewage, chlorination of polluted river water at municipal water treatment plants may also be responsible for producing carcinogens in drinking water.

The report went on to cite a study of the Carrollton Water Treatment Plant in New Orleans. Typical of most municipal water treatment facilities in the United States, it was designed and constructed in the early 1900's, employing latter 19th century and early 20th century technology. The treatment processes at Carrollton, the primary function of which is to prevent the spread of waterborne diseases, were not designed to remove carcinogenic and other toxic substances.

In the absence of procedures to remove toxic chemicals and in the absence of disinfection practices which do not produce toxic chemicals, the citizens of New Orleans can be assured of the presence of carcinogenic chemicals in their drinking water indefinitely, or until procedures are taken to both clean up the river and to remove the remaining toxic chemicals at the water treatment plant.

For example, a significant relationship was found over the 64 parishes in Louisiana between total cancer mor-

tality and urbanization and drinking water from the Mississippi River. An interpretation of the results would suggest, for example, that if New Orleans, which obtains all of its drinking water from the Mississippi River, were to either treat its water to remove the carcinogens or switch to local groundwater free of carcinogens, in the long run over 50 premature deaths from cancer among white males alone would be averted annually. This would represent a reduction of approximately 15 percent in the cancer mortality rate among white males in New Orleans.

Considering the extent of pollution of the nation's surface waters and the existence of toxic materials in drinking water supplies, Jay Lehr, Executive Director of the National Water Well Association (NWWA) and a member of the National Drinking Water Advisory Council (charged with advising EPA on implementation of PL 93-523), implored Congress to pass legislation to protect the unpolluted groundwater of the nation's aquifers.

### NWWA Urges Groundwater Control

Said Lehr, "With the recognition that most of our ground waters have yet to suffer broad exposures to chemical wastes which may be responsible for the development of some cancers in our population, it may at last be possible to convince the voters and their elected government officials to begin the development of adequate regulations to safeguard our nation's ground water from the incredible destruction which has befallen our surface waters. Thus the recent disclosures regarding the threat of drinking some surface water supplies may spur activity which will greatly benefit mankind."

In a November 27, 1974, interview on the Today Show, Lehr stated, "Ground-water sources which are relatively free from municipal and industrial wastes that contribute potentially dangerous chemicals offer us safer sources for drinking-water supplies," and, that with passage of the Safe Drinking Water Act, "... there is hope of protecting our generally pure ground-water supplies from invasion by industrial and municipal pollutants which appear almost universally in our surface waters."

As a result of the Environmental Defense Fund study and NWWA pressure, EPA Administrator Russell Train, early in 1975, ordered the EPA to test the drinking water supplies of 79 cities, in order to ascertain the existence of certain toxic materials.

### Testing Revealed Chemicals

The July, 1975, issue of *Water Well Journal*, NWWA publication, reported that the testing revealed traces of pollutant organic chemicals, including two potential carcinogens. The survey, designed to provide a cross section of the problem in the nation's larger water supply systems, concentrated primarily on six chemicals. More detailed studies of 10 cities in the survey also revealed traces of other hazardous pollutants, including the pesticide diel-drin and vinyl chloride.

Minute traces (one-tenth of one part per billion to 311 parts per billion) of chloroform, one of the suspected cancer-causing agents, was found in the water of every city tested and is

—continued on page 3... EPA

## IN "WATER-SHORT" AREAS

## Nebraska Legislature Gives Groundwater Control Powers to Local Districts

The effects of a declining groundwater supply, in conjunction with drought conditions, are common to the semi-arid Midwestern United States. When drought conditions exist, more groundwater pumpage is necessary, and the resultant drop in the water table causes people to become concerned about the future.

In Texas, groundwater pumpage has been locally controlled since the early 1950's, but other High Plains states (as mentioned in the May, 1975, issue of *The Cross Section*) are beginning to realize the potential benefits and necessity for groundwater management.

In May, 1975, the Nebraska Legislature (the Nebraska Legislature has only one House) got into the business of regulating groundwater by giving certain regulatory powers to the State's 24 Natural Resources Districts (NRD's). The action, however, followed more than a year of study and legislative debate.

**Nebraskans Become Concerned**

Following the dry summer of 1974, more and more Nebraskans became concerned that the State Legislature had failed to pass out of the Agricultural and Environment Committee Legislative Bill 990. According to M. M. Van Kirk, Director of Information for the Nebraska Farm Bureau Federation, the death of the bill was because, "When the vote was taken, there was reticence to get down to the business of actually regulating the installation of new wells."

Essentially the bill would have assigned major responsibility for groundwater control and management to the natural resources districts within their jurisdictions. The bill would not have affected existing wells, but would have required new wells to be drilled pursuant to permit, and, where declining water tables require designation as critical areas, special restrictions for groundwater development would have been applied.

On the final day of the 1974 session, however, Legislative Resolution 182 was passed, charging the Public Works Committee with the responsibility of conducting a study of Nebraska's laws relating to ground and surface waters "... with special emphasis upon the statutory recognition of the interrelationship of underground and surface waters and to locate statutory needs to prevent and solve any current underground water problems the Committee finds to exist in Nebraska".

**SCHNEIDER ... continued from page 1**

Force as a pilot and operations officer, Schneider was General Manager of Grain, Incorporated, in Corpus Christi and Operations Manager for the Brownsville Navigation District.

A member of the American Institute of Industrial Engineers, the American Management Association and the Corpus Christi Chamber of Commerce, the Executive Director is also a Lieutenant Colonel in the Air Force Reserve and holds a current commercial pilot's license.

The Water District congratulates Mr. Schneider on his appointment and wishes him many more years of successful service to the public.

This resolution prompted the Committee's September, 1974, visit to the High Plains Underground Water Conservation District No. 1 and the Texas Water Development Board.

**Legislators Come to Lubbock**

While in Lubbock, the Nebraska legislative delegation reviewed a slide presentation explaining the physical area and boundaries, functions and water conservation programs of the High Plains Water District. They also heard discussion by area agriculture and economic experts as to the economic effects of agriculture on the High Plains, and an update of area artificial recharge projects and experimentation dealing with water-use efficiency on crops grown in the High Plains of Texas.

Frank Rayner, District Manager, also reviewed with the group the Texas law creating groundwater conservation districts and the effectiveness of the programs of the other such districts in Texas.

Following its stay in Lubbock, the delegation met with officials of the Texas Water Development Board (TWDB) in Austin. They were told by TWDB representatives that, while local control of groundwater resources is preferable to State control, there must be a provision to handle situations where local people do not act in the best interests of the general public.

TWDB Legal Counsel Lutchter Simmons said, "In such instances, the State must have the power to step in and resolve such situations."

**Public Hearings Conducted**

Following this information-gathering tour of Texas, the Public Works Committee spent the next three months conducting public hearings to measure local opinion. Local farmers and irrigators favored some form of per-well pumpage rather than blanket restrictions on future irrigation development. Also, the idea remained prevalent that legislation would be needed to establish management procedures for groundwater use in water-short areas, but with local administration.

Eventually, a new version of the old bill was introduced at the beginning of the 1975 legislative session, this time by the Public Works Committee. LB 101, the Nebraska Groundwater Management Act, would have required permits for the drilling of new wells and would designate as "critical" areas where the water table showed decline. The bill would not interfere with pumping from existing wells if the use of the water was beneficial.

The bill remained unpopular, though, because it gave administration of the program to the NRD's, and would phase out the six existing groundwater conservation districts.

Following public hearings, the Committee amended the bill and changed its title to LB 577, which eventually passed the Legislature on May 23, 1975, with a vote of 40 to 1, and was signed into law by Governor J. James Exon on May 27.

The bill, as amended, defines authorities of the NRD's and groundwater conservation districts in areas covered by both, and states that groundwater conservation districts may

adopt no rules or regulations after the effective date of LB 577 and that the districts' current rules would remain in effect if they are consistent with the Groundwater Management Act and regulations by the NRD's.

Areas designated to have a groundwater shortage must first initiate regulations which provide for allocation of pumping among well owners, rotation of pumping and control of spacing between wells. If those control measures fail to halt the water table decline, a ban on drilling new wells may be imposed for one-year periods.

NRD's can implement these groundwater controls *only* after an area has been declared "water-short" by the Director of the Nebraska Department of Water Resources. He can make the declaration *only* after a public hearing, which can be called *only* by the local NRD'S.

**Water-Short Areas Designated**

Concerning designation of a water-short area, Section 3 of the Act states, "An area shall be designated a control area if it shall be determined, following evaluation of relevant hydrologic data, history of developments, and projection of effects of current and new development, that there is an inadequate groundwater supply to meet present or reasonably foreseeable needs for beneficial use of such water supply. In determining the adequacy of such groundwater supply, the director's (director of the Department of Water Resources) considerations shall include, but not be limited to, a finding of the existence of any of the following conditions:

(a) Conflicts between users are occurring or may be reasonably anticipated;

(b) Substantial economic hardships exist or are foreseeable as a direct result of current or anticipated groundwater decline; or

(c) Other conditions exist that indicate the inadequacy of the groundwater supply or that require the area be designated as a control area for protection of the public welfare."

Now that the Groundwater Management Act is law, the NRD's have be-

gun to apply the law on the local level. According to Dayle Williamson, Executive Secretary of the Nebraska Natural Resources Commission, Section 9 of the Act is the first to be implemented. "One of the first tasks that will need to be tackled by the NRD's is the immediate development and approval of rules and regulations to prohibit surface runoff of any irrigation water derived from the groundwater basin. A 'last-minute' amendment to the law added this section and requires the rules and regulations to be adopted by November 21, 1975. These regulations will be required in all NRD's, not in just the control areas."

**EPA ... continued from page 2**

thought to be a by-product of chlorination.

But Train emphasized his belief that "the benefits of chlorine used to prevent immediate, acute biological diseases far outweigh the potential health risks from chlorine-derived organic compounds."

Although he stressed that "people should not react with any sense of panic," Train said that "even at these low levels, the chemicals are a matter of concern that warrants the diligent carrying out of our safe drinking plans."

The plans include finding how widespread the chemical pollution problem is, determining if the low levels are significant to human health, the source of the organic chemicals and the most practical route to resolving the problem.

As in most cases involving huge sums of public money and long periods of testing, only time and experience will reveal which step to take next.

In only seven short months, and after an extensive study of the larger public water supply systems in the country, EPA has decided to turn from a very active role of implementation of the Act's guidelines—in the good spirit of protecting all drinking water and, thus, protecting the nation's citizens—to the role of the watchdog, waiting to find out exactly how bad the present situation really is.

**Total Well Permits Down in 1975**

A recent study of the District's applications for irrigation well permits during the first half of 1975 reveals that, while the percentage of wells completed has experienced a marked increase in 1975 as compared to 1974, the number of applications received in the District offices has dropped significantly.

In the first half of 1974, 629 wells were completed, as compared to 427 in 1975. However, the completions in 1974 represent only 67 percent of the applications for permits received, while 94 percent of the well applications have been completed thus far in 1975. Permits applied for through June, 1974, totaled 927, as compared to 450 by June, 1975.

Eighty-two percent of the applications for wells (1171 of 1416) were completed in 1974, up from 59 percent completions in 1973.

Though fewer applications for permits were received, the percentage increase of well completions experienced in the 15 counties comprising the Water District could be due to the fact that in 1974 farmers had more money to spend (following the good 1973 crop year) and acreage limitations were lifted by the Federal government.

However, supplies of construction material became unavailable at the same time the farmers had money to spend on new wells. Therefore, the drilling companies got behind on their jobs. Now, with adequate drilling supplies, drillers are catching up (see story on page 1), but farmers no longer have extra money for new wells—thus, the drop in permit applications and the rise in completions.

## CALIFORNIA DESALINATION PROJECT CONFRONTED BY HIGH POWER COSTS

The fact that supplies of fresh water and the energy necessary to deliver that water to the user are becoming more and more scarce and, consequently, more expensive is being experienced daily across this country. And, even with thoughtful, forward planning, the Orange County Water District in Fountain Valley, California, is realizing the effects of unpredictably high energy costs on a recently completed project, Water Factory 21.

Water Factory 21 is an advanced fresh water factory, the ultimate goal of which is the injection of 30 million gallons a day (mgd) of high quality water into the groundwater basin as a deterrent to seawater intrusion and for basin replenishment to meet the needs of the Orange County community. (Orange County is located between Los Angeles and San Diego Counties in Southern California.)

### Wastewater and Seawater Combined

In order to reduce the dependence of the county's 1,500,000 residents upon imported water systems and, in order to replenish a 1956 overdraft of 500,000 acre-feet of water from the groundwater basin, the facility injects a blended combination of 50 percent reclaimed wastewater and 50 percent desalted seawater through a series of 23 multi-casing injection wells. The wells were constructed on a line, 600 feet apart, an average of four miles from the Pacific ocean.

Principal facilities of Water Factory 21 include a 15 mgd advanced wastewater reclamation plant and a Vertical Tube Evaporator/Multi-Stage Flash

seawater distillation plant with an initial capacity of three mgd.

The desalting plant will be expanded to 15 mgd after a period of operational experience, bringing the combined total of product water to 30 mgd. The 23 injection wells will create a coastal barrier preventing seawater intrusion, as well as replenish local groundwater supplies from which 70 percent of the county's water is drawn.

### 30,000 Acre-feet of Water

Water Factory 21 will produce 30,000 acre-feet of water per year, which is 10 percent of the present consumption of the county, or enough water to meet the needs of 150,000 people.

In choosing the combination of seawater desalination and wastewater reclamation from a list of water source alternatives, the District considered several environmental advantages, which were not available from the other alternatives, to outweigh the high costs involved. They were: 1) the reduction of 15,000 acre-feet of waste discharge to the ocean annually, 2) the reduction of dependency on Northern California and Colorado River water supplies by development of 30,000 acre-feet of local water annually and 3) the addition of ocean brine to wastewater discharge into the ocean, reducing the impact on marine environment.

The chosen alternatives were also considered individually, but neither were accepted alone for the following reasons.

The use of reclaimed wastewater for barrier purposes in Orange County has

many advantages, but, because the base supply of the County is composed of highly mineralized Colorado River water, the most advanced wastewater removal process will result in a product water from 1,100 to 1,300 parts per million (ppm) total dissolved solids (TDS). This is well above the 500 ppm recommended by the U. S. Health Department as a safe drinking water standard.

Desalted water, on the other hand, is extremely high quality, less than 25 ppm TDS, but an injection source of 100 percent distilled water would cost as high as \$300 per acre-foot to produce.

### Office of Saline Water Interested

Desalting of seawater was selected rather than demineralizing reclaimed wastewater because the desalted seawater provided a new source of water supply to meet the needs of the District, and demineralization of wastewater has not yet been commercially tested at the 15 mgd range required for the facility. Another consideration which entered into the decision to desalt seawater was the availability of research funds and interest of the Office of Saline Water in the construction of a large-scale seawater desalting test module.

The Orange County Coastal Project was built with the cooperation of the Federal government (the Environmental Protection Agency and the Office of Saline Water), the State of California and the District. Of the total \$24,475,000 cost, 50 percent was

financed with Federal funds, 13 percent with State funds and 37 percent with District money.

### Energy Costs Considered

The other major consideration entering into the choosing of sources of water supplies, energy costs incurred by power demands, was not fully realized until the plant began operation. In a May 16, 1975, letter to the District's Board of Directors, Secretary Manager Neil M. Cline wrote, "The energy crisis has caused everyone in this country to reassess priorities of energy consumption, and in the years ahead there will be increasing emphasis to fully analyze and conserve power requirements for all District programs. While good water system management has always considered long-range power costs, the sudden escalation in the price for imported oil and the consequent increase in electrical rates was a painful reminder of how fragile our best forecasts of future water values can be."

The District's new water supplies, he continued, "... impose heavy power demands over conventional methods of water supply."

### Water Sources Inconsistent

The following table reveals exactly how inconsistent are the power costs of the various water source alternatives for providing water to Orange County residents. Units are indicated in terms of electrical (or equivalent) kilowatt-hours per acre-foot, rather than traditional dollars per acre-foot.

SOURCE	KWH
Local groundwater	450
Imported Colorado River water (transported 242 miles)	2,000
Imported Northern California water (transported 444 miles)	3,400
Reclaimed wastewater	4,860
Demineralized wastewater (reverse osmosis)	3,300
Demineralized wastewater (electrodialysis)	2,600
Desalted seawater	50,000

Considering the staggering energy demands on the seawater desalination process, priorities will need to be established for the area. As Cline pointed out to the District's Directors, "It is apparent that priorities will have to be established and compromises of economy and environment will have to be accepted by the entire community if we are to continue to provide water and power resources at the levels we presently enjoy."



Some people, as in the photograph above, waste groundwater. And, if they continue to let it escape from their property, they will no longer have groundwater to conserve. KEEP YOUR FUTURE ON YOUR FARM—REUSE TAILWATER.

# THE Cross SECTION

A Monthly Publication of the High Plains Underground Water Conservation District No. 1

Volume 21—No. 8

"THERE IS NO SUBSTITUTE FOR WATER"

August, 1975



THE BOARD OF DIRECTORS OF THE HIGH PLAINS UNDERGROUND WATER CONSERVATION DISTRICT NO. 1 will conduct an open house of its new Lubbock headquarters, Saturday, September 20, 1975, from 1:00 p.m. until 6:00 p.m. The public is cordially invited to tour the facility and meet with the Directors and staff.

