

# THE Cross SECTION

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

Volume 20—No. 1

"THERE IS NO SUBSTITUTE FOR WATER"

January, 1974



Directors for 1974 are, standing, Webb Gober, Secretary-Treasurer; Selmer Schoenrock, Member, and Billy Wayne Sisson, President. Seated are Chester Mitchell, Member, and Ray Kitten, Vice President.

## 1974 Election Results Announced

The results of the January 8, 1974, election of the High Plains Underground Water Conservation District No. 1 were declared official on January 15 by the District's Board of Directors during their initial meeting of the new year. Votes were canvassed and three Directors and 16 County Committeemen were elected to new terms.

Chester Mitchell, incumbent for Director's Precinct 5 (Floyd and Hale Counties), was re-elected to his unprecedented sixth two-year term. Mitchell, unopposed on the ballot, received all 56 of the votes cast for Director.

### Schoenrock Re-Elected

Selmer Schoenrock, Levelland, defeated Hugh Hansen of Morton by a vote of 151 to 91 to win re-election to his third term. Schoenrock represents Cochran, Hockley and Lamb Counties (Director's Precinct 2).

Representing Director's Precinct 1 (Crosby, Lubbock and Lynn Counties), Ray Kitten of Slaton polled 239 votes to win his third term on the Board. Kitten had no opponent on the ballot.

Other members of the Board beginning the second year of their present terms are Billy Wayne Sisson of Hereford and Webb Gober of Farwell.

### Officers Elected

Judge Howard C. Davidson, 99th District Court, administered the oath of office to Kitten, Schoenrock and Mitchell in his offices at the Lubbock County Courthouse. The District Di-

rectors and Manager, Frank Rayner, attended the ceremony (see picture on page 3).

Following the swearing-in ceremony, the Board re-convened and elected officers for 1974 to 1975.

Billy Wayne Sisson was elected President; Ray Kitten, Vice President, and Webb Gober, Secretary-Treasurer.

### County Committeemen

Sixteen County Committeemen were elected from Director's Precincts 1, 2 and 5. These men will serve four-year terms, all to expire in January of 1978. They are:

#### CROSBY

Donald Aycok, Lorenzo  
Alvin Morrison, Lorenzo

#### LUBBOCK

Dan Young, Lubbock  
Clifford Hilbers, Idalou

#### LYNN

Orville Maeker, Wilson  
Freddie Kieth, New Home

#### COCHRAN

Jessie Clayton, Morton  
Robert Yeary, Morton

#### HOCKLEY

J. E. Wade, Levelland  
Jimmy Price, Levelland

#### LAMB

Billy J. Langford, Olton  
Edward Fisher, Sudan

#### FLOYD

Joe Cunyus, Lockney  
Fred Cardinal, Floydada

#### HALE

Henry Kveton, Petersburg  
Gaylord Groce, Petersburg

### For Income Tax Claims

## DISTRICT RELEASES 1973 GUIDELINE MAPS

The Board of Directors of the High Plains Underground Water Conservation District No. 1, in their January 15 meeting, voted to retain the cost of \$7.50 for guideline maps, a part of the cost-in-water depletion, income-tax-allowance, program.

They also determined that a charge of \$5 per parcel will be levied by the District for the service of figuring decline in Parmer, Bailey, Castro and Lamb Counties.

### Must Supply Data

Landowners in the above-mentioned counties will not be furnished decline maps—they must contact the District's Lubbock office (by phone or mail) to supply the information necessary in order to locate the parcel and determine the decline.

Data necessary to determine the decline for Parmer, Bailey, Castro and Lamb 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 number of acres, quarter, section or labor, block or league, survey, township and range.

The guideline maps, depicting the decline of the water table by county, may be purchased at the District office. Persons buying maps or depletion information by the parcel will be billed upon purchase.

### Saturated Thickness

A new method for determining sat-

urated thickness for any new claims for depletion allowance in Parmer County was also adopted by the Board on January 15.

### Cost Would Be \$31.50

In the past, Parmer County decline maps for 1963 through 1970 were sold for one dollar apiece. In 1971 they were raised to \$7.50 and in 1972 the county was automated and the charge was set at \$5 per parcel. Saturated thickness, therefore, for those years would have been determined at a cost to the claimant of \$31.50.

However, to figure saturated thickness in this way would require the District to reprint outdated maps—therefore, the Board voted to provide to individual claimants the information necessary to determine the base saturated thickness at the time of purchase at a fee of \$25. This cost will also include the decline for all years necessary to the claim, including the current year.

### Example of Procedure

For example, a Parmer County landowner purchasing land in 1970 and making a claim for the first time in 1973 would receive the saturated thickness information and the 1970 to 1973 decline information for the \$25-fee.

Also, the Board announced that the Internal Revenue Service had accepted the results of a District survey of cost-in-water values for land changing hands in 1973. This information will be supplied free-of-charge to claimants.

## DISTRICT WELCOMES NEW SECRETARY

The Cross Section is pleased to introduce to its readers the newest addition to its staff, Mrs. Penny Newberry. Penny, 20, serves the District as Secretary.

A native of Lubbock and a 1971 graduate of Lubbock High School, Penny began employment with the Water District September 17, 1973.

Her employment commenced only three days after her graduation from a Lubbock business college.

Penny is a quick and eager learner, and the Water District is pleased to welcome her to its staff.

Penny and her husband, Tim, reside in Lubbock.



PENNYE NEWBERRY



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

1628 15th Street, Lubbock, Texas 79401

Telephone 762-0181

REBECCA CLINTON, Editor

Second Class Postage Paid at Lubbock, Texas District Office at Lubbock

- Frank Rayner, P.E. \_\_\_\_\_ Manager
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- Don McReynolds \_\_\_\_\_ Geologist
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**BOARD OF DIRECTORS**

**Precinct 1**

(CROSBY, LUBBOCK and LYNN COUNTIES)  
Ray Kitten, Secretary-Treasurer \_\_\_\_\_ Slaton

**Precinct 2**

(COCHRAN, HOCKLEY and LAMB COUNTIES)  
Selmer H. Schoenrock \_\_\_\_\_ Levelland

**Precinct 3**

(BAILEY, CASTRO and FARMER COUNTIES)  
A. W. Gober \_\_\_\_\_ Farwell

**Precinct 4**

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

**Precinct 5**

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

**COUNTY COMMITTEEMEN**

**Armstrong County**

- Charles Kennedy, 1975 \_\_\_\_\_ Rt. 1, Happy
- Cordell Mahler, 1975 \_\_\_\_\_ Wayside
- Guy Watson, 1977 \_\_\_\_\_ Wayside
- C. D. Rogers, 1977 \_\_\_\_\_ Wayside
- Bill Heisler, 1977 \_\_\_\_\_ Wayside

**Bailey County**

Mrs. Darlene Henry, Secretary  
Henry Ins. Agency  
217 East Ave. B, Muleshoe

- Lloyd D. Throckmorton, 1975 \_\_\_\_\_ Rt. 1, Muleshoe
- W. R. "Bill" Welch, 1975 \_\_\_\_\_ Star Rt., Maple
- Eugene Shaw, 1977 \_\_\_\_\_ Rt. 2, Muleshoe
- Adolph Wittner, 1977 \_\_\_\_\_ Star Rt., Baileyboro
- Jessie Ray Carter, 1977 \_\_\_\_\_ Rt. 5, Muleshoe

**Castro County**

E. B. Noble, Secretary  
City Hall, 120 Jones St., Dimmitt

- Glenn Odom, 1975 \_\_\_\_\_ Rt. 4, Box 136, Dimmitt
- Anthony Acker, 1975 \_\_\_\_\_ Rt. D, Nazareth
- Jackie Clark, 1977 \_\_\_\_\_ Rt. 1, Box 33, Dimmitt
- Joe Nelson, 1977 \_\_\_\_\_ Box 73, Dimmitt
- Bob Anthony, 1977 \_\_\_\_\_ Rt. 4, 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  
1628 15th Street, Lubbock

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

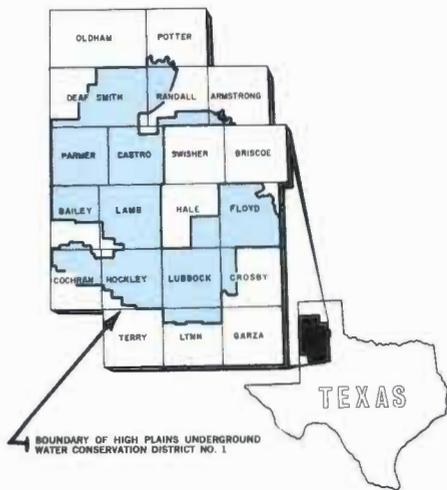
**Deaf Smith County**

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

- George Ritter, 1975 \_\_\_\_\_ Rt. 5, Hereford
- Harry Fuqua, 1975 \_\_\_\_\_ Rt. 1, Hereford
- James E. Higgins, 1977 \_\_\_\_\_ 200 Star St., Hereford
- Garland Solomon, 1977 \_\_\_\_\_ Rt. 5, Hereford
- W. L. Davis, 1977 \_\_\_\_\_ Box 312, 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 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, 1978 \_\_\_\_\_ 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 Kleith, 1978 \_\_\_\_\_ New Home

**Farmer County**

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Horn Insurance Agency, Bovina

- Guy Latta, 1975 \_\_\_\_\_ 1006 W. 5th, Friona
- Edwin Lide, 1975 \_\_\_\_\_ Rt. 1, Bovina
- Troy Christian, 1977 \_\_\_\_\_ Rt. 1, Farwell
- Joe Moore, 1977 \_\_\_\_\_ Box J, Lazbuddie
- Dalton Caffey, 1977 \_\_\_\_\_ 15th St., Friona

**Potter County**

- F. G. Collard, III, 1975 \_\_\_\_\_ Rt. 1, Box 101, Amarillo
- W. J. Hill, 1975 \_\_\_\_\_ Bushland
- Henry W. Gerber, 1977 \_\_\_\_\_ Rt. 1, Amarillo
- Jim Line, 1977 \_\_\_\_\_ Box 87, Bushland
- Albert Nichols, 1977 \_\_\_\_\_ Rt. 1, Box 491, Amarillo

**Randall County**

- Mrs. Louise Tompkins, Secretary  
Farm Bureau, 1714 Fifth Ave., Canyon
- John F. Robinson, 1975 \_\_\_\_\_ 1002 7th St., Canyon
- Fred Begert, 1975 \_\_\_\_\_ 1422 Hillcrest, Canyon
- Harry LeGrand, 1977 \_\_\_\_\_ 4700 S. Bowie, Amarillo
- Joe Albracht, 1977 \_\_\_\_\_ Box 81, Bushland
- Leonard Batenhorst, 1977 \_\_\_\_\_ Route 1, Canyon

**SOIL MOISTURE LOW FOR 1974 SEASON**

by O.H. NEWTON, OTTO WILKE and CHARLES WENDT\*

Measurements of soil moisture in the top five feet of soil in the Southern High Plains of Texas during the 1973-74 fall and winter soil moisture survey show all sections of the area to be relatively dry.

Some areas do show that up to four inches of moisture are available, but even in these areas this moisture is located three to five feet deep and will not be of any value to crops until root systems are well established. The map on this page shows those areas that need indicated amounts so that the top five feet of soil will be at field capacity.

*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 available in the top five feet of South Plains soils. This provides a basis for estimating the amount of preplant irrigation required to rewet the soil and give the farmer an excellent possibility 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 either by irrigation or rainfall 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.

If irrigation water supplies are adequate, it may pay the producer to use herbicides and plant his grain sorghum dry and then irrigate it up. 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 preseason water needs.

Farmers who irrigate in excess of that which is needed will lose money and water. Producers with sandy soils may also lose nutrients which may be leached out of the soil.

*The Effect of Rainfall and Past Season Irrigation*

The total rainfall during 1973 ranged from 12 to 16 inches, which was below normal. However, the season began with a wet soil profile. Crop production was high, which meant that a high percent of the available soil moisture was extracted. Added to this was a much later than normal first freeze date, which allowed plants to continue the extraction of moisture from the soil over a longer period.

Late fall and winter rains and snows have not developed, which continues to add to the dry soil problems. The combination of all these factors has produced a serious depletion of soil moisture which must be replaced before or during the next agricultural season if normal crop production can be expected.

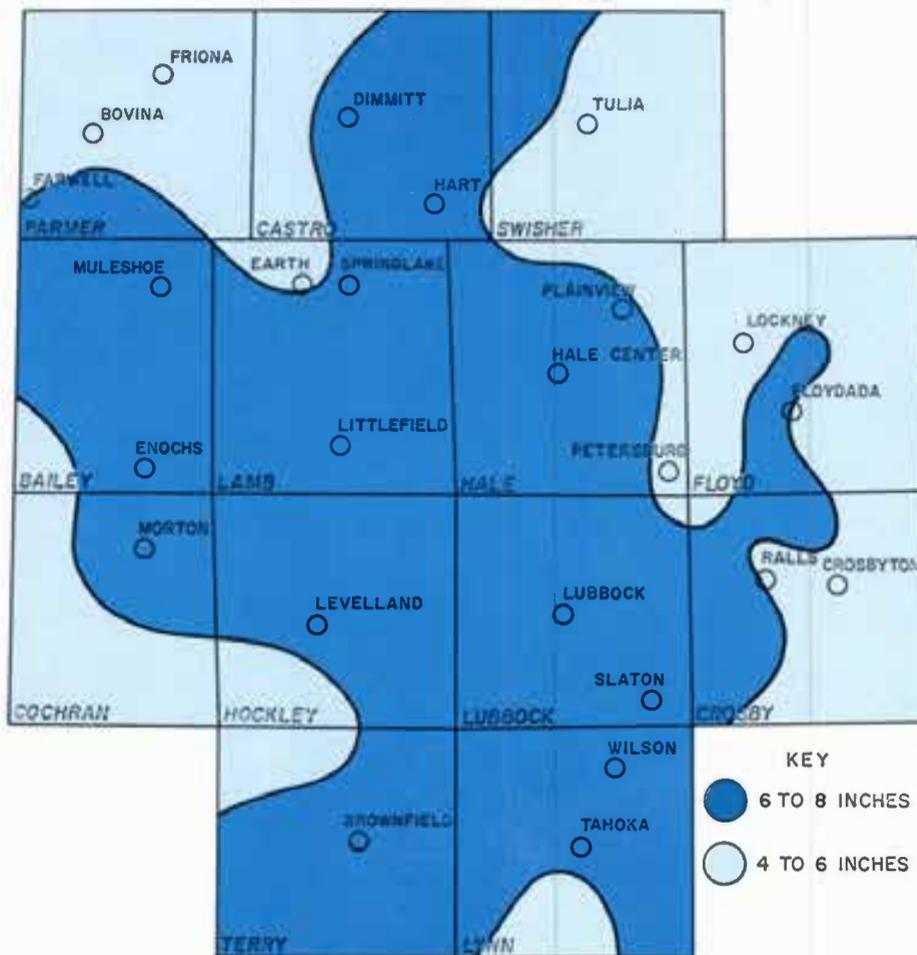
*Soil Moisture Evaluation Methods*

It would be highly preferable to evaluate the soil moisture in every field in the South Plains to determine water needs; but, because this is well beyond the scope of this survey, a wide-spaced sampling technique was used.

Up to 12 representative locations were selected in each of the 14 counties in which the amount of available moisture was determined. Because South Plains soils are quite variable in texture and, thus, water-holding capacity, the values found were compared to the highest values ever found during previous readings.

In most cases this high value was recorded during the 1969-70 survey

—continued on page 3 . . . SOIL



INCHES OF MOISTURE NEEDED TO REWET THE SOIL TO A DEPTH OF FIVE FEET

**NOTICE:** Information regarding times and places of the monthly County Committee meetings 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.

## Board Of Directors Adopts Resolution

On December 14, 1973, the Board of Directors of the High Plains Underground Water Conservation District No. 1 adopted a resolution concerning its interest in the successful implementation of the Bureau of Reclamation's weather modification research being proposed for the High Plains (see story in the November, 1973, issue of *The Cross Section*).

The resolution reads as follows:

*WHEREAS, the Bureau of Reclamation has initiated plans to begin a program to scientifically test the feasibility and potential benefits of weather modification on the High Plains, entitled the High Plains Cooperative Program; and,*

*WHEREAS, the Bureau has published "Conceptual Plan for a High Plains Cooperative Program", a framework for initiating and conducting local-state-federal precipitation management research, outlining the proposed agenda and calendar of weather modification research for the High Plains; and,*

*WHEREAS, the High Plains Underground Water Conservation District No. 1 is charged with the responsibility of conserving the existing supply of groundwater in the Ogallala aquifer through all available means; and,*

*WHEREAS, the District recognizes that there is a*

*continuing need for proper scientifically-controlled experimentation with unbiased evaluations of weather modification projects in terms of predictability and economic impact; and,*

*WHEREAS, the District foresees the possibility of successful augmentation of available groundwater supplies by enhancing precipitation through weather modification;*

*NOW THEREFORE BE IT RESOLVED by the Board of Directors of the High Plains Underground Water Conservation District No. 1:*

*THAT the District has a vital interest in any program which might prove capable of extending the viable life of the Ogallala aquifer by substituting natural moisture from precipitation for a part of the demand being made on the declining water supply stored in the Ogallala aquifer.*

*Adopted this 14th day of December, 1973.*



CHESTER MITCHELL, PRESIDENT,  
High Plains Underground Water  
Conservation District No. 1

SOIL . . . continued from page 2

which followed an excessive rainfall period. The technique further involved the best information available on the water-holding capacity of various soils in the area.

### 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 follows.

\*EDITOR'S NOTE: The authors are O. H. Newton, Advisory Agricultural Meteorologist, National Weather Service for Agriculture; Otto Wilke, Assistant Professor of Agricultural Engineering, Texas A&M University Agricultural Research and Extension Center, Lubbock, and Charles Wendt, Associate Professor, Texas Agricultural Experiment Station, Texas A&M University Agricultural Research and Extension Center, Lubbock.

## Texas Supreme Court Rules for Landowner

The Texas Supreme Court recently added a new dimension to its 1972 decision that water is part of the surface estate by ruling that no distinction can be made between salt water and fresh water when it is used in a waterflood operation to obtain oil from beneath the property of the owner of the surface estate.

On November 15, 1973, the Texas Supreme Court, in an opinion handed down by Associate Justice Tom Reavley, reversed the decision of the trial court in the case of R.O. Robinson v. Robbins Petroleum Corporation, Inc., Et Al.

### Trial Court Decision Reversed

The trial court, Wood County, Texas, Twelfth District, had ruled in favor of the operator (Robbins) and the mineral interest owners by allowing them to take salt water from beneath 80 acres of Robinson's land in an attempt to recover oil throughout a 2,000-acre waterflood unit.

Robinson said that three million barrels of his salt water had been used and no compensation rewarded by Robbins.

Robinson owned only the surface estate of 80 acres since it was deeded to him in 1964. Those 80 acres were also a part of several tracts totaling 221 acres leased in 1943 to Robbins Petroleum Co. by D. V. Wagoner. The Wagoner lease owned the mineral rights to all 221 acres.

### Three Recovery Units Operated

Three secondary recovery units, formed after Robinson acquired his land, were being operated on all or part of the 221 acres. However, Robbins was pumping salt water from an old oil well on the Robinson estate to drive the three waterflood units on the 221 acres.

Reavley created another precedent by writing in his opinion that the dominant oil and gas estate may not take water (salt or fresh) from under one

tract of land and use it for the operation of a waterflood project that operates under more than that one tract of land.

Reavley wrote, "The question here is the right of the surface owner of a tract, the minerals of which are included within a secondary recovery unit, to recover damages from the operator and owners of the unit for salt water taken from his tract for purposes of waterflooding the entire unit."

### Salt Water Part of Surface Estate

The secondary question is whether or not salt water is part of Robinson's surface estate. Having been previously decided by the high court that "water" is part of the surface estate (*Sun Oil Company v. Whitaker*), Reavley said, "The water itself is an incident of surface ownership . . . and, in our case, the saline content has no consequence upon ownership."

Reavley commented on the fact that the implied easement of mineral owners carries with it the right to use the surface, including water, "to the extent necessary to develop and produce the minerals". This right was upheld in the *Whitaker* case (see articles in the July and September, 1966; February, July and October, 1967; February, 1968; January, May and November, 1969; January, July and December, 1970; November, 1971, and October, 1972, issues of *The Cross Section*).

However, in *Whitaker*, the parties gave proof to show that the waterflood operation was necessary for the production of oil from the leased property.

### No Proof Shown in Robbins Case

"There is no proof in the record before us now of the necessity . . . of the waterflood operation on Robinson's land."

"Even if the waterflood operation is reasonably necessary to produce oil from premises of the Wagoner lease,

it does not follow that the operator is entitled to the use of Robinson's surface for the secondary recovery unit that includes acreage outside the Wagoner lease," said Reavley.

Reavley concluded by ordering Robbins to duly compensate Robinson for the salt water taken from his land for the waterflooding project.

### 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



Judge Howard C. Davidson, right, of the 99th District Court, issued the oath of office to Directors Selmer Schoenrock, Chester Mitchell and Ray Kitten on January 15 in Judge Davidson's offices. The three Board members are beginning two-year terms.

# THREE DIRECTORS RE-ELECTED TO NEW TERMS



RAY KITTEN



SELMER SCHOENROCK



CHESTER MITCHELL

## RAY KITTEN

On January 15, 1974, Ray Kitten was officially declared the winner of his unopposed bid for re-election to the Board of Directors of the High Plains Underground Water Conservation District No. 1. A Slaton farmer, Kitten represents Crosby, Lubbock and Lynn Counties.

Beginning his third two-year term on the Board, Kitten was elected Vice President during the group's first meeting of 1974. He has served as Secretary-Treasurer from January, 1971, until his being named Vice President.

Born in Lawrence, Nebraska, in 1911, Kitten moved with his parents to the Slaton area in 1916. The Director began operating his present farm in 1931.

He now operates 320 acres of cotton and maize. Having drilled his first irrigation well in 1945, Ray has grown up with irrigation in West Texas. He now operates two eight-inch irrigation wells.

For nearly 20 years, Kitten has allowed one of his irrigation wells to be measured as one of the more than 800 wells participating in the observation well program carried on by the District and the Texas Water Development Board. This well is equipped with an automatic water-level recorder, a device used to calculate and record water-level fluctuations.

Also, the Vice President is continuing to participate in a contract he signed with Texas Tech University in 1971 for the installation of an experimental artificial recharge well near a

lake on his Lubbock County farm.

Ray and his wife, Laurena, have been married 42 years. They have four children—Betty Reissig of Conroe, 41; Mary Lou Mosser of Slaton, 38; Shirley Bednarz, 33, of Slaton, and Kenny, 26, Slaton.

*The Cross Section* speaks for the District in welcoming Ray to his third term as its Director and thanks him for his obviously intense interest in the welfare and future of the District and its residents.

## SELMER SCHOENROCK

Selmer Schoenrock, Director representing Director's Precinct 2 (Cochran, Hockley and Lamb Counties), was re-elected to that position for the third time January 8, 1974.

First elected to the Board in January, 1970, Schoenrock was declared the official winner of the position on January 15, 1974.

Schoenrock, 52, served the District as a County Committeeman, representing Hockley County, from January, 1963, until January, 1969.

Born in Clifton, Texas, in 1922, Schoenrock and his family moved to the Levelland area in December, 1934. The Director graduated from Levelland High School and joined the U. S. Navy. He served from 1944 to 1946.

Upon his discharge from the Navy, Schoenrock married and began farming his own place near Levelland. He and his wife, Maurene, still reside near that Hockley County town.

The Schoenrock's have three children: Donna Kay Taylor, Gloria Lynn and Jerrell. Donna Kay, 25, married

and living in Corpus Christi, has a daughter, Heather. Lynn, 24, and Jerrell, 18, live with their parents.

Having drilled his first irrigation well at the height of the drought in 1956, Schoenrock now operates 21 irrigation wells, ranging from two-inch to six-inch. "However, there is only one six-inch well on the place," added the Director.

He farms 1,600 acres of cotton and milo, partially by the dry land method.

When asked his opinion of what kind of job the farmers living within the Water District are doing toward water conservation, Schoenrock quickly replied, "I think there are only a few who are wasting water and those are the ones who are noticed the most often." "The hard-working farmer who never wastes a drop of water is never noticed for his good work."

Schoenrock added, "I think that all through the years farmers have been basically water conservation-minded. If they hadn't been, they probably wouldn't have the means to carry on farming today."

Considering this basic attitude, the Water District feels confident in knowing that he is one of those types of farmers about which he is proud. The District, itself, is proud that Selmer Schoenrock remains as a Member to its Board of Directors.

## CHESTER MITCHELL

Chester Mitchell, Director since January, 1964, was officially declared the winner of an unprecedented sixth consecutive two-year term on January

15, 1974. A Lockney farmer, Mitchell has served as a Member to the Board longer than any other man in the District's 22-year history.

A native of Winters, Texas, Mitchell also served six years on the Floyd County Committee.

The Director and his parents moved to Floyd County in 1919, when Chester was five years old.

Following graduation from Oklahoma State University in 1937 with a Bachelor of Science degree in Agronomy, Chester married Alice Miller. Alice graduated from Oklahoma State the following year with a degree in Home Economics.

Mitchell became employed as a County Agent for Logan County, Oklahoma, and remained in that capacity for seven years before returning to farming near Lockney in 1946.

The Director now operates a 720-acre farm and produces cotton, milo, soybeans and wheat. He also maintains two modified playa lakes and one tailwater return system on his place.

"I feel modifications are a good investment in a farm's future and in the future of the area's groundwater supply," he adds. He says the three modifications allow his four irrigation wells to remain in operation for a longer duration.

As an officer with the Board for nine years, Chester has been extremely active in the District's behalf. The fact that Precinct 5's voters re-elected Chester to his eleventh year as their representative is proof of his success as a spokesman for groundwater conservation.

# THE Cross SECTION

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Volume 20—No. 2

"THERE IS NO SUBSTITUTE FOR WATER"

February, 1974



John C. White, Texas Agriculture Commissioner, comments on the outlook for High Plains water resources, while speaking before a Lubbock meeting of Water, Inc. Seated to his right is Lloyd Calhoun of Hobbs, New Mexico.

## OF HIGH PLAINS

### State Water Leaders View Economic Future

Agriculture—the backbone of the American economy—and water—the valuable resource which sustains it—were the topics of debate in Lubbock, February 16.

Water leaders from all areas of the State of Texas were on hand at the annual meeting of Water, Inc., to discuss the importance to the area, nation, and even the world, of maintaining the present level of agricultural production on the High Plains.

"Compared to the outlook for our High Plains water resources, the present energy crisis is a *short-term* problem," said Texas Agriculture Commissioner John C. White.

#### Affirmative Action Needed

He emphasized the need for affirmative action to expand water resource programs in Texas, adding that without action, "there simply will not be any more major expansion in our economy."

White described the High Plains region of Texas, Oklahoma and New Mexico as being one of the most important food and fiber producing areas of the world.

He warned, "If our water plans are shortsighted and action is short-circuited, it is inevitable that much of this land must revert to its natural state—a sea of sand and grasses—with isolated pockets of subsistence agriculture and substandard living."

On the immediate problem of fuel

shortages, White noted that agricultural producers are being asked to go all out in production of food and fiber this year.

#### Farmers Must Get Fuel

He said getting the fuel to the farmer when he needs it will be one of his main concerns this year in helping the farmer meet the plea for increased production.

"It is imperative that farmers receive their fuel requirements, since agriculture produces the most basic energy of all—food," the Commissioner concluded.

During the afternoon session of the meeting, a panel, comprised of the General Managers of three groundwater conservation districts, commented on various aspects of the districts' conservation programs.

J. W. Buchanan, North Plains Underground Water District, Dumas, said his staff is backing research on crop efficiency in relation to the amount of water applied.

#### Efficiency Needed

Noting that his district advocates the increased use of return systems and sprinkler systems in order to receive the maximum benefit of water used, Buchanan said, "The responsibility lies with the farmer to manage all of his water more efficiently."

Frank Rayner, Manager, High Plains Underground Water Conservation District No. 1, Lubbock, con-

cerned his discussion with the immediate role of groundwater conservation districts in relation to the long-range goals of Water, Inc.

"The Water District's primary function is the economic utilization of the existing water supplies," he said. Reuse of tailwater through return systems, modification of existing playa

—continued on page 3... STATE

### Drilling of Irrigation Wells Continues to Rise in 1973

Drilling of irrigation wells on the High Plains of Texas continues on the upswing, as the 1973 total of new wells increased nearly eight percent over 1972.

In 1973 a total of 670 wells were completed as compared to 618 in 1972, an increase of 8 percent. However, 1,137 permits were issued in 1973, leaving 467 not completed, or only 59 percent of the wells actually drilled.

For 1972, 618 wells were completed out of a total of 821 applications for permits received by the Water District—a total of 75 percent.

A few counties within the District in which well drilling is the most active are Bailey, Castro, Deaf Smith, Lamb and Parmer. Statistics in those coun-

ties for permits issued and wells completed are as follows:

PERMITS ISSUED			
County	1972	1973	Percent of Increase
Bailey	60	123	105
Castro	79	139	75
Deaf Smith	121	163	34
Lamb	91	186	104
Parmer	133	201	51

WELLS COMPLETED			
County	1972	1973	Percent of Increase
Bailey	54	86	59
Castro	55	80	45
Deaf Smith	83	98	18
Lamb	69	123	78
Parmer	103	127	23

Considering the eight-percent rise in wells completed in 1973 as compared to 1972, it might seem surprising that well permits received by the District increased 38 percent during the year and more than 100 percent during the months of peak drilling from 1969 to 1972.

However, it is suspected that the primary reason for the increase in applications for water well permits may be due to the removal of acreage limitations on agricultural production.

These increases in applications may also be attributed to the decline of the water table, competition for well sites

—continued on page 2... DRILLING



From left to right, Frank Rayner, Felix Ryals and J. W. Buchanan, General Managers of the three underground water conservation districts, in the High Plains, participate in a panel discussion in Lubbock, February 16.



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

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Telephone 762-0181

REBECCA CLINTON, Editor

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Frank Rayner, P.E. \_\_\_\_\_ Manager  
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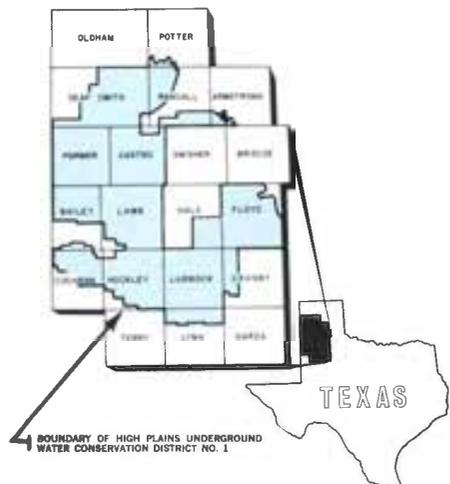
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**NOTICE:** Information regarding times and places of the monthly County Committee meetings can be secured from the respective County Secretaries.

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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**DRILLING STATISTICS FOR 1972**

County	Permits Issued	New Wells Drilled	Replacement Wells Drilled	Reported Dry Holes
ARMSTRONG	0	0	0	0
BAILEY	60	54	4	0
CASTRO	79	55	6	1
COCHRAN	26	15	0	0
CROSBY	10	7	2	0
DEAF SMITH	121	83	2	2
FLOYD	72	57	9	2
HALE	16	9	6	1
HOCKLEY	51	38	2	2
LAMB	91	69	15	1
LUBBOCK	100	79	9	6
LYNN	28	32	1	2
PARMER	133	103	13	3
POTTER	3	1	0	0
RANDALL	31	16	1	4
<b>TOTALS</b>	<b>821</b>	<b>618</b>	<b>70</b>	<b>24</b>

**DRILLING STATISTICS FOR 1973**

County	Permits Issued	New Wells Drilled	Replacement Wells Drilled	Reported Dry Holes
ARMSTRONG	0	0	0	0
BAILEY	123	86	7	2
CASTRO	139	80	4	1
COCHRAN	21	13	0	2
CROSBY	11	8	0	0
DEAF SMITH	163	98	5	2
FLOYD	90	35	4	1
HALE	21	11	3	0
HOCKLEY	56	20	0	0
LAMB	186	123	5	0
LUBBOCK	64	29	9	3
LYNN	10	4	1	0
PARMER	201	127	8	1
POTTER	4	3	1	0
RANDALL	47	33	2	2
<b>TOTALS</b>	<b>1137</b>	<b>670</b>	<b>49</b>	<b>14</b>

DRILLING... continued from page 1

and the fear of waiting until supplies of drilling equipment are exhausted. And, as is evident today, this increased rate of drilling wells is, in itself, creating shortages in drilling supplies.

The accelerated irrigation development within the sandhills area of Bailey and Lamb Counties is reflected in the large increase in well applications in those counties. The well applications tendered by only two large farm corporations account for most of these wells.

**May Be Due To Shortages**

The fact that so many of the wells applied for are not completed may be attributed to these shortages, and it also may be traced to a delayed schedule on the part of local drillers due to a backlog of orders.

Additionally, expiration of the four month period provided for in the permit applications might be creating part of the numerical increase in issued permits.

Local irrigation well drillers say they have not been so busy in years—at least as long as their supplies are adequate.

As the availability of supplies increases, one might expect more wells to be completed on the High Plains. However, within the boundaries of the Water District, certain spacing proce-

dures must be followed.

This is, in itself, a conservation measure in that it promotes orderly drilling. Only time will tell how quickly available well sites are developed.

**Colorado Irrigators Form Subdistrict**

The following paragraphs, reprinted from the October, 1973, issue of *The Colorado Water Congress Newsletter*, reveal that irrigators in other states are becoming increasingly concerned with the idea of control of groundwater on the local level.

"District Water Judge Donald Carpenter, Greeley, Colorado, on July 26, authorized irrigators belonging to the Central Colorado Water Conservancy District to form a ground water management subdistrict. The purpose of the subdistrict is to enable the irrigators to determine their own water needs and administer their own wells.

"Dave Miller, attorney for the Water Conservancy District, said well owners had a choice—they could join the subdistrict and act as a body to administer the water available to them or go it alone. 'If they chose not to organize, then it was inevitable that their wells could be curtailed or shut down,' he said."

## Researchers Testing Water-Saving Irrigation Practice

A concept for prolonging an existing water supply, drip irrigation, is being considered by many researchers as a practice adaptable to many areas of the Texas High Plains.

Already employed at sites in other parts of the United States, drip irrigation is a means of applying a small and continuous amount of irrigation water to plants in specific concentrated areas of application.

By applying water drops to a specific area of the plant where the water enters the soil surface readily, drip irrigation eliminates soil erosion that can occur under other types of irrigation.

### Conservation Measure Tested

Drip irrigation, considered to be a unique and effective method of saving water while maintaining a high level of productivity, is primarily used in greenhouses, gardens and orchards. However, its application is being researched for extensive use on other crops, such as cotton.

