

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

Volume 2—No. 7

"THERE IS NO SUBSTITUTE FOR WATER"

January 1956

WATER DISTRICT PRESENTS BRIEF TO WATER RESOURCES COMMITTEE

The following is an excerpt from the formal brief of the High Plains Underground Water Conservation District No. 1 as presented to the Texas Water Resources Committee by Mr. W. O. Fortenberry, Chairman of the High Plains Board of Directors. Mr. W. M. Sherley and Mr. Marvin Shurbet, District Board members, were also present at the hearing.

"Different areas of the State present vastly different hydrological, geological, and economic problems and the Legislature has recognized that the problems even within one reservoir may likewise be substantially different; hence the authority vested in the Board of Water Engineers to determine 'subdivisions' of an underground water reservoir. Characteristics of the various underground water reservoirs are so distinctly different that administration of the ground water program through ground water districts over each reservoir or subdivision thereof becomes the most practical method of governing and regulating water uses in such geologically defined reservoir.

This district feels that the principle of local self government for each area should be continued.

The Legislature has heretofore correctly determined that taxation to support ground water conservation and development should be maintained on a local level.

Since the ground water and economic problems of each area are so different, each area should have authority, as now granted, to levy and collect taxes to defray the cost of administration as well as the respective programs and practices which may be undertaken for each such area.

The Legislative program heretofore established that each district should be governed by directors elected by the people of that area should be continued.

Responsibility for administration of each District should ultimately rest with the people thereof, and the responsibility of those administering the program can be maintained only by making them responsible to the people. People elected from within the district will know the conditions better; and, assisted by competent hydrologists, they will be best able to administer the affairs of the district.

This practice has worked very well in the High Plains District. The five directors there are elected by the "precinct method" with one director from each precinct. The directors

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Salt Water Problems Discussed With Railroad Commission

The oil that is produced within the High Plains Underground Water Conservation District contributes substantially to the economy of the region, but the salt water that is produced with the oil presents some complicated economic problems.

In general the common practice in the past has been to construct earthen pits and run the salt water into the pits to evaporate or sink into the ground. Evidence has shown that a large percentage of the salt water moved downward from the pits into the fresh water sands.

Most of the salt water pits were located at considerable distances from existing wells, and because of the slow rate of movement of the underground water the pollution of wells has not been widespread. However, during recent years numerous irrigation wells have been drilled near the salt water pits, and, after relatively short periods of pumping, the water became so high-

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Water District Shown On National Television Show

Douglas Edwards, in his nationwide TV news commentary last week, showed maps, charts and other data of the High Plains Underground Water Conservation District.

A cameraman and technicians were sent from CBS TV, New York, to visit the High Plains area and take pictures, and a brief discussion of our program by Tom McFarland, manager of the District, for the broadcast. Contrary to the belief of a lot of Eastern people, the crew did not record a wind blown arid country, but one of a highly progressive agricultural economy where soil and water conservation practices are serving to prolong that economy.

The district is very grateful to Mr. Dave Sherill, Lubbock County Agent and Mr. Otis Green, with the Lubbock Chamber of Commerce, for arranging the program in order that we might do our part in telling the story of irrigation and conservation in Texas.

TWO DIRECTORS AND TWENTY-SIX COMMITTEEMEN ELECTED JANUARY 10

Gus Parish of Springlake, in Lamb County, was re-elected to the District Board of Directors by voters in the January 10th Water District elections. He will represent Precinct No. 2 which includes Cochran, Hockley, and Lamb Counties.

Marvin Shurbet of Route 1, Petersburg, in Floyd County, was re-elected to the Board of Directors from Precinct No. 5 which includes only Floyd County.

Each of the two re-elected Directors will serve a two-year term. They join W. O. Fortenberry, Lubbock, of Precinct No. 1; W. M. Sherley, Lazbuddy, of Precinct No. 3; and V. E. Dodson, Hereford, of Precinct No. 4.

Two Committeemen from each coun-

ty were elected to serve three-year terms on the County Committees.

These elected Committeemen are as follows:

ARMSTRONG COUNTY

Clifford Stevens, Happy
H. C. Newsome, Wayside

BAILEY COUNTY

Robert Blackwood, Muleshoe
A. H. Daricek, Maple

CASTRO COUNTY

L. H. Gladden, Hereford
Frank Annen, Dimmitt

COCHRAN COUNTY

Max M. Bowers, Morton
Haskell Milligan, Morton

DEAF SMITH COUNTY

George K. Muse, Hereford

There was a tie for the other Committee position in this County. The one to fill the post will be announced at a later date.

FLOYD COUNTY

Ernest Lee Thomas, Floydada
Robert Lee Smith, Lockney

HOCKLEY COUNTY

Joe W. Cook, Ropesville
H. C. James, Levelland

LAMB COUNTY

Price Hamilton, Earth
J. B. Davis, Amherst

LUBBOCK COUNTY

Howard Alford, Lubbock
Leroy Johnson, Shallowater

LYNN COUNTY

Aubrey Smith, Wilson
Lit H. Moore, Wilson

PARMER COUNTY

Dick Rockey, Friona
Carl Schlenker, Friona

POTTER COUNTY

James W. Walton, Bushland
W. J. Hill, Sr., Bushland

RANDALL COUNTY

John Butler, Happy
L. E. Mason, Wildorado

We are very happy to welcome these newly elected men to the Board of Directors and to the County Committees.

Also, we want to thank each of the retiring Committeemen for a job well done.

Many of the arbitrated well spacing problems that have been settled without too much difficulty, would not have been settled without the fair and diligent efforts of the County Committeemen. To these retiring Committeemen we say, "thank you, for a job well done."

Our programs will go forward as scheduled as long as we have aggressive and honorable men working for the greatest possible economic return from the underground water that we produce.

Water Problems Discussed With Parmer County Farmers

Farmers in Parmer County met at the American Legion Hall of Bovina on the night of January 17th to discuss water and irrigation problems.

Mr. W. M. Sherley of Lazbuddy, Water District Director of Precinct No. 3 which includes Bailey, Castro and Parmer Counties, and members of the County Committee informally discussed with 25 area farmers the importance of wise use of the ground water available.

Legal, hydrologic and economic aspects of irrigating with underground

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STATISTICS FOR DECEMBER

During the month of December, 209 completed wells were registered with the District office and 296 permits were issued by the County Committees. These new permits issued and completed wells follow by county:

County	Completed Wells	Permits Issued
Armstrong	0	0
Bailey	12	19
Castro	17	17
Cochran	18	15
Deaf Smith	17	19
Floyd	19	18
Hockley	39	53
Lamb	6	1
Lubbock	40	85
Lynn	17	44
Parmer	16	15
Potter	0	0
Randall	8	10



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ALLAN WHITE
Editor

BOARD OF DIRECTORS

Precinct 1

W. O. Fortenberry, President—1123 Lubbock National Bank Building, Lubbock, Texas

Precinct 2

Gus Parish Box 67, Springlake, Texas

Precinct 3

W. M. Sherley, Vice Pres. Lazbuddie, Texas

Precinct 4

V. E. Dodson Hereford, Texas

Precinct 5

Marvin Shurbet, Secretary Route One Petersburg, Texas

District Office

Tom McFarland General Manager
W. L. Broadhurst Chief Hydrologist
G. W. Willis District Geologist
Allan White Office Manager
Y. F. Snodgrass Field Representative
Mrs. M. McVay Secretary-Bookkeeper
Mrs. Ann Drake General Office
Mrs. Jean Lancaster General Office

COUNTY COMMITTEEMEN

Armstrong County

John Patterson, Happy
John Patterson Happy, Texas
James Bible, Chairman Wayside, Texas
Floyd B. Adams Wayside, Texas
Guy Watson Wayside, Texas
Bill Heisler Wayside, Texas

Bailey County

Mrs. Doris Traweek, Bailey County Farm Bureau Office, Muleshoe
Buck Gregory Route 2, Muleshoe, Texas
Bill Garrett Route 2, Muleshoe, Texas
W. R. Carter Muleshoe, Texas
Robert F. Byrd Route 2, Muleshoe, Texas
D. V. Terrell Morton, Texas

Castro County

Eugene Ivey, Dimmitt
Ivor Baggwell Route 4, Dimmitt, Texas
Sid Sheffy Dimmitt, Texas
T. R. Davis Hart, Texas
H. F. Benson Star Route 1, Hereford, Texas
Steve Brockman Nazareth, Texas

Cochran County

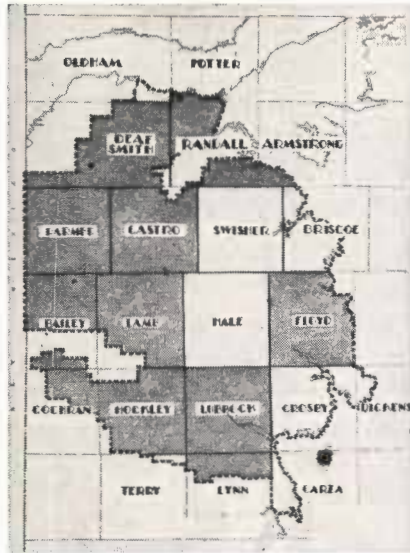
J. B. Knox, Western Abstract Co., Morton
Max Bowers, Chairman Morton, Texas
Hume Russell Morton, Texas
Herbert Cadenhead Route 1, Morton, Texas
W. R. Key Morton, Texas
R. B. Stovall Star Route 2, Morton, Texas
Committeemen meet first Tuesday night of each month, Cochran County Farm Bureau Office, Basement of Court House, Morton.

Deaf Smith County

Mrs. Pat Loerwald, Deaf Smith County Farm Bureau Office, Hereford
Frank J. Bezner, Chmn, Box 14, Hereford, Tex
Ed Dziuk, Sr. Route 2, Hereford, Texas
Ralph Hastings Route 4, Hereford, Texas
Floyd Walton Route 5, Hereford, Texas
J. N. Fish Hereford, Texas
Committeemen meet the first Monday of each month in the Farm Bureau Office, Hereford, 7:30 p. m.

Floyd County

Mrs. Ida Puckett, 319 South Main Street, Floydada
Tate Jones Floydada, Texas
J. R. Belt Lockney, Texas
R. C. Mitchell Lockney, Texas
Robert L. Smith Lockney, Texas
Lee Trice Route 1, Floydada, Texas



Hockley County

Z. O. Lincoln, 913 Houston, Levelland
Henry Schmidley Route 3, Levelland, Texas
Cecil Pace Levelland, Texas
J. J. Hobgood Route 2, Anton, Texas
W. H. Cunningham Star Rt. 4, Levelland, Texas
Committeemen meet first and third Fridays of each month at 1:30 p. m. 913 Houston, Levelland.

Lamb County

Jess Everett, Chamber of Commerce Office, Littlefield
V. M. Peterman, Chmn, Route 1 Amherst, Texas
Elmer McGill Olton, Texas
Roy McQuatters Route 1, Anton, Texas
L. Z. Anglin Box 86, Earth, Texas
Bill Nix Sudan, Texas

Lubbock County

Mrs. Jean Lancaster, 1628-B 15th Street, Lubbock
Earl Weaver Idalou, Texas
Earl Reasoner Box 335, Slaton, Texas
Leroy Johnson Shallowater, Texas
Howard Alford Route 4, Lubbock, Texas
Vernice Ford 3013 20th St., Lubbock, Texas
Committeemen meet on the First Monday of each month at 2:00 P. M. in the District Office, 1628-B 15th Street, Lubbock, Texas.

Lynn County

Mrs. Jean Lancaster, 1628-B 15th Street, Lubbock
Roger Blakney Route 1, Wilson, Texas
E. L. Blankenship Route 2, Wilson, Texas
Joe D. Unfred Route 4, Tahoka, Texas
A. E. Hagens Route 1, Wilson, Texas
H. D. Dean Route 6, Lubbock, Texas
Committeemen meet the first and third Tuesdays of each month at 10:00 a. m. in the District Office, 1628-B 15th Street, Lubbock.

Parmer County

Aubrey Brock, Bovina
John Gammon, Chmn. Friona, Texas
Walter Kaltwasser Rt. 1, Farwell, Texas
D. B. Ivy Rt. 1, Friona, Texas
C. V. Potts Rt. 2, Friona, Texas
Matt Jesko Rt. 1, Muleshoe, Texas
Committeemen meet first and third Thursday nights at 8:00 p. m. in Bovina.

Potter County

Jim Line, Box 87, Bushland
R. C. Sampson, Jr. Box 86, Bushland, Texas
Earl Barclay Bushland, Texas
Jim Line Box 87, Bushland, Texas
E. L. Milhoan Box 45, Bushland, Texas
T. G. Baldwin Bushland, Texas

Randall County

Mrs. Eutha Hamblen, 1710 5th Ave., Canyon
J. L. Welch Rt. 1, Canyon, Texas
Frank Begert Rt. 1, Canyon, Texas
Donald Olson Rt. 4, Amarillo, Texas
D. L. Allison Happy, Texas
W. C. Angel Rt. 2, Canyon, Texas
Committeemen meet first Monday night each month at 8:00 p. m., County Agent's Office, Canyon, Texas.



Meet R. C. Mitchell of Route M, Lockney. He is beginning his third year as a County Committeeman in Floyd County.



Mr. Mitchell and his wife, Ruth have one son, David, 7. They attend the Baptist Church.

After graduating from Lockney High School in 1932, Mr. Mitchell attended Texas Tech, Iowa State, Colorado A & M and then back to Texas Tech where he received his M. S. degree in Agriculture. Mr. Mitchell taught school for nine years before moving to the farm in 1946.

Immediately upon moving to the farm, Mr. Mitchell drilled the first of his three irrigation wells. He waters 480 acres of land with the three wells. Mr. Mitchell enjoys playing an occasional round of golf, and he does some hunting.

Meet Cordie V. Potts of Friona, in Parmer County. Mr. Potts is completing his present term of office on the Parmer County Committee this month.



Mr. Potts and Helen, his wife, have three children, Marilyn, 13, Larry, 10 and Jay, 5. They attend church in Belview, New Mexico at the Baptist Church. Mr. Potts finished high school at Ranchual, N. Mexico; however, he attended all but the last year at Holone, New Mexico.

400 acres of Mr. Potts farm land is irrigated by two wells, the first being drilled in 1950. He also farms 1200 acres of dry land.

When Mr. Potts gets a chance, he sneaks off on a hunting trip (vary rarely.)

We want to thank Mr. Potts, and all the other Committeemen whose terms expire this month, for the fine job they have done. We will always appreciate suggestions and help from them.

Meet Bill Nix of Sudan, who is a County Committeeman in Lamb County. Mr. Nix is serving his second year on the Committee and has done a fine job.



Mr. Nix and his wife, Joyce, have 2 children, Nancy, 6, and Tim, 4. The family attends the Sudan First Methodist Church. Mr. Nix attended public school in Sudan and college at Texas Tech in Lubbock. Aside from being a member of the Methodist Church, Mr. Nix belongs to the Farm Bureau and Texas Producers Ass'n. He farms 395 acres of

irrigated land and operates three wells. Also, he works 52 acres of dry land.

Mr. Nix enjoys relaxing at home by playing the piano and reading. He also studies Spanish when time permits.

Meet Jim Line, who lives at Bushland, and serves on the Potter County Committee. Since only a small portion of the county lies within the bounds of the Water District, there is not a sufficient amount of office work to warrant maintaining a full-time office, so Mr. Line keeps the county records in his home. We appreciate this additional work and trouble very much.



Mr. Line and Dot, his wife, have four children, Cherie, 11, James L., Jr., 6, Sammy, 5 and Amy, 6 months. The family goes to church at the Bushland Baptist Church.

Mr. Line attended public school in Hale County. He belongs to the Farm Bureau, Marine Corps Reserve and the Bushland Grain Cooperative. He also deals in real estate.

Mr. Line drilled his first irrigation well during 1946, and now operates six. With these six wells he waters 1346 acres of farm land.

Fishing is Mr. Lines hobby, and he enjoys it very much.

Meet Eugene L. Ivey of Dimmitt who is the Water District's Secretary for Castro County.

Mr. Ivey and his wife, Connie, have four children, Raneal, 18; Wilton, 16; Zetha, 13; and Laurel 11. They attend the First Baptist Church at Dimmitt.

Mr. Ivey farms 250 acres of irrigated land with 2 irrigation wells. He drilled his first well in 1947. He also has 55 acres of dry land in cultivation. Mr. Ivey is the Castro County Farm Bureau General Agent and is active in the Lions Club and the IOOF Lodge of Dimmitt.

Mr. Ivey has been a resident of Castro County for the past 23 years and he says that the proper use of irrigation water cannot be stressed too much. He feels that irrigation has been the big factor in increased crop production, and in giving the farmers a higher standard of living and a better outlook on the future.

As a hobby, Mr. Ivey enjoys singing and he also attends football games and other athletic events.

Please Close Those Abandoned Wells!!!

BRIEF TO WATER RESOURCES COMMITTEE Water Problems Discussed In Parmer County—

(Continued from Page 1)
 serve without salary but have nevertheless rendered extremely valuable service to the district.

After the statutory delineation and organizational elections, this district opened its doors on April 1, 1952. Its Board began comprehensive studies to determine the most vital practices of conservation. Some of the nation's leading hydrologists were employed to assist in writing reasonable rules to be promulgated by the Board. A five-man committee was elected in each county, in an election held under the general election law of Texas, to represent the people of each county, such committees acting in an advisory capacity to the Board of Directors.

In February 1953, the District promulgated rules designed to prevent waste and to conserve and preserve the water. Among other things, the rules provide that a permit must be obtained before drilling a well capable of producing in excess of 100,000 gallons per day. They also provide for the spacing of wells.

The rules further provide that exceptions to such spacing rules may be granted by the Board in order to protect vested property rights, to prevent waste, or to prevent confiscation of property.

By November 1, 1955, 8,300 permits had been processed by the District office, regulating the spacing of all municipal, individual and agricultural wells drilled within the thirteen participating counties. This means that a great number of wells have been drilled upon the approved pattern, and that the clustering of wells has been substantially eliminated.

The effectiveness of the administration of the program may be illustrated by the fact that so far only one case challenging the authority of the District to require well-spacing has been maintained.

The District has also engaged in studies to ascertain the feasibility of artificial recharge by draining precipitation run-off from the numerous wet-weather lakes into the underground reservoirs. Observations are being made of experiments by farmers who have drilled 'triple purpose' wells at the lower sides of their fields. These 'triple purpose' wells: (1) develop irrigation water at the maximum distance from existing wells; (2) recover and return to the reservoir 'tail water' which otherwise would be wasted; and (3) salvage water from the wet-weather lakes which otherwise would be lost by evaporation.

The District has also undertaken an extensive educational program to impress upon the people of the area the necessity of reasonable rules and regulations for the development and use of available underground water supplies and the importance of a sound conservation program. Every effort has been made to disseminate through publications of the District and through the public press information concerning technical studies undertaken by the District including the rate of decline of water levels in various areas, as well as recommendations for more efficient use of the water being pumped.

The District has advocated various soil management practices such as bench levelling and the return of cotton burs to the field which are highly recommended by those who have adopted the practice.

Another recommended practice which unquestionably has saved many millions of acre-feet of water, and will

continue to contribute materially to future conservation, is that of installation of underground concrete pipe. Reliable reports indicate that since 1948 more than 1500 miles of underground pipe has been laid on the South Plains. In addition to underground concrete pipe, thousands of feet of aluminum, plastic, and canvas pipe are used to transport the water in enclosed distribution systems.

The number of wells in operation has doubled within the past five years and correspondingly the number of acres under irrigation has doubled. The phenomenal growth of the entire West Texas area, including its cities and towns is directly related to the development of the area's underground water resources.

If it is assumed that each well involves an investment of \$5,000, it can readily be seen that more than \$167,000,000.00 is invested in irrigation installations alone. Assuming that the value of the lands placed under irrigation has been increased from an average of \$100.00 per acre to an average of \$300.00 an acre, land values have been increased by more than \$800,000,000.

The foregoing statistics and information demonstrates that this district is an important part of the State and that it has substantial problems and opportunities. The operation and maintenance of this district is a big job. The water itself is a major support to the economy of the entire area. As stated, the area will be best served by local control, local government, and local taxation.

At the same time, other areas can be and are being similarly served. Each area and ground water reservoir has different problems: some reservoirs are artesian and some are not; some are located under arid lands and some under non-arid lands; some are under sparsely-settled areas and others under industrial districts; and the farming, industrial, and irrigation practices and needs differ widely in the different areas.

The Legislature authorized the establishment of these districts in 1949 and this district began its operation in 1952. The districts are just beginning to hit their stride. It is respectfully submitted that they should be given an opportunity to work out their plans and to prove their usefulness before any substantial change in the government and method of conserving and developing the underground water is made.

This District's aim is to establish policies and disseminate information which will contribute to an efficient use of its water resources under both water and soil conservation practices which will extend the life of its water resources to the maximum beneficial use of the people of the area which the District serves."

(Continued from Page 1)
 water were discussed with Sam Aldridge, attorney from Farwell; W. L. (Bill) Broadhurst, Chief Hydrologist for the Water District; and Tom McFarland, Manager of the Water District.

Proposed legislation was discussed by Mr. Sherley. He stated that we were making progress with opposing factions in other parts of the State; but to maintain private ownership of our

underground water, we must, as individuals, make new and more effective efforts to put all the water produced to a beneficial use.

It was agreed that the waste of irrigation water is not nearly so bad as it has been, but improvement can be made in watering methods and procedures.

After all the people present had the opportunity to express their opinions and ask questions the meeting was adjourned.



Pictured above are Parmer County irrigation farmers who met in Bovina on January 17th with W. M. Sherley, member of the Board of Directors, and other Water District officials to discuss methods of conserving water.

Salt Water—

(Continued from Page 1)
 ly mineralized that it killed the crops being irrigated.

In the course of recent litigation, evidence presented and conclusions drawn have shown that pollution of fresh water was caused by seepage from salt water pits. Copies of such evidence and conclusions have been presented to the Railroad Commission by the Water District.

Representatives of several major oil producers have stated that programs have been started to collect the salt water and return it below the fresh water sands back to salt water strata.

We realize that proper disposal of the oil field brine, which is several times as salty as sea water, is an expensive operation. However, the pollution of the fresh water which would render it unfit for irrigation and most other uses, can hardly be measured in dollars and cents. We believe the expense of proper salt water disposal will be justified by allowing orderly development and provident use of the ground water supply.

Well Statistics For 1955

During 1955 the Water District County Committees issued 4,051 well drilling permits, and there were 3,998 wells completed and registered with the District office. Below these figures are given by counties:

County	Permits Issued	Wells Completed
Armstrong	8	12
Bailey	287	254
Castro	331	371
Cochran	220	196
Deaf Smith	273	285
Floyd	349	358
Hockley	582	547
Lamb	480	456
Lubbock	679	606
Lynn	277	268
Parmer	427	494
Potter	1	4
Randall	137	147

NOTICE!

Are there questions in your mind relating to the Water District, or underground water? If so, we would like to hear from you. Tell us about your problem or question. If we can answer you intelligently, we will.

Your newspaper, THE CROSS SECTION, is designed to educate and inform. If it is lacking in this respect we want to know where and how we can best serve you, the people.

EDITOR
 THE CROSS SECTION
 1628-B 15th Street
 Lubbock, Texas

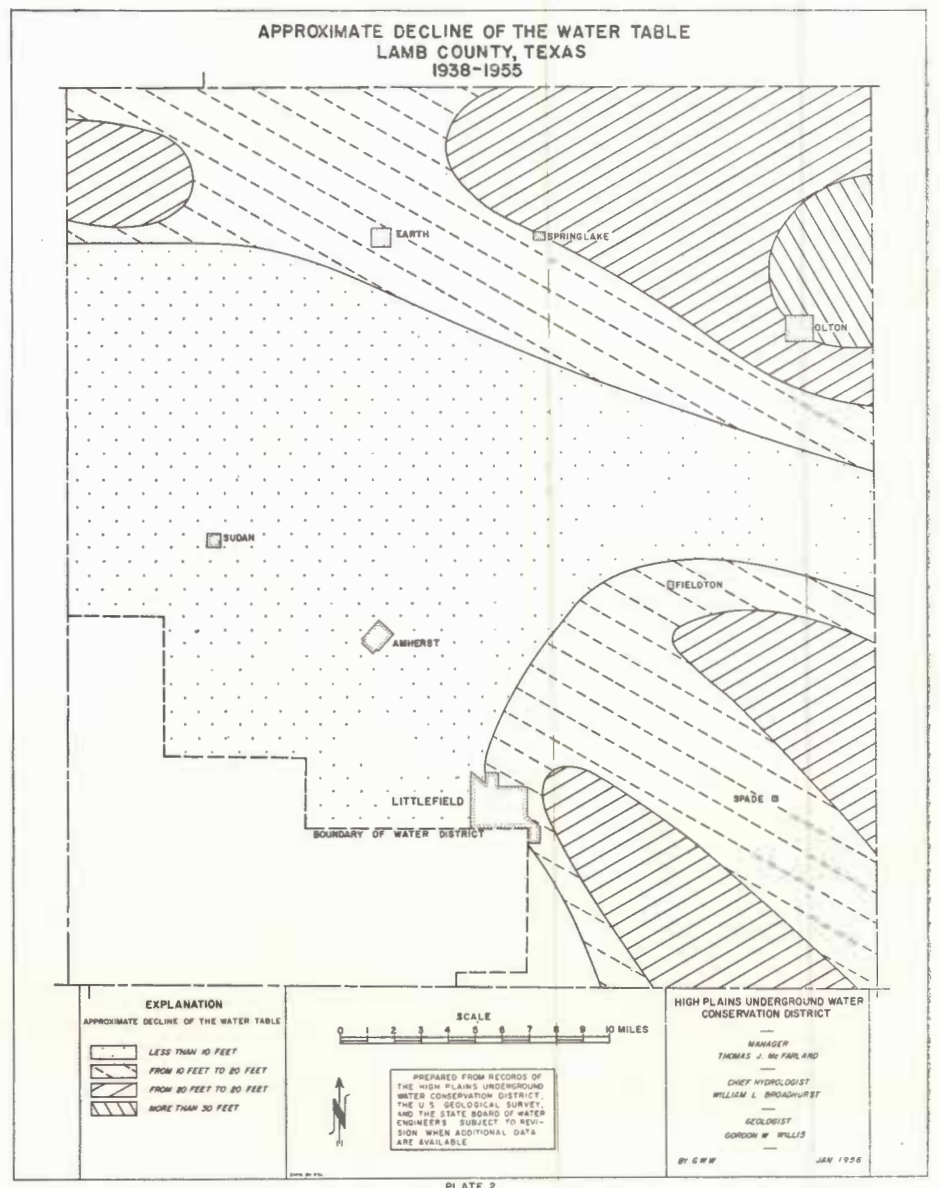
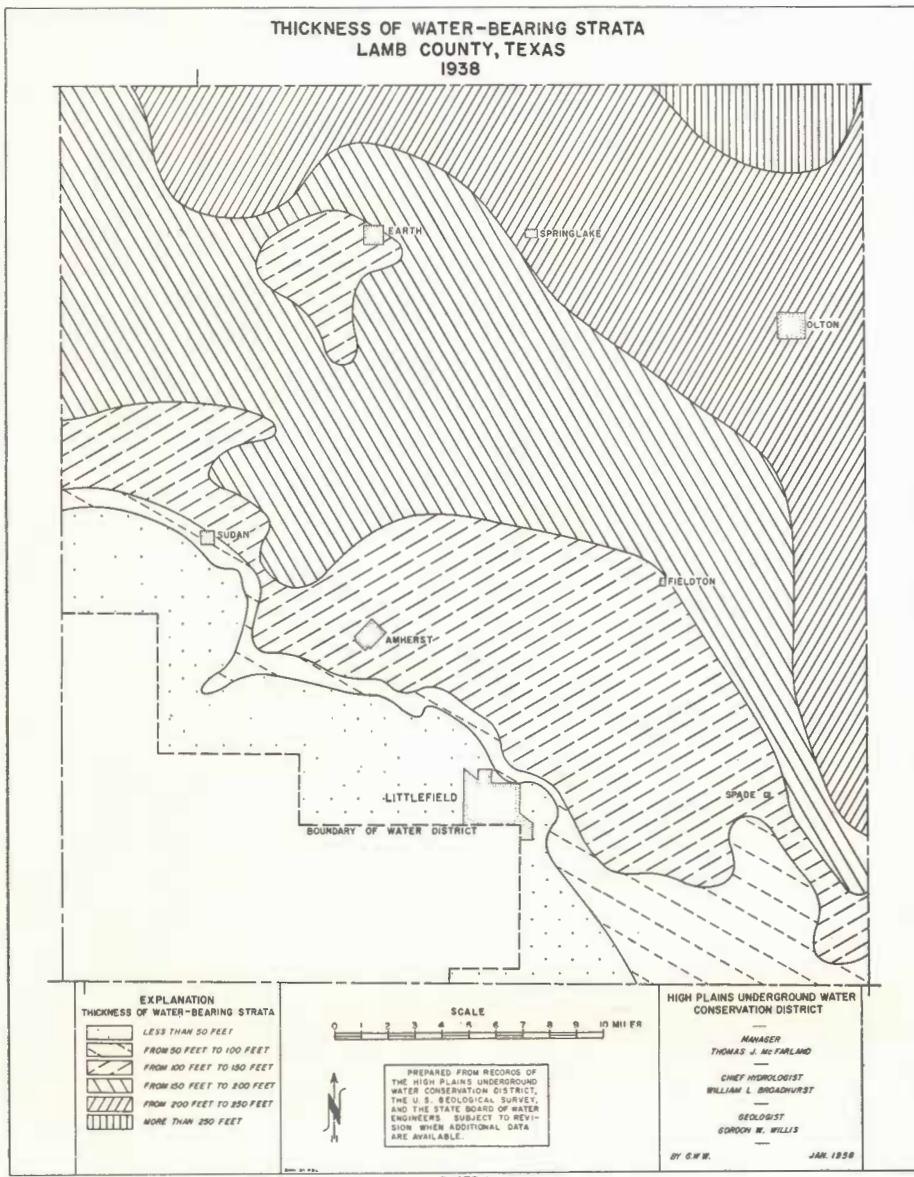
Dear Sir:

I do not now receive THE CROSS SECTION, but would like to have it sent to me each month, free of charge, at the address given below.