## World Food Crisis Demands More of U.S. Farmer

Food production, for several years, has been losing the race with population growth. And, for years, the world's food producers have been developing and practicing new techniques to help harvest more food per acre, while world leaders have been urging, and even demanding, the practice of birth control in order to slow down the rising world-wide birth rate.

Even with all the technical data available today, the discrepancies of uneven distribution of population and natural resources, and changing weather patterns reveal some startling facts, some of which are mentioned below.

- Today, there are 3.9 billion mouths to feed; in 24 hours, there will be 203,000 new births, and 74 million more next year. Two-thirds of the world's population (living in 33 of the poorest nations comprising the tropical area known as "the hunger belt" and designated by the United Nations as "most seriously affected") account for four of every five births, but produce only one-fifth of the world's food.

- At present, all the world's land economical to cultivate — 3.6 billion acres — is already in production. And, climatologists have predicted changing weather patterns will likely bring colder weather and drought to the most populous regions.

- The United States, where affluence and high living standards create an appetite for meats and dairy products (not generally consumed in other parts of the world), places four times as much demand on the food supply as the poorest nations combined.

- Oceans cover 71 percent of the land surface, but only produce one percent of man's food.

- United States farmers, aided by superb machinery, fertilizers and the results of agricultural research, only make up one percent of the world's total of farmers, but raise 15 percent of all food.

- The United States farmer produces enough food in a year to feed 50 people, while his Russian counterpart only feeds six others besides himself.

- The United States farmer spends only five minutes to harvest 100 pounds of grain, while an Asian farmer must spend five days in the field.

- In 1974, United States farmers' crops (soybeans, wheat and corn at the top of the list), brought in \$20 billion from abroad — enough to pay for four-fifths of the country's oil imports.

- Each year, the world consumes 1.2 billion metric tons of cereal grains. Eating the cereals directly, people of the poorer nations consume about 400 pounds per year per person, while the most affluent nations consume approximately one ton per person in the converted form of meat, eggs and dairy products.

- One of every three pounds of grain goes into the production of animal feed. Because of this, some agricultural experts feel that the livestock of the rich world are competing for grain with the people of the poor world.

—continued on page 3... WORLD

## DISTRICT PUBLISHES WELL BROCHURE

The Water District has recently published a new brochure entitled, "Procedures for Obtaining a Water Well Permit and a Valid Water Well". This publication can be obtained, free of charge, at the District's county offices (for the location of these county offices, see page 2 of *The Cross Section*) or by visiting or writing the District's Lubbock office.

The brochure outlines, in detail, the landowner's responsibilities and obligations in obtaining a valid water well permit; summarizes the procedures for making an "Application for Water Well Permit", and explains how to properly "register" a newly constructed well.

Spacing requirements (minimum distances to be spaced away from all existing wells, depending on the size of the well to be drilled) are also explained in detail.

Applicants for irrigation well per-

—continued on page 4... BROCHURE



**A MONTHLY PUBLICATION OF THE HIGH PLAINS UNDERGROUND WATER CONSERVATION DISTRICT NO. 1**

2930 Avenue Q, Lubbock, Texas 79405

Telephone 762-0181

REBECCA CLINTON, Editor

Second Class Postage Paid at Lubbock, Texas

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- Don Smith \_\_\_\_\_ Geologist
- Don McReynolds \_\_\_\_\_ Geologist
- Tony Schertz \_\_\_\_\_ Draftsman
- Obbie Goolsby \_\_\_\_\_ Field Representative
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- Guy Watson, 1977 \_\_\_\_\_ Wayside
- C. D. Rogers, 1977 \_\_\_\_\_ Wayside
- Bill Heisler, 1977 \_\_\_\_\_ Wayside
- Charles Kennedy, 1979 \_\_\_\_\_ Rt. 1, Happy
- Cordell Mahler, 1979 \_\_\_\_\_ Wayside

**Bailey County**

Doris Wedel, Secretary

H&R Block, 224 W. 2nd, Muleshoe

- Eugene Shaw, 1977 \_\_\_\_\_ Rt. 1, Muleshoe
- Adolph Wittner, 1977 \_\_\_\_\_ Star Rt., Baileyboro
- Jessie Ray Carter, 1977 \_\_\_\_\_ Rt. 5, Muleshoe
- Marshall Head, 1979 \_\_\_\_\_ Rt. 3, Muleshoe
- Harold Layton, 1979 \_\_\_\_\_ Rt. 2, Morton

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City Hall, 120 Jones St., Dimmitt

- Jackie Clark, 1977 \_\_\_\_\_ Rt. 1, Box 33, Dimmitt
- Joe Nelson, 1977 \_\_\_\_\_ Box 73, Dimmitt
- Bob Anthony, 1977 \_\_\_\_\_ Rt. 4, Dimmitt
- Anthony Acker, 1979 \_\_\_\_\_ Rt. D, Nazareth
- Glenn Odom, 1979 \_\_\_\_\_ Rt. 4, Box 136, Dimmitt

**Cochran County**

W. M. Butler, Jr., Secretary

Western Abstract Co., 108 N. Main Ave., Morton

- Dan Keith, 1976 \_\_\_\_\_ Route 1, Morton
- H. H. Rosson, 1976 \_\_\_\_\_ Route 1, Morton
- Danny Key, 1976 \_\_\_\_\_ Star Route 2, Morton
- Jessie Clayton, 1978 \_\_\_\_\_ 706 S. Main, Morton
- Robert Yearly, 1978 \_\_\_\_\_ Route 2, Morton

**Crosby County**

Clifford Thompson, Secretary

2930 Avenue Q, Lubbock

- W. O. Cherry, 1976 \_\_\_\_\_ Lorenzo
- E. B. Fullingim, 1976 \_\_\_\_\_ Lorenzo
- M. T. Darden, 1976 \_\_\_\_\_ Lorenzo
- Donald Aycock, 1978 \_\_\_\_\_ Lorenzo
- Alvin Morrison, 1978 \_\_\_\_\_ Lorenzo

**Deaf Smith County**

B. F. Cain, Secretary

County Courthouse, 2nd Floor, Hereford

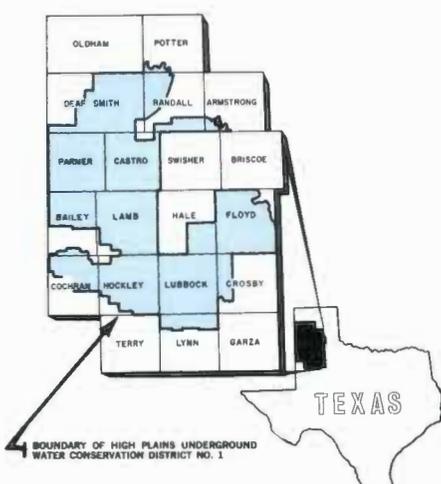
- James E. Higgins, 1977 \_\_\_\_\_ 200 Star St., Hereford
- Garland Solomon, 1977 \_\_\_\_\_ Rt. 5, Hereford
- W. L. Davis, 1977 \_\_\_\_\_ Box 312, Hereford
- Bill Cleavinger, 1979 \_\_\_\_\_ Star Rt., Wildorado
- George Ritter, 1979 \_\_\_\_\_ Rt. 5, Hereford

**Floyd County**

Don Grantham, Secretary

Farm Bureau, 101 S. Wall Street, Floydada

- Malvin Jarboe, 1976 \_\_\_\_\_ Route 4, Floydada
- Connie Bearden, 1976 \_\_\_\_\_ Route 1, Floydada
- M. M. Smitherman, 1976 \_\_\_\_\_ Silverton Star Route, Floydada
- Joe Cunyus, 1978 \_\_\_\_\_ Lockney
- Fred Cardinal, 1978 \_\_\_\_\_ Route 4, Floydada



**Hale County**

J. B. Mayo, Secretary

Mayo Ins., 1617 Main, Petersburg

- Clint Gregory, Jr., 1976 \_\_\_\_\_ Box 98, Petersburg
- Henry Scarborough, 1976 \_\_\_\_\_ Route 2, Petersburg
- Homer Roberson, 1976 \_\_\_\_\_ Box 250, Petersburg
- Henry Kveton, 1978 \_\_\_\_\_ Route 2, Petersburg
- Gaylord Groce, 1978 \_\_\_\_\_ RFD, Petersburg

**Hockley County**

Jim Montgomery, Secretary

609 Austin Street, Levelland

- Ewel Ekum, 1976 \_\_\_\_\_ Route 1, Ropesville
- Douglas Kauffman, 1976 \_\_\_\_\_ 200 Mike, Levelland
- Billy Ray Carter, 1976 \_\_\_\_\_ Route 5, Levelland
- J. E. Wade, 1978 \_\_\_\_\_ Route 2, Levelland
- Jimmy Price, 1978 \_\_\_\_\_ Route 3, Levelland

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Calvin Price, Secretary

620 Hall Avenue, Littlefield

- Gene Templeton, 1976 \_\_\_\_\_ Star Route 1, Earth
- W. W. Thompson, 1976 \_\_\_\_\_ Star Route 2, Littlefield
- Donnie Clayton, 1976 \_\_\_\_\_ Box 276, Springlake
- Billy J. Langford, 1978 \_\_\_\_\_ Box 381, Olton
- Edward Fisher, 1978 \_\_\_\_\_ Box 67, Sudan

**Lubbock County**

Clifford Thompson, Secretary

2930 Avenue Q, Lubbock

- Glenn Blackmon, 1976 \_\_\_\_\_ Route 1, Shallowater
- Andrew (Buddy) Turnbow, 1976 \_\_\_\_\_ Route 5, Box 151 B, Lubbock
- Alex Bednarz, 1976 \_\_\_\_\_ Route 1, Slaton
- Dan Youngs, 1978 \_\_\_\_\_ 4607 W. 14th St., Lubbock
- Clifford Hilbers, 1978 \_\_\_\_\_ RFD, Idalou

**Lynn County**

Clifford Thompson, Secretary

2930 Avenue Q, Lubbock

- O. R. Phifer, Jr., 1976 \_\_\_\_\_ New Home
- S. B. Rice, 1976 \_\_\_\_\_ Route 1, Wilson
- W. R. Steen, 1976 \_\_\_\_\_ Route 2, Wilson
- Orville Maeker, 1978 \_\_\_\_\_ Route 1, Wilson
- Freddie Kleth, 1978 \_\_\_\_\_ New Home

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Horn Insurance Agency, Bovina

- Troy Christian, 1977 \_\_\_\_\_ Rt. 1, Farwell
- Joe Moore, 1977 \_\_\_\_\_ Box J, Lazbuddie
- Dalton Caffey, 1977 \_\_\_\_\_ 15th St., Friona
- Floyd Reeve, 1979 \_\_\_\_\_ Box 1196, Friona
- Ralph Roming, 1979 \_\_\_\_\_ 809 Ridgela Dr., Bovina

**Potter County**

- Henry W. Gerber, 1977 \_\_\_\_\_ Rt. 1, Amarillo
- Jim Line, 1977 \_\_\_\_\_ Box 87, Bushland
- Albert Nichols, 1977 \_\_\_\_\_ Rt. 1, Box 491, Amarillo
- F. G. Collard, 1979 \_\_\_\_\_ Rt. 1, Box 433, Amarillo
- W. J. Hill, 1979 \_\_\_\_\_ Box 53, Bushland

**Randall County**

Mrs. Louise Tompkins, Secretary

Farm Bureau, 1714 Fifth Ave., Canyon

- Harry LeGrand, 1977 \_\_\_\_\_ 4700 S. Bowie, Amarillo
- Joe Albracht, 1977 \_\_\_\_\_ Box 81, Bushland
- Leonard Batenhorst, 1977 \_\_\_\_\_ Rt. 1, Canyon
- Bill Dugan, 1979 \_\_\_\_\_ Rt. 2, Box 30, Happy
- John F. Robinson, 1979 \_\_\_\_\_ 1002-7th St., Canyon

**NOTICE**

The Board of Directors would like to extend a special invitation to all County Committeemen and their families and all former Directors and County Committeemen and their families to share in the District's dedication of its new headquarters building, 2930 Avenue Q, Lubbock, on Saturday, September 20, 1975, from 1:00 p.m. until 6:00 p.m.

**Taxes Become Biggest Family Expenditure**

The following article by Carl F. Hawner, Columnist for Consumer Credit Leader, is reprinted from the August, 1975, issue of Water Equipment News.

About April 15 each year, for some reason I get tax conscious. And I begin to wonder how much it takes to run our government, anyway — and what in the world are they doing with it all? I am advised that the federal government is planning to spend some \$304.4 billion in fiscal 1975. Now when you talk about billions of dollars to a country boy like me you've got me at a disadvantage. I just can't quite grasp billions. Someone once told me that if I started spending \$1,000 an hour, 24 hours a day, 365 days a year, and kept up the pace for 100 years, I'd still not have spent a billion dollars. This impressed me, but it didn't help much, because I can't even imagine spending \$24,000 a day.

This year, however, someone came to my rescue. They reported that the \$304.4 billion would amount to an average tax on every household in this country of \$4,362. That's the price of a new car, or a year or two of college for Junior. It is also likely to be more than it costs to feed his family, or clothe them, or pay their medical bills. In fact it may be that government is the biggest single expense the average family has.

Of course, nothing is supposed to be certain except death and taxes, but if taxes continue to go up I may be too poor to die. The average household's federal tax load is more than double what it was 10 years ago. In fact it is up by 108 per cent. Of that \$4,362 tax bill, the biggest bite, \$1,434, goes to provide income for other persons. There is a 215 per cent rise in this department, and it scares me a little. Another area where federal spending has been soaring is in health care. Now I'm in favor of health care, but I'm amazed to find expenditures in that field have gone up 1,157 per cent in the last 10 years. As I find at the grocery store these days, just because a thing is good doesn't mean I can afford it.

If I want to be fair, I guess I have to note that federal spending has not gone up in every area. Space research,

which was very big in the 1960s now costs Mr. Average Householder (let's call him "AH") only \$47 as opposed to the \$90 it cost in 1965. Before you start cheering, however, I should warn you that there is a relative newcomer in the federal spending family that is more than taking up the slack. It is a little dandy called general revenue sharing and it now costs old AH a whopping \$88 a year.

Of course, defense is still a Big Item, costing AH \$1,257 a year—over \$100 a month—compared to \$877 in 1965. And there is that Growing Youngster, interest on debt, which will cost AH \$417 in 1975, compared to \$183 in 1965. That is up 128 per cent and reflects higher interest costs and a bigger debt.

Then we get to the item General Government. I must confess I don't know just what this means, but someone tells me it is "overhead". I guess that means the cost of collecting and spending money is going up, because this will cost AH \$97, compared to \$38 in 1965—and that is a hefty increase of 155 per cent.

Now it may be that all these federal expenditures are going for real good things but old AH and I have a problem. Our salaries did not increase 215 per cent in the last 10 years (like the taxes did) and this means that these new increases are cutting into my family needs. If AH's salary only went up 65 per cent in the last 10 years and his taxes went up 215 per cent, then that extra 150 per cent comes out of what used to go for groceries, or clothes, or rent, or health care, or maybe even savings.

Like I say, every year, about income tax deadline day, I tend to get very, very philosophical and wonder if somehow Congress couldn't be persuaded to refrain from doing me more good than I can afford. I even dream up a law that would prohibit Congress from spending more money than was taken in the previous year. Then I get to reviewing some of the huge sums of money reportedly wasted on foolish government projects and I send in my income tax check most reluctantly. But I send it in! I'm not anxious to become an added burden to AH by being awarded free board and room at some federal institution.

**NOTICE:** Information regarding times and places of the monthly County Committee meeting can be secured from the respective County Secretaries.

Applications for well permits can be secured at the address shown below the respective County Secretary's name, except for Armstrong and Potter Counties; in these counties contact Carroll Rogers and W. J. Hill, respectively.

## IN MEETING WORLD DEMANDS

## Water Delivery Key to Food Production

The current demand on the U. S. farmer's ability to produce crops with which to feed the world and ease this country's balance-of-trade deficit is ever increasing. And, with this growing need for all-out production has come shrinking supplies of the raw materials necessary for that production—not the least of which are water and energy.

Ron Stanley, District Manager of the nation's largest supplier of finished steel products to the irrigation, oil, construction and rail industries, L. B. Foster Co. of Lubbock, says *water delivery is the key to increasing food production in the United States.*

Stanley explains that this is emphasized locally by the fact that the company's major product lines have become irrigation- and energy-related "because of the world-wide food crisis and shortage"

*Grain Producers Must Feed World*

"The United States, Canada and Australia, the only great grain-producing nations, must feed the world, and I don't really think economists realize that agricultural goods are our only tool, or weapon, in bartering for world power in the next 15 to 20 years," he continued.

The irrigation specialist believes that the best way to alleviate the problem is to make the best use of agricultural land already under cultivation, and irrigating and transporting water to dry, but productive, agricultural areas is essential. He also feels that supplemental wells are necessary in order to make productive land even more productive.

*Expanding Irrigation Supplies*

Stanley added that irrigation pipe is available and his company and other steel suppliers "are investing heavily in tooling and other equipment and directing our expansion program in that direction (irrigation)". Hopefully, he said, the push toward all-out expansion of irrigation will not surpass the production of the necessary steel products.