Water is released through applicators called emitters. Drip irrigation drops the water onto the ground through one or more emitters, attached to a hose or above-the-ground pipe, located adjacent to each plant. Therefore, this type irrigation is capable of supplying small quantities of water at any desired interval of irrigation.

Emitters are selected by the irrigator according to the amount of water application desired and the pressure needed. The quantity of water applied by each emitter is expressed in gallons per hour (gph)—usually one-half to three gph.

### Emitter Pressure Varies

Low-pressure emitters will apply more water at a given pressure than high-pressure emitters. Low-pressure emitters are more sensitive to differences in land elevation, with high-pressure emitters less likely to become clogged because of their water-flow design.

Seasonal water applications can be controlled by varying operating time and pressure.

Under each emitter a wetted area is formed which varies in shape and extent, depending upon the soil characteristics. In drip irrigation, about

40 to 50 percent of the allocated area per plant is wetted, as compared to nearly 100 percent with sprinkler irrigation.

### Water Replacement Important

In drip irrigation, the irrigator tries to replenish the water on an almost daily basis, the concept being to replace the water the plant has already used, rather than storing water for future use. Water should be applied only as quickly as the soil absorbs it.

According to Leon New, Irrigation Specialist with the Texas Agricultural Extension Service, Lubbock, a more uniformly high soil moisture content can be maintained with drip irrigation. He also said plants that are not subject to extreme soil wetting and drying are normally healthier and can be more productive.

Otto Wilke, Agricultural Engineer, Texas Agricultural Experiment Station, another researcher testing the advantages of drip irrigation, says two newly-advanced techniques may allow drip irrigation to more readily adapt itself to field crops.

### Plastic Pipeline Used

The first is the use of plastic trail lines, instead of sprinklers, attached to a pivot sprinkler system. He said a few of the advantages of using these 100-foot-long plastic lines are that lower operating pressures are needed, less water is lost to evaporation and there is little or no surface runoff.

The second technique involves the development of a rig to move the irrigation pipe in a field of cotton. By using a simple attachment behind a tractor, the emitter hose can be moved laterally from one row to another in a few minutes—it can even be moved with water flowing through the hose and without stopping the well pump.

### Can Irrigate 40 Rows

In this manner one hose or pipeline can be used to apply a single irrigation to 40 rows of cotton. A typical installation would be for a 40-acre field of cotton, with 40 gallons per minute pumped from one or more small capacity wells.

Another type of drip irrigation design is employed on a Lubbock County farm. It calls for a mainline installed beneath 70 acres of cotton with garden hose hydrants spaced on the mainline every 132 feet. Each hydrant is connected to a one-quarter-mile length of emitter hose and waters 40 rows—an area of four acres per hose.

According to the farmowner, Dale Brown, on a 40-inch spacing, and by watering every other row, more than four inches of pre-plant irrigation can be applied on 40 acres within three months with the pipe mover. "With only 10 emitter hose laterals to move twice weekly across the 40-acre field, very little hand labor is required," says the landowner.

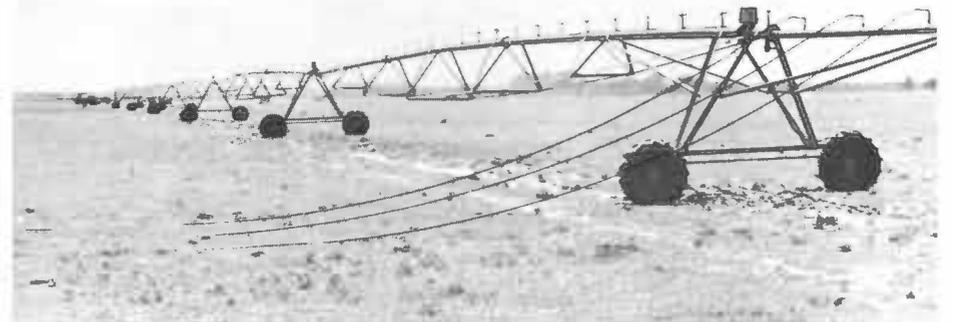
### Can Move Hose Quickly

He continued, "After planting, the hose could be moved daily in about an hour, applying 1.2 inches of water within a 20-day period."

Researchers also cited the need for a filter or strainer to flush any dirt or

foreign materials from the system. Clogging of the emitters was one of the first problems encountered by system designers, but researchers claim this problem is being eliminated with the availability of better materials and improved orifice designs.

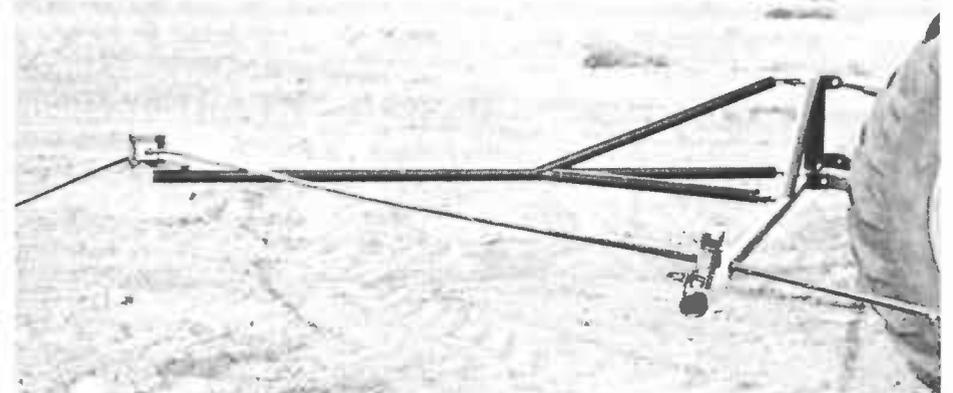
Considering the small amount of water required by the drip irrigation method, some High Plains farmers may soon find it necessary to consider this technique as an integral part of their water conservation program in the future.



A new technique being adapted by researchers of drip irrigation is the use of plastic trail lines, instead of sprinklers, attached to a pivot sprinkler system.



Dr. Otto Wilke, Agricultural Engineer with the Texas Agricultural Experiment Station, Lubbock, examines one of the 100-foot trail line pipes used in drip irrigation. Researchers say less water is lost to evaporation and there is little surface runoff with these surface pipelines.



A method for transporting a drip irrigation emitter hose in a field of cotton is a second technique being advanced. A simple attachment behind a tractor enables the hose to be moved quickly from one row to another without stopping the well pump.

STATE... continued from page 1

lakes and other water conservation measures are being considered by the water districts to prolong the ground-water supply.

Rayner added that the efforts of the three groundwater conservation districts augment the efforts of Water, Inc., to bring a supplemental source of water to West Texas, Eastern New Mexico and Western Oklahoma.

The High Plains Water District Manager concluded by noting, "Water, Inc., needs more time to see their plans become a reality and water districts, such as these three on the Texas High Plains, can buy that time for them."

Felix Ryals, Panhandle Ground Water Conservation District, White Deer, mentioned other functions of groundwater districts. Some of these

—continued on page 4... STATE

## AUTOMATION DEVICES STUDIED

With the advent of shortages on the farm, both real and anticipated, new methods of irrigation are gaining popularity in an effort to conserve water, fuel and man-hours.

A few of these methods, drip irrigation and subsurface irrigation, have been the subject of some experiments to automate them by researchers in Texas and Colorado.\*

Drip irrigation systems, closed pipe systems, are easily automated by the use of soil moisture sensors or switching tensiometers. Considering the fact that irrigation on the High Plains is most often used to supplement rainfall, soil moisture sensors have been found to coordinate the use of erratic rainfall and irrigation water more efficiently.

### Tensiometer Device

A tensiometer is a device set in the ground which records the soil moisture and can be made to automatically send a signal that the soil is adequately saturated to a pre-determined point.

This checking device allows more efficient use of available water and provides for adequate irrigation of a crop to prevent stress and still retain dry zones in the soil profile in which rainfall can be stored.

According to Otto Wilke, Agricultural Engineer, Texas Agricultural Experiment Station, Lubbock, four types of irrigation were tested for total water

applied and total water used by the crop.

Under sprinkler irrigation, 10.05 inches were applied and 11.53 inches used. Fifteen inches of water were applied on a furrow-irrigated plot and 12.03 inches were consumed. A sub-irrigated plot received 8.10 inches and used 11.33 inches.

Finally, an automated subirrigated plot needed only 5.19 inches of irrigation water and used 10 inches of total water, drawing the other 4.81 inches from rainfall.

### May Expand Research

Wilke said this research may be expanded to apply automation by tensiometer controls to circular sprinkler systems. In this case, the tensiometer could automate the sprinkler by limiting the number of circles the system would make during a given period of time, the time one rotation would take, the amount of water to be applied during each circle and the amount of delay between waterings.

\*A method of automating drip and subsurface irrigation was designed and operated by Charles Wendt, Soil Physicist, Texas Agricultural Experiment Station, Lubbock; H. P. Harbert, III, Graduate Assistant, Colorado State University, Fort Collins, Colorado; W. Bausch, Research Associate, Texas A & M University Vegetable Research Station, Munday, and Otto Wilke, Agricultural Engineer, Texas Agricultural Experiment Station.

STATE . . . continued from page 3

are to provide for the spacing of wells—a procedure for avoiding interference between wells, the observation well program and public education.

### Public Education Important

"The most important function of our water districts is to educate the public of the rate of decline of the water table, the problems associated with such a decline, and the procedures recommended by which to conserve the water which remains," Ryals emphasized.

Joining Commissioner White in presenting addresses to the group were General James M. Rose, Director, Division of Planning Coordination, Office of the Governor; Senator H. J. Blanchard, Chairman, West Texas Water Resources Study Council; Wayne Wyatt, Chief, Groundwater Data Branch, Texas Water Development Board; Dr. James E. Osborn, Assistant Dean of Agriculture, Texas Tech University; John C. Ball, Chief, Planning Branch, Corps of Engineers; James Bradley, Regional Administrator, Bureau of Reclamation, and Harvey Davis, Executive Director, Texas Soil and Water Conservation Board.

Legislators present were Blanchard, Representative E. L. Short, Tahoka; Representative R. B. McAlister, Lubbock; Representative Bill Clayton, Springlake, and Representative Charles Fennell, Holiday.

## Area Conservationist Promoted to SCS Post

Arneal Scott, Area Conservationist with the Soil Conservation Service (SCS) at Lubbock since 1968, has been promoted to serve the SCS as Assistant Director of Conservation in the Caribbean. His territory will include Puerto Rico and the Virgin Islands.

His transfer effective February 14, Scott said he will remain in Puerto Rico for at least two years. He will reside in San Juan.

While in the Caribbean, the conservationist will aim his efforts toward achieving more effective resource development, conservation and watershed programs in the area.

An SCS employee for 17 years, Scott is past President of the South Plains Chapter of the Soil Conservation Society of America and a member of the West Texas Water Institute and Water, Inc.

As of press time for *The Cross Section*, Scott's replacement had not been named.

The Water District extends to Arneal congratulations on his new assignment and good luck in all his endeavors.



## TAILWATER REUSE IS ENERGY CONSERVATION

INVEST IN A TAILWATER  
RETURN SYSTEM TODAY

# THE Cross SECTION

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

Volume 20—No. 3

"THERE IS NO SUBSTITUTE FOR WATER"

March, 1974

## CAPTURING AND STORING SOLAR ENERGY STUDIED

The continual, comfortable heating and cooling of homes and buildings has become a much-demanded modern-day necessity, brought on largely by the previously abundant availability of energy.

And, as has been previously experienced by man in his history of over-using what once appeared to be an inexhaustible resource, our country is now beginning to see the bottom of the cheap fuel barrel.

Once a resource, upon which a populace has become dependent, is depleted, alternate sources of supply must be determined in order to maintain the status quo.

In increasing numbers, researchers across the country are concerning themselves with the study and possible application of solar energy as a supplemental, or even replacement, source of energy.

### A&M Research Effort

Leading the push to develop alternate energy sources is a group of Texas A&M University researchers. Dr. W. B. Harris, Professor of Chemical Engineering at A&M, and John H. Martin, Graduate Assistant in Chemical Engineering there, visited the High Plains Water District's Lubbock office March 4 to discuss their efforts in that

direction. Dr. Harris and his associates have invented a new type of relatively low cost solar collector, patents upon which are now pending.

### Space Heating and Cooling

Considering the vast and unlimited supply of solar energy, Dr. Harris and Dr. Richard Davison, Professor of Chemical Engineering, have aimed their talents at the study and practice of space heating and cooling, which consume 20 percent of the nation's energy supplies.

The popular idea today is to place a solar "collector" on the roof of individual houses or buildings. However, the A&M researchers see many reasons why this concept would be inconvenient and uneconomical—mostly because of the small scale of the operation.

"I have proposed building heaters on a large scale that will heat complexes of buildings or even a city," explained Dr. Harris.

The researchers claim that their "Solaterre" system will work on a large scale for the cost of one dollar per square foot—at present cost guidelines.

Besides being less expensive to build and operate on this scale, Dr. Harris

—continued on page 2... SOLAR



Dr. W. B. Harris, Professor of Chemical Engineering at Texas A&M; Don Smith, Frank Rayner and John H. Martin, Graduate Assistant in A&M's Chemical Engineering Department, get together at the Water District's offices in Lubbock to discuss the possibility of a joint study on the future adaptability of solar energy.

## HIGH PLAINS DIRECTORS VISIT SOUTHWEST FLORIDA WATER DISTRICT

The Board of Directors of the High Plains Water District recently toured the Southwest Florida Water Management District (SWFWMD).

The SWFWMD, headquartered at Brooksville, Florida, covers all or part of 15 counties of Florida, an area of 10,000 square miles. This District, governed by nine members appointed by the Governor of Florida, was established in 1961 as a flood control agency, but its powers were enlarged in 1969 to deal with the area's burgeon-

ing groundwater conflicts and problems. As an example, during only the last three years, the SWFWMD has issued 44,000 water well permits.

### Directors Briefed

During their three-day visit to the SWFWMD, the High Plains District Directors were briefed on the geology and hydrology of the Floridan and associated aquifers; were presented a review of the functions and administrative procedures of the Florida District; toured a part of the area to view the hydrologic conditions and problem areas and works of the Florida District, and attended the March meeting of the Board of Governors of the SWFWMD.

The HPUWCD#1 Directors were also afforded a detailed review of the present groundwater management procedures and rules and regulations of the SWFWMD, and they were also presented copies of the very comprehensive and far-reaching drafts of groundwater rules and regulations now pending consideration by the SWFWMD Board of Governors.

While in Florida the HPUWCD Directors also heard reports by attorneys to the SWFWMD on pending State (Florida) and Federal legislation effecting groundwater and land use regulation.

## Moore Advocates Future Regulation Of Groundwater

The following is an excerpt from a speech by Joe G. Moore, Director of the National Commission on Water Quality, presented at the 30th annual meeting of the Texas Water Conservation Association on March 1, 1974. Former Executive Director of the Texas Water Development Board, Moore pointed out nine areas he considers important to the future water needs of Texas.

One area of his concern was the

—continued on page 3... MOORE



Selmer Schoenrock, Billy Wayne Sisson, Ray Kitten, Chester Mitchell and Webb Gober visit with Derrill S. McAteer (third from left), Chairman of the Board of Governors of the Southwest Florida Water Management District.

# THE Cross SECTION

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

1628 15th Street, Lubbock, Texas 79401

Telephone 762-0181

REBECCA CLINTON, Editor

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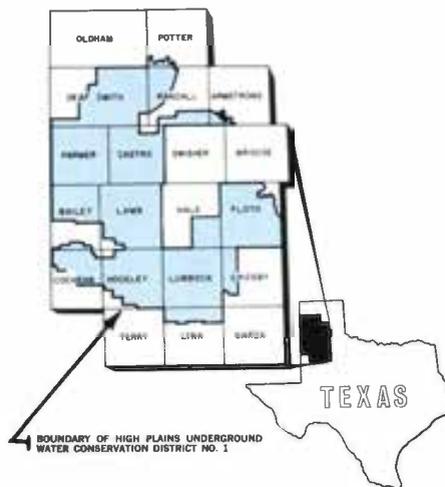
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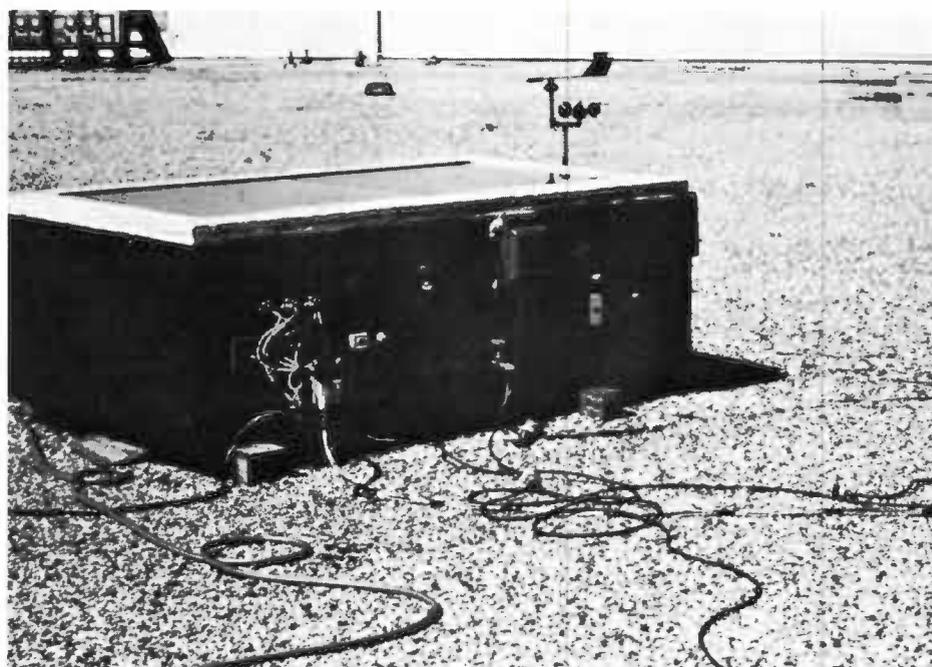
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Pictured above is the experimental heater designed by the Texas A&M researchers for the specific purpose of correlating operating variables in the testing of their concept of space heating.

**SOLAR... continued from page 1**

claims the heater is capable of eliminating one of the major drawbacks of heating an individual building with its separate heater—the need for a back-up source of heat on cloudy days.

The proposal is to build large solar collectors on unoccupied land on which large volumes of water can be heated. "The beauty of this idea," Harris explains, "is that this water can be pumped into the area's existing aquifer for underground storage."

He also pointed out that this readily-available storage factor renders the idea less expensive, and more economically feasible.

**Solar Water Heater**

The professors developed a solar water heater which, with the economies of scale, could be operated efficiently at a currently competitive economic rate.

"If an aquifer was 50 feet thick and

you replaced the available water with hot water within a 700-foot radius around the well, only 10 percent of the heat input would be lost underground over a six-month storage period," Harris postulated.

Based on this premise, Dr. Davison proposed the idea that cold water could also be stored underground until the summer months, at which time it could be pumped through the same distribution system, used in the winter for hot water, to cool buildings during the summer months.

**Plan to Cool Water**

"The idea is to pump water from underground and run it through a cooling pond in the winter," said Harris. "Hopefully, the water can be cooled to near 32 degrees. This water could then be piped through the distribution system for cooling in the summer." After this cold water completes the cooling cycle, it will be considerably warmer—warmer than 65 degrees—and this water will be pumped back underground for storage until needed for the heating process.

Considering the possible adaptability of such a plan, Dr. Harris, in behalf of his cohorts, requested that the Water District aid the A&M research effort in finding an area within the Ogallala aquifer suitable to a study of the injection of water for the purpose of heating and cooling a large complex of homes and/or buildings.

Harris' figures show that the cost for such a project would require a two-and-one-half-million-dollar investment for 2,000 homes.

**Good Return Likely**

"If solar energy was sold at the current cost for gas energy, the utility would see a yearly return of approximately \$250,000—or 10 percent a year for the original investment in the project," explains Harris.

Another idea would be to charge each house or unit a \$1,000 hook-up fee. "This initial charge wouldn't be unreasonable, though, because the customer would save \$1,500 or more by not having to build or buy an individual heater or air conditioner for his

—continued on page 4... SOLAR

**NOTICE:** Information regarding times and places of the monthly County Committee meetings 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.

MOORE . . . continued from page 1

need for regulation of groundwater. His statements on this subject follow.

When I say regulate, I mean regulate, and not permit. There's a difference. Regulation implies restriction. It means someone may be deprived. Permitting merely means you allow it to proceed. It doesn't make any difference, I don't think, whether regulation is at the State or local level. It must, however, be effective. There isn't an argument against local regulation of groundwater, provided that regulation is effective. And this justification arises in different circumstances in various parts of the State.

For example, the land subsidence problem in Houston is obviously different from the municipal water supply question in San Antonio, and undoubtedly different from the High Plains problem in terms of the Ogallala

underground aquifer. Let me point out, however, that, for the land subsidence problem in Houston to be adequately regulated, it is important that the geographic extent of the regulatory body be broad enough to cover the area that can cause the subsidence, which means that you must have a governmental unit that is either broader than the City of Houston, the County of Harris, the Counties of Montgomery, Chambers and Galveston, in terms of the land subsidence problem. The question is this: you must have a jurisdictional unit broad enough to cover the geographic area in which the problem occurs.

I will say the same thing about the City of San Antonio. Unless a way can be found to regulate the irrigation to the West of San Antonio, it is obvious that, over a period of time, there will be a substantial impact on the Edwards underground aquifer. The municipal water supply problem will not necessarily be solved by the Wagstaff Act—the so-called priority allocation or priority assignment of water uses. It has been on the books for a number of years now, and, if it is a solution, it can only be effective after long litigation. Certainly, after some attempt is made to eliminate the irrigation, then you have a resolution of the question of municipal use as opposed to irrigation use.

For the High Plains of West Texas, I think it is important that the Ogallala underground aquifer or reservoir be conserved to the greatest degree possible. What this may mean, however, for the High Plains is a change in the cropping pattern. Over a time, it may be necessary that the water that is to be used for irrigation there be used for the highest and best use, regardless of who makes the determination—that it be used for the highest and best use and it may mean the elimination of those crops that use large quantities of water and represent a relatively small, marginal, economic return.

Again, regulation is important. It must be effective. It must incorporate the geographic area to be regulated, and it can be local if it achieves those objectives.

## FARMER MUST PUT PRICE TAG ON IRRIGATION WATER

An important factor in any water conservation program, and one too often overlooked by even the most conscientious farmers, is the economic value of irrigation water.

When an irrigator realizes that his water is used to produce crops that are sold at market prices brought for irrigated crops (as grain sorghum and cotton on the High Plains), he will be convinced of the importance of wisely applying the water available to him.

According to researchers at the Texas Agricultural Extension Service, Lubbock, a single four-inch irrigation, when applied at certain growth stages, can produce 1,600 pounds of grain sorghum. In this case, the irrigation water has a value of approximately \$64, or \$16 an acre-inch.

The same four-inch irrigation is likely to produce 4,000 pounds of grain and be worth up to \$160 (\$40 an acre-inch) when applied during a growth stage when the response is greatest.



Ross Goodwin, Member of the Executive Board of Directors of the Texas Water Conservation Association (TWCA); Chester Mitchell, High Plains Water District Director, and Ray Kitten, Vice President of the Water District Board, pause during a break in the proceedings of the 30th meeting of the TWCA in Austin, March 1, 1974. Present, but not pictured, is Selmer Schoenrock, Director from Levelland.



Joe Moore speaking before the annual meeting of the TWCA, March 1, 1974. (Photo Courtesy of Texas Water Development Board)

## A. L. BLACK APPOINTED TO TWDB

A. L. Black, a Friona farmer-rancher, was named by Governor

Dolph Briscoe to a six-year term on the Texas Water Development Board (TWDB). Appointed on March 6, Black replaces Marvin Shurbet, Petersburg, whose term on the Board had expired in November, 1973. Briscoe also re-appointed Milton Potts, Livingston, to another six-year term as a Member of the TWDB.

### Irrigation Panel Elects Goodwin Vice Chairman

Ross Goodwin of Muleshoe, past President of the Board of Directors of the High Plains Underground Water Conservation District No. 1, was named Vice Chairman of the Irrigation Panel of the Texas Water Conservation Association (TWCA) at its annual meeting in Austin, February 27 through March 1.

Elected to serve on the Irrigation Panel in 1973, Goodwin now also serves TWCA as a Member of its Executive Board of Directors.

#### Other Panel Members

Other members of the Irrigation Panel are W. D. Parish of Mercedes, Chairman; T. R. Galloway, Beaumont; C. B. Jeffrey, Devers; John A. Hayes, Pecos; Paul Hetrick, Edinburg, and Fred Vanderburg, Pampa. Vanderburg is a Member of the Board of Directors of the Panhandle Groundwater Conservation District No. 3, which offices at White Deer in Carson County.

Other TWCA panels are Ground Water, Municipal, Industrial, River Authorities, Environmental and Navigation. Frank Rayner is a Member of the Groundwater Panel. All panel members also serve on the Board of Directors.

Goodwin will serve as Vice Chairman for one year.

At the time of his appointment to the TWDB, Black was serving Water, Inc., as its President. Effective March 22, 1974, Black resigned that position and the vacancy was filled by the organization's First Vice-President, George McCleskey, a Lubbock attorney.

Shurbet was President of the Board of Directors of the High Plains Underground Water Conservation District No. 1 when appointed by Governor Price Daniel in January, 1958, to serve as one of the first members of the newly-formed TWDB.

During his 16 years of service, Shurbet was re-appointed to subsequent six-year terms by Governor Price Daniel and Governor John Connally.

A Floyd County farmer, Shurbet was first elected to the District's Board of Directors in 1954. He served as Secretary from 1954 to December, 1955, and President from January, 1956, until his appointment to the TWDB in 1958.

Shurbet's name became directly linked to the groundwater economy of the High Plains as the plaintiff in the District-sponsored suit of the United States Internal Revenue Service, for an income tax allowance on the landowner's cost in groundwater depleted as a result of producing income.

# ENERGY FOR IRRIGATION IS KEY FACTOR

By LEON NEW\*

*Extension Irrigation Engineer*

The natural resources that have permitted the Texas High Plains to become one of the world's leading agricultural regions are much less than abundant for the 1974 crop year. This year's crop will be produced, stretching the diminishing supply of irrigation water over more thirsty acres of dry soil than have ever been irrigated in this productive region.

New wells have been drilled at a fast clip since early winter, perhaps in an effort to provide water to irrigate a portion of the land that in recent years has been set-aside acres in government programs. But connections to fuel lines for power in certain areas are curtailed due to the gradual increase in the number of wells and in fuel use that has over-loaded supply systems.

### *Fuel Uncertain*

Then, there is at least some uncertainty of available fuel for the peak pumping period in the summer. And where is the fertilizer which once supplied adequate plant nutrients and, when combined with irrigation water, boosted crop yields to optimum levels?

The demand is keen for fuel resources to pump irrigation water, process anhydrous ammonia, and run tractors. Will there be enough for all? Fuel available for these purposes in 1974 is no longer the low price once enjoyed, so irrigation costs for this year's crop will be more, too.

### **SOLAR . . . continued from page 2**

home as a backup device," Harris continued. "This is a guaranteed source of energy at a guaranteed price."

So, considering the Federal Government's present policy of awarding grants of money for solar energy research, the A&M group plans to apply to the National Science Foundation for a continuation of the project on July 1, 1974. If accepted, A&M and the Water District may build a large solar heater above a suitable part of the aquifer—possibly adjacent to a complex needing space heating and cooling. According to Harris, the project could also include cooling ponds and piping needed for the air conditioning phase of the "Solaterre" system.

Fuel or energy costs to power the estimated 68,000 irrigation wells on the Texas High Plains are likely to average \$25,000 to \$30,000 hourly. This is indeed a tremendous demand for energy and one which requires intensive planning by energy suppliers. Sixty-five percent of the irrigation wells are powered by natural gas, while 30 percent use electricity and five percent use butane or propane.

### *Energy Important*

Energy for irrigation is important, though, since irrigated crop yields average two to five times that of dry-land yields. There are few crop failures on irrigated farms due to the lack of moisture. Irrigation permits high water use crops such as corn, soybeans, sugar beets, alfalfa, and vegetables to be grown in the area. About 60 percent of the grain sorghum and cotton acreage and 50 percent of the wheat acreage grown in the area is irrigated. Approximately six million acres of cropland are irrigated each year.

The energy required to pump irrigation water is controlled by (1) the quantity of water each well delivers, (2) the depth from which it must be pumped, (3) the method of irrigation

and (4) the pumping plant efficiency. The first three factors are somewhat predetermined. The amount of energy used to deliver irrigation water is influenced and can be controlled by the pumping plant efficiency. Both the power unit and pump must be considered.

### *Maintenance Important*

The energy required to operate internal combustion engines is influenced by the engine's mechanical condition. Typical irrigation engines in top running condition will convert 20 to 25 percent of the energy taken in through the carburetor into actual power for pumping. Engines in moderate to poor running condition may use two to three times or even more fuel to develop the same amount of power.

Usually, when an engine is in poor mechanical condition, its power declines to the extent that normal pumping rates cannot be maintained, but fuel use does not drop off appreciably. Good engine repair is important and may pay more dividends than in the past even when repair costs are also increasing, especially if the fuel supply should be short.

Electric motors consistently convert 85 to 90 percent of the electric energy

taken in by the motor into power to operate the pump. Electric power generation is normally only 30 to 34 percent efficient, however, and is an influential factor in determining power costs for irrigation.

The capacity a pump has to utilize power in delivering irrigation water also influences irrigation costs and overall energy needs. Pumps in good condition and properly selected to match the well are likely to be 70 to 80 percent efficient. Pumps with badly worn impellers or installed in wells where the lift is greater than that for which the pump was designed will be much less efficient.

### *Decline of Water Table*

The declining water level of the Ogallala Formation can create a mismatched pump-well situation over time. Where the pump efficiency is only 35 to 40 percent, energy requirements and fuel costs to pump the same amount of water will be approximately twice that of a pump operating at peak efficiency. Pump efficiency can drop to 10 to 20 percent or lower if pump repairs or adjustments are not made. However, declines in pump efficiency are usually accompanied by reductions in the amount of water delivered, but power and fuel requirements are not that much less.

Pump performance guides are available for use in selecting a pump and to estimate its efficiency. These are available for each pump from manufacturers. Pump dealers usually have copies. Even small reductions in fuel use through improved pump efficiency may permit a few more acres to be irrigated in case energy is short.

### *Savings Make Difference*

A comparison of savings in fuel costs to engine and pump repair costs may not in all cases indicate a quick payout, but having fuel to continue irrigation plus the reduced pumping costs is likely to make more difference than ever before.

So, this year and perhaps for years to come, water and energy must both be used more judiciously than ever.

\*EDITOR'S NOTE: Leon New, Irrigation Engineer with the Texas Agricultural Extension Service, prepared this paper expressly for publication in *The Cross Section*.

## Groundwater Conservation

IS

## Energy Conservation

IS

## Money Conservation

# THE Cross SECTION

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

Volume 20—No. 4

"THERE IS NO SUBSTITUTE FOR WATER"

April, 1974

## WT Chamber of Commerce Honors High Plains Water District

The West Texas Chamber of Commerce (WTCC) recently paid tribute to the High Plains Underground Water Conservation District for "23 years of innovative pioneering leadership in local regulation and conservation of groundwater."

Billy Wayne Sisson of Hereford, President of the Board of Directors, was present to receive the plaque at the West Texas Chamber's Great West Texan Luncheon, April 19 in Odessa, during the group's 56th Annual Convention.

Arthur Duggan, Littlefield attorney

### Candidates Differ on Water Problems

The increasing dependence of the world upon the agricultural production of West Texas and the area's dependence upon groundwater to maintain that level of production has been the subject of much comment in the race to win the gubernatorial nomination in the May 4 Democratic primary election.

Recently addressing the subject have been Governor Dolph Briscoe and former Representative Frances "Sissy" Farenthold, candidates for the Democratic nomination for Governor.

Speaking before an April 16 meeting of the Water Resource Conserva-

—continued on page 4... CANDIDATES

and Chairman of the WTCC Water Conservation Committee, presented the award.

Also honored by the Chamber were the North Plains Water Conservation District, Dumas, and the Panhandle Underground Water Conservation District, White Deer. J. W. Buchanan, Manager of the North Plains District, accepted the award for 19 years of service, and James B. McCray, President of the Panhandle Board of Directors, received his District's award for 18 years of service.

#### Contribution of Agriculture

In his remarks prior to the presentations, Duggan cited the significant contribution West Texas has made to the increased agricultural production of the past year, and the effect this effort has had on the United States' balance-of-payments record on the world trade scene.

Speaking of the importance of water to this economic picture, Duggan said, "The life of water production from these great underground reservoirs already has been extended until importation of water can be achieved to enable production, perhaps, for all time to come.

"For this notable achievement, the West Texas Chamber of Commerce hereby presents to each of the three active underground water conservation districts in West Texas an award for conservation of water."



Arthur Duggan, Chairman of the West Texas Chamber of Commerce Water Committee, presents an award for "23 years of innovative pioneering leadership in local regulation and conservation of groundwater" to Billy Wayne Sisson, right, President of the Board of the High Plains Water District.

### PUBLIC HEARING RESOLVES WELL ISSUE

On February 26, 1974, the Board of Directors of the High Plains Underground Water Conservation District No. 1 held a public hearing to resolve a conflict in applications for water wells on and surrounding a labor of land located in the "sandhills" area southeast of Muleshoe in Bailey County.

A group of investors had reportedly purchased or agreed to purchase, in fee, approximately 170 acres of land which was bordered on three sides by lands whereunder the water rights had been purchased by the City of Lubbock in the 1950's. The investors, through their agent, Kenneth Morrison of Hastings, Nebraska, had made applications for eight irrigation wells of eight-inch capacity on the subject land.

#### Wells on Property Lines

Six of the proposed wells were to be located on the property lines common to the City's water rights land. The group had also reportedly purchased or agreed to purchase the land surface of several hundred acres adjoining the proposed well-site land, whereunder the City owned the water rights.

O. M. Spurlock, representing the investors, testified at the public hearing that it was their intent to pump the groundwater from the proposed well-field and to use it to irrigate surrounding lands overlying the City's water rights.

The City had made applications for three wells of eight-inch capacity at

sites offsetting some of the investors' applications with less than the minimum spacing between wells as required by the Rules of the District. Additionally, the City had filed a written protest with the District contesting the granting of the well applications applied for by the investor group interests.

In view of the ongoing and widespread development and planned development taking place throughout the sandhills area, the Board decided to invite testimony from all interested parties at a public hearing. Testimony was invited from knowledgeable individuals concerning the ability of the sandhills area to support concentrated well development and any potential contamination problems that industrial and municipal waste disposal or concentrated irrigation could create.