Name _____
 Street Address _____
 City and State _____

(Please cut out and mail to our address)

GROUND-WATER INVENTORY CONTINUED—LAMB COUNTY



The portion of Lamb County within the boundary of the High Plains Underground Water Conservation District covers about 560,000 acres of land. (The total area of the county is about 654,000 acres.) The underground reservoir in the Ogallala formation beneath the area within the district contained approximately 11,700,000 acre-feet of ground water in storage available for pumping in January 1955. The above maps were prepared from data compiled from a study of about 900 logs of water wells and about 300 measurements of water levels in wells.

The map in plate 1 shows the thickness of the water-bearing strata between the water table and the redbeds in 1938 before an appreciable

amount of water had been pumped from the reservoir. The map in plate 2 shows the decline of the water table from the spring of 1938 to January 1955.

The volume of water remaining in the underground reservoir was determined by subtracting the volume of material unwatered since 1938 from the total volume of saturated material in 1938 and multiplying the remainder by the coefficient of storage of 15 percent.

These data show that 12,800,000 acre-feet of water was in storage available for pumping in 1938, and that the net decrease in storage from 1938 to 1955 was 1,100,000 acre-feet. In other words, the net decrease in storage is about 9 percent of the quantity

available in 1938.

The approximate quantity of underground water in storage, available for pumping, beneath an individual farm may be determined by multiplying the number of acres in the farm by the thickness of the water-bearing strata underlying the farm and then multiplying by the storage coefficient of 15 percent. Suppose the farm consists of 320 acres and has 200 feet of water-bearing strata underlying it, then $320 \text{ acres} \times 200 \text{ feet} \times 0.15$ equals 9,600 acre-feet of water available for pumping. An acre-foot of water is the quantity required to cover one acre to a depth of one foot, and it is also equal to 43,560 cubic feet or 325,829 gallons.

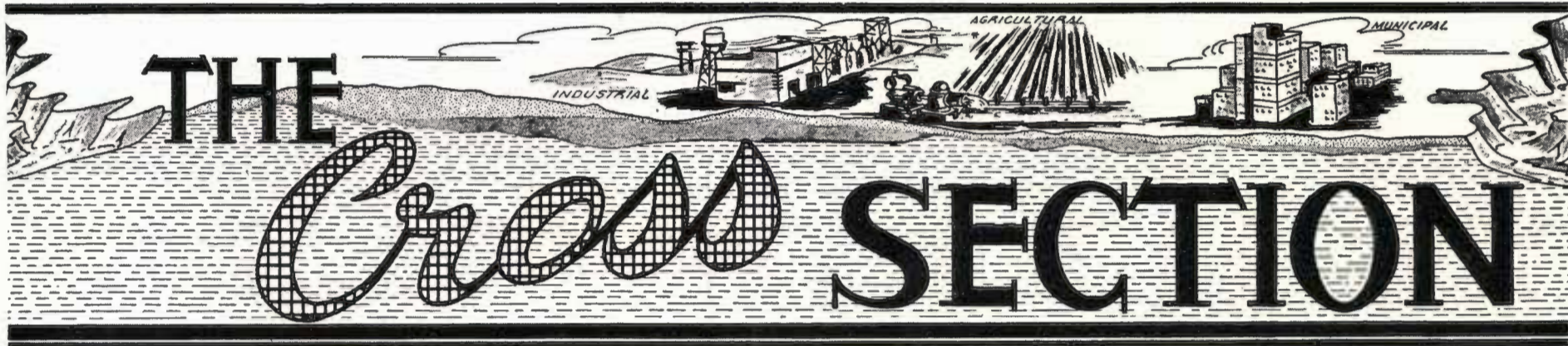
An individual may use this infor-

mation to determine, within reasonable limits, how long the quantity of underground water in storage beneath his farm will last at any annual rate of withdrawal. This assumes of course, that his neighbors pump a comparable amount of water per acre on their farms.

These maps and studies of this type are parts of the regular hydrological work in progress by the staff of the Water District. Similar maps and information will be prepared as rapidly as practicable, for all the counties within the Water District. Maps of Deaf Smith, Parmer, Castro, Potter, Randall, Armstrong, Floyd, Bailey and Lamb Counties are now available.

High Plains Underground Water Conservation District No. 1
1628-B Fifteenth Street
Lubbock, Texas

Second Class Permit



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Volume 2—No. 8

"THERE IS NO SUBSTITUTE FOR WATER"

February 1956

RIVER BASINS APPROACH NOT PRACTICABLE

A strong feeling prevails among a lot of state and federal agencies that river authorities should have control of all water within the drainage area of their respective basins.

This statement was made several times last month at a convention in St. Louis, Missouri being held by the United States Chamber of Commerce and the National Water Conservation Conference.

The Policy Declaration of the Natural Resources Committee of the U. S. Chamber of Commerce states:

"Major River Basin Planning. The Chamber recommends the establishment of major river basin areas as planning units for water resources. Plans for such units shall be developed by Federal-State Basin Planning Committees, subject to review by the Board of Coordination and Review."

Although ground water may contribute to the normal flow of certain streams, it appears that a great many advocates of river basin control of ground water have lost sight of the fact that ground-water basins are a separate entity and should be dealt with as such.

Based on geologic and hydrologic data it is a known fact that no two ground-water reservoirs are similar in nature, therefore each reservoir should require an entirely different procedure in development and conservation practices.

In almost all cases major rivers cross several ground-water reservoirs as well as many state lines, thereby necessitating a very complicated set of rules and regulations for the control of ground water if reservoirs are treated individually as they should be.

Even in those states that do not recognize the right of private ownership of ground water, many foreseeable complications would hamper the development of sound conservation programs and particularly so if the character of the aquifer is taken into consideration, which should be the governing factors in establishing a program.

With the increasing importance of ground water through the nation it is hard to understand the lack of knowledge pertaining to its development and proper use. It also appears that ground water should no longer be swept along with surface water programs.

In the rank of importance, it appears that ground water has become of age and the many cities, industries,

(Continued on Page 3)

GROUND - WATER BILLS PROPOSED

At its monthly meeting last week the Texas Water Resources Committee instructed its attorney Joe Carter to draft several new bills for committee discussion at its next regular meeting.

One bill in particular is causing a lot of questions to be asked in regards to the intention behind the bill. It appears that certain members of the Committee would like to see the filing of annual reports by water well users as to the number of gallons pumped annually. When members of the Committee were asked why such legislation was necessary no two gave the same answer.

If such a bill were to pass the Legislature requiring the actual measurement of the water it would cost the well owners in the High Plains in excess of six million dollars for meter equipment.

With no more concrete facts relating to the necessity of such information as has been given it appears that this type of legislation is unnecessary at this time.

Other proposed bills seem very appropriate, one strengthening the statutes requiring surface casing in oil wells to protect fresh water sands. Another suggestion is a revised version of a bill presented in the last session requiring water well drillers to obtain licenses and permits and the filing of drillers logs with the State Board of Water Engineers.

Another anti-pollution measure which would be helpful to the High Plains area would be the requiring of permits for injection wells for disposal of plant waste and Water Board approval of designs of such wells.

Several groups of industrial and municipal representatives appeared before the Committee to discuss the water developments of their respective organizations. Most all were in agreement that the Texas ground-water law and the right of private ownership is the proper approach to conservation and development of the ground water of Texas.

Public Hearing Held In Seminole

The State Board of Water Engineers held a public hearing at Seminole, in Gaines County on February 8th for the purpose of obtaining information and data which will enable them to designate the subdivision of the underground water reservoir underlying parts are all of Gaines, Yoakum, Cochran, Lynn, Dawson, Terry, and Borden Counties.

Approximately fifty men attended the hearing and a number of these testified to certain facts which they possessed pertinent to the underground water.

Judge Otha Dent, member of the Board of Water Engineers, representing West Texas and H. A. Beckwith, also a member of the Board, conducted the hearing. Joe Carter, attorney for the Board, called on Board staff members to present results of certain studies and investigations made in the area.

After hearing testimony from all who had any information to present, Judge Dent explained that after enough time had elapsed to compile the information given and draw the

District Judge Upholds Ground-Water Law

District Judge Victor H. Lindsey ruled in favor of the Texas ground-water law and the rules of the High Plains Water District last week in a case tried in the 72nd District Court in Hockley County.

The case involved a Hockley County farmer and the High Plains Underground Water Conservation District. A well was drilled and equipped by the farmer in violation to the spacing rules of the District.

This is the first case in 9,000 permits that has contested the spacing rules of the District.

boundary of the subdivision, another hearing would be called to ascertain whether or not enough people in the area effected want an underground water district before calling an election.

This procedure which the Board of Water Engineers follows in establishing the framework for a locally-controlled underground water district is set out in the statutes of the State of Texas.

Marvin Shubert Elected Board Chairman

At the first regular annual meeting of the Water District's Board of Directors, new officers were elected to serve during the coming year.

Marvin Shurbet, Floydada, Director for District Precinct No. 5, was elected as Chairman of the Board. W. M. Sherley, Lazbuddy, Director for Precinct No. 3, was re-elected Vice-Chairman; and W. O. Fortenberry, Lubbock, Director for Precinct No. 1, was elected to serve as Secretary.

Gus Parish, Springlake, Director for District Precinct No. 2 and Virgil E. Dodson, Hereford, Director for Precinct No. 4, complete the five-man Board of Directors.

Too much can not be said about the job that your Board of Directors are doing and has done in the past. They work long hours frequently in behalf of the Water District and for its promotion, with absolutely no pay.

The Board promises their continued efforts in behalf of our area and the Water District.

SIMILARITY NOTED IN PRESIDENT'S WATER POLICY

A great deal of similarity has been noticed between the Resolutions presented by the High Plains Water Conservation District to the National Reclamation Association meeting in Lincoln, Nebraska and the Water Resources Policy presented by the Presidents Advisory Committee.

An excerpt from the High Plains resolution reads as follows:

The state is the lowest level political subdivision that can legislate regarding ground water property rights and reclamation and conservation measures for ground water. It is not practical for the Federal Government or a major river basin authority solely to regulate ground water because, among other reasons, sharply conflicting state laws of ground water ownership stand in the way of a single theory approach. Each state must set its own theory of property rights and should provide for development, conservation and reclamation of its own ground water.

(Continued on Page 4)



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ALLAN WHITE
Editor

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Precinct 4

V. E. Dodson — Hereford, Texas

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G. W. Willis — District Geologist
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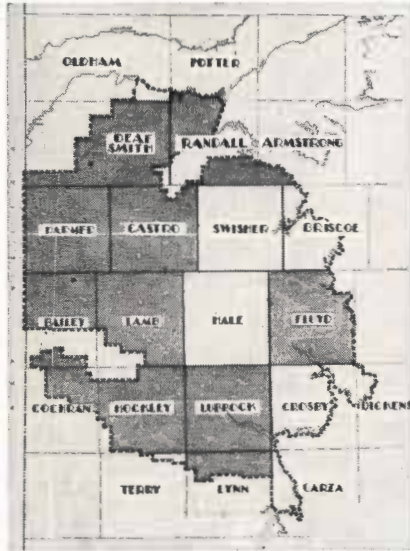
Mrs. Pat Loerwald, Deaf Smith County Farm Bureau Office, Hereford

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Ed Dziuk, Sr. — Route 2, Hereford, Texas
Ralph Hastings — Route 4, Hereford, Texas
Floyd Walton — Route 5, Hereford, Texas
George T. Turrentine — Route 5, Hereford, Texas
Committeemen meet the first Monday of each month in the Farm Bureau Office, Hereford, 7:30 p. m.

Floyd County

Mrs. Ida Puckett, 319 South Main Street, Floydada

Tate Jones — Floydada, Texas
J. R. Belt — Lockney, Texas
R. C. Mitchell — Lockney, Texas
Robert L. Smith — Lockney, Texas
Ernest Lee Thomas — Route 1, Floydada, Texas



Hockley County

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Cecil Pace — Levelland, Texas
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H. C. James — Route 4, Levelland, Texas
Joe W. Cook, Jr. — Route 1, Ropesville, Texas
Committeemen meet first and third Fridays of each month at 1:30 p. m., 913 Houston, Levelland, Texas.

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J. B. Davis — Route 1, Amherst, Texas
Elmer McGill — Olton, Texas
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Mrs. Jean Lancaster, 1628-B 15th Street, Lubbock

Earl Weaver — Idalou, Texas
Earl Reasoner — Box 335, Slaton, Texas
Leroy Johnson — Shallowater, Texas
Howard Alford — Route 4, Lubbock, Texas
Vernice Ford — 3013 20th St., Lubbock, Texas
Committeemen meet on the first and third Mondays of each month at 2:00 p. m. in the District Office, 1628-B 15th Street, Lubbock, Texas.

Lynn County

Mrs. Jean Lancaster, 1628-B 15th Street, Lubbock

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E. L. Blankenship — Route 2, Wilson, Texas
H. D. Dean — Route 6, Lubbock, Texas
Lit H. Moore, Jr. — Route 1, Wilson, Texas
Aubrey Smith — Route 1, Wilson, Texas
Committeemen meet the first and third Tuesdays of each month at 10:00 a. m. in the District Office, 1628-B 15th Street, Lubbock.

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Aubrey Brock, Bovint, Texas

John Gammon — Friona, Texas
Walter Kaltwasser — Rt. 1, Farwell, Texas
Carl Schlenker — Route 2, Friona, Texas
Dick Rocky — Friona, Texas
Matt Jesko — Rt. 1, Muleshoe, Texas
Committeemen meet first and third Thursday nights at 8:00 p. m. in Bovina.

Potter County

Jim Line, Box 87, Bushland, Texas

James W. Walton — Bushland, Texas
Earl Barclay — Bushland, Texas
Jim Line — Box 87, Bushland, Texas
E. L. Milhoan — Box 45, Bushland, Texas
W. J. Hill, Sr. — Bushland, Texas

Randall County

Mrs. Eutha Hamblen, 1710 5th Avenue, Canyon, Texas

J. L. Weick — Rt. 1, Canyon, Texas
Frank Begert — Rt. 1, Canyon, Texas
L. E. Mason — Wildorado, Texas
W. C. Angel — Route 2, Canyon, Texas
John Butler — Route 2, Happy, Texas
Committeemen meet first Monday night each month at 8:00 p. m., County Agent's Office, Canyon, Texas.



KNOW YOUR COUNTY NEIGHBORS

Meet Mrs. Pat Loerwald of 205 Lawton Street, Hereford. She is the Secretary of the Deaf Smith County committee.

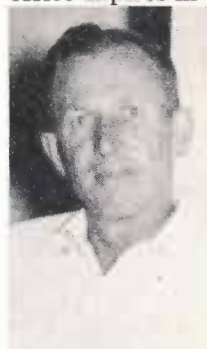


Mrs. Loerwald's husband operates a machine shop in Hereford. They attend the First Baptist Church. Hereford is home for Mrs. Loerwald. She attended public school there, graduating from high school in 1949. She is active in the Hereford Business and Professional Women's Club, The Shadow Players and the Jaycee-ettes. Mrs. Loerwald is Secretary for the Deaf Smith County Farm Bureau.

Her hobbies are many—she plays golf, enjoys music and "Little Theater" work. We are very proud of Mrs. Loerwald and the excellent work that she does.

If you Deaf Smith County people do not know her, you will become acquainted with Mrs. Loerwald the next time you make application for a well permit.

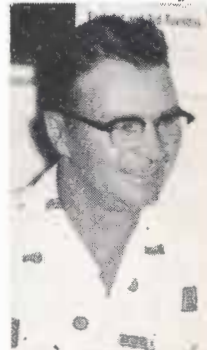
Meet Earl W. Reasoner of Slaton. He is chairman of the Lubbock County Committee and his present term of office expires in January, 1957.



Mrs. Reasoner, teaches school in Slaton. They attend church at the First Christian Church in Slaton. Mr. Reasoner attended public school at Lorenzo and McClung. In 1946, Mr. Reasoner, drilled his first irrigation well. Since then he has drilled six more to water 250 acres of land. He also has 750 acres of dry land he farms.

Besides his farming, Mr. Reasoner, raises registered Hereford cattle. Fishing is his hobby. In fact, he could be found enjoying his hobby at this very time we are going to press.

Meet E. L. Blankenship of Route 2, Wilson. This year he is beginning the last year of his present three-year term on the Lynn County Committee.



Mr. Blankenship and Natalie, his wife, have two children, Judy, 17 and Jimmy, 15. The family attends church at the Wilson Methodist Church. Mr. Blankenship attended the Farmers Valley public school, Vernon High School and Texas University. He is a member of the Wilson Lions Club and the Masonic Lodge. In 1951, Mr. Blankenship drilled the

first of his nine irrigation wells. It takes all these small wells to get over 360 acres of land. He also farms 733 acres of dry land.

As for hobbies — Mr. Blankenship says that "living" is his favorite pastime.

Meet Hume Russell of Morton, who is a member of the Cochran County Committee. His present term of office will expire in January, 1958. Mr. Russell attended public school at Esteline and college at Wayland College in Plainview.



Mr. Russell and his wife, Eltha, have one son, Jack, 18. The family attends the Methodist Church in Morton. Mr. Russell is a member of the local Lions Club. In 1947, Mr. Russell, drilled his first irrigation well. He has his farm rented out and actually only works 177 acres of dry land. He also is a retired cotton ginner.

Hunting and fishing are two sports that Mr. Russell really enjoys. He has been thinking seriously about taking up golf again, too, after laying off for a number of years.

Meet W. R. (Ray) Carter of Muleshoe. He is a member of the Bailey County Committee. His present term of office will expire in January, 1958.



Mr. Carter and his wife, Myrtle, have two grown children, Mrs. Mildred Harrison and Jesse Ray Carter. Oklahoma has furnished these southern high plains of Texas with some mighty good people, and Mr. Carter falls into this category. He attended public school in Atoka, Oklahoma.

The Carters attend the Church of Christ Church in Muleshoe, and Mr. Carter is a member of the I. O. O. F. Lodge. Besides farming 225 acres of dry land, Mr. Carter waters 100 acres of land with two irrigation wells. He drilled the first of these in 1950. Mr. Carter is the Bailey County Farm Bureau General Insurance Agent at Muleshoe. As far as hobbies are concerned—fishing comes first with Mr. Carter.

Please Close Those Abandoned Wells!!!

Your Winter Water Works All Summer

By JESS F. BLAIR

Reprinted from an article appearing in the February 1956 issue of THE FARMER-STOCKMAN magazine.

A farmer can irrigate a large acreage with only small wells if he makes preparation ahead of time and plans his work well. This is the advice of Elmer Braden, who irrigated 90 acres of cotton in 1955 with just 340 gallons of water per minute.

Braden owns 160 acres of flat, tight land in northern Reagan County and rents an adjoining 160 from his brother. He has 2 wells which pump 200 and 140 gallons per minute. Last year he was making over 100 bales of cotton on 90 acres. Some of it produced nearly 3 bales per acre, but much of the acreage was watered only one time.

Besides the cotton, he cut 1,500 lbs. of hegari from 14 acres which had been irrigated only one time. The rest of the feed crop didn't make it thru the long drouth and was hardly worth harvesting.

Braden says a farmer can make money with small wells if he follows a proper system. Here is the way he does it: He starts next year's crop as soon as this one is harvested. The stalks are cut and the land is put up early. Then he starts the wells pumping and soaks every acre he can get to before spring. Some of this won't be watered again, but he has found that even one pre-planting irrigation will double the dryland yields.

While the pumps are running this winter, he will be levelling land, working on ditches and repairing equipment, so that everything will be ready to roll next spring at planting time.

Once the irrigation season starts, he never stops the water flowing down the rows. Pumps go 24 hours a day, and the water is changed at 12-hour intervals.

He plants his cotton in a two in and one out pattern. This makes for easier irrigation and the water goes farther. He does all the labor on the farm himself with the exception of a part-time hand. Some of the poisoning is done by airplane, particularly after the plants become tall.

Another thing a small irrigation farmer must do, he says, is to cut down overhead. The Bradens practice a live-at-home plan. They keep milk cows on an irrigated Sudan patch, raise their chickens and eggs and occasionally put a calf in the deep freeze. A big garden helps further reduce the cost of living. When he picked that 100 bales of cotton, there was a big likelihood that a big part

of it was profit.

The Bradens have been here 8 years. Dryland crops seldom make in this arid tightland area, so he had to turn to irrigation for survival. In 1956 he will have 3 wells and hopes to do much better, irrigating more land and raising the yield.

For him there will be no winter lull. The next crop is already being planned and the work on it started after the Christmas holidays.

Gray - Carson Counties Form Water District

A new underground water district High Plains Underground Water Conservation District No. 3, south of the Canadian River, has been created by the State Board of Water Engineers, and a vote of the people in Gray and Carson Counties.

The reservoir, or subdivision thereof, underlies almost all of the two counties, and its boundaries will be those fixed by the Water Board within the two counties and the county lines themselves elsewhere.

Four directors of the new board were elected, and are as follows: A. L. Stovall and Raymond Durrett, both of Panhandle; Russell McConnell of White Deer; and John Harnly of Gray County. Harnly lives in Gray County, although his address is Miami rural route.

Irvin Cole of Pampa was elected director-at-large by the other four directors, to succeed Glen Butler whose territory voted not to enter into the district.

Lefors, a town in Gray County, voted itself out of the district under the provisions of the law which permits incorporated towns to vote separately from the rural voters.

Congratulations to our friends to the north on the creation of this new locally - controlled ground - water district.

River Basin Approach—

(Continued from Page 1)

and agricultural areas that are wholly dependent upon its vast reservoirs should spend more time and money in determining the amount of water available in their individual basins.

The U. S. Geological Survey has stood by ready to help and has helped in many areas on cooperative programs to make the necessary studies.

Individual state agencies have been lax in many states, overlooking the time that many of their cities, industries and farmers would be looking



CONSERVATION CONVERSATION

It has come to the attention of various County Committeemen that a few wells are being drilled without the landowner having first obtained a drilling permit. After the well is drilled, then he is making application for the permit.

This practice is, of course, contrary to the rules of the Water District. The permit is to be obtained before the drilling operation is begun.

On the surface this rule might appear to be splitting hairs. You might say, "well what difference could it possibly matter whether I get my permit before or after the well is drilled, as long as I am careful to space it properly from existing wells." This thought is partially true. However, it can lead to very serious complications. To mention a couple—you might be misinformed as to what the proper spacing requirements are. Then too, without your knowledge, a neighbor could have a permit on file which you naturally would not be considering.

These, and other circumstances, could possibly change the picture in your well site area.

Your County Committee is available at all times, for your convenience, to sign permits. Please do your part in helping the committee keep your county records correct and proper.

The success of your locally-controlled Water District depends to a very large extent on you and the records that are obtained from you in regards to your wells.

It's some trouble to get out there in the field and tape the distances needed on the permit application, but anything worthwhile is going to present some difficulties. At any rate its certainly a lot easier and better than perhaps making a trip to Austin, don't you think?

It has been recommended by the Lubbock Experiment Station that approximately 6-inches to 8-inches of water be applied to an acre of land when watering beds for planting. Not more than 4-inches to 6-inches of water per acre should be applied during each summer watering. This recommendation must take into consideration rainfall preceeding the watering time.

This information together with the fact that a well which produces 450 gallons of water per minute, will deliver sufficient water to cover 1 acre of land to a depth of 1 inch in 1 hour, may guide the irrigation farmer as a general rule.

As an example, a farmer has 50 acres of land on which he wants to put 6 inches of irrigation water using a well that produces water at a rate of 450 gallons per minute. How much time will it take to do this job? Since it takes 1 hour to put 1 inch on 1 acre then it would take 50 hours to put 1 inch on 50 acres and 6 times this 50 hours, or 300 hours, to put on 6 inches of water, provided all the water is uniformly distributed.

to ground water for the chief source of supply.

Texas should be proud of the fact that its Legislature spelled out the right of individual ownership and gave us a ground-water law to work with that enables us to control and develop ground water by the reservoir or subdivision at local levels.

It is not a workable practice to allow river authorities to determine ground-water policies.

An educated man is not one whose memory is trained to carry a few dates in history—he is one who can accomplish things. A man who cannot think is not an educated man, however many college degrees he may have acquired. Thinking is the hardest work anyone can do—which is probably the reason why we have so few thinkers. There are two extremes to be avoided; one is the attitude of contempt toward education, the other is the tragic snobbery of assuming that marching through an educational system is a sure cure for ignorance and mediocrity. You cannot learn in any school what the world is going to do next year, but you can learn some of the things which the world has tried to do in former year, and where it failed and where it succeeded. If education consisted in warning the young student away from some of the false theories on which men have tried to build, so that he may be saved the loss of time in finding out by bitter experience, its good would be unquestioned.—Henry Ford.

We are at the present time in the process of increasing the mailing list of your paper, THE CROSS SECTION. We need to get it in the hands of more people.

Do you have someone in mind that you think would like to receive the paper each month? If so, please cut out the coupon on page 3 and fill it in for them. If you have several people you want on the mailing list, send their names and addresses to us. There's no charge for receiving it.

Please give us complete mailing addresses—this will insure your friends getting THE CROSS SECTION.

The Department of Agricultural Engineering of Texas A & M College conducted an Irrigation Short Course on February 23-24 at the Memorial Student Center in College Station.

The program was divided into four major sections: "Water Sources for Irrigation in Texas"; "Irrigation Wells"; "Managing Irrigated Soils"; and "Plant Varieties, Disease and Insect Problems Under Irrigation."

Programs of this type are certainly worthwhile in planning irrigation farming procedures. Mr. Roy C. Garrett with the Agricultural Engineering Department and others planning the program, should certainly be congratulated for their efforts.

STATISTICS FOR JANUARY

During the month of January, 244 completed wells were registered with the District office and 415 permits were issued by the County Committees. These new permits issued and completed wells follow by county.

County	Permits Issued	Completed Wells
Armstrong	0	0
Bailey	31	0
Castro	10	12
Cochran	11	9
Deaf Smith	24	15
Floyd	13	9
Hockley	87	59
Lamb	70	32
Lubbock	93	58
Lynn	48	28
Parmer	18	17
Potter	0	0
Randall	10	5

NOTICE!

The Lamb County Committee office has been moved to a new location in the City Hall Building at Littlefield.

EDITOR
THE CROSS SECTION
1628-B 15th Street
Lubbock, Texas

Dear Sir:

I do not now receive THE CROSS SECTION, but would like to have it sent to me each month, free of charge, at the address given below.

Name _____
Street Address _____
City and State _____

(Please cut out and mail to our address)

GROUND-WATER INVENTORY WILL BE CONTINUED

Circumstances beyond our control prevented the completion of a set of maps showing the thickness of the water-bearing strata and decline of the water table in another county within the water district for this issue of THE CROSS SECTION. However, the inventory will be continued in the next issue.

The preparation of maps and the computations of the quantity of water in storage in the underground reservoir within each county were undertaken by the District as a result of

a meeting of about 200 men in the Caprock Hotel on July 21, 1954. Those men represented nearly every large industry in the region including the Banks, Railroads, Gas Companies, Power Companies, Cotton Oil Mills, Concrete Pipe Companies, Compresses, Oil Companies, Avalanches-Jorunal, City of Lubbock and Texas Tech. After lengthy discussions of the various phases of a ground-water conservation program, many of those present expressed the opinion that a prerequisite for a sound program was a detailed inventory of the available supply of water.

The finished maps and figures of

available water which have been published in previous issues, are simple, but the procedure for arriving at those conclusions is somewhat complex and time-consuming. The procedure is briefly as follows:

All available driller's logs are studied in detail in order to determine the thickness of the Ogallala, and lines of equal thickness are drawn on a map. Then available records of depths to water in 1938 are plotted on another map and lines of equal depths to water are drawn. The depth to water map is then laid over the thickness of the formation map and the points are plotted showing the thickness of the water-

bearing strata.

A map is then prepared showing by 50-foot intervals the thickness of the water-bearing strata. The area within each 50-foot interval is then determined by planimeter and in turn the quantity of water in storage is calculated.

Another set of maps showing depths to water in 1938 and 1955 are prepared from which the map showing decline of the water table is prepared. Again the area within each 10-foot interval is determined by planimeter and the amount of water removed from storage between the two dates is computed.

GROUND-WATER CONSERVATION IN THE TEXAS HIGH PLAINS

By W. L. BROADHURST

ABSTRACT**

The supply of ground water in storage available to wells within the widespread underground reservoir beneath the High Plains in Texas amounts to about 500 million acre-feet. Total withdrawals from the time irrigation started in 1910 through 1954 amounted to about 300 million acre-feet, of which nearly one-third was pumped for irrigation during the 2-year period 1953-54. In one area of early development where the wells are concentrated and withdrawals have been heavy the water table has declined 80 feet, but the thickness of the saturated section in that area is still about 250 feet. In some areas where the saturated section was very thin at the beginning of irrigation development, wells have already reached economic exhaustion; and in the future, as a result of continued large-scale pumping, we must realize that other wells throughout the region can be expected to do likewise. However, under prudent conser-

vation practices including (1) wide spacing of wells to minimize so far as practicable the drawdown of the water table during the pumping season, (2) transporting water in closed distribution systems to prevent water losses from open ditches, (3) soil management to prevent excessive runoff of both precipitation and pumped water, and (4) other practices that have been feasible, the supply of ground water throughout much of the region is adequate to sustain a balanced agricultural economy for several generations.