When asked why the United States experienced a pipe shortage in 1973, Stanley explained, "There was a demand world-wide which created a market in other parts of the world that would pay more for the product than the U. S. was paying; therefore, the foreign mills were not selling to us."

He continued, "Adding to the problem, price controls on domestic steel encouraged domestic mills to sell over-

—continued on page 4... WATER



Ron Stanley stands beside a supply of eight-inch and 10-inch column pipe to be used in the equipping of irrigation wells on the High Plains. Stanley says timely and efficient water delivery to agricultural land is the key to producing adequate supplies of food to feed the world and balance the U. S. trade deficit on the world market.

## WORLD... continued from page 1

- India grows only 100 million tons of cereal on the same acreage that supports 250 million tons in the U.S. The quadrupling of oil prices has meant essentially that agricultural progress has stopped in some of the poorer nations.

- Americans feed their pet cats and dogs enough protein to satisfy the daily requirements of 122 million people.

- India supports more cattle than any nation on earth, and most of them die of old age, useless as food because of the Hindu belief that cattle are sacred.

- Rats eat or spoil eight million tons of grain each year in India.

- United States farmers made up more than 90 percent of the population of the colonies, while less than five percent of the nation's population today farms the land.

- Agriculture employs four out of ten non-farm workers in the United States, while one acre out of four produces crops to be sold to foreign customers.

*Demands on Farmer Increasing*

At a time when demands on the farmer are increasing as quickly as the birth rate, the farmer's tasks are becoming more difficult because of the following complications.

1) *Shortages and uneven distribution of water.* Most of the world's rivers, which are not dammed, are located where the need is least. About one-third of the earth's rivers flow through South America, which only covers one-eighth of the land. Approximately six million cubic miles of water is located underground, but most of it is economically inaccessible. Actually, only about one-eighth of the total available water can be developed for beneficial use. One alternative, desalting some of the 317 million cubic miles of available sea water, is still economically infeasible on a large scale.

2) *Changing weather patterns.* The cooling trend may result in shortened growing seasons in producing countries such as Canada and Iceland. Droughts may also be attributed to the cooler weather.

3) *Scarcity of fertilizer.* The \$8 to \$10 billion necessary to build a fertilizer plant makes the total number of fertilizer-producing plants small. Enough gas is uselessly flared off in the principal oil-exporting countries to produce twice as much nitrogen fertilizer as the world now uses.

—continued on page 4... WORLD

## ENERGY REQUIREMENTS LOW FOR RECIRCULATION SYSTEMS

By BUTCH DAVIS

Last month's energy bill was probably indicative of the skyrocketing cost of energy used by farmers. Even so, High Plains irrigators may take consolation in the fact that underground water used for irrigation is far less expensive than the surface water used by urban dwellers.

Data released by the Canadian River Municipal Authority (the source for practically all of the City of Lubbock's municipal water needs) show that the energy requirement for pumping an acre-foot (325,850 gallons) of water to Lubbock along the 158-mile aqueduct is 1080 kilowatt hours (KWH). An additional charge (\$112.23/acre-foot) must be included

for treating and distribution before the water is ready for use.

Conversely, a study of irrigation pumping plants conducted by the Agricultural Engineering Department at Texas Tech University, Lubbock, reveals that the average irrigation well (222 feet total dynamic head operating at 50 percent efficiency) requires 453 KWH to pump an acre-foot (AF) of water, and there is no treating charge.

*Tailwater Use Requires Less Power*

The conscientious irrigator who incorporates playa water or tailwater into his existing irrigation operations will reduce his energy requirement even more. The average tailwater or playa water pump requires only about 80 KWH/AF (40 feet total dynamic

head operating at 50 percent efficiency) or 13½ times less energy than that required for municipal water.

*Comparison of Pumping Costs*

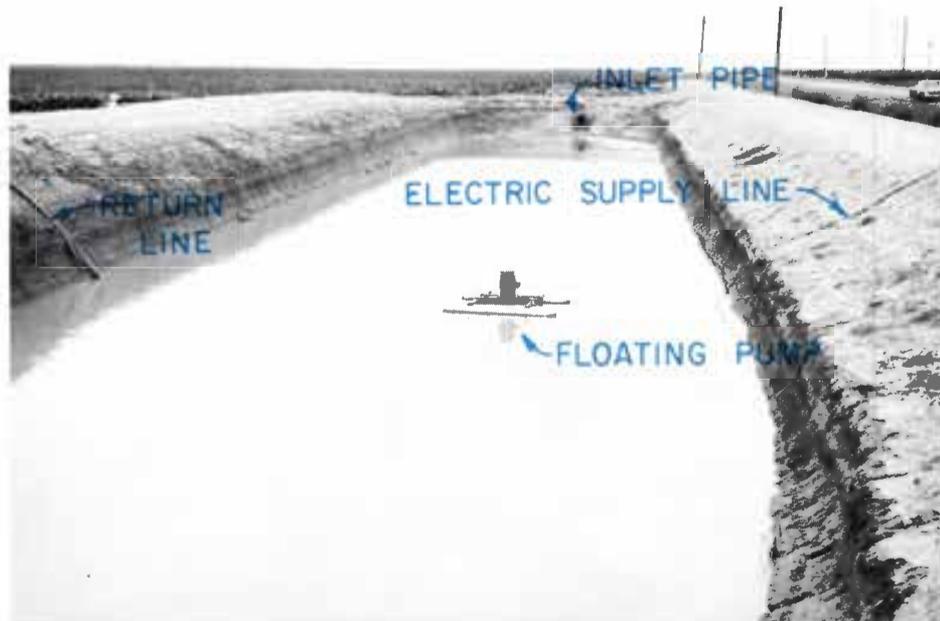
To make for easier comparison, the cost of pumping water from the various sources is found by multiplying KWH/AF by the current rate for electricity in dollars per KWH. The following statistics are based on the assumption that electricity costs \$0.02 per KWH.

Source	Cost To Pump An Acre-Foot of Water
Lake Meredith	\$21.60
Irrigation well	\$ 9.06
Tailwater or lake water	\$ 1.60

Considering these lower costs, it should also be noted that, with energy conservation, even less energy is required. Properly selected and maintained pumping plants will exceed 70 percent overall efficiency, pushing the energy requirement down from 453 to 324 KWH/AF (or \$6.48/AF) for irrigation well water, and from 80 to 58 KWH/AF (or \$1.16/AF) for tailwater.

*Groundwater Least Expensive*

As this cost comparison reveals, High Plains irrigators should realize that their present source of irrigation water (groundwater pumped from the Ogallala aquifer) is the cheapest source available and that every means to conserve this supply should be exercised. Tailwater return systems and lake pumps not only provide the means for water conservation, but these practices cost the irrigator five times less to pump the same amount of water for irrigation wells.



Tailwater recovery pits, like the one pictured above, are popular with conservation farmers on the High Plains because of the water savings associated with their use. Another major consideration, however, is the lower energy requirements involved in operating and maintaining a tailwater pit. With electricity priced at \$0.02 per KWH, it costs the irrigator \$1.60 to pump an acre-foot of tailwater from a recirculation pit as compared to \$9.06 an acre-foot for an irrigation well.

WORLD... continued from page 3

4) *Limitation of available land.* Farmlands in most industrial nations are shrinking. In the United States more than one million acres are removed from production each year. However, some experts say that the earth's arable land area, if properly developed, could produce edible plant material for between 38 and 48 billion people — ten times today's population.

5) *Dependence on energy.* The equivalent of 80 gallons of fuel is used to produce a single acre of corn. Because of its high yield, it returns about four calories of food for each calorie of energy used to produce it. However, some plants create a deficit in energy. As we know, the U. S. farmer has been hard hit by the energy shortage and many farmers have gone out of business or seriously cut their operations. On the other hand, developing countries, facing the same abrupt increase in import costs for fuel, cannot pay the price and, thus, cannot produce their own food.

#### *Why Does the Farmer Farm?*

With these thoughts in mind, one wonders why the farmer stays in business, for his life-style definitely is a business. American farmers have al-

## Agricultural Field Days Scheduled

The Texas Agricultural Experiment Station, Texas A&M University Agricultural Research and Extension Center, at Lubbock will host its 66th Annual Field Day September 9 from 1 to 5 p.m. Other agencies located at the Center and cooperating in the event are the URS-USDA, National Weather Service and the Agricultural Extension Service.

The Texas Agricultural Experiment Station at Halfway will conduct its annual field day September 11 from 1 to 5 p.m. At both field days, detailed discussions will be presented at various research plots in the field. A shuttle service will depart from headquarters every 15 minutes with a narrator to explain the tour. Displays and exhibits will also be featured at both locations.

Featured at the two field days will be such topics as soil water research, cotton varieties, weed control research, sunflower research, water conservation and cropping systems.



Official meetings of the Board of Directors are conducted regularly for the purpose of carrying out the administrative and judicial functions of the District as required and/or authorized by law. In the photograph above, the Board reviews testimony and pleadings during a "public hearings" portion of the July 12 meeting agenda.

ways been better at farming than any of their counterparts because of the assurance that they will earn a living from their profession. A farmer cannot be forced to farm, with or without a profit.

The farmer cannot feed the world until his problems are alleviated, and the problems of the world will not be solved on an empty stomach. This vicious cycle must be solved, but only with the sincere efforts of every per-

son, no matter to what extent he may or may not suffer from the problems of feeding the world.

**BROCHURE . . . continued from page 1**

mits are encouraged to obtain one of these brochures before they apply for a water well permit. This free brochure could result in the savings of tens of thousands of dollars by ensuring that the landowner receives a valid water well.

## SPECIAL INVITATION TO RESIDENTS OF THE HIGH PLAINS

*The Board of Directors of the High Plains Underground Water Conservation District No. 1 takes great pride in announcing the formal opening of the District's new office headquarters at 2930 Avenue Q in Lubbock. Following several years of planning the design of the facility and saving the necessary funds for the purchase of the property and construction of the building, the District broke ground on July 11, 1974.*

*At the groundbreaking ceremony, Billy Wayne Sisson of Hereford, then President of the Board, stated in part, "It is particularly fitting today, as we assemble on this ground—which is also underlain by a part of the fabled Ogallala aquifer—that we commence the construction of a building to serve as a center for the conservation of this precious water supply."*

*And, upon the completion of construction, the Board of Directors accepted the keys to the building at a formal*

*ceremony on March 19, 1975.*

*The Directors and staff are extremely proud of the flexibility and accessibility of the building and the many benefits which its availability will bring to the public. We hope you, the public, will continue to take advantage of the District's services in the future and that your District's new facilities will be more accessible to your needs.*

*In behalf of the Board of Directors, I wish to cordially invite all friends of the District to the open house, Saturday, September 20, from 1 p.m. to 6 p.m.*

Sincerely,

*Ray Kitten*

Ray Kitten, President  
Board of Directors

WATER... continued from page 3

seas."

Stanley believes the shortage was eventually relieved by the nation-wide recession, which eliminated the demand for pipe supplies, and the subsequent removal of price controls.

"Now we are experiencing a food shortage. The farmer has suffered droughts and shortages of supplies, but is still demanded to produce more than ever before. Producing more food has become a matter of necessity."

Farmers, encouraged by the government that producing for the world market is essential in covering the costs of importing oil, are concerned with being able to step up production and still realize a profit.

"The United States can't feed the world free and subsidize the practice with tax money, and still keep the farmer in business," he continued.

#### *Shortage Not Needed at Home*

"We must export our food in order to help other countries, but not at the expense of creating shortages at home," Stanley added.

Considering the pressure brought on the farmer by the world-wide demand, Stanley believes that water conservation is even more essential to meeting that demand.

"Every ounce of water saved is important to every person, business and corporation—not just the farmer. I just don't believe the average American realizes how important agriculture is to this country," Stanley concluded.

# THE Cross SECTION

A Monthly Publication of the High Plains Underground Water Conservation District No. 1

Volume 21—No. 9

"THERE IS NO SUBSTITUTE FOR WATER"

September, 1975



**WATER DISTRICT STAFF**—Members of the District Staff pose following the open house, September 20. From left, are Frank Rayner, Manager; Rebecca Clinton, Editor of *The Cross Section*; Obbie Goolsby, Field Representative; Norma Fite, Bookkeeper; Don Smith, Geologist; Dan Seale, Field Representative; Kenneth Carver, Field

Representative; Kathy Redeker, Receptionist; Oscar Riemer, Field Representative; Pennyne Newberry, Secretary; Don McReynolds, Geologist; Clifford Thompson, Head, Permit Section; Butch Davis, Graduate Engineer, and Tony Schertz, Draftsman. (See related photographs on pages 3 and 4.)

## DISTRICT CONDUCTS OPEN HOUSE

On September 20, 1975, the Board of Directors of the High Plains Underground Water Conservation District No. 1 conducted an open house of its new headquarters office building and dedicated it to the future of water conservation on the High Plains of Texas.

In behalf of the Board, Ray Kitten, President, made the following dedication statement.

*It is my pleasure, on behalf of the Board of Directors, to dedicate this building to the service of the people of the High Plains Underground Water Conservation District No. 1, and to the propositions for the development, protection, replenishment and conservation of water.*

The new District offices were designed to accommodate the many diverse programs and functions of the District and to provide facilities for other water-oriented activities, such as meetings by industrial, civic, governmental and educational groups.

The District Directors hope that the building will allow for more efficient achievement of the District's creed, "Dedicated to the Principle that Water Conservation is Best Accomplished Through Public Education".

## For Sewage Disposal

# Lubbock County Commissioners Ban Cesspools

by BUTCH DAVIS

Adequate water supply and sewage disposal systems are a necessity today, for obvious reasons, whether the systems serve vast municipalities or a single home. In rural areas, with population generally concentrated along rural transportation corridors and at those sites available for dissection into small parcels, these services are not provided by a municipality. In this case, the individual landowner is responsible for his own system, and, often times, the sewage works are poorly designed and maintained, creating potential pollution dangers to adjacent water supplies.

### Cesspools Illegal in Lubbock County

It was this type situation, backed by the urging of concerned parties, that prompted the County Commissioners of Lubbock County to issue an Order whereby new private sewage disposal systems are to be licensed to insure proper installation and operation, thereby reducing the possibility of groundwater contamination. This Order, issued August 11, 1975, became law upon approval by the Texas Water Quality Board on September 23, 1975.

Historically, rural families have disposed of their wastes into cesspools or pit privies. It is readily apparent that

this type of sewage disposal presents some potential for groundwater pollution. Due to their greater depths (three to six feet in diameter and as much as 60 feet deep), cesspools drilled (as opposed to dug) into the Ogallala may encounter more permeable vertically porous zones which allow rapid migration to the aquifer. Moreover, their construction and spacing (from wells) have not been specified, regulated or recorded in the past, thus, compounding the dangers of potential contamination to groundwater supplies.

The County Commissioners' Order states that new cesspools, pit privies, and injection wells are no longer lawful and that sewage shall be discharged only into an organized disposal system operating under a valid Waste Control Order issued by the TWQB, or into private sewage facilities licensed or registered in accordance with the regulations contained in the Order.

### Licensing Authority Necessary

Under this Order, all licensing func-

—continued on page 2...CESSPOOLS



E. E. "BUTCH" DAVIS

## Engineer Joins District Staff

On June 2, 1975, the District employed the newest member of its staff, Edwin Eugene "Butch" Davis. A May, 1975, graduate of Texas Tech University, Davis serves the District as Graduate Engineer.

Davis, 22, received a Bachelor of Science degree in Agricultural Engineering and graduated second in his class with a 3.37 grade point average. He was also listed on the Dean's List seven semesters.

Born in Lubbock, Davis graduated

—continued on page 4...ENGINEER



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Telephone 762-0181

REBECCA CLINTON, Editor

Second Class Postage Paid at Lubbock, Texas

District Office at Lubbock

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 Oscar Elmer \_\_\_\_\_ Field Representative  
 Clifford Thompson \_\_\_\_\_ Head, Permit Section  
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**Precinct 4**

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 Billy Wayne Sisson \_\_\_\_\_ Hereford

**Precinct 5**

(FLOYD and HALE COUNTIES)  
 Chester Mitchell \_\_\_\_\_ Lockney

**COUNTY COMMITTEEMEN**

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 C. D. Rogers, 1977 \_\_\_\_\_ Wayside  
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 Marshall Head, 1979 \_\_\_\_\_ Rt. 3, Muleshoe  
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 M. T. Darden, 1976 \_\_\_\_\_ Lorenzo  
 Donald Aycock, 1978 \_\_\_\_\_ Lorenzo  
 Alvin Morrison, 1978 \_\_\_\_\_ Lorenzo

**Deaf Smith County**

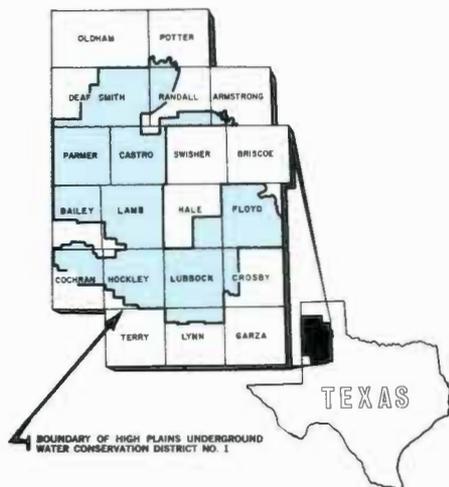
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 George Ritter, 1979 \_\_\_\_\_ Rt. 5, Hereford

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 Malvin Jarboe, 1976 \_\_\_\_\_ Route 4, Floydada  
 Connie Bearden, 1976 \_\_\_\_\_ Route 1, Floydada  
 M. M. Smitherman, 1976 \_\_\_\_\_ Silverton Star  
 Route, Floydada  
 Joe Cunyus, 1978 \_\_\_\_\_ Lockney  
 Fred Cardinal, 1978 \_\_\_\_\_ Route 4, Floydada

**NOTICE:** Information regarding times and places of the monthly County Committee meeting can be secured from the respective County Secretaries.