In conducting this public hearing, it was the Board of Directors' intent to bring attention to the problems associated with the development of the sandhills area with the hope that individual landowners, cities and industries will approach utilization of the sandhills with a better understanding of the fragile ecology involved, the physical limitations of the aquifer thereunder, and the potential for the degradation of the high quality of the groundwater therein.

Testimony at the public hearing showed that the wells proposed by

—continued on page 2... PUBLIC



O. M. Spurlock, left, talks with Board Members Chester Mitchell, Ray Kitten and Webb Gober following a public hearing held by the Board of Directors February 26 in Lubbock. Spurlock appeared before the Board as a witness.



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1628 15th Street, Lubbock, Texas 79401

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REBECCA CLINTON, Editor

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- Frank Rayner, P.E. Manager
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- Charles Kennedy, 1975 Rt. 1, Happy
Cordell Mahler, 1975 Wayside
Guy Watson, 1977 Wayside
C. D. Rogers, 1977 Wayside
Bill Heisler, 1977 Wayside

Bailey County

- Doris Wedel, Secretary
H&R Block, 306 W. 2nd, Muleshoe
Lloyd D. Throckmorton, 1975 Rt. 1, Muleshoe
W. R. "Bill" Welch, 1975 Star Rt., Maple
Eugene Shaw, 1977 Rt. 2, Muleshoe
Adolph Wittner, 1977 Star Rt., Baileyboro
Jessie Ray Carter, 1977 Rt. 5, Muleshoe

Castro County

- E. B. Noble, Secretary
City Hall, 120 Jones St., Dimmitt
Glenn Odom, 1975 Rt. 4, Box 138, Dimmitt
Anthony Acker, 1975 Rt. D, Nazareth
Jackie Clark, 1977 Rt. 1, Box 33, Dimmitt
Joe Nelson, 1977 Box 73, Dimmitt
Bob Anthony, 1977 Rt. 4, 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, 1978 Star Route 2, Morton
Jessie Clayton, 1978 706 S. Main, Morton
Robert Yearly, 1978 Route 2, Morton

Crosby County

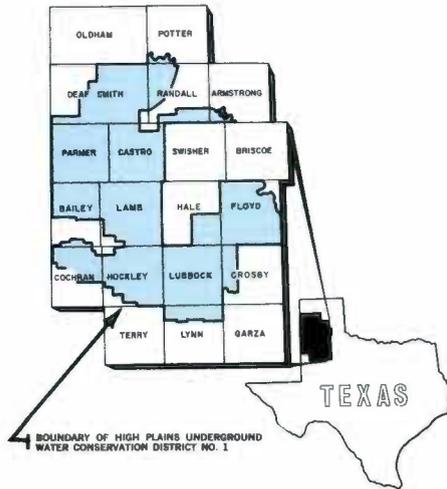
- Clifford Thompson, Secretary
1628 15th Street, Lubbock
W. O. Cherry, 1976 Lorenzo
E. B. Fullingim, 1976 Lorenzo
M. T. Darden, 1976 Lorenzo
Donald Aycock, 1978 Lorenzo
Alvin Morrison, 1978 Lorenzo

Deaf Smith County

- B. F. Cain, Secretary
County Courthouse, 2nd Floor, Hereford
George Ritter, 1975 Rt. 5, Hereford
Harry Fuqua, 1975 Rt. 1, Hereford
James E. Higgins, 1977 200 Star St., Hereford
Garland Solomon, 1977 Rt. 5, Hereford
W. L. Davis, 1977 Box 312, 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 Silvertown 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 Exum, 1976 Route 1, Ropesville
Douglas Kauffman, 1976 200 Mike, Levelland
Billy Ray Carter, 1976 Route 5, Springlake
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 278, 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 Youngs, 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 Kleth, 1978 New Home

Parmer County

- Johnie D. Horn, Secretary
Horn Insurance Agency, Bovina
Guy Latta, 1975 1006 W. 5th, Friona
Edwin Lide, 1975 Rt. 1, Bovina
Troy Christian, 1977 Rt. 1, Farwell
Joe Moore, 1977 Box J, Lazbuddie
Dalton Caffey, 1977 15th St., Friona

Potter County

- F. G. Collard, III, 1975 Rt. 1, Box 101, Amarillo
W. J. Hill, 1975 Bushland
Henry W. Gerber, 1977 Rt. 1, Amarillo
Jim Line, 1977 Box 87, Bushland
Albert Nichols, 1977 Rt. 1, Box 491, Amarillo

Randall County

- Mrs. Louise Tompkins, Secretary
Farm Bureau, 1714 Fifth Ave., Canyon
John F. Robinson, 1975 1002 7th St., Canyon
Fred Begert, 1975 1422 Hillcrest, Canyon
Harry LeGrand, 1977 4700 S. Bowie, Amarillo
Joe Albracht, 1977 Box 81, Bushland
Leonard Batenhorst, 1977 Route 1, Canyon

PUBLIC... continued from page 1

the investor group would greatly exceed the capacity of the aquifer to produce water, representing a 1,000-gallons-per-minute well for each approximately 21 acres of land—an eight-inch well density more than seven times that common to irrigation development in the same area, and more than five times that common to the City of Lubbock's well development.

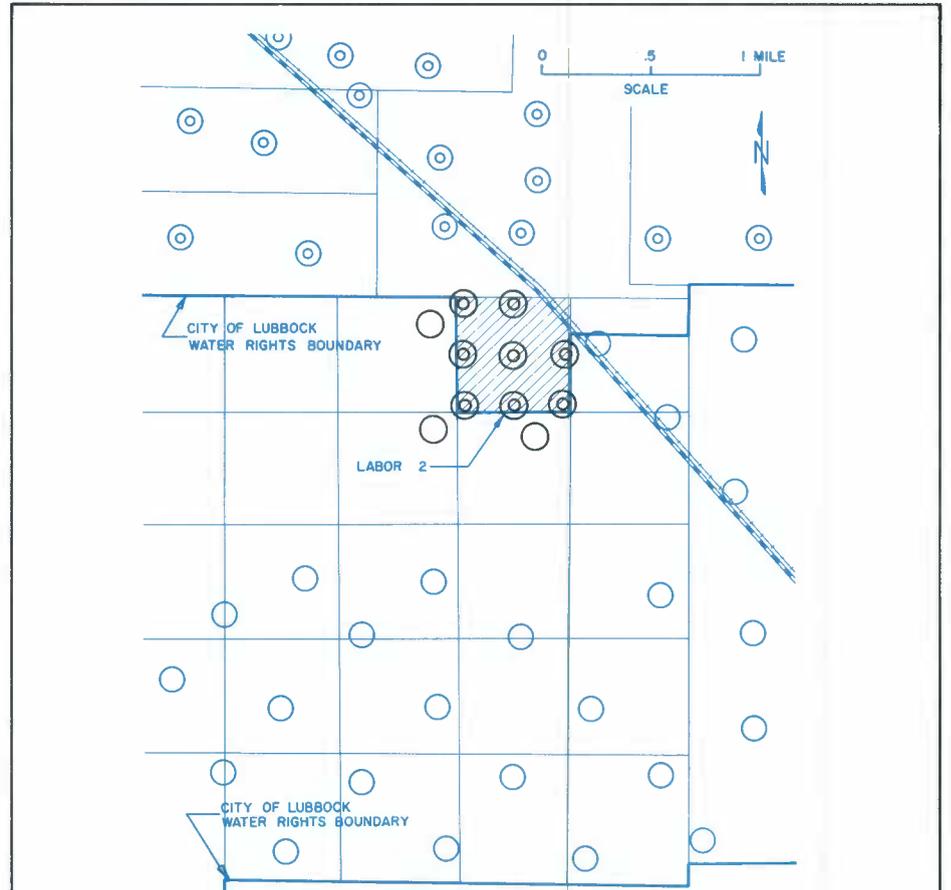
By law, the Board is required to

"assure the equitable development of" and "prohibit the pollution of" the groundwater within the District. A transcript of the hearing was made and is available for public inspection at the District's Lubbock office.

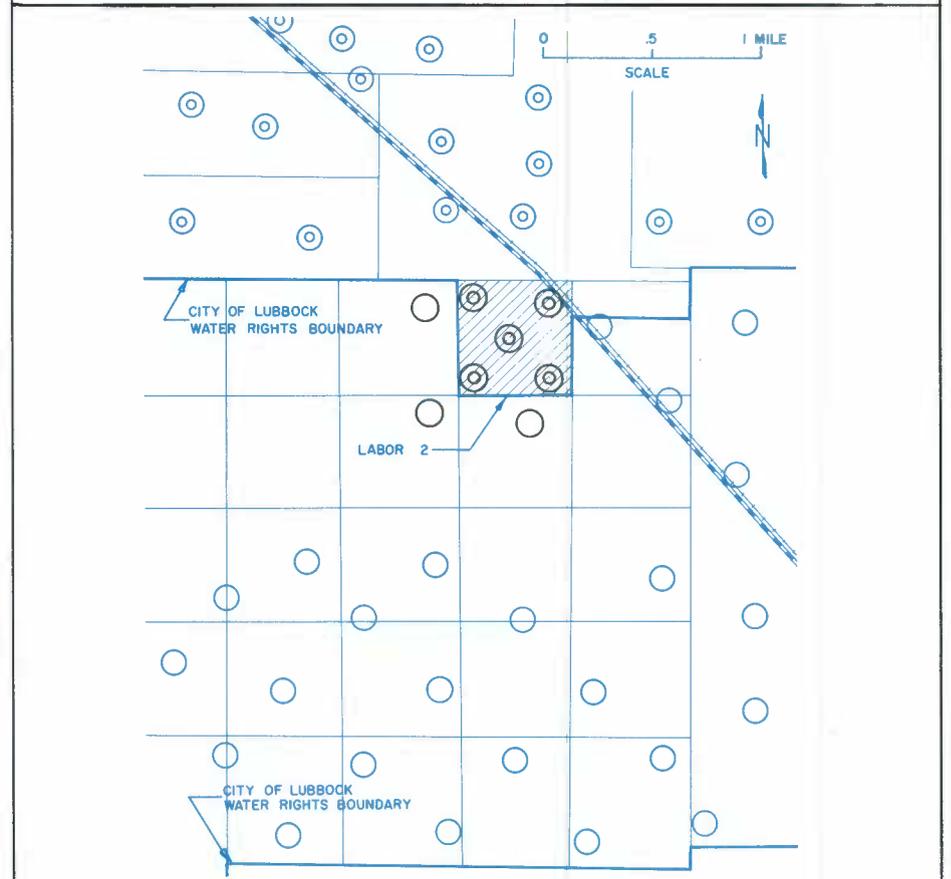
Subsequent Board Action

Subsequent Board action denied the eight applications for one labor of land under the provisions of Rule 4(E), paragraph 2, and ordered the City's

—continued on page 4... PUBLIC



Proposed well-site locations, City of Lubbock and Kenneth Morrison, Subject to public hearing, February 26, 1974.



Approved well-site locations, City of Lubbock and O. M. Spurlock, resulting from public meeting, March 27, 1974.

NOTICE: Information regarding times and places of the monthly County Committee meetings 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.

# Some Experts In Doubt About Possibility Of Drought

While many forecasters of gloom are predicting deepening drought on the High Plains of West Texas, by drawing attention to the possible existence of a 20-year drought cycle, experts who actually live and work on the High Plains seem less pessimistic about the blowing dust and high winds.

Oliver Newton, Advisory Agricultural Meteorologist with the National Weather Service for Agriculture, says you first must define the word "drought." "We are in a drought condition, rather than a true drought," explained Newton. "And I certainly don't think there are enough years on record to actually determine the existence of a drought cycle."

Noting that a drought is only effective as it affects living things, Newton pointed out the lack of a substantial amount of planted crops in the field because of the time of year and the coolness of the soil.

## Effect of Drought Condition

"The only effect of the 'drought condition,'" says the weather specialist, "is that the soil is made to blow and this condition is physically uncomfortable to the city dweller and farmer alike."

According to Newton, this year "the farmer cannot afford to depend on rainfall." More water has been pumped for pre-plant irrigation during the last month than during any year lately.

However, Newton stressed that, when you talk about drought, you talk about non-irrigated farm land. The area of the Southern High Plains of Texas is six to eight inches deficient in the top five feet of soil. This fact, and the below-normal rainfall record for the year, certainly has caused the dryland farmer to be a bit concerned about this year's crop.

The probability of rain and the need for rain are two variables of important consequence to the High Plains farmer. "In this area, a farmer can plant as late as the first of June. And the probability of rainfall is going up because we are approaching the highest rainfall month—May."

Newton went on to explain that there is no reason to say we are in a critical stage now because "we don't need the rain now."

## Other Problems To Be Considered

However, there are a few problems other than the immediate need for rainfall that must be considered. The meteorologist emphasized that, in order to produce a cotton crop, the soil must receive eight to 12 inches of moisture.

"This means that, in the coming months, we must add 15 or 16 inches of rain before the crop will finish." He explains this is due to the 35- to 40-percent evaporation of the rainfall before it actually enters the soil.

"This means we will need more-than-normal rainfall in order to get a good dryland cotton crop," he explained.

Newton noted two other minor problems with receiving the necessary rainfall in May—wet fields at planting time and the difficulty of coping with weeds.

Young T. Sloan, Meteorologist in Charge, Weather Forecast Office at Lubbock, when asked about the high

winds and lack of rainfall characteristic of West Texas, explained that the highest wind speed is traditionally during the month of April (15.7 mph) and the lowest mean wind speed (10.3) is during August, with 13.1 mph being the average yearly mean wind speed.

He also noted that, in some cases, the month with the lowest wind speed has been the month with the highest rainfall, "but this is certainly not always the case." Wind speed for May, considered the high rainfall month, averages 14.8 mph; therefore, the higher-than-normal wind speed for the month of May contradicts any error-free correlation.

## Reason For High Winds

On the subject of high winds in the area, Sloan and his assistant, Ken Wigner, Special Program Meteorologist for Agriculture, explained that wind direction or the general circulation of the atmosphere have the best correlation. "The high winds in the Spring are the result of seasonal pressure patterns," Sloan pointed out.

"In the Summer, a high pressure area builds up over the land because the land is warmer than the oceans—the reverse being true in the winter months."

Most of the area's rainfall or low-level moisture comes from the southeast. "Because of so few southeast winds, the number of days when conditions are right for precipitation is limited," said Wigner.

When asked why some areas are characterized as being generally dry or wet, Wigner commented, "The climatology of the area determines what is normal—the areas close to an ocean or large water-source area normally receive more rainfall than other areas."

Sloan mentioned the existence of storm tracts and their affect on the weather patterns on the earth. "There is only so much moisture on the earth and it is constantly changing form—it evaporates here and falls as rain somewhere else."

Going back to the dry weather conditions in West Texas, Sloan noted, "The dry spell started last Fall, but the lack of rainfall at the time was of help to the farmer in harvesting his crop."

## Below-Normal Rainfall

According to Newton, a drought is a result of several years of below-normal rainfall. Last year produced only 15.16 inches (18.40 inches being normal). However, the 15.16 inches

in 1973 were both favorable and timely—the result was a bumper crop.

However, in producing this crop, all the soil moisture was used up and there was no Fall rain to re-supply the soil. The later-than-normal freeze also accounts for the dry soil condition.

Newton also stressed that it takes back-to-back years with below-normal rainfall to produce a drought. An example would be the nine years during the 1950's with low rainfall. During 1957, 24.96 inches were recorded, up from 9.50 inches in 1956.

The weather specialist compared the drought of the 1950's with that of the 1930's. "With only horses and mules to cultivate the land in the '30's, the methods for the elimination of erosion were limited," He continued, "Conditions were less damaging in the '50's due to the advent of irrigation and improved mechanization, even though the extended drought of the '50's was more serious."

Considering the advanced farming and ranching operations of the 1970's and the ability of agriculture to replace barren soil with an erosion-preventing cover, the possibility of a series of droughts comparable to that of the 1930's seems doubtful.

## TASK FORCE PRESENTS 'RECOMMENDED STATEWIDE PROGRAM'

The Water Resource Conservation and Development Task Force presented to Governor Dolph Briscoe a report entitled, "Recommended Statewide Program for Conservation and Development of Texas Water Resources," on April 16 in Austin.

Appointed November 21, 1973, by Governor Briscoe, the 31-member Task Force unanimously adopted its recommendations on April 15, a culmination of several months of meetings in Austin. The Task Force is comprised of heads of water agencies from across the State. General James M. Rose, Office of the Governor, has served as Chairman of the Task Force. Frank Rayner, District Manager, is a Task Force member.

The report deals with goals of a statewide scope. Some of these goals are to develop all the ground and surface water resources of the State, to realize the State's potential for irrigated agriculture and to improve and maintain water quality as required in the public interest.

Recognizing that the total long-range projected water needs of the people of Texas exceed the State's total developable water resources, the Task Force recommended certain long-range objectives.

These goals are:

- 1) To establish and implement programs for full and timely development of Texas surface water resources to insure that these resources will be dependably available to meet the people's statewide water needs.
- 2) To establish and implement programs for movement of developed surface water resources to areas of water need, with adequate safeguards included to assure that the future water needs of source areas will be met.
- 3) To assure efficient use of the State's available water resources.
- 4) To seek water from outside the State to supplement as necessary the water supplies that can be developed within Texas to meet fully its anticipated long-range water needs.
- 5) To give balanced consideration to environmental, economic and social requirements in striving to meet the water needs of the people of Texas.
- 6) To assure the most effective means of developing and conserving the groundwater resources of Texas.

- 7) To seek appropriate Federal participation in water resource conservation and development in Texas while taking the necessary steps to effectively conserve and develop the State's water resources regardless of the nature or extent of Federal participation.

- 8) To utilize fully the capabilities of existing State water agencies and political subdivisions, modifying and supplementing these entities as appropriate to accomplish the most effective conservation and development of Texas water resources.

## Short-range Plans Suggested

As a balance to the recommended long-range plans, the Task Force suggested the need for short-range plans. According to the report, the principal purpose of short-range or "action" plans is to convert plans into action.

Short-range plans, 10 to 20 years in the future, encompass those projects and activities currently under way or which must be initiated immediately or in the near future and actively prosecuted to completion if anticipated water needs are to be met when they are expected to occur.

The Task Force recommended that the Governor request the Texas Water Development Board (TWDB) to undertake the development of a short-range plan and a coordinated statewide action program on a continuing basis. It also suggested that the Governor have the Division of Planning Coordination establish the necessary mechanics for obtaining active participation in developing and maintaining the short-range plans by all the public entities concerned throughout the State.

The Task Force also proposed that its members begin immediately to

## TEXAS CROP REPORTS NEEDED

During the last of May, 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, Texas. The program is a cooperative effort of the U.S. Department of Agriculture Statistical Reporting Service and the Texas Department of Agriculture.

This information will be the basis for determining the planted acreage for the State of Texas and for each

county. There are 254 counties in Texas, and reports are needed from many farmers so that each county will be well represented. Accurate estimates are of great importance to farmers in planning production and marketings and in providing an unbiased picture of Texas agriculture.

Texas covers such a wide area that state totals alone do not provide adequate information on Texas' most basic industry—agriculture. The Texas Legislature has provided a program of estimates for each county.

**CANDIDATES . . . continued from page 1**  
tion and Development Task Force, which he created by executive order in November, 1973, Briscoe said the fact that the food and fiber production in West Texas is so efficient and has contributed so heavily in last year's favorable balance-of-payments showing has caused the area's problem to be one of national, and even worldly, scope. For this reason, he sees the importation of a supplemental source of water from outside the state to be a reality in the near future.

Following the text of his prepared speech to the Task Force, Briscoe talked extemporaneously. Those remarks follow:

"I want to say again that I am very proud of the work of this Task Force. I appreciate your dedication to the job ahead. I think that we need to examine the situation as it exists here in Texas today. Then, we need to look to the future to determine what the water needs of this state will be in the years ahead.

"Again, if the energy crisis has taught us anything, it should be that, unless we have proper planning, we will find ourselves in Texas with a water crisis in not too many years. I think it is also essential in our long-range planning, and I am not the least bit discouraged on this one point. As I mentioned in our first meeting, I think it is absolutely essential that we seek and that we secure a supplemental source of water outside the State of Texas to meet the needs of the water-deficit areas of this State.

"And, without that, we will not be able, in my opinion, to meet the water needs of Texas in the years ahead, recognizing the importance of that great agricultural area of West Texas, one of the most productive anywhere to be found in the world, recognizing the fact that it is only through that kind of agricultural production that we have been able to offset what in the past years has been a deficit balance of payments — that agricultural productivity, producing the food, grain and the fiber so strongly in demand throughout the world today, last year made it possible for the first time in several years to have a favorable balance of payments for this country.

"I think that this has to be and I would like to ask in your long-range planning to give this top priority, because we do live in an entirely different world today than we were just a few years ago, when the National Water Commission plans were made

and also when the Bureau of Reclamation and the Corps of Engineers said that their findings and their studies on the plan to import water from outside the state into this state were not feasible. They were looking at an entirely different set of figures at that time than now exist. And I would like to ask you to pursue that with the greatest possible input and because this, to me, must have very top priority if we are to meet the water needs of Texas in the years ahead.

"And I am confident that with the work of those of you in this room that have dedicated so many years of your life to this one, important project—that with your continued effort, that we will be able to meet the water needs of Texas in the years ahead, and that we will not wake up some ten, fifteen years, twenty years from now and have those Texans of that time say, well, those back in the seventies, they missed their chance, they failed to plan, they failed to plan far enough ahead. And with the dedicated efforts of those of you here, I am sure that will not be the case. But, rather, the case will be that we will plan for the future; we will meet the water needs of the Texas of the 80's and 90's and up to 2000."

Addressing the subject of water importation to West Texas, Mrs. Farenthold told groups in Lubbock, Odessa, Post and other West Texas towns that it is not feasible, for economic and energy-related reasons, to bring additional water to this area.

#### *Better Management Needed*

In stressing that she would not deny the possibility of water importation in the future, she cited "better water conservation and management" as a solution to the immediate problem. "We must do what we can with what we have," she stressed.

Briscoe, on the other hand, criticized the Federal Government for withdrawing its support of water supply and water development projects. Noting the emerging trends of the importance of irrigated agriculture to the economy and well-being of the State, Briscoe said it is unfortunate that "the report of the National Water Commission was conceived before these emerging trends became evident."

"Because of this conviction, I have directed my staff to begin a vigorous reexamination, in the light of present conditions, of the analyses that were the basis of the Commission's conclusions and recommendations regarding irrigated agriculture. We will be work-

#### **TASK . . . continued from page 3**

work in close cooperation with the TWDB by indicating the degree of urgency and desired time schedule for accomplishing each water project, and to specify procedures and allocate responsibilities for taking the actions necessary to achieve the desired results.

Upon receiving the Task Force's

#### **PUBLIC . . . continued from page 2**

three applications held in abeyance for 30 days to provide time for the investors' interests to make new well applications of a more "reasonable nature".

Since that time, the City of Lubbock and the Spurlock group, now reportedly doing business as Neb-Tex Farms, have entered into a legal agreement, whereby each party agreed to space away from their *property lines* a minimum of one-half of the distance required by the District as the minimum spacing between wells of such capacity as applied for. Spurlock has since made new applications for five wells of six-inch capacity on the subject labor of land.

At a public meeting on April 27, 1974, the District's Directors approved the revised well applications as applied for by Spurlock and the three wells applied for by the City of Lubbock, and recognized the property line spacing agreement entered into by the two parties.

The City of Lubbock also reduced the size of their applications from eight-inch to six-inch wells. The resultant spacing of the City's wells 200 yards from the boundary of the Neb-Tex Farms' land and the setback of the Neb-Tex Farms' wells 150 yards from their own property lines, will result in spacing between the subject wells in excess of the minimum spacing of 300 yards between six-inch wells as required by the District's rules. Testimony presented during the public hearing of the 26th showed that such increased spacing between wells is better attuned to the hydrology of the Ogallala aquifer in the area of concern.

ing with this Task Force, and with interested and informed groups throughout Texas and elsewhere in the nation, to make certain that the place of food and fiber production generated by irrigated agriculture is properly documented and supported by comprehensive study based on today's real-life situation."

report, Governor Briscoe commented, "I have read and reviewed the draft with my staff, and, since submission of the final document this morning, I have read the proposed program with great interest. I can assure you that it will receive careful study, and I will respond to it as you proceed."

"I fully concur in the approach you propose for developing a short-range water plan . . .," he continued. "This short-range plan . . . must not wait upon the completion of every possible study."

#### *New Demands Seen*

Concerning the need for carefully examining the present and potential requirements for water for all purposes, Briscoe cited the "new and different demands which the production of coal and lignite in our state will impose."

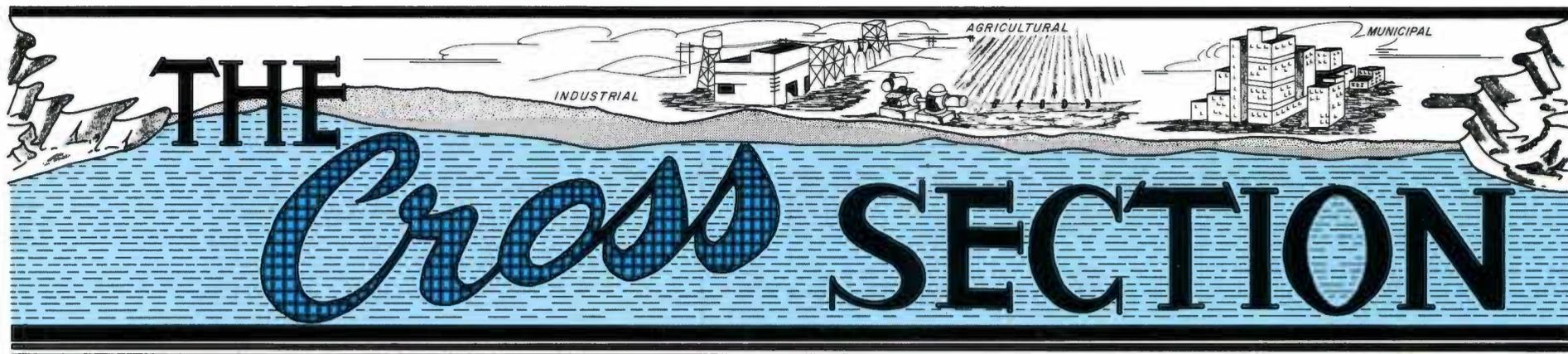
He also noted the need to accelerate efforts to protect and improve water quality conditions throughout Texas. He then discussed the role of groundwater resources in the State.

"As you know, I believe very strongly that management of all resources should be exercised at the most local level of government where that responsibility can be undertaken effectively." He continued, "In the case of groundwater, Texas has vast resources. In the High Plains, groundwater is being depleted at a rate exceeding the rate of recharge. It can, however, with conservation management, serve as a valuable resource for many years."

#### *Local Authority Best*

"It is my conviction that the groundwater within each of these areas (aquifers) should be managed through local authority. In this way we have an opportunity to provide the most effective mechanism for the proper conservation and development of ground and surface waters as a vast resource system," the Governor commented.

Concerning the recent trend of the Federal government's withdrawal from the financing of water projects, he said, "In the light of Federal trends, it may be necessary that we undertake new initiatives to share those costs where there is a proper Federal interest. On the other hand, where the interests of Texas are involved, and the Federal interest is either undefined or peripheral, it may be, in the long run, more feasible, and, with escalating costs, more prudent, for the State to undertake its own water program implementation."



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

Volume 20—No. 5

"THERE IS NO SUBSTITUTE FOR WATER"

May, 1974

## Economics of Alternative Conservation Practices on the High Plains

by  
Kenneth B. Young and Anthony Kuehler\*

Various water conservation techniques are being used in the Texas High Plains to enhance water utilization. In evaluating these techniques, the farm operator frequently has difficulty in determining which method would be most satisfactory for his particular situation.

For example, he may have to choose between either bench leveling or a tail-

water return system for controlling tailwater runoff. Projected returns from either system selected depend largely on the irrigation water supply available, which will vary with different farm situations.

### Study Recently Completed

A study of the economic returns from alternative water conservation techniques over the projected economic life of the groundwater supply for typical High Plains irrigated farms

was recently completed. Each farm situation evaluated had 394 irrigated acres with one- to three-percent slope, 76 irrigated acres with zero- to one-percent slope and 79 non-irrigated acres.

The analysis considered production costs, input requirements, government programs and irrigation efficiency conditions that existed in 1973.

A computer model was employed to select farm crops, allocate resources and project economic returns to conservation methods employed in alternative initial farm water situations. The goal of the farm operator was assumed to be maximum net annual income. The computer model evaluated the returns annually until groundwater supplies were no longer economically feasible for irrigation use in each farm situation.

### Groundwater Supply Stratified

Initial groundwater supply in the alternative farm situations analyzed was stratified by initial saturated thickness—93 feet in Situation 1, 135 feet in Situation 2 and 184 feet in Situation 3. The study area included parts of Hale, Floyd, Crosby, Lamb, Lubbock, Castro and Swisher Counties with clay loam soils.

Alternative techniques evaluated in the study (Table 1) were bench leveling and tailwater return systems on one- to three-percent slope soils, and a

non-specific technique for all soil slopes that was assumed to reduce gross irrigation water requirements by 10 percent. The latter was included to estimate potential benefits of several new techniques presently under investigation, such as deep tillage and playa lake modifications.

Results for the non-specific tech-

—continued on page 4 . . . ECONOMICS

## Water-Level Book To Be Released

The 1973-1974 annual water statement, usually produced in the April or May issue of *The Cross Section*, will be published by July in book form.

In departing from the established format of past years, the District hopes a county-by-county assessment of the groundwater conditions within the Water District's boundaries will be of benefit to those interested in current and past statistics.

Water-level records are obtained from the District's observation well program. The observation wells are measured in January of each year by District personnel in cooperation with the Texas Water Development Board. Currently, the observation well network within the 15-county area consists of 835 wells. The depth-to-water

—continued on page 4 . . . WATER

### FOR IRRIGATING CORN

## TAILWATER SYSTEMS RECOMMENDED

Corn production is increasing on the Texas High Plains and, in many counties, is taking the lead over other crops, such as grain sorghum. For example, agricultural experts predict that, if corn acreage continues to rise as it has in the past year, corn may become 90 percent of the crops planted in Parmer County. Experts also predict that 1974 will be the first year for corn to overcome the lead held by milo production in Parmer County, long considered the "grain sorghum capital of the world".

Last year, 108,000 acres of corn were harvested in the county, as compared to 125,000 acres of milo. According to Mack Heald, Parmer County Agent, 1974 records indicate that approximately 130,000 acres may be planted to corn, and milo could drop to around 80,000 acres.

Considering the high volume of water demanded by this crop and the rate of decline of the Ogallala aquifer, the High Plains Underground Water Conservation District No. 1 urges farmers to seriously consider only timely and mandatory irrigations in order to conserve the groundwater supply and stresses that re-using tailwater on the crop saves money as well as water.

### Pit Stretches Water Supply

The number and timing of irrigations applied and the amount of water pumped should be dependent upon the plant's moisture requirements and the amount of water supplied by rainfall. Since corn crops grown on the High Plains are irrigated, growers must think, not only in terms of "maximum yield per acre", but also of "maximum yield per acre-inch of water". A tailwater pit helps stretch the remaining groundwater supply and, in turn, allows the grower to save on energy and other irrigating costs.

Although preplant irrigation is now

considered mandatory on the High Plains, little water is needed from the time the crop is planted until the corn plant has eight to 10 leaves. The next five to six weeks is a period of fast growth, and prolonged moisture stress will limit yields. If rainfall has not provided adequate moisture, the plant must be watered 30 to 40 days after planting (eight- to 10-leaves stage) and again about 20 days later.

Highest plant water needs of the season usually occur during silking and pollination stages, after which the primary plant function is to produce grain. A shortage of moisture at this point will reduce yields. Three to four inches of water must be applied 10

—continued on page 2 . . . TAILWATER

TABLE 1. Costs of production, yields and water requirements for crop enterprises, Texas Southern High Plains, 1973.

	Cost of Production	Yield Per Acre	IRRIGATION WATER REQUIREMENT (Ac. in/year)			
			No Savings <sup>1</sup>	Tailwater Return System <sup>2</sup>	Bench Leveling System <sup>2</sup>	10% Savings Level <sup>2</sup>
<b>COTTON (Solid)</b>						
Dryland .....	\$30.92	130 lb <sup>3</sup>	0	0	0	0
Preplant .....	50.77	350	7.50	5.85	3.92	6.75
Preplant + 1 .....	75.65	575	13.50	10.53	8.46	12.15
Preplant + 2 .....	85.92	700	19.50	15.21	13.00	17.55
<b>COTTON (2 in, 2 out)</b>						
Dryland .....	29.87	220 <sup>4</sup>	0	0	0	0
Preplant .....	46.18	320	7.50	5.85	3.92	6.75
Preplant + 2 .....	55.82	390	10.50	8.19	6.21	9.45
<b>GRAIN SORGHUM</b>						
Dryland .....	10.30	1250 <sup>5</sup>	0	0	0	0
Preplant .....	18.66	2250	7.50	5.85	3.46	6.75
Preplant + 1 .....	23.54	3500	13.50	10.53	8.79	12.15
Preplant + 2 .....	33.80	5000	19.50	15.21	12.69	17.55
Preplant + 3 .....	40.30	6500	25.50	19.89	17.20	22.95
<b>WHEAT</b>						
Dryland .....	9.50	14 bu <sup>6</sup>	0	0	0	0
Preplant .....	19.49	22	7.50	5.85	3.46	6.75
Preplant + 1 .....	25.45	35	13.50	10.53	8.19	12.15
Preplant + 2 .....	31.14	45	19.50	15.21	12.70	17.55
Preplant + 3 .....	36.76	55	25.50	19.89	17.19	22.95
<b>WHEAT GRAZING</b>						
Dryland .....	7.14	1 A.U. <sup>7</sup>	0	0	0	0
Preplant .....	15.23	2 A.U. <sup>8</sup>	6.0	4.68	2.34	5.4

<sup>1</sup>Except for underground pipe

<sup>2</sup>Including underground pipe

<sup>3</sup>229 lb/acre with bench leveling

<sup>4</sup>291 lb/acre with bench leveling

<sup>5</sup>1790 lb/acre with bench leveling

<sup>6</sup>20.1 bu/acre with bench leveling

<sup>7</sup>One 400 lb stocker grazed for 4 mos.

<sup>8</sup>Two 400 lb stockers grazed for 4 mos.