**The foregoing is a summary of a paper presented by Mr. Broadhurst, Chief Hydrologist for the High Plains Water District, at the annual national convention of the American Society of Civil Engineers, on February 17th in Dallas.

The paper in its entirety is being reviewed for publication in the Transactions of the engineering society. If it is not published by the society, we will reprint it in full in THE CROSS SECTION.

SUMMARY OF INVENTORY COMPLETED TO DATE

County	Acres within the district	Acre-feet of water in storage, 1938	Acre-feet of water in storage, Jan. 1955	Acre-feet of water removed from storage, 1938 to 1955
Armstrong	39,000	325,000	279,000	46,000
Bailey	362,000	6,100,000	5,770,000	330,000
Castro	540,000	17,200,000	15,900,000	1,300,000
Deaf Smith	632,000	15,000,000	13,70,000	1,300,000
Floyd	600,000	14,400,000	12,500,000	1,900,000
Lamb	560,000	12,800,000	11,700,000	1,100,000
Parmer	550,000	*	16,300,000	*
Potter	273,000	376,000	344,000	32,000
Randall	275,000	3,940,000	3,380,000	560,000

*Water in storage in 1938 and amount removed not computed.

Water Policy Report—

(Continued from Page 1)

The similarity is noted in the Presidents Water Policy Report under the section "Underground Water."

"The ownership and use of underground water are so closely related to surface land titles that any regulations relating to underground water should remain strictly a matter of State concern. Not many of the States, however, have adopted any policy for

regulating the use of such waters."

"The problem is of increasing importance. The Committee suggests that the States give serious consideration to the enactment of appropriate legislation regarding the ownership, right to use, purposes of use, and place of use of such underground water. This would encourage optimum utilization of available supplies and insure that undue reliance upon such water sources does not result in excessive investments based on an economy which can only be temporary."

Total Precipitation — Lubbock, Texas

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	July	Aug.	Sept.	Oct.	Nov.	Dec.	Ann'l
1911	0.38	5.83	0.43	2.36	0.72	0.28	6.75	0.21	1.33	1.08	0.22	1.55	21.14
1912	0.02	1.28	0.61	0.50	1.58	0.96	3.35	2.37	0.73	2.81	0.01	0.38	14.60
1913	0.40	0.20	1.18	1.82	0.24	5.88	0.40	0.32	4.19	1.53	1.54	2.13	19.47
1914	0.15	0.10	0.29	1.47	4.04	3.86	6.17	5.95	0.46	7.12	0.35	1.47	31.43
1915	0.09	3.00	2.52	6.18	1.52	4.01	1.42	2.96	7.86	1.52	0.04	0.76	31.88
1916	0.17	T	1.15	2.63	0.39	1.52	0.46	2.45	2.79	2.19	0.55	0.11	15.03
1917	0.35	0.05	0.21	0.58	1.07	0.64	1.42	1.16	3.03	0.14	0.08	T	8.73
1918	0.84	0.58	0.05	0.72	1.67	2.95	0.53	0.79	0.79	0.51	0.69	T	12.15
1919	0.12	0.25	3.39	3.52	2.10	3.52	2.28	2.83	5.70	7.34	0.36	0.19	31.61
1920	0.90	0.11	0.24	0.15	2.91	3.66	2.19	2.64	1.63	1.45	2.21	0.09	18.16
1921	0.14	0.45	1.47	0.24	0.43	7.71	0.84	0.92	4.50	0.02	T	T	16.72
1922	0.34	0.20	0.55	3.59	3.50	2.43	1.36	0.28	0.17	0.60	1.50	0.07	14.59
1923	0.24	0.76	1.04	3.18	2.77	3.98	1.65	1.59	2.67	6.80	0.85	0.64	26.17
1924	T	0.17	0.96	0.86	0.90	1.79	1.20	1.76	1.25	0.47	0.03	0.06	9.45
1925	0.65	0.02	T	1.12	2.31	0.86	3.38	3.32	9.44	1.33	0.11	0.21	22.75
1926	0.56	0.04	1.64	1.81	5.14	1.10	1.03	2.75	4.15	8.40	0.67	1.77	29.06
1927	0.79	0.37	T	0.40	T	2.91	2.16	0.59	1.16	0.40	T	0.81	9.59
1928	0.31	1.18	T	0.09	3.08	1.06	6.78	4.04	0.08	2.10	0.74	0.28	19.74
1929	0.43	0.34	2.03	0.15	0.91	0.90	0.20	1.68	1.36	3.56	1.00	0.07	18.63
1930	0.61	0.03	0.45	1.04	1.71	1.70	0.12	1.34	0.11	3.91	0.94	1.44	13.40
1931	0.32	1.98	1.34	1.82	1.32	0.95	2.17	2.44	0.72	3.47	1.39	1.44	19.36
1932	0.93	1.09	0.04	1.84	2.37	5.66	1.90	3.15	3.41	1.29	T	2.48	24.16
1933	0.37	0.95	0.02	0.06	2.97	0.21	1.36	2.19	6.71	0.42	0.99	0.06	10.31
1934	0.06	0.06	1.98	1.08	1.26	0.28	0.65	1.66	1.86	0.28	0.55	T	9.72
1935	0.12	0.60	0.89	0.04	3.49	2.57	1.25	1.69	3.02	1.22	2.04	0.33	17.28
1936	1.08	T	0.59	0.92	5.86	0.92	1.13	0.13	13.93	1.52	0.74	0.21	22.03
1937	0.26	0.01	1.81	2.01	4.00	3.12	1.32	2.06	3.85	3.22	0.07	0.52	22.75
1938	0.91	1.18	0.49	0.14	1.99	5.89	4.01	0.47	0.63	0.51	0.27	0.03	16.52
1939	2.45	0.19	0.09	0.28	1.82	0.67	1.73	2.75	0.01	0.94	0.18	0.60	11.71
1940	0.23	1.97	T	1.84	1.74	2.06	T	1.57	0.73	1.07	2.35	0.20	13.71
1941	0.55	0.61	3.56	2.23	12.69	4.13	3.68	1.85	4.47	5.89	0.17	0.72	40.55
1942	0.04	0.18	0.51	3.25	0.35	1.74	2.58	4.97	7.61	3.39	0.01	2.70	27.33
1943	0.04	0.02	0.25	0.53	2.71	2.37	3.17	T	1.16	0.10	0.62	1.87	12.84
1944	1.28	1.36	1.09	0.84	3.03	1.75	2.93	2.37	3.73	0.80	1.72	1.64	22.54
1945	0.69	0.39	0.10	0.46	0.46	0.36	3.08	2.17	2.22	2.26	0.27	0.32	12.78
1946	1.10	0.15	0.76	0.07	1.49	2.72	0.58	3.55	3.49	4.67	0.44	1.04	20.14
1947	0.73	0.02	0.69	1.06	6.35	1.56	1.06	0.06	0.08	0.37	1.43	0.52	13.93
1948	0.14	1.38	0.17	0.33	2.88	2.31	1.75	0.31	1.45	0.98	0.03	0.13	11.86
1949	4.05	0.29	0.80	1.84	7.80	4.65	1.18	2.07	4.76	1.49	T	0.43	29.36
1950	0.28	0.18	T	0.88	3.93	0.68	3.12	2.08	3.74	0.14	0.03	0.03	15.53
1951	0.32	0.66	0.78	0.58	2.63	4.19	2.04	2.62	0.70	0.93	0.06	0.02	15.53
1952	0.98	0.05	0.04	2.30	1.39	1.94	3.24	1.88	0.92	0.00	0.96	0.06	13.76
1953	0.34	0.16	1.01	0.62	1.37	0.45	1.47	2.57	0.04	4.01	0.16	0.05	12.25
1954	0.06	T	0.04	1.91	4.45	0.51	0.19	2.92	T	2.82	T	1.09	13.99
1955	0.83	0.00	0.03	0.19	2.45	2.30	3.03	.62	2.76	4.53	.10	T	16.84
1956	.01	1.50											
Normal	0.67	0.53	0.80	1.11	3.36	2.53	1.89	1.79	2.85	2.07	0.63	0.66	18.89

High Plains Underground Water Conservation District No. 1
1628-B Fifteenth Street
Lubbock, Texas

Second Class Permit

THE Cross SECTION

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

Volume 2—No. 9

"THERE IS NO SUBSTITUTE FOR WATER"

March 1956

BROADHURST ATTENDS ANNUAL WATER POLICY MEETING

Willis Resigns As District Geologist



GORDON W. WILLIS

Gordon W. "Doc" Willis, District Geologist, has resigned his position on the Water District staff to enter private business as a consulting ground-water geologist.

The District Board accepted his resignation, effective March 15th, very reluctantly, but with every good wish for success in his new business.

The county ground-water inventory maps which Mr. Willis has been preparing will be continued as rapidly as possible. They will be published as they are completed.

Mr. Willis will maintain offices in the Commercial Building, 2247 34th Street, Lubbock.

Broadhurst Takes 90-Day Leave - Of - Absence

W. L. Broadhurst, Chief Hydrologist for the Water District has been granted a 90-day leave of absence by the Board of Directors. He will plan to leave Lubbock about April 1 for Guatemala, where he will serve as a consultant to International Development Services, Inc., New York City,

The water policy committee of the National Reclamation Association met March 17, 1956, in Salt Lake City, Utah. The committee reviewed previous work of the policy subcommittee and also the report by the Presidential Advisory Committee on Water Resources Policy, House Document No. 315 84th Congress, 2nd Session.

A report on national water policy will be submitted to the association membership when it meets November 14, 15, and 16 in Salt Lake City. The report will be a joint effort to present common understanding and agreement in the matter of National Water Policy which will fulfill the requirements of every section of the country, according to Hugh A. Shamberger, Chairman, Carson City, Nevada.

Activities of the Association in the past have been confined primarily to reclamation and development of surface water. However, Guy C. Jackson, Anahuac, Texas, President of N.R.A., recognizes the importance of ground water in the national economy, and in order to include ground water in the program he appointed W. L. Broadhurst as the Texas member of the water policy committee.

Other members of the water policy committee present at Salt Lake City included Tony Jones, Arizona; Bert L. Smith, California; Harold H. Christy, Colorado; N. V. Sharp, Idaho; D. P. Fabrick, Montana; John Bliss, New Mexico; Marshall N. Dana, Oregon; E. J. Fjelsted, Utah; Jack Rogers, Washington; and Earl T. Bower, Wyoming.

regarding certain rural development programs of the Government of Guatemala.

The problems on which he will be working include the collection and interpretation of data and statistics regarding available water resources, the scope and character of water programs to be developed, the feasibility and methods of establishing public policy for water control, (perhaps similar to the High Plains Water District) and other matters directly or indirectly related to the orderly development and wise use of water in the over-all rural development.

At the end of the tour of duty in Guatemala, Broadhurst will be expected to deliver a written report to International Development Services, covering his activities and recommendations; however, in his work contract, IDS attached as much importance to his availability for program planning as to the prospects of his final report.

REGIONAL WATER MEETING HELD IN LUBBOCK MARCH 15

The Water Resources Committee of the West Texas Chamber of Commerce held a meeting in Lubbock on March 15th for the purpose of informing the people of our area as to the work of the State Board of Water Engineers.

The Committee, headed by chairman Frank Kelley of Colorado City, invited the Board of Water Engineers, Mr. R. M. Dixon, Judge Otha Dent and Mr. H. A. Beckwith to speak on various phases of their work. Mr. Joe Carter, attorney for the Board was invited to talk briefly on the legal problems pertaining to water of the state.

Mr. Dixon pointed out the need for more gauging stations in Texas to measure more accurately the run-off in our surface streams. He also pointed out that in his opinion the river basin should not be the unit to be used in development of ground water.

Judge Dent explained the work being done by ground-water districts in development and use of underground water. He explained the location and geological structure of the various

ground-water aquifers of the state and some of the individual problems confronting each.

The need for more money to be used in investigating was also urged by Judge Dent.

Mr. Beckwith discussed the old statutes, grants, rights and law suits that have been instrumental in forming the framework of Texas water rights.

The meeting pointed out that Texas, during 1955, pumped 7,600,000 acre-feet of ground water, and of this total 65 percent was produced on the High Plains. There are 6,000,000 acres of land in Texas being irrigated.

The afternoon session was given completely to questions from the floor.

County Committeemen from almost all of the High Plains Water District's member counties were present at the meeting.

We congratulate the WTCC and the Board of Water Engineers for a very well planned program and for their efforts in bringing to our area pertinent information that they have gathered.



Shown are members of the State Board of Water Engineers after they spoke to area farmers and businessmen in Lubbock March 15th. They are left to right, H. A. Beckwith, Eagle Pass; R. M. Dixon, Dallas; and Otha Dent, Littlefield.

Notice Of Correction

Several typographical errors occurred in the February issue of The Cross Section, of which two had important bearing on the facts presented.

The first occurred in the article by

Mr. Broadhurst entitled "Ground-Water Conservation in the Texas High Plains." "Total withdrawals from the time irrigation started in 1910 through 1954 amounted to about 30 million acre-feet,"—rather than 300 million

(Continued on Page 4)



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ALLAN WHITE
Editor

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Floyd Walton Route 5, Hereford, Texas
George T. Turrentine Route 5, Hereford, Texas
Committeemen meet the first Monday of each month in the Farm Bureau Office, Hereford, 7:30 p. m.

Floyd County

Mrs. Ida Puckett, 319 South Main Street, Floydada

Tate Jones Floydada, Texas
J. R. Belt Lockney, Texas
R. C. Mitchell Lockney, Texas
Robert L. Smith Lockney, Texas
Ernest Lee Thomas Route 1, Floydada, Texas



Hockley County

Z. O. Lincoln, 913 Houston, Levelland, Texas

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Cecil Pace Levelland, Texas
J. J. Hobgood Route 2, Anton, Texas
H. C. James Route 4, Levelland, Texas
Joe W. Cook, Jr. Route 1, Ropesville, Texas
Committeemen meet first and third Fridays of each month at 1:30 p. m., 913 Houston, Levelland, Texas.

Lamb County

Jess Everett, Chamber of Commerce Office, Littlefield, Texas

J. B. Davis Route 1, Amherst, Texas
Elmer McGill Olton, Texas
Roy McQuatters Route 1, Anton, Texas
Price Hamilton Earth, Texas
Bill Nix Sudan, Texas

Lubbock County

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Earl Weaver Idalou, Texas
Earl Reasoner Box 335, Slaton, Texas
Leroy Johnson Shallowater, Texas
Howard Alford Route 4, Lubbock, Texas
Vernice Ford 3013 20th St., Lubbock, Texas
Committeemen meet on the first and third Mondays of each month at 2:00 p. m. in the District Office, 1628-B 15th Street, Lubbock, Texas.

Lynn County

Mrs. Jean Lancaster, 1628-B 15th Street, Lubbock

Roger Blakney Route 1, Wilson, Texas
E. L. Blankenship Route 2, Wilson, Texas
H. D. Dean Route 6, Lubbock, Texas
Lit H. Moore, Jr. Route 1, Wilson, Texas
Aubrey Smith Route 1, Wilson, Texas
Committeemen meet the first and third Tuesdays of each month at 10:00 a. m. in the District Office, 1628-B 15th Street, Lubbock.

Parmer County

Aubrey Brock, Bovina, Texas

John Gammon Friona, Texas
Walter Kaltwasser Rt. 1, Farwell, Texas
Carl Schlenker Route 2, Friona, Texas
Dick Rokey Friona, Texas
Matt Jesko Rt. 1, Muleshoe, Texas
Committeemen meet first and third Thursday nights at 8:00 p. m. in Bovina.

Potter County

Jim Line, Box 87, Bushland, Texas

James W. Walton Bushland, Texas
Earl Barclay Bushland, Texas
Jim Line Box 87, Bushland, Texas
E. L. Milhoan Box 45, Bushland, Texas
W. J. Hill, Sr. Bushland, Texas

Randall County

Mrs. Eutha Hamblen, 1710 5th Avenue, Canyon, Texas

J. L. Weick Rt. 1, Canyon, Texas
Frank Begert Rt. 1, Canyon, Texas
L. E. Mason Wildorado, Texas
W. C. Angel Route 2, Canyon, Texas
John Butler Route 2, Happy, Texas
Committeemen meet first Monday night each month at 8:00 p. m., County Agent's Office, Canyon, Texas.



KNOW YOUR COUNTY NEIGHBORS

Meet J. B. Davis of Route 1, Amherst, who is a new member of the Lamb County Committee. He was elected this past January by the people in his county to serve a three-year term on the committee.



Mr. Davis and his wife, Joyce have two children who are in school at Littlefield, Diane, 16, and Tommy, 13. The family attends church at the First Methodist Church.

Mr. Davis went to school in Vernon and at the North Texas Agricultural College in Arlington. He is a member of the Littlefield Masonic Lodge.

Irrigation problems are nothing new to Mr. Davis because he has been irrigating his own farm land since 1938 when he drilled the first of three wells, with which he waters all of his 360 acres of land.

Mr. Davis enjoys relaxing from his farming and irrigating duties by playing bridge. He also is a football and basketball fan.

Meet Bill Garrett of Route 2, Muleshoe, who is a member of the Bailey County Committee. His present term of office will expire in January 1957.

Mr. Garrett graduated from the Muleshoe High School and is very well known in his community.



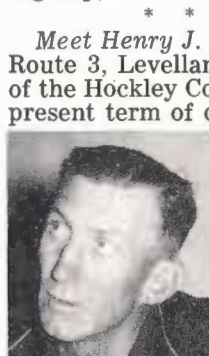
He and his wife, Joann, have three fine children, Sharon, 4, Craig, 3, and Terri, 1. They attend church at the Methodist Church in Progress, Texas.

Mr. Garrett belongs to the Bailey County Farm Bureau.

He and his partner, Joe Sooter, farm 320 acres of irrigated land in the Muleshoe valley. They operate two irrigation wells. Back during 1948, Mr. Garrett's family drilled the first of these two wells.

When it comes to hobbies, Mr. Garrett has a very unique one—water skiing. He enjoys an occasional fishing trip, too.

Meet Henry J. (Chick) Schmidly, of Route 3, Levelland, who is a member of the Hockley County Committee. His present term of office expires in January, 1958.



Mr. Schmidly and his wife, Norvell, have two boys, David, 12, and Stephen, 6. They attend the Catholic Church in Levelland.

Mr. Schmidly attended school in Austin and Levelland. He is a Farm Bureau member and a director of

the Farmer's Cooperative Gin in Levelland.

As to Mr. Schmidly's farming operation—he works 350 acres of irrigated land and 175 acres of dry land. He operates three irrigation wells. The first of these three was drilled in 1948.

Mr. Schmidly likes all sports, primarily as a spectator, and his principal hobby is square dancing.

Meet J. R. Belt, Jr. of Lockney. He is a member of the Floyd County Committee, and his present term of office will expire in January 1958.



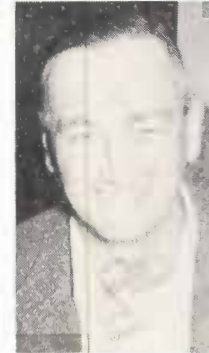
Mr. Belt is a Floyd County man all the way. He was educated in the Lockney public schools and has lived in the community since that time.

Mr. Belt and his wife, Maye, have three children, Ann, 19, Carolyn, 10, and Steve, 8. The family attends church at the

Church of Christ in Lockney.

Mr. Belt farms 630 acres of land, which he irrigates with six wells. He drilled the first of these wells in 1942.

When Mr. Belt is not working at his business of farming he enjoys an occasional hunting trip. He also raises Shetland ponies as a hobby.



Mr. Gammon attended the University of Oklahoma and Texas Technological College.

He and his wife, Grace, have three children, Jean Louise, 17, Johnny, 15 and Marianna, 8. The family attends the Church of Christ.

Mr. Gammon farms 170 acres of land and operates one irrigation well, which was drilled in 1952, but mainly he is a cattleman. He has several hundred acres of grassland where he runs his stock.

Like so many of our High Plains residents, Mr. Gammon is a native of Oklahoma. However, he has lived in Parmer County since 1929 at the present location of his farm home.

Mr. Gammon plays golf and fishes for enjoyment and relaxation. He also likes to follow most of the athletic events in this area as a spectator.

Please Close Those Abandoned Wells!!!

WATER CONSERVATION PRACTICES ON THE HIGH PLAINS



Open ditch being concrete lined to save water that would otherwise be lost to soil seepage. The steep walls of the ditch help cut down evaporation loss.



Aluminum surface pipe is used on this farm to carry irrigation water to a point away from the well where it will be applied to the land.



Flexible plastic pipe is used on the farm shown above to transport water from the well to the point where irrigation water is being applied. Closed systems are excellent conservation measures.



Underground concrete pipe has been installed on the above farm to conserve water. This type system saves water from evaporation and seepage, and it also affords the operator the convenience of plowing over the pipe.



Canvas pipe is still another water conservation measure being used in our area. Evaporation and seepage losses are minimized and the pipe can be easily folded and stored when not in use.

EDITOR
THE CROSS SECTION
1628-B 15th Street
Lubbock, Texas

Dear Sir:

I do not now receive THE CROSS SECTION but would like to have it sent to me each month, free of charge, at the address given below.

Name _____

Street Address _____

City and State _____

(Please cut out and mail to our address)



**CONSERVATION
CONVERSATION**

The Federal Bureau of Reclamation has planned a project in western Oklahoma that should be of interest to all. The Congress has authorized the project which consists of building two large dams on the Wachita River at a cost of \$40 million.

Four towns are asked to pay \$19 million of the total amount under provisions of a 50-year federal loan. This loan would perhaps be retired through municipal water revenues.

If no other benefits were derived, the remaining cost of \$21 million would be paid by farmers who would receive irrigation water from the project.

The land that would come under this reclamation program totals 9,440 acres.

Let us break \$21 million down and prorate an equal amount of this cost of obtaining a source of irrigation water to each acre of land that will benefit. You will find this cost to be roughly \$2,000 per acre. This tremendous cost for irrigation water would be incurred and without the assurance that water would be available in storage at the time it would be needed.

Would you be willing to pay approximately \$2,000 per acre to obtain a source of irrigation water for your farm? This would not include the cost to the individual of actually applying the water to the land.

* * * * *

Every time another well is drilled we get to wondering about the miracle of water. Many people have wondered about water, its control, use, and development. Even in Bible times people were discussing and arguing about the digging and relocating of water wells.

It is quite apparent that a few peo-

STATISTICS FOR FEBRUARY

During the month of February, 262 completed wells were registered with the District office and 200 permits were issued by the County Committees. These new permits issued and completed wells follow by county.

County	Permits Issued	Compl'd Wells
Armstrong	0	0
Bailey	14	38
Castro	11	12
Cochran	9	6
Deaf Smith	14	12
Floyd	18	16
Hockley	29	37
Lamb	23	32
Lubbock	53	48
Lynn	21	37
Parmer	7	12
Potter	0	0
Randall	1	12

ple have known about the hydrologic cycle for a long time. The trouble today is that not enough people are educating themselves to the occurrence, and importance of water. The average person's curiosity about water ends at the tap. Informed self-interest would make a lot more people aware of the terrific withdrawals occurring today and impress upon their minds the great necessity of conservation.

In the State of Texas from 1890 to 1940 our population increased only 3 times yet in the same period our use for fresh water increased 71 times. In 1900 the average per capita use of water ranged from 500 to 600 gallons per day for domestic, agricultural, and industrial uses. Today the per capita use is up to approximately 1400 gallons per day. Yet the average citizen drinks less than half a gallon of water daily.

Approximately 590 Texas cities are wholly dependent upon underground water for their full supply. Bearing in mind that 85 percent of all industry depends upon municipal supply it is quite justifiable that a lot of City Commissioners are becoming concerned about their demands for more water.

In agriculture, suggestions have been made on preferential crop use to allow the greatest monetary return for the gallon of water. At this time a plan of this kind does not sound workable, but the future may demand such operation if our state and nation are to maintain an economic balance in their irrigated lands.

Today Texas has six million acres under irrigation or roughly 12 percent of all its farm land. In West Texas more than 3/5 of the cotton is grown on irrigated land. It has been computed that 115 gallons of water are necessary to produce 1 pound of cotton or 1 pound of beef. Who can say that one should be produced and that the other should not? Time will be the determining factor.

* * * * *

POPULATION PINBALL

To see the most exciting pinball machine in the country, you'll have to visit the lobby of the Department of Commerce in Washington, D. C.

Flashing lights on a big map of the U. S. give a play-by-play of life and death in the 48 states.

Every nine seconds, a bluish light flashes—another baby is born.

Every 21 seconds, a purplish light blinks—someone has died.

Every two minutes, a blinking green light indicates another immigrant has arrived in this country.

Every 17 minutes, a light flickers—

AN EDITORIAL

We hear a few of our people say, "Why do we need a water district to tell us what to do? We can take care of our own water."

That's just exactly what we are all doing—taking care of our own water, without the state government or federal government doing it for us. The Water District was not created in an effort to do away with the rights of the individual, but rather it is a local organization designed to maintain those individual rights, and at the same time provide for orderly development and wise use of our own water.

Why have the many towns in the Plains incorporated and established local self government? Was the purpose to take away the rights and privileges of the good folks who live in the towns? No! It was to assist in orderly development of the community for the good of all. Certainly local city government is more practical than one central agency running the affairs of all cities.

Several years ago Southern High Plains farmers and businessmen could see that certain other groups in Texas were making headway toward legislation declaring, by law, that ground water was property of the state, thereby giving a central agency the authority to administer and appropriate the ground water of Texas. Had legislation of that nature been allowed to pass into law, the development of these Southern High Plains unquestionably would never have progressed to the point where it is today. We would no doubt have had a curtailment of well drilling many years ago.

Through the efforts of many High Plains people, bills that recognized State ownership or public ownership of water were killed and by compromise bills that now constitute the ground-water laws of Texas were passed by the legislature.

One of the big features of this law is the portion that sets forth the recognition of the ownership and rights of the owner of the land in underground water.

This same law sets forth the framework of locally-controlled water districts, and provides for a five-man Board of Directors to be elected by the resident taxpaying voters within the bounds of the district. The Directors themselves must own taxable land within the precinct they represent.

An organization such as your water district is of great benefit in fulfilling the wishes of a majority of the people in orderly development of our ground-water aquifer. It is invaluable as a means of gathering data pertaining to our underground water and the geological formations which contain this water. These data can be and are being used to formulate methods of better conserving, preserving, protecting, and recharging the underground water reservoir.

Your Water District has been quite active in recognizing other ways in which it can help you. To mention one: an extensive story of the geological, hydrological, and economic conditions of the Southern High Plains was drawn up in brochure form and presented to the Bureau of Internal Revenue at Washington, D. C., in an effort to get an income tax deduction for depletion of water used to produce income. So far, the Bureau has not handed down a ruling to cover this depletion of underground water, but we have every reason to believe that headway is being made toward the proper end. Reports we receive from Washington indicate that our request is receiving every consideration.

A favorable ruling by the tax people would virtually mean millions of dollars in tax savings to the people in our area. A ruling that would mean so much to so many possibly could never be obtained by efforts of an individual.

Every person living within the boundaries of the High Plains Water District should use his or her energies in working for and defending locally-controlled water districts.

someone has left this land for other shores.

Every 13 seconds, a bright white light flashes on the board. It shows the national population has made a net gain of one. This is posted on the population speedometer across the top of the map, giving an up-to-the-minute picture.

By the time you read this, our population will be increased by two.

Joseph Papara in the VICTORIAN.

Correction—

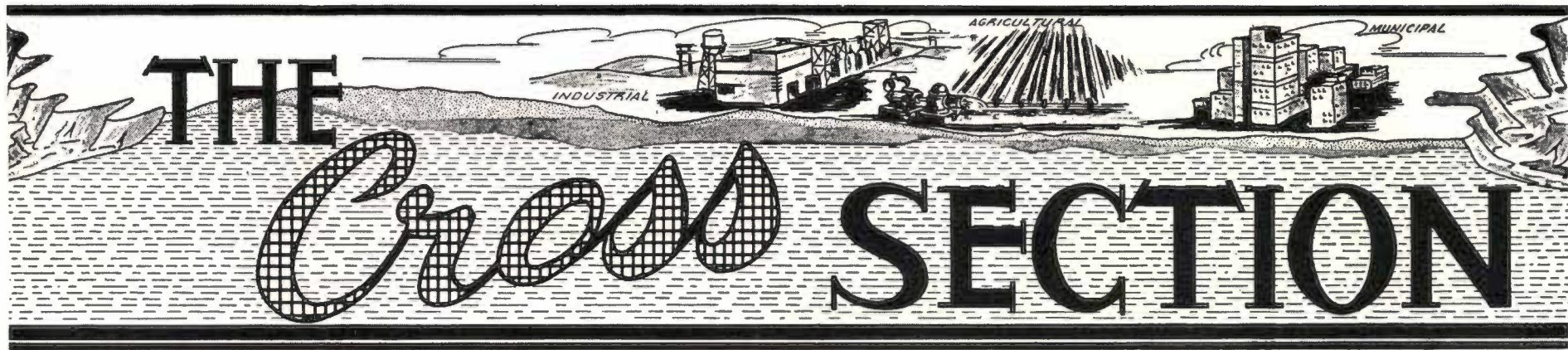
(Continued from Page 1)

acre-feet that appeared in print.