Applications for well permits can be secured at the address shown below the respective County Secretary's name, except for Armstrong and Potter Counties; in these counties contact Carroll Rogers and W. J. Hill, respectively.



Frank Rayner, District Manager, testifies before an Environmental Protection Agency (EPA) committee in Dallas regarding the permitting of cattle feedlot operations. EPA committee members are, from left, Ozzie Linnquist and Ralph Corley, both of Region VI, and Laura Glassman of Headquarters. Present, but not pictured, were Wally McCorkle, Andy Sielo and Pam Quinn, all of Headquarters.

**EPA Hears Testimony On Feedlot Permits**

The U.S. Environmental Protection Agency (EPA), on September 24, 1975, held an informal meeting in Dallas for the purpose of obtaining ideas from the livestock and poultry industry concerning the restructuring of the EPA feedlot permitting procedures.

As a result of a Federal court decision (Natural Resources Defense Council, Inc., vs. Russell Train, EPA, et. al.; Civil Action No. 1629, U.S. District Court for the District of Columbia, March 24, 1975) which invalidated the previous EPA permit program (established under the Federal Water Pollution Control Act Amendments of 1972, PL 92-500), it is no longer valid to use feedlot size, alone, in determining who should or should not obtain a National Pollution Discharge Elimination System (NPDES) permit from EPA.

**Rayner Testifies Before EPA**

Frank Rayner, Manager of the High Plains Underground Water Conservation District No. 1, testified before the EPA committee on September 24 and suggested alternatives regarding the permitting of feedlot operations inside the Water District.

He urged EPA to consider making the necessary wording changes in the

law, rather than trying to lobby for new legislation. He also recommended that the Agency wait until the National Commission on Water Quality releases its report before making any final decisions.

In discussing the District, Rayner noted, "The area within the jurisdictional boundaries of the District is the most concentrated agricultural area and the most concentrated cattle-feeding area in the world."

**District Has No-Pit Order**

He also pointed out that the District established a no-pit order in the mid-1950's, 12 years before the Texas Railroad Commission established such an order; that the District established the first water-quality monitoring network in Texas (in 1966, prior to PL 92-500 and PL 93-523), and developed the first injection well rules in the State.

Rayner went on to endorse the special recommendations of the American National Cattlemen's Association (ANCA) regarding feedlot sizes and the definition of concentration of cattle feeding (published in the ANCA special report, *Feedlot Runoff Control From Point/Non-Point Sources*).

—continued on page 4 . . . EPA

**CESSPOOLS . . . continued from page 1**

tions are the responsibility of the Lubbock City-County Health Department. The Licensing Authority will enforce regulations, make inspections of all private sewage facilities located or to be located within the licensing area (Lubbock County) and collect the fees required to cover costs incurred in licensing.

Minimum State requirements, as recorded in the pamphlet, entitled "A Guide to the Disposal of Household Sewage" (published by the Texas Department of Health Resources and available on request from the Lubbock City-County Health Department in Lubbock, Texas), will be enforced with respect to the installation of septic tanks and absorption bed sewage disposal systems.

Some of the requirements of the Order are minimum septic tank capacities; minimum required trench (percolation) area; minimum number and maximum length of lateral lines; depth, width and spacing of trenches, and minimum safe distances from water supplies, foundations and property lines. As a protective measure, a final performance inspection and approval

will be made by the Licensing Authority prior to earth backfill over the completed system.

Even though septic tank-drainage field systems also create some potential for pollution to groundwater supplies, the County Commissioners felt that, due to the lack of pressure heads, the greater distance the effluent must filter downward to the aquifer, while not coming into contact with the horizontally permeable zone, the less dangerous is the disposal of sewage. And, through regulation and licensing to assure quality control of the construction procedures, the potential dangers of polluting the groundwater will be greatly reduced.

The septic tank-field absorption system consists of a large settling tank (septic tank) and a drainage tile lateral (absorption system). Most of the solids are retained in the septic tank and undergo anaerobic (without oxygen) decomposition. Liquid sewage effluent travels to the absorption field where it percolates into the soils. Periodic removal of accumulated sludge in the septic tank is necessary for proper maintenance.

Through licensing, the County Com-  
 —continued on page 4 . . . CESSPOOLS

# OPEN HOUSE AND BUILDING DEDICATION



Frank Rayner, left, explains various features of the building to Don Workman, Vice President of First National Bank of Lubbock, and James R. Nichols of Fort Worth, partner in the firm of Freese, Nichols and Endress, engineering consultants to the water industry.



Directors and their wives participating in the open house activities were, left to right, Selmer Schoenrock, Maurene Schoenrock, Ray Kitten, Lorena Kitten, Alice Mitchell, Chester Mitchell, DeAun Sisson and Billy Wayne Sisson.



Floyd County Committeeman Joe Cunyus, Lockney, and his son, Ronnie, visit with Director Chester Mitchell, also of Lockney.



Ray Kitten, right, visits with E. C. Hatton of Lubbock. Hatton was a member of the original Board of Directors, appointed by the Board of Water Engineers in 1951, immediately after the District was created.



Mr. and Mrs. W. R. Steen of Wilson (center) visit with Ray Kitten left, and Oscar Riemer, Field Representative. Steen is a member of the Lynn County Committee.



Directors Chester Mitchell, Ray Kitten, Selmer Schoenrock and Billy Wayne Sisson pause for a picture with Gordon Treadaway, Attorney (second from left).



State Senator Kent Hance of Lubbock and Selmer Schoenrock stand beside the Texas State flag.



Dan Seale (center), Field Representative, gives the "tour" to Mr. and Mrs. Bill Cox. Cox was the architect of the District's new office building.



A. Wayne Wyatt and his mother, Mrs. Jim Wyatt, enjoy refreshments with Chester Mitchell. Wyatt, a former Water District employee, is with the Texas Water Development Board in Austin.



Board of Directors and Staff attending the 35th Annual State Meeting of the Soil and Water Conservation Districts, September 23-25, in Fort Worth, are, standing, Frank Rayner (second from left), Manager, and Chester Mitchell (far right), Director. Seated, are Billy Wayne Sisson, Director; Rebecca Clinton, Public Education, and Ray Kitten, President of the Board. Also pictured are, far left, Charles Wood, Director of the Texas Association of Soil and Water Conservation Districts, and Frank Gray (third from left), Director of the Texas State Soil and Water Conservation Districts Board.

EPA . . . continued from page 2

According to those testifying in Dallas, the central issue is the undefined term "concentrated animal feeding operation", which was identified by Congress as a "point source" and, thereby, requiring a permit under PL 92-500. Under the current application of the law, with no distinction between point and non-point source, every livestock production operation could be required to obtain some type of permit.

*Criterion Not Objective*

Witnesses also felt that the 1,000-animal-unit criterion only takes into account the amount of manure excreted, rather than the amount of pollutants that can reach a stream.

Rayner, and others, also urged the committee to recommend to EPA that local control of this type problem is the only solution, and that the State of Texas has been providing adequate water-pollution prevention and water-quality protection programs for years.

An example of EPA duplicating the efforts of state government is the imposition of the NPDES program in Texas. A joint permitting system now exists in Texas, whereby the Texas Water Quality Board and the EPA (through

the NPDES program) both issue permits, necessitated by the difference in the per-day fines for violations of the State versus the Federal law.

"No one, by legislation, can make all geology, geography and climate the same," said Rayner. "The current rules of EPA are unenforceable," he concluded.

**District Publishes Brochure On Office**

The District has published a new brochure, entitled "Office of the High Plains Underground Water Conservation District No. 1", which explains, in detail, the construction, financing and proposed uses of the District's new headquarters office building.

Distributed at the District's open house on September 20, the brochure also contains numerous photographs of the building, both interior and exterior, and a scale drawing of the building layout.

Copies of the brochure may be obtained by contacting the District headquarters office, 2930 Avenue Q, Lubbock, Texas.

ENGINEER . . . continued from page 1

from Shallowater High School in 1971. While at Texas Tech, he was Student Branch Member and Vice President of the American Society of Agricultural Engineers (ASAE), representative of ASAE on both the Aggie Council and Engineering Student Council, member of Tau Beta Pi (Engineering honorary) and member, Vice President and President of Alpha Epsilon (Agricultural Engineering honorary).

The recipient of four agricultural-related scholarships, Davis was raised on a farm and, during high school and college, he worked for a Lubbock County farmer and a ginning research laboratory.

Davis and his wife, Jody, reside in Lubbock. They have one daughter, Jill, three-and-one-half months old.

CESSPOOLS . . . continued from page 2

missioners hope that quality controls placed on rural sewage disposal systems will create an ecologically acceptable method of recycling waste. Such protection will also provide some measure of assurance for the continued usability of the only available water supply (groundwater pumped from wells) and will prevent severe economic loss, which would result from contamination.



**DEDICATED TO WATER CONSERVATION**—The District's new headquarters office building was dedicated, September 20, in a formal ceremony. Ray Kitten, Board President, read the dedication statement. Pictured, following the unveiling of the

dedication plaque, are Selmer Schoenrock, Vice President; Kitten, Chester Mitchell, Member, and Billy Wayne Sisson, Member.

# THE Cross SECTION

A Monthly Publication of the High Plains Underground Water Conservation District No. 1

Volume 21—No. 10

"THERE IS NO SUBSTITUTE FOR WATER"

October, 1975



Former Governor of Texas Preston Smith, Lubbock, presents his views in opposition to the proposed new State Constitution for Texas. Smith appeared before the District's Board of Directors October 22 for the purpose of analyzing portions of the document related directly or indirectly to water matters important to the District and all West Texans.

## On Texas High Plains

### EVALUATION OF WEATHER MODIFICATION ACTIVITIES

By BUTCH DAVIS

After several years of weather modification programs on the Texas High Plains, it is still to be determined to what extent (if any) cloud seeding programs have affected otherwise normal weather activity. According to "experts" speaking on both sides of the controversial issue, weather modification programs on the Texas High Plains can a) increase rainfall and decrease hail damage; b) decrease hail damage; c) have no effect on rainfall or hail damage; d) have no effect on rainfall but decrease hail damage, or e) none of the above.

It has long been man's desire to control his weather, thereby adjusting his environment to a more favorable state. Various scientists have proven that, in some instances, cloud seeding (introducing condensation nuclei into potential rainclouds) has boosted rainfall by as much as 300 to 500 percent. However, these increases are isolated and far from being the norm, and relate only to unique clouds during certain days of judicious seeding operations.

#### Hale County Farmers Organize

In 1970, farmers in Hale County endeavored to protect their farm commodities by organizing and operating a cloud seeding program which would, hopefully, reduce hail damage. Three years later, farmers in Lamb County initiated a similar program. The two groups coordinated their activities to avoid duplication.

Both operations located potential hail-producing (convective storms) clouds from ground-based radar, and then directed aircraft to perform the

seeding before the cloud reached hail stage. Silver iodide particles were released from pyrotechnic devices and wing tip generators while flying at the base of the cloud. Strong updrafts carried the silver iodide particles up into the cloud where they became condensation nuclei for water vapor preventing the buildup of hailstones.

#### Report Studies 14 Counties

In a report\* submitted to the Texas Water Development Board in Austin by the Center of Applied Geosciences, College of Geosciences, Texas A & M University, considerable statistical analysis was made on rainfall and hail damage data for a 14-county area in the Texas High Plains for the years 1966 to 1973. Three counties (Floyd, Hale and Lamb) conducted hail suppression programs through cloud seeding during the four-year period, 1970-1973.

The other 11 counties (Bailey, Briscoe, Castro, Cochran, Crosby, Hockley, Lubbock, Lynn, Parmer, Swisher and Terry) were considered surrounding control counties having no weather modification programs.

One of the objectives of this report was to estimate the effect (if any) of cloud seeding on 1) rainfall and 2) hail-related cotton crop damages. To be completely objective, the authors avoided fallacious inferences which attribute rainfall and/or hail damage changes on cloud seeding operations.

#### Typical Assumption Cited

An example of this type inference is assuming that changes in the rainfall of a particular county, from a non-seeded to seeded year, is a result of

cloud seeding operations, when the change may actually be due to a general, regional weather change, irrespective of seeding operations.

Similarly, rainfall differences between two adjacent seeded and non-seeded counties during the same year may be due to persistent differences in the two counties and *not* due to a seeding program.

Rainfall data from 22 observation stations within the 14-county area were subject to comprehensive tests to determine the sources and extent of variation between the rainfall amounts observed during the 1966 to 1973 period. According to the report, the data revealed that "statistical analysis

—continued on page 3... EVALUATION

### DIRECTORS HEAR TESTIMONY ON PROPOSED STATE CONSTITUTION

The proposed new Constitution for Texas, to be accepted or rejected (in part or in full) by the State's voters November 4, was the major subject of discussion at the District's Board of Directors' meeting October 22.

Former Governor Preston Smith and Betty Anderson, President of the Texas League of Women Voters, both of Lubbock, presented to the Board opposing views on nearly every article of the proposed new charter.

Governor Smith said he opposes the new document because "I believe we move from a Constitution that is restrictive to one that is permissive." "The need is simply this," he con-

tinued. "The Constitution is there to protect the people from the government."

Mrs. Anderson said she did not share the former Governor's "fear" that people should be protected from government. "I believe that government should be for the people."

#### Present Constitution Restrictive

She added, "Because our present Constitution is so restrictive, the Legislature has found it necessary to submit 95 Constitutional amendments in the last 30 years concerning financing State and local government." Governor Smith retorted, "Yes, but the people got to vote on them."

Frank Rayner, District Manager, analyzed several articles of the proposed Constitution, particularly those related to or directly affecting the District. Reviewed in detail were the provisions for annual sessions and legislative salaries, checks and balances between the three branches of government, local government financing and taxation, and environmental and water development issues (see related story on page 3 of this issue).

#### Legislature Given More Power

Rayner noted that the proposed Constitution appears to grant more legislative discretion than has been historically accorded the Legislature for more than 100 years.

He pointed out to the Board that the words, "except as authorized by this constitution", were a provision of the separation of powers article and that

—continued on page 4... DIRECTORS



Texas League of Women Voters President Betty Anderson of Lubbock analyzes the proposed new State Constitution from the proponent's viewpoint. She explained to the District's Board of Directors arguments in favor of several of the major issues of concern in the proposed document. (See related article and photograph on this page.)