# THE Cross SECTION

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

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REBECCA CLINTON, Editor

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Frank Rayner, P.E. \_\_\_\_\_ Manager  
Don Smith \_\_\_\_\_ Geologist  
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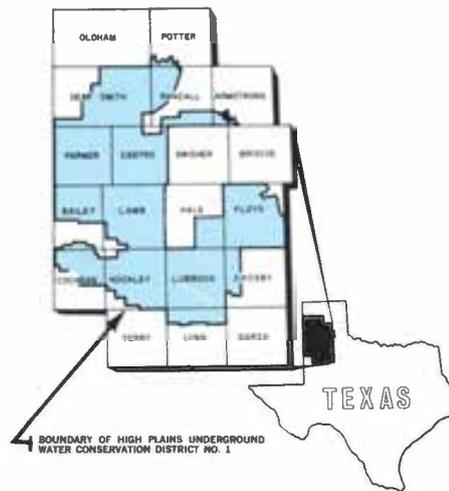
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## TAILWATER . . . continued from page 1

days apart, at silking and pollination.

During the three to four weeks following pollination, grain is filling and high moisture levels should be maintained. An irrigation at the milk or soft dough stage, three weeks after pollination, will ensure maximum grain filling. Water requirements drop rapidly as the grain matures, and additional irrigation rarely pays.

According to Leon New, Irrigation Engineer, Texas Agricultural Extension Service, irrigation during stages of growth with high water requirements normally gives corn yields a good boost, while only minimum increases are obtained from irrigations during growth stages requiring less water.

### Irrigation May Be Unnecessary

Irrigations applied earlier than the six- to eight-leaf stage have given only minimum corn yield increases, says the specialist. Adequate moisture for optimum growth is important during this stage when water needs are low, but a larger plant may be the only result of early irrigation. "Unless the corn is grown only for ensilage, this irrigation can be an unnecessary waste of valuable groundwater," New added.

The engineer cautions that large quantities of water do not have to be

applied to produce top corn yields. Applying smaller amounts when crop water requirements are highest have produced yields equal to those where large quantities of water were applied. Pumping costs are also less using smaller applications, thereby leaving a higher profit potential.

### Apply Smaller Irrigations

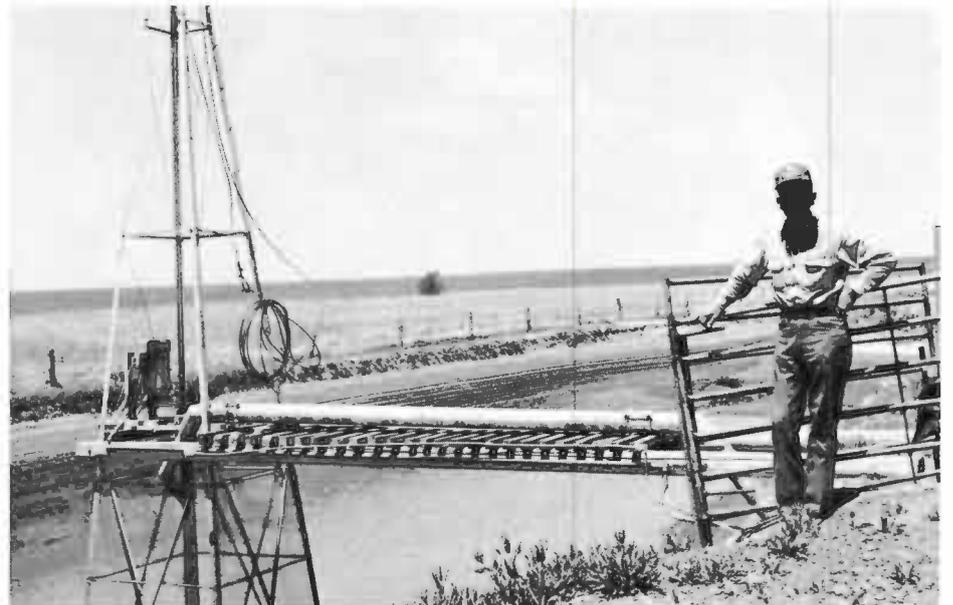
Alternate furrow applications can be used to apply smaller amounts of irrigation water on mixed soils. Irrigations may need to be slightly more frequent (nine to 12 days from tassel through soft dough), but the irrigation rate is faster. This allows for timely irrigation on more acres. On drier clay soils, alternate furrow irrigation may be difficult to manage, so smaller amounts of irrigation water can be applied by increasing the number of furrows normally irrigated during a set, or by setting fewer hours.

### Re-use Tailwater on Corn

The Water District encourages corn growers to immediately install tailwater return systems. The increased water applications made possible by a tailwater return system will help meet the critical irrigation and timing needs of corn *without* pumping additional groundwater. In short, a tailwater return system can enable the production of higher crop yields *without* additional groundwater.



T. I. Burlison, Parmer County farmer, stands beside one of his two tailwater pits from which he irrigates corn. Says Burlison, "With tailwater, I get just as good yields on the end of the field and the water is better for the crop because of the nutrients it contains."



Friona farmer Herschel Johnson maintains three tailwater return systems, one of which he constructed ten years ago. Johnson, who has found tailwater re-use beneficial to the production of corn, recommends that farmers give up an acre or so of their land to put a pit on higher ground rather than in a low corner where silting can be a problem.

**NOTICE:** Information regarding times and places of the monthly County Committee meetings 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.

# History of Major Droughts on the High Plains

by  
JACK T. MUSICK\*

Since man first ventured into the Great Plains, he has been faced with major drought of two or three years' duration or longer. Exploration parties who saw the Plains during the major drought of the 1850's designated the area the "Great American Desert". It did not lose this designation until settlement during the better rainfall years following the Civil War.

Major drought during subsequent years spelled disaster for many unprepared settlers of the Plains. Many people abandoned their High Plains farm, and population declined during major droughts of 1892-94, 1909-12 and during the 1930's. Farmers were better prepared to face major drought in the 1950's and the disastrous effects were abated.

Historic records indicate that major drought has occurred periodically in the Plains and statistical probability suggests it will likely occur in the future. However, when it will occur is the unanswered question.

### Newton's Comments Cited

Oliver Newton, in the April issue of *The Cross Section*, discussed the cur-

## Surface Water Irrigation Causes Too Much Groundwater

Diversion of water from the Platte River for irrigation since the late 1930's has caused the water table in some parts of three south-central Nebraska counties to rise as much as 90 feet, according to the March 27, 1974, issue of *The Groundwater Newsletter*. This application of large amounts of surface water to an already groundwater-rich region is causing the waterlogging of valuable farmland and a proliferation of potholes.

A Bureau of Reclamation investigation estimates that as much as five million acre-feet of water a year have been added to the groundwater reservoir from canal seepage and percolation of water from the irrigated acreage. In some areas, it is evident that accumulations of salts from the evaporation of groundwater is taking place at the ground surface.

The high groundwater table has developed despite the increasing number of private wells in the region. Appraisals of different plans to correct the situation estimate a need for reducing the net groundwater recharge by an average of 28,000 acre-feet per year, to lower water levels about one foot per year in waterlogged areas.

Withdrawal of this water would necessitate construction of an additional 43 wells. Other suggestions include lining all irrigation canals to prevent seepage. However, the cost of lining the canals is estimated at \$6,680,000 as opposed to a cost of \$890,000 for construction of the 43 wells.

The investigators point out that the situation is complicated by rapid development of private wells. Also, natural recharge will be reduced as population and construction expand in the region.

rent "drought condition" and distinguished it from "true drought", such as that which occurred during the 1930's and the 1950's ("Some Experts in Doubt About Possibility of Drought", Vol. 20, No. 4, p. 3, 1974).

The article stated in conclusion, "Considering the advanced farming and ranching operations of the 1970's, and the ability of agriculture to replace barren soil with an erosion-preventing cover, the possibility of a series of droughts comparable to that of the 1930's seems doubtful." The question arises—how serious was the drought of the 1930's and how does this drought compare with the 1950's and with present conditions?

### Back-to-Back Dry Years

Major drought is generally recognized when two or more dry years occur in succession and the dry condition extends over a sizeable area. Rainfall during the driest years is about 50 percent of normal. Although some rains occur, they are less frequent and smaller in amount. The smaller rains wet the soil to a shallower depth, more time occurs for evaporation to take place before the next rain, and soil water storage and storage efficiencies are reduced greatly.

During major drought years at the USDA Southwestern Great Plains Research Center, Bushland (west of Amarillo), the soil profile was wet by rainfall only a few inches below the surface at any time during the year, and little or no grain yields were obtained from dryland wheat or grain sorghum. After a rain or short period of rainy weather, the dry condition tends to reestablish and persist. During such years, the climate shifts from semiarid to arid.

Rainfall since last summer or fall has been much below normal in the High Plains. For example, since last June at Bushland, it has been only 60 percent of normal. Whether the current "dry condition" will continue to

develop into major drought is anyone's guess.

Although the usual safe bet is that rainfall will at least approach normal, the odds that major drought can occur should be honestly faced. The recent period of good production and prices should place farmers and ranchers in a better position to economically face a period of drought if it occurs.

An examination of major droughts in the High Plains was made using monthly and annual rainfall data for locations having 50 to 80 years of records. Some locations in the Central Great Plains were examined that had records longer than 100 years. The longest and most widespread drought period during the past century occurred during the 1930's. The drought of the 1950's, the second most severe drought of the past century, equalled the 1930 drought in intensity in some areas but was of shorter duration.

### Rainfall Deficits Plotted

Rainfall deficits during these two major droughts in the Southern High Plains are plotted below. Usually, major drought in an area cannot be adequately characterized by rainfall data from one location, and a National Weather Service climatic subdivision such as the Texas High Plains may be too large to show relative uniform conditions of rainfall and drought. Therefore, the Southern High Plains (which includes the High Plains part of the Oklahoma Panhandle) was divided into five areas (two of which are depicted on the graph on this page) and rainfall averaged for five locations in each area. The areas plotted are the South Central, including Crosbyton, Littlefield, Lubbock, Muleshoe and Plainview, and the Central area, comprised of Amarillo, Canyon, Dimmitt, Tulia and Vega.

The drought of the 1930's was much less intense in the south area and increased in intensity going north

with accumulated deficits ranging from 10 to 43 inches. The area was more uniformly affected by the drought of the 1950's with accumulated deficits ranging from 27 inches in the northeast to 36 inches in the south. The relative intensity of the two droughts depends on the specific area under consideration.

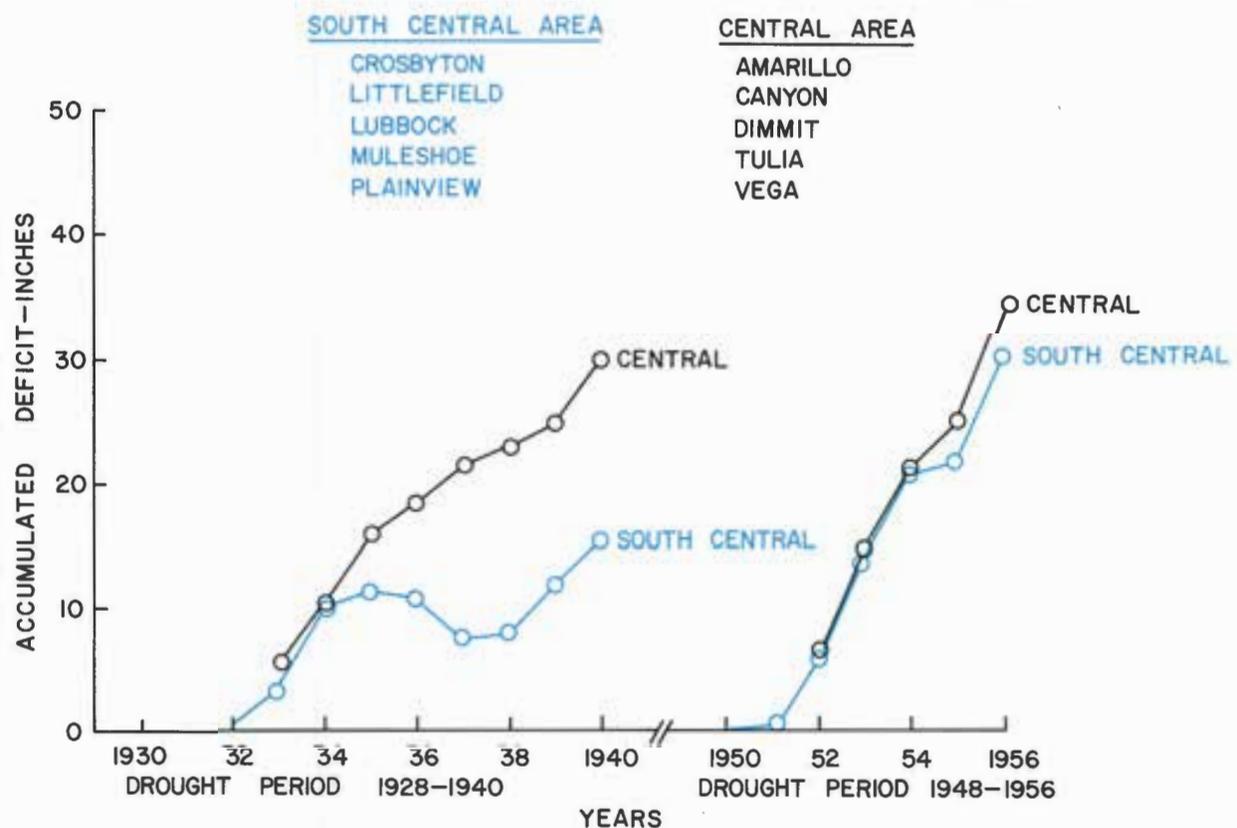
### Three Years Drought Required

The maximum accumulated rainfall deficits during major droughts are approximately equal to two years of annual rainfall. Since annual rainfall seldom drops below 50 percent of normal during major drought years, at least three more years of severe drought are required for the present condition to approach the drought severity of the 1930's and 1950's. The chance of a major drought of this intensity occurring in the 1970's is probably low. However, chances of a more frequent two-year drought occurring is much more likely.

Major irrigation development first occurred in the High Plains during the drought of the 1930's and expanded greatly south of the Canadian River and approached its present level during the drought of the 1950's. Continued expansion may not be possible during a future drought because of declining water tables and well yields.

Irrigation is of greater importance to the agricultural economy of the High Plains during drought periods. Since future drought is no doubt inevitable, we need to conserve and reduce groundwater usage during the "fat" years to better provide for the future "lean" ones.

\*Agricultural Engineer, Agricultural Research Service, USDA Southwestern Great Plains Research Center, Bushland, Texas 79012. Musick has also written a more detailed report dealing with the subject of drought, entitled, "Supplementing Rainfall With Limited Irrigation in Minimum Tillage Systems."

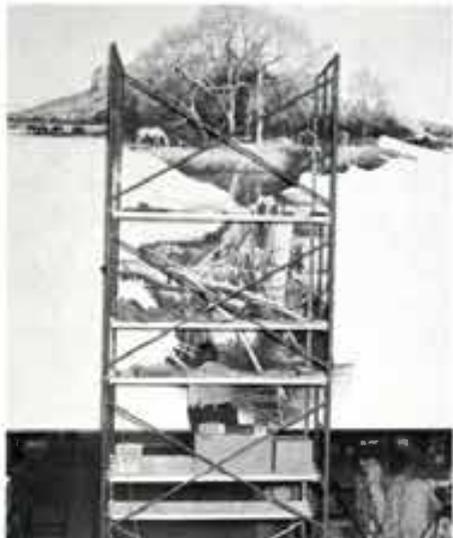


Accumulated area rainfall deficits during major droughts of the 1930's and 1950's in the Southern High Plains of Texas. Deficits determined from 60-year (1911-70) area mean precipitation of 19.19 inches for the South Central area and 19.21 for the Central area (National Weather Service data).

## HISTORY OF WESTERN IRRIGATION DEPICTED BY MUSEUM MURAL

A mural depicting the history of irrigation in the western United States is in the final stages of production at the Texas Tech University Museum. Artist Peter Rogers of San Patricio, New Mexico, has chosen as his theme the region's dependence upon water.

The black-and-white mural (black ink on gesso) displays a Fall scene of a valley of irrigated lands to the left (all pastureland and orchards) and mesas running into a desert on the right. The focus, however, is a crib dam.



PETER ROGERS AT WORK

A man can be seen clearing away debris at the headgate of an irrigation channel, the evidence left behind by a summer flood.

Though the mural scene is of "no particular place", Rogers says the dam is one he has seen on the Ruidoso River, close to his New Mexico home. "My wife and I have visited the dam at all times of the year for several years," said the artist, explaining his efforts at detail and realism in this painting.

After photographing the actual dam, Rogers used the photographs to paint the scene on a small scale, whereby he could divide the painting into sections or grids.

He said he began drawing the grids and marking off the mural last October and he did not begin the actual painting of the mural wall until March of this year.

Rogers, son-in-law of the painter Peter Hurd, came to America from England in 1963. A student at St. Martin's School of Art in London, Rogers has painted two other murals—one (religious) in his home in Spain and a second (historical) in the State Archives and Library in Austin.

Officials of the Texas Tech Museum say the mural should be completed by the end of the Summer.

TABLE 2. Present worth of increased annual net returns to a High Plains irrigated farm operation, attributable to using alternative water conservation practices, 1970-2019.\*

Initial Ground-Water Reserve Situation	WATER CONSERVATION PRACTICES		
	Bench-Leveling (1-3% Slope) <sup>e</sup>	Tailwater Return System (1-0% Slope)	Non-Specific (10% Saving, All Slopes) <sup>e</sup>
	Dollars Per Acre <sup>a</sup>		
SITUATION 1 <sup>b</sup> .....	464	191	76
SITUATION 2 <sup>c</sup> .....	291	168	64
SITUATION 3 <sup>d</sup> .....	141	141	54

\*Each irrigated farm had 549 cropland acres, a 98-acre cotton allotment, 20-acre wheat allotment and a 282-acre grain sorghum base.

<sup>a</sup>Annual net returns discounted by eight percent to determine present worth.

<sup>b</sup>93 feet initial saturated thickness.

<sup>c</sup>135 feet initial saturated thickness.

<sup>d</sup>184 feet initial saturated thickness.

<sup>e</sup>No modification costs included.

\*Assistant Professor and Research Assistant, respectively, Agricultural Economics, Texas Tech University and Texas A&M University Cooperative Research Unit, Lubbock, Texas.

### ECONOMICS . . . continued from page 1

nique evaluated would also measure appropriate returns from using underground pipe, since open ditch losses on clay loam soil have been estimated to range from 5.3 to 6.8 percent of water flow per 1000-foot section of ditch.

Results of the study shown in Table 2 indicated that bench-leveling produced the greatest net economic return per acre modified, while tailwater return systems provided the greatest net economic return per dollar invested.

Both systems were estimated to be profitable in all water situations analyzed. Bench leveling still provided an economic benefit while irrigation was projected to terminate due to increased rainfall utilization with this practice.

### WATER . . . continued from page 1

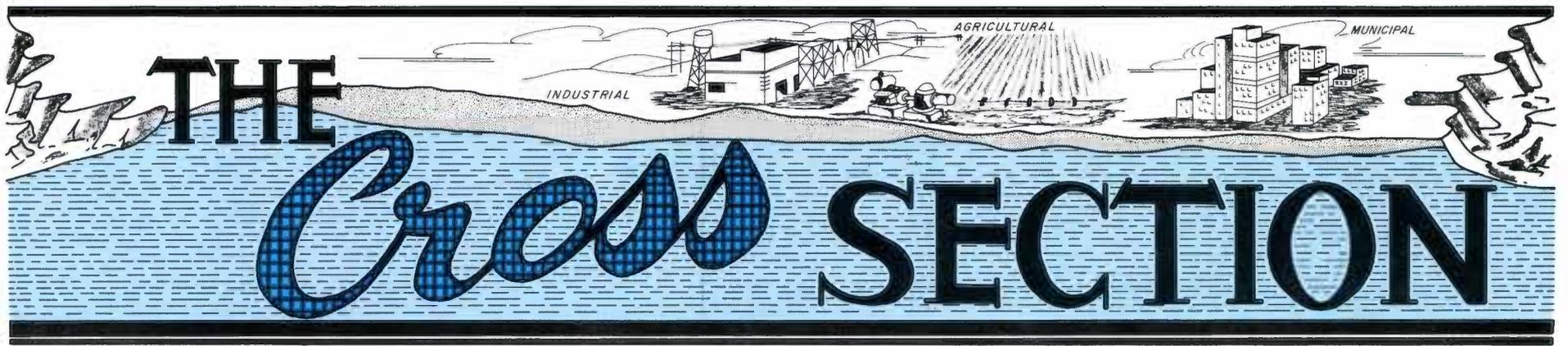
measurements from each of these wells are tabulated, and these data are machine-processed and analyzed to determine changes in the groundwater conditions.

The book will consist of a detailed explanation of these changes and will also contain a section on the rate of depletion of the Ogallala aquifer. Maps and hydrographs have been prepared for each of the counties concerned, and tables were calculated for each well, listing measurements and average annual changes.

Anyone interested in obtaining a copy of the water-level book can do so by contacting the District's Lubbock office, 1628 15th Street.



PHOTOGRAPH OF PRELIMINARY SKETCH  
(Courtesy of Rollin Herald)



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

Volume 20—No. 6

"THERE IS NO SUBSTITUTE FOR WATER"

June, 1974

## MUNICIPAL GROUNDWATER RESERVE A NECESSITY

By F. A. Rayner

The safety, convenience, purity and ready availability of a municipal groundwater supply again were vividly demonstrated after a massive hail and rain storm struck the White River watershed above White River Lake on June 3, 1974.

White River Lake, located in southeast Crosby County, began impounding the flow of White River in October, 1963. This lake, with a normal storage capacity of approximately 45,000 acre-feet, supplies the municipal water needs of Spur, Dickens County; Post, Garza County, and Ralls and Crosbyton in Crosby County, and some mining needs in Garza County.

The White River Lake water is normally cool, clear and exceptionally high in quality for lake water in semi-arid West Texas. These and other qualities have made this lake one of the prime recreational centers of this area.

### Financial Structure

The value of this impoundment to the area's economy, and the quality of its management structure, are exemplified by its financial condition. Built totally without the aid of Federal funds, the White River Municipal Water District commenced operation on an ad valorem tax rate of 50 cents per \$100 valuation on all of the real and personal property within the four

## Otha Dent Resigns From Commission

Judge Otha Dent of Littlefield, 20-year veteran of the Texas Water Rights Commission (TWRC), has announced his resignation from the Commission, effective July 15, 1974.

As of press time for *The Cross Section*, Governor Dolph Briscoe had not announced a replacement to the three-man Commission.

Dent was first appointed to the TWRC (then the Board of Water Engineers) in 1953 by Governor Allen Shivers, then reappointed in 1959 by Governor Price Daniel. In 1965, he was renamed to the Commission by Governor John Connally, and again in 1971 by Governor Preston Smith.

Chairman of the TWRC for more than three years, Dent is a former Lamb County Judge and Past President of the Texas County Judges and Commissioners Association.

The Water District extends to Judge Dent its every wish for a happy and healthful future.

cities it serves. In 1971, the White River Municipal Water District discontinued its taxation and commenced operating on income from water sales, leasing of property around the lake and a nominal recreational fee.

All of the above was cited only to show what a tremendous asset the White River Lake is to this area; however, in spite of its necessity and its value, the individual cities' groundwater supplies are still of prime importance and, perhaps, even a necessity.

### Runoffs Displaced Water

Prior to the June 3rd storm, the numerous rainfall runoffs that have entered White River Lake since 1963 had simply displaced the water in the upstream reaches of the lake, and their primarily silt load dissipated far upstream of the lake's water supply intake structure (intake tower shown in photograph on pages 2 and 3).

However, during the night of June 3, a storm dumped several inches of cold rainfall (containing hail) on the watershed immediately adjacent to White River. The ensuing runoff appeared to have entered the lake as a large mass of cold water, and instead of simply displacing the water in the upper reaches of the lake, this flood appeared to flow beneath the warmer lake water, following the old silt-laden stream channel beneath the lake.

The runoff appeared to traverse the entire length of the lake, and, after striking the dam, flowed east across the lower face of the dam, and then turned upstream near the east bank traveling some distance upstream beneath the lake water. This inflow raised the lake level nearly 11 feet, while stirring up and suspending the very fine silt that had accumulated in the old stream channel—the deepest part of the lake.

### Silt Entered Pumps

The lower part of the lake's water supply intake structure and its 48-inch lateral line, located immediately adjacent to the old stream channel, were inundated with an exceptionally fine silt. To further complicate the problem, the lower intake gates on the intake tower could not be fully closed, permitting the silt-laden water to enter the intake pumps.

This silt was of such a very fine nature that the treatment and filtration facilities could not remove such fine material, and, consequently, could not clarify the water. Since untreated water could not be pumped to the

—continued on page 2 . . . MUNICIPAL



Fire trucks (two) and portable pumps (two) can be seen supplying water to the treatment plant at White River Lake, June 9, 1974.

## WEATHER MODIFICATION TRIAL HELD

By D. D. Smith

Commercial weather modification activities in parts of nine High Plains counties were the object of five days of extensively detailed testimony in Judge Pat Boone, Jr.'s, 154th District Court in Littlefield, Lamb County, from June 14 through June 19, 1974.

Approximately 127 area residents, banded together as Farmers and Ranchers for Natural Weather, have sued to enjoin the operations of Better Weather, Inc., and Plains Weather Improvement Association (membership organizations comprised of several hundred area farmers and residents), claiming that the weather modification activities carried out by the Defendants, designed to suppress hail, have decreased natural rainfall over their land.

The Plaintiffs contend that chemical cloud seeding activities are carried out over their lands and that these activities constitute trespass, create pollution of the environment and deprive them of the economic benefit of natural precipitation. Plaintiff's attorneys Bill Browder and Harrell Feldt introduced testimony from area farmers Ross Lumsden, Dean Elms, Robert Layton, Frank Daugherty, Dwain Kuhler, Charles Burt, Bennie Clauch and J. D. Ratliff.

### Testimony for Plaintiffs

Expert testimony for the Plaintiffs was solicited from Dr. E. J. Workman and Dr. Charles B. Moore, who testified that over seeding with silver iodide or seeding at the wrong development stage of a cloud could "glaciate" the moisture content and preclude the development of rainfall.

The Defendants, Better Weather,

Inc., and their commercial contractor, Atmospherics, Inc., were represented by attorney Jerome Kirby, while Plains Weather Improvement Association was represented by attorneys Gene Owens and Paul Lyle. The defense introduced expert testimony from a large number of recognized authorities in weather modification, including Dr. Pierre St. Amand, Dr. M. C. Williams, Dr. Louis Grant, Dr. Richard Schleusener, Dr. Ray Booker, John Carr, Jr., Stanley Changnon, Dr. Paul Schickendanz and Tom Henderson. Also testifying were bankers Paul Leach and J. B. Wheeler; insurance man Lloyd Hughes; project directors John Medina from Plainview and Wayne Wilkinson for Littlefield, and area farmers Les Watson, Fred Clayton, Vernon Qualls, Orville Cleavinger, Jeff Willey, Dale Stanley, Dean Faver, Charles Martin, Jr., F. F. Calhoun, Robert Short, Truman Redwine and Chester Mitchell.

### Defense Testimony Detailed

Expert testimony for the defense centered around the types of clouds which would need to be modified to suppress hail, methods employed to achieve the most desirable results, theory and observations of scientific research and elemental laws of physics and chemistry.

Farmer testimony depicted hail occurrence and rainfall prior to and subsequent to the weather modification activities, and their belief that it had decreased incidents of hail fall and had not decreased normal rainfall, and that they would not participate in the program if it was decreasing rainfall at any other location.

The Texas Weather Modification

—continued on page 2 . . . WEATHER

# THE Cross SECTION

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

1628 15th Street, Lubbock, Texas 79401

Telephone 762-0181

REBECCA CLINTON, Editor

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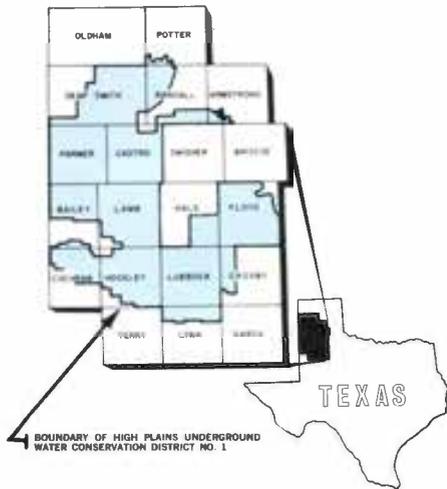
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 Joe Albracht, 1977 \_\_\_\_\_ Box 81, Bushland  
 Leonard Batenhorst, 1977 \_\_\_\_\_ Route 1, Canyon

**MUNICIPAL . . . continued from page 1**

member cities, those cities that had continued to maintain their water supply wells—Spur, Crosbyton and Ralls—simply reverted to the use of groundwater and were not faced with any interruption or curtailment of water delivery to their citizens. However, Post, which no longer has a groundwater supply system, was soon out of water.

**Wells Maintained**

Three of Spur's five water wells were placed in operation to supply that city's needs. The three water supply wells at Crosbyton and at Ralls were put into operation. City officials of each of the three cities noted that they have a continuous maintenance and periodic operation routine for their wells, and that their wells also provide a backup water supply in the event of a major fire.

**Post Abandoned Wells**

Prior to receiving water from the White River Municipal Water District, Post's municipal water needs were supplied by several small wells located on the caprock (High Plains) west of the city. These wells were operated by the city through a leasing arrangement with several landowners, but, when the city began receiving water from White River, the lease agreements were not continued.

As is apt to happen in an emergency, a malfunctioning recorder at the city of Post water storage facility resulted in the complete depletion of that city's small water reserve, leaving that city without water for even fire-fighting purposes.

**Emergency Pumps Employed**

The White River Municipal Water District first engaged local skin divers to assess the intake structure gate malfunction, but these divers could not operate in the deep water at the base of the intake tower. Deep-sea divers were then brought in from the Texas Gulf Coast. The divers had to use a dredge pump to remove the silt from the intake structure (see photograph on this page). The District also tested several types of flocculating chemicals, but to no avail.

An emergency water supply was provided to Post by employing the pumps of four fire trucks—one each

supplied by each of the member cities. The fire trucks were parked at the lake's edge and pumped water through a fire hose to the water treatment plant. The Texas Highway Department later supplied three large pumps and aluminum pipeline to pump water to the treatment plant (see photograph on page 1). The fine silt was primarily confined to the deep water part of the lake, and the turbidity at the lake surface was not of a magnitude that would prevent its removal through the normal operation of the District's filtration plant.

Although the circumstances that led to Post's water shortage problem may have been unique, other circumstances—power failure, pipeline and other equipment failures, fire, prolonged drought, or even extensively damaging rainfall and other natural and man-made catastrophes that can pollute

—continued on page 3 . . . MUNICIPAL

**WEATHER . . . continued from page 1**

Act (V.A.T.S. Water Code, Ch. 14) states in part:

Sec. 14.101 *The state and its officers and employees are immune from liability for all weather modification and control activities conducted by private persons and groups.*

Sec. 14.012(a) *This chapter does not affect private legal relationships, except that an operation conducted under the license and permit requirements of this chapter is not an ultra-hazardous activity which makes the participants subject to liability without fault.*

Sec. 14.012(b) *The fact that a person holds a license or permit under this chapter, or that he has complied with this chapter or the regulations issued under this chapter, is not admissible as evidence in any legal proceeding brought against him.*

The issue before the Court is of vital interest to every citizen. The outcome will influence all commercial weather modification programs, irrespective of the type of decision (for the Plaintiffs or against the Plaintiffs), and the decision could be of such a nature as to influence even experimental weather modification research.

At the conclusion of testimony, Judge Boone promised to hand down his written judgment during the first week in July.



Deep-sea divers (to right of intake tower) and dredge pump used to remove silt and repair the White River Lake intake structure.

**NOTICE:** Information regarding times and places of the monthly County Committee meetings 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.



White River Lake, looking south at the dam.



White River Municipal Water District intake tower and water treatment plant.

## Big Storm Undetected By Official Rainfall Records

By F. A. RAYNER

A series of thunderstorms developed during the evening hours of June 2, 3 and 4, 1974, and traversed the central High Plains in the vicinity of Running Water Draw (the surface drainage area known as Running Water Draw within the High Plains Plateau is known as White River where it enters the canyon area of Floyd and Crosby Counties). The largest of these storms occurred on June 3 and caused extensive flooding in Running Water Draw and White River. However, the official rainfall records maintained by the U. S. Weather Bureau's Lubbock office do not reveal the true magnitude of these storms.

The U. S. Weather Bureau records show the following recorded rainfall amounts at the specified reporting stations.

Recording Station	Total Recorded Rainfall, In Inches		
	June 2, 1974	June 3, 1974	June 4, 1974
Olton (Lamb County)	Trace	0.06	0.96
Plainview (Hale County)	0.49	1.11	1.61
Floydada (Floyd County)	0.55	0.78	2.63
Crosbyton (Crosby County)	0.91	2.30	3.00

The magnitude of the recorded rainfall, if representative of the entire area, would have precluded the flooding in Running Water Draw and at White River Lake (see the story, "Municipal Groundwater Reserve a Necessity") and the magnitude of the filling of the playas (see photograph on page 4).

### Rainfall Approached Eight Inches

Unofficial reports show rainfall in excess of five inches on June 3, and Jim Belvelle, Meteorologist with the Lubbock office of the U. S. Weather Bureau, estimates the rainfall in certain areas must have approached eight inches in order to account for the flooding experienced. Belvelle described the June 3 storm as a freak oc-

currence; however, it typically illustrates the fallacy of assuming that official rainfall records of large thunderstorm systems adequately describe the general rainfall received.

The overflowing and overflowing of the playas southeast of Plainview (see photograph on page 4) would indicate that the center of the massive thunderstorm probably passed over that area. Flooding in Running Water Draw at Plainview and playa catchment indicate that the storm centers passed over

Running Water Draw between Olton and Plainview traveling southeast in the general vicinity of Running Water Draw.

### Farmland Flooded

In eastern Hale and western Floyd Counties, Running Water Draw becomes very broad and shallow and there was extensive flooding of farmland in that area.

An aerial inspection indicated that the large flood flow of Running Water Draw was dissipated in eastern Hale

and western Floyd Counties, and relatively little of the Running Water Draw flood over the caprock (High Plains area) ever entered the canyon area of White River (see photograph on page 4). The White River Lake flood of June 3 was derived primarily from precipitation falling in the White River canyon and tributary areas of Crosby County, and not from runoff from the High Plains area.

MUNICIPAL . . . continued from page 2

surface water supplies—could result in an interruption in a city's surface water supply. It was 11 days before the White River Municipal Water District was back in normal operation, and, even then, the Post residents continued to experience low water pressure because of the extensive watering of parched lawns. The stability of a backup groundwater supply is vividly illustrated under such conditions.

### Reference

Howell, C. L., and Petty, R. G., *Engineering Data on Dams and Reservoirs In Texas Part II*, Texas Water Development Board Report 126, 1973.