The second was in the "Summary of Inventory Completed to Date." Under the heading "Acre-feet of water in storage, January 1955," the Deaf Smith County figure should have read 13,700,000.

High Plains Underground Water
Conservation District No. 1
1628-B Fifteenth Street
Lubbock, Texas

Second Class Permit



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

Volume 2—No. 10

"THERE IS NO SUBSTITUTE FOR WATER"

April 1956

DOWELL INCORPORATED DISCUSSES RECHARGE WITH WATER DISTRICT

WATER CONDITIONS IN MARCH 1956

Replacement Well Permit Discussed

The question of what one must do in order to "replace" an old well is asked quite often. We will try to clear up some of the thinking in this matter with a short discussion on the rule and the procedure to follow in making application for the permit.

Keep in mind, the "replacement well" may be to replace an old well which was drilled before the water district had any spacing rules, and which may not conform to the present spacing requirements.

First, a permit from your County
(Continued on Page 4)

Problems Arise With Increased Water Demands

The development of American agriculture, industry, rural life, and metropolitan growth has been based upon the availability of an abundant and economical water supply of suitable quality. With recent increases in each of these uses, difficulties are being encountered in planning economical increases for future water supplies.

Wide variations in natural availability of water are a limiting factor in future development in many areas. Recognition of this fact has led many States and metropolitan areas to make special studies of their areas, aimed at potential development of water supply and projected future water requirements for all purposes. Such studies and future plans endeavor to visualize an appropriate balance in the competition for water from agriculture, industry, rural life, and metropolitan development.

Uses of water in these categories have been estimated in the table below for the period 1900 to 1955. The portion of the total volume estimated to have been obtained from ground water resources is also indicated.

ESTIMATED UNITED STATES WATER USE

(In billions of gallons daily average)

Year	Irrigation*		Public Water Supplies		Total Water Use	
	Total	Ground	Total	Ground	Total	Ground
1900	20.19	2.50	3.00	1.14	40.19	6.97
1950	100.00	18.00	14.10	3.58	203.10	31.48
1955	119.84	24.75	17.00	4.18	262.04	41.24

*TOTAL take, including delivery losses but not including reservoir evaporation.

SOURCE: Water and sewerage industry and utilities division, BDSA, department of commerce.

Dowell Incorporated of Tulsa, Oklahoma has been discussing with the Board of Directors of the Water District, an experimental project to try to recharge the Ogallala formation which is the principal source of underground water within the bounds of the Water District.

Dowell engineers are interested in the challenging aspects that the falling water-table in this area presents. These experienced men hope that plans can be developed that will be helpful in increasing the recharge rate of the water reservoir. The company has for some time been interested in the water conservation problem in many areas of the United States, especially where increased usage of underground water has made supplies critical.

Dowell Incorporated, a wholly owned subsidiary of the Dow Chemical Company, has its general offices, laboratories and shop facilities in Tulsa. Other offices are located in 165 points in the United States, Canada and Venezuela.

Waste Of Water Prohibited By State Law

The willful and habitual waste of underground water is prohibited by the laws of the State of Texas. For the purpose of informing our readers of the existence and content of this law, we print it below:

"Willfully causing, suffering, or permitting underground water produced for irrigation or agricultural purposes to escape into any river, creek or other natural watercourse, depression, or lake, reservoir, drain, or into any sewer, street, highway, road, road ditch, or upon the land of any other person than the owner of such well, or upon public land."

Deficient streamflow and dwindling conservation storage during March magnified the seriousness of the persistent drought as expected spring rainfall failed to materialize. According to records of the Texas Board of Water Engineers, collected in cooperation with the United States Geological Survey, record-low flows for March occurred in most river basins and spring flow from the Edwards limestone decreased sharply. Cumulative runoff for the first six months of the water year varied from 24 percent of the median in the east to 5 percent in the west. Reservoir storage declined 4 percent during the month.

Water levels in observation wells in many parts of the state continued to decline during March, although water levels in the Houston area continued a rising trend which began in July 1955.

Statewide average rainfall was less than one-fourth of normal.

PRECIPITATION

According to the U. S. Agricultural Marketing Service cooperating with the Texas Agricultural Extension Service from data collected by the U. S. Weather Bureau for about 120 selected rainfall gaging stations, the statewide precipitation average was 0.41 inches, or 23 percent of normal.

No rainfall was reported in extreme west Texas with rainfall conditions being only slightly improved in many other areas. The highest area average of 1.80 inches in central east Texas was only 50 percent of normal.

GROUND WATER

Water levels in observation wells in many parts of the state continued to decline during March. Water levels in five observation wells in the western half of the state showed declines ranging from 0.6 foot to 7.8 feet. In the Houston area, however, water levels continued on a rising trend which began in July 1955. The rise in one observation well has been 14 feet since that time.

Press Release By Texas Board of Water Engineers

News Of Broadhurst Is Received From Guatemala

W. L. (Bill) Broadhurst, District Hydrologist, who is on leave-of-absence from the Water District in order to enter into a rural water development program with the Guatemalan government, has written that he has arrived safely in Guatemala City.

Following is an excerpt from Mr. Broadhurst's letter describing the country — "... I honestly believe 95% of the transportation is on foot 'bare feet at that', and nearly the same amount of commerce is carried on top of the head or in a bag with a band extended over the forehead.

However, the good level land and numerous rivers larger than any in Texas are at their finger-tips. The only thing holding the people back is machinery and know-how. The two primary tools of the thousands and thousands of 'farmers' are a machete and a large eye-hoe. They clear brush with the machete, plow the land, plant the seed, and cultivate the crop with a hoe. Then next year the process is repeated as it has been for several hundred years. . . ."

Because we know that our readers are interested in Mr. Broadhurst, his work and activities will be reported from time to time in THE CROSS SECTION.

States Continue To Lose Rights

With the accelerated pace toward government centralization that is occurring in America today, people interested in the use and conservation of the nations resources immediately began to wonder just how far the Federal Government will go in development and utilization of our resources.

The duties and responsibilities of the states are being increasingly encroached upon by the Federal Bureaucrats in almost all fields and today has begun to be felt in some sections of the nation even in resource use and development.

Felix Morley of "Nations Business Magazine" recently pointed out in his column that 407,900,000 acres are currently owned by the Federal Government. As of June 30, 1955, a little more than one-fifth of the land or 21.4 percent was federally owned. Another 3 percent of the total acres, principally Indian reservations, is held in trust in Washington. Counting the relatively small tracts owned by the various state governments, something more than one quarter of the country is held for—but not by—the people.

Much can be said about the sale and purchase of land by the Federal Government.

Another state power that is grad-
(Continued on Page 4)



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

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Telephone PO2-8088

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ALLAN WHITE
Editor

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Ed Dziuk, Sr. Route 2, Hereford, Texas
Ralph Hastings Route 4, Hereford, Texas
Floyd Walton Route 5, Hereford, Texas
George T. Turrentine Route 5, Hereford, Texas
Committeemen meet the first Monday of each month in the Farm Bureau Office, Hereford, 7:30 p. m.

Floyd County

Mrs. Ida Puckett, 319 South Main Street, Floydada

Tate Jones Floydada, Texas
J. R. Belt Lockney, Texas
R. C. Mitchell Lockney, Texas
Robert L. Smith Lockney, Texas
Ernest Lee Thomas Route 1, Floydada, Texas



Hockley County

Z. O. Lincoln, 913 Houston, Levelland, Texas

Henry Schmidley Route 3, Levelland, Texas
Cecil Pace Levelland, Texas
J. J. Hobgood Route 2, Anton, Texas
H. C. Janes Route 4, Levelland, Texas
Joe W. Cook, Jr. Route 1, Ropesville, Texas
Committeemen meet first and third Fridays of each month at 1:30 p. m., 913 Houston, Levelland, Texas.

Lamb County

Jess Everett, Chamber of Commerce Office, Littlefield, Texas

J. B. Davis Route 1, Amherst, Texas
Elmer McGill Gilon, Texas
Roy McQuatters Route 1, Anton, Texas
Price Hamilton Earth, Texas
Bill Nix Sudan, Texas

Lubbock County

Mrs. Jean Lancaster, 1628-B 15th Street, Lubbock

Earl Weaver Idalou, Texas
Earl Reasoner Box 335, Slaton, Texas
Leroy Johnson Shallowater, Texas
Howard Alford Route 4, Lubbock, Texas
Vernice Ford 3013 20th St., Lubbock, Texas
Committeemen meet on the first and third Mondays of each month at 2:00 p. m. in the District Office, 1628-B 15th Street, Lubbock, Texas.

Lynn County

Mrs. Jean Lancaster, 1628-B 15th Street, Lubbock

Roger Blakney Route 1, Wilson, Texas
E. L. Blankenship Route 2, Wilson, Texas
H. D. Dean Route 6, Lubbock, Texas
Lit H. Moore, Jr. Route 1, Wilson, Texas
Aubrey Smith Route 1, Wilson, Texas
Committeemen meet the first and third Tuesdays of each month at 10:00 a. m. in the District Office, 1628-B 15th Street, Lubbock.

Parmer County

Aubrey Brock, Bovina, Texas

John Gammon Friona, Texas
Walter Kaltwasser Rt. 1, Farwell, Texas
Carl Schlenker Route 2, Friona, Texas
Dick Rocky Friona, Texas
Matt Jesko Rt. 1, Muleshoe, Texas
Committeemen meet first and third Thursday nights at 8:00 p. m. in Bovina.

Potter County

Jim Line, Box 87, Bushland, Texas

James W. Walton Bushland, Texas
Earl Barclay Bushland, Texas
Jim Line Box 87, Bushland, Texas
E. L. Milhoan Box 45, Bushland, Texas
W. J. Hill, Sr. Bushland, Texas

Randall County

Mrs. Eutha Hamblen, 1710 5th Avenue, Canyon, Texas

J. L. Weick Rt. 1, Canyon, Texas
Frank Begert Rt. 1, Canyon, Texas
L. E. Mason Wildorado, Texas
W. C. Angel Route 2, Canyon, Texas
John Butler Route 2, Happy, Texas
Committeemen meet first Monday night each month at 8:00 p. m., County Agent's Office, Canyon, Texas.



KNOW YOUR COUNTY NEIGHBORS

MEET EARL WEAVER of Route 1, Idalou, who is a member of the Lubbock County Committee.

He attended the Idalou High School and Texas Tech College.

Mr. Weaver and his wife, Mattie Fern, have four children, Mrs. Bill Brown, Ken, Jan and a new baby boy. The family attends the Methodist Church in Idalou, where Mr. Weaver teaches a Sunday School class.

He also is a member of the Idalou Lions Club and the Farm Bureau.

Mr. Weaver tells us that he does not have a hobby, mainly because of five irrigation wells that he operates and 500 acres of land that he works. He drilled his first well in 1944.

In January, 1958, Mr. Weaver's present term of office will expire.

MEET ROBERT L. SMITH of Route F, Lockney, who is a member of the Floyd County Committee. His present term of office expires in January, 1959.

Mr. Smith graduated from the Lockney High School and Texas Tech College in Lubbock.

He and his wife, Lucile, have four children, Sandra, 10, Karla, 8, David, 5 and Robin Ann, 2. They attend the Main Street Church of Christ in Lockney.

Mr. Smith is the president of the Floyd County Farm Bureau and is a member on the Board of Trustees of the Lockney school district.

He farms 715 acres of irrigated land and 410 acres of dry land. In 1947 he drilled the first of his five irrigation wells.

Mr. Smith is very interested in water and soil conservation methods and is always ready to help out where he can best serve his community.

As for hobbies, he enjoys reading and is interested in photography.

MEET MATT G. JESKO of the Lazbuddy community, who is a member of the Parmer County Committee.

Mr. Jesko attended country schools and St. Marys in Indiana.

He and his wife, Christene, have four children, Clara Jean, 18, Theresa, 16, Richard, 14 and Herman, 12. The family attends the Catholic Church.

Mr. Jesko also belongs to the Optimist Club and the Knights of Columbus.

In 1952, Mr. Jesko drilled his first

irrigation well and started watering part of his 910 acres of land. Since then he has put down four more wells. Aside from his farming, he also raises cattle.

Mr. Jesko enjoys fishing and attending baseball games. His present term of office expires in January, 1958.

MEET ROGER W. BLAKNEY, of Route 1, Wilson, who is a member of the Lynn County Committee. His present term of office expires in January 1958.

Mr. Blakney attended public school in Wilson and New Home, and also he attended the Lynn County Veteran's Vocational School.

Mr. Blakney and his wife, Bobbye attend church in Wilson at the First Baptist Church. He also belongs to the Farm Bureau and V.F.W.

In 1947, Mr. Blakney drilled the first of three irrigation wells with which he waters 220 acres of farm land. He also operates 220 acres of dry land.

We want to warn all of you that smoke about this fellow and his very unique hobby—collecting cigarette lighters. He never has been known to have actually picked anyone's pockets, but you sure don't want to leave your lighter laying around when he's about.

Fishing is another hobby in which Mr. Blakney also indulges.

MEET T. R. DAVIS of Hart. He is a member of the Castro County Committee. His present term of office will expire in January, 1957.

Mr. Davis graduated from high school at Ranger, Texas. He and his wife, Cora, have two daughters, Helen and Peggy, and two sons, Bob and Doyle. The family attends church at the Baptist Church in Hart.

During 1938, Mr. Davis drilled his first irrigation well. Since that time he has learned a lot about watering crops and irrigating farmland. At present he operates five wells which will water his 700 acres.

Mr. Davis is in the dairy business along with his farming.

Horseback riding is Mr. Davis' principal means of relaxation.

Please Close Those Abandoned Wells!!!

''TAIL-WATER'' PROBLEM SOLVED ON DEAF SMITH FARM

The Trautman Brothers, vegetable growers in Deaf Smith County, have made tremendous strides in the conservation of irrigation water on their half-section of farm land west of Hereford.

They had been faced with the problem of "tail-water" escaping from their land, as so many others have been. This problem presents not only a waste of precious underground water, but also it constitutes an enormous cost in fuels for producing this extra water.

After considerable thought on the subject, the Trautmans gave their manager, L. F. Wood, the green light to work out a plan of catching this "tail-water" and returning it to the high point of the farm for use.

Mr. Wood called in the County Soil Conservation people to confer with him as to a possible solution to the problem. When the various ideas and methods were considered, Mr. Wood decided that a large sump should be dug at the lowest side of the farm to catch all the water which otherwise would escape from the land. The water would then be picked up from the sump by a centrifugal pump, and it would pump the water 960 feet through 12-inch concrete pipe to a point where it would join the farm's existing 15-inch concrete pipe system. From there it could be put to the beneficial use of irrigating vegetables.

It was decided that the sump should be 100 feet long x 40 feet wide x 10 feet deep. A 6-inch centrifugal pump

was selected to circulate the water. It was to pick up the water by means of a 6-inch diameter suction pipe 10 feet long.

Mr. Wood, Soil Conservation personnel and a concrete pipe company put these plans into action and soon the problem of "tail-water" escaping the land was solved.

The cost of this entire installation will soon be paid for by saving the

cost of having to drill and produce another well to obtain this added amount of water.

The Trautman Brothers and their farm manager, Mr. Wood, have set a pattern that many people who have waste water problems could duplicate and by doing so help themselves econ-

omically and conservatively. Perhaps this exact method is not the answer for you and your farm but by studying it and similar installations, and with the initiative that southern high plains farmers have always shown, this prime problem of wasted underground water can be solved.



L. F. Wood, Trautman farm manager, proves that "tail-water" can be put to beneficial use.



6-inch centrifugal pump picks up "tail-water" from sump and pumps it into concrete pipeline.



Sump 100 feet long x 40 feet wide x 10 feet deep was excavated to retain farm's "tail-water."



Water enters 12-inch underground pipeline at first riser and is pumped 960 feet up the land to where it joins an existing 15-inch pipeline at second riser.



Picture shows "tail-water" being pumped from sump to higher land where it can be put to beneficial use.

EDITOR
THE CROSS SECTION
1628-B 15th Street
Lubbock, Texas

Dear Sir:

I do not now receive THE CROSS SECTION but would like to have it sent to me each month, free of charge, at the address given below.

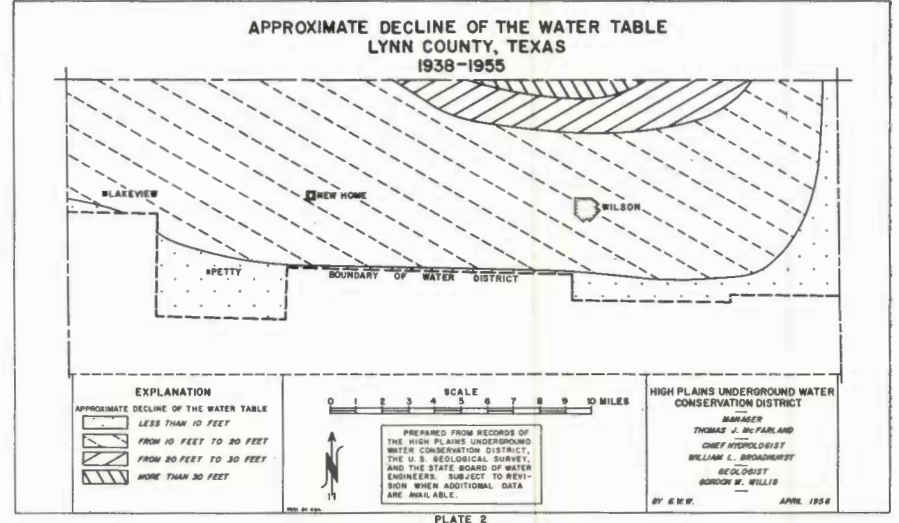
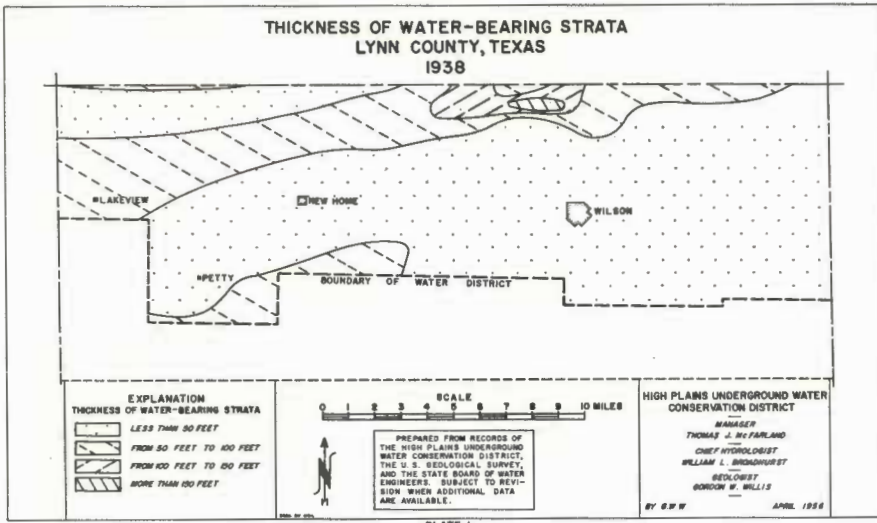
Name _____

Street Address _____

City and State _____

(Please cut out and mail to our address)

GROUND-WATER INVENTORY CONTINUED—LYNN COUNTY



The portion of Lynn County within the boundary of the High Plains Underground Water Conservation District No. 1 contained about 780,000 acre-feet of ground water available for pumping in January 1956. This portion of Lynn County contained about 1,140,000 acre-feet of ground water available for pumping in 1938, and about 360,000 acre-feet, or 32 percent, of the water was pumped from 1938 to 1956.

About 156,000 acres of Lynn County are within the boundary of the Water District. The accompanying maps were prepared from data compiled from a study of about 650 logs of water wells and about 200 measure-

ments of water levels in wells. The map in plate 1 shows the thickness of the water-bearing strata in the Ogallala formation in 1938 before an appreciable amount of water had been pumped from the reservoir. The map in plate 2 shows the decline of the water table from the spring of 1938 to January 1956.

The volume of water remaining in the underground reservoir was determined by subtracting the volume of material unwatered since 1938 from the total volume of saturated material in 1938 and multiplying the remainder by the coefficient of storage of 15 percent.

The approximate quantity of under-

ground water in storage, available for pumping, beneath an individual farm may be determined by multiplying the number of acres in the farm by the thickness of the water-bearing strata underlying the farm and then multiplying by the storage coefficient of 15 percent.

Suppose the farm consists of 160 acres and has 150 feet of water-bearing strata underlying it, then 160 acres x 150 feet x 0.15 percent equals 3600 acre-feet of water available for pumping. An acre-foot of water is the quantity to cover one acre to a depth of one foot, and it is also equal to 43,560 cubic feet or 325,829 gallons.

An individual may use this informa-

tion to determine, within reasonable limits, how long the quantity of underground water in storage beneath his farm will last at any annual rate of withdrawal. This assumes of course, that his neighbors pump a comparable amount of water per acre on their farms.

These maps and studies of this type are parts of the regular hydrological work in progress by the staff of the Water District. Similar maps and information will be prepared, as rapidly as practicable, for all the counties within the Water District. Maps of Deaf Smith, Parmer, Castro, Potter, Randall, Armstrong, Floyd, Bailey, Lamb and Lynn Counties are now available.

States Rights—

(Continued from Page 1)
usually being undermined by Washington is that of control of other natural resources. The Navy Department is now claiming that it has an absolute property right to all water within a 180,000 acre reservation in Nevada. In that nationalized area, says the Navy's general council, Nevada's water law does not apply. If that claim holds, then Nevada and other states in proportion to the land they govern, provisionally will be wards of Washington rather than sovereign partners in a federal union.

Replacement Well—

(Continued from Page 1)
Committee is required. The well site must be located from the two nearest property lines, and the measured yards from the well site to the three nearest wells within 440 yards must

be set out in the application. This should include the well to be replaced. These are the measurements that the applicant must furnish his County Committee.

The rule of the district pertaining to the replacement of old wells is as follows:

"Rule 5—Reworking or Replacing of Old Wells.

(a) No person, firm, or corporation shall rework, redrill, or re-equip an existing well in a manner that would increase the rate of production of water from such well beyond any previous normal rate of production of such well without first having filed an application therefor and having been granted a permit to do so. Neither shall any person, firm, or corporation replace an existing well without a permit. A replacement well, in order to be considered as such, must be drilled within one hundred fifty (150) feet of the old well and not elsewhere. It must not be located toward any

other existing well unless the new location complies with the minimum spacing provided for under provisions of Rule 4 (a); otherwise the drilling shall be considered as a new well for which application must be applied for under provisions of Rule 4 above. Immediately upon completion of a replacement well, the old well shall be:

- (1) Filled and abandoned; or
- (2) Properly equipped in such a manner that it cannot produce more than 100,000 gallons of water a day; or
- (3) Without exception, closed to comply with Article 1721 of the Penal Code passed by the 51st Legislature of the State of Texas. Violation of such offense is punishable by a fine of not less than one hundred dollars (\$100) and not more than five hundred dollars (\$500).

An application to rework, re-equip, redrill, or replace an existing well may be granted by the Board without notice or hearing."

STATISTICS FOR MARCH

During the month of March 215 completed wells were registered with the District office and 232 permits were issued by the County Committees. These new permits issued and completed wells followed by county.

County	Permits Issued	Completed Wells
Armstrong	0	0
Bailey	35	16
Castro	9	6
Cochran	13	12
Deaf Smith	21	12
Floyd	16	8
Hockley	21	34
Lamb	21	14
Lubbock	52	68
Lynn	25	36
Parmer	14	5
Potter	0	0
Randall	5	4

MR. Z. O. LINCOLN
913 HOUSTON
LEVELLAND, TEXAS

THE CROSS SECTION

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

Volume 2—No. 11

"THERE IS NO SUBSTITUTE FOR WATER"

May 1956

NEW IDEA PRESENTED FOR THE FINANCING OF WATER PROGRAMS

Procedure To Follow In Applying For Well Drilling Permits

The first step in making an application for a well drilling permit is for the landowner, or his agent, to submit the following information to the County Committee of the county within which the proposed well will be located.

1. Owner and legal description of the land.
2. Measured yards from proposed well site to the two (2) nearest property lines, quarter-section lines, or labor lines.
3. Measured yards from proposed well site to the three (3) nearest wells that are within 440 yards, or a quarter of a mile.

This information is obtained by the applicant and submitted to the County Committee.

Spacing for a proposed well site must meet the published rules and regulations for the size well desired before the application can be approved by three of the five County Committeemen. These published spacing requirements are as follows:

- 4-inch or smaller well must be 200 yards from nearest well or pending permit.
- 5-inch well must be 250 yards from nearest well or pending permit.
- 6-inch well must be 300 yards from nearest well or pending permit.
- 8-inch well must be 400 yards from nearest well or pending permit.
- 10-inch well or larger must be 440 yards from nearest well or pending permit.

The various sized permits also specify a maximum yield in gallons per minute. These maximums are:

- 4-inch well or smaller 265 G.P.M.
- 5-inch well 390 G.P.M.
- 6-inch well 560 G.P.M.
- 8-inch well 1000 G.P.M.
- 10-inch well or larger .. More than 1000 G.P.M.

A \$10.00 deposit is required of each applicant. This deposit is refunded in full when the log of the formation and the description of the pump is furnished the County Committee. Forms for submitting this information are furnished the applicant.

The most important things to re-

(Continued on Page 3)

A few of the new Water Bills that will undoubtedly appear in the next session of the Texas Legislature have begun to be discussed by various groups.

Representative Harold Parish has proposed a new idea on financing a state water program. He suggested a reallocation of the 35c State Available School Tax by giving 10c of it to the school districts as state aid, 10c to a state equalization fund for schools and the remaining 15c to back up a water bond financing plan yet to be determined.

McFarland Appointed To State Committee

Dr. J. W. Edgar, Commissioner of Education for the State of Texas has recently established a 24-man advisory committee to work with the Texas Educational Agency in placing courses of study on conservation of our state's natural resources in the Texas school system.

Texas has lagged behind many of its neighboring states in studies of this type.

Tom McFarland, manager of the High Plains Water District was appointed to this committee and was also selected as chairman of a sub-committee whose job it will be to ascertain what sources of materials are available to the T.E.A. for use in the establishment of conservation courses.

W. E. Williams of Sul Ross State College is the general chairman of the advisory committee.

Waste Of Underground Water Is No. 1 Problem

In a concerted effort to inform our irrigators as to the state statutes pertaining to the waste of underground water, we are again running that portion of the law which applies directly to waste as we in this area know it.

"Willfully causing, suffering, or permitting underground water produced for irrigation or agricultural purposes to escape into any river, creek or other natural watercourse, depression, or lake, reservoir, drain, or into any sewer, street, highway, road, road ditch, or upon the land of any other person than the owner of such well, or upon public land."

ANNUAL WATER LAW CONFERENCE TO BE HELD IN AUSTIN MAY 25 - 26

Pauline Lovan Is New Deaf Smith Secretary



MRS. PAULINE LOVAN

Mrs. Pauline Lovan, 222 Avenue J., Hereford has been employed by the Deaf Smith County Committee to assume the duties of their County Secretary. Her employment followed the resignation of Mrs. Pat Loerwald who formerly held the position, but who is moving from the County.

She took over her new position on May 1st.

Mrs. Lovan is married to Herbert C. Lovan, and they have one son, Herbert Paul, who will be 4 years old June 11th.

Mrs. Lovan attended the Hereford and Vernon High Schools and Flemings Business School at Amarillo.

She attends the Baptist Church in Hereford.

If you Deaf Smith County folks do not know Mrs. Lovan now, you will get acquainted when you make application for your next water well drilling permit at her office, which is located across the street from the county court house in the Farm Bureau Office at Hereford.

Farmers are good customers of industry. In 1955, they used 16 billion gallons of crude oil, more than any other industry. They spent \$300 million for pesticides. They spent a billion dollars for fertilizer and lime. And, in recent years, they have bought 4 1/2 million tractors.

The University of Texas Law School will hold its annual Water Law Conference in Austin on Friday and Saturday, May 25th and 26th.

The conference will be divided into a discussion of four general topics. The morning session of May 25th will be devoted to a discussion of "Financing Water Development". The afternoon session of that day will be devoted to two general topics of very timely importance. They will be "Special Producers for Adjudication of Water Rights and Supervision of Diversion" and "Selected Texas Problems of Current Importance".

Mr. Guy Jackson, President of the National Reclamation Association and long-time leader of the Texas Water Conservation Association, will be the speaker of the annual banquet to be held Friday night at the Commodore Perry Hotel.

The morning session of May 26 will be the discussion of the general topic of "Ground Water Rights and Control".

Much time and effort has gone into obtaining well qualified speakers for the conference. Mr. Hugh Shamburger, State Engineer for the State of Nevada will give an analysis of the Presidential Advisory Committee on Water Resources Policy, with a special reference to its import upon the sphere of state responsibility.

The conference will adjourn at noon Saturday, the 26th.

Statistics For April 1956

During the month of April 248 wells were registered with the District office and 199 permits were issued by the County Committees. These new permits issued and completed wells follow by county.

County	Permits Issued	Completed Wells
Armstrong	0	0
Bailey	22	8
Castro	15	11
Cochran	14	19
Deaf Smith	8	9
Floyd	16	12
Hockley	26	44
Lamb	21	28
Lubbock	40	68
Lynn	13	26
Parmer	13	20
Potter	0	0
Randall	11	3

Please Close Those Abandoned Wells!!!