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 Cordell Mahler, 1979 \_\_\_\_\_ Wayside

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 Harold Layton, 1979 \_\_\_\_\_ Rt. 2, Morton

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Garnett Holland, Secretary

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2930 Avenue Q, Lubbock

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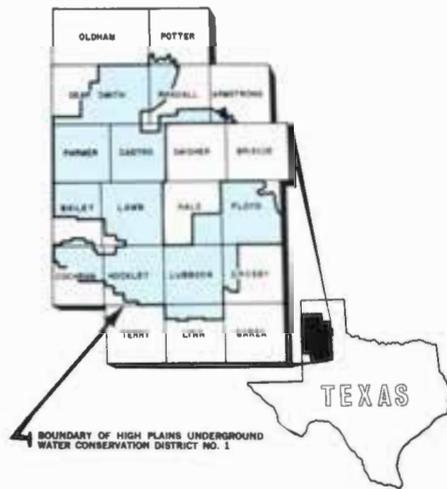
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Helen Bertrand, Secretary

Farm Bureau, 101 S. Wall Street, Floydada

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 M. M. Smitherman, 1976 \_\_\_\_\_ Silverton Star  
 Route, Floydada  
 Joe Cunyus, 1978 \_\_\_\_\_ Lockney  
 Fred Cardinal, 1978 \_\_\_\_\_ Route 4, Floydada



**Hale County**

J. B. Mayo, Secretary

Mayo Ins., 1617 Main, Petersburg

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 Homer Roberson, 1976 \_\_\_\_\_ Box 250, Petersburg  
 Henry Kveton, 1978 \_\_\_\_\_ Route 2, Petersburg  
 Gaylord Groce, 1978 \_\_\_\_\_ RFD, Petersburg

**Hockley County**

Jim Montgomery, Secretary

609 Austin Street, Levelland

Ewel Exum, 1976 \_\_\_\_\_ Route 1, Ropesville  
 Douglas Kauffman, 1976 \_\_\_\_\_ 200 Mike, Levelland  
 Billy Ray Carter, 1976 \_\_\_\_\_ Route 5, Levelland  
 J. E. Wade, 1978 \_\_\_\_\_ Route 2, Levelland  
 Jimmy Price, 1978 \_\_\_\_\_ Route 3, Levelland

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620 Hall Avenue, Littlefield

Gene Templeton, 1976 \_\_\_\_\_ Star Route 1, Earth  
 W. W. Thompson, 1976 \_\_\_\_\_ Star Route 2, Littlefield  
 Donnie Clayton, 1976 \_\_\_\_\_ Box 276, Springlake  
 Billy J. Langford, 1978 \_\_\_\_\_ Box 381, Olton  
 Edward Fisher, 1978 \_\_\_\_\_ Box 67, Sudan

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Clifford Thompson, Secretary

2930 Avenue Q, Lubbock

Glenn Blackmon, 1976 \_\_\_\_\_ Route 1, Shallowater  
 Andrew (Buddy) Turnbow, 1976 \_\_\_\_\_ Route 5,  
 Box 151 B, Lubbock  
 Alex Bednarz, 1976 \_\_\_\_\_ Route 1, Slaton  
 Dan Young, 1978 \_\_\_\_\_ 4607 W. 14th St., Lubbock  
 Clifford Hilbers, 1978 \_\_\_\_\_ RFD, Idalou

**Lynn County**

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O. R. Phifer, Jr., 1976 \_\_\_\_\_ New Home  
 S. B. Rice, 1976 \_\_\_\_\_ Route 1, Wilson  
 W. R. Steen, 1976 \_\_\_\_\_ Route 2, Wilson  
 Orville Maeker, 1978 \_\_\_\_\_ Route 1, Wilson  
 Freddie Kleth, 1978 \_\_\_\_\_ New Home

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Horn Insurance Agency, Bovina

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 Joe Moore, 1977 \_\_\_\_\_ Box J, Lazbuddie  
 Dalton Caffey, 1977 \_\_\_\_\_ 15th St., Friona  
 Floyd Reeve, 1979 \_\_\_\_\_ Box 1196, Friona  
 Ralph Roming, 1979 \_\_\_\_\_ 809 Ridslea Dr., Bovina

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 Albert Nichols, 1977 \_\_\_\_\_ Rt. 1, Box 491, Amarillo  
 F. G. Collard, 1979 \_\_\_\_\_ Rt. 1, Box 433, Amarillo  
 W. J. Hill, 1979 \_\_\_\_\_ Box 53, Bushland

**Randall County**

Mrs. Louise Tompkins, Secretary

Farm Bureau, 1714 Fifth Ave., Canyon

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 Joe Albracht, 1977 \_\_\_\_\_ Box 81, Bushland  
 Leonard Batenhorst, 1977 \_\_\_\_\_ Rt. 1, Canyon  
 Bill Dugan, 1979 \_\_\_\_\_ Rt. 2, Box 30, Happy  
 John F. Robinson, 1979 \_\_\_\_\_ 1002-7th St., Canyon

## FLORIDA WATER DISTRICT INITIATES CONSUMPTIVE USE PERMITTING PROGRAM

Beneficial use of remaining water supplies is a concern of many areas of the country—not just the High Plains of Texas. The Governing Board of the Southwest Florida Water Manage-

ment District (SWFWMD), Brooksville, Florida, has implemented a new permitting program whereby farmers, citrus growers, cattle ranchers, mining and power companies and many large industries—all large water users—must apply for a Consumptive Use Permit.

## WT Water Institute to Co-sponsor Food and Water Conference

The West Texas Water Institute (WTWI) will co-sponsor a conference in Lubbock on January 30, 1976, which will deal with the timely subject, "Population, Food and Water: West Texas Faces the Challenge".

Joining the WTWI in planning the day-long conference are the College of Agricultural Sciences, Texas Tech University; Texas Department of Agriculture, Planned Parenthood Association, West Texas Chamber of Commerce and the Lubbock Chamber of Commerce.

According to Bill Glover, Assistant to the Commissioner of Agriculture, Texas Department of Agriculture, the thrust of the conference will reflect the growing conviction that the solution to regional and national agricultural problems must be examined in the context of population trends and resource use. "Once we see the crucial problems facing the world through overpopulation and massive hunger, the strategic value of the High Plains for agricultural productivity becomes even more evident.

## Productivity Dependent Upon Water

"Yet, the abundant productivity of the High Plains is dependent upon the exhaustible water found in the Ogallala aquifer. Any alternative method of bringing surface water into the High Plains entails tremendous financial and energy problems. It is, therefore, absolutely necessary for people in rural and urban areas of the High Plains to do everything possible to conserve the limited and unreplenishable groundwater still available."

According to the September, 1975, issue of the *Hydroscope*, monthly publication of the SWFWMD, the program, effective since January, 1975, requires that "anyone in the District who withdraws more than one million gallons of water per day (gpd); or whose withdrawals average more than 100,000 gpd on an annual basis; or whose facilities have a capacity of more than one million gpd; or whose well has an inside diameter of six inches or more must have a permit."

## New Users Must Have Permit

Any new users of water in these quantities must have a permit before withdrawal can begin. Existing water users, however, have until December 31, 1976, to apply.

To receive a Consumptive Use Permit, an applicant must demonstrate that the intended use will be "reasonable and beneficial—that is, the use of the quantity must be necessary for economic and efficient utilization and for a purpose and in a manner which is consistent with the public interest". Also, the intended use must not interfere with any existing legal water usage.

"If the intended use will adversely affect the water resources—lower a stream's flow, the potentiometric surface or water table, decrease surface levels, significantly induce salt water encroachment—or will exceed the water crop for the lands controlled by the applicant, the permit may be denied." The Governing Board may also grant exceptions if the use is shown to be consistent with the public good, and may modify and place conditions on permits as it determines are necessary.



James F. Moore of Lubbock, right, presents to Board President Ray Kitten a copy of the Declaration of Independence of the State of Texas. The document, presented to the late Judge Pat S. Moore, 72nd District Court, in appreciation for her participation in several years of installation services for newly-elected Directors, was returned to the District by her husband and will be hung in the District's new office building in her honor.

**NOTICE:** Information regarding times and places of the monthly County Committee meeting can be secured from the respective County Secretaries.

Applications for well permits can be secured at the address shown below the respective County Secretary's name, except for Armstrong and Potter Counties; in these counties contact Carroll Rogers and W. J. Hill, respectively.



State Senator Max Sherman, Amarillo, and State Senator Kent Hance, Lubbock, participate in a news conference October 28 in the District's Lubbock office. The subject of the conference was the proposed new State Constitution, to be presented to the voters of Texas November 4.

## Haves vs. the Have-Nots: Should Water be Shared?

The idea of sharing natural resources is discussed more and more frequently these days, with the shocking realization in many areas of the country that water, natural gas and oil are becoming more and more scarce with ever-increasing consumption.

Dick Reavis, writer for *The Moore County News-Press*, Dumas, Texas, reported in a recent article in that newspaper that U. S. Senator John Glenn of Ohio has been arguing in the Senate that "natural gas should be regarded as a national resource, not one belonging to the state in which it is found."

### State Should Not Be Without Resource

Reavis theorized, like the Senator, that a state without a natural resource, whether it be natural gas or water, should not be without this resource because of a geographic misfortune.

Speaking of the surplus water avail-

able at certain times of the year in the banks of the Mississippi River, he wrote, "Down the road a few years this same kind of national thinking needs to be applied to surplus water that can be imported to Texas, where there is a shortage every now and then."

### Proposed Texas Constitution

Reavis has made a good point, but it should also be noted that the Texas Legislature has put before the voters of Texas (in the form of a proposed new State Constitution) a different view on sharing between the haves and have-nots. One very encouraging addition to the proposed new Constitution, Section 8(b), Conservation and Development of Natural Resources, states, "No state fund established for purposes of water development, transmission, transfer, or filtration may be used to finance a project that contemplates or results in removing surface water from the river basin of origin if the surface water is necessary to supply the reasonably foreseeable water requirements of the basin for the ensuing 50 years. This subsection does not apply to a removal of water (1) that is sufficiently replaced to the point of removal from outside the state or (2) that is on a temporary, interim basis."

However, the following question arises. If the provision restricts movement of water from the basin of origin to another basin for the next 50 years, when does the 50-year period commence? Under the present system, adopted in 1962, it could be said the period would end in 2012. And, if the proposed new constitution is approved, the 50-year period would expire in 2026.

### Amendment Would Increase Funds

Even if the provision of the proposed new constitution fails November 4, Senate Joint Resolution Number 49, adopted by the Texas Senate on April 17, 1975, and by the Texas House of Representatives on May 27, 1975, which is a proposed amendment to the

—cont. on page 4 . . . HAVES

### EVALUATION . . . continued from page 1

of rainfall data indicate that cloud seeding does not influence rainfall."

#### Results Same for Cotton Losses

Likewise, exhaustive tests were applied to the effect of cloud seeding on the percentage cotton losses incurred by operators who reported losses due to hail. Again the results—"statistical analysis of cotton losses attributed to hail and insurance damages paid due to hail damage on cotton indicates that the hail suppression program did not significantly affect cotton hail damage."

Indeed, the findings of the report suggest that weather modification attempts in the area have had no significant effect on the observed rainfall distribution or hail damage. However, this does not prove that there is no effect from seeding programs. It appears that the "question" of weather modification remains unanswered.

\*An Evaluation of Weather Modification Activities in the Texas High Plains, Texas Water Development Board Report 193, by James R. Scoggins, P. Das, John F. Griffiths, Herman O. Hartley, Ronald D. Lacey and George W. Bomar.

## GROUNDWATER MANAGEMENT WORKSHOP SCHEDULED FOR DECEMBER 9 AND 10

Groundwater conservation district directors and managers from the Great Plains States of Texas, Kansas, Nebraska, Colorado and Oklahoma will conduct a groundwater management workshop December 9 and 10 at the Silver Spur Convention Center in Dodge City, Kansas.

The major thrust of the workshop will be to discuss and study three major areas of concern to groundwater management districts: 1) Government's Role in Groundwater (with statements by Federal, state and local government officials); 2) Reports of Local Management Districts (a discussion by managers and directors of what local districts are doing), and 3) Energy Outlooks for Pump Irrigators (representatives from the natural gas, petroleum products and electricity industries and the Federal Power Commission and the Federal Energy Administration).

Nebraska's new Groundwater Man-

agement Act, signed into law in May, 1975, will also be reviewed during an informal session on the evening of December 9. (For more information on the Act, see the July, 1975, issue of *The Cross Section*.)

Members of the committee sponsoring the workshop are Frank Rayner, District Manager; DeLynn Hay, Extension Agricultural Engineer, Kansas State University; Deon Axthelm, Extension Water Resources Specialist, University of Nebraska-Lincoln; Bonita Hoeme, Secretary-Treasurer, Texas County Irrigation District, Guymon, Oklahoma; John Vasa, Chairman, Frenchman Groundwater Management District, Holyoke, Colorado, and Milvern Noffke, Manager, Big Blue Association of Groundwater Districts, York, Nebraska.

Anyone interested in obtaining a copy of the conference schedule should contact the Water District office in Lubbock.

## Questionnaires Mailed to Farmers

Approximately 75,000 Texas farmers and ranchers will receive a crop or livestock questionnaire between mid-November, 1975, and early January, 1976. In order to provide comprehensive information on Texas agriculture, this roundup survey of crop production and livestock numbers is made annually by the Texas Crop and Livestock Reporting Service, in cooperation with the Texas Department of Agriculture and the Statistical Reporting Service, U. S. Department of Agriculture.

#### Producers Selected by Size

According to Charles E. Caudill, Agricultural Statistician in Charge of the Texas Crop and Livestock Reporting Service, Austin, producers from each of the 254 counties in Texas are

—cont. on page 4 . . . QUESTIONNAIRES



State Senators Kent Hance of Lubbock (second from left) and Max Sherman of Amarillo (second from right) visit with District Directors Chester Mitchell (far left) and Ray Kitten (far right). Senators Hance and Sherman were in the District's Lubbock headquarters office to explain various aspects of the

proposed new State Constitution, to be voted on by the electorate November 4. The Legislators also participated in a press conference in the District's Board of Directors' room October 28. (See related photograph on this page.)

## Elementary School Students Study Groundwater Conservation

Dan Seale, District Field Representative, visited with 110 fourth and fifth grade students at Stubbs Elementary School in Lubbock, September 26.

In a slide presentation, Seale pointed out the areas in West Texas where the water is stored underground (in the Ogallala formation), and explained the reasons farmers originally turned to irrigation (after the Dust Bowl days of the 1930's) and how modern-day technology is being applied to conserve the remaining supply of water.

He also discussed with the students how some farmers waste water and ways they can learn to conserve it for their children—the future farmers of America.

One of the subjects in which the students displayed the most concern was abandoned wells. The slides revealed the dangers to children playing in a field where an open hole may be camouflaged from view. Seale pointed out that, in the District, no lives have been lost but that the danger is still present, and the District is searching out these abandoned wells and ensuring that they are properly covered and made safe.

*The Cross Section* would like to encourage other educators to contact District personnel to make a similar presentation in their area.



Dan Seale, District Field Representative, answers questions following a slide presentation before more than 110 fourth and fifth grade students at Stubbs Elementary School in Lubbock. The District's Board of Directors believes that this type discussion is an excellent means of furthering the message embodied in the District's creed, "Dedicated to the Principle That Water Conservation is Best Accomplished Through Public Education".

### QUESTIONNAIRES . . . cont. from page 3

selected proportional to size of operation.

"The small producer sampled represents many others of comparable size, while the very largest producers will represent only themselves. It is equally important for all farmers and ranchers receiving a questionnaire to complete and return it promptly," said Caudill.

The individual report is confidential—available to no other government agency or anyone except those persons required to process the data. The State and county estimates published will be made available for everyone at the same time.

County statistics for 1974 and January 1, 1975, are available on livestock, poultry, dairy, field crops, small grains, cotton, vegetables, fruits and pecans, and cash receipts from the sale of Texas farm commodities. Bulletins can be obtained from the Texas Crop and Livestock Reporting Service, P. O. Box 70, Austin 78767.

### HAVES . . . continued from page 3

new or old constitution, would authorize an additional \$400 million in Texas water development bonds.

If approved, the amendment (Section 3[c][2]) would provide that "an implementing law under this section must further provide that no state fund established for purposes of water development may be used for the development of water resources from the Mississippi River."

Therefore, if the voters adopt the new constitution or the proposed amendment to it (Senate Joint Resolution 49), they will be diminishing West Texans' chances of receiving State funding for bringing surplus East Texas or Mississippi River water to West Texas. And, it causes one to ask the following question: If West Texans cannot convince their own State Legislators of the importance of "sharing", how will they be able to convince anyone on the national level to bring water to the High Plains irrigation complex?

### DIRECTORS . . . continued from page 1

words to the effect, "as authorized by the Legislature", "as provided by the Legislature" and "as authorized by law", were replete throughout the proposed Constitution.

Comparing the present form of the Texas Constitution to the Ten Commandments, in as much as both documents are written in the restrictive sense (what one, and the Legislature, shall not do), Rayner said the proposed Constitution takes the form of what the Legislature "can do", "may do" or "shall do".

Regarding annual sessions, Smith opposes the idea because they are more costly than a session every other year. Mrs. Anderson claimed that the last three Governors have approved annual budgeting and that "we cannot have annual budgeting without annual sessions." She added, "Texas is the third largest State and it is imperative that we deal with public problems before they become crises."

The two speakers agreed, however, on a provision under the article on the Executive which allows the Governor, with consent of the Senate, to remove appointed officials of boards and agencies, before their terms expire, when they neglect or abuse their responsibilities.

### Finance Article Discussed

Governor Smith and Mrs. Anderson also noted some provisions in the Finance Article that are of special concern to West Texans. The new Constitution prohibits sales taxes on agricultural machinery and parts, as well as taxes on food and medicine. It also mandates the Legislature to provide, by law, a separate formula for the appraisal of farm and ranch land.

It also provides for equal and uniform ad valorem taxation of all property that realistically can be subjected to property taxation, for taxation in proportion to market value and for new procedures for taxpayer suit of arbitrary or unequal taxation.

# THE Cross SECTION

A Monthly Publication of the High Plains Underground Water Conservation District No. 1

Volume 21—No. 11

"THERE IS NO SUBSTITUTE FOR WATER"

November, 1975

## District Conducts Energy Conference

In order to explore the avenues to energy conservation and, thus, water conservation, the High Plains Water District conducted a working conference October 24 in the District's Lubbock headquarters office.

According to Frank Rayner, District Manager, the workshop was held in an effort to "correlate energy and water conservation in such a manner that the District's irrigators will become aware of how important both energy and water conservation are to their economic survival".

The workshop was organized as a working group in an effort to bring together experts in the energy supply and use fields to explore the needs for energy and water conservation and for investigating the feasibility of the District's establishing a program for measuring pumping plant efficiencies which would aid irrigators in making economical decisions as to the advisability of workover or replacement of inefficient units.

### Proceedings Recorded

The proceedings of the one-day conference were recorded. A decision will be made by the participants in the near future as to whether the proceedings should be published.

Presenting prepared statements were A. Wayne Wyatt, Texas Water Development Board, Austin, "Groundwater Availability, Pumping Levels and Well Capacities—Present and Future"; James Halsey and Bob Mills, Pioneer Natural Gas Company, Lubbock and

—continued on page 3... ENERGY



A Wayne Wyatt, Assistant Director, Ground Water Data and Protection Division, Texas Water Development Board, discusses the subject, "Groundwater Availability, Pumping Levels and Well Capacities—Present and Future", during the Water

District's energy and water conservation conference October 24. Other topics of concern were the availability of natural gas and electricity for irrigation and pump and powerplant efficiencies. (See related photographs on page 3.)