## DISTRICT WATER-LEVEL BOOK NOW AVAILABLE

The 1973-1974 water-level statement, published this year in book form, is now available at the Water District office. The book is entitled, "Ogallala Aquifer Water-Level Data, With Interpretation, 1965-1974".

The book consists of a detailed explanation of the changes in the area's water levels and a section on the rate of depletion of the Ogallala aquifer. Maps and hydrographs have been prepared for each of the counties within the District, and tables were calculated for each well, listing measurements and average annual changes.

Persons interested in obtaining a copy of the book may do so by contacting the District's Lubbock office, 1628 15th Street.

## LUBBOCK CITIZENS AND LEADERS CONCERNED WITH FUTURE OF WATER

KCBD-TV of Lubbock, a subsidiary of State Telecasting Company, Inc., recently announced the results of a survey taken in Lubbock as a part of its broadcasting license-renewal application to the Federal Communications Commission.

According to News Director Dick Benedict, the "community ascertainment program" determined, via an in-depth survey of 400 Lubbock citizens and 70 community leaders, that the need for an adequate supply of water for the future is the number one concern of the citizens and their leaders.

### Issues Vary With Groups

However, in spite of the fact that water needs are the major concern of the 470 persons interviewed, the citizens as a group rated traffic and city street problems at the top, and the leaders overwhelmingly ranked the water issue at the head of their list of problems to be solved.

According to Benedict, the community leaders' opinions were given a 10-to-one ratio over the public's views. In other words, more emphasis (a rating of 10) was given to the questionnaire returned by a leader, and a rating of one was given each citizen questioned. "This was done in an effort to give equal weight to both the community and its leaders in establishing the community needs profile," said

Benedict.

Section 1V-B, Part 1, Paragraph 1.B, of the application states as follows:

"Remaining as the primary concern of Lubbock citizens and leaders is the need to provide an adequate supply of water for the future of the city and to insure the continued expansion of its agricultural and economic base. Current thinking is tending away from the past total concentration on importing water and turning instead toward seeking other ways through modern technology and weather control to providing an adequate supply for the future. Consideration of weather modification, ground recharge systems, and new methods of limiting evaporation are now considered to be hand-in-hand methods with the older question of water importation. Industrial development that will not further deplete the available supplies is still a high priority for area developers and economists.

"Growing in importance to community leaders is the concern that continued predictions of water shortfalls in the future may do more to hinder future economic growth than the possibility of the shortfalls themselves. A primary need seems to be the development of a positive attitude about the future of water resources for the Lubbock area."



PLAYAS IN EASTERN HALE AND WESTERN FLOYD COUNTIES, JUNE 5, 1974.

**NOW IS THE TIME TO CONSERVE WATER**

# THE Cross SECTION

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

Volume 20—No. 7

"THERE IS NO SUBSTITUTE FOR WATER"

July, 1974

## Water District Breaks Ground For New Office Headquarters



Ray Kitten, Selmer Schoenrock, Webb Gober, Chester Mitchell and Billy Wayne Sisson break ground during the ceremonies held July 11 at the 30th Street and Avenue Q location of the District's new headquarters, to be ready for occupancy in February, 1975.

The High Plains Underground Water Conservation District No. 1 broke ground July 11 for its new headquarters to be located at 30th Street and Avenue Q in the City of Lubbock, Texas. Chester Mitchell, Member of the District's Board of Directors, turned the first spade of earth. Joining him in the ground-breaking were the other four Directors, Billy Wayne Sisson, Ray Kitten, Webb Gober and Selmer Schoenrock.

Prior to the actual breaking of ground, Sisson, President of the Board, made the following remarks.

*We are here today to break ground for a building whose use will be dedicated to the conservation of this area's only major water supply—the groundwater stored in the Ogallala aquifer.*

*The Ogallala aquifer is one of the principle groundwater supplies on this continent. It is the foundation of the High Plains economic structure, and the products created using water pumped from this aquifer comprise a major part of our State's economy and are a large contributor to our Nation's foreign trade.*

*It is particularly fitting that 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.*

*To this new office building, for the*

*High Plains Underground Water Conservation District No. 1, will be brought the history of nearly 23 years of pioneering innovation in groundwater conservation and management. The capabilities to be provided by this new facility will build upon the District's past accomplishments, by launching a new era of even greater service to its citizens.*

*In the spirit of this endeavor, I now ask my fellow Board Members to join me in breaking ground for this project, and that Mr. Mitchell, who has served 11 years as a Member of this District's Governing Board—a tenure longer than that of any other of the 32 outstanding men that have served as officers of this District—turn the first spade of earth.*

*General Rose Speaks*

General James M. Rose, Director of the Division of Planning Coordination, Office of the Governor, served as the guest speaker. Addressing 50 area community and business leaders at a dinner following the groundbreaking ceremony, Rose called the new headquarters a "benchmark in the continuing faith you have in the future of this area and the State".

He then turned his thoughts to the responsibility of the Governor toward allocating natural resources. "Governor (Dolph) Briscoe has identified this responsibility and has isolated one

—continued on page 4... WATER

## JUDGE DENIES TEMPORARY INJUNCTION IN WEATHER MODIFICATION HEARING

District Judge Pat Boone, Jr., of the 154th Judicial District, Littlefield, Lamb County, Texas, handed down his written decision July 2 in the case of Farmers and Ranchers for Natural Weather, et al, vs. Atmospherics, Inc., et al, the first suit filed in Texas against a hail suppression program.

In his ruling, Judge Boone denied the Plaintiffs (a group of 127 farmers and ranchers) a temporary injunction against cloud seeding activities; overruled all special exceptions asked by the Defendants (Lamb County Better Weather, Inc., Plains Weather Improvement Association of Plainview and Atmospherics, Inc., the contracting company for the Littlefield-based operation) to the Plaintiffs' pleadings, and overruled the plea of privilege of the Defendants.

The five-day hearing (June 14 through June 19) was the result of a suit filed by the farmers' group in an attempt to restrain the Defendants

from seeding clouds above their land, in an effort to suppress hail by artificial nucleation, or from interfering, in any other manner, with the natural conditions of the air or sky over their land.

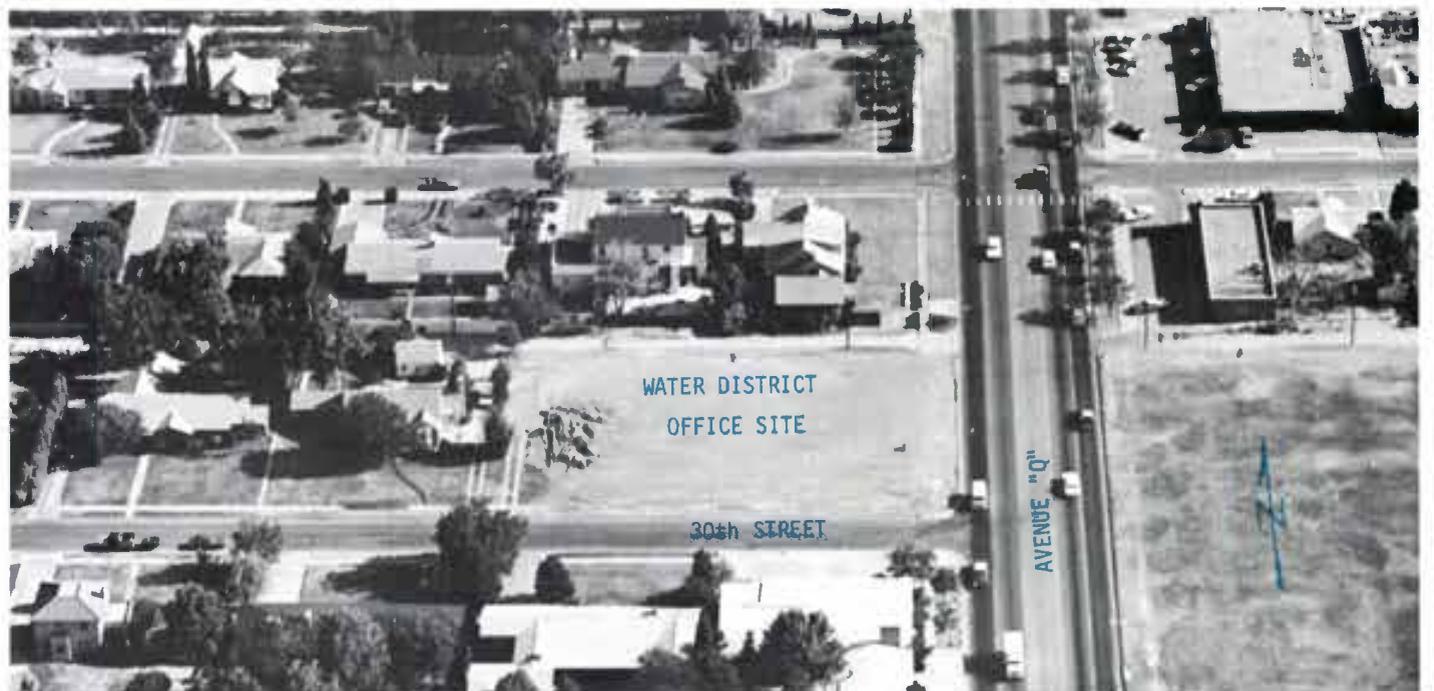
The importance of the case was revealed prior to the ruling, when both parties expressed determination to appeal the case to a higher court if they lost.

—continued on page 2... JUDGE

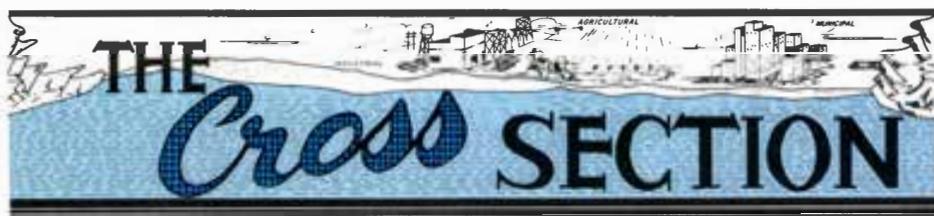
## HOLMAN NAMED TO TWRC

Burke Holman, a Houston attorney, was appointed on June 28 by Governor Dolph Briscoe to serve the remainder of the unexpired term of Otha Dent on the Texas Water Rights Commission.

The announcement followed Dent's resignation, effective July 15. Holman will join Joe Carter of Sherman and Dorsey Hardeman of San Angelo on the Commission.



AERIAL VIEW OF WATER DISTRICT OFFICE SITE



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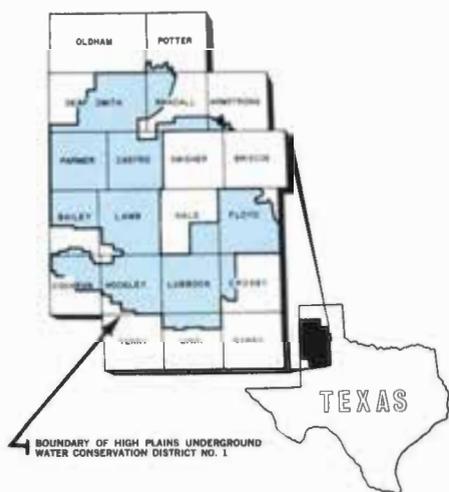
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**Hockley County**  
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Clifford Thompson, Secretary  
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Harry LeGrand, 1977 \_\_\_\_\_ 4700 S. Bowie, Amarillo  
Joe Albracht, 1977 \_\_\_\_\_ Box 81, Bushland  
Leonard Batenhorst, 1977 \_\_\_\_\_ Route 1, Canyon

**Value of Farmland Increasing in 1974**

The value of farmland, like many other large property investments, has increased markedly during the past 12 months, and the High Plains area is no exception.

Marvin Sartin, Area Specialist in Farm Management, Texas Agricultural Extension Service, Lubbock, says the latest transition of government away from subsidizing agriculture has resulted in increasing farm prices, exactly opposite from what normally could have been expected.

"Investment in land as a hedge against our galloping inflation probably had some impact on this increase," the economist states. "However, the primary stimulus was the profitability of 1973 for agricultural producers."

**Land Valued On Utility**

Sartin explains that agricultural cropland is valued, much as other real estate, based upon its utility. "This utility (or usefulness) of agricultural cropland is derived primarily from its ability to generate profits, the almost constant upward trend in land values and the intrinsic value of owning a farm."

Along this line, the farm management expert stressed the added value that an abundant supply of groundwater gives to a piece of property. "The Plains area is one of the few areas in the country that has the potential to deflate in value, because of the rate at which farmers are depleting the groundwater supply."

Sartin noted that, in a three- to five-month period, land values shot up \$200 to \$300 an acre in some parts of northern Lamb County, western Hale County and the tighter-soil areas of Bailey County.

**Water Conservation Important**

"Those people who have purchased land at high prices in the last six to eight months need to be more conscious of water conservation than anyone else," he stressed. "While looking at substantial loan payments and a long payout period, the landowner must seriously consider water conservation in order to make his purchase a profitable venture."

*Tailwater return systems and playa lake modifications also prove to enhance the value of the farm for the future as well as the present.*

Aside from its usefulness, agricultural cropland is also valued by its ability to produce net income.

In the past, says the specialist, government programs have played import-

ant roles in determining income from farms. Since their inception, these programs have run the gauntlet—from paying farmers to remove land from production, direct payments for conservation practices, guaranteed high prices, rigid supply controls and direct subsidies to the program which we have today.

**Current Program Different**

The current program, effective from 1974 until 1977, is considered by Sartin to be a radical change from the farm policy of the past. "Today, farmers are not limited in their choice of crops to produce nor in the acreage of these crops (except tobacco and peanuts). They are relatively free to choose those crops returning the highest profits.

"Likewise, they will not receive any subsidy or government payment unless farm prices fall below specified 'target' levels. However, each farmer is free to plant his land to the crop or crops that he desires, with no acreage allotment considerations or limitations."

Sartin points out that the current law does include some compensation for disasters which prevent farmers from producing a normal crop. Thus, a farmer may be eligible for some government assistance if he is affected by drought or hail.

**Lack Of Guaranteed Income**

The primary differentiating characteristic between the current program and those of the past is the lack of guaranteed income flow. Under past programs, farmers producing allotted crops were assured of a certain quantity of income. The removal of this assurance does increase the risk factor associated with agricultural production.

Says the specialist, "While, in my opinion, income-producing potential is an important factor in determining the value of cropland, the effects of the past and current government programs on land values are impossible to quantify. It is impossible to ascertain what situation would have existed if government programs had never been instituted. Thus, a comparison of the worth of land with crop allotments and histories to similar lands without allotments does not reflect the total impact of government programs on land values."

**Speculate Government Effects**

Speculation remains as the only method of evaluating the effects of government intervention on the value of farmland. "Without a doubt, values were affected; and, probably, considering the past limitations of marketing our abundance throughout the world, land values were enhanced," he continued.

"The primary concern now is, 'What will be the effect, if any, of the current change in farm policy?' Eighteen months ago, I would have speculated that this change would have had a depressing effect upon farmland values to the extent of at least slowing the rate of increase. However, 1973 was a year of unparalleled prosperity in agriculture. Product prices for almost all commodities set new records. Farmers made a lot of money."

Land availability was greatly exceeded by the demand for land at past prices. Farmland values shot up as

JUDGE ... continued from page 1

Stated Judge Boone in his decision, "The Defendant, Plains Weather Improvement Association, in open Court, excepted to the Court's overruling its plea of privilege and gave notice of appeal to the Court of Civil Appeals for the Seventh Supreme Judicial District of Texas at Amarillo, Texas, and the Plaintiffs, in open Court, excepted to the Court's ruling denying their application for temporary injunction and gave notice of appeal to the Court of Civil Appeals for the Seventh Supreme Judicial District of Texas at Amarillo, Texas."

Until that time, the weather modification program in question will be allowed to continue.

—continued on page 4... VALUE

# SOME OF THE DIGNITARIES AND HONORED GUESTS ATTENDING THE GROUNDBREAKING CEREMONY



Frank Rayner, District Manager, introduces the Board of Directors and the guest speaker. Seated behind him are Selmer Schoenrock, Webb Gober, Billy Wayne Sisson and General James M. Rose, Office of the Governor. Note the architect's plans displayed on the speaker's podium.



Water District Directors are joined in the groundbreaking ceremonies by the evening's guest speaker, General James M. Rose, Director of the Division of Planning Coordination, Office of the Governor, and Chairman of the Water Conservation and Development Task Force, third from right.



Left to right are guests Ed Irons, Superintendent of Lubbock Public Schools; Bob Brummal, President, Lubbock Chamber of Commerce; Bill McLaughlin, Vice President, Lubbock National Bank, and Judge Howard Davison, 99th District Court.



Standing, left to right, are Jim Ravanelli, Director of Development, Lubbock Christian College; Donald Harragan, Chairman, Texas Tech Department of Geosciences; Rich Brown, U.S. Geological Survey; Philip Johnson, Department of Petroleum Engineering, Texas Tech; Dan Wells, Director, Water Resources Center, Texas Tech, and Bob Sweazy, Assistant Director, Water Resources Center.



George McCleskey, President, Water, Inc.; Dick Moseley, Assistant General Manager, Lubbock Chamber of Commerce; Wayland Bennett, Professor, Agricultural Economics, Texas Tech; Alton Brazell, Lubbock County Commissioner, and Allan White, Vice President, Federal Land Bank, attend the groundbreaking ceremony.



Other guests attending the groundbreaking were George McBee, Director, Texas Agricultural Experiment Station; Y. F. Snodgrass, Grain Sorghum Producers Association; Kent Hance, Member, Lieutenant Governor Bill Hobby's Citizens' Advisory Water Council; Felix Ryals, Manager, Panhandle Underground Water Conservation District, White Deer; A. L. Black, Texas Water Development Board Member; Frank Rayner; Rose Jean Griffith, representing Congressman George Mahon, and Alan Henry, Lubbock City Councilman.

**WATER . . . continued from page 1**

of the most pressing by appointing a group of water professionals from across the State to his Water Resource Conservation and Development Task Force."

"Governor Briscoe has directed the Water Task Force to plan and provide the policies and finances necessary to implement a water program that will benefit all of the State, and to examine all possibilities for an import of water from outside the State."

**BAILEY COUNTY OFFICE RELOCATED**

Effective July 15, 1974, the Bailey County Office of the High Plains Underground Water Conservation District No. 1 was officially moved to the office of H&R Block, 224 West 2nd, Muleshoe. Doris Wedel, Manager of the tax accounting company, became the County Secretary for the District office on April 3, at which time her office was located at 306 West 2nd.

*Hours—9 a.m. to 5 p.m.*

Mrs. Wedel will keep the new office open from 9 a.m. to 5 p.m., Monday through Friday. Her telephone number is 272-3283.

Mrs. Wedel's primary function will be to issue applications for permits to drill water wells. She will also serve as Secretary to the Bailey County Committee.

The Water District is proud to welcome Mrs. Wedel as Bailey County Secretary, and urges Bailey County residents to contact her about any Water District matters in the future.



DORIS WEDEL

Rose noted that the Task Force has completed step one—determining the State water policy, which addresses the importance of irrigated agriculture.

"Currently the Task Force is developing a State-wide short-range plan, identifying current water availability within the State, providing for the immediate needs and getting current projects underway where early needs are demonstrable."

"Definitive work on a long-range plan of twenty to fifty years will follow immediately," said Rose.

He concluded by saying, "Difficult decisions lie ahead, but the people of the High Plains here today are once again reaffirming their dedication to our common goal."

*Architect Discusses Features*

Following Rose's speech, Bill Cox, the building's architect, then presented a brief account of the size and features of the building. He pointed out that the Board room, 1,200 square feet, was also designed to be used by the general public as a meeting room.

Rayner then introduced each of the participants, correlating their unique relationship to the project. He concluded the program by noting the District's intent to play a bigger part in its role as a public servant by making its new facilities accessible to those who require its services.

**VALUE . . . continued from page 2**

farmers purchased land at almost any asking price. "Because the cost-price squeeze perennially plagues agriculture, forcing increased unit size, the trend toward larger farming operations continued and will likely continue for some time."

Sartin concludes, "In my opinion, the value of farmland will not continue to soar at anywhere near the rate we have just experienced. However, I feel that we will not see any significant or prolonged decline from these levels in the near future. Even though government has shifted away from subsidizing agriculture, current world demand for agricultural products and the economic advantage that we enjoy in agricultural production point toward the maintenance of 'good' prices for our agricultural products. A profitable agriculture will mean increasing land prices.

"Therefore, it seems to me that the shift of government away from agriculture will not adversely affect farmland values at present."



Participants in the purchasing of the property, design and construction of the building are Ludwig Teinert, President, Teinert Construction Co.; Gordon Treadaway, Attorney; Jack McQueen, Realtor, and Bill Cox, Architect.



Members of the Water District staff attending the groundbreaking ceremony are Obbie Goolsby, Tony Schertz, Don McReynolds, Rebecca Clinton, Oscar Riemer and Frank Rayner. Present, but not pictured, were Dan Seale and Penny Newberry.

**Past TWRC Executive Director Dies**

Louis L. McDaniels, 63, Executive Director of the Texas Water Rights Commission (TWRC) from October 12, 1971, until June 30, 1973, died July 7 at his home in Newton, Texas. He retired from the TWRC in 1973 due to poor health.

McDaniels was born April 11, 1911, in Lufkin, Angelina County, and graduated with honors from Palestine High School, Palestine, Texas. Following his graduation, he attended Texas A&M College at College Station, North Texas Agricultural College, Denton, and the University of Texas at Austin.

*History With TWRC*

McDaniels began his employment with the TWRC in March, 1943, as

Hydrographer for the then Texas Board of Water Engineers. He served in various capacities with the then Board of Water Engineers and the U. S. Geological Survey until September 1, 1965, when he was appointed Chief Hydrologist and Director of Technical Services, TWRC, in which capacity he served until he was named Executive Director.

*The Cross Section*, in behalf of the Board of Directors of the High Plains Underground Water Conservation District No. 1, extends to Mr. McDaniels' family its sincere sympathy for their loss, and its sincere appreciation for the many accomplishments and contributions Louis made to the betterment of the State-wide water community.

# THE Cross SECTION

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

Volume 20—No. 8

"THERE IS NO SUBSTITUTE FOR WATER"

August, 1974



Frank Rayner, District Manager and Member of the Board of Directors of the Texas Water Conservation Association (TWCA) Groundwater Panel, and Webb Gober, District Director and TWCA Member, tour the grounds of the Battleship Texas while in Baytown for a public hearing of the Groundwater Panel concerning land subsidence, August 12. See related story and photograph on page 2. (Photograph, courtesy of Duncan Ellison.)

## STREAM IRRIGATION STOPPED TEMPORARILY

The severe drought conditions existing in the Southwest have caused the Texas Water Rights Commission (TWRC) to issue orders during July ceasing irrigation along certain Texas streams in order that domestic and livestock requirements might be met.

On July 23 and 30, the TWRC voted to cease diversion of water for irrigation on a segment of the Colorado River (upstream from the mouth of the San Saba River, including the Concho), on the Clear Fork of the Brazos River, and on a segment of Brady Creek, Colorado River Basin, McCulloch County.

The Commission also directed the San Angelo Water Supply Corporation to release water from Twin Buttes Reservoir for "domestic and livestock uses and for other superior and senior water rights downstream on the Concho River", and ordered the City of San Angelo to provide for the passage of the releases through the stream-courses through the city.

### Three Orders Rescinded

According to TWRC Executive Director Gene Richardson, three of the four orders were rescinded on August 7 and 12 due to recent rains. These three orders stated, "Continued diversions of water by irrigators . . . will impair the rights of domestic and livestock users within the area," and ". . . diverters . . . are directed to immediately cease their diversions of water until further notice."

Richardson said the order to the San Angelo Water Supply Corporation shall not be rescinded. The case involved diversion of water from Twin Buttes Reservoir by the Corporation

to Tom Green County Water Control and Improvement District No. 1 for irrigation purposes. The Corporation

—continued on page 4 . . . STREAM

## EPA To Control Groundwater

"To protect groundwater, EPA (Environmental Protection Agency) will use regulatory powers incidental to its control of surface discharges; establish groundwater criteria for treatment works it funds; and structure its permit and planning regulations and research activities to encourage states in establishing full groundwater protection programs." This statement of policy is spelled out in a new Water Quality Strategy Paper recently released by the EPA, according to the May 9, 1974, issue of the Ground Water Newsletter.

The EPA Strategy Paper says, ". . . the laws give (EPA) only limited authority to regulate the pollution of groundwater." The types of regulation envisaged by the Agency to fulfill the mandates of the laws as they relate to the quality of all water supplies include:

—Action through the National Pollution Discharge Elimination System (NPDES) which requires Federal approval of statewide programs to abate pollution discharges. In this respect,

dischargers who contemplate a change from direct discharge to land disposal, or employ a combination of both, would be given permits "containing conditions to minimize the damage to underground and surface water resources".

—Municipal permits could require regulatory controls to protect groundwater from facilities presently connected to a municipal sewer system but where, for a variety of reasons, the municipality expresses a desire to change to a land disposal technique.

—Grants for construction of publicly-owned treatment works using land disposal or aquifer recharge will be contingent on the design of the project to meet specific groundwater quality standards in the zone of saturation for such constituents as heavy metals, a wide variety of dissolved salts, nitrates and organic pollutants.

—The laws setting out requirements for approval of a state NPDES program stipulate that Federal approval of the program will be maintained only as long as the state prohibits the disposal of pollutants into wells or controls such disposal to prevent pollution of groundwater and surface water resources.

—The states are already required to submit annual reports to EPA on sources of pollution and plans for control and cost of controls. EPA strategy envisages that "as they become more sophisticated, these reports should cover groundwater effects from these sources of pollution." The agency may request states to "designate principal aquifers, locate groundwater pollution sources and provide an inventory of wells which can be used to determine groundwater quality within their jurisdiction."

Overall, the EPA report says, "The general ability of the states and EPA to report on groundwater lags behind their ability to report on surface water. EPA is, moreover, assigning first emphasis to surface water in the further development of monitoring systems. The Agency will, however, begin to emphasize groundwater monitoring in areas where there is high use of groundwater."

### TWQB Standards Rejected

The Texas Water Quality Board's (TWQB) suggested water quality standards for Texas (the NPDES) have been rejected by the EPA (in accordance with the provisions of P.L. 92-500), and the EPA has proceeded to require that all waste disposal permits previously issued by the TWQB be

—continued on page 2 . . . EPA

## Notice To Small Land Tract Purchasers

There has been considerable speculation recently in the subdivision of land holdings into 10- to 40-acre country homesites, with the inticing advertisement that these small tracts of land have agricultural income potential. However, experience has shown that, in this area, even these small land tracts require irrigation.

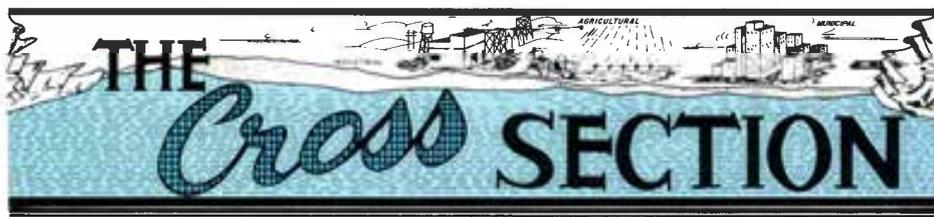
Purchasers are most often unaware and not informed about the law requiring persons owning land located within the boundaries of the High Plains Underground Water Conservation District No. 1 to obtain a permit to drill a water well, when such well is to produce more than 100,000 gallons per day (69.4 gallons per minute).

Wells pumping less than 69.4 gallons per minute (gpm) are exempt from the rules of the Water District. These wells are intended to supply only peak domestic and livestock needs, and, therefore, are of limited usefulness as an irrigation source to supply peak crop needs.

In subdividing land, considerable planning is needed in determining the optimum well locations in order to satisfy the District's minimum spacing requirements. According to the rules of the Water District, a well pumping from 70 to 265 gpm (four-inch pump, or smaller), must be spaced at least 200 yards from any existing wells. Other statistics and spacing requirements are as follows:

265 to 390 gpm (five-inch pump) .....	250 yards
390 to 560 gpm (six-inch pump) .....	300 yards
560 to 1,000 gpm (eight-inch pump) .....	400 yards
More than 1,000 gpm (ten-inch pump, or larger) .....	440 yards

Purchasers and developers are advised to contact the District headquarters in Lubbock for assistance in subdivision planning, in order that well sites are developed in accordance with the rules of the District.



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

1628 15th Street, Lubbock, Texas 79401

Telephone 762-0181

REBECCA CLINTON, Editor

Second Class Postage Paid at Lubbock, Texas

District Office at Lubbock

Frank Rayner, P.E. \_\_\_\_\_ Manager  
 Don Smith \_\_\_\_\_ Geologist  
 Don McReynolds \_\_\_\_\_ Geologist  
 Tony Schertz \_\_\_\_\_ Draftsman  
 Obble Goolsby \_\_\_\_\_ Field Representative  
 J. Dan Seale \_\_\_\_\_ Field Representative  
 Kenneth Carver \_\_\_\_\_ Field Representative  
 Clifford Thompson \_\_\_\_\_ Head, Permit Section  
 Mrs. Norma Fite \_\_\_\_\_ Secretary-Bookkeeper  
 Mrs. Penny Newberry \_\_\_\_\_ Secretary  
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 Danny Key, 1976 \_\_\_\_\_ Star Route 2, Morton  
 Jessie Clayton, 1978 \_\_\_\_\_ 706 S. Main, Morton  
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 Connie Bearden, 1976 \_\_\_\_\_ Route 1, Floydada  
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 Route, Floydada  
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 Joe Albracht, 1977 \_\_\_\_\_ Box 81, Bushland  
 Leonard Batenhorst, 1977 \_\_\_\_\_ Route 1, Canyon



Following their meeting on the land subsidence problem in the Houston area, the TWCA Groundwater Panel toured a part of the subsiding area, viewing several sites where the salt (bay) water encroachment has forced the abandonment of numerous houses. Note the water in the front yard of this large, abandoned and vandalized house (the bay is to the rear of the house), the trees killed by the salt water, and other shrubbery. See associated picture on page 1. (Photograph, courtesy of Duncan Ellison.)

**Groundwater Panel Considers Subsidence**

The quarterly public meeting of the Groundwater Panel of the Texas Water Conservation Association (TWCA) was held August 12 in Baytown, Texas. The purpose of this meeting was for the Panel to receive input from interested citizens, elected officials and other water leaders as to their thoughts on the problems of land subsidence in the Gulf Coast area, and possible legislation to correct the problem.

Bill Jenkins, Lieutenant Governor Bill Hobby's Office, submitted and discussed an outline for a proposed model act that would provide for the creation of locally-controlled groundwater management districts that could address the land subsidence problem.

There were approximately 52 persons in attendance at the meeting, including State Representatives Joe Allen, Baytown, and Ray Barnhart, Pasadena. Representing the Water District at the hearing were Frank Rayner, Member of the Board of Directors of the TWCA Groundwater Panel, and Webb Gober, District Director and Member of TWCA.

**CONSUMPTION RECORD SET DURING PIPELINE BREAK**

Man's dependence upon an adequate water supply and the wisdom of providing alternate and independent systems for a municipal water supply were clearly demonstrated recently by a break in the pipeline of the Canadian River Municipal Water Authority (CRMWA). The pipeline, which transports water from Lake Meredith to Lubbock and other member cities, ruptured in the vicinity of the north Lubbock County line.

**Line Shut Down**

Repair efforts necessitated shutting the line down and pumping out (draining) a segment of the pipeline (the water was delivered to a local farmer's irrigation ditch and used to water his growing crop). The line was out of service for two days (July 22 and 23),

—continued on pg. 3... CONSUMPTION

EPA... continued from page 1

reissued under the auspices of EPA. The Texas Water Report (August 1, 1974) notes, "Here in Texas, EPA and the Water Quality Board continue to call in permittees by the scores to amend State permits to fit Federal permits, and to issue EPA permits, after costly public hearings in each case. EPA is issuing some 200 pages of hearing notices a week, and WQB is preparing the permits for EPA to issue in an exasperating and costly duplication of effort."

The August, 1974, issue of The Well Log, publication of the NWWA, editorializes on HR 13002. That editorial follows:

*In the first days of 1972, the Congress passed the "Water Pollution Control Act of 1972" which had been debated in the House and Senate for two long years. Due to the efforts of the Oil and Gas Industry to prevent regulation of their activities, groundwater protection was omitted from the bill and, in fact, this 158-page document refers to the words ground water only twice, and it takes an educated eye to find these references. Because this bill was focused entirely on surface-water protection, it could result in the forcing of contaminants underground. Thus, for the past three years, NWWA has worked hard on behalf of our water well industry to obtain legislative attention to the potential problem of groundwater pollution.*

*The Safe Drinking Water Act, first introduced in 1971, appeared to be the best vehicle for the job. Approximately one dozen congressional hearings later, and at least as many rewritings of the initial legislation, "The 1974 Safe Drinking Water Act" carrying the number HR 13002 has been passed out of the House Committee on Interstate and Foreign Commerce recommended for passage by the whole House.*

*Happily, the report contains 67 direct references to groundwater, which is quite an improvement over the Water Pollution Control Act of 1972. The bill by no means contains all the language we would desire to adequately protect our underground-water resources, but it is certainly a starting*

—continued on page 3... EPA

## DIMMITT FARMER MAINTAINS EXCELLENT NETWORK OF CONSERVATION SYSTEMS

In a time when water conservation is becoming an extremely popular concept on the High Plains, a Castro County farmer already maintains a superior conservation operation.

Jack Miller owns eight sections of farmland near Dimmitt, on which he maintains and operates 12 tailwater return systems and playa lake modifications.

Farming since 1929, Miller says he dug his first tailwater pit in 1967 "to save water from evaporation". He later realized the benefits of reclaiming land by removing water from where it is caught naturally to a smaller and more concentrated area, such as a modified playa or a tailwater storage pit.

"I reclaimed more than 120 acres around four lakes on four-and-one-half sections," says the landowner.

### Modifications Tied To Pipeline

The modifications, mostly 200 feet long by 150 feet wide, are tied into a 50-mile underground pipeline system with 60 irrigation wells. According to Charles King, operator of more than four sections of Miller's property, tailwater is not recharged into the wells, but is tied into the underground pipeline system.

"We consider that a playa lake can produce water equivalent to two irrigation wells and we very seldom shut the lake pump off," adds King.

The farm owner shows his pleasure with his conservation system by boasting, "We don't lose a drop of water now—the water doesn't run off our land and it is all reclaimed."

One of the most impressive features of the Miller set-up is the dirt work and design of the lake modifications and tailwater return system pits. To deal with the problem of siltation, the modifications are elevated in order that silt will be deposited in the lake bed and not enter the excavated area of the lake.