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

Published monthly by the High Plains Underground Water Conservation District No. 1 1628-B 15th Street, Lubbock, Texas

Telephone PO2-8088

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ALLAN WHITE Editor

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T. R. Davis — Hart, Texas
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Floyd Walton — Route 5, Hereford, Texas
George T. Turrentine — Route 5, Hereford, Texas
Committeemen meet the first Monday of each month in the Farm Bureau Office, Hereford, 7:30 p. m.

Floyd County

Mrs. Ida Puckett, 319 South Main Street, Floydada

Tate Jones — Floydada, Texas
J. R. Belt — Lockney, Texas
R. C. Mitchell — Lockney, Texas
Robert L. Smith — Lockney, Texas
Ernest Lee Thomas — Route 1, Floydada, Texas



Hockley County

Z. O. Lincoln, 913 Houston, Levelland, Texas

Henry Schmidley — Route 3, Levelland, Texas
Cecil Pace — Levelland, Texas
J. J. Hobgood — Route 2, Anton, Texas
H. C. Janes — Route 4, Levelland, Texas
Joe W. Cook, Jr. — Route 1, Ropesville, Texas
Committeemen meet first and third Fridays of each month at 1:30 p. m., 913 Houston, Levelland, Texas.

Lamb County

Jess Everett, Chamber of Commerce Office, Littlefield, Texas

J. B. Davis — Route 1, Amherst, Texas
Elmer McGill — Olton, Texas
Roy McQuatters — Route 1, Anton, Texas
Price Hamilton — Earth, Texas
Bill Nix — Sudan, Texas

Lubbock County

Mrs. Jean Lancaster, 1628-B 15th Street, Lubbock

Earl Weaver — Idalou, Texas
Earl Reasoner — Box 335, Slaton, Texas
Leroy Johnson — Shallowater, Texas
Howard Alford — Route 4, Lubbock, Texas
Vernice Ford — 3013 20th St., Lubbock, Texas
Committeemen meet on the first and third Mondays of each month at 2:00 p. m. in the District Office, 1628-B 15th Street, Lubbock, Texas.

Lynn County

Mrs. Jean Lancaster, 1628-B 15th Street, Lubbock

Roger Blakney — Route 1, Wilson, Texas
E. L. Blankenship — Route 2, Wilson, Texas
H. D. Dean — Route 6, Lubbock, Texas
Lit H. Moore, Jr. — Route 1, Wilson, Texas
Aubrey Smith — Route 1, Wilson, Texas
Committeemen meet the first and third Tuesdays of each month at 10:00 a. m. in the District Office, 1628-B 15th Street, Lubbock.

Parmer County

Aubrey Brock, Bovina, Texas

John Gammon — Friona, Texas
Walter Kaltwasser — Rt. 1, Farwell, Texas
Carl Schlenker — Route 2, Friona, Texas
Dick Rocky — Friona, Texas
Matt Jesko — Rt. 1, Muleshoe, Texas
Committeemen meet first and third Thursday nights at 8:00 p. m. in Bovina.

Potter County

Jim Line, Box 87, Bushland, Texas

James W. Walton — Bushland, Texas
Earl Barclay — Bushland, Texas
Jim Line — Box 87, Bushland, Texas
E. L. Milhoan — Box 45, Bushland, Texas
W. J. Hill, Sr. — Bushland, Texas

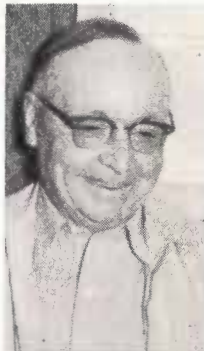
Randall County

Mrs. Eutha Hamblen, 1710 5th Avenue, Canyon, Texas

J. L. Weick — Rt. 1, Canyon, Texas
Frank Begert — Rt. 1, Canyon, Texas
L. E. Mason — Wildorado, Texas
W. C. Angel — Route 2, Canyon, Texas
John Butler — Route 2, Happy, Texas
Committeemen meet first Monday night each month at 8:00 p. m., County Agent's Office, Canyon, Texas.



MEET ROY B. McQUATTERS of Littlefield, who is Chairman of the Lamb County Committee. His present tenure on the Committee will be terminated in January, 1957.



Mr. McQuatters attended high school in Hillsboro, Texas.

He and his wife, Mary, have twin daughters, Veta and Vera, and one son, Roy B. Jr.

Mr. and Mrs. McQuatters attend church at the Methodist Church in Spade. He also belongs to the Masonic Lodge and the Lamb County Farm Bureau.

Mr. McQuatters had his first irrigation well drilled in 1945. He no longer works his land but has it all rented.

He is another one of those guys who does not have any actual hobbies — just enjoys life.

Mr. McQuatters is a long-time advocate of private ownership of underground water and local control of the resource.

MEET GUY AUSTIN of Route 1, Farwell, who is a County Committeeman in Bailey County. His present term of office will expire in January, 1958.



Mr. Austin attended school in Lubbock.

He and his wife, Naomi, have one daughter Mikala, and one son, Stanley. They attend church at the West Camp Baptist Church.

Mr. Austin is a member of the Bailey County Farm Bureau.

In 1947, Mr. Austin drilled his first irrigation well. At the present time he operates 8 wells and waters 640 acres of land.

When it comes to hobbies, Mr. Austin tells us that he enjoys most of all doing a little fishing with his friends and family.

MEET ZACK O. LINCOLN, 913 Houston Street, Levelland, Texas, who is the Hockley County Committee secretary. Mr. Lincoln is known by most of his neighbors and friends as "Judge", since he served as Hockley County Judge sometime back.

Mr. Lincoln was educated in Oklahoma at the Central State Teachers College, located in Edmond, where he received a B.A. Degree.



He and his wife, Retha, have five daughters, Leona, Eleanor, Anne, Patsy Ruth, Martha Lynn and Linda Kay. They also have four grandchildren of which they are very proud.

The family attends church at the Methodist Church in Levelland. Mr. Lincoln, also belongs to the Masonic Lodge, Lions Club, American Legion and has served as a director of the Community Chest.

Mr. Lincoln has devoted all of his time to his Public Accounting work and dealings in rental properties since 1948, when he sold his farm.

As for hobbies, he enjoys fishing, watching football games, keeping in touch with current events and sideline politics.

If you Hockley County folks do not know Mr. Lincoln now, the next time you drill a well on your place you will meet him, because he is the person you will contact to fill out a well drilling permit application.

MEET HERBERT "HUB" CADENHEAD of Route 2, Morton, who is a member of the Cochran County Committee. His present term of office expires in January 1958.



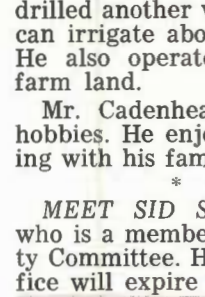
Mr. Cadenhead attended Tarleton State College in Stephenville, and Texas Tech in Lubbock.

He and his wife, Maxyne, have two daughters, Sherri Jan, 2, and Mary Carol, 1. The family attends church at the Church of Christ in Morton. Mr. Cadenhead also belongs to the Jaycees and the Cochran County Farm Bureau.

As most people know, a big part of Cochran County was late to develop irrigation water, compared to other areas in the Southern High Plains. Mr. Cadenhead drilled his first well in February 1953—since then he has drilled another well and with both he can irrigate about 340 acres of land. He also operates 300 acres of dry farm land.

Mr. Cadenhead has no particular hobbies. He enjoys mostly just relaxing with his family.

MEET SID SHEFFY of Dimmitt, who is a member of the Castro County Committee. His present term of office will expire in January 1958.



Mr. Sheffy attended public school in Plainview and West Texas State College in Canyon.

He and his wife Myrtle, have two daughters, Dorothy and Ruth, and five sons, Ted, Bob, Rex Don and Tommye.

The Sheffys attend church at the Methodist Church. Mr. Sheffy also belongs to the Masonic Lodge and the Castro County Farm Bureau.

In 1943, Mr. Sheffy drilled the first of his two irrigation wells. He waters 360 acres of farmland with these two wells. Besides farming, Mr. Sheffy is active in the stock raising business.

For relaxation, he enjoys activities of the Riders Club, football and TV.

ONE-STAGE PUMP SAVES WATER THAT WOULD USUALLY BE LOST



LOTS OF TAIL WATER — This photograph, made on the Wilbur Charles farm northwest of Bovina, illustrates a condition that is typical of many irrigated fields where the land slopes rather steeply.

PICKING IT UP—This is a close-up of Charles and his tractor-mounted pump, and shows how waste water is lifted from the end of the field and recirculated through a canvas pipe to the ditch 550 feet away.

Salvaging waste or "tail" water that runs out the end of rows on sloping hills of irrigated farms is a knotty problem, although it is one that needs to be solved.

One way of getting the job done is illustrated by the ingenuity of Wilbur Charles of Bovina, in Parmer County, who had a "custom-made" pump built to his specifications that has made his irrigated farm a model of efficiency.

Whenever, recirculating pumps are

mentioned, most farmers bring to mind the centrifugal type, but Charles has utilized the well known vertical turbine principal in his surface unit, and it is working perfectly. The components of his pump are a one-stage bowl-assembly of a standard 8-inch column pump, which is driven through an old automobile transmission.

The apparatus is mounted in such a fashion that it may be attached to the power take-off of the Charles'

tractor operated at any speed desired and in addition, the hydraulic lift makes it easy to move the pump from one location to another, should this be desired.

The pump cost \$300.00, and it was made by Watts Machine and Pump Company of Farwell.

In the instance shown by the accompanying pictures, Charles' pump is being used to pick up "tail" water at the west end of the field, and return it through 550 feet of canvas

pipe to the irrigation ditch.

If it was not for the pump on the lower end of the field, thousands of gallons of water would drain off the field daily into a nearby lake.

Because the pump is operated against such a low "head"—only about 12 feet—it will outproduce the farm's 8-inch irrigation well with ease, says Charles, and that is plenty of water to get for just about "free".

By Courtesy of "The State Line Tribune" of Farwell, Texas.



CONSERVATION CONVERSATION

Approximately 7,600,000 acre feet of ground water was produced in Texas last year. Of this amount about 80% was used by agriculture, and it has been estimated that 65% of this water was used on the High Plains.

* * * * *

We welcome your letters and comments pertaining to your paper "The Cross Section", or your Water District. The programs of water conservation that the Board of Directors instigate can only be successful through the help and cooperation of each of you. We hope you will let us know what you are thinking on these various matters so we can profit from your suggestions. Let us hear from you.

* * * * *

With Soil Stewardship Sunday, May 6, and a full week of soil and water conservation emphasis, May 6 to 12, just past, we ought to resolve that not only during one week of the year, but

all through the year we will be faithful stewards of the fertile soil and abundant supply of water that are ours to use.

We should think about and give thanks unto the Lord for the blessings of the land, and to stress the importance and urgency of wise use of soil and water resources.

* * * * *

There are an estimated 6,200,000 acres of Texas farm land under irrigation. Of these acres approximately 5,000,000 are watered from wells and the remaining land being irrigated with surface waters.

* * * * *

At least one research source claims that it takes 7,500 gallons of water to produce one bushel of wheat; 65,000 gallons of water to produce one ton of finished steel; 500 gallons of water to produce one yard of woolen cloth, and 100 to 200 gallons of water to pro-

duce a pound of rayon.

* * * * *

Before World War I the average city's daily water use per capita was 50 to 75 gallons. After World War I and before World War II this water use per capita jumped to 75 to 125 gallons per day. Since World War II, it has been running from 125 to as high as 225 gallons per capita.

* * * * *

It has been estimated that there are over 42,000 wells in Texas.

* * * * *

Most of the cotton that will be planted on the Southern High Plains is in the ground, and below we have listed a few statistics that should be of interest to you.

Emergence to square—30 days.
Square to white bloom—20 to 25 days.

Bloom to open boll—45 to 65 days.
Boll full grown 18 days after bloom.
It is ready to harvest in 155 days (25% open in 130 days).

120,000 equal the number of seed in one bushel of average seed.

Most effecting fruiting period is from July 20 to August 10.
Approximately 35 to 40% of blooms make bolls.

September 1st is general last day for fruit to be set.

Fiber length laid down first 25 to 30 days.

Critical period is 16 days after blooming.

Strength of fiber is built up in the second 25 to 30 days.

Moisture is limiting factor in length of lint.

85 is average number of days to blooming peak.

27 is average number of days from first bloom to peak.

30 is average number of days from

first bloom to shed peak.

Average percent of blooms shed is 65%.

Average number of blooms per plant is 35.

In 50-54 days after first white bloom 30% of crop is open.

In 60-64 days after first white bloom 71% of crop is open.

In 65-70 days after first white bloom 84% of crop is open.

* * * * *

The April 1956 edition of "Water Resources Review," U. S. Geological Survey news bulletin, states that ground-water levels remained well below average over most of the south, southwest and midcontinent areas; they were above average in the northwest and in most of the northeast.

In Texas, ground-water levels in the Edwards limestone and Carrizo sand generally declined, and a record-low level was measured in the key well in San Antonio. In the Houston district, water levels continued to rise for the ninth consecutive month.

Well Drilling Permits—

(Continued from Page 1)

member about drilling a well are to make application and have the County Committee approve the permit before the well drilling operation is begun. Also, the well must be drilled within ten (10) yards of the specified location for the permit to be valid.

We hope that the above information will help all applicants who desire well drilling permits. If there should be questions in your mind that are still not clear, please contact your County Secretary or one of your County Committeemen who will be glad to go into your particular problem more thoroughly.

EDITOR
THE CROSS SECTION
1628-B 15th Street
Lubbock, Texas

Dear Sir:

I do not now receive THE CROSS SECTION but would like to have it sent to me each month, free of charge, at the address given below.

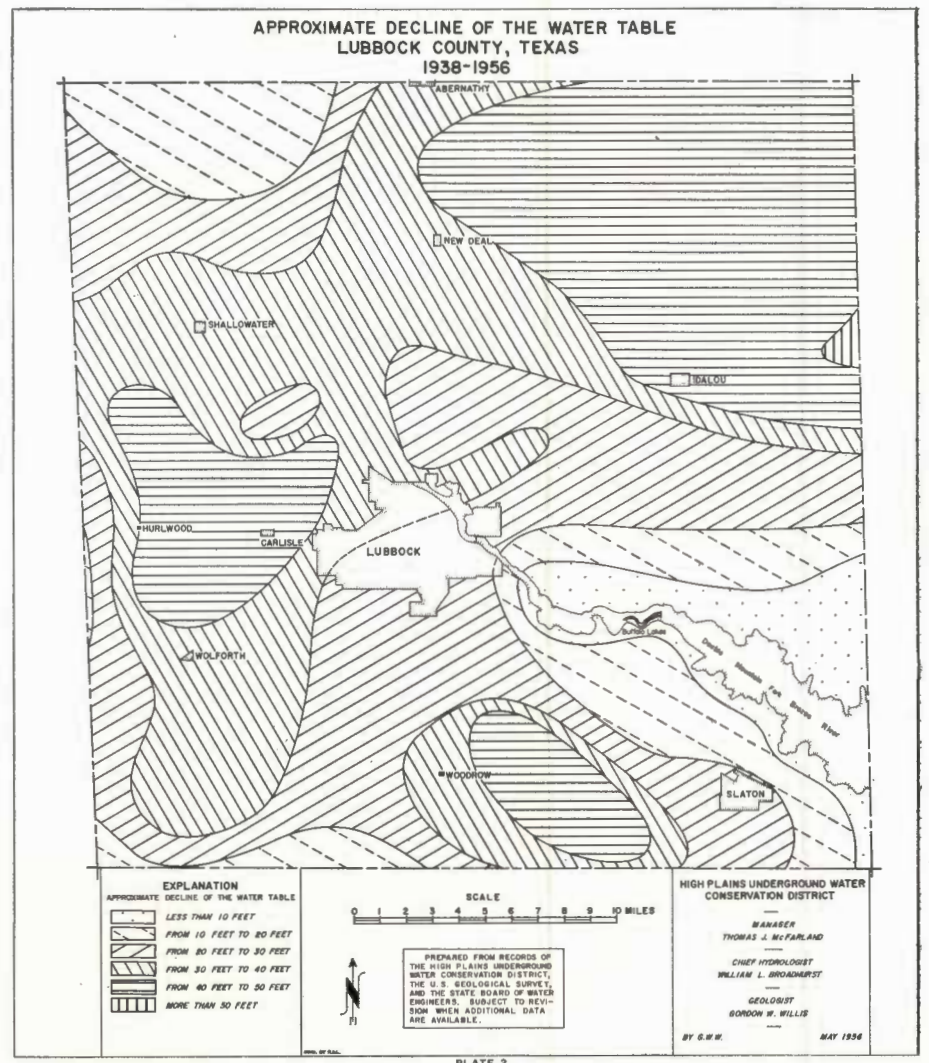
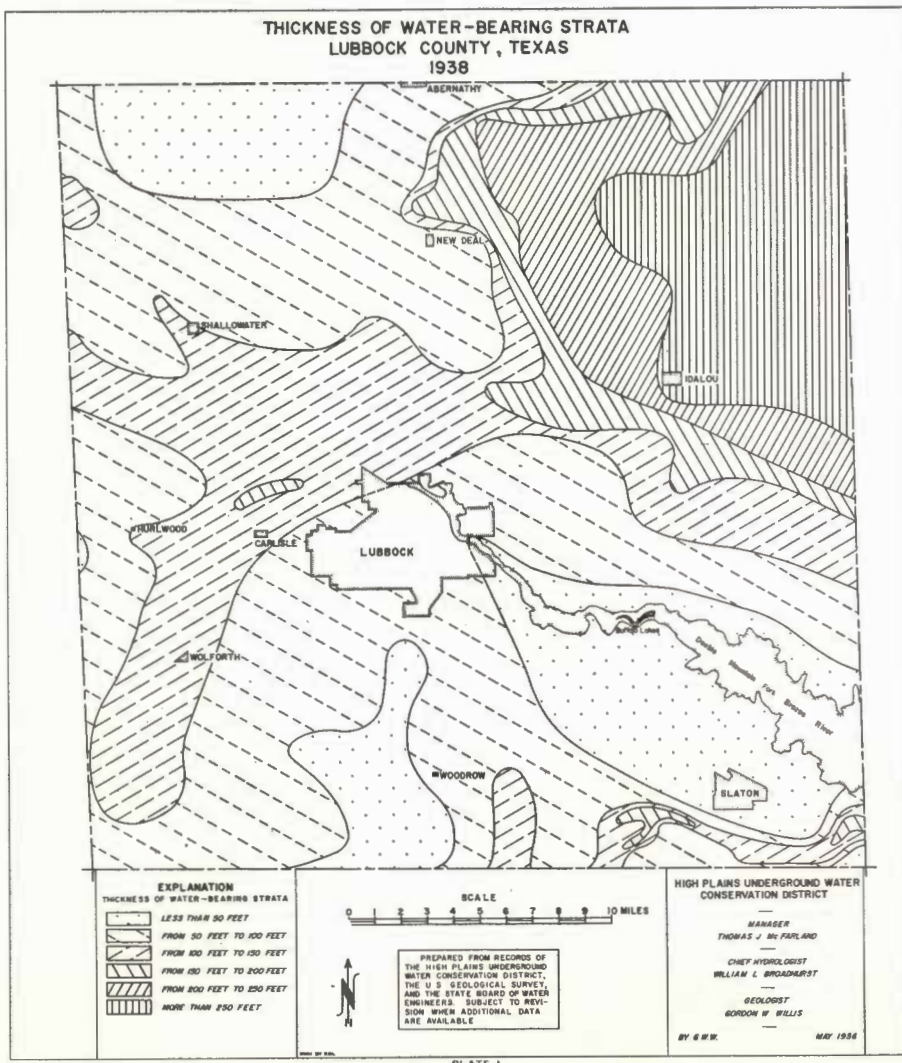
Name _____

Street Address _____

City and State _____

(Please cut out and mail to our address)

GROUND-WATER INVENTORY CONTINUED—LUBBOCK COUNTY



Lubbock County in January 1956 contained about 4,630,000 acre-feet of ground water available for pumping. In 1938, Lubbock County contained about 7,350,000 acre-feet of ground water available for pumping and about 2,720,000 acre-feet or 37 percent of the water was pumped from 1938 to 1956.

All of Lubbock County, about 570,000 acres, is within the boundary of the Water District. The accompanying maps were prepared from data compiled from a study of about 1,600 logs of water wells and about 400 measurements of water levels in wells.

The map in plate 1 shows the thickness of the water-bearing strata in the Ogallala formation in 1938 before an appreciable amount of water had been pumped from the reservoir. The map in plate 2 shows the decline of the water table from the spring of 1938 to January 1956.

The volume of water remaining in the underground reservoir was deter-

mined by subtracting the volume of material unwatered since 1938 from the total volume of saturated material in 1938 and multiplying the remainder by the coefficient of storage of 15 percent.

Some of the irrigation wells in the north central part of Lubbock County draw water from crevices and solution channels in limestone strata in the Cretaceous rocks which underlie the Ogallala formation in that area. Pumping from the so called "crevice wells" causes a decline of the water table in the Ogallala formation; therefore, it is evident that the water in the crevices and solution channels is derived from water in storage in the Ogallala formation. The thickness of the water-bearing material in the Ogallala formation underlying any particular farm, therefore, is a practical measure for the determination of the quantity of water in storage available for pumping.

Some areas in the eastern part of

Lubbock County have a hundred or more feet of water-bearing material, however, some of the irrigation wells have rather meager yields in gallons per minute. Logs of many of the wells in the eastern part of the county show that the Ogallala formation consists mainly of very fine-grained sandy clay and clay. These fine-grained materials reduce the permeability of the water-bearing strata, and are responsible for the meager yields of the wells.

The approximate quantity of underground water in storage, available for pumping, beneath an individual farm may be determined by multiplying the number of acres in the farm by the thickness of the water-bearing strata underlying the farm and then multiplying by the storage coefficient of 15 percent.

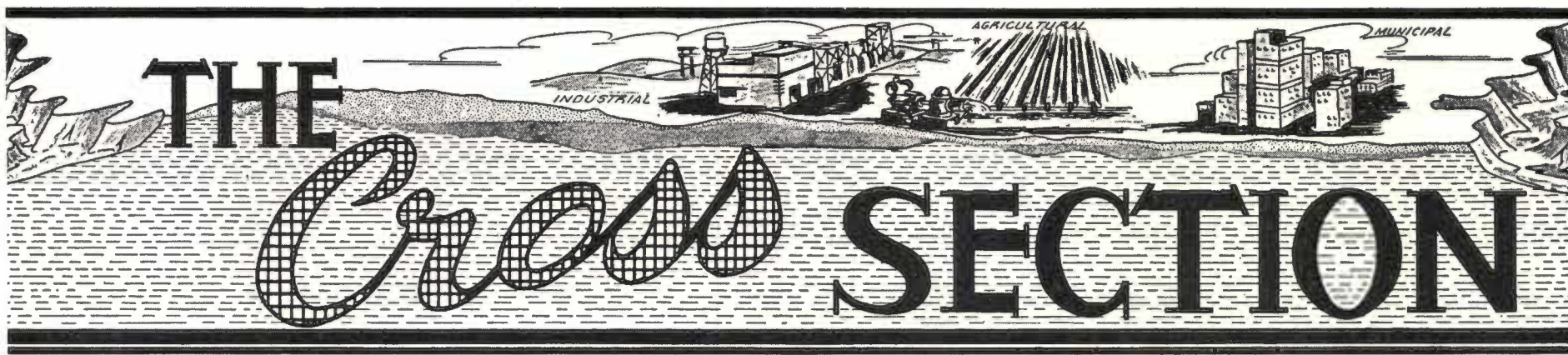
Suppose the farm consists of 160 acres and has 150 feet of water-bearing strata underlying it, then 160 acres x 150 feet x 0.15 percent equals 3600 acre-feet of water available for

pumping. An acre-foot of water is the quantity to cover one acre to a depth of one foot, and it is also equal to 43,560 cubic feet or 325,829 gallons.

An individual may use this information to determine, within reasonable limits, how long the quantity of underground water in storage beneath his farm will last at any annual rate of withdrawal. This assumes of course, that his neighbors pump a comparable amount of water per acre on their farms.

These maps and studies of this type are parts of the regular hydrological work in progress by the staff of the Water District.

Similar maps and information will be prepared, as rapidly as practicable, for all the counties within the Water District. Maps of Deaf Smith, Parmer, Castro, Potter, Randall, Armstrong, Floyd, Bailey, Lamb, Lynn and Lubbock Counties are now available.



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

Volume 2—No. 12

"THERE IS NO SUBSTITUTE FOR WATER"

June 1956

Law Conference Reveals Varied Approaches To State Water Problems

The recent Water Law Conference, sponsored by the Law School of Texas University, in Austin, presented some very important thinking on water problems across our state.

The thing that impressed this writer was the fact that each speaker during the two day conference had a slightly different idea of what should or should not be done about water in Texas.

On surface water, it was pretty well the concensus of opinion that we have too much water going into the Gulf of Mexico unused, but that is about where the meeting of the minds stopped. Some thought that the State should have control of the development of all streams; others believe that individual river sheds should set up their own authorities and develop their stream according to the conditions that exist at that particular time.

To confuse the situation even more, some feel that the development of our water resources should be financed by ad valorem taxes so that the entire state will help in the development. Others think that the persons who derive direct benefit from the water programs should pay for them through user taxes.

Moving on to ground water, which is no more exempt from this same type dissension than is surface water, it was rather alarming to hear some of the conference speakers express to their audience that a central agency of control was the only way in which ground-water resources could be developed fairly and equitably.

Others expressed their opinions to the contrary—that we have legislation on the books at this time giving each ground-water reservoir the authority to establish its own locally-controlled district and enabling the people in the area to elect directors to pass rules and instigate programs of conservation that are practical at the time.

Of course, the final outcome of this basic difference of ideas will be determined by the people. They should take hold of their individual problems and work toward the end they desire. The people did this in the Southern High Plains when they banded together to organize the High Plains Water District. Since the organization of this district constant efforts have been made to determine what the majority wanted done and then administer programs designed to obtain these wants.

The question that boils down this entire problem of who should govern the development of our water re-

(Continued on Page 4)

Hydrologist Will Return To U. S. A. And Texas July 2

W. L. (Bill) Broadhurst, Water District Chief Hydrologist, has stated, in a letter received from him in Guatemala, that he plans to return to Lubbock on July 2.

Mr. Broadhurst has been on a 90-day leave-of-absence from his Water District job in order to work as a rural development consultant for United Development Services in a cooperative program with the Guatemalan government.

Upon completion of field studies being made by Mr. Broadhursts and other experts, a written report as to available resources and recommendations for development will be presented to U. D. S.

When Mr. Broadhurst returns to his desk he will undoubtedly have knowledge that can be of help to our area, and those which will be of direct assistance to our irrigators and water users will be published in "The Cross Section."

Field Checks Are Being Made By Water District

Y. F. Snodgrass, Water District field representative, and his assistant, Joe Bryant, have been spot-checking permits since June 1st, and they will continue to do so through the summer.

These spot-checks are made each summer in every county that comprises the Water District for several purposes.

They serve as useful tools in correcting errors that might be otherwise overlooked. For an example, a permit could show that the well was drilled in the NE 1/4 of a particular section. Upon checking the permit in the field, it is found that the well owner owns the NW 1/4 rather than the one specified.

The correctness of the permit determines its validity. For an example, if the permit specifies that the well was drilled a given number of yards from the north and the west lines, and

(Continued on Page 4)

Results Of Municipal Questionnaire Released By Water Resources Committee

Irrigation Training School To Be Held By Extension Service

The Extension Service of A. & M. College is conducting an Irrigation Training School on June 25, 26, and 27 for County Agents and Vocational Agriculture instructors. The school will be held in the Aggie Auditorium on the Texas Tech campus in Lubbock.

Mr. George Black, Associate Agricultural Agent on Irrigation, has planned a very excellent program touching on various phases of irrigation in the Southern High Plains.

Mr. Tom McFarland, manager of the Water District, is a part of this program and is scheduled to speak to the group at 11 a. m. on the 25th concerning a general topic of "Ground Water District Law — Organization, Purpose and Functions."

Two field trips are on the program—one will be primarily for the purpose of inspecting wells, pumps, power units and water measuring devices; the other will be for the purpose of inspecting irrigation methods.

This type school is excellent and we want to congratulate Mr. Black and others in charge of the program. The better educated our leaders are in the laws pertaining to underground water and the methods of using this water, the more capable they will be in advising us as to how best to approach our water problems as they arise.

STATISTICS FOR MAY

During the month of May 183 wells were registered with the District office and 154 permits were issued by the County Committees. These new permits issued and completed wells follow by county.

County	Permits Issued	Completed Wells
Armstrong	0	0
Bailey	15	29
Castro	13	11
Cochran	8	8
Deaf Smith	26	18
Floyd	16	15
Hockley	25	26
Lamb	13	10
Lubbock	18	28
Lynn	5	15
Parmer	12	13
Potter	0	0
Randall	3	10

Word has been received from the governor's Water Resources Committee as to the results of a questionnaire sent to 580 cities belonging to the League of Texas Municipalities.

Senator George Parkhouse, WRC Chairman, states that the questionnaires show an urgent need for State financial aid in building water facilities.

Representative Leroy Saul of Kress is writing a bill at the present time which would place the State's credit behind cities or other political bodies which need to raise funds for water projects.

Since bills involving ad valorem taxes and water user taxes were turned down by the Legislature during the last session, it would appear that perhaps Rep. Saul's plan could be the answer.

Senator Parkhouse pointed out an important revelation of the questionnaire, "almost without exception, the cities feel that they should build and own their water projects, and that financing should be handled on the lowest level of government possible."