## CORPS OF ENGINEERS EXPLAINS "SECTION 404 PERMIT PROGRAM"

The United States Army Corps of Engineers, under Section 404, Federal Water Pollution Control Act Amendments of 1974 (PL 92-500), has expanded its traditional role of regulating "navigable waters of the United States" to regulating "all waters of the United States". And, as in the case of all Federal bureaucracy, with regulatory powers come certain controls and procedures—in this case, the "Section 404 permit program".

Since 1899, the Corps has been charged with the non-military function of protecting the U. S. navigation channels and harbors against encroach-

ments and, more recently, restoring and maintaining water quality by regulating the discharge of dredged or fill material in coastal and inland waters and wetlands.

Initially, the Corps limited its regulatory authority under Section 404 to "waters which are presently used, were used in the past, or could be used by reasonable improvements to transport interstate commerce".

### Corps' Authority Challenged

Limiting the Corps' authority under Section 404 to navigable waters of the United States was successfully challenged in the U. S. District Court for the District of Columbia. On March 27, 1975, the Court directed the Corps of Engineers to extend its responsibility to regulate the discharge of dredged or fill material under Section 404 to all waters of the United States and to revise its regulations accordingly.

The Court interpretation of PL 92-500 extended the Corps' jurisdiction to "all rivers, lakes and streams up to their headwaters, including contiguous and adjacent wetlands".

A proposed draft regulation was published in the *Federal Register* on May 6, 1975, and an interim final regulation, entitled, "Permits for Activities in Navigable Waters or Ocean Waters", was published on July 25, 1975, and became effective on that date.

The various Corps Districts are currently in the process of conducting public hearings across the country for the purpose of explaining the scope of

the new program and answering questions. Under the new regulations, the Corps' authority will be "extended to many areas that have never been regulated before".

The Corps, in what it calls a "moderate and reasonable approach", will expand its authority in a three-phase program over the next two years.

—continued on page 3... CORPS

## Irrigation Gas Priority Raised to No. 2 by FPC

The Federal Power Commission (FPC) issued an opinion November 13 affirming the July 24 decision of FPC Administrative Law Judge Curtis L. Wagner that natural gas used for irrigation qualifies as "process gas" and should, therefore, be re-classified as a No. 2 priority (commercial), rather than a No. 3 priority (industrial).

The Commission found, in opinion 745, "(1) facilities to provide electric energy to substitute for natural gas for El Paso's irrigation pumping requirements do not exist at present, nor will such facilities be available in the immediate future, and (2) due to the absence of available alternate fuels, irrigation pumping requirements served by the El Paso system should be classified as 'process gas' for purposes of curtailment priority classification."

Process gas is defined by the FPC as a use for which alternate fuels are

—continued on page 3... IRRIGATION



Len Brown, Staff Scientist with the Office of Water Research and Technology, U. S. Department of the Interior, visited the District's Lubbock headquarters November 18 and 19 for the purpose of familiarizing himself with some of the water resources problems of the High Plains of Texas. From left, are Brown, Frank Rayner, District Manager; Board President Ray Kitten, and Secretary-Treasurer Webb Gober. (See related photograph on page 2.)



## Energy, Water and Government to be Topics of Ground Water Management Workshop

The second Ground Water Management Workshop will be held December 9 and 10 at the Silver Spur Convention Center, Dodge City, Kansas. Sponsored by local management districts, the Cooperative Extension Service and the Great Plains Council Water Resources Committee, the workshop will bring together groundwater conservation district directors and managers from the Great Plains States of Texas, Kansas, Nebraska, Colorado and Oklahoma (see the October, 1975, issue of *The Cross Section*).

A registration fee of \$7 per person should be mailed by December 5 to Dave Pope, Ground Water Management Workshop, 1501 Fulton Terrace, Garden City, Kansas 67846. Registration fees are refundable if cancellation notice is received by December 5.

The schedule for the two days is reprinted below.

### TUESDAY, DECEMBER 9

#### Ground Water Management and Government

- 8:30—Introduction and Conference Objectives, DeLynn Hay, Extension Agricultural Engineer, Kansas State University, Manhattan
- 8:45—"The Federal Role in Ground Water Management", Ed Hockman, Chief, Groundwater Supply Section, Office of Water Supply, EPA, Washington, D.C.
- 9:25—"State and Local Roles in Ground Water Management", Harry Burleigh, Executive Director, Texas Water Development Board, Austin
- 10:05—Coffee
- 10:20—"The Allocation Dilemma", Keith Krause, Executive Director, Kansas Water Resources Board, Topeka
- 10:50—"What Do the People Think of District and Management Policies?", Frank Baird, Associate Professor, Department of Political Science, Texas Tech University, Lubbock
- 11:15—Floor Discussion with the Speakers

#### Resource Management—District Reports

- 1:15—"Operational Weather Modification—Muddy Road I", Keith Lebbin, Manager, Western Kansas Groundwater Management District #1, Scott City
- 1:35—"The Benedict Water Management Area—Start Toward Allocation", Milvern H. Noffke, Manager, Blue River Association of Groundwater Conservation Districts, York, Nebraska; H. Robert Mulliken, Consultant, Irrigation, Hastings, Nebraska
- 2:15—"Upper Frenchman Creek Watershed Program", Dwayne Konrad, Extension Agricultural Engineer, Colorado State University, Burlington
- 2:35—Idea Exchange—Other District Programs
- 3:30—Coffee
- 3:45—Business Session
- 6:00—Dinner on your own
- 8:00—"Nebraska's New Groundwater Management Act", Lee Orton, Executive Director, Nebraska Association of Resources Districts, Lincoln

### WEDNESDAY, DECEMBER 10

#### Energy and Ground water

- 8:15—"Outlook for Natural Gas Supplies", Robert Robel, Professor, Department of Biology, Kansas State University, Manhattan
- 8:40—"The Gas Industry Looks at Natural Gas Use", Rodney J. White, Director, Customer Relations, Northern Natural Gas Company, Omaha, Nebraska
- 9:05—"Outlook for Diesel and Propane Fuels", Dave Arthur, Executive Director, Fuels and Lubricant Sales, Farmland Industries, Kansas City, Missouri
- 9:35—"Outlook for Electric Power", LaVerne Stegerson, Agricultural Engineer, Agricultural Research Service, USDA, University of Nebraska, Lincoln
- 10:05—Coffee
- 10:20—"The Federal Power Commission—How It Affects the Irrigator", Bill Beselka, Civil Engineer, Regional Office, Federal Power Commission, Fort Worth
- 10:50—"The Federal Energy Administration—How It Affects the Irrigator", Lloyd Costley, Agricultural Irrigation, Office of Regulatory Progress, Federal Energy Administration, Washington, D.C.
- 11:20—Questions and Floor Discussion
- 12:15—Adjourn

#### A MONTHLY PUBLICATION OF THE HIGH PLAINS UNDERGROUND WATER CONSERVATION DISTRICT NO. 1

2930 Avenue Q, Lubbock, Texas 79405

Telephone 762-0181

REBECCA CLINTON, Editor

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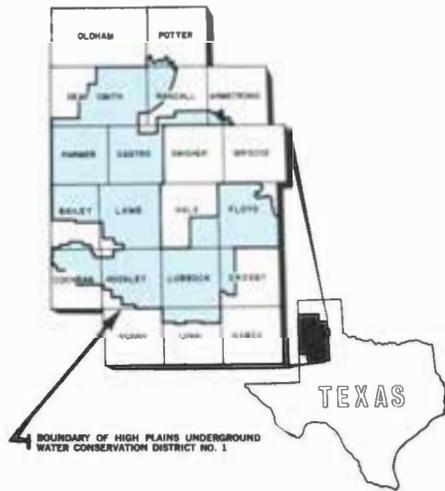
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 609 Austin Street, Levelland  
 Ewel Exum, 1976 \_\_\_\_\_ Route 1, Ropesville  
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- Potter County**  
 Henry W. Gerber, 1977 \_\_\_\_\_ Rt. 1, Amarillo  
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 Albert Nichols, 1977 \_\_\_\_\_ Rt. 1, Box 491, Amarillo  
 F. G. Collard, 1979 \_\_\_\_\_ Rt. 1, Box 433, Amarillo  
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- Randall County**  
 Mrs. Louise Tompkins, Secretary  
 Farm Bureau, 1714 Fifth Ave., Canyon  
 Harry LeGrand, 1977 \_\_\_\_\_ 4700 S. Bowie, Amarillo  
 Joe Albracht, 1977 \_\_\_\_\_ Box 81, Bushland  
 Leonard Batenhorst, 1977 \_\_\_\_\_ Rt. 1, Canyon  
 Bill Dugan, 1979 \_\_\_\_\_ Rt. 2, Box 30, Happy  
 John F. Robinson, 1979 \_\_\_\_\_ 1002-7th St., Canyon



Members of the Water District staff and Board of Directors, as well as water resources specialists from several educational institutions and representatives of two energy suppliers, met in the District's Lubbock office November 18 and 19 for the purpose of reviewing the water situation in West Texas with Len Brown, Staff Scientist, Office of Water Research and Technology, U. S. Department of the Interior. The District provided the facilities for the meeting and acquainted Brown with the District's research and technical capabilities. Representatives from the Texas Agricultural Experiment Station, Texas A&M University, Texas Tech University, Pioneer Natural Gas, Southwestern Public Service and the Lubbock Chamber of Commerce met with Brown during his two-day visit to the area. (See related photograph on page 1.)

**ENERGY . . . continued from page 1**

Amarillo, respectively, "Natural Gas for Irrigation; Adequacy and Availability of Supply, Cost—Present and Future"; Glenn Bickel and Bill Helton, Southwestern Public Service Company, Plainview and Amarillo, respectively, "Electricity for Irrigation; Adequacy and Availability of Supply, Cost—Present and Future".

Also making statements were Rick Akeroyd and Don McElroy, Stewart and Stevenson Services, Inc., Lubbock, "Pump and Powerplant Efficiencies; Significance, Measurement and Improvement"; several representatives from electric cooperatives and irrigation businesses, "Pumping Plant Efficiency Measurement Programs", and Dr. James Osborn, Texas Tech University, "Cutting Cost of Irrigation Through Proper Pumping Plant Maintenance, Energy and Water Management".

**Workshop Participants**

Also participating in the workshop were David Brack, Swisher Electric Cooperative, Inc., Tulia; J. W. Coppedge, Bailey County Electric Cooperative Association, Muleshoe; Butch Davis, Engineer in Training, High Plains Water District; Joe Harbin, Bailey County Electric Cooperative, Muleshoe; Alton Higginbotham, Lighthouse Electric Cooperative, Inc., Floydada; James T. Hull, Deaf Smith Electric Cooperative, Inc., Hereford; Don McReynolds, Geologist, High Plains Water District, and W. G. Newton, South Plains Electric Cooperative, Inc., Lubbock.

Others were Dr. Bill Ott, Texas Agricultural Experiment Station, Lubbock; Lyle M. Robinson, Swisher Electric Cooperative, Inc., Tulia; Ronnie J. Shepherd, Brandon and Clark Electric Company, Inc., Lubbock; Don Smith, Geologist, High Plains Water District; Dr. Robert Sweazy, Texas Tech University, and Newton C. Vance, Gifford-Hill and Company, Inc., Lubbock.

**IRRIGATION . . . continued from page 1**

not technically feasible.

The Commission's decision causes El Paso Natural Gas Company to raise the priority of natural gas used by its irrigation customers in its overall curtailment plan. The re-classification makes the possibility of curtailment, in cases of severe shortages of natural gas, less likely and will allow farmers to more easily obtain financial assistance for winter crops, such as wheat.

The ruling was the result of a December 19, 1974, FPC ruling (Opinion 697-A) which lowered the priority of irrigation from a No. 2 category to No. 3. This conflicted with El Paso's curtailment plan and El Paso filed a motion for a rehearing. The motion was denied, but the Commission scheduled an expedited hearing to consider El Paso's "process gas" conclusion.

**Fuel Conversion Not Feasible**

Following three public hearings (one held in Lubbock May 15 and 16), Judge Wagner issued an opinion concurring with testimony received from approximately 2,000 farmers and other witnesses who argued that they could not afford to convert their irrigation engines from natural gas to other fuels without a massive capital outlay that would probably cause many to return to dryland farming.



Jim Osborn, left, Chairman of the Department of Agricultural Economics, Texas Tech University, discusses ways to cut the cost of irrigation through proper pumping plant maintenance and energy and water management, while



western Public Service Company, and Bob Mills, Pioneer Natural Gas Company, give their views on methods to conserve energy in irrigation farming. (See photograph and article, "District Conducts Energy Conference", on page 1.)

**CORPS . . . continued from page 1**

*Phase I*, effective July 25, 1975, extends the Corps' regulation of disposal of dredged or fill material to the traditional "navigable waters of the United States" and contiguous or adjacent wetlands.

*Phase II*, effective July 1, 1976, will expand the Corps' permit program into primary tributaries of navigable waters of the United States, all natural lakes greater than five acres, and the contiguous or adjacent wetlands.

*Phase III*, after July 1, 1977, will extend the Corps' authority to cover "all waters" of the United States, which include secondary tributaries, and any stream greater than five cubic feet up to its headwaters, and associated wetlands.

**Additional Activities Included**

Along with the discharge of material which has been dredged or excavated from any waters of the United States, the following *additional types of activities* will also be regulated by this program: 1) site developmental fills for recreational, industrial, commercial, residential and other uses; 2) causeways or road fills; 3) dams and dikes; 4) artificial islands; 5) property protection and/or reclamation devices such as riprap, groins, seawalls, breakwaters and bulkheads and fills; 6) beach nourishment; 7) levees; 8) sanitary landfills, and 9) backfill required for the placement of structures such as sewage treatment facilities.

However, the Corps says that, under Section 404, *normal farming practices* are exempt from regulation. *Section 404 does not apply to such normal farming practices as plowing, cultivating, seeding and harvesting. Nor does it apply to such farm and ranch conservation practices as terracing, land leveling and the construction of check dams unless they occur in a water of the United States.*

*However, damming of major streams, diking and the discharge of dredged or fill material in wetlands associated with farm practices will require permits.*

**Definition of Terms Important**

The greatest conflict in the new permitting procedures is expected to occur in defining certain terms, such as lakes, wetlands, navigable waters, dredged material, fill material, etc. Some of the terms which might affect the farming industry are listed below.

• *Lakes* — natural bodies of water

greater than five acres in surface area and all bodies of standing water created by the impounding of navigable waters. Stock watering ponds and settling basins that are not created by such impoundments are not included.

• *Headwaters* — the point on the stream above which the flow is normally less than five cubic feet per second; provided, however, the volume of flow, point and non-point source discharge characteristics of the watershed, and other factors that may impact on the water quality of waters of the United States will be considered in determining this upstream limit.

• *Dredged Material* — material that is excavated or dredged from navigable waters. The term does not include material resulting from normal farming, silviculture and ranching activities, such as plowing, cultivating, seeding and harvesting, for production of food, fiber and forest products.

• *Fill Material* — any pollutant used to create fill in the traditional sense of replacing an aquatic area with dry land or of changing the bottom elevation of a water body for any purpose. Fill material does not include material resulting from normal farming, silviculture and ranching activities such as plowing, cultivating, seeding and har-

vesting, for the production of food, fiber and forest products.

However, the farming exemptions listed in the program do *not* mention two farming practices most common to the High Plains — playa lakes and grassed waterways. (See related story on page 4.)

**West Texas May Be Exempt**

In the Lubbock hearing November 12, hearing examiner Lt. Colonel Charles Tracey, Deputy District Engineer, Fort Worth District, stated that he felt most of West Texas would be exempt from any Corps control.

"The High Plains of West Texas is probably well above the headwaters of any navigable stream and will probably not be affected," Tracey explained.

He went on to note that the Fort Worth District defines "five cubic feet" (in regards to the definition of "headwaters") as "50 percent flow". He said this definition is better for West Texas irrigation farmers because the averaging of all flows would have to take into account very wet years, which are uncommon to West Texas.

Tracey also expressed concern over the definition of lakes because the Corps definition is so general (natural bodies of water greater than five acres in surface area) that it might include the thousands of playa lakes dotting the High Plains.

State water officials have questioned whether the Corps can take jurisdiction over bodies of water (playa lakes) that the State of Texas has ruled are private property. (See story on page 4, "District Petitions Corps of Engineers".)

Tracey added, "We hope we do not have to get involved in playa lakes."

**Who Needs a Permit?**

Private individuals, as well as local, state and Federal agencies, need permits, and receipt of a Corps permit does not exempt an applicant from obtaining state and/or local authorization, if required.

Application for a permit should be made to the nearest district office of the Corps of Engineers, with a \$10 fee for small projects and \$100 for projects seeking to move more than 2,500 yards of dirt.

Tracey said routine applications should be processed within 90 to 120 days, but controversial construction might take a year or more to study.

Any person undertaking construc-

—continued on page 4 . . . CORPS

### New ICASALS Chairman Appointed at Texas Tech

Horn Professor Harold E. Dregne, Chairman of the Department of Plant and Soil Science, Texas Tech University, has been named by Texas Tech President Grover E. Murray as Director of the University's International Center for Arid and Semi-Arid Land Studies (ICASALS). The appointment, announced October 31, will become effective February 1, 1976, after the retirement of Dr. Frank B. Conselman. Conselman has served as ICASALS Director since January, 1970.