### Lakes And Pits Combined

Most of the conservation systems are combinations of lakes and pits. Tailwater is allowed to flow to the lake, where it is diverted through a



Standing by a lake pump at one of their twelve tailwater return systems are, left to right, Jack Miller, Tom Miller and Charles King. Tom Miller and King operate eight sections of Jack Miller's farmland near Dimmitt in Castro County.



Shown here is one of the methods utilized on the Miller farms whereby water caught at other locations flows into a tailwater pit, where it remains until it is pumped into an underground pipeline system and back on the land for irrigation of more than 2,000 acres of beets, corn, milo, cotton and alfalfa.



In several instances, Jack Miller has located a tailwater pit near a playa lake, so that the playa can serve as a settling pond (by itself, or in conjunction with a small silt pit) to trap silt before it enters the tailwater pit and clogs the lake pump. Note the lake in the background at the top of the photograph.

pipeline system or ditch to a settling pond, and then diverted to the tailwater pit, from which the crop is irrigated. Says Miller of his ability to do all this dirt work, "We use the dirt from the pits to build up roads and turnrows, and get two benefits from the same expenditure."

Reflecting on total expenditures for his conservation system, Miller admits he has already paid out more than \$50,000 for the dirt work and \$60,000 for pumps and pipeline. "However, I would do it again if I was starting out today, because the installations pay off."

"Today, a well pump costs \$10,000 and a lake pump costs \$2,000. It takes about \$25 to pump an acre-foot of water from a well, and \$10 from a lake pump. So, this, alone, proves the savings involved from reclaiming water," concludes Miller.

The Water District is pleased that men such as Jack Miller are concerning themselves with the savings and benefits of reclaiming water for irrigation, for the benefits extend beyond these forward-thinking farmers to the future generations of farmers who will benefit from the efforts of today's conservationists.

### CONSUMPTION . . . continued from page 2

during which time a new peak day consumption record of 67.8 million gallons was recorded for the City of Lubbock. During this period, few, if any, Lubbock citizens were even aware that their primary water supply was out of service.

### City Planned In Advance

The ability to continue uninterrupted delivery is the result of advance planning by the City of Lubbock, which allows for two contingent alternatives. The CRMWA pipeline drains into a 400-acre-foot pond at the Lubbock Treatment Plant, which can be allocated to provide service for several days. Additionally, the City owns extensive groundwater supplies in the form of three separate well fields—the Lubbock field, with a firm yield of approximately five million gallons per day (mgd); Shallowater field, four mgd, and the Sandhills field, 33 mgd, for a total capacity of about 42 mgd. Also, peak-period demand has now risen above the primary supply capability of the CRMWA, and the well fields are being used on a regular basis.

### Example Of Good Planning

This situation proves to be an excellent example of the thoughtful planning that must go into the creation and maintenance of primary and secondary water supplies at the municipal level. The flexibility of two separate and independent supplies has proven invaluable to the future of one of West Texas' largest metropolitan centers.

### EPA . . . continued from page 2

point and clearly signals a congressional awareness of this wonderful resource for which we have all sought recognition and protection.

The so called "Safe Drinking Water Act" (HR 13002) has been hotly debated for years. This act, perpetrated under the guise of a need to regulate the health aspects of public water supplies, has been a vehicle for some admitted (NWWA), alleged (oil and gas industries) and unadmitted (EPA) special interest groups seeking to force their special interests through Federal dominance over another necessity to human and animal life—potable water.

### Data Misrepresented

Unfounded claims as to mass deaths, sicknesses and epidemics were alleged to sell this act to the U.S. Congress, when, in fact, none of the alleged deaths, epidemics or mass sicknesses can be traced to public water supplies in the United States. Most of the statistics quoted Congress were of a world-wide nature. Lone references to deaths and sicknesses caused by injected water were connoted to be as-

sociated with municipal water supplies (the supposed target of HR 13002), when such isolated and insignificant cases were actually associated with privately-controlled water supplies.

One widely-quoted survey of a rural Georgia area notes that a majority of the surveyed shallow wells and springs contained coliform bacteria; however, the subject report failed to connect any deaths or even sicknesses associated

—continued on page 4 . . . EPA

**STREAM . . . continued from page 1**

was directed to release water from the reservoir to honor the superior and senior water rights below San Angelo on the Concho River "at the same time and in the same quantities as water is hereafter diverted for irrigation purposes in the Tom Green County Water Control and Improvement District No. 1".

This is one of the first times, according to Richardson, that the TWRC has received complaints of this nature and taken corrective action since the drought of the 1950's. "During that drought, the Commission issued some orders for entire segments of streams," said Richardson.

**EPA . . . continued from page 3**

therewith. Persons knowledgeable in the conditions associated with springs and shallow wells know that they can be expected to contain coliform bacteria. Such persons also know that, except for the fecal coliform bacteria, which connotes the presence of human or animal excreta, the great majority of the coliform (soil) bacteria is harmless to human and animal health. The majority of the "facts" presented at Congressional hearings on HR 13002 failed to specify what bacteria (harmful or harmless) were being cited.

**States Cannot "Interfere"**

The NWWA, while lamenting the influence of the oil and gas industry

over the Water Pollution Control Act Amendment of 1972 (P.L. 92-500), should note that HR 13002, page 96, Sec. 1421 (D) (2), states, "Regulations for State underground injection control programs may not prescribe requirements which interfere with or impede (A) the underground injection of brine or other fluids which are brought to the surface in connection with oil or natural gas production, or (B) any underground injection for the secondary or tertiary recovery of oil or natural gas, unless such requirements are essential to assure that underground sources of drinking water will not be endangered by such injection."

**EPA Cannot "Interfere"**

HR 13002 also states that the EPA Administrator may prescribe state programs (under subsection [b] [2]), but that, "Such program may not include requirements which interfere with or impede (1) the underground injection of brine or other fluids which are brought to the surface in connection with oil or natural gas production, or (2) any underground injection for the secondary or tertiary recovery of oil or natural gas, unless such requirements are essential to assure that underground sources of drinking water will not be endangered by such injection."

At least P.L. 92-500 did not interfere with the individual states' efforts to control the petroleum industry's contamination of groundwater; how-

ever, HR 13002 dictates that neither the states nor EPA can take any action to "interfere" with this, the major source of groundwater contamination in the United States.

Concerning the states' primary enforcement responsibility for grants made by EPA to states for state programs, HR 13002 states, "No grant may be made under paragraph (1) unless an application therefor has been submitted to the Administrator in such form and manner as he may require. The Administrator may not approve an application of a State for its first grant under paragraph (1) unless he determines that the State (A) has established or will establish within two years from the date of such grant an underground water source protection, and (B) will, within such two years, assume primary enforcement responsibility for underground water sources within the State."

Somehow, considering the aforementioned statements from HR 13002, the NWWA victory claims (the NWWA Water Well Journal and Well Log of August, 1974) seem a little "shallow".

The proponents for state control of groundwater will probably view HR 13002 as a vehicle to attain their goals, but, like P.L. 92-500, HR 13002 also provides that the Administrator of EPA can reject the states' efforts and impose direct EPA control—which is exactly what EPA did in Texas under the NPDES program.

## Water For Texas Conference Set

The 1974 Water for Texas Conference is scheduled for September 19 and 20, Texas A&M University, J. Earl Rudder Center Tower, College Station, Texas. The conference's theme will be "Groundwater Management — Current Issues".

The program for the two days is as follows:

**THURSDAY, SEPTEMBER 19**

- MORNING SESSION**—Joe D. Carter, Texas Water Rights Commissioner, presiding
- 9:30 **Keynote address**—Lieutenant Governor William P. Hobby, "Groundwater Issues Facing Texas"
  - 10:00 Bill Clayton, State Representative, "Legislative Perspective on Groundwater Issues"
  - 10:30 **RECESS**
  - 10:50 Bill Waddle, Texas Water Conservation Association, "Approaches to Groundwater Management"
  - 11:20 Frank R. Booth, Austin attorney, "Alternative Groundwater Laws for Texas"
  - 11:50 **LUNCH**
- AFTERNOON SESSION**—Harry Burreigh, Texas Water Development Board, presiding
- 1:30 Don Owen, Don Owen Associates, California, "Engineer's Approach to Groundwater Management"
  - 2:10 Bill Guyton, William F. Guyton & Associates, "Technological Limitations to Groundwater Management"
  - 2:40 Jean Williams, Division of Planning Coordination, Office of the Governor, "Issues of Groundwater Management in the Coastal Zone"
  - 3:10 **RECESS**
  - 3:25 Robert Van Dyke, San Antonio Water Board, "Groundwater Management in Metropolitan Areas"
  - 3:55 J. W. Buchanan, North Plains Groundwater District, "Groundwater Management in Irrigated Areas"
  - 4:20 Frank Rayner, High Plains Underground Water Conservation District No. 1, "Government and Groundwater Management"
  - 4:45 **DISCUSSION**
  - 5:00 **ADJOURN**
  - 6:30 **BANQUET**—Governor Dolph Briscoe

**FRIDAY, SEPTEMBER 20**

- MORNING SESSION**—Colonel M. D. Weinert, Edwards Underground Water District, presiding
- 8:40 Lewis B. Seward, Texas Water Development Board, "Groundwater Models for Texas"
  - 9:10 Dick Whittington, Texas Water Quality Board, "Groundwater Quality Management—Regional Aspects"
  - 9:40 James Osborn, Texas Tech University, "Economic Impact of Groundwater Depletion"
  - 10:10 **RECESS**
  - 10:30 James Valliant, High Plains Research Foundation, "Opportunities for Artificial Recharge"
  - 11:00 Bob Gabrysch, U.S. Geological Survey, "Groundwater Development and Land Surface Subsidence"
  - 11:30 L. L. Jones, Texas A&M University, "Cost of Land Surface Subsidence"
  - 12:00 **ADJOURN**

Anyone interested in attending the conference should contact Dr. J. R. Runkels, Water Resources Institute, Texas A&M University, College Station 77843.

### AGRICULTURAL FIELD DAYS

The annual agricultural research demonstration field days on the High Plains are set for the month of September. The Texas Agricultural Experiment Station, Lubbock, will conduct its 65th Annual Field Day and Open House September 10, beginning at 1 p.m., and the High Plains Research Foundation, Halfway, will begin its 18th yearly event at 1:30 p.m., September 12.

Both research and experiment stations will conduct field tours and will feature equipment and machinery exhibits.

# THE Cross SECTION

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

Volume 20—No. 9

"THERE IS NO SUBSTITUTE FOR WATER"

September, 1974

## NEBRASKA LEGISLATIVE DELEGATION VISITS HIGH PLAINS WATER DISTRICT

Members of the Public Works Committee of the Nebraska legislature visited the Directors and staff of the High Plains Water District, September 16 and 17 in Lubbock, in an effort to study groundwater problems on the High Plains of Texas and the groundwater management solutions the area has found to alleviate and lessen those problems.

The Nebraska contingent came to Texas on a fact-finding mission prior to a study in their home state of possible legislation relating to underground and surface waters.

### District Programs Detailed

In an afternoon study session, Frank Rayner, District Manager, presented a slide review of the District's physical area and boundaries, its functions and water conservation programs. He also dealt with the state law creating underground water conservation districts and the effectiveness of the four such districts in Texas, the High Plains Underground Water Conservation District No. 1, the North Plains Water Conservation District No. 2 and the Panhandle Ground Water Conservation District No. 3 (all located on the High Plains of West Texas), and the Edwards Underground Water District.

Other water experts available for questions during the session were Dr. James Osborn, Agricultural Economics Department, Texas Tech University; Richmond Brown, U.S. Geological Survey; Dr. George McBee, Dr. Otto Wilke and Dr. Charles Wendt, Texas Agricultural Experiment Station; Don Graf, Lubbock attorney; Duane Crawford, Petroleum Engineering Department, Texas Tech, and Dr. Dan Wells, Director, Water Resources Center, Texas Tech.

### Economic Effects Studied

Discussions dealt with the subjects of economic effects of agriculture on the High Plains area, artificial recharge projects, and experimentation dealing with water-use efficiency on crops grown in the High Plains.

Following the work sessions, the legislators and their attorneys and other members of the group attended the meeting of the Board of Directors of the Water District, and then toured the U.S. Geological Survey facilities at Texas Tech.

They followed their visit in Lubbock with a trip to Austin where they met with State Representative Bill Clayton of Springlake, State Senator Max Sherman of Amarillo, and rep-

resentatives of the Texas Water Development Board.

### Nebraska Delegation Attending

Members of the Nebraska delegation were Senators Maurice Kremer, Chairman of the Public Works Committee, Aurora; Richard Lewis, Holbrook; Irving Wiltse, Falls City; Glenn Goodrich, Omaha; Gerald Stromer, Kearney; William Hasebroock, West Point; Jerome Warner, Waverly, and Otho Kime, Valentine.

Also attending were Stuart Wheeler, Legal Counsel, Nebraska Legislative Council; William Gilmore, Legal Counsel, Agriculture and Environment Committee; Jim Cook, Legal Counsel, Nebraska Natural Resources Commission; Dr. Les Sheffield, Irrigation Specialist, University of Nebraska; Don Ringler, Farm Editor, Omaha World Herald; Vance Anderson, President, Western Land Roller Company, Hastings, and Dayle Williamson, Executive Secretary, Nebraska Natural Resources Commission.



Stuart Wheeler, Legal Counsel, Nebraska Legislative Council; Senator Maurice Kremer, Chairman of the Nebraska Public Works Committee; Senator Gerald Stromer, and Senator Jerome Warner review a Water District publication while in Lubbock to study groundwater management in Texas. (See associated photographs on page 4.)

## Groundwater Management—Current Issues

The 1974 Water for Texas Conference, conducted September 19 and 20 on the Texas A&M University campus at College Station, dealt strongly with a state-wide problem currently receiving much recognition by the state's political, as well as water, leaders—groundwater management.

Governor Dolph Briscoe, banquet speaker, once again emphasized the importance of the agricultural production of the High Plains to the total economic picture of the nation, and vowed to do all he could to ensure an

adequate water supply for the area in years to come.

Briscoe also emphasized his belief that groundwater management is best effected by local government.

The session's keynote speaker, Lieutenant Governor Bill Hobby, addressed the three problems regarding groundwater: 1) subsidence (Gulf Coast area), 2) pollution (Edwards aquifer) and 3) depletion (High Plains).

"These problems are regional and need regional solutions with state-wide support," he proposed.

Hobby went on to emphasize that there is a need to *localize* power, rather than to *centralize* it because "big government doesn't work."

"However, if localities do not take action, I feel this should result in state control of the area with a groundwater problem."

The Lieutenant Governor concluded by noting the need for revision of Chapter 52, the law regarding underground water conservation districts, "in order to encourage local solutions to local problems".

### Approaches to Management

Bill Waddle, General Manager of the Texas Water Conservation Association, discussed approaches to groundwater management. While noting that *management* is not *ownership*,

he cited the four types of management—federal, state, local and none.

"The question is, who will do the managing?" Objecting to federal control and urging local control of groundwater, he stated, "We must take care of ourselves today before someone else tries to do it for us."

Representative Bill Clayton, Chairman of the House Interim Committee on Water, called groundwater the "most valuable resource in Texas".

### Salvation Is Management

However, considering that in Texas groundwater, the private property of the landowner, is free for the taking, "our salvation is management."

"I think the individual's rights must end where another's begin," Clayton explained. "In other words, an individual must restrict his rights to the end that others might enjoy theirs, and I feel that we need laws to see that this happens."

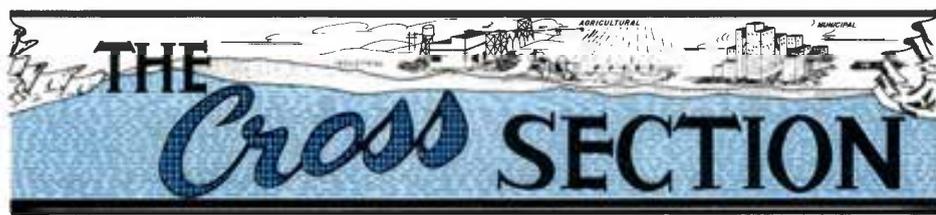
Frank Booth, Austin attorney, discussed alternative groundwater laws for Texas. He pointed out that groundwater law in Texas concerns regulation of the use of it only in areas lying within groundwater districts.

"The well-grounded idea of protecting private ownership and also regu-



LIEUTENANT GOVERNOR BILL HOBBY

—cont. on page 2...GROUNDWATER



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

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REBECCA CLINTON, Editor

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District Office at Lubbock

- Frank Rayner, P.E. \_\_\_\_\_ Manager
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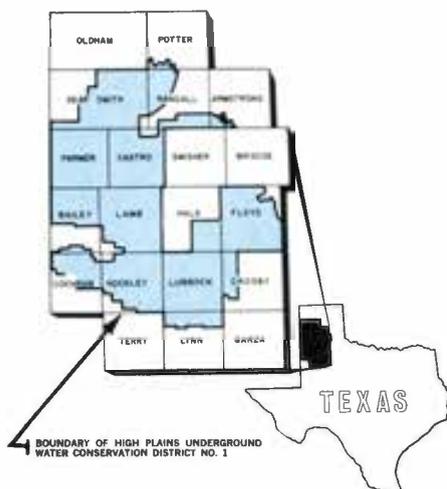
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**NOTICE:** Information regarding times and places of the monthly County Committee meeting can be secured from the respective County Secretaries.

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.



Directors Ray Kitten, Chester Mitchell and Webb Gober listen to proceedings of the 1974 Water for Texas Conference, September 19 and 20, in College Station. The theme of the conference was "Groundwater Management—Current Issues". Present, but not pictured, was Board Member Selmer Schoenrock.

**GROUNDWATER... cont. from page 1**

lating rights, presents a legislative problem, and legal action may be necessary to solve it."

Booth stressed that economics may bring about the need for landowners to give up absolute ownership in order to effect an overall water plan which would benefit an entire area.

An engineer, Don Owen, President of Don Owen and Associates of Newport Beach, California, discussed the success of the basin-equity assessment program in Orange County, California. "In California, we feel that groundwater management programs should reflect the views of people in the community."

"The programs that do worst in California have state or national control," he added.

Discussing technological limitations to groundwater management, Bill Guyton, President of William F. Guyton and Associates, noted that Texans are resisting the effort toward state control of groundwater, but that he is less critical of the idea now than before because "we need additional groundwater management in areas where people are being hurt in areas of unlimited pumping and have no recourse."

**State Versus Local Government**

Others addressing the idea of state versus local control were Dick Whittington, Deputy Director of the Texas Water Quality Board, and Frank Rayner, Water District Manager. Whittington observed, "The state must provide the protection of groundwater resources for the public good, and the objective of the Water Quality Board is to implement regulations to fulfill that goal."

Rayner cited the active groundwater conservation and management programs carried on by the three active groundwater conservation districts in the High Plains and the Edwards District, headquartered in San Antonio.

In his paper, entitled "Government and Groundwater Management", he outlined the adaptability or inadaptability of several units and types of government to groundwater management.

Rayner included a discussion of the current popularity of the proposed conjunctive management of surface and groundwaters, giving examples of results of such efforts in other states.

He particularly emphasized the inadaptability of groundwater management by the "Administrator" of super big government agencies.

The economic effect of groundwater on the High Plains area was discussed by two agriculture experts, Jim Osborn, Texas Tech University, and Jim Valliant, High Plains Research Foundation.

**Irrigation Major Factor**

Osborn, pointing out that irrigation is the major factor in the growth of the area's economy in that it effects every industry in the High Plains, cited statistics that revealed that the current economic status will probably be maintained until the year 2010.

"Considering that \$560 million of the \$600 million total income received from the area in agricultural production is related to irrigated land, the theory that economic activity will decrease with a return to dry land farming is obvious."

Speaking to artificial recharge as a method for prolonging the water supply, Valliant observed that the High Plains area needs to put a value on water and on the replenishing of the water supply.

"If you look at the projections by Osborn and still allow the available source to be depleted without attempting to replenish it, will we be able to afford water if and when it is imported to the area?"

Speakers dealing with land surface subsidence and water districts were Lew Seward, Texas Water Development Board; Robert Van Dyke, Manager, San Antonio City Water Board; J. W. Buchanan, Manager, North Plains Water Conservation District; Jean Williams, Division of Planning Coordination, Office of the Governor; Bob Gabrysch, U. S. Geological Survey, and Lonnie L. Jones, Texas A&M University. These speakers brought out the unique water problems of their individual areas and the ways in which these areas deal with their own problems.

## SOME COMMENTS ON FORESTRY, TREES AND THE SOUTHERN HIGH PLAINS OF TEXAS\*

by F. A. RAYNER

I assume that you have been informed that I, Frank Rayner, am not present with you today, but that my kind friend, Professor Fewin, is presenting this paper in my absence.

Perhaps it is first in order to properly introduce myself. An adequate introduction will provide you with the background information to appraise the expertise from which I speak. I do this knowing full well that it will rob me of the advantage—the often mistaken intelligence attributed to an ordinary person a long way from home.

First, I must proudly point out that I am a graduate of Texas A&M University (Bob, it will probably be necessary to pause here to let the cheers die down). I am a geologist and a registered professional engineer in Texas. I immediately entered the groundwater field after graduating from Texas A&M in 1958, and, except for a two-year stint in Austin, Texas, as the Assistant Director of the Groundwater Division of the State Water Agency, my entire professional career has been spent in the High Plains of Texas.

In the event you are not familiar with the Texas High Plains, it is an area where a standing person can see for three days in any direction. In other words, it is so devoid of trees that fireplugs and hubcaps are the only means for regularity, and communication to the canine community.

If any trees could be considered indicative of this area, they were the ones planted as windbreaks by the old CCC (Civilian Conservation Corps) and the WPA (Works Progress Administration).

From that introduction you can now accurately judge my qualifications to speak on the subject of forestry. Perhaps my one and only qualification stems from my realization as a pilot of a small single engine aircraft, I hope I never experience engine failure over any forest.

Secondly, the title assigned to me, "Water Table Crisis and How it Relates to Need for More Intensive Forestry Programs", came as a complete surprise, and what little I will tell you about it will more than surprise you—it will be downright shocking. When Professor Fewin telephoned and asked me to present a paper about our water table situation, I assumed that I was going to get the opportunity to brag about my District's groundwater conservation efforts that have reduced the rate of decline of the water table in this area. Under this assumption I accepted this speaking engagement. I hope you can appreciate my shock when I received a copy of the conference program.

The sad fact is that the only firsthand knowledge I have about the effect of trees—if a mesquite *bush* is a tree—on a water table, is the phenomenal rise of the water table in the Seymour Aquifer of West Central Texas when the mesquite brush was grubbed out by the early farmers in that area.

This exposure of my lack of forestry expertise may come as no surprise to those responsible for the makeup of this conference. I am inclined to

believe that they were familiar with my shortcomings. The first clue was my placement at the end of the program, and the clincher was allotting me one hour to speak when most of the other speakers, the true forestry experts, were only allotted 30 or less minutes. Everyone knows that a knowledgeable person can quickly convey his intelligence, but a pseudo-expert needs an hour for a good snow job. However, since I have already exposed my hand, I must now assure you that my allotted time is excessive to my needs by more than a factor of two.

To illustrate the conditions I have just alluded to, I would now like to show you some slides.

### SLIDE 1

The first slide shows, to scale, the area covered by the geologic rock unit known as the Ogallala formation in the Southern High Plains of Texas and the Eastern Plains of New Mexico.

The Ogallala formation was named after a classic exposure of this sand, gravel, clay and caliche series near Ogallala, Nebraska. Although this slide shows only that part of the Ogallala formation in Texas and New Mexico south of the Canadian River, the Ogallala formation actually extends from the south tip of the area shown on Slide 1, northward to the Dakotas. The Ogallala formation is the Great Plains physiographic province of our Nation.

The Ogallala aquifer consists of the water saturated material in the lower part of the Ogallala formation. In the Southern High Plains of Texas, the Ogallala aquifer has been delineated into several identifiable subdivisions or distinct hydrologic units.

### SLIDE 2

This slide, also to scale, shows the area covered by the High Plains Underground Water Conservation District No. 1, of Subdivision No. 1 of the Ogallala aquifer in the Southern High Plains of Texas.

There are all or parts of 21 counties in this subdivision; however, by popular vote, the residents of all or parts of 15 of these counties chose to participate in the High Plains Underground Water Conservation District No. 1. This 15-county District, consisting of 8,149 square miles, is shown in black on this slide.

Until a few years ago, Texas could claim the largest groundwater management district (the High Plains Underground Water Conservation District No. 1) in the nation. However, not too many years after Alaska made Texas the second largest state, the creation of the Southwest Florida Groundwater Regulatory District set us back another notch on the bigness scale. The Florida District contains about 10,000 square miles; however, the magnitude of well development and groundwater pumpage therein is only a fractional percent of the nearly 50,000 large capacity wells (domestic and stock wells not considered), pumping, by some estimates, as much as 5 million acre-feet annually—with in the High Plains Underground Water Conservation District No. 1.

### SLIDE 3

Slide 3 shows the area covered by

the High Plains Underground Water Conservation District No. 1—in red—in the Southern High Plains of Texas. This slide illustrates the isolation of the Southern High Plains of Texas and Eastern Plains of New Mexico. This is the only large aquifer system isolated on four sides by air—that is, on the north by the canyon of the Canadian River, on the west by the escarpment east of the Pecos River, on the east by the pronounced eastern escarpment, and on the top. To the south the Ogallala formation pinches out over older rocks not hydraulically associated with the Ogallala aquifer system.

The Rocky Mountains of New Mexico are shown to the right on slide 3. The North High Plains of Texas, and part of the plains area north of the Canadian River in New Mexico and Oklahoma, are also shown on this slide—the yellow area north of the Canadian River.

The aquifer in this high plateau, ranging from just under 3,000 to nearly 5,000 feet in elevation, naturally discharges through springs and seeps on the north and east escarpments, and into a small number of interior (to the plains) springs. It was only at these relatively few discharge points that some small trees could survive. The water table beneath the plains was much too far below the land surface to supply the needs of trees, in this area that only receives, on the average, 15 inches of precipitation annually. In January, 1973, the average depth to the water table in the District ranged upward in excess of 300 feet for an average of over 150 feet.

Early explorers and pioneers failed to note any forest or even individual or groups of trees indigenous to the High Plains of Texas; therefore, it can be assumed that forests were never a part of this area's physiography; and further, the lowering of the water table as a result of the area's extensive groundwater pumpage has never been a factor in the demise of trees.

During the early years of extensive irrigation development—the 1930's—trees were planted along ditches used to carry water from wells to the fields. These tree windbreaks—which I have previously referred to as CCC and WPA trees—have now almost entirely disappeared. Their effectiveness as a windbreak was undesirable, because they created ridges of trapped sand; they interfered with large mechanized farm machinery, and, as water conservation and labor saving measures, the ditches that were used to water them were replaced by pipelines.

### SLIDES 4 AND 5

You will recall that I previously noted that one could see for three days in any direction in the High Plains of Texas; the next few slides illustrate this claim. These slides also show the magnitude of farming in this area.

### SLIDE 6

Slide 6 is an aerial view looking northeast. The small town in the foreground is Wolfforth; the large town in the background is Lubbock, the largest city in the area.

### SLIDES 7, 8 AND 9

The next three slides (7, 8 and 9) also illustrate the immensity and "flat-

ness" of the Southern High Plains of Texas; this time when it was—as it is infrequently—covered with snow, such as it was earlier this year (1973).

### SLIDE 10

If the High Plains of Texas must have a tree, I suppose this annual variety would be it. (END OF SLIDES)

Now that I have done my duty—that is, I have plugged my District and talked about the water table—I hope you will permit me to make some layman observations that might be relevant to the forestry professional and forestry profession.

I cannot envision a more challenging or rewarding time in the history of professional forestry. Aside from lawn grass, the next most cared for, admired and enjoyed living things are trees. I often believe that we cultivate lawn grass just to exhibit our civilization. My thoughts are particularly strong along this line when every Saturday I must mow back my growing success. But, with a tree, we are obliged only to admire its increasing beauty, week after week, year after year, decade upon decade.

If made nearly two decades ago, during the plastics revolution, my next observation would have been scoffed at. Plastic was then fast replacing wood and wood products. I recall a popular cartoon of the time, where the proprietor of a lumber yard, holding a board in his hand, was explaining to a customer that wood could be sawed, drilled, filed, sanded and otherwise finished *just like plastic*.

What is the situation today? Let me tell you that you do not see wood being made to resemble plastic; it is the other way around. Some of the most impressive wood-grain desk and table tops are plastic. However, still reigning king are the true, naturally finished to emphasize their wood-grain beauty, hardwood furnitures. When a proud housewife describes her most cherished furniture, she often adds, *it is all solid pecan*, etc. The classic beauty of naturally finished wood is the epitome of the elegance of wood, that seems to implant social prominence.

In the building industry, a substitute for the structural integrity—with a forging nature—of wood has not been found. When one thinks of a house or a home, wood is the first tangible thing that comes to mind.

Perhaps the only undesirable forestry product is the paper that makes possible the recording of speeches like this.

All of this appreciation and need for the beauty and aesthetic peace of trees, and the beauty and utility of their wood products, requires and guarantees the acceleration of the implementation and adoption of professional forestry practices throughout our nation. Our forest and other agricultural products are our only renewable natural resources. It is this perpetuity that we need to capitalize on. The expansion of our forestry reserves is doubly important if we are ever forced to conquer another Asian country. Thanks to Pearl Harbor, we are about to see the large part of our timber sail west on floating sawmills.

—continued on page 4... COMMENTS

COMMENTS... continued from page 3

Based upon the age of the forestry profession, and a comparison with my own, I have assumed that the scientific know-how of the forestry business far exceeds its practical application—a condition that is indicative of most professions. Like most professions, efficient application of scientific forestry techniques is probably limited by economic and governmental constraints. If these are legitimate assumptions, then it is time for the forestry professional to abstain from grafting, seeding, and other research and to concentrate on the limiting obstacles of his profession—economics and government.

It appears that it is reasonable—in these times of the fast buck—to assume that the very long time required to reclaim capital invested in forestry programs (through tree harvesting) tends to limit such investments to governmental entities, particularly in the northern, short growing season, part of our nation. If the tax and investment credit incentives to the expansion of our forestry reserves are not available through local, state and Federal governments, then it is in the national interest to publicly expose these constraints and garnishee public support for changing them. In this context, perhaps the local unit of government concept of the High Plains Underground Water Conservation District No. 1 would be adaptable to forestry conservation and propagation. The High Plains Underground Water Conservation District No. 1 is prohibited by law from owning or devel-

oping any of the groundwater it is charged with managing. Groundwater in Texas, like trees almost everywhere, is the property of the landowner. It appears that "forestry districts" could provide the vehicle that could unite the efforts of individual land and forest owners that could produce the needed changes in financing and government to propagate forestry.

Forestry offers the greatest potential for economically, efficiently, and aesthetically reclaiming surface (strip) mined areas—a current target of the environmental obstructionists. Reclamation of the strip (surface) mined areas, even the long forgotten placer mined areas that destroyed numerous mountain valleys, could be accomplished through forestry districts.

I recently returned from an automobile trip covering more than 4,300 miles in Colorado, Utah, Wyoming, Idaho and other states and perhaps it is best that I am not present today to make my next statement. That being my impression of the magnitude of the waste of surface and groundwater in several of the mountain states. Millions of acre-feet of fine surface water are being diverted from streams to flow through unlined canals (some as large as any river in Texas) to filter into the subsurface and to irrigate the trash trees and bushes clogging the canal banks.

In most of the areas where surface water diversion has been a long term practice, infiltration has saturated the subsurface, creating extensive salt seeps and salt-grass marshes. With proper drainage of these areas, com-

mencing with more efficient use of surface water, large areas suitable for reforestation or other agricultural endeavor could be created. The failure to develop the naturally occurring, and man-made aquifers, is also a tragic waste of groundwater throughout most of the mountain states. It appears to this layman that coordinated water and forestry management would be mutually beneficial throughout a large part of the area of my recent travels.

Recapping, it appears that my observations are in direct contrast to the title assigned to me—my observations reveal a need for forestation to control the rise of the water table, but not to prevent its recession. In any event, I plead no contest to any critique of my observations, but please give me the advantage of the consideration and courtesy of a trespasser on your profession; and allow me to re-emphasize my kinship with the aims of the forestry professional.

After driving through Yellowstone National Park, it is obvious that Momma nature has the expertise to create a tree, but she has overdone a good thing. Proper management would require that they be created with a little more individual growing space. In any context, a pine tree grasping for sunlight in a dense forest, or a large sprawling lone liveoak commanding its one lone hill, each has a beauty that has to be revered by man.

Joyce Kilmer saw in a tree what really is there. I would like to believe that it was no accident that God chose to make the bristlecone pine and the

giant redwoods the oldest living things on our earth. Those of us less articulate are confined to describe a majestic tree in the same phraseology as those used to express the admiration, pride and reverence we feel when the American flag passes in review. Yet all of us middle aged tree lovers can identify with the ever increasing majesty of one or more trees that were a part of our youth. Trees, like we, grow old, but, unlike man, they never deteriorate to insignificance. Can any of you think of a greater living tribute than to be immortalized in name by a tree?

How many of us will be remembered by references such as, "The Washington Elm", "The Houston Pecan", or "The Evangeline Oak"? Granted, we will never be as famous as the "Father of our Country", the "Father of Texas", or the party to a starcrossed tale of unquenchable love, but we should hope for the honor of a reference such as, "That's Daddy's tree", or "That's Mother's tree".

Never expecting to successfully earn the type of public acclaim that would warrant recognition such as, "The Rayner Oak", "The Rayner Pecan", or even "The Rayner Tree", I nevertheless appeal to the kindness, compassion and generosity of my survivors to give my name to at least one tree, even if only to, "The Rayner Mesquite".

\*A paper prepared for presentation at the 25th Annual Meeting of the Forestry Committee of the Great Plains Agricultural Council, Missoula, Montana, June 19-21, 1973, and published in the proceedings of that conference.



Visiting the Water District are, from left to right, Jim Cook, Legal Counsel, Nebraska Natural Resources Commission; Dayle Williamson, Executive Secretary, Natural Resources Commission; Vance Anderson, President, Western Land Roller Company, and Dr. Les Sheffield, Irrigation Specialist, University of Nebraska. (See story on page 1.)



Members of the Public Works Committee of the Nebraska legislature are Senators William Hasebroock, Otho Kime, Richard Lewis, Glenn Goodrich and Irving Wiltse. (Present, but not pictured, were William Gilmore, Legal Counsel, Agriculture and Environment Committee, and Don Ringler, Farm Editor, Omaha World Herald.)

# THE Cross SECTION

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

Volume 20—No. 10

"THERE IS NO SUBSTITUTE FOR WATER"

October, 1974



Cross Section Editor Rebecca Clinton, left, accepts the 1974 Clarion Award from Jo-Ann Albers of Cincinnati, Ohio, President of Women in Communications, Inc., a national mass communications organization. The award was presented to the District's monthly publication October 5 in Philadelphia, Pennsylvania, during WICI's second annual Clarion Awards Luncheon.