The questionnaires also showed that 76 cities had been unable to build reservoirs because of lack of funds; 95 said projects would be undertaken if State loans had been available; 55 rationed water in 1952; 58 in 1953; 43 in 1954 and 21 in 1955; 37 said they do not have water to meet present needs; 137 said they do not have supplies adequate for future needs.

114 of the cities answered a question which sought ideas as to what, in their opinion, would solve the State's water problems.

The Water Resources Committee conducts monthly hearings in an effort to determine the water legislative needs of our State.

NOTICE!

"The Cross Section" circulation has passed the 11,000 mark, with more subscriptions coming in each day.

Let us point out that "The Cross Section" is free of cost to those who will take the time to mail to us their name and address.

For the convenience of those who do not receive "The Cross Section" but would like to get it, a cut-out coupon has been provided in another part of the paper.

Also, we would like to urge you to send your comments about "The Cross Section" and the material contained therein.

We will be glad to publish your letters of interest to others.

—The Editor.

THE Cross SECTION

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

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ALLAN WHITE
Editor

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Jim Line — Box 87, Bushland, Texas
E. L. Milhoan — Box 45, Bushland, Texas
W. J. Hill, Sr. — Bushland, Texas

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Mrs. Eutha Hamblen, 1710 5th Avenue, Canyon, Texas

J. L. Weick — Rt. 1, Canyon, Texas
Frank Begert — Rt. 1, Canyon, Texas
L. E. Mason — Wildorado, Texas
W. C. Angel — Route 2, Canyon, Texas
John Butler — Route 2, Happy, Texas
Committeemen meet first Monday night each month at 8:00 p. m., County Agent's Office, Canyon, Texas.

KNOW YOUR COUNTY NEIGHBORS

MEET LIT H. MOORE, Jr., who lives near the New Home Community and is a new Committeeman on the Lynn County Committee. His present term of office expires in January 1959.



Mr. Moore attended the New Home High School. He and Mrs. Moore, Ruby Lee, have four children, Yvonna, 6; Gid, 5; Debe, 4; and Kenzel, 2. The family attends the Lakeview Methodist Church.

During the war, Mr. Moore was with the 4th Marine Division and now belongs to the Marine Corps League. He also belongs to the New Home Civic Club, and he teaches the Young People's Sunday School class at his church.

In 1947, Mr. Moore began irrigating with the first of four wells which he operates at the present time. He farms 320 acres of irrigated land and 480 acres of dry land.

Hunting is Mr. Moore's hobby.

MEET DICK ROCKEY of Friona. He serves on the Parmer County Committee. He is beginning the first of a three year term of office which expires in January 1959.



Mr. Rockey and his wife, Lucille, have one son, Howard. They attend the Methodist church.

In 1950, Mr. Rockey started farming under irrigation. Since then he has drilled a second well and now waters 300 acres of land. He also operates 60 acres of dry land.

Mr. Rockey is very concerned about the problems that surround our underground water. He says, "Conservation of our water and attention to our individual farm management problems is very important in retaining ownership and control of this, our most valuable resource."

MEET ELMER L. MCGILL, who lives in Olton and serves as a member of the Lamb County Committee. His present term of office will expire in January 1958.



Mr. McGill was educated in the Olton public school system. He and his wife, Doris do not have any children. They attend the Baptist church in Olton.

All of the 820 acres of land that Mr. McGill farms are irrigated. In 1946, he drilled his first well and began watering. Since that time he has put down four more wells.

member of the Lamb County Farm Bureau, and is a Director of the Olton Co-op Gin.

Hunting is Mr. McGill's favorite hobby even though he does not get to do as much as he would like since his farming duties take most of the time.

MEET MRS. IDA B. PUCKETT, of 319 South Main in Floydada, who is secretary of the Floyd County Committee. She offices in the Floyd County Farm Bureau office in Floydada.



Mrs. Puckett attended Mary Hardin Baylor in Belton. She is a member of the First Baptist church in Floydada. Also she belongs to the Eastern Star. She and Mr. Puckett, who is the county manager of the Farm Bureau, have one daughter, Mrs. Harold Haynie, who lives in Waco and attends Baylor University; and two sons, Dale, who lives in Seminole and Sam, who lives in Floydada.

Mr. and Mrs. Puckett have a 33 acre tract of land outside of Floydada that they work. It has an irrigation well that was drilled in 1954.

Drop by the office and meet Mrs. Puckett personally. She will assist you with any of your water problems.

MEET HASKELL MILLIGAN, who lives in Morton and serves on the Cochran County Committee. His present term of office on the Committee will expire in January 1959.



Mr. Milligan and his wife, Wilma, have two daughters, Darla Jean, 20; and Crystal Arlene, 18; and two sons, Calvin, 26 and Raymon, 25.

Besides serving on the County Water Committee, Mr. Milligan also is a member of the Farm Bureau.

He operates three wells on the 410 acres of land that he farms in Cochran County. He also has irrigation on his farm in Bailey County.

Mr. Milligan desires to serve his community and area by doing all in his power to conserve the available water and fight for local control of our water affairs.

When you move, please notify "The Cross Section" on Post Office Form 22S obtainable from your local postmaster, giving old as well as new address, to insure no interruption in the delivery of your paper.

COTTON BURS — THEIR VALUE IN WATER AND SOIL CONSERVATION

More tons of cotton burs are being put back on the land in the Southern High Plains than ever before. The increase in yields received by neighbors and friends is spurring others to action. The increased water holding capacity of soils treated with cotton burs is most attractive to irrigation farmers who are confronted with annual underground water level declines.

Comparative fertilizer values of bur mold and barnyard manure are shown

to point out the favorable comparison of burs with manure.

Elements	Percent Available	Pounds Per Ton
Bur Mold		
Nitrogen	1.5	30
Phosphate (P205)	.395	7.9
Potash (K20)	5.076	101.52
Barnyard Manure		
Nitrogen	.5	10
Phosphate (P205)	.3	6
Potash (K20)	.4	8

There actually has been more re-

search done on the use of cotton burs than most of us realize and yet there are many answers yet to be determined. For an example, researchers know that on bur treated soil the wind erosion is lessened because of better condition of the soil. It is known that burs mellow the soil and make it spongy and easier to work. Water penetration from rainfall is greater and evaporation is minimized on bur treated land. However, figures are not available that point out statistically the extent of these truths.

Much has been learned pertaining to crop yields and their relationship to burs. The Paymaster Farm in Aiken says that in 1954 test plots showed that 5 tons of composted burs increased the yield on cotton lint per acre by 65 lbs. 10 tons of composted burs increased the yield of lint per acre by 275 lbs.

When this increase in lint yield is multiplied by the present price of cotton a very substantial figure is forthcoming.

The cost of applying burs to the land varies; however, the general cost of distributing the burs is \$2.50 per ton. Of course, the burs themselves are free—the farmer only pays for the spreading. When this spreading is done by the individual the cost figure is lessened.

Certain increased yields can prob-

ably be seen from one application of burs, for a three or four year period.

The Lubbock Experiment Station has conducted controlled research on bur treatment of soils for at least 3 years, and they have obtained very interesting yield data. Their experiments have been conducted on test plots where 0, 2, 4 and 6 tons of burs were distributed by use of a manure spreader. The results of these experiments follow:

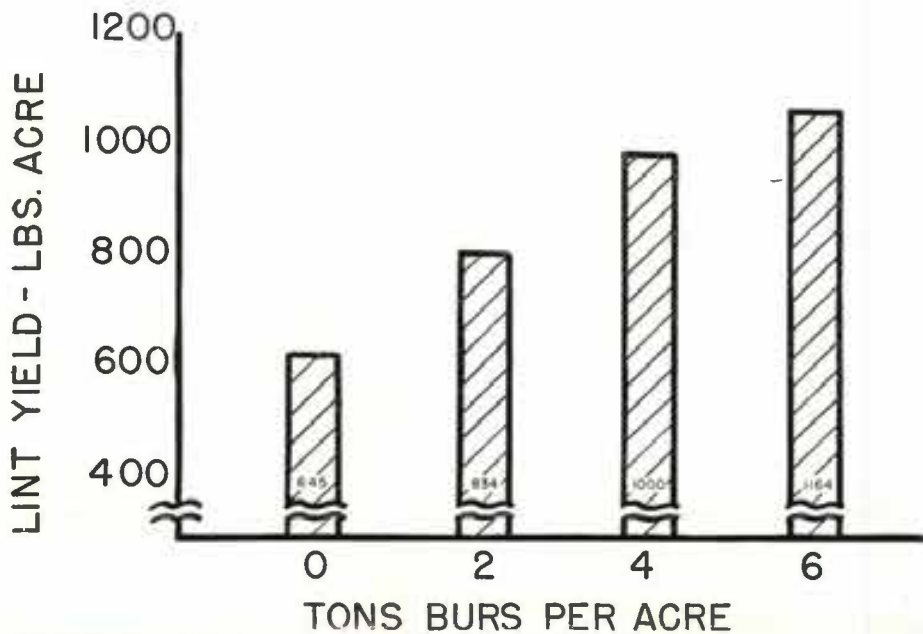
Burs Ton/Acre	Yield—Lbs. Lint Per Acre			
	1953	1954	1955	Av.
0	379	449	645	491
2	422	537	821	593
4	421	490	1017	643
6	453	555	1143	717

Dave Sherrill, Lubbock County Agent, says that he has several farmers within his county that want all the burs that they can get. This comment is the same over the entire Southern High Plains.

With good soil management a must in obtaining the most from the land that we have and the water that is available, soil building practices such as this of returning cotton burs to the land have many farmers and water users taking a long second look.

As information is available from our research centers, this paper will print water penetration and water holding results of bur experiments.

EFFECT OF COTTON BURS ON YIELD OF IRRIGATED COTTON - 1955



Burs are loaded at cotton gin on truck which has been equipped with special distributing features for spreading compost over farm. Burs will hold a great deal of water—about four times their own weight.



Results of using burs are shown above. At the right of the boy, the corn is growing rich and tall on land which was treated with burs.

PROFIT FROM BURS ON IRRIGATED LAND COTTON — 1953-55 AVG.

BURS - TONS/ACRE	VALUE/ACRE
2	\$ 22.80
4	\$ 27.42
6	\$ 44.91

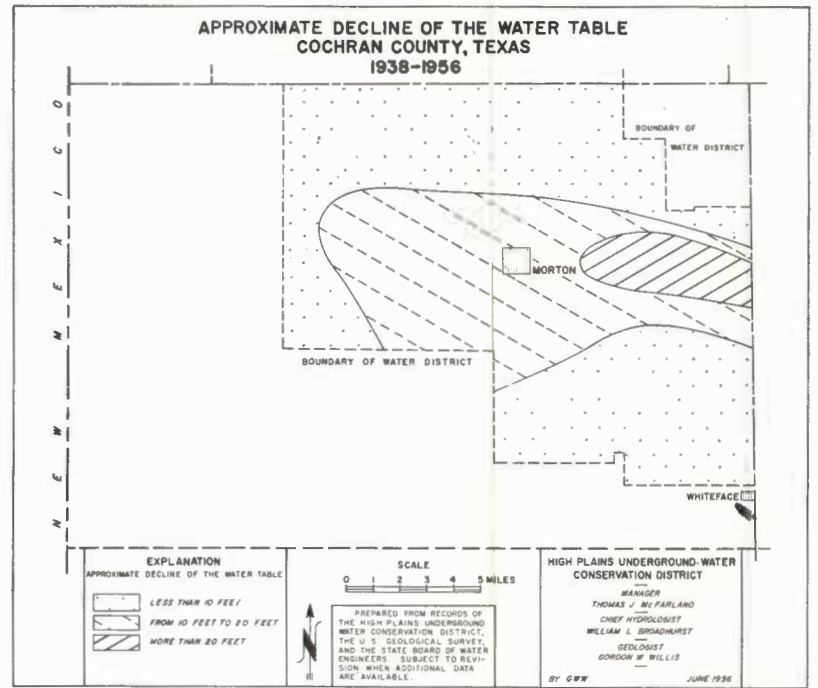
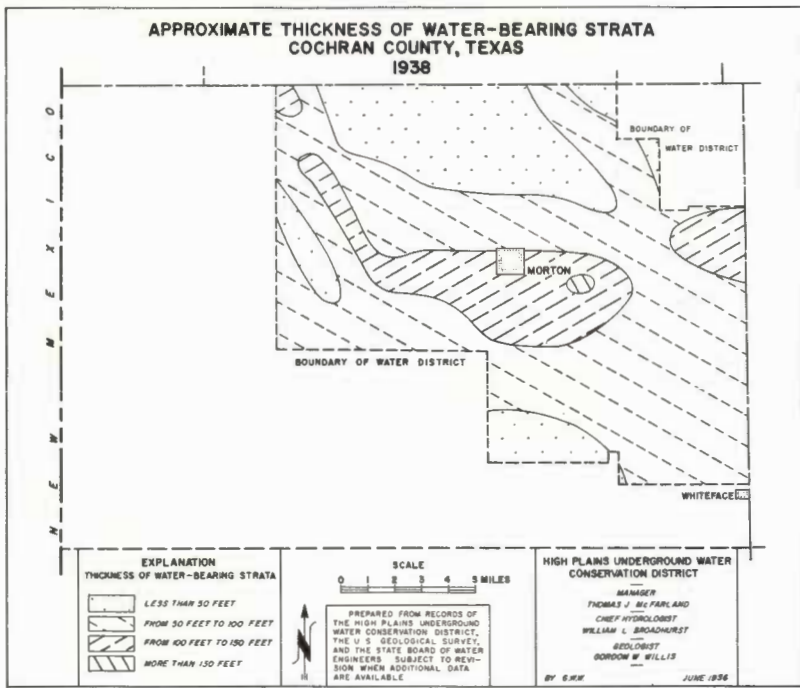


Truck drives back and forth across the tract spreading burs as it goes. Burs have, in the past, normally been disposed of by burning.



The cotton stalks held by the two men above show the dramatic results of using burs. The stalk on the left was grown on land where burs had been applied.

GROUND-WATER INVENTORY CONTINUED—COCHRAN COUNTY



The portion of Cochran County within the boundary of the High Plains Underground Water Conservation District No. 1 contained about 1,320,000 acre-feet of ground water available for pumping in January 1956. This same portion of the county contained about 1,500,000 acre-feet of ground water available for pumping in 1938; and about 180,000 acre-feet, or about 13 percent of the water in storage, was removed by pumping during the 18-year period. Most of the irrigation wells were drilled after World War II, therefore, most of the pumping took place after the war.

About 117,000 acres of Cochran County are within the boundary of the Water District. However, several thousand acres of land outside of the boundary of the Water District are irrigated by more than a hundred ir-

rigation wells. The figures above do not include the ground water in storage or the water that was pumped in the irrigated area outside the Water District.

The accompanying maps were prepared from data compiled from a study of about 400 logs of water wells and about 150 measurements of water levels in wells.

The map in plate 1 shows the approximate thickness of the water-bearing strata in the Ogallala formation in 1938 before an appreciable amount of water had been pumped from the reservoir. The map in plate 2 shows the approximate decline of the water table from the spring of 1938 to January 1956.

The volume of water remaining in the underground reservoir was determined by subtracting the volume

of material unwatered since 1938 from the total volume of saturated material in 1938 and multiplying the remainder by the coefficient of storage of 15 percent.

The approximate quantity of underground water in storage, available for pumping, beneath an individual farm may be determined by multiplying the number of acres in the farm by the thickness of the water-bearing strata underlying the farm and then multiplying by the storage coefficient of 15 percent.

Suppose the farm consists of 160 acres and has 100 feet of water-bearing strata underlying it, then 160 acres x 100 feet x 0.15 percent equals 2400 acre-feet of water available for pumping. An acre-foot of water is the quantity required to cover one acre to a depth of one foot, and it is also equal

to 43,560 cubic feet or 325,829 gallons.

An individual may use this information to determine, within reasonable limits, how long the quantity of underground water in storage beneath his farm will last at any annual rate of withdrawal. This assumes, of course, that his neighbors pump a comparable amount of water per acre on their farms.

These maps and studies of this type are parts of the regular hydrological work in progress by the staff of the Water District. Maps for 12 of the 13 counties in the District have been completed, including Armstrong, Bailey, Castro, Cochran, Deaf Smith, Floyd, Lamb, Lubbock, Lynn, Parmer, Potter, and Randall Counties. The maps for Hockley County will be completed as soon as possible.

Law Conference—

(Continued from Page 1)

sources and who should pay for the programs of development is this, "Who is in a better position to know what will be good for the Southern High Plains, or any other area, than the people who live in these areas and have interests in them?"

All in all, the Law Conference was very informative and helpful in getting other area's ideas as to what problems exist and what can possibly be done to alleviate them.

The University's Law School and Dean Page Keeton deserve a "thank you" for presenting an interesting and controversial program.

Field Checks—

(Continued from Page 1)

when checked in the field, it is found to be at another location, then the permit is not valid. The well must be drilled at the location specified on the permit. It is the same thing as a man who gets a building permit from a city to build a house on a specified lot and actually builds the house on the adjoining lot. You can see that the permit would not be valid.

Accuracy is very important to our work. Your Water District staff can not give you the correct information that you demand and deserve, if the records that we have are inaccurate.

We hope you will work with our field representatives if they should call on you.

EDITOR
THE CROSS SECTION
1628-B 15th Street
Lubbock, Texas

Dear Sir:

I do not now receive THE CROSS SECTION but would like to have it sent to me each month, free of charge, at the address given below.

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MR. Z. O. LINCOLN
913 HOUSTON
LEVELLAND, TEXAS



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

Volume 3—No. 1

"THERE IS NO SUBSTITUTE FOR WATER"

July 1956

Expert Discusses Cotton Production Under Irrigation On The High Plains

Mr. Earnest Thaxton, Assistant Irrigation Engineer, with the Lubbock Experiment Station, speaking to a group of County Agents and Vocational Agricultural teachers during an Irrigation Short Course presented at Texas Technological College by the Extension Service last month, made some very interesting observations:

"Our annual rainfall averages 18.77 inches per year, and approximately 82 percent of this total rainfall comes from April through October. As we all know, distribution is more important than the total amount of rainfall received. There are two rainfall peaks during the year; the first comes in June and the second in September. In four years out of ten the rainfall received in September amounts to more than three inches. Irrigation water used wisely to supplement the annual rainfall insures a good yield of high quality cotton each year. The Lubbock area has a normal frost-free season of 211 days. The average dates for killing frost are April 6 in the spring and November 4 in the fall.

This short growing season is a constant threat to the cotton producer. Other climatic conditions, such as cool temperatures, wind, and torrential rain, make it highly impractical to plant cotton before the middle of May. For this reason we lose 40 to 50 of our original 211 days, leaving 160 to 170 days to mature our crops. In this locality it requires 150 to 160 days to mature cotton so that there is a minimum of damage from frost. Anything that we do during the growing season which tends to delay maturity is to our disadvantage at harvest time. Since this is a fact that we cannot overlook, we must observe certain general rules as regards the application of irrigation water during the growing season.

Cotton which is planted at the normal date will not come into peak fruiting until mid July or later. This period normally lasts from 21 to 30 days. This stage of growth also coincides with our highest temperatures and lowest rainfall average for the growing season. On account of the very dry winter and spring months the soil is usually very dry. For this reason the preplanting irrigation, which is by far the most important, is used to fill the soil reservoir to its full capacity and will thus sustain the plant during the first 45 to 50 days of its development. With the appearance of the first blooms, however, there is a very sharp demand for water which draws heavily on this stored moisture

in the soil. The grower should catch this downward trend in soil moisture with an irrigation. This will push his moisture back to a high level and insure that there is adequate water available during the period when the bolls are growing to full size.

We have found in this area that moisture conditions should be kept as nearly optimum as possible for the cotton plant up until about the 20th of August. By this time the cotton plant will have set and matured a good crop of bolls. Irrigation water applied after the above date more often than not will cause a decrease in yield and, certainly, a lowering of the quality of cotton produced. It may be impossible for the farmer to cover all his acres with an adequate application of water during this period of July 10 to August 20. If this is true, the grower should concentrate his supply of water on those acres which have the highest potential production indicated.

It is equally important that this irrigation completely soak the soil profile, so that there will be water available to the plant for the longest possible period. Cotton will normally exhaust soil moisture from such an irrigation with 18 to 21 days following the application of water. Continued irrigation late in the season does not allow the cotton plant to mature properly and enhances the likelihood of being severely damaged by frost in the fall. Tests conducted here at the Lubbock Experiment Station show that the greatest return per inch of water applied comes from the preplanting application given some time in late April or early May.

In every instance the quality of the product has been higher and thus the return per unit to the farmer has been greater from the cotton produced with a preplanting application alone. The highest yields, however, will come from the treatments which receive the preplanting application, plus one in July about the time peak blooming occurs, with a second application being applied early in August about the time the bolls are full grown. This treatment will return the highest per acre yield but will not necessarily return the greatest monetary value per inch of water applied. It is also of interest to note that in every instance where irrigation water is applied late in the growing season there has actually been a loss in dollars returned per inch of water applied for all water over and above the preplanting application."

BIG CHALLENGE: WATER CONSERVATION

SENATE BILL IS DISCUSSED BY SUBCOMMITTEE

S. 863 is being discussed by a Senate Subcommittee of the Interior and Insular Affairs Committee. One of the attractive issues of the Bill would affirm the jurisdiction of the states over their own water resources.

For many years it has been the established concept that western water rights are dependent on, and determined by, State law. The States themselves and not the Federal Government, have a proprietary interest in and the right to the utilization and control of their own water resources. Such interest and rights should not be withdrawn by any court of law or by any act of Congress. These interests and rights should be strengthened so as to preserve and protect to the fullest lawful extent both the established and the potential uses of western water resources.

The Federal Government should not have, as they claim, a paramount right to western water resources. It should be required to follow a due process of the law in any state in which it is operating.

S. 863 will plug constitutional loop holes that have allowed Federal agencies to supersede state water laws. It is a common feeling that S. 863 should be enacted by the Congress with little, if any, delay.

STATISTICS FOR JUNE

During the month of June 151 wells were registered with the District office and 86 permits were issued by the County Committees. These new permits issued and completed wells follow by county:

County	Permits Issued	Completed Wells
Armstrong	0	0
Bailey	11	9
Castro	13	12
Cochran	5	17
Deaf Smith	24	23
Floyd	4	12
Hockley	7	15
Lamb	7	17
Lubbock	9	23
Lynn	2	11
Parmer	4	9
Potter	0	0
Randall	0	3

The prolonged drouth in Texas has created a critical water shortage in many areas. It is causing some cities to ration supplies and has focused the minds of the people anew on the importance of this vital resource.

Despite scattered rains in some sections, the drouth has reached dangerous proportions and presents a threat to the economy of the State. Not only is the drouth affecting the farmers and ranchers, but dwellers in Texas' fast-expanding cities are feeling the pinch. They are conserving their supplies and looking for new sources of water.

Drouths are not uncommon in Texas. They have occurred at intervals so far back as history records. But rarely has there been a drouth of such duration and intensity as the present one. And there is no end of it in sight.

If "misery loves company," Texas can take some comfort from the fact that drouths have occurred in most parts of the country during the past few years and the water shortage has become a national problem. But realizing that other areas face similar problems doesn't help Texas very much. The whole future of this State is bound up with its water supplies. Unless present supplies can be conserved and new sources found, Texas' industrial development may be stymied and its growth brought to a halt.

Texas' population growth has far outstripped its water supplies. In the 60-year period between 1890 and 1950, the population increased 300 percent but water consumption jumped 13,500 percent, according to figures presented in a recent magazine article. And the ratio probably has increased since 1950, since industrialization has been proceeding rapidly in this period.

Water conservation is the big challenge of the future. It is not a job simply for the conservationists. If Texas expects to expand, all Texans must cooperate in every effort to save our dwindling supplies and find new sources. Upon what happens in the next few years may depend the entire future of this vast Southwestern empire.

Editorial from the—

Lubbock Avalanche-Journal.

Please Close Those
Abandoned Wells!!!



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

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ALLAN WHITE
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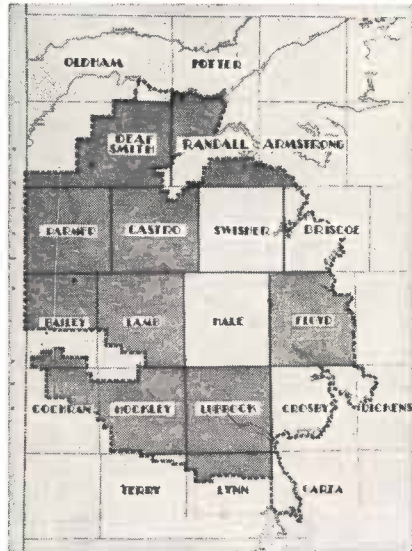
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W. J. Hill, Sr. — Bushland, Texas

Randall County

Mrs. Eutha Hamblen, 1710 5th Avenue, Canyon, Texas

J. L. Weick — Rt. 1, Canyon, Texas
Frank Begert — Rt. 1, Canyon, Texas
L. E. Mason — Wildorado, Texas
W. C. Angel — Route 2, Canyon, Texas
John Butler — Route 2, Happy, Texas
Committeemen meet first Monday night each month at 8:00 p. m., County Agent's Office, Canyon, Texas.



KNOW YOUR COUNTY NEIGHBORS

MEET FRANK ANNEN, who lives on Route 2, Dimmitt. He is a member of the Castro County Committee, and his present term of office will expire during January 1959.



Mr. Annen attended school in Lubbock and Dimmitt. He and his wife, Rose, have two sons, Fred, 30, and Don, 25. The family attends the Catholic Church. Mr. Annen is a member of the Farmer's Union and a past Director in both the National Farm Loan Association and the Dimmitt Cooperative Elevator.

He farms 320 acres of land that he irrigates with two wells. The first of these was drilled in 1950. In conjunction with his 320 acres of irrigated land, he also works 1800 acres of dry land.

Mr. Annen is a long-time resident of Castro County and a man who is vitally interested in his community and the conservation of its water resources.

MEET ERNEST LEE THOMAS of Route 1, Floydada. He is a member of the Floyd County Committee, and his present term of office will expire in January 1959.



Mr. Thomas attended public school in Lockney.

He and his wife, Minnie Faye, have two sons, Bill, 17 and Keith, 12. The Thomas' attend church at the Floydada Methodist Church, where Mr. Thomas serves as a steward.

Mr. Thomas operates 730 acres of irrigated farm land and 110 acres of dry land. He drilled his first well in 1943—now operates four. Along with his farming operation, he also raises livestock.

Mr. Thomas is a member of the Floydada Country Club. He has served twelve years on the Floydada School Board of Trustees and is now serving as a director of the Cooperative Elevator.

For relaxation, Mr. Thomas enjoys traveling, hunting and fishing.

MEET AUBREY BROCK, who lives in Bovina and serves as secretary for the Parmer County Committee. Mr. Brock was educated in Berwyn, Oklahoma.



He and Mrs. Brock, Lorena, have two married children, Nena, who lives in Lubbock, and Ted, who lives in Boulder, Colorado. Mr. and Mrs. Brock attend the Methodist Church in Bovina.

Mr. Brock belongs to the Lion's Club and several Masonic bodies, including the Hoo Hoo.

He is a partner in the insurance firm, Wilson and Brock Insurance Agency. The firm deals in all types of insurance and in real estate sales.

Mr. Brock assists in filling out Parmer County well drilling permit applications, and he does a very fine job, too.

When business slacks off a little, you can usually catch Mr. Brock at the nearest lake with a fishing rod in his hands, or else in the mountains hunting.

MEET ROBERT BLACKWOOD, who lives on Route 1, Muleshoe. He is a new member of the Bailey County Committee. His present term of office will expire in January 1959.



Mr. Blackwood and his wife, Cozette, have two boys, Rodney, 12 and Gregory, 8. The family attends the Church of Christ in Muleshoe.

Mr. Blackwood is a member of the Bailey County Farm Bureau.

He farms 320 acres of irrigated land which he bought in 1949. The two wells with which he does his irrigating were both on the land at the time he purchased the land.

Mr. Blackwood is a strong believer in the rights of the individual to determine policies for the orderly development of our area and its underground water resources.

You Bailey County residents who do not know Mr. Blackwood, get acquainted and talk your individual water problems over with him. You will find him very willing and able to help in any way possible.

MEET PRICE HAMILTON, who lives in the Earth Community on Route 4, Muleshoe. He is a new member of the Lamb County Committee. His present term of office will expire in January 1959.



Mr. Hamilton attended grade, junior high and senior high school in Plainview.

He and his wife, Lillian, have three daughters, Charlene, 17, Norma Lynn, 12 and Loy Jean, 10. They also have a son, Kenney, who is 14.

The Hamiltons attend church at the First Baptist Church in Earth.

Mr. Hamilton operates four irrigation wells, with which he waters 610 acres. He drilled the first of these four wells in 1948. Besides farming, Mr. Hamilton also has a ranch at Shamrock.

When it comes to relaxation and play, Mr. Hamilton has rather a full schedule—he hunts coyotes with greyhound dogs, trains cutting horses, breaks colts, rides with the Earth Riding Club and is a member of the Earth Roping Club.

AN EDITORIAL COMMENT

We appreciate the thoroughness with which "The Cross Section" is being read. Many comments have been received from within the District, but none as complete in all details as those of Mr. Orlin Brewer, quoted below.

If we can be assured of as complete a scrutinization of "The Cross Section" as that given by Mr. Brewer, the people who are paying the tax bill can never say they have not been kept abreast of the activities of the District and what could happen to their water-rights by legislation or other controls.

We respect the right to comment, either editorially or by private letter.

Editorial from—

The Levelland Daily Sun News.