Dr. Dregne, primarily interested in arid lands, and plant-water-soil relationships in particular, will deal with the educational, research and scientific programs of the International Center. Dregne also serves as Chairman of the American Association for the Advancement of Sciences Committee on Arid Lands.

Dregne is the third Director of the Center since its establishment by the Board of Directors of Texas Tech University in 1966.



Frank Rayner, District Manager, testifies before an Environmental Protection Agency (EPA) Committee October 29 in Denver, Colorado, in response to an EPA request for suggestions regarding that agency's permitting procedures for point and non-point agricultural runoff and discharge.



District Manager Frank Rayner, Chairman of the Federal Legislation Committee of the National Association of State Groundwater Officials (NASGO), is pictured as he reports on currently pending Federal legislation directly and indirectly related to groundwater at NASGO's annual meeting in New Orleans on October 6. NASGO is a non-profit organization established to provide state groundwater officials an opportunity to exchange ideas and experiences and to participate in the development, utilization, conservation, protection and management and control of groundwater. Seated to Rayner's left is NASGO's Chairman A. Wayne Wyatt, Texas Water Development Board, Austin.

#### CORPS... continued from page 3

tion which is not permitted is subject to a fine of \$2,500 to \$25,000 per day and up to one year in prison upon conviction. Persons who file false statements to obtain a permit are subject to \$10,000 fines and six months in jail.

#### Public Notice Issued

Applications are processed routinely, with a public notice issued on each permit application to interested agencies, people and institutions. Following a 30-day period for receiving public opinion, substantive or adverse comments are furnished to the applicant for his rebuttal or resolution of the problem/s.

The applicant can request the Dis-

trict Engineer to rule for him or the objector, or rule to modify the project to eliminate the objection so that the modified work can continue.

The decision to issue the permit, according to Tracey, is based on the impact of the proposed activity on certain water quality, conservation, economic, aesthetic and environmental considerations.

A state water quality agency must also certify the project before the Corps will issue a permit. Said Tracey, "If the state will not issue a permit, the Corps won't either. If the state approves the permit, the Corps will generally accept it unless there is an overriding national interest to consider."

## DISTRICT PETITIONS CORPS OF ENGINEERS

In response to a request by the U. S. Army Corps of Engineers that interested persons make comments regarding the "Section 404 permit program", Federal Water Pollution Control Act Amendments of 1972 (PL 92-500), District Manager Frank Rayner submitted a written petition to Colonel Joe Sheard, District Engineer, Fort Worth District, at a public hearing November 12 in Lubbock.

Attempting *not* to "argue the merits" of the Corps' expanded control over "waters of the United States", the petition reviewed some of the definitions of "navigable waters", as contained in the final regulation, "Permits for Activities in Navigable Waters or Ocean Waters", as published in the *Federal Register*, July 25, 1975. (For more information, see story on page 1, "Corps of Engineers Explains 'Section 404 Permit Program'.")

Rayner dedicated most of his testimony to a discussion of the thousands of playa lakes found on the High Plains of West Texas.

"Playas range greatly in size, and vary even more erratically in the times and magnitudes of runoff catchment. Generally, playa basins can be described as saucer-shaped depressions ranging in size from a few acres to nearly 600 acres, with a closure (depth) of from less than 10 to more than 60 feet. In the northern part of the Southern High Plains there is an average of one playa basin per square mile."

He continued, "What should be evident is that playas are just that—playas. And, although they may be a 'natural lake of more than five surface acres', they are usually only a few inches deep and may exist for only a few days; therefore, it is not reasonable to assume that they could be interpreted as 'navigable waters'."

Rayner urged the District Engineer to use his "discretionary powers" to *restrict* the Corps' involvement wherein such involvement is inadvisable or otherwise discretionary.

He also recommended that the Corps "more specifically define what constitutes a 'lake', and, thereby exclude playas and other similar basins wherein the inflow and/or outflow watercourses do not have a *continuous* flow in excess of five cubic feet per second."

Rayner suggested that "the agricultural endeavor excluded by Paragraph (d) (4) be expanded to include *all* agricultural endeavor that does not inter-

fer with boat navigation, or which does not constitute an impediment to National defense. In any event, cut and fill materials in, and other modifications of playas should be specifically exempt from Corps regulation. A grassed waterway, to facilitate drainage of runoff after severe storms—to prevent soil erosion—would, under the proposed definition of navigable streams (with flows of five cubic feet per second), require a Corps permit to construct and maintain."

The petition concluded by pointing out that playa lakes are considered by the State of Texas to be private property. "We would contend that 'waters of the United States', and watercourses associated therewith, should, in any event, not include any waters not specifically defined as waters of any state—that is, waters and watercourses not subject to the jurisdiction of the State of Texas, or any other state. Herein it is specifically noted that an opinion issued by the Chief Legal Counsel of the Texas Water Rights Commission concluded, 'That the waters of playa lakes are surface waters, *owned by the owners of the lands upon which they appear*, to which no riparian rights attach, and to which the appropriation statutes are not applicable' (*The Cross Section*, August, 1963)".

Copies of the District's four-page petition, including illustrations, can be obtained by contacting the District's Lubbock office.

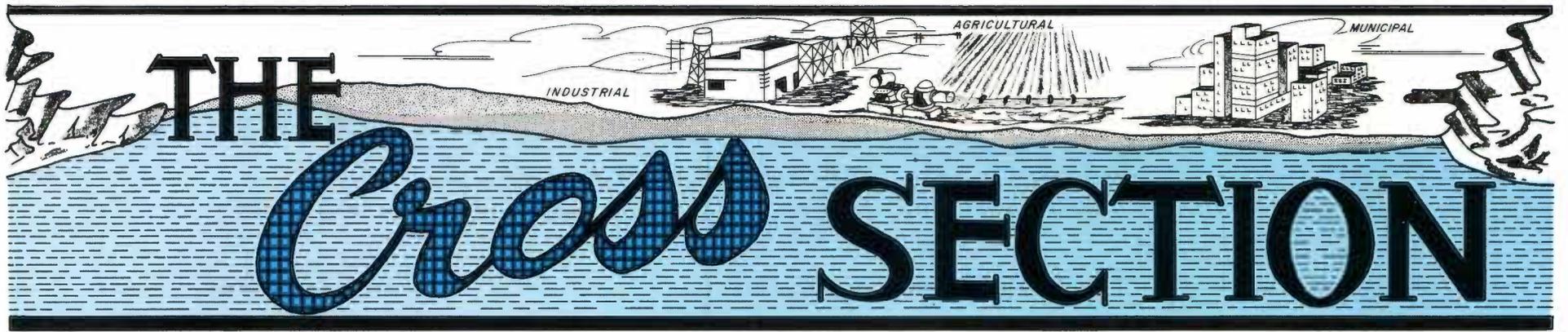
## Burleigh Resigns As TWDB Head

Texas Water Development Board (TWDB) Executive Director Harry Burleigh resigned that position November 4, according to John H. McCoy, New Boston, TWDB Chairman. Burleigh's resignation, effective December 31, follows nearly five years of service as Executive Director.

Prior to his appointment to the TWDB in March, 1971, Burleigh had retired from his position as Area Engineer, U. S. Bureau of Reclamation.

Burleigh, 69, said he resigned so that he and his wife could have more time to travel.

Board Chairman McCoy appointed Board Members A. L. Black of Friona, Robert B. Gilmore, Dallas, and Milton Potts, Livingston, to interview applicants and make recommendations to the Board for a successor to Burleigh.



A Monthly Publication of the High Plains Underground Water Conservation District No. 1

Volume 21—No. 12

"THERE IS NO SUBSTITUTE FOR WATER"

December, 1975



Jim McCray of Panhandle, President of the Board of Directors of the Panhandle Ground Water Conservation District at White Deer, and Frank Rayner, Manager of the High Plains Water District, Lubbock, have been elected to the first Board of Directors of the newly-created Groundwater Management Districts Association. The Association was formed December 9 by water district directors and managers from the Great Plains States of Texas, Nebraska, Colorado, Kansas and Oklahoma.

## WATER DISTRICTS CREATE GROUNDWATER MANAGEMENT DISTRICTS ASSOCIATION

A group of approximately 175 groundwater management district directors and managers from the Great Plains States of Texas, Nebraska, Kansas, Colorado and Oklahoma voted December 9 to create a coalition of groundwater management districts to be named Groundwater Management Districts Association.

The delegates to the second Groundwater Management Workshop in Dodge City, Kansas, December 9 and 10, created the organization upon the recommendation of an interim committee formed during the first Groundwater Management Workshop held in Garden City, Kansas, in November, 1974. (For more information, see the November, 1974, issue of *The Cross Section*.)

### Committee Makes Recommendations

The committee, composed of Chairman Deon Axthelm, Lincoln, Nebraska; Keith Lebbin, Scott City, Kansas; DeLynn Hay, Colby, Kansas; John Vasa, Burlington, Colorado; Frank Rayner, Lubbock, Texas; Mel Noffke, York, Nebraska; David Pope, Garden City, Kansas, and Roland and Bonita Hoeme, Guymon, Oklahoma, made the following recommendations to the workshop delegates.

"We find that there is a need for an exchange of technical and managerial information between districts involved with groundwater management.

There is a need for an organizational structure which can advise its membership of the availability of technical and financial assistance available from

state and Federal government.

There is a need for an organization to bring to the groundwater management entities, and to the people they serve, water conservation management and other types of information, developed by agricultural and other assistance services, such as technical research by universities, studies by Federal agencies, and information on financial assistance.

There is a need for exchange of information in regard to laws, rules, and regulations to keep the managerial districts advised about existing and proposed legislation, and directives of state and Federal agencies.

There is a need for a forum for addressing common problems; and also for coalescing of opinions on Federal and state regulatory actions.

There is a need for an organized effort to make the nation aware of the stability of its food supply, and the economic benefits made possible through groundwater irrigation.

Therefore, we recommend that the delegates to the second Groundwater Management Workshop favorably consider the creation of a coalition of Groundwater Management Districts."

Workshop delegates also voted unanimously to elect two members from each state represented in the organization to serve on the Board of Directors, the members being selected by state caucus.

Elected to the first Board of Directors were the following delegates.

—cont. on page 4 . . . WATER

## 1975 President's Report

In 1975, those of us involved in agriculture experienced increased Federal involvement in agricultural affairs, from the Environmental Protection Agency taking on regulatory controls "incidental to its control of surface discharges" to protect the quality of the Nation's groundwater (PL 93-523), to the United States Army Corps of Engineers expanding its traditional role of protector of the "navigable waters of the United States" to protector of "all waters of the United States".

This type bureaucratic control eventually affects all people, whether they like it or not. And, too often, those controlled are afraid they can do nothing to change what they feel is an abuse on the part of some big, distant government.

The time, however, has come for all of us who labor to produce food and fiber for this country and for the world to join together in a common and united effort to work out our own problems at the local level.

An example of this type of united effort was the response of irrigators to a recent ruling by the Federal Power Commission (FPC) that the priority of natural gas used for irrigation should be lowered and subject to curtailment. Thousands of farmers and other agribusinessmen appeared at local hearings called by the FPC and, eventually, the FPC reversed its earlier ruling and retained the priority for natural gas used for irrigation at its present priority (No. 2).

My experience on the Board of Di-

### WATER LEVELS TO BE MEASURED IN JANUARY

Field personnel of the High Plains Water District will begin the annual depth-to-water measurement of more than 800 observation wells during the first week of January.

Purple and white identification tags will be placed on the well-head equipment of all observation wells measured in 1976. The wells comprising the District's observation well program are located within the boundaries of the District and are not owned by the District.

In order to conduct this annual measuring program, field personnel will take a break from an irrigation well inventory they have been conducting since early December. Field Representatives Obbie Goolsby, Dan Seale and Oscar Riemer have been "driving out", or locating, irrigation wells in Deaf Smith County for the purpose of

—cont. on page 4 . . . WATER LEVELS

rectors of the High Plains Underground Water Conservation District No. 1 has shown me that people need to get involved in their government, and the best place to start is at the local level. Government is not so big that a farmer should stay on the farm and hope that things will get better—the favorable FPC decision is an excellent example of a few concerned farmers banding together in an organized effort to make their needs known to the Federal government.

Concern, as expressed by active participation, is the key to maintaining successful local government and, thereby, preserving representative government in our United States. Representative government cannot survive if local people do not make their wishes known. Boards and commissions are the foundation of representative government, and an uneducated bureaucracy cannot function for the people without the people's support.

My service on the District's Board of Directors for the past six years has revealed to me the importance of putting the control of a local resource—groundwater, in the case of the District—in the hands of the local people whose livelihood depends on the efficient and beneficial use of that resource. More than 25 years ago, a group of citizens concerned about the future of the dwindling supply of water found in the Ogallala aquifer organized and convinced the State Legislature to create the High Plains Underground Water Conservation District No. 1.

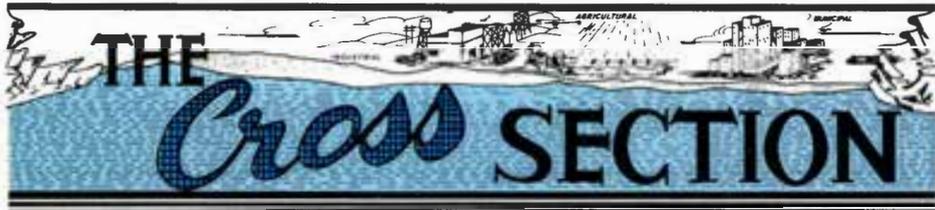
This District, the first District in the country created by landowners to preserve and protect their groundwater—their private property—carries on conservation programs which have been praised across the country. Other states have followed suit and created their own special purpose districts, with elected boards of directors.

The time has come to return government to the grass roots of America. One of the most effective ways to participate in your government is the elective process, and I encourage all eligible voters within the District to go to the polls and vote in the District's election on January 17, 1976. The District is dedicated to the principle that the foundation for successful government is public participation.

Respectfully submitted,

*Ray Kitten*

RAY KITTEN, President  
Board of Directors



A MONTHLY PUBLICATION OF THE HIGH PLAINS UNDERGROUND WATER CONSERVATION DISTRICT NO. 1

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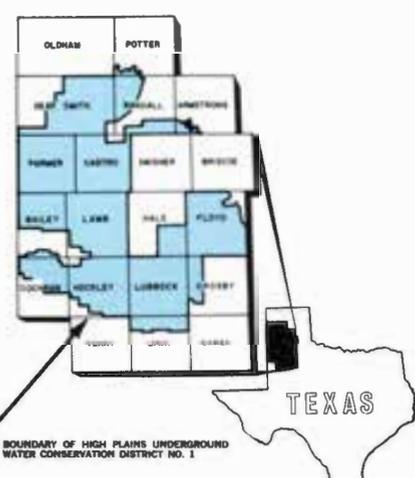
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- Jim Line, 1977 Box 87, Bushland
Albert Nichols, 1977 Rt. 1, Box 491, Amarillo
F. G. Collard, 1979 Rt. 1, Box 433, Amarillo
W. J. Hill, 1979 Box 53, Bushland

Randall County

Mrs. Louise Tompkins, Secretary

Farm Bureau, 1714 Fifth Ave., Canyon

- Harry LeGrand, 1977 4700 S. Bowie, Amarillo
Joe Albracht, 1977 Box 81, Bushland
Leonard Batenhorst, 1977 Rt. 1, Canyon
Bill Dugan, 1979 Rt. 2, Box 30, Happy
John F. Robinson, 1979 1002-7th St., Canyon

Population, Food and Water Conference Scheduled

The role West Texas farmers and ranchers must play in feeding the world will be the subject of a one-day food conference, "Population, Food and Water: West Texas Faces the Challenge", scheduled for January 30, 9 a.m. to 3 p.m., at the SouthPark Inn in Lubbock.

Sponsors of the public seminar are the West Texas Water Institute, Texas Department of Agriculture, Texas Tech University College of Agricultural Sciences, Planned Parenthood Association of Lubbock, Planned Parenthood Association of Northeast Texas, West Texas Chamber of Commerce and the Lubbock Chamber of Commerce.

According to Texas Agriculture Commissioner John C. White, the purpose of the seminar is to help Texas farmers and ranchers to plan for the future by providing them with information on world population growth and available and necessary food supplies.

Conferences Important to Farmers

"Because Texas is a large provider of basic food supplies for the export market, our producers need to get through the rhetoric and discover the realities of world conditions. Such conferences will help Texas farmers and ranchers to plan for the future," said White.

Speaking at the morning program, dealing with the subject "Balancing Food Supplies and Population", are Dr. Charles Westoff, Director of the Office of Population Research, Princeton University, "World Population Control: Progress and Perspectives"; Dr. John Timmon, Department of Agricultural Economics, Iowa State University, "World Land Resources for Food Production: How Far Can We Go?"; Dr. Glenn Burton, USDA and Georgia Agricultural Experiment Station, "Meeting World Food Needs Through Genetics"; and Dr. Georg Bergstrom, Professor of Food Science and Geography, Michigan State University, "Food-Population Crisis: How Near the Limit?".