## Cross Section Receives National Recognition

The Cross Section has been named a winner in the 1974 Clarion Awards Contest, second annual national awards program sponsored by Women in Communications, Inc. (WICI), a national mass communications organization. This marks the second year the Water District's monthly publication has been so honored.

### Merger Announced By Experiment Station

The Texas Agricultural Experiment Station, College Station, completed an agreement September 12 with the High Plains Research Foundation at Halfway, whereby the Experiment Station will operate the 152 acres and facilities owned by the Foundation at Halfway, Hale County, for the next five years.

The Texas A&M University System Board of Directors authorized President Jack K. Williams to enter the agreement at its September 10 meeting. Acquisition of the property is to be effective January 1, 1975.

—continued on page 4... MERGER

In behalf of the District, Rebecca Clinton, Editor, accepted the award at the Clarion Awards Luncheon, October 5, in Philadelphia, Pennsylvania, during WICI's Annual National Meeting.

#### Three Issues Submitted

Three issues (July, 1973, and April and June, 1974) were entered in the Environment category, Continuing Publication division. All entries were judged on the basis of educational and informational content, effectiveness, credibility, depth and use of research, relation to desired audience, freshness of approach, use of graphics and audio-visual techniques where appropriate, and general excellence.

According to the contest chairman, Barbara McDonnell of Denver, Colorado, there was a 220 percent increase in entries over 1973. Twenty-nine awards were presented in three major categories—the environment, community service and women's rights—open to communicators in the fields of broadcasting, news-editorial, public relations and advertising.

—continued on page 3... AWARD

## WATER POLICY ISSUES DISCUSSED DURING LAW SCHOOL SYMPOSIUM

"What will you do when the water is gone?" This was the thought-provoking question asked by Professor Charles J. Meyers, Stanford University School of Law, during a water law symposium sponsored by the Texas Tech University School of Law, October 18, as a part of the university's 50th Anniversary Fall Convocation Week.

Meyers, principal author of Chapter 7B, "Improving Groundwater Management", of the National Water Commission (NWC) report, charged West Texas to re-evaluate whether "the hope is justified that Congress will continue its policy of rescue operations when the area fails to take action to solve its problems today."

In a paper, entitled "Policy Issues of Ground Water Withdrawals and Inter-Basin Transfers", the professor cited statistics regarding the decrease in production and a corresponding decline in the area's economy which will be experienced with a return to dryland farming.

#### Nothing Wrong With Mining

"There is nothing wrong with groundwater mining," he said. "It is only wrong when the groundwater users take no account of the future."

Meyers said most groundwater reservoirs suffer from mismanagement of common pool resources, "those reservoirs in which the right to make use of the resource, without charge, is shared with others".

The speaker went on to emphasize

that this situation does away with the incentive to save for tomorrow, although all users agree the resource will be more valuable in the future.

Citing the need, therefore, to regulate the withdrawal of water from the reservoir, Meyers suggested the creation of a management district which could adopt a pricing policy by charging a pump tax on each acre-foot of water pumped. "Pumpers whose present uses are equal to or greater than the pump tax would be allowed to continue and the others would be phased out," he added.

#### Value Would Be Realized

He defended his theory with the idea that, if water is priced as a valuable resource, its value to the region would be more fully realized.

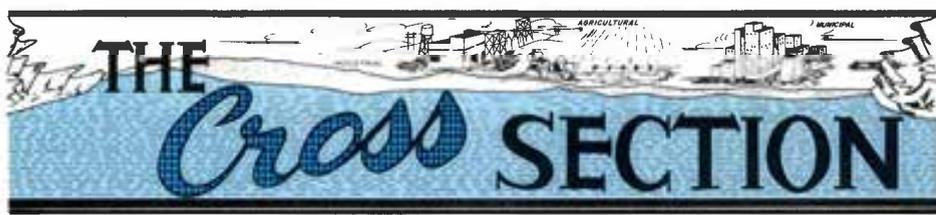
Meyers continued, "If you adopt the tax, where would the revenues go?" He suggested that the management district would purchase the pump rights of the users who could not afford to pump and, over a period of years, a fund would be developed that could be used for a water project, such as importation of water.

The professor briefly discussed two recommendations of the NWC to the Congress and President regarding inter-basin transfers of water. First, the Commission said Congress should declare the economic criteria to apply to these transfers. Some of these criteria are that inter-basin transfers should be the least cost, the value in the new

—continued on page 4... WATER



Professor Charles J. Meyers, Stanford University School of Law, and Professor Corwin W. Johnson, University of Texas School of Law, pause following their presentations before a group of Lubbock citizens, during a symposium October 18, sponsored by the Texas Tech University School of Law as a part of the university's celebration of its 50th anniversary.



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

1628 15th Street, Lubbock, Texas 79401

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REBECCA CLINTON, Editor

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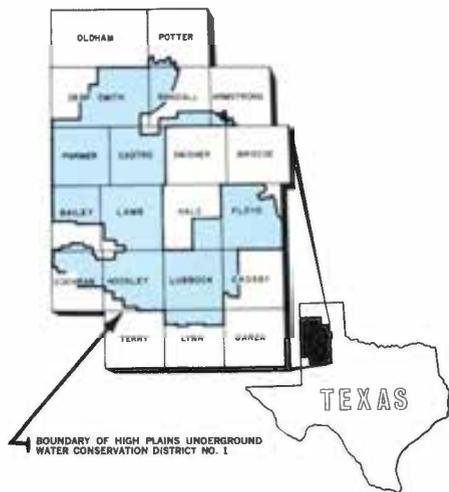
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## WEST TEXAS WATER COUNCIL REVIEWS GROUNDWATER LAW

The West Texas Regional Water Council, an advisory group charged by Lieutenant Governor Bill Hobby in August, 1973, to study and determine the unique water problems of the area, conducted a work session September 27 in Lubbock. The purpose of the session was to review proposed changes in Chapter 52, the underground water district statute.

The 16-member council, along with the other three regional councils, has heard testimony since its creation showing the need to revise certain portions of the existing law. If the councils vote favorably on a revision

of the statute, they plan to submit it to the State Legislature during its next session.

### District Managers Present

The managers of the three underground water conservation districts on the High Plains, Frank Rayner, High Plains Underground Water Conservation District No. 1; J. W. Buchanan, North Plains Water Conservation District No. 2, and Felix Ryals, Panhandle Ground Water Conservation District No. 3, were present to answer questions of the panel regarding possible changes in a draft of the proposed document. They also submitted several suggested changes in the study draft.

Bill Jenkins, Administrative Assistant to Hobby and staff adviser to the councils, read the document, noting changes and taking comments from the water district representatives.

Kent Hance, council chairman, concluded the session by noting the need for the document changes to be worded correctly and suggested another meeting in Lubbock in November for the purpose of additional review.

Prior to the working part of the session, the council heard testimony from Arthur P. Duggan, Jr., Littlefield attorney, who made comments on proposed changes in Chapter 52.

### Document Withstood Test

Basically, his line of reasoning was that the document, as drafted by experts, has withstood the test of a "quarter of a century experience" and should be brought up to date, without throwing away the "successful operation of districts in the field of true groundwater conservation".

"In considering changes, one should bear in mind the facts that the present law was carefully drafted by experts, much valuable experience has been gained in applying the statute, a minimum of controversy has been occasioned and courts have upheld the current statute. Since experience under present Chapter 52 has been constructive, economically beneficial, ecologically helpful, socially desirable

—continued on page 4... WEST

## Reports Needed From Farmers And Ranchers

Some 75,000 Texas farmers and ranchers will receive a crop or livestock questionnaire during the period from mid-November to early January.

This roundup survey of crop production and livestock numbers is made annually by the Texas Crop and Livestock Reporting Service. The Texas Department of Agriculture and the Statistical Reporting Service, U. S. Department of Agriculture, work together to provide comprehensive information on Texas agriculture.

Producers from each of the 254 counties in Texas are 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.

County statistics for 1973 and January 1, 1974, 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, or by writing John C. White, Commissioner of Agriculture, P. O. Box 12847, Capitol Station, Austin 78711.



Field Representatives Dan Seale, Kenneth Carver, Oscar Riemer and Obbie Goolsby tour the High Plains Research Foundation facilities with Gregory Curtis (right), Senior Editor of Texas Monthly Magazine. Curtis visited the Water District and other High Plains water leaders and farmers in September, as a part of the research he conducted for a story on the area which will appear in the December issue of the state-wide magazine.

**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.



Three Water District Directors visit with Archie M. Kahan, Director of the Division of Atmospheric Water Resources, Bureau of Reclamation, Denver, Colorado, during a weather modification symposium at Texas Tech University, October 15. From left, are Selmer Schoenrock, Kahan, Chester Mitchell and Ray Kitten.

## Progress In Weather Modification Reviewed

Weather modification, a subject gaining much attention in the arid and semi-arid areas of the world, was the subject of a day-long symposium at Texas Tech University, October 15.

Eight speakers discussed various aspects of modifying the weather and several talked about actual ongoing research and operational projects.

Dr. Richard A. Schleusener, Vice President and Dean of Engineering, South Dakota School of Mines and Technology, Rapid City, South Dakota, detailed several experiments for weather modification.

Dr. Schleusener talked of projects in South Dakota which utilized radar to observe the actual seeding of clouds. "Radar combines with a computer to numerically calculate the acceleration of raindrop growth and the stimulation of cloud growth."

### High Plains Program

The High Plains Cooperative Program, an experimental cloud seeding program designed by the U.S. Bureau of Reclamation to test the scientific concepts of precipitation augmentation in the Western United States (the High Plains), was briefly detailed by Archie M. Kahan, Director, Division of Atmospheric Water Resources, Bureau of Reclamation, Denver, Colorado. (See story on page 2 of the November, 1973, issue of *The Cross Section*.)

According to Kahan, the primary goal of the research effort, as set forth by the Bureau's Project Skywater, is to establish a verified working technology and operational framework by 1980 capable of producing additional rain from cumulus clouds in the semi-arid Plains States.

As a result of experiments conducted in San Angelo and Big Spring, Dr. T. B. Smith, Vice President, Meteorology Research, Inc., Atladena, California, made three general observations. "Salt seeding can increase the precipitation process; the opportunities are limited for successful seeding, and modifiers should gear up to operate on big cloud systems, realizing that cloud seeding will only work on a limited number of days."

Regarding hail suppression on the Texas High Plains, Tom Henderson, President of Atmospherics, Inc., Fresno, California, presented an analysis

of what he called the "only operational project on the High Plains of Texas". The target area for the project includes large portions of Hale and Lamb Counties and parts of Castro and Swisher Counties.

"After five years of operation, I feel the project will reveal that hailfall has been reduced between 40 and 50 percent, with no significant effect on rainfall."

The idea of modifying or altering the damaging effects of severe local storms was reviewed by Dr. Edwin Kessler, Director, National Severe Storms Laboratory, National Oceanographic and Atmospheric Administration (NOAA), Norman, Oklahoma.

"If we actually do learn to alter the natural course of severe storms, such as a tornado or hurricane, we must realize the harm we might do to an area which would not otherwise have been affected by the storm," Kessler charged.

"Someone must be able to pay the damages to an area, no matter how few people live in the area affected."

### Man Depends On Nature

The luncheon speaker, Joseph O. Fletcher, Deputy Director, Environmental Research Laboratory, NOAA, Washington, D.C., dealt with the reliance of humanity upon agriculture and the need for full exploitation of available resources.

"Man, being vulnerable to variations in climatic conditions, must learn to predict the climate, with the ultimate goal of affecting it on a world-wide scale."

He went on, "The need for the ability to predict and control the weather increases daily with growing population and increased dependence on food production and natural resources."

According to Howard J. Taubenfeld, Professor of Law, Southern Methodist University, the State of Texas is more advanced than most states in its dealings with weather modifiers.

The Texas Weather Modification Act (August, 1967) provides for licensing of projects and contains a provision stating that weather modification is not considered to be "ultra-hazardous".

Taubenfeld explained that, in an attempt to stop a weather modification

## Texas Tech Researchers To Begin Survey Of High Plains Irrigation Farmers

The initial phase of a survey of High Plains farmers, conducted by Texas Tech University researchers, Dr. Frank L. Baird, principal investigator and Professor of Political Science, and Russell E. Smith, graduate student, is in the final stages of preparation. According to Baird, 1500 questionnaires will be mailed to irrigation farmers in six counties (250 to each county) before the end of the year.

Farmers' names will be chosen at random from farm plat books in the counties of Lubbock, Carson and Moore (representing counties within active underground water conservation

districts) and Hale, Dallam and Gray (lying outside the boundaries of a water district).

The follow-up phases of the survey, funded by the Water Resources Center at Texas Tech and the Water Resources Institute at Texas A&M University, will be personal interviews with ten farmers in each county who wish to participate further, a questionnaire to be filled out by Texas Tech students from High Plains irrigation farms and a separate questionnaire to be completed by a random sample of 400 Lubbock residents.

According to Baird, students from cooperating classes at Tech, whose parents own or operate irrigation farms on the Texas High Plains, will be asked to complete and return a less technical questionnaire. The purpose of this part of the survey is to determine if there is a difference in opinion among age groups.

The survey of Lubbock residents, whose names will be drawn from the city directory, will be conducted by Texas Tech students on a door-to-door basis. Said Baird, "Student volunteers will ask the person to fill out the form and will offer to return to pick it up at a convenient time, say in a week or so."

## District Welcomes Oscar Riemer To Staff

On April 9, the District added a new member to its field staff, Oscar Riemer. A native of Lubbock, Riemer, 28, will serve the District as a Field Representative.

A 1965 graduate of Lubbock High School, Riemer studied marketing at Texas Tech University from 1965 to 1966 and from 1972 to 1973. His education was interrupted in 1967, at which time he began two years of service in the U. S. Army.

Riemer enjoys bowling, golf, fishing and hunting and attends the First Presbyterian Church in Lubbock.

*The Cross Section* is pleased to welcome Oscar Riemer to the Water District.



OSCAR RIEMER

project in court, "A farmer must not only prove that he has been hurt by the project, but that the modifier acted negligibly."

Citing the fact that only one of the 15 court cases attempting to stop weather modification activity was successful, Taubenfeld said, "This is because of the difficulty of proving the weather modifier harmed you."

"It is most difficult, because of our lack of expertise in forecasting."

### Licensing Discussed

Going into more detail with the subject of Texas' involvement in weather modification was John T. Carr, Director of the Weather Modification and Technology Division, Texas Water Development Board, Austin.

"Texas entered the weather modification business in 1967 in an attempt to bring it under control and to see that modifiers are qualified and use proper techniques," Carr explained.

He also emphasized that Texas has never spent any money on weather modification—only on the evaluation of weather modification schemes.

Carr concluded with an explanation of the procedure by which weather modifiers apply for a license and permit for a project.

Dr. Donald Haragan, Chairman of the Department of Geosciences, and Dr. Dan Wells, Director, Water Resources Center, both at Texas Tech, were the co-chairmen of the symposium.

### AWARD... continued from page 1

In a slide-film-sound presentation during the awards luncheon, Mrs. McDonnell noted several aspects of the publication which captured the judges' attention. "The layout is legible and allows for good readability," she noted. The statement, *There is No Substitute for Water*, printed beneath the masthead on page one of every issue, was cited, and several individual stories were singled out.

Mrs. McDonnell concluded by labeling *The Cross Section* "an excellent example of a publication written for a desired audience".

The Water District extends its thanks to WICI for this unique honor extended to *The Cross Section*.

**WEST . . . continued from page 2**

and approved by Texas courts, great care should be exercised in making changes."

**Law Should Correct Subsidence**

Some of his other points were: 1) the need for the State to provide guidance in certain critical areas, areas where the tax base of the aquifer is too small to finance proper management, and areas where no steps have been taken to manage the groundwater on a local basis; 2) to include provisions to prevent and correct land subsidence, and 3) the legislature, rather than the courts, should provide guidelines as to limitation of production of water from wells.

Two other speakers addressed the secondary recovery of oil. Tommy Swann, Water, Inc., Economist, reported on a recent survey of the economic benefits from the use of

water in secondary recovery operations.

As a result of the study, Swann noted that the primary benefits for secondary oil production in the year 2020 would be estimated at \$824 million. "This figure represents almost one-half the total quantified benefits of the Bureau of Reclamation study, with only 3.7 percent of the water."

James E. Smith, Assistant Director of Field Operations, Texas Railroad Commission, Austin, presented a statement concerning the use of fresh water for secondary recovery operations and the manner in which the Railroad Commission regulates secondary recovery operations in Texas.

**Permitting Procedure Discussed**

He discussed the permitting procedure for the application of a secondary recovery project. Forms to be filled out must outline the type of project, the stage of depletion of the existing project and the additional oil anticipated to be recovered as a direct result of the project.

If the operator advises the Commission that he will be using fresh water in the project, an additional inquiry is made of the operator on a separate form.

Said Smith, "The Commission then determines that the operator has the right to use the fresh water, that the water contracted for is sufficient to fulfill the requirements of the water-flood project, and that there is no source of fluids other than fresh water that could be used for the project."

**TWDB TO HOLD PUBLIC MEETING IN LUBBOCK**

The Texas Water Development Board will hold a public meeting in Lubbock, November 11, at 10 a.m., on the fifth floor of the First National-Pioneer Building, 1500 Broadway.

Governor Dolph Briscoe directed the six-man board to meet for the purpose of hearing testimony regarding hail suppression projects in West Texas.



West Texas Regional Water Council members present in Lubbock September 27 were, left to right, George McCleskey, Lubbock; Roy Breimon, Office of the Lieutenant Governor, Austin; Kent Hance, Lubbock; Bill Jenkins, Administrative Assistant to Lieutenant Governor Bill Hobby, Austin; Marshall Formby, Plainview; James B. McCray, Panhandle; Edward G. Weber, Amarillo, and Troy McNeill, Dumas. Breimon and Jenkins are staff assistants to the Regional Water Councils.



Underground water district managers J. W. Buchanan, North Plains Water Conservation District No. 2; Frank Rayner, High Plains Undergruond Water Conservation District No. 1, and Felix Ryals, Panhandle Ground Water Conservation District No. 3, answer questions of the West Texas Regional Water Council, during the council's September 27 meeting in Lubbock. The three men recommended certain changes in Chapter 52, the groundwater district law, currently under consideration by the citizens' council.

**WATER . . . continued from page 1**

uses of the water should exceed the value if it had not been exported, and the costs of building and operating the project should be considered.

The second recommendation was that it should be national policy to require the direct beneficiaries to pay the full cost, including a compensation (interest) to the area where the water was purchased. "A rescue operation under these criteria should be a paying proposition," explained Meyers.

He concluded his presentation by noting that, although the NWC report was unanimously adopted by the seven-member Commission, it has yet to be accepted by the Congress.

A second lecturer, Professor Corwin W. Johnson of the University of Texas School of Law, presented a paper, entitled "New Directions in Public Control of Land Use".

**Land Uses Separated**

Citing the traditional zoning ordinance (1922) in which the government (Department of Commerce) tried to separate neighboring land uses that were incompatible, Johnson analyzed the current trend toward more comprehensive public control of land uses.

"There are several instances where growth and large scale development are being prohibited and where interest is growing on the Federal level," he stated.

Some of these are: 1) small resort towns want to retain the small town

atmosphere, which in itself draws people to them; 2) in some states, land outside municipalities is almost without control, and developers are gaining interest; 3) much concern is being generated on the national level about the removal of land from agricultural production, and 4) states are becoming more interested in protecting certain areas of value, such as certain recharge areas in major aquifers.

Johnson summed, "Although comprehensive public control is here to stay, there is a shift from rigid control to case-by-case considerations, with government agencies being held more and more accountable."

**MERGER . . . continued from page 1**

The agreement provides for use of the facilities and personal property of the Foundation for agricultural research and education by the Experiment Station and those institutions which cooperate with the Station.

Director Jarvis E. Miller of the Experiment Station said the property will be operated as a satellite of the Experiment Station at Lubbock.

Scientists from the Experiment Station at Lubbock, with present Foundation personnel, will conduct research on the site at Halfway. Among major research thrusts will be water-use efficiency, and research relating to many aspects of cotton, sorghum, soybean, sunflower and Triticale (a wheat-rye cross) breeding and production work.

# THE Cross SECTION

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

Volume 20—No. 11

"THERE IS NO SUBSTITUTE FOR WATER"

November, 1974

## WATER CONSERVATION DISTRICT DIRECTORS AND MANAGERS MEET IN KANSAS

A delegation of approximately 120 groundwater conservation district directors and managers, representing the Great Plains States of Texas, Kansas, Colorado, Nebraska and Oklahoma, met November 7 and 8 in Garden City, Kansas, in an effort to coordinate these States' ideas about effective water conservation and management practices.

Deon Axthelm, Extension Water Resources Specialist, University of Nebraska-Lincoln, and originator of the conference, appointed Carl Epp, Chairman of the York County Ground Water Conservation District, Nebraska, as acting chairman and Epp appointed Wallace Robinson III, Chairman of the Board of Directors of the Western Kansas Groundwater Management District No. 1, to be interim secretary.

### Annual Meeting Considered

As a result of the two-day conference, the participants elected to consider the idea of an annual meeting of the five States. The Directors, acting under the supervision of Mr. Epp, unanimously passed the following recommendations:

1) A cross flow of communications is needed during the year between the people who organized the conference and the participants;

2) A list of all district directors and managers and the addresses of the home offices of all water districts should be compiled and distributed, and

3) All directors should become knowledgeable about HR 13002, the so-called Safe Drinking Water Act,

and should contact their respective legislators about it.

During the business meeting, the conference delegates unanimously accepted the following motions:

1) Each State should select a manager or director to form a steering committee to determine if an organization of the five States would be beneficial. (Axthelm was named to head the steering committee.)

2) The steering committee is to determine if an annual meeting would be worthwhile. (The steering committee would also announce the time and place of any proposed meeting.)

3) The steering committee should be given access to the remaining funds from the conference, and Dave Pope, Extension Agricultural Engineer,

—continued on page 3... WATER



Members of the Texas delegation in Garden City, Kansas, for the workshop on groundwater management and recharge are, left to right, A. Wayne Wyatt, Texas Water Development Board; Don Signor, U. S. Geological Survey; Chester Mitchell, District Director; Bill Klemt, Texas Water Development Board; C. R. Miertschin, Texas Water Rights Commission; Ray Kitten, District Director; James McCray, Panhandle Ground Water District President, and Felix Ryals, Manager, Panhandle Ground Water District.

## Groundwater Monitoring Rules Proposed by EPA

The Environmental Protection Agency (EPA) has proposed rules as a supplement to the Federal Water Pollution Control Act, as amended, which will qualify the terms for grant awards to states for monitoring in state and inter-state water pollution control programs. Appendix A—Water Quality and Pollutant Source Monitoring (Federal Register, Vol. 39, No. 168, August 28, 1974) sets forth the monitoring requirements each state must meet in order to remain eligible for Federal financial support.

The Act states, "... no grant shall

be made under Section 106 of the Act to any State, beginning in fiscal year 1974, which has not provided or is not carrying out as part of its program the establishment and operation of appropriate devices, methods, systems, and procedures necessary to monitor, and to compile and analyze data on (including classification according to eutrophic condition), the quality of navigable waters and to the extent practicable, ground waters including biological monitoring; and provision for annually updating such data and including it in the report required under section 305 of the Act."

### Strategy Required

The proposed rules also designate the Director of the water pollution control agency in each state to "develop and implement a strategy for progressing systematically toward implementation of the requirements set forth in this Appendix".

The objectives and general requirements of the state monitoring programs are "to determine compliance with permit terms and conditions, to develop and maintain an understanding of the quality (and causes and effects of such quality) of the waters in the State for the purpose of supporting State water pollution control activities, to report on such quality and its causes and effects, and to assess the effectiveness of the State's pollution control program. To this end each State shall carry out a broad range of monitoring activities both

before and after implementing pollution controls, including measurement of pollutant sources, water quality, the factors affecting water quality, and the specific effects of such quality upon beneficial uses of the State's waters."

### Aquifers to be Designated

With regard to groundwater monitoring, the Director of the state water pollution control agency shall designate principal aquifers in a manner mutually agreeable to the Regional Administrator (of EPA). Aquifers are to be designated and classified according to the terms of the Federal inter-agency report, Recommended Methods for Water Data Acquisition.

With the initial designation to be

—continued on page 2... EPA

## District Releases New Publication

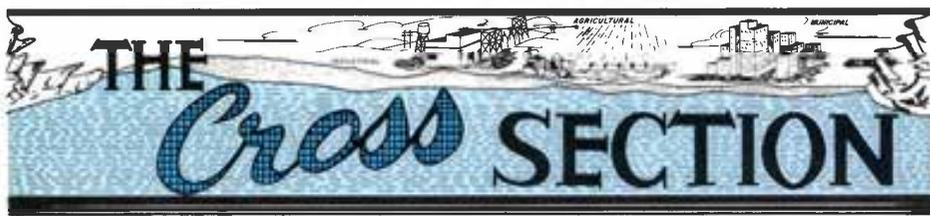
A book entitled, "Government and Groundwater Management", has recently been published by the District. Written by District Manager Frank A. Rayner, the publication deals with capabilities for groundwater management by the various forms of government—Federal, state and local.

This report will also be published in the proceedings of the 1974 Water For Texas Conference, Texas A&M University.

Copies of the book may be obtained from the District upon request.



Organizers of the groundwater management workshop are, left to right, DeLynn Hay, Kansas; Deon Axthelm, Nebraska; Frank A. Rayner, District Manager; Dave Pope, Kansas, and Dwayne Konrad, Colorado.



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REBECCA CLINTON, Editor

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Frank Rayner, P.E. \_\_\_\_\_ Manager  
 Don Smith \_\_\_\_\_ Geologist  
 Don McReynolds \_\_\_\_\_ Geologist  
 Tony Schertz \_\_\_\_\_ Draftsman  
 Fred Cowart \_\_\_\_\_ Draftsman  
 Obble Goolsby \_\_\_\_\_ Field Representative  
 J. Dan Seale \_\_\_\_\_ Field Representative  
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 Donald Aycock, 1978 \_\_\_\_\_ Lorenzo  
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 Harry Fuqua, 1975 \_\_\_\_\_ Rt. 1, Hereford  
 James E. Higgins, 1977 \_\_\_\_\_ 200 Star St., Hereford  
 Garland Solomon, 1977 \_\_\_\_\_ Rt. 5, Hereford  
 W. L. Davis, 1977 \_\_\_\_\_ Box 312, Hereford

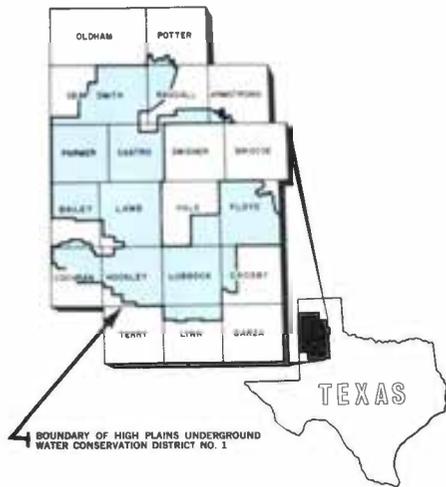
**Floyd County**

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 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.

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**CASTRO COUNTY FARMER SAVES WATER**



Pictured above are three of seven settling ponds, all part of a seven-acre tailwater recirculation project designed and operated by Fred Kuntz of Dimmitt. Floodwater from area farms and his own tailwater flow into and through the settling basins.



From the basins, the water is transported into a 10-foot deep tailwater pit. "I really have no problem with silt because it is all trapped in one of the basins before it gets to the pit," says Kuntz. From the pit, the farmer can spread the water over a quarter-section of carrots, corn and vegetables, or he can pump it back underground through a recharge well.



Kuntz is pictured above as he operates a valve at his recharge well. He says he has no way of determining how much water he is recharging into the aquifer, but he feels it will definitely extend the life of his eight-inch irrigation well and will ensure the water supply on his farm for years to come.

EPA... continued from page 1

completed by fiscal year 1975, the Directors shall then establish and maintain a statewide groundwater monitoring program "which shall consist of a network of groundwater quality monitoring stations sampled in a systematic manner and designed to determine baseline conditions and provide early detection of pollution". The rules also require a program of identification and surveillance of existing and potential groundwater pollution sources to be provided to complement the network of monitoring stations.

The proposed rules would also require inventories of the groundwater monitoring stations and groundwater pollution sources. The requirements

read as follows:

(1) *Inventory of Groundwater Monitoring Stations*—The Director shall develop and maintain an inventory of existing wells which are or may be suitable for inclusion in the State-wide groundwater monitoring network. This inventory shall be developed by April 15, 1976, and shall be updated as additional wells are selected or installed for the purpose of determining groundwater quality in accordance with this Appendix. Types of groundwater quality monitoring wells to be identified in the inventory include, but are not limited to, wells for saline water intrusion monitoring, baseline monitoring, routine monitoring in zones of high utilization of ground-

—continued on page 3... EPA

## WATER... continued from page 1

Kansas State University, Garden City, is to be the interim treasurer.

*Districts Introduced*

The initial part of the program allowed district representatives time to introduce themselves and briefly comment on their districts. The working phase of the program involved presentations dealing with groundwater management and recharge.

Speakers were Rayner; Clint Hall, Groundwater Geologist, Environmental Protection Agency, Washington, D.C.; Dwayne Konrad, Extension Agricultural Engineer, Colorado State University, Burlington; Mel Noffke, Manager, Big Blue Association of Groundwater Districts, York, Nebraska; Fred Henninghausen, District II Supervisor, State Engineer's Office, Roswell, New Mexico; Dwight Baier, Consultant, Woodland, California; Don Signor, U. S. Geological Survey, Lubbock, and James Osborn, Chairman, Agricultural Economics Department, Texas Tech University, Lubbock.

*District Directors Speak*

Representing the body of directors in a special program were Epp; Robinson; John Vasa, Chairman of the Frenchman Groundwater Management District, Holyoke, Colorado, and James McCray, Chairman of the Panhandle Ground Water Conservation District No. 3, White Deer, Texas.

The theme of the presentations of the directors vigorously stressed local control of the groundwater resource. As Epp said, "It has been found in Nebraska, through public hearings, that the people want local control because they understand their problems the best and they must live with the regulations imposed."

Vasa pointed out that local control is the reason for Colorado's seven districts, and Robinson urged the conjunctive use of surface water, groundwater and the moisture provided by the atmosphere. Said Robinson, "We can talk controls, but they only prolong the agony. We must look for new sources of water."

*Workshop Organizers*

Organizers of the workshop were Rayner, Axthelm, Pope, Konrad and DeLynn Hay, Extension Agricultural Engineer, Kansas State University, Colby, Kansas.

Representing the High Plains Water District at the conference, along with Rayner, were Ray Kitten of Slaton, Vice President of the Board, and Chester Mitchell, Lockney.

## EPA... continued from page 2

water, and monitoring in the vicinity of pollution sources.

(2) *Inventory of Groundwater Pollution Sources*—Monitoring is required of waste disposal sites and other pollution sources which pollute or threaten pollution of the groundwaters of the State. Where appropriate, the types of pollution sources to be monitored include, but are not limited to, injection wells, sanitary landfills, chemical stockpiles, municipal and industrial waste lagoons, waste holding ponds, and sludge drying beds. Each State shall develop an inventory of groundwater pollution sources by April 15, 1976, and thereafter the inventory shall be updated annually.

## IN WEST TEXAS

**TWDB Hears Testimony On Hail Suppression**

Several High Plains dryland farmers were granted an audience with the Texas Water Development Board (TWDB), November 11, in Lubbock to present testimony before the Board regarding hail suppression activities over their farms.

In response to an extensive letter-writing campaign staged in protest of hail suppression activities by farmers from Bailey, Hockley, Cochran and Lamb Counties, Governor Dolph Briscoe requested the TWDB to meet with and hear all persons interested in weather modification.

*Group Protesting Seeding*

The protesting group asked for the hearing in order to continue its attack against the cloud seeding by Atmospherics, Inc., of Littlefield and Plains Weather Improvement Association of Plainview. The activities of Plains Weather Improvement Association were recently the subject of an appeal by a group called Farmers and Ranchers for Natural Weather to 154th District Judge Pat Boone of Littlefield to receive a court order to enjoin the seeding flights over the land owned by the petitioners. However, the Judge refused the injunction and the seeding program was allowed to continue until its expiration.

Representing the opposition, Tommy McKinnon of Littlefield cited documented cases where, in other states, crops were lost due to hail suppression activities. He also noted that, with a 63-year rainfall average of 19.46 inches, the Littlefield area received "only 14.50 inches under the seeding airplanes as compared to 17.93 inches during the Dustbowl days".

Another dryland farmer, E. L. Schlottman of Levelland, presented to the Board rainfall figures for his area which revealed an above-average total of 21.25 inches in 1969 and a drop to 9.21 inches in 1970, the first year cloud seeding operations began out of Plainview.

*Bureau Opposes Hail Suppression*

A representative of the Hockley County Farm Bureau, Danny Grant, was present to publicly reveal to the Board that the 800 members of his organization had voted in recent weeks to oppose weather modification in that county.

Seven other farmers testified briefly as to their belief that a seeded cloud over their farm had resulted in little or no rainfall. Edgar Schultz, Littlefield, said, "The irrigation farmers on either side of me don't have the right to fight the hail suppression battle because they have irrigation to fall back on when it doesn't rain. I wish they would leave the planes out of the dryland territory."

Of the 54 persons in attendance, several represented the interest of the modifiers. Earl Beach, President of the Plains Weather Improvement Association, delivered a letter to the Board which acknowledged the complaints of the farmers to the Governor and briefly reviewed the history of the suit against his organization, composed of 732 West Texas residents who support hail suppression activities in the counties of Floyd, Hale, Castro and Swisher.

Said Beach, "Since the case is still pending, we have been advised by our attorneys that it would be improper for us, as parties to that lawsuit, to make or participate in making any extra-judicial statement that relates to the merits of the claim, or defenses of any of the parties or to any other matter reasonably likely to interfere with a fair trial of the action."

*State Statute Reviewed*

Prior to the testimony received from the opponents of hail suppression, Lutch Simmons, General Counsel to the TWDB, briefly reviewed the Weather Modification Act of 1967, the legislation which enables the TWDB to license and issue permits to weather modification operations in the State.

Simmons also noted the establishment of an advisory committee to assist and counsel the Board with regard to matters in the field of weather modification and control. The Weather Modification Advisory Committee, present at the Lubbock meeting, is composed of the following members: F. F. Calhoun, Secretary of the Hale County Soil and Water Conservation District, Plainview; Richard L. Dobbs, El Paso machinery salesman; George M. Parker, First Vice President of URS/Forrest and Cotton, Inc.; Dr.

James R. Scoggins, Associate Professor of Meteorology, Texas A&M University, and Dr. Howard J. Taubenfeld, Professor of Law, Southern Methodist University.