"When county residents pay taxes to the High Plains Underground Water District, they pay the bill for lobbying which is done in the state legislature and for propaganda which is issued on a wide scale, as well as for the services of the district in helping enforce the conservation of water.

Hockley County farmers found out about the lobbying when some of them tried to get a few provisions of the current underground water law changed in Austin.

The water district had prepared the proposed state underground water law and done enough work on top of the ground in Austin that any protests were useless.

The water district is now preparing to start its third year of publication of a monthly paper entitled, "The Cross Section."

It goes out free to anybody who wants it, because it is paid for by taxes of the people living in the 13-county district.

A note from the editor in the June issue brings this into focus:

"The Cross Section" circulation has passed the 11,000 mark, with more subscriptions coming in each day.

"Let us point out that 'The Cross Section' is free of cost to those who will take the time to mail us their name and address.

"For the convenience of those who do not receive 'The Cross Section' but would like to get it, a cut-out coupon has been provided in another part of the paper.

"Also, we would like to urge you to send your comments about 'The Cross Section' and the material contained therein.

"We will be glad to publish your letter of interest to others."

The June issue of the Cross Section has a total of six stories on the front page. One discusses a Water Law conference held recently at the University of Texas Law School, another the results of a municipal questionnaire released by the water resources committee. A third story tells that District Manager Tom McFarland will appear on an extension service program and a fourth that Hydrologist Bill

Broadhurst will return from Guatemala on July 2.

Another story tells that district personnel are making spot-checks of well permits in the district throughout the summer. The final story shows drilling statistics for the month of May, including the fact that 25 permits were issued in Hockley County in May and 26 wells completed.

Half of page two is devoted to listing district personnel and county committeemen for each of the counties; the other half to pictures and thumbnail sketches of these committeemen from over the district. Page three is filled by an illustrated article on use of cotton burs. Page four is devoted to a ground water inventory of Cochran County. (Inventories have been completed on all counties but Hockley).

"The Cross Section" may have a limited value to the 11,000 people who get it, but the bill for printing and editing is paid by all county and district property owners. By its very nature, the paper will never print anything bad about the water district or its operation, for it is the mouthpiece of the management of the district office—not the farmers whose agricultural destiny is governed by the district.

If the farmers decide the district office is getting out of hand, they certainly won't be able to fight for changes through the pages of The Cross Section, or we miss our guess.

Of course, the district office could use The Cross Section to battle down their complaints.

Like any other bureau which ever came into existence, the water district office will probably grow in size and in power as the years go by. Individual farmers will have a smaller and smaller voice.

But since conservation of water resources is so vital to the area, most farmers will be willing to put up with it (conservation of water resources).

Hockley County residents are receiving approximately 1,000 copies of "The Cross Section" each month.

—Editor.

When you move, please notify "The Cross Section" on Post Office Form 22S obtainable from your local postmaster, giving old as well as new address, to insure no interruption in the delivery of your paper.

IRRIGATION TRAINING SCHOOL HELD

The Irrigation Training School, which was held on the Texas Tech campus June 25, 26 and 27, was attended by approximately 40 area county agents, vocational agricultural teachers and farmers.

The school was sponsored by a joint effort of the Texas Educational Agency, Texas Extension Service and the Texas Tech School of Agriculture. Its purpose was to inform the agricultural teachers and leaders of the area as to the geology and hydrology of the Southern High Plains, the laws of our State governing the development of underground water, irrigation methods being used at present and ways and means of improving these methods.

The speakers who made up the program were well qualified to discuss

their assigned subjects.

Statistics presented on present economics of Southern High Plains farming showed a very narrow margin of profit at present production; however with improved planting seed strains and improved practices of working the land and harvesting the crop, this margin can be increased.

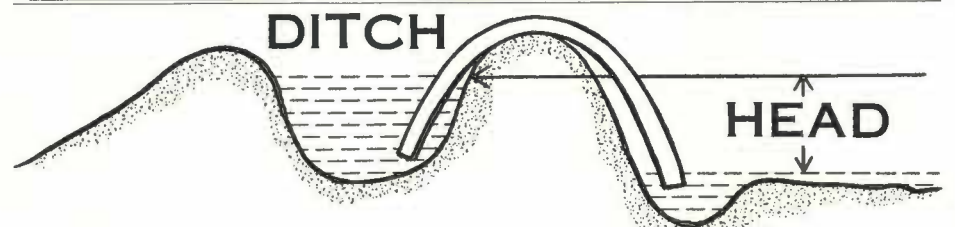
Mr. Walter Labay, Area Supervisor for the Texas Educational Agency; Mr. George Black, Associate County Agent in charge of Irrigation for Districts 1 and 2; and Mr. Robert Thurman, Agricultural Engineer, Texas A. & M. Extension Service, certainly have done a fine job in presenting such an excellent program and one which is of interest to all who depend directly, or indirectly, upon agriculture and irrigation.



Being discussed during recent Irrigation Training School, held in Lubbock, is a cross-section of the geologic formations of the Southern High Plains. Left to right are, Walter Labay, Area Supervisor for the Texas Educational Agency; George Black, Associate County Agent in charge of Irrigation for Districts 1 and 2; Bill Moore, New Deal Vocational Agricultural teacher; and Robert Thurman, Agricultural Engineer, Texas A. and M. Extension Service.

APPROXIMATE FLOW THROUGH FULL SIPHON TUBES FOR VARIOUS HEADS IN GALLONS PER MINUTE

Head in Inches	Diameter of Siphon Tube in Inches						
	3/4	1	1 1/4	1 1/2	2	3	6
1.0	2	3	5	8	15	31	
1.5					18		
2.0	3	5	8	13	21	46	
2.5					23		
3.0	4	6	10	16	26	55	240
3.5					29		
4.0	5	7	12	18	30	63	
4.5					32		
5.0		8	13	21	33	69	
5.5					35		
6.0	6	9	15	24	37	75	345
6.5					38		
7.0					40	81	
7.5					41		
8.0					43	86	
8.5					44		
9.0	7	11	18	28	45	92	420
9.5					47		
10.0					48	98	



Furnished through Cooperative Services of Texas A. and M. College Extension Service.

EDITOR
THE CROSS SECTION
1628-B 15th Street
Lubbock, Texas

Dear Sir:

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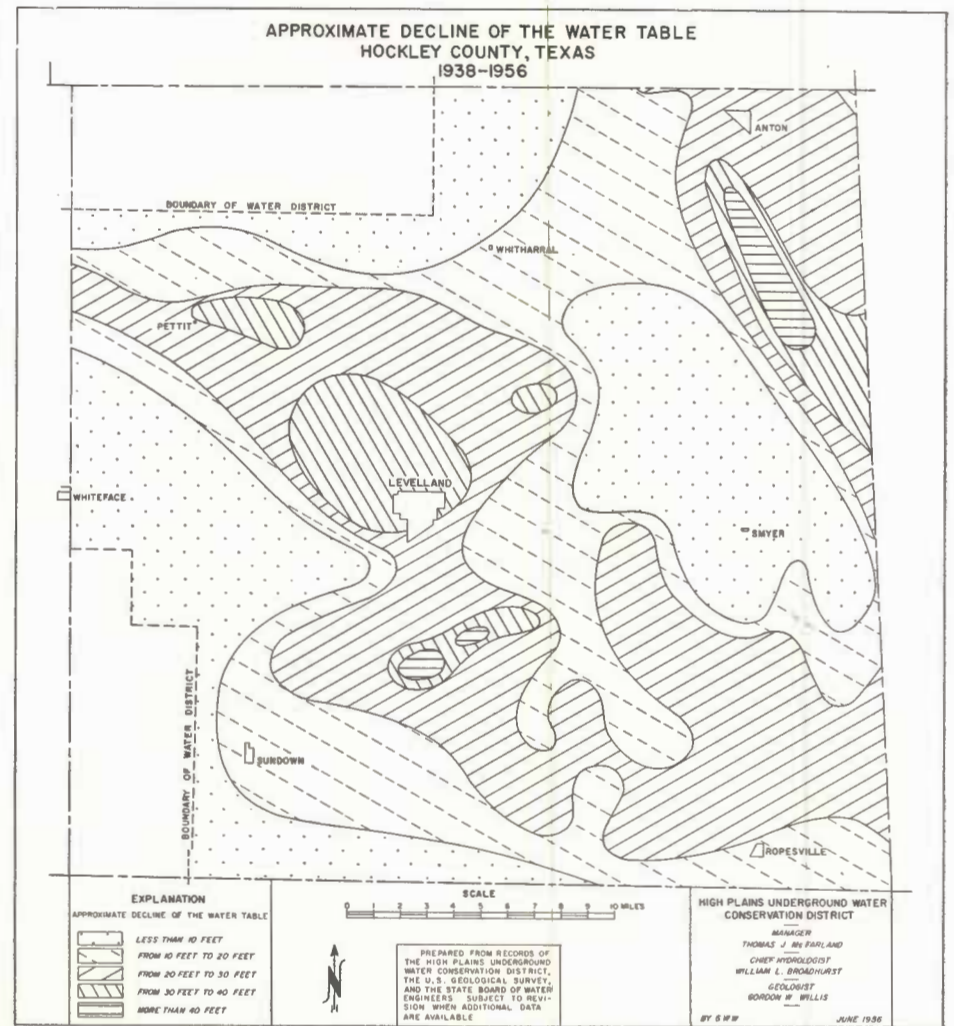
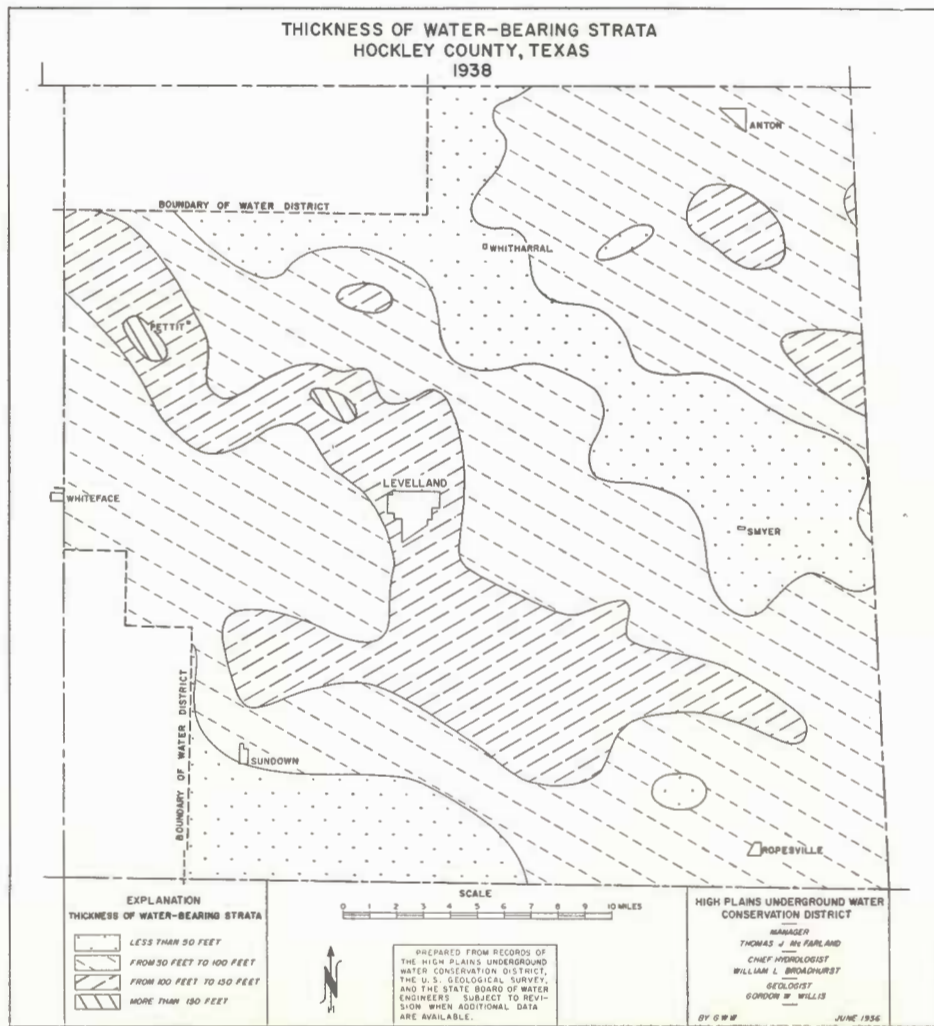
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City and State _____

(Please cut out and mail to our address)

GROUND-WATER COMPLETED GROUND-WATER INVENTORY



The portion of Hockley County within the boundary of the High Plains Underground Water Conservation District No. 1 contained about 4,400,000 acre-feet of ground water available for pumping in January 1956. This portion of the county contained about 5,700,000 acre-feet of ground water available for pumping in 1938, and about 1,300,000 acre-feet, or 23 percent of the available supply of water in storage was removed by pumping during the 18-year period, 1938-55.

Hockley County contains about 577,900 acres and the portion of the county within the boundary of the Water District contains about 496,000 acres. The accompanying maps were prepared from data compiled from a study of about 1,200 logs of water wells and about 1,200 measurements of water levels in wells.

The map in plate 1 shows the thickness of the water-bearing strata in the Ogallala formation in 1938 before an appreciable amount of the water had

been pumped from the reservoir. The map in plate 2 shows the decline of the water table from the spring of 1938 to January 1956.

The volume of water remaining in the underground reservoir was determined by subtracting the volume of material unwatered since 1938 from the total volume of saturated material in 1938 and multiplying the remainder by the coefficient of storage of 15 percent.

The strata underlying the Ogallala formation throughout the entire county are Cretaceous in age. The Cretaceous strata consist of beds of yellow and blue clay, thin beds of limestone, and in some places a thin bed of sand at the base. Practically all of the water from wells in the county is obtained from the Ogallala formation, and only meager quantities of water are obtained from the beds of limestone and sand in the Cretaceous strata.

The approximate quantity of underground water in storage, available for pumping, beneath an individual

farm may be determined by multiplying the number of acres in the farm by the thickness of the water-bearing strata underlying the farm and then multiplying by the storage coefficient of 15 percent.

Suppose the farm consists of 160 acres and has 100 feet of water-bearing strata underlying it, then 160 acres x 100 feet x 0.15 percent equals 2,400 acre-feet of water available for pumping. An acre-foot of water is the quantity required to cover one acre to a depth of one foot, and it is also equal to 43,560 cubic feet or 325,829 gallons.

An individual may use this information to determine, within reasonable limits, how long the quantity of un-

derground water in storage beneath his farm will last at any annual rate of withdrawal. This assumes of course, that his neighbors pump a comparable amount of water per acre on their farms.

These maps and studies of this type are parts of the regular hydrological work in progress by the staff of the Water District.

This series on Hockley County completes the individual county ground-water inventory maps of Armstrong, Bailey, Castro, Cochran, Deaf Smith, Floyd, Hockley, Lamb, Lynn, Parmer, Potter and Randall Counties.

At a later date, composite maps will be published which will consolidate the county maps into district-wide maps.

A LITTLE LIFE IS WORTH MORE THAN A LITTLE TIME . . . CLOSE THOSE ABANDONED WELLS!



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

Volume 3—No. 2

"THERE IS NO SUBSTITUTE FOR WATER"

August 1956

Lamb County Attorney To Serve On American Bar Association Water Rights Committee

Rep. Saul Appointed To Southern Water Committee

State Representative Leroy Saul of Kress, in Swisher County, has accepted an appointment by Governor Allan Shivers as one of two Texans to serve on the Southern Regional Conference of the Council of State Government's special committee on water policy.

A legislative and administrative official of each of the Southern States will serve.

Representative Saul is vice-chairman of the Texas Water Resources Committee, consisting of nine members, appointed to study proposed state water legislation.

He has always worked with the High Plains Water District in the interest of private ownership of underground water and local control of its development.

The Council of State Government's special committee is to develop suggestions in the water policy field to be reviewed at the 1957 annual meeting of the Southern Conference.

Mr. Ed Felder, Executive Secretary of the State Water Resources Committee, is the other Texas appointee to this special committee on water policy.

TWCA Presents Proposed Water Program For Texas

An interesting item appeared in the August 9 edition of "Texas Water Report," a weekly newsletter published in Austin. We print it below for our readers information.

—Editor.

"A. F. Mitchell of Corsicana president of the Texas Water Conservation Ass'n., outlined for TWR the ideas his board of directors members are working on for a water program for Texas. At their meeting in Austin Sept. 6-7, they are to take up a plan for proposed legislation calling for State appropriation of at least \$1 million to finance a long-range Water Planning Commission, to correlate water research activity and fill in the gaps so as to eventually develop a water-use master plan for Texas.

A Committee headed by Frank Kelley of Colorado City, is also working

(Continued on Page 3)

Mr. Arthur P. Duggan, Jr., Littlefield attorney, who has worked with the High Plains Water District on many occasions, has received word of his appointment to the Water Rights Committee of the American Bar Association.

Mr. John S. Field, Chairman, Water



ARTHUR P. DUGGAN, Jr.

Rights Committee, Section of Mineral Law, American Bar Association advised Mr. Duggan of his appointment this month. Mr. Duggan will serve along with six other lawyers on the Committee. They are: John Shaw Field, Reno, Nevada; Booth Kellough, Tulsa, Oklahoma; Calvin A. Behle, Salt Lake City, Utah; Clifford E. Fix, Twin Falls, Idaho; Raphael J. Moses, Alamosa, Colorado; and Fred E. Wilson, Albuquerque, New Mexico.

The committee will make up a panel at a session which will lead off the activities of the Section of Mineral Law during the American Bar Association Convention in Dallas, August 28 at the Hotel Adolphus.

An important talk will be made during the American Bar Association Convention by Raphael J. Moses of Alamosa, Colorado, on "The Correlation of Surface and Underground Water Rights." Clifford E. Fix, Twin Falls, Idaho, formerly Chief Counsel for the Bureau of Reclamation, is scheduled to speak on "Conflict Between Federal and State Water Laws."

Our area is fortunate to have such a representative as Mr. Duggan on this important Committee. He has always used his efforts in fighting for the rights of the individual in developing

(Continued on Page 3)

Report On Guatemalan Assignment

By WILLIAM L. BROADHURST

Guatemala, our neighbor Republic of Central America, is known as the land of Eternal Spring, and in many parts of the Nation that seems to be true, especially in Guatemala City which is about 4,900 feet above sea level. However, both along the Caribbean and the Pacific coasts the temperature really goes up.

The Nation has an area of 42,000 and some odd—some exceedingly odd—square miles. According to the natural geography, Guatemala can be divided into four distinct parts:

(1) The lowland of Peten, which occupies the northern third of the Nation. This region is as flat as the High Plains, but mostly less than 1,000 feet above sea level. It is a dense jungle and is practically uninhabited; the principal living creatures in the jungle are snakes and wild animals. Travel is by boat, air, or on foot—there are no roads. Peten is a region of ruined temples that were built by the ancient Mayan Indians during the time of a once flourishing agricultural empire about 2,000 years ago. (After seeing that region from the air, I could not help wondering how the writers will describe the High Plains of Texas in the year 4,000).

(2) The Central Mountain System of middle Guatemala which consists of strongly folded, faulted, and elevated sedimentary rocks. Canyons are several thousand feet deep; some ridges are capped by local plains that stand more than 10,000 feet above sea level, and mountain peaks reach up to 13,000 feet.

(3) The Pacific Cordillera which consists chiefly of extrusive volcanic material, much of which was violently expelled into the air and solidified in fragments that ranged in size from large boulders to fine dust. The material settled on the land and in lakes to form massive beds of volcanic tuff and agglomerate, some of which are between 1,000 and 2,000 feet thick. The region has about 30 volcanic cones which form a line almost like a picket fence along the Pacific Coast, with peaks as high as 13,800 feet.

(4) The Pacific Coastal Plain which slopes gently southward from the volcanoes to the Pacific Ocean. The Pacific Coast consists of about 10,000 square kilometers of dense jungles (about 2 1/2 million acres or about 9 percent of the Nation). The soil is dark and rich and is underlain at depths of 5 to 15 feet by an immense

supply of ground water. The area receives about 100 inches of rainfall a year and according to preliminary calculations, the underground reservoir beneath the Coastal Plain receives an estimated 2 feet of natural recharge each year. The rain falls during one period from May to October; November to April the Coastal Plain receives about the same amount of precipitation as West Texas.

Guatemala has a population of about 3 million. Nearly all live in the rugged mountainous region of the south-central part of the Nation. Guatemala City, the relatively modern city with many beautiful homes, has a population of about 300,000. Most of the rural inhabitants are Indians and are engaged in agriculture. It is interesting to note that in two departments, units of the nation, for which records are available of the more than 21,000 farms, 77 percent contain less than 3 1/2 acres. By far the majority of the farmers have neither work stock nor machinery. The people prepare the land with hoes, plant the corn with sticks, cultivate it with the hoes, and harvest with sacks or baskets.

The principal exports are coffee, which is grown in the mountains, and bananas, which are grown on the Pacific Coast and along the Valley of the Motagua River near the eastern coast. Very little cotton is grown in Guatemala, and, because of the excessive rainfall and many insects, it seems unlikely that cotton will ever be a major crop.

For centuries the rural inhabitants and the municipalities have obtained

(Continued on Page 3)

Price Daniel Is Interviewed By District

A delegation of High Plains Water District county committeemen and officials attended a Lubbock television show Thursday, August 16, on which Senator Price Daniel appeared in behalf of his candidacy for governor. This delegation was headed by Mr. Marvin Shurbet, President of the Board of Directors of the Water District.

After the television show was completed, our delegation was able to gain a conference with Sen. Daniel in order to ask him questions pertaining to development of underground water.

Naturally, it is very important to understand how the various candidates feel on matters concerning water and our southern High Plains area.

Our delegation was pleased with Sen. Daniel's answers to their questions.

THE Cross SECTION

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

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Telephone PO2-8088

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ALLAN WHITE
Editor

BOARD OF DIRECTORS

Precinct 1

W. O. Fortenberry, Secretary — 1123 Lubbock National Bank Building, Lubbock, Texas

Precinct 2

Gus Parish — Box 67, Springlake, Texas

Precinct 3

W. M. Sherley, Vice Pres. — Lazbuddy, Texas

Precinct 4

V. E. Dodson — Hereford, Texas

Precinct 5

Marvin Shurbet, President — Route 1, Petersburg, Texas

District Office

Tom McFarland — General Manager
W. L. Broadhurst — Chief Hydrologist
Allan White — Office Manager
Y. F. Snodgrass — Field Representative
Mrs. M. McVay — Secretary-Bookkeeper
Mrs. Jean Lancaster — General Office

COUNTY COMMITTEEMEN

Armstrong County

Clifford Stevens — Happy, Texas
James Bible — Wayside, Texas
Floyd B. Adams — Wayside, Texas
Guy Watson — Wayside, Texas
H. C. Newsome — Wayside, Texas

Bailey County

Mrs. Doris Traweek, Bailey County Farm Bureau Office, Muleshoe

Guy Austin — Route 1, Farwell, Texas
Bill Garrett — Route 2, Muleshoe, Texas
W. R. Carter — Muleshoe, Texas
Robert Blackwood — Route 1, Muleshoe, Texas
A. H. Daricek — Maple, Texas

Castro County

Eugene Ivey, Dimmitt

Ivor Baggwell — Route 4, Dimmitt, Texas
Sid Sheffy — Dimmitt, Texas
T. R. Davis — Hart, Texas
L. H. Gladden — Star Route 1, Hereford, Texas
Frank Annen — Route 2, Dimmitt, Texas

Cochran County

J. B. Knox, Western Abstract Co., Morton, Texas

Max Bowers — Morton, Texas
Hume Russell — Morton, Texas
Herbert Cadenhead — Route 1, Morton, Texas
W. R. Key — Morton, Texas
Haskell Milligan — Morton, Texas

Deaf Smith County

Mrs. Pauline Lovan, Deaf Smith County Farm Bureau Office, Hereford

George K. Muse — Box 574, Hereford, Texas
Ed Dziuk, Sr. — Route 2, Hereford, Texas
Ralph Hastings — Route 4, Hereford, Texas
Floyd Walton — Route 5, Hereford, Texas
George T. Turrentine — Route 5, Hereford, Texas
Committeemen meet the first Monday of each month in the Farm Bureau Office, Hereford, 7:30 p. m.

Floyd County

Mrs. Ida Puckett, 319 South Main Street, Floydada

Tate Jones — Floydada, Texas
J. R. Belt — Lockney, Texas
R. C. Mitchell — Lockney, Texas
Robert L. Smith — Lockney, Texas
Ernest Lee Thomas — Route 1, Floydada, Texas



Hockley County

Z. O. Lincoln, 913 Houston, Levelland, Texas

Henry Schmidley — Route 3, Levelland, Texas
Cecil Pace — Levelland, Texas
J. J. Hobgood — Route 2, Anton, Texas
H. C. Janes — Route 4, Levelland, Texas
Joe W. Cook, Jr. — Route 1, Ropesville, Texas
Committeemen meet first and third Fridays of each month at 1:30 p. m., 913 Houston, Levelland, Texas.

Lamb County

Jess Everett, Chamber of Commerce Office, Littlefield, Texas

J. B. Davis — Route 1, Amherst, Texas
Elmer McGill — Olton, Texas
Roy McQuatters — Route 1, Anton, Texas
Price Hamilton — Earth, Texas
Bill Nix — Sudan, Texas

Lubbock County

Mrs. Jean Lancaster, 1628-B 15th Street, Lubbock

Earl Weaver — Idalou, Texas
Earl Reasoner — Box 335, Slaton, Texas
Leroy Johnson — Shallowater, Texas
Howard Alford — Route 4, Lubbock, Texas
Vernice Ford — 3013 20th St., Lubbock, Texas
Committeemen meet once a month in the District office 1628-B 15th Street, Lubbock, Texas.

Lynn County

Mrs. Jean Lancaster, 1628-B 15th Street, Lubbock

Roger Blakney — Route 1, Wilson, Texas
E. L. Blankenship — Route 2, Wilson, Texas
H. D. Dean — Route 6, Lubbock, Texas
Lit H. Moore, Jr. — Route 1, Wilson, Texas
Aubrey Smith — Route 1, Wilson, Texas
Committeemen meet the first and third Tuesdays of each month at 10:00 a. m. in the District Office, 1628-B 15th Street, Lubbock.

Parmer County

Aubrey Brock, Bovina, Texas

John Gammon — Friona, Texas
Walter Kaltwasser — Rt. 1, Farwell, Texas
Carl Schlenker — Route 2, Friona, Texas
Dick Rocky — Friona, Texas
Matt Jesko — Rt. 1, Muleshoe, Texas
Committeemen meet first and third Thursday nights at 8:00 p. m. in Bovina.

Potter County

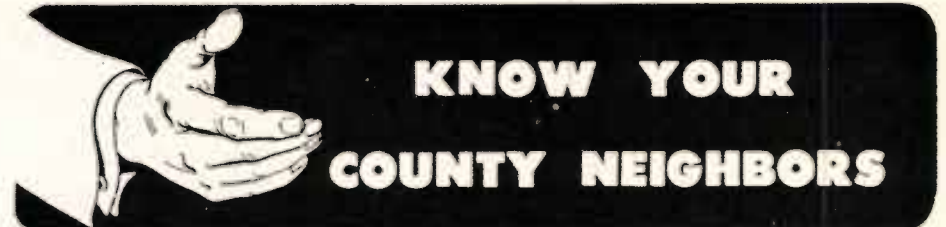
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W. C. Angel — Route 2, Canyon, Texas
John Butler — Route 2, Happy, Texas
Committeemen meet first Monday night each month at 8:00 p. m., County Agent's Office, Canyon, Texas.



Meet A. H. Daricek, who lives in the Maple community, and who is a member of the Bailey County Committee.

Mr. Daricek was raised in Oklahoma — he attended public schools in Chattanooga and Tishomingo, Oklahoma. After operating a garage and service station for a while in Vernon, Texas, he moved in 1930, to the farm where he and his family now reside.

Mr. Daricek and his wife, Cliffie, have one daughter, Afton and one son, Jimmie. The family attends the Baptist Church in Maple.

In 1944, Mr. Daricek drilled one of the early irrigation wells in south Bailey County. He now waters his 427 acres of land with three wells.

For relaxation, Mr. Daricek likes to get away on an occasional fishing trip.

Mr. Daricek's present term of office on the Bailey County Committee will expire in January 1959.

Meet Tate Jones of Floydada, who is a member of the Floyd County Committee. His present term of office will expire in January 1958.

Mr. Jones is a long-time resident of the Floydada community. He attended public school there. Mr. Jones and his wife, Maggie, have two grown sons, Travis, 24 and Bill, 21. The Jones family attends the First Baptist Church in Floydada.

600 acres of irrigated land and 4 irrigation wells to operate are plenty to keep most men more than busy. Mr. Jones not only does just that, but he also has 2400 acres of dry land to farm.

Mr. Jones takes an active part in the Lions Club, Farm Bureau and Chamber of Commerce.

He gets in an occasional round of golf at the Country Club and does some fishing for relaxation.

Meet Harlan D. Dean who lives on Route 6, Lubbock and is a member of the Lynn County Committee.

Mr. Dean finished high school at Tahoka.

He and his wife, Maurine, have one daughter, Sandra, 13; and three sons, Gary, 20, Jimmy, 17 and Wesley, 15. The family attends church at the New Home Baptist Church.

Mr. Dean farms 140 acres of irrigated land, which he waters with three wells. He also works 225 acres of dry land. The first

well to be drilled on Mr. Dean's land was completed in 1947.

Civic activities have a vital place in Mr. Dean's life. He helps to promote his community through the New Home Civic Club, the Agricultural Club and the Farm Bureau.