Speakers for the afternoon session, "Critical Necessities for Food Production", are George W. McCleskey, President, Water, Inc., "Water Trans-

fer to Arid Lands: A Realistic Appraisal"; K. Bert "Tex" Watson, President, Pioneer Corporation, Amarillo, "The Energy Crisis: An Analysis"; Dr. Frank G. Viets, Jr., Independent Agriculture Consultant, Fort Collins, Colorado, "Water Stretching Through Agronomy"; and Dr. Jack Musick, USDA Southwestern Great Plains Research Center, Bushland, "Water Stretching Through Engineering".

Registration fee is \$12.50. For programs and pre-registration forms, contact the District office, 2930 Avenue Q, Lubbock, Texas 79405.

Decline Maps to Be Released in January

The 1975 cost-in-water depletion, income-tax-allowance, decline maps or water depletion information for individual land parcels will be available the first week of January, 1976.

The District's Board of Directors voted in its December 19 meeting to retain the cost of \$7.50 for decline maps and \$5 per parcel for computerized decline data.

Landowners in Bailey, Castro, Floyd, Lamb and Parmer Counties will not be furnished decline maps—they will receive decline information on a parcel basis. These landowners must contact the District's Lubbock office (by phone or mail) to supply the information needed in order to locate the parcel and determine the water-level decline thereunder.

Data necessary to determine the decline for these counties is as follows: 1) taxpayer's agent's name and address, 2) landowner's name, address and social security number, 3) account number and 4) the legal description of the land.

The correct legal description includes the county in which the property is located, block and section, league and labor, township, range and section, homestead pre-emption name and abstract number, etc.

Accountants are urged to promptly supply the District with all information

—continued on page 4... DECLINE



Representatives of the Dallas office of the Internal Revenue Service met with Water District personnel December 11 and 12 for the purpose of reviewing water-level maps to be used in the District's cost-in-water depletion, income-tax allowance, program. From left are Don Smith, District Geologist; Jack Page, IRS Engineer; Don McReynolds, District Geologist, and B. C. Seiden, IRS Engineer.

NOTICE: Information regarding times and places of the monthly County Committee meeting can be secured from the respective County Secretaries.

Applications for well permits can be secured at the address shown below the respective County Secretary's name, except for Armstrong and Potter Counties; in these counties contact Carroll Rogers and W. J. Hill, respectively.

# 1976 WATER DISTRICT ELECTION SET FOR JANUARY 17

The High Plains Underground Water Conservation District No. 1 will conduct annual elections January 17, 1976, to name three Members to the Board of Directors and 24 County Committeemen.

Elections will be held only in those counties located within Director's Precinct 1 (Crosby, Lubbock and Lynn), Precinct 2 (Cochran, Hockley and Lamb) and Precinct 5 (Floyd and Hale). Directors will serve two-year terms and County Committeemen will serve four years.

Board President Ray Kitten of Slaton, who has served the District since January, 1970, is vacating his seat in Precinct 1. James P. Mitchell of Lubbock is unopposed on the ballot for the position.

Chester Mitchell of Lockney, who has served the District as a Member and officer of its Board of Directors for 12 years, longer than any other person, will also vacate his post as representative of Precinct 5. Seeking to replace him is Malvin A. Jarboe of Floydada.

Director Selmer Schoenrock of Levelland is unopposed on the ballot for Precinct 2.

Absentee balloting will begin at noon on December 30, 1975, and will continue through January 14, 1976, at the District headquarters, 2930 Avenue Q, Lubbock, for Crosby, Lubbock and Lynn Counties; the District office, 1617 Main, Petersburg, for Hale County; the District office, 609 Austin, Levelland, for Hockley County, and the County Clerks' offices in Cochran, Floyd and Lamb Counties.

### Qualifications to Vote

A qualified voter in the District's election is any person possessing a valid voter registration certificate and residing within the delineation of the District and within the county where a vote will be taken. The election judge at each of the polling places will have maps depicting the Commissioner's Precincts within each county included in the District's boundaries.

### Ballots

The names of all candidates will be listed on a ballot for each county. Voters can place an X in the box preceding the candidate's name or place an X in the box preceding the space provided for a write-in vote, and can follow this procedure by writing in the name of the person of their choice.

In accordance with the laws of Texas, the order of names on the ballots was determined by drawing lots.

### Polling Places

For the 1976 election, a total of 24 polling places has been established in the eight counties.

The names and addresses of the candidates, the location of polling places and the names and addresses of the election judges are listed below.

### NOMINEES FOR DISTRICT DIRECTOR

**Director's Precinct No. One**—Territory within the District which is situated in each of the following counties: Crosby, Lubbock and Lynn.

James P. Mitchell, Route 4, Lubbock, Texas

**Director's Precinct No. Two**—Territory within the District which is situated

in each of the following counties: Cochran, Hockley and Lamb.

Selmer Schoenrock, 112 Rip, Levelland, Texas

**Director's Precinct No. Five**—Territory within the District which is situated in each of the following counties: Floyd and Hale.

Malvin A. Jarboe, Route 4, Floydada, Texas

### NOMINEES FOR COUNTY COMMITTEEMEN

#### COCHRAN COUNTY

*Residents from Committeemen's Precinct east of State Highway 214 vote for one*

Hurbert C. Deavours, 108-4th St., Whiteface, Texas

Hershel M. Tanner, Route 2, Box 36, Morton, Texas

*Residents from Committeemen's Precinct west of State Highway 214 vote for two*

Danny Key, Star Route 2, Morton, Texas

H. H. Rosson, Star Route 2, Morton, Texas

#### CROSBY COUNTY

*Residents vote for three Committeemen-at-large*

Tommy McCallister, 209 N. Van Buren Ave., Lorenzo, Texas  
Edward S. Smith, 102 N. Van Buren Ave., Lorenzo, Texas  
Pat Yoakum, 708 First St., Lorenzo, Texas

#### FLOYD COUNTY

*Residents vote for one Committeeman-at-large*

C. O. Lyles, Route 4, Floydada, Texas

*Residents from Commissioner's Precinct 1 vote for one*

Connie Bearden, Route 1, Floydada, Texas

*Residents from Commissioner's Precinct 3 vote for one*

M. M. Smitherman, Silverton Star Route, Floydada, Texas

#### HALE COUNTY

*Residents vote for three Committeemen-at-large*

Clint Gregory, Jr., Box 98, Petersburg, Texas

Homer Roberson, Box 250, Petersburg, Texas

Henry Scarborough, Route 2, Petersburg, Texas

#### HOCKLEY COUNTY

*Residents from Commissioner's Precinct 1 vote for one*

Billy Ray Carter, Route 5, Levelland, Texas

*Residents from Commissioner's Precinct 2 vote for one*

Leon Young, Route 1, Ropesville, Texas

*Residents from Commissioner's Precinct 4 vote for one*

Robert Phillips, 218 Redwood, Levelland, Texas

#### LAMB COUNTY

*Residents vote for one Committeeman-at-large*

Larry Lockwood, Star Route 2, Littlefield, Texas

*Residents from Commissioner's Precinct 2 vote for one*

P. A. Washington, Box 124, Springlake, Texas

*Residents from Commissioner's Precinct 3 vote for one*

Jack Stubblefield, Box 397, Spade, Texas

#### LUBBOCK COUNTY

*Residents from Commissioner's Precinct 1 vote for one*

Don Bell, Box 114, Wolfforth, Texas

*Residents from Commissioner's Precinct 2 vote for one*

Ronald C. Schilling, Route 1, Slaton, Texas

*Residents from Commissioner's Precinct 4 vote for one*

Granville Igo, Route 1, Shallowater, Texas

#### LYNN COUNTY

*Residents vote for one Committeeman-at-large*

S. B. Rice, Route 1, Wilson, Texas

*Residents from Commissioner's Precinct 1 vote for one*

W. R. Steen, Route 2, Wilson, Texas

*Residents from Commissioner's Precinct 4 vote for one*

Wendell Morrow, Route 1, Wilson, Texas

### POLLING PLACES AND JUDGES FOR 1976 ELECTION

#### COCHRAN COUNTY

*Polling Place No. 1:* County Activities Building, Morton, Texas

*Presiding Judge:* Clayton Stokes, Morton, Texas

*Polling Place No. 2:* G & C Gin, Morton, Texas

*Presiding Judge:* Max Clark, RFD 2, Morton, Texas

*Polling Place No. 3:* Star Route Gin, Morton, Texas

*Presiding Judge:* Mrs. Ike Williams, Star Route 2, Morton, Texas

#### CROSBY COUNTY

*Polling Place No. 1:* Lorenzo Community Center, Lorenzo, Texas

*Presiding Judge:* Mrs. Ralph Wiese, 103 Harrison Ave., Lorenzo, Texas

#### FLOYD COUNTY

*Polling Place No. 1:* County Courthouse, Floydada, Texas

*Presiding Judge:* Mrs. W. O. Newberry, 812 Mesquite, Floydada, Texas

*Polling Place No. 2:* Barker Ins. Agency, Main & Locust, Lockney, Texas

*Presiding Judge:* Barry Barker, Box 518, Lockney, Texas

#### HALE COUNTY

*Polling Place No. 1:* Community Center, Petersburg, Texas

*Presiding Judge:* Floyd Trowbridge, Box 646, Petersburg, Texas

#### HOCKLEY COUNTY

*Polling Place No. 1:* County Courthouse, Levelland, Texas

*Presiding Judge:* B. D. Carter, Box 534, Levelland, Texas

*Polling Place No. 2:* Ropesville Co-op Gin, Ropesville, Texas

*Presiding Judge:* Frank Sylvester, Ropesville, Texas

*Polling Place No. 3:* City Hall, Sundown, Texas

*Presiding Judge:* Mrs. T. I. Elliott, Box 743, Sundown, Texas

*Polling Place No. 4:* Whitharral Lions Club Bldg., Whitharral, Texas

*Presiding Judge:* Robert E. Avery, Jr., Route 2, Levelland, Texas

*Polling Place No. 5:* City Hall, Anton, Texas

*Presiding Judge:* Orval Williams, Box 748, Anton, Texas

#### LAMB COUNTY

*Polling Place No. 1:* Olton Grain Co-op, Olton, Texas

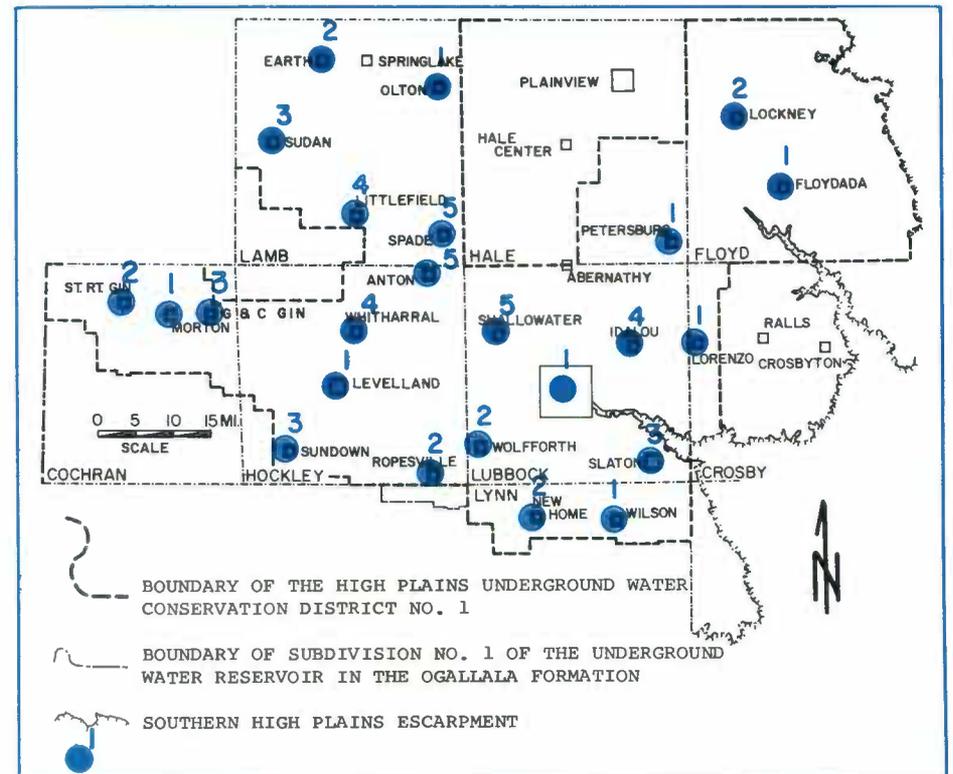
*Presiding Judge:* Eldon Franks, Box 36, Olton, Texas

*Polling Place No. 2:* Chamber of Commerce Bldg., 206 E. Main, Earth, Texas

*Presiding Judge:* Norman G. Ellis, Box 194, Earth, Texas

*Polling Place No. 3:* Community Center, Sudan, Texas

—cont. on page 4 . . . ELECTION



Map showing the area—District Directors Precincts 1, 2 and 5—and the locations of polling places wherein the election will be held on January 17, 1976.

**WATER . . . cont. from page 1**

Representing Texas were Frank Rayner, Manager of the High Plains Underground Water Conservation District No. 1, Lubbock, and Jim McCray, President of the Panhandle Ground Water Conservation District No. 3, White Deer.

Elected by the Nebraska delegation were Milvern Noffke, Manager, Blue River Association of Groundwater Conservation Districts, York, and Frank Dragoun, Assistant Manager, Central Nebraska Public Power and Irrigation District, Holdrege.

*Kansas Representatives*

The Kansas delegation elected Keith Lebbin, Executive Director of the Western Kansas Groundwater Management District No. 1, Scott City, and Melvin Winger, Chairman of the Southwestern Kansas Groundwater Management District, Johnson.

Representing Colorado were Ben Saunders, Manager of the Central Yuma County Groundwater Management District, Wray, and Gordon Thompson, irrigator from Wray.

Elected by the Oklahoma delegates were G. C. Bergner, irrigator from Texhoma, and Mrs. Bonita Hoeme, Secretary-Treasurer of the Texas

County Irrigation and Water Resources Association, Inc., Guymon.

During the two-day workshop, sponsored by the Great Plains Council Water Resources Committee, the Cooperative Extension Service and local management districts, three sessions were conducted covering such topics as Groundwater Management and Government, Resources Management and Local Management District Reports and Energy and Groundwater.

Dr. Frank Baird, Professor of Political Science, Texas Tech University, revealed results of a survey he conducted on the underground water conservation districts in the High Plains of Texas. His survey will be reviewed in a future issue of *The Cross Section*.

**WATER LEVELS . . . cont. from page 1**

updating the District's maps depicting the locations of the area's groundwater supplies and other information on groundwater quality and availability.

Upon finalizing the depth-to-water measurements, the Deaf Smith County inventory will be completed.

Anyone sighting a blue-and-white pickup truck with the District seal on the door should note that a District representative is conducting field work in the District's behalf.

**ELECTION . . . cont. from page 3**

*Presiding Judge:* Nolan Parrish, Box 456, Sudan, Texas

*Polling Place No. 4:* County Courthouse, Littlefield, Texas

*Presiding Judge:* Mrs. Arthur Jones, 707 Littlefield Dr., Littlefield, Texas

*Polling Place No. 5:* Farmer's Co-op Gin, Spade, Texas

*Presiding Judge:* C. C. Byars, Box 343, Spade, Texas

**LUBBOCK COUNTY**

*Polling Place No. 1:* East entrance to the hallway, County Courthouse, Lubbock, Texas

*Presiding Judge:* Tom C. Ingram, 3810 39th St., Lubbock, Texas

*Polling Place No. 2:* City Hall, Wolf-  
forth, Texas

*Presiding Judge:* Mrs. E. R. Haskins, 814 Main, Wolfforth, Texas

*Polling Place No. 3:* County Club-  
house, Slaton, Texas

*Presiding Judge:* Wayne Liles, 305 S. 11th St., Slaton, Texas

*Polling Place No. 4:* Community Club-  
house Bldg., Idalou, Texas

*Presiding Judge:* Earl Weaver, 904 W. 7th St., Idalou, Texas

*Polling Place No. 5:* Community Club-  
house, Shallowater, Texas

*Presiding Judge:* Mrs. George Black-  
mon, 1008 14th St., Shallowater,  
Texas

**LYNN COUNTY**

*Polling Place No. 1:* Wilson Co-op  
Gin, Wilson, Texas

*Presiding Judge:* Mrs. W. C. Maeker,  
Box 92, Wilson, Texas

*Polling Place No. 2:* New Home Co-  
op Gin, New Home, Texas

*Presiding Judge:* Marlow Rudd, Route  
1, Wilson, Texas

**DECLINE . . . continued from page 2**

necessary to compute their claimants' 1975 water-level decline. Accountants should also note that the District will explain the depletion-allowance program in detail at the Texas Tech University Tax Institute in Lubbock October 7 and 8, 1976.

The decline maps, depicting the decline of the water table by county, may be purchased at the District office for the following counties: Armstrong, Cochran, Crosby, Deaf Smith, Hale, Hockley, Lubbock, Lynn, Potter and Randall.

*Season's  
Greetings  
from  
Directors  
and  
Staff*



LEFT TO RIGHT: Kenneth Carver, Billy Wayne Sisson, Director; Selmer Schoenrock, Director; Rebecca Clinton, Webb Gober, Director; Frank Rayner, Obbie Goolsby, Dan Seale, Don Smith, Chester Mitchell, Director; Clifford Thompson, Ray Kitten, Director; Tony Schertz, Butch Davis, Pennye Newberry, Norma Fite, Don McReynolds and Kathy Redeker.