Professor Taubenfeld, speaking in an attempt to clarify some of the farmers' questions, stressed that the weather modification statute "encourages weather modification activities and does not call for local opinion on the matter." "If you want change, perhaps the best thing for you to do would be to go to the Legislature for changes in the statute, rather than to the Board."

*TWDB Issues Program Permits*

He noted that, as long as the modification programs meet specifications requested under the existing law, the TWDB cannot refuse a permit. Atmospherics, Inc., whose permit expired October 30, and Plains Weather Improvement Association, whose permit expired November 30, are expected to apply for new permits next Spring.

Members of the TWDB in attendance in Lubbock were John H. McCoy of New Boston, Chairman; Milton Potts, Livingston; W. E. Tinsley, Austin; Robert B. Gilmore, Dallas; A. L. Black, Friona, and Carl Illig, Houston.



Members of the Texas Water Development Board convening in Lubbock November 11 for the purpose of hearing testimony on hail suppression activities in West Texas are John H. McCoy, Chairman; Robert B. Gilmore, A. L. Black and Carl Illig. Present, but not pictured, were W. E. Tinsley and Milton Potts.



Present in Lubbock for the special meeting of the Texas Water Development Board are members of the Weather Modification Advisory Committee. They are, in a counter-clockwise direction, Richard L. Dobbs, F. F. Calhoun, John T. Carr (head of the Weather Modification division of the TWDB), James R. Scoggins, Howard J. Taubenfeld and George M. Parker.

# Future Water District Headquarters Going Up



VACANT LOT—30th STREET AND AVENUE Q



FOUNDATION BEING LAID

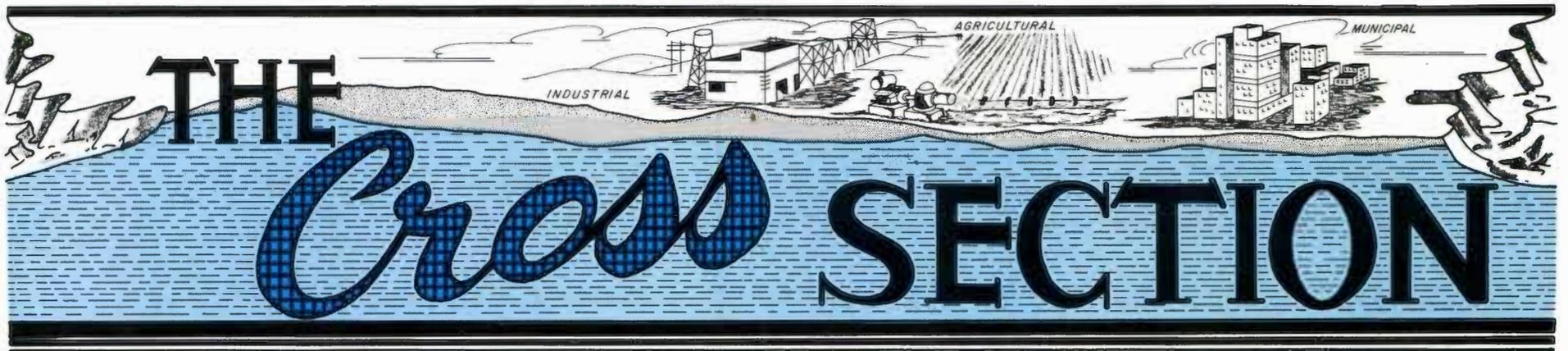


WALLS GOING UP

*Construction of the future home of the High Plains Underground Water Conservation District No. 1, located at 30th Street and Avenue Q in Lubbock, is steadily progressing. Projected completion date for the new headquarters office is March 1, 1975.*



COMPLETION OF EXTERIOR CONSTRUCTION



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

Volume 20—No. 12

"THERE IS NO SUBSTITUTE FOR WATER"

December, 1974

## THE 1975 HIGH PLAINS WATER DISTRICT ELECTION

The High Plains Underground Water Conservation District No. 1 will conduct its annual election on January 14, 1975.

Elections will be held only in those counties located in Director's Precinct 3 (Bailey, Castro and Parmer) and Director's Precinct 4 (Armstrong, Deaf Smith, Potter and Randall). The elections will be conducted for the purpose of electing two members of the Board of Directors, who will serve

two-year terms, and 14 County Committeemen (to serve four-year terms).

A. W. Gober, Director representing Precinct 3, will be opposed on the ballot by Bob Anthony, a Castro County Committeeman. Billy Wayne Sisson is unopposed for Director of Precinct 4.

Absentee balloting, which began December 26 and will continue through January 10, will be conducted in the Office of the County Clerk in

each of the seven counties involved.

### 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 1975 election, a total of 12 polling places has been established in the seven 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. Three**—Territory within the District which is situated in each of the following counties: Bailey, Castro and Parmer.

A. W. Gober, Route 1, Farwell, Texas

Bob Anthony, Route 4, Dimmitt, Texas

**Director's Precinct No. Four**—Territory within the District which is situated in each of the following counties: Armstrong, Deaf Smith, Potter and Randall.

Billy Wayne Sisson, 114 Liveoak, Hereford, Texas

### NOMINEES FOR COUNTY COMMITTEEMEN

#### ARMSTRONG COUNTY

Residents vote for two Committee-men-at-large

Charles Kennedy, Route 1, Happy, Texas

Cordell Mahler, Wayside, Texas

#### BAILEY COUNTY

Residents of Commissioner's Precinct 1 vote for one

Marshall Head, Route 3, Muleshoe, Texas

Teddy Harrison, Route 1, Muleshoe, Texas

Residents of Commissioner's Precinct 4 vote for one

W. R. Welch, Star Route, Maple, Texas

Harold Layton, Route 2, Morton, Texas

#### CASTRO COUNTY

Residents of Commissioner's Precinct 3 vote for one

Glenn Odom, Route 4, Box 135, Dimmitt, Texas

Residents of Commissioner's Precinct 4 vote for one

Anthony Acker, Route D, Nazareth, Texas

#### DEAF SMITH COUNTY

Residents of Commissioner's Precinct 3 vote for one

George Ritter, Route 5, Hereford, Texas

Residents of Commissioner's Precinct 4 vote for one

Bill Cleavinger, Route 1, Hereford, Texas

—continued on page 3... 1975

## 1974 President's Report

*The past year has been a progressive one, complete with increased involvement on the part of those interested in water conservation and the efficient management of the resource. Government is also beginning to express more concern with the protection and management of groundwater, almost to the extent of its historical concern with surface water. However, with this new interest have risen the voices of opposition to strict regulation by some distant government—those who favor local management of groundwater by those who benefit from the beneficial use of that resource.*

*The State of Texas, the pioneer in the establishment of groundwater conservation districts (the High Plains Water District, created in 1951, is one of the oldest such districts in the Nation), has taken great strides in the last year to solicit involvement on the part of its citizens, both water professionals and concerned community leaders.*

*As we all know, Governor Briscoe has created a Water Conservation and Development Task Force which has been working hard toward accomplishing its short-range goals for a year, and Lieutenant Governor Bill Hobby's Regional Water Councils are working toward the revision of Chapter 52, the underground water conservation district statute, in order to make it more applicable to today's needs.*

*And, the theme of the annual meeting of the Texas Water Conservation Association in March and the Water for Texas Conference in September was the same—existing State laws, which provide for local control of groundwater, should be preserved.*

*However, in spite of the strongly-stated position of State leaders, the President of the United States recently signed into law one of the most potentially damaging pieces of legislation in history. HR 13002, the so-called "Safe Drinking Water Act", while it intends to ensure the protection of the quality of the Nation's groundwater, will cause the efficient management of the resource to become more and more tangled in the red tape of the Federal bureaucracy. And, in a December 18 Lubbock Avalanche-Journal news story, the President, in signing HR 13002, is said to have expressed reservations, however, about "extensive Federal involvement into what has traditionally been state and local regulatory matters and unnecessary costs to the Federal government".*

*The bill passed the House on November 19 by a vote of 296-85, then went to the House-Senate conference committee, and to President Ford's desk for his signature.*

*The bill was approved by the House in spite of opposition from such groups as the National Water Resources Association, the American Water Works Association, the National Association of State Groundwater Officials, the Texas Water Conservation Association and many local water districts, such as the High Plains Water District. The danger of HR 13002 is that it would exclude the oil and gas industry from the provisions of the law. In short, the Federal government, through the Environmental Protection Agency (EPA), and the states would not be allowed to prohibit the oil and gas industry from polluting the surface water or groundwater supplies of the Nation.*

*Many state water pollution control agencies feel that prohibiting the EPA from "interfering" with the pollution carried on by the oil industry is bad enough,*

—continued on page 2... PRESIDENT'S



DONNA SMITH

## Donna Smith Joins Water District Staff

A new secretary has recently joined the Water District staff. Mrs. Donna Smith, 19, began her employment on September 4, 1974.

A 1973 graduate of Monterey High School in Lubbock, Donna was born in Cleburne, Texas, where she lived until 1970. She was previously employed by two Lubbock firms before joining the District.

Donna is married to Sam Smith. The Cross Section is pleased to welcome Donna Smith to the District.



# A BRIEF 1974 NEWS RECAP

1974 was an eventful year, and some of the year's happenings are worth reviewing for the purpose of reflecting on their significance. A few of the year's major news stories which appeared in *The Cross Section* are recapped here.

February, 1974

**Drilling of Irrigation Wells Continues to Rise in 1973**—The 1973 total of newly-drilled wells increased nearly eight percent over 1972. At the same time, the number of permits received by the District increased 38 percent. These increases were attributed to the severe drought conditions, the removal of acreage limitations on agricultural production, the decline of the water table and the subsequent decline in well capacities, increased competition for well sites and the fear of shortages of drilling equipment and supplies. (As you will remember, this was one of the critical months during the realization of the scarcity of tubular steel products.)

December, 1974

**Briscoe Appoints Water Task Force**—On November 21, 1974, Governor Dolph Briscoe created a Water Conservation and Development Task Force, which he charged to translate existing planning efforts into a "strong action program coordinating the efforts of the State and local levels of government with appropriate Federal actions." Frank Rayner, District Manager, was one of the original 29 water leaders from across the State appointed to the Task Force.

March, 1974

**High Plains Directors Visit Southwest Florida Water District**—The Board of Directors toured the Southwest Florida Water Management District, Brooksville, Florida, in March. During their three-day visit, the Directors were briefed on the geology and hydrology of the Floridian and associated aquifers, presented a review of the functions and administrative procedures of the District and given an aerial tour of the 10,000-square-mile District. The Directors also attended the March meeting of the Florida District's Board of Directors.

January, 1974

**Soil Moisture Low for 1974 Season**—The 1973-1974 fall and winter soil moisture survey showed that, in the top five feet of soil, all sections of the area were relatively dry. As a result of the lack of soil moisture and the ensuing drought of the summer months there was probably a more concentrated effort by area farmers to practice water conservation in 1974 than ever before.

**Board of Directors Adopts Resolution**—On December 14, 1973, the Board of Directors adopted a resolution expressing its interest in the successful implementation of the Bureau of Reclamation's weather modification research being proposed for the High Plains. The resolution concludes, "... the District has a vital interest in any program which might prove capable of extending the viable life of the Ogallala aquifer by substituting natural moisture from precipitation for a part of the demand being made on the declining water supply stored in the Ogallala aquifer."

April, 1974

**WT Chamber of Commerce Honors High Plains Water District**—On April ...

—continued on page 3 ... NEWS

PRESIDENT'S ... continued from page 1

but that legislation should not be adopted that would prohibit the states from protecting their own aquifers from contamination.

Another area where the Federal government has extended its grasp to the local level is EPA's contract with the National Water Well Association (NWWA) which will fund the development of the so-called model "State Ground Water Protection Regulations". According to the September issue of *The Well Log*, NWWA publication, "Part of EPA's new concern with the protection of our nation's ground-water resources is focused on the currently inadequate laws and regulations by which many States control this valuable resource. EPA decided this year to help the various States by developing a set of model laws, regulations and institutional constraints which the States could consider for adoption in their efforts to improve internal development of their ground-water resources."

It is obvious that HR 13002 was passed by a body that was not fully aware of the dangers of such legislation; but this sort of misunderstanding will remain the norm if people, like ourselves, who stand to suffer or benefit the most from any legislation dealing with the water under our land, do not take a more active part in educating our elected representatives as to our true needs.

Starting with the 1975 legislative session, let us all do our part to protect what we feel to be the most capable and efficient form of government—local groundwater management.

Respectfully submitted,

*Billy Wayne Sisson*

BILLY WAYNE SISSON, President  
Board of Directors

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

1628 15th Street, Lubbock, Texas 79401

Telephone 762-0181

REBECCA CLINTON, Editor

Second Class Postage Paid at Lubbock, Texas

District Office at Lubbock

- |                      |                      |
|----------------------|----------------------|
| Frank Rayner, P.E.   | Manager              |
| Don Smith            | Geologist            |
| Don McReynolds       | Geologist            |
| Tony Schertz         | Draftsman            |
| Fred Cowart          | Draftsman            |
| Obbie Goolsby        | Field Representative |
| J. Dan Seale         | Field Representative |
| Kenneth Carver       | Field Representative |
| Oscar Riemer         | Field Representative |
| Clifford Thompson    | Head, Permit Section |
| Mrs. Norma Fite      | Secretary-Bookkeeper |
| Mrs. Penny Newberry  | Secretary            |
| Mrs. Donna Smith     | Secretary            |
| Mrs. Rebecca Clinton | Public Education     |

### BOARD OF DIRECTORS

#### Precinct 1

(CROSBY, LUBBOCK and LYNN COUNTIES)

Ray Kitten, Vice President Slaton

#### Precinct 2

(COCHRAN, HOCKLEY and LAMB COUNTIES)

Selmer H. Schoenrock Levelland

#### Precinct 3

(BAILEY, CASTRO and FARMER COUNTIES)

A. W. Gober, Secretary-Treasurer Farwell

#### Precinct 4

(ARMSTRONG, DEAF SMITH, POTTER and RANDALL COUNTIES)

Billy Wayne Sisson, President Hereford

#### Precinct 5

(FLOYD and HALE COUNTIES)

Chester Mitchell Lockney

### COUNTY COMMITTEEMEN

#### Armstrong County

- |                       |              |
|-----------------------|--------------|
| Charles Kennedy, 1975 | Rt. 1, Happy |
| Cordell Mahler, 1975  | Wayside      |
| Guy Watson, 1977      | Wayside      |
| C. D. Rogers, 1977    | Wayside      |
| Bill Heisler, 1977    | Wayside      |

#### Bailey County

Doris Wedel, Secretary  
H&R Block, 224 W. 2nd, Muleshoe

- |                             |                      |
|-----------------------------|----------------------|
| Lloyd D. Throckmorton, 1975 | Rt. 1, Muleshoe      |
| W. R. "Bill" Welch, 1975    | Star Rt., Maple      |
| Eugene Shaw, 1977           | Rt. 2, Muleshoe      |
| Adolph Wittner, 1977        | Star Rt., Baileyboro |
| Jessie Ray Carter, 1977     | Rt. 5, Muleshoe      |

#### Castro County

Garnett Holland, Secretary  
City Hall, 120 Jones St., Dimmitt

- |                     |                         |
|---------------------|-------------------------|
| Glenn Odom, 1975    | Rt. 4, Box 136, Dimmitt |
| Anthony Acker, 1975 | Rt. D., Nazareth        |
| Jackie Clark, 1977  | Rt. 1, Box 33, Dimmitt  |
| Joe Nelson, 1977    | Box 73, Dimmitt         |
| Bob Anthony, 1977   | Rt. 4, 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  
1628 15th Street, Lubbock

- |                       |                   |
|-----------------------|-------------------|
| W. O. Cherry, 1976    | Lorenzo           |
| E. B. Pullinsim, 1976 | Lorenzo           |
| M. T. Darden, 1976    | Star Rt., Lorenzo |
| Donald Aycock, 1978   | Lorenzo           |
| Alvin Morrison, 1978  | Lorenzo           |

#### Deaf Smith County

B. F. Cain, Secretary

County Courthouse, 2nd Floor, Hereford

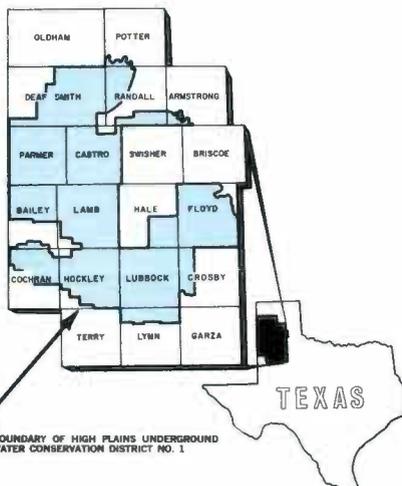
- |                        |                        |
|------------------------|------------------------|
| George Ritter, 1975    | Rt. 5, Hereford        |
| Harry Fuqua, 1975      | Rt. 1, Hereford        |
| James E. Higgins, 1977 | 200 Star St., Hereford |
| Garland Solomon, 1977  | Rt. 5, Hereford        |
| W. L. Davis, 1977      | Box 312, 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 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 Kleth, 1978     | New Home        |

#### Parmer County

Johnie D. Horn, Secretary

Horn Insurance Agency, Bovina

- |                      |                     |
|----------------------|---------------------|
| Guy Latta, 1975      | 1006 W. 5th, Friona |
| Edwin Lide, 1975     | Rt. 1, Bovina       |
| Troy Christian, 1977 | Rt. 1, Farwell      |
| Joe Moore, 1977      | Box J, Lazbuddie    |
| Dalton Caffey, 1977  | 15th St., Friona    |

#### Potter County

- |                          |                          |
|--------------------------|--------------------------|
| F. G. Collard, III, 1975 | Rt. 1, Box 101, Amarillo |
| W. J. Hill, 1975         | Bushland                 |
| Henry W. Gerber, 1977    | Rt. 1, Amarillo          |
| Jim Ilne, 1977           | Box 87, Bushland         |
| Albert Nichols, 1977     | Rt. 1, Box 491, Amarillo |

#### Randall County

Mrs. Louise Tompkins, Secretary

Farm Bureau, 1714 Fifth Ave., Canyon

- |                          |                         |
|--------------------------|-------------------------|
| John F. Robinson, 1975   | 1002 7th St., Canyon    |
| Fred Begert, 1975        | 1422 Hillcrest, Canyon  |
| Harry LeGrand, 1977      | 4700 S. Bowie, Amarillo |
| Joe Albracht, 1977       | Box 81, Bushland        |
| Leonard Batenhorst, 1977 | Route 1, Canyon         |

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.

NEWS... continued from page 2

19, the West Texas Chamber of Commerce honored the District for "23 years of innovative pioneering leadership in local regulation and conservation of groundwater".

**Public Hearing Resolves Well Issue**—On February 26, 1974, the Board of Directors held a public hearing to receive testimony regarding several applications for water wells in the "sandhills" area, southeast of Muleshoe in Bailey County. In view of the ongoing and widespread development taking place throughout the area, the Board decided to invite testimony from all parties interested in that development. It was also the Board's intent to bring attention to the problems associated with the development of the sandhills area, with the hope that individual landowners, cities and industries would approach utilization of the sandhills with a better understanding of the fragile ecology involved, the physical limitations of the aquifer thereunder, and the potential for the degradation of the high quality of the groundwater therein.

**Experts in Doubt About Possibility of Drought**—While many weather experts predicted drought for the country, High Plains meteorologists tried to delay the fear overcoming area farmers with each windy, dusty day. Dryland farmers were encouraged by statistics concerning advanced technology and reminded that the dustbowl days would not likely reoccur in 1974. As we now know, the extended dry period was followed by an extended rainy period, bringing the year's rainfall total above the annual average.

May, 1974

**Water-Level Book to be Released**—The District announced the release of the 1973-1974 annual water statement, which was published for the first time in book form. The 80-page book, entitled "Ogallala Aquifer Water-Level Data With Interpretation, 1965-1974", contains maps and hydrographs for each county and tables were calculated for each of the District's more than 800 observation wells, listing measurements and average annual changes.

June, 1974

**Municipal Groundwater Reserve a Necessity**—Several small towns east of Lubbock, whose municipal water is supplied by the White River Municipal Water District (White River Lake), had to revert to their groundwater reserves, as the result of a storm which polluted the lake water and made it unfit for municipal use. One town, Post, had no groundwater supply system, and had to be rescued. This situation pointed out the importance of a stable groundwater supply.

**Weather Modification Trial Held**—A farmers' group called Farmers and Ranchers for Natural Weather sued to enjoin weather modification projects in several High Plains counties in 154th District Court, Littlefield, Lamb County, Texas. Judge Pat Boone, Jr., denied the injunction and the projects were allowed to continue until their expiration.

July, 1974

**Water District Breaks Ground for New Office Headquarters**—The Water

—continued on page 4... NEWS

1975... continued from page 1

**PARMER COUNTY**  
*Residents of Commissioner's Precinct 1 vote for one*  
Floyd Reeve, Box 1196, Friona, Texas

*Residents of Commissioner's Precinct 2 vote for one*  
Ralph Roming, 809 Ridglea Drive, Bovina, Texas

**POTTER COUNTY**  
*Residents vote for two Committeemen-at-large*  
F. G. Collard, Route 1, Box 433, Amarillo, Texas  
W. J. Hill, Box 53, Bushland, Texas

**RANDALL COUNTY**  
*Residents vote for one Committeeman-at-large*  
John F. Robinson, 1002-7th, Canyon, Texas

*Residents of Commissioner's Precinct 3 vote for one*  
Bill Dugan, Route 2, Box 30, Happy, Texas

POLLING PLACES AND JUDGES FOR 1975 ELECTION

**ARMSTRONG COUNTY**  
*Polling Place No. 1:* Schoolhouse, Wayside, Texas  
*Presiding Judge:* Bernice Hamblin, Wayside, Texas

**BAILEY COUNTY**  
*Polling Place No. 1:* Enochs Gin Office, Enochs, Texas  
*Presiding Judge:* W. R. Adams, Route 2, Morton, Texas

Decline Maps To Be Released In January

The 1974 cost-in-water depletion, income-tax-allowance, decline maps or water depletion information for individual land parcels will be available January 15, 1975.

The District's Board of Directors voted in their December 17 meeting to retain the cost of \$7.50 for decline maps and \$5 per parcel for computerized decline data.

The Board also voted to add Floyd County to the list of counties whose decline is now provided on a parcel basis. The other counties are Parmer, Bailey, Castro and Lamb.

Landowners in the above-mentioned counties will not be furnished decline maps—they 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.

NOTE

Accountants are urged to promptly supply the District with all information necessary to compute their claimants' 1974 water-level decline.

The decline maps, depicting the decline of the water table by county, may be purchased at the District office.

*Polling Place No. 2:* Bailey County Courthouse, Muleshoe, Texas  
*Presiding Judge:* B. H. Black, Route 2, Box 77, Muleshoe, Texas

**CASTRO COUNTY**  
*Polling Place No. 1:* American Legion Hall, Nazareth, Texas  
*Presiding Judge:* Greg Hoelting, Box 103, Nazareth, Texas

*Polling Place No. 2:* County Courthouse, Dimmitt, Texas  
*Presiding Judge:* Lonnie Bell, 1011 Oak, Dimmitt, Texas  
*Polling Place No. 3:* City Hall, Hart, Texas

*Presiding Judge:* Percy Hart, Route 1, Hart, Texas

**DEAF SMITH COUNTY**  
*Polling Place No. 1:* County Courthouse, Hereford, Texas  
*Presiding Judge:* Mrs. Clinton Jackson, N. 385, Hereford, Texas

**PARMER COUNTY**  
*Polling Place No. 1:* County Courthouse, Farwell, Texas  
*Presiding Judge:* Mrs. Albert H. Smith, Route 2, Farwell, Texas  
*Polling Place No. 2:* Horn Insurance Agency, Bovina, Texas  
*Presiding Judge:* Aubrey Brock, 704 Boyce, Bovina, Texas

*Polling Place No. 3:* City Hall, Friona, Texas  
*Presiding Judge:* J. L. Witten, 1602 W. 7th, Friona, Texas

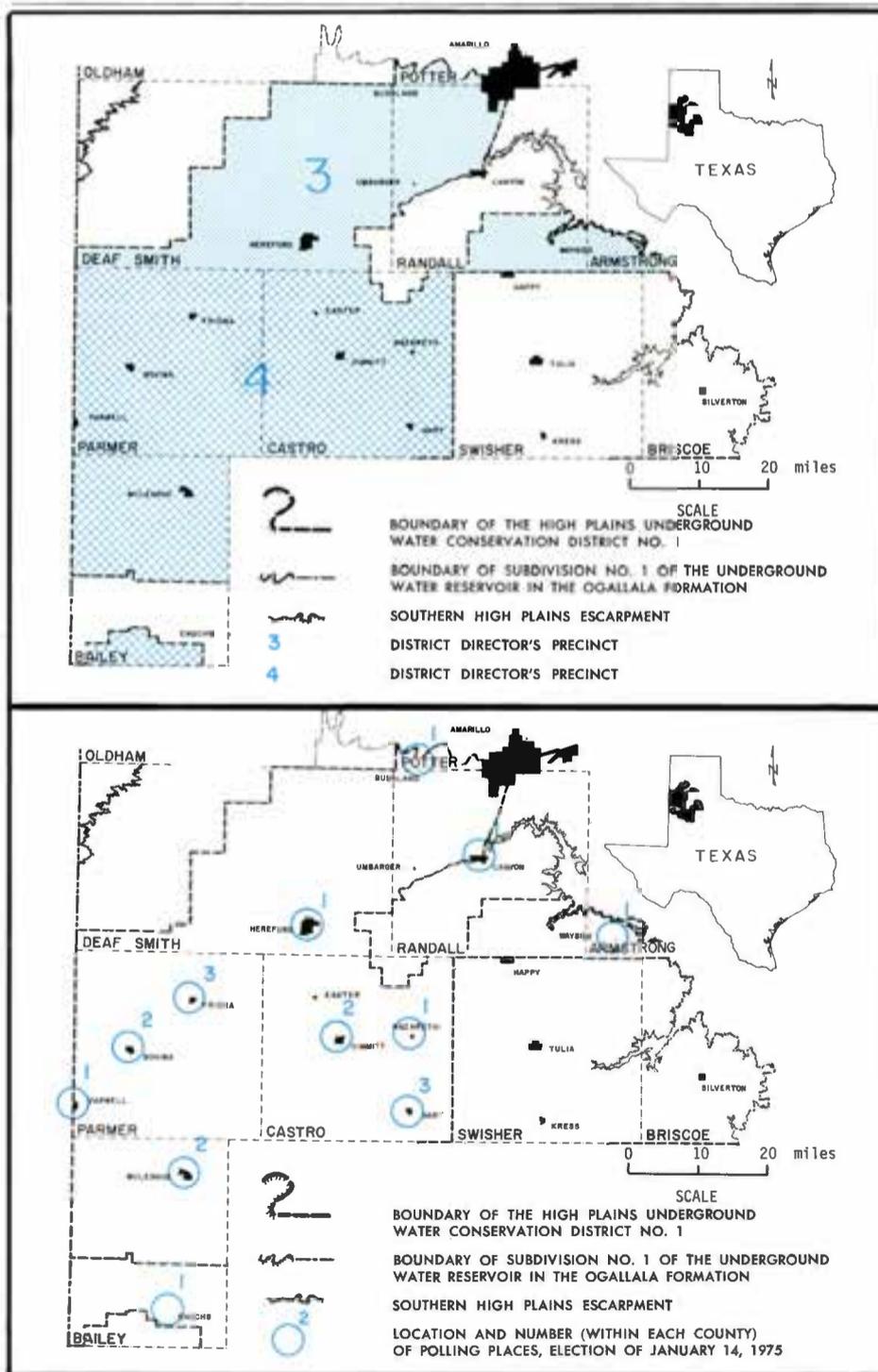
**POTTER COUNTY**  
*Polling Place No. 1:* Schoolhouse, Bushland, Texas  
*Presiding Judge:* Mrs. James Walton, Box 76, Bushland, Texas

**RANDALL COUNTY**  
*Polling Place No. 1:* Randall County Farm Bureau Office, 1714-5th Ave., Canyon, Texas  
*Presiding Judge:* Marshall Rockwell, Jr., Route 2, Box 514, Canyon, Texas

WATER LEVELS TO BE MEASURED IN JANUARY

High Plains Water District personnel will begin the annual depth-to-water measurement of more than 800 observation wells during the first week of January.

The wells comprising the District's observation well program are located within the boundaries of the District. 1975 tags, to be placed on the well-head equipment of all observation wells, will be gray and white.



The maps above show the area—District Director's Precincts 3 and 4—wherein the January 14, 1975, election will be held, and the locations of polling places for the election.

**NEWS . . . continued from page 3**

District conducted groundbreaking ceremonies July 11 at its new office headquarters site, 30th Street and Avenue Q. General James Rose, Director of the Division of Planning Coordination, Office of the Governor, and Chairman of the Governor's Task Force, served as the guest speaker.

*August, 1974*

**EPA to Control Groundwater**—The Environmental Protection Agency issued a policy statement regarding its intention to use regulatory powers "incidental to its control of surface discharges . . . to encourage states in establishing full groundwater protection programs".

**Consumption Record Set During Pipeline Break**—The flexibility of providing two separate and independent municipal water supplies (with groundwater as the primary or secondary supply) was proven to be invaluable when the Canadian River Municipal Water Authority experienced a rupture in the Lubbock County line. Uninterrupted service was possible during this time because of advanced planning by the City of Lubbock. In fact, a consumption record was set during the time of the pipeline break.

*September, 1974*

**Nebraska Legislative Delegation Visits High Plains Water District**—A delegation of eight members of the

Public Works Committee of the Nebraska Senate visited the Water District September 16 and 17. They came on a fact-finding mission prior to a study in their home State of possible legislation relating to underground and surface waters.

*October, 1974*

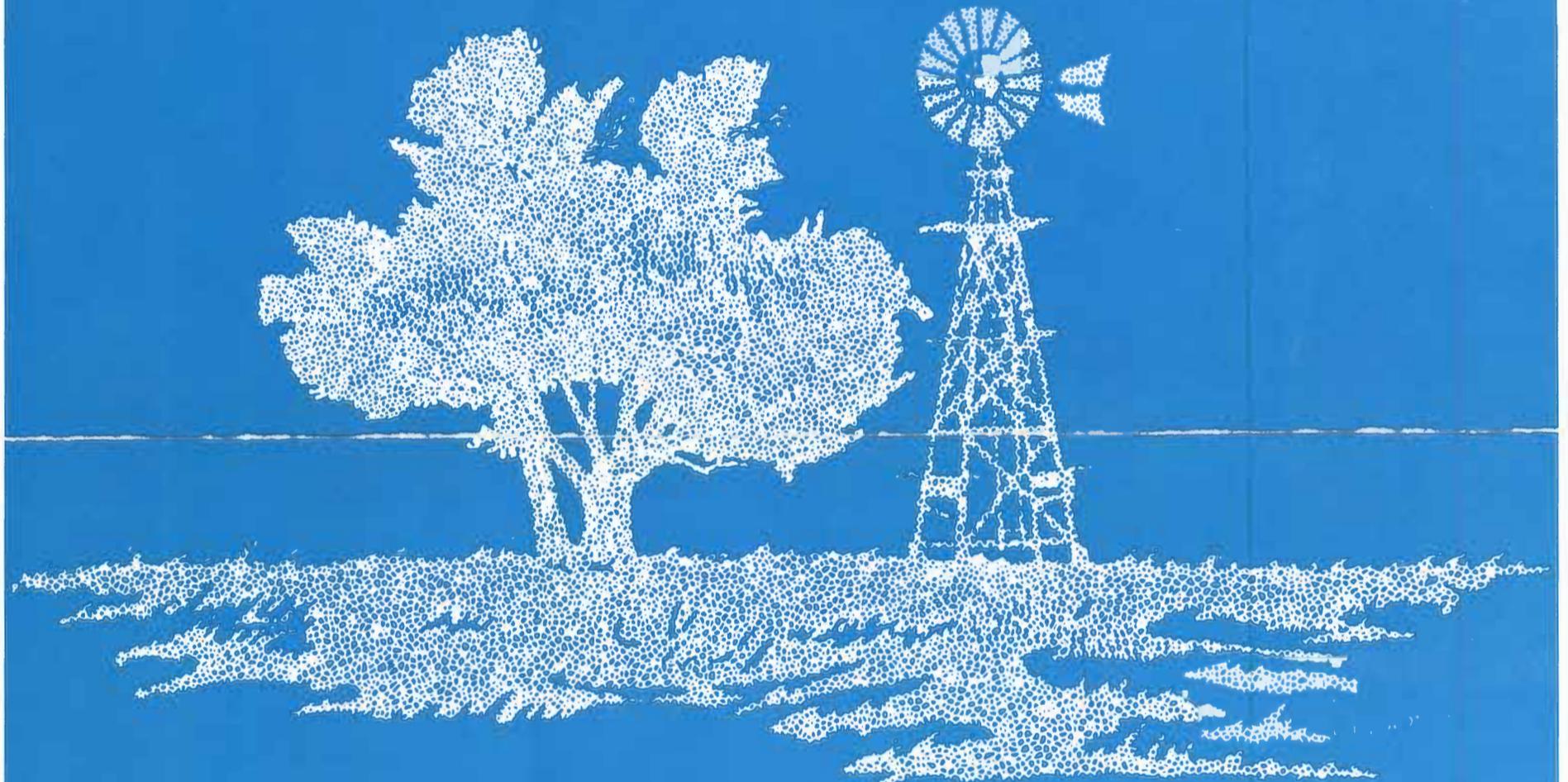
**Cross Section Receives National Recognition**—The Cross Section was named a recipient of the 1974 Clarion Award by Women in Communications, a national mass communications organization. This was the second year in a row that the District's publication was so honored.

*November, 1974*

**Water Conservation District Direc-**

**tors and Managers Meet in Kansas**—Approximately 120 groundwater conservation district directors and managers from five Great Plains States met in Kansas in an effort to coordinate these States' ideas about effective water conservation and management practices. The participants voted to consider meeting annually.

**District Releases New Publication**—"Government and Groundwater Management", by Frank Rayner, was released by the District. The publication deals with capabilities for groundwater management by the various forms of government—Federal, state and local.

*Season's Greetings**From the Directors and Staff**"Caraway Corner — Winchester Square"*

by Fredric H. Cowart, II—1971

Survivors of a passing era are depicted in the original ink drawing by Fred Cowart, Draftsman for the High Plains Underground Water Conservation District No. 1. The tree and windmill, located in front of the Winchester Theater, 50th and Indiana in Lubbock, were originally part of a ranch settlement of the late 1800's. The

fruitless mulberry, believed to be the oldest living tree in Lubbock County, was planted in 1892 by John Keathley Caraway. When Caraway purchased the large tract of land in 1891, the original windmill well had already been drilled.