Fishing is what Mr. Dean calls, "my hobby." He is also an ardent baseball, basketball and football fan.

His term of office on the Lynn County Committee will expire January 1958.

Meet Mrs. Doris Traweek of Muleshoe, who is the office secretary for the Bailey County Committee. She has held her present position with the Committee for three year.

Mrs. Traweek is originally from Lynn County. She attended public school at New Home and college at Eastern New Mexico Junior College in Portales.

Mrs. Traweek and her husband, J. P., have one son, Billy Lee, who is 18 years old and in the Air Force

stationed at Denver, Colorado. Mr. Traweek has a half section of land east of Muleshoe that he farms, and on which he operates two irrigation wells. He drilled his first well in 1952.

Mrs. Traweek is the secretary for the Bailey County Farm Bureau. She worked for the Muleshoe Coop. Gin prior to her Farm Bureau position.

Mrs. Traweek attends the Baptist Church. She has in the past been active in 4-H Club and Home Demonstration work, even though, at present, she is not active in these fields.

Everyone likes Mrs. Traweek and enjoys her friendship. If you do not know her, drop by the office in Muleshoe and get acquainted. She will also be happy to assist you in submitting your application to the Bailey County Committee for a well drilling permit.

Meet Mr. Ivor Bagwell, who lives on Route 4, Dimmitt and is a member of the Castro County Committee. Mr. Bagwell's present term of office will expire in January 1958.

Floyd County seems to be the one-time home of many southern high plains folks and Mr. Bagwell is one of these. He attended both grade and high school in Floyd County.

The Bagwell family numbers four— Mr. Bagwell; his wife, Hazel; Milton, 21; and Nelda Jean, 17. They attend the Baptist Church.

Mr. Bagwell farms on a rather large scale—800 acres of irrigated land and 700 acres of dry land. In 1950, he drilled the first of his four irrigation wells.

Aside from Mr. Bagwell's farming operation, he also raises Angus cattle.

(Continued on Page 3)

IS THE USE OF SMALL IRRIGATION WELLS PROFITABLE?

The question is often asked, "How much water must one have available in order to economically irrigate agricultural crops in the southern High Plains?"

This question probably can not be answered with an unqualified reply, because the answer will necessarily depend upon several factors — soil type, crop prices, and water management by the individual perhaps being the most important of these factors.

In order, however, to pass on some information to those who are interested in this question, we have interviewed one irrigation farmer who has what most would consider a very small amount of available water. The

results of this interview are stated and shown below on this page.

—Editor.

Mr. W. H. Bartlett, who owns 60 acres of land 2 miles southeast of Slaton, in Lubbock County, has one 3-inch well with which he irrigates the larger part of his farm.

The well was drilled five years ago. Its original yield and present yield is approximately 80 gallons per minute. The well is 114 feet deep and the small pump is set at a depth of 110 feet. Total cost of the well, pump, and 5-horsepower electric motor was \$2,118.00.

Generally, during the month of January, Mr. Bartlett begins his pre-plant-

ing watering on his listed land.

By planting time all his land can be watered. During the growing season only 44 acres can be watered adequately. This 44 acres includes all the 25.5 acres of the farm's cotton allotment.

It has been estimated by Mr. Bartlett's neighbors that the maize planted on the 16 acres which was watered only before planting will produce approximately 2,000 pounds of grain per acre.

The 25.5 acres planted to cotton is equal to, or better than, last year's crop, which produced 36 bales from 24.5 acres.

Mr. Bartlett does the work neces-

sary to produce his crops, except the cotton harvest. He hires the labor which is necessary to hand-pull the cotton.

He has the other normal operating expenses, which includes approximately \$45 per month for electricity. The pump usually is used from January to September.

Before reading this report most would say that Mr. Bartlett does not have enough water with which to make an irrigation farm operation pay a fair profit; however, the facts and figures show that with diligent work and good management of the soil and of the water pumped, small wells are profitable.



W. H. Bartlett stands beside his 80 gallon per minute well.



Mr. Bartlett's 25.5 acres of cotton is estimated to produce 1 1/2 bales per acre.



Pictured 16-acre maize crop is estimated to produce 2,000 pounds per acre with only pre-planting watering.



During the winter months Mr. Bartlett uses his small well to irrigate listed land before planting.

REPORT ON GUATEMALA—

(Continued from Page 1)

their water supplies from springs, surface streams, and lakes. However, during the last 25 years 100 or more wells have been drilled, chiefly by the Railroad for locomotive supplies and by the United Fruit Company for domestic uses. The wells were drilled with cable tools to depths ranging from a few feet to more than 700 feet and cased with 6-inch steel casing. The casing is not perforated—all water enters from the bottom. In general the wells yield less than 100 gallons a minute.

Although I traveled about 10,000 kilometers during the three months I was in Guatemala, I saw only three irrigation wells, and they were all on one farm near Zacapa. The wells range in depth from 250 to 400 feet; two are cased with 8-inch casing. There are no perforations in the cas-

ing, all water enters the wells at the bottoms, and consequently the yields are very small. There are two small rotary rigs in the country and the costs for drilling and casing the 6-inch wells are \$10.00 per foot and for the 8-inch wells are \$12.50 per foot.

While on leave from the Water District, I was working for International Development Services, Inc. of New York City, under a contract with the International Cooperative Administration, as part of the technical services that are being furnished in certain rural-development programs of the Government of Guatemala. It was a most interesting assignment and I learned a few facts about ground water that I hope I can pass on to the people of this area. My wife, Ruth, who spent the last six weeks in Guatemala with me, and I were both happy to get our feet back on Texas soil.

TWCA Water Program— Duggan—

(Continued from Page 1)

on a brochure aimed at selling Texans on better management of what water does fall, so as to obtain fuller utilization. Finally, the Board will consider committee reports on the 11 proposed pieces of legislation advanced by the Water Resources Committee.

Mitchell said the work of the Board is progressing nicely, and they hope to bring it into focus at the next meeting. He stressed that the proposal for a water planning commission would be for an agency to cooperate fully with the Board of Water Engineers and to try to pull together a complete picture of Texas' water needs and supplies, with a plan for proper management of the supply."

Neighbors—

(Continued from Page 2)

As a leader of civic activities in the community, Mr. Bagwell has assumed responsibilities—he is a member of the Dimmitt Independent School Board and also is a member of the Board of Directors of the Dimmitt Co-operative Gin.

(Continued from Page 1)

underground water in Texas.

Mr. Duggan is the only Texan who serves on any committee within the American Bar Association.

We offer our congratulations to Mr. Duggan on this appointment.

STATISTICS FOR JULY

During the month of July 165 wells were registered with the District office and 109 permits were issued by the County Committees. These new permits issued and completed wells follow by county:

County	Permits Issued	Completed Wells
Armstrong	0	0
Bailey	16	29
Castro	3	15
Cochran	2	6
Deaf Smith	17	23
Floyd	17	19
Hockley	11	18
Lamb	5	9
Lubbock	15	26
Lynn	2	5
Parmer	18	12
Potter	0	0
Randall	3	3

EDITOR
THE CROSS SECTION
1628-B 15th Street
Lubbock, Texas

Dear Sir:

I do not now receive THE CROSS SECTION but would like to have it sent to me each month, free of charge, at the address given below.

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Street Address _____

City and State _____

(Please cut out and mail to our address)

AN INTERESTING PLAN PRESENTED

The following letter was received from Mr. Stanley Scott of Oakland, California, a former Castro County resident, by the Castro County News of Dimmitt. Mr. Scott is a native of Castro County and an owner of a section of irrigated farmland two miles south of Hart.

We publish this letter because we feel that it presents a plan that is worthy of serious consideration by each Southern High Plains water user.
—Editor.

March 30, 1956

Dear Editor:

Your news story and editorial of March 26 on the Castro County underground water supply prompts me to write this letter. The figures quoted on the total water supply and recent heavy withdrawals are not encouraging, particularly in view of the fact that the rate of withdrawal is still increasing. Mr. Broadhurst's report does indicate that the water supply could sustain a balanced agricultural economy for several generations, but only if a number of extremely important conservation principles are observed.

Up to the present time only a minimum of conservation practices have been put into effect. It seems clear that extensive additional measures must be taken soon, or the available water supply will drop to a critically low level in the not distant future. If conservation methods are to succeed they must be put into effect while there is still something to conserve. If we wait until most of the water is gone it will be too late. We are dealing with an exhaustible natural resource.

In this connection we can take a lesson from those who have been concerned with another exhaustible resource—oil. The United States government has recognized the fact that a limited supply of oil exists. When an oil well is pumped dry, that is the end of it. Because of this fact the government has allowed the oil producers a 27 1/2 percent depletion allowance on their income tax.

The High Plains water supply presents a very close parallel with oil resources. The total available water supply is known, within limits, and the possibilities for recharge are small in comparison with the rate at which water is being pumped out (unless new water sources are found). In fact, there are strong indications that the High Plains underground water will be exhausted long before the Panhandle's oil has been used up, unless something is done.

Thus it seems perfectly legitimate and reasonable to ask that the Federal government recognize through tax

concessions, the exhaustibility of High Plains water, just as it has recognized the exhaustibility of the oil fields. Politically it would probably be difficult to get a special tax cut for each and every High Plains farmer. So a slightly different approach may be desirable. A water depletion allowance could be subtracted from the income tax payments of all High Plains farmers and placed in a special fund. This fund could be administered by a board composed of the directors of the Water District, plus representatives from the State government, plus representatives from the Federal government.

The purpose of the fund might be the following, listed in the order of their importance: (1) To investigate and promote a water recharge program, including an attempt to determine whether or not outside sources of supply can be found. (2) To promote and help finance conservation measures, such as the use of closed distribution systems, the development of methods to get the greatest value from each gallon of water, and the planting of crops which require less irrigation. (3) If other means fail, and early exhaustion of the water supply appears inevitable, to take active steps toward rehabilitating the economy, and toward cushioning the shock that will occur if the water supply should dwindle to the vanishing point.

An effective program of research and development will cost money and effort. It cannot be financed on the shoestring provided by the Water Districts ad valorem tax of 5 cents per \$100 assessed valuation. An income tax depletion allowance would provide the necessary funds for a real program, and place no additional burden on the taxpayers.

Castro County and the High Plains enjoy a complex and productive economy—the area is now one of the richest agricultural regions in the United States. But its future hinges on one factor—water—and the road ahead is not at all clear. If the water plays out, Castro County and the High Plains will revert to the conditions of the 1920's and early 1930's when there was only dry-land farming. If means can be found to replenish the water supply or to conserve it and make it stretch, Castro County and the High Plains have, without question, a long and prosperous future ahead. But the time to do something is now, not after the water is gone.

Yours sincerely,

Stanley Scott
348-63rd Street
Oakland 9, Calif.

AN EDITORIAL

By TOM McFARLAND

In reading the records of ancient history, we become alarmed at the similarity in attitude of the farmer, the man on the street, the politician and the population in general of those times and of our modern times, regarding the one thing that made their civilization and ours so great. All civilization began with the plow. Unless wise conservation of soil and water is practiced at the same time the furrows are being turned, all civilization will ultimately wither and disappear from the earth.

Let us look at some of the records written on the land in the course of civilization from the Holy Land to the Pacific coast of our young country.

The Near East has been called "The Graveyard of Empires." Agriculture had its beginning at least 7,000 years ago in the fertile alluvial plains of Mesopotamia and the Valley of the Nile. In the great plains of Mesopotamia harvest became bountiful by the added use of irrigated water. The crops flourished and granaries filled to overflowing; thereby releasing a great number of laborers, formerly used in the production of food. These laborers turned to the arts and trades creating what we call today, civilization.

In the romantic stories of the Valley of the Nile, we find a situation of abundant food supplies and a remarkable civilization. Our debt to the ancient Egyptians is great. In the Nile Valley the first farmer hitched an ox to a hoe to change the social structure of the times as much as the tractor has changed ours today. From Judea, across China, Cyprus and Syria, through what was once the great forest of Lebanon, which today contains only a small grove of trees, into Timgad, North Africa, once a great thriving agricultural and cultural city, now barely supporting 300 shepherds, the story repeats itself. All through the years as civilizations have grown and prospered, they have neglected the conservation of the resources, soil and water, and have perished.

Today the granaries of this great nation are filled and overflowing. We are enjoying a very high standard of living. The general culture has reached greater heights than was imagined even 50 years ago, and now it appears that the farmer is virtually to be legislated out of existence which could be the first step to the retardation of our nation.

It is a known fact that America's ability to produce food and fiber has always been the greatest factor in winning wars. Should the great American agricultural machine be so weakened as to cause the neglect of conservation of our soil and water, certainly our first line of National Defense would be weakened in direct proportion.

This is the last frontier, for there are no more new continents to discover and exploit. If we are to discover a way of establishing an enduring civilization, we must do it here. This is our last stand. We must find the way.

Mr. W. C. Lowdermilk, former Assistant Chief of the Soil Conservation Service made the following remarks: "If Moses had foreseen what suicidal agriculture would do to the land of the holy earth he might have been inspired to deliver another Commandment to establish man's relation to the earth and to complete man's trinity of responsibilities to his Creator."

In a talk made in Jerusalem on the importance of conservation, Mr. Lowdermilk gave what has become known as the "Eleventh Commandment," "Thou shalt inherit the Holy Earth as a faithful steward, conserving its resources and productivity from generation to generation. Thou shalt safeguard thy fields from soil erosion, thy living waters from drying up, thy forests from desolation, and protect thy hills from overgrazing by the herds, that thy descendants may have abundance forever. If any shall fail in this stewardship of the land thy fruitful fields shall become sterile stony ground and wasting gullies, and thy descendants shall decrease and live in poverty or perish from the face of the earth."

**A LITTLE LIFE IS WORTH MORE
THAN A LITTLE TIME . . .
CLOSE THOSE ABANDONED WELLS!**



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

Volume 3—No. 3

"THERE IS NO SUBSTITUTE FOR WATER"

September 1956

GROUND WATER: ITS IMPORTANCE TO THE ECONOMY OF NEW MEXICO

By C. S. CONOVER

District Engineer, Ground Water Branch, U. S. Geological Survey, Albuquerque, New Mexico

It goes without saying that water and its availability are one of the principal factors in the expanding economy of New Mexico. However, it is not so well recognized or known that ground water, as well as surface water, plays a major role in the economy. Also, in the long run, the most efficient use of our water resources will require increasing attention to the interrelation of surface and ground waters and their development as an integrated water supply.

An estimate of water use in New Mexico for 1955 shows that ground water is used for irrigation on about 66 percent of the irrigated land, or on about 576,000 acres of a total of 873,000 acres. About 131,000 acres of the 576,000 are lands normally furnished surface water but which now are furnished ground water also. Usually it is considered that ground water, when applied to lands normally furnished surface water, is supplemental to the surface water supply. However, because of drought and the interrelation of the waters, such is not always the case. For example, in the Rincon and Mesilla Valleys on the Rio Grande, where until about 1948 ground-water irrigation virtually did not exist, there were in 1955 some 1,700 irrigation wells which furnished all but a few inches of the total irrigation supply. At present, therefore, in the Rincon and Mesilla Valleys the surface water applied to

the irrigated lands is supplemental to the ground-water supply. The situation calls for more than a casual consideration of the pumping of ground water, as it will have far-reaching effects on both the economy and the hydrology of the area.

The importance of ground water to New Mexico is further emphasized by the fact that, of the total quantity of municipal water used, 92 percent comes from wells. The 92 percent is used by 87 percent of the population that is furnished public water. That the proportion of ground water used is greater than the proportion of the population using ground water is interesting, for it means that—contrary to the situation in many other States—the per-capita use of ground water from municipal systems is greater than that of surface water. This is because many of the towns using surface water are located where they have access to streams having only limited flows and also because most of the towns using surface water are in the northern part of the State where the climate is cooler. Where possible some towns that normally use surface water, such as Santa Fe, have drilled wells as a supplemental supply. It is interesting to note that in 1955 Santa Fe used nearly twice as much ground water as surface water, whereas prior to about 1951 only surface water was used. Albuquerque, the largest city in the State, pumped about 26,000 acre-feet of ground water in 1955, an amount sufficient to irrigate 10,000 acres of farmland or to flood the area within the city limits to a depth of about 8 inches. Presently, though municipal use of water is large, it represents only about 5 percent of the water use in the State.

The third important use of water is for industry, although present industrial use of water is only about 1 percent of the total water use in the State. Industrial use now is confined primarily to the refining of petroleum and potash. The need and value of water for industry is emphasized by the potash mines in the vicinity of Carlsbad; there pipelines as much as 35 miles in length have been laid from the potash refineries to the High Plains in Lea County to obtain adequate quantities of fresh water. In addition, appreciable quantities of the saline ground water available locally are used for certain processing.

The value in dollars and cents of ground water to New Mexico is difficult to assess. Without ground water, the population of the State probably would have become fixed long

(Continued on Page 2)

WEATHER MODIFICATION IS DISCUSSED BEFORE WATER RESOURCES COMMITTEE

The September 6-7 meeting of the Texas Water Resources Committee held at the Stephen F. Austin Hotel in Austin, presented many important facts relating to the controversial subject of weather modification (rain-making).

However, there were varying ideas as to the extent of a program and as to the amount of research that should be conducted before actual experiments on a wide scale are undertaken.

The Resources Committee, headed by Senator George Parkhouse of Dal-



The Texas Water Resources Committee is composed of, seated left to right: Rep. Leroy Saul, Kress; Chairman George Parkhouse, Senator from Dallas; Sen. Ray Roberts, McKinney; and standing left to right, Marvin Nichols, Fort Worth; Rep. Stanley Banks, San Antonio; O. G. McClain, Corpus Christi; Howard Boswell, Temple; and Ed Felder, Executive Secretary, Austin. Sen. Frank Owen, El Paso, and Rep. Bill Wood, Tyler, who has recently been elected to the State Senate, were not present for the picture.

Several experts appeared before the Committee and testified as to the possibilities of modifying Texas weather, and to the estimated costs involved in such an undertaking.

Those testifying were: Captain Howard T. Orville, Chairman of the President's Advisory Committee on Weather Control; Dr. Paul C. MacCready, President of Meteorological Research, Inc., Pasadena, California; Jack C. Oppenheimer, Executive Secretary to the Advisory Committee; Paul J. Caubin, Secretary-Treasurer of the Irving P. Krick, Inc., of Texas Weather Modification Projects; Archie M. Kahan, Executive Director of Texas A. & M. Research Foundation; Dr. M. G. H. Ligda, Professor of Meteorology, Department of Oceanography, Texas A. & M. College; K. H. Jehu, University of Texas; Dr. M. H. Halstead, Texas A. & M. College; and Alex Koscielski, University of Texas.

Each of the above men expressed to the Committee his professional opinion that favorable results probably could be forthcoming from a statewide weather modification program.

las, after hearing the testimony, voted to continue studying the matter and to take weather modification under careful consideration as a possible tool in helping to solve the States' mounting water problems.

The Committee heard officials from the oil and gas interests on certain proposed amendments to a draft of a bill entitled, "Waste Disposal by Injection Act."

Also, the Committee heard a proposal by Marvin Nichols, Committee member from Fort Worth, that a bill be drafted and presented to the next Legislature asking that funds be appropriated and used in obtaining state conservation storage in federal flood-control projects.

The Committee decided a bill should be drafted to cover Mr. Nichols' proposal and instructed its legal counselor, Joe Carter, and executive secretary Ed Felder, to begin working on the draft.

The next meeting of the Water Resources Committee will be held October 4-5.

STATISTICS FOR AUGUST

During the month of August 118 wells were registered with the District office and 157 permits were issued by the County Committees. These new permits issued and completed wells follow by County:

County	Permits Issued	Completed Wells
Armstrong	0	0
Bailey	0	1
Castro	29	20
Cochran	3	2
Deaf Smith	16	18
Floyd	28	17
Hockley	14	11
Lamb	16	8
Lubbock	21	14
Lynn	7	5
Parmer	15	18
Potter	0	0
Randall	8	4



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ALLAN WHITE
Editor

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Committeemen meet once a month in the District office 1628-B 15th Street, Lubbock, Texas.

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E. L. Blankenship — Route 2, Wilson, Texas
H. D. Dean — Route 6, Lubbock, Texas
Lit H. Moore, Jr. — Route 1, Wilson, Texas
Aubrey Smith — Route 1, Wilson, Texas
Committeemen meet the first and third Tuesdays of each month at 10:00 a. m. in the District Office, 1628-B 15th Street, Lubbock.

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Carl Schlenker — Route 2, Friona, Texas
Dick Rocky — Friona, Texas
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Frank Begert — Rt. 1, Canyon, Texas
L. E. Mason — Wildorado, Texas
W. C. Angel — Route 2, Happy, Texas
John Butler — Route 2, Happy, Texas
Committeemen meet first Monday night each month at 8:00 p. m., County Agent's Office, Canyon, Texas.

Ground - Water Of New Mexico—

(Continued from Page 1)

ago at a level lower than at present. However, for talking purposes, it may be assumed that irrigation water is worth \$10 an acre-foot, municipal water 25 cents per 1,000 gallons, and industrial water 50 cents or more per 1,000 gallons. The latter figure is set high because of the high cost of getting water for some of the principal industrial users. In other terms, the water is worth about 0.7 cent per ton, 6 cents per ton, and 12 cents per ton for the three uses, respectively. Water is still our best buy. Using the above figures, the present annual value of ground water to New Mexico is \$13,500,000 for irrigation, \$8,600,000 for municipal use, and \$3,800,000 for industrial use, a total of about \$26,000,000.

The present use and value of the ground water to the State are only a part of the picture that must be known before the potential value of this resource to the economy of the State can be appraised. A study of the increase in development in the past, coupled with evaluation of its effects on the water supply; an inventory of the volume of ground water in storage and of the recharge to and discharge from this supply; and additional knowledge of basic hydrologic principles are needed to appraise the ground-water potential of the State. Needless to say, in such a large State with such a varied geologic and hydrologic environment, an accurate answer is difficult to obtain and in addition requires appreciable time. Also, as the availability of water and the need for it vary with time, owing to changes in precipitation and demand, all estimates are subject to continued reappraisal.

One of the important programs with the State Engineer is that of continuing evaluation of changes in ground-water storage as represented by changes in water levels in observation wells. At present water levels are measured annually in some 1,700 wells in 18 main areas of development. Such records, however, are not now being obtained in some important areas—for example, the Rincon and Mesilla Valleys.

The amount of land irrigated by ground water in New Mexico has increased appreciably in the last few years, from about 140,000 acres in 1940, to 320,000 acres in 1950, and to about 576,000 acres in 1955. Ground-water irrigation is practiced in about 20 major areas. Part of the increase, some 130,000 acres since 1940, represents lands previously served exclusively by surface water, such as those in the Rincon and Mesilla Valleys and some in the Carlsbad area.

Much of the ground-water development has occurred in areas where the recharge is small, such as the High Plains of Lea and Curry Counties, the Mimbres Valley near Deming, and the Animas Valley southwest of Lordsburg. However, the volume of water contained in ground storage in these areas is very large, and development over a long period will be possible if this valuable resource is used wisely and efficiently. For instance, fairly reliable information indicate that some 25,000,000 acre-feet of water is stored in the Ogallala formation in Lea County. The hydrologic conditions in Lea County are such that essentially all water pumped is taken from storage. At present most water in Lea County is being used for irrigation. Appreciable development for irrigation began in 1948, and to date

water levels have lowered about 25 feet locally where pumping is concentrated. However, in areas distant from pumps, water levels have declined only a few feet. Because of the slow rate of movement of ground water, long-term development is favored by conservative pumping which allows time for water to move from distant areas to the pumped wells. Under present controls established in Lea County by the State Engineer, a minimum safe life of development of 40 years appears assured. Increased conservation of water, and increased industrial use of water, would maintain the economy at a high level for many years.

In contrast to areas where water essentially is being mined, there are certain areas in the State, particularly along the Rio Grande in places such as the Rincon and Mesilla Valleys, where ground-water reservoirs are or can be replenished from surface-water supplies. In such areas efficient utilization of the ground-water resource revolves around the long-term availability of surface water taking into account the need of downstream users, the capture of water being wasted by native vegetation, and maintenance of soil-moisture salinity at a safe level. In other words, in such stream valleys the total water supply must be considered as a unit, ground water plus surface water. Full integration of the ground-water and surface-water use in stream valleys apparently could increase measurably the amount of water dependably available for beneficial use. The ground-water reservoir in the Rio Grande Valley is very large when compared with present surface reservoirs constructed in the State. For instance, in the middle Rio Grande Valley, it is estimated that nearly half a million acre-feet of ground water is stored within 100 feet of the surface under each area of valley floor equivalent to a township (36 square miles); in other words, there is more water stored under 5 townships than can be stored in Elephant Butte reservoir. Underground storage generally has the advantage of being relatively immune to direct evaporation losses, a major item in surface reservoirs in this dry country. Because of the large underground storage, utilization of the ground water as a regulating reservoir would result in a firmer supply, during droughts, than could be obtained through man-made surface reservoirs alone.

Full utilization of the ground-water reservoir in the Rio Grande Valley would result in an appreciable lowering of water levels during droughts. This would have a three fold effect: (1) waste of water by water-loving plants would be measurably reduced, resulting in an effective increase in water supply; (2) the quality of the ground water would deteriorate temporarily, owing to cessation of drain flow; and (3) nearly all water users would of necessity use ground water to secure a dependable water supply.

In considering the water potential of the State, mention is made many times of the total precipitation as a measure of potential water supply. Using 13.9 inches as the average precipitation for the State, it might be stated that the potential water supply is 90,000,000 acre-feet. However, the real potential is only a very small fraction of this, as evapotranspiration must take its toll. If it were not for the fact the precipitation comes main-

(Continued on Page 3)

ARE YOU WASTING VALUABLE WATER WHICH SHOULD BE SAVED FOR FUTURE USE?

Good soil and water management appears to be the answer to most waste water problems. Preparation of the soil in such manner as to facilitate the "in-soak" from not only irrigation water, but also the rain that falls on the land, is the condition for which each farmer should strive.

Plowing under shredded grain sorghum stalks or cotton burs provides the organic matter necessary to prepare the soil for good "in-soak" texture.

"In-soak" conditioning of the soil provides a useful tool in combating waste of precious water. Well conditioned soil has the ability to hold more water and to give it up to evaporation more slowly.

Many farms in the Southern High Plains consist of very sharply sloping lands, and even though excellent conditioning of the soil has been accomplished they still present the problem of how to soak the soil and still

not run water off the land. This problem is being solved by many of our enterprising farmers. Various methods are being employed and most are excellent.

Contour irrigation farming is one method, even though it is somewhat of a controversial one. It controls the rate of flow of water. It provides for good "in-soak" of both irrigation water and rainfall. The biggest objection to irrigating on the contour is the danger of heavy rains washing down the slope across the rows leaving the land in such condition as to be difficult to work.

Bench levelling of sloping land is probably the best method of keeping water under control. Heavy rains can be handled with practically no runoff and irrigation water can be distributed evenly.

High borders at the end of rows are being used with satisfaction by

many farmers who have sloping land. This method of controlling water is inexpensive and normally is satisfactory, particularly on land where the sharp slope is not immediately at the end of the rows.

On land where the majority of the slope comes at the immediate end of the rows, many farmers have found that by planting grain sorghum, alfalfa or corn in perpendicular rows to the main crop, that these rows will take up the excessive runoff of irrigation water.

Many methods are being used other

than those discussed. In one method, or a combination of methods, should lie the key to improving the irrigating problems on your individual farm.

If you have the problem of what to do about "tail-water" on your farm, please think about it seriously, do some talking with your County Agent, Soil Conservation and Experiment Farm personnel, and your fellow irrigators. See if it will be feasible for you to employ a good program of water and soil management for the coming year. You will find that it will pay you dividends.



Plowing shredded grain sorghum stalks and cotton burs into the soil helps water penetration and lessens "runoff."



Contour irrigation slows down the rate of water flow and facilitates water penetration.



Perpendicular rows to the main crop help in soaking up excessive irrigation water, and at the same time can produce a profitable crop.



Heavy borders at the end of rows keeps irrigation water on the cropland where it can be used beneficially.



Bench levelling is excellent for distributing water uniformly and preventing "runoff."

Ground - Water Of New Mexico—

(Continued from Page 2)

ly in showers of short duration in snow, evapotranspiration would claim all the precipitation. We must therefore content ourselves with essentially the water that appears as run off to the streams and as recharge to the ground-water bodies. This amount is only a small fraction of the precipitation, on the order of 5 percent. Of this amount, nature takes a further toll in the form of evaporation from streams and surface reservoirs and evapotranspiration from areas of shallow water table where dense growths of native vegetation exists. The remaining 95 percent includes the soil moisture that benefits mankind by maintenance of range, forest, and cropland. There are two main areas in New Mexico where large areas of native vegetation exist, the delta areas of Elephant Butte Reservoir and McMillan Reservoir. The Bureau of Reclamation has spent considerable sums in salvaging water in the Elephant

Butte delta by construction of a river channel and drains. The Pecos River Commission is proposing a similar project in the McMillan delta to salvage about 25,000 acre-feet of water annually. Further, in considering the water available for development in the State, allowance must be made for downstream users such as Texas and Arizona.

Considering the future, it has been estimated that the population of New Mexico will increase by more than 50 percent by 1975. The need for water will undoubtedly increase by a greater percentage, as the tendency is for continued increase of per-capita use of water. Though our water supplies are limited and generally fully utilized at present, the future is not exactly bleak. Much can be done and undoubtedly will be done to assure the continuing availability of water. Solution to many of the water problems revolve around economics. As water becomes more scarce, it be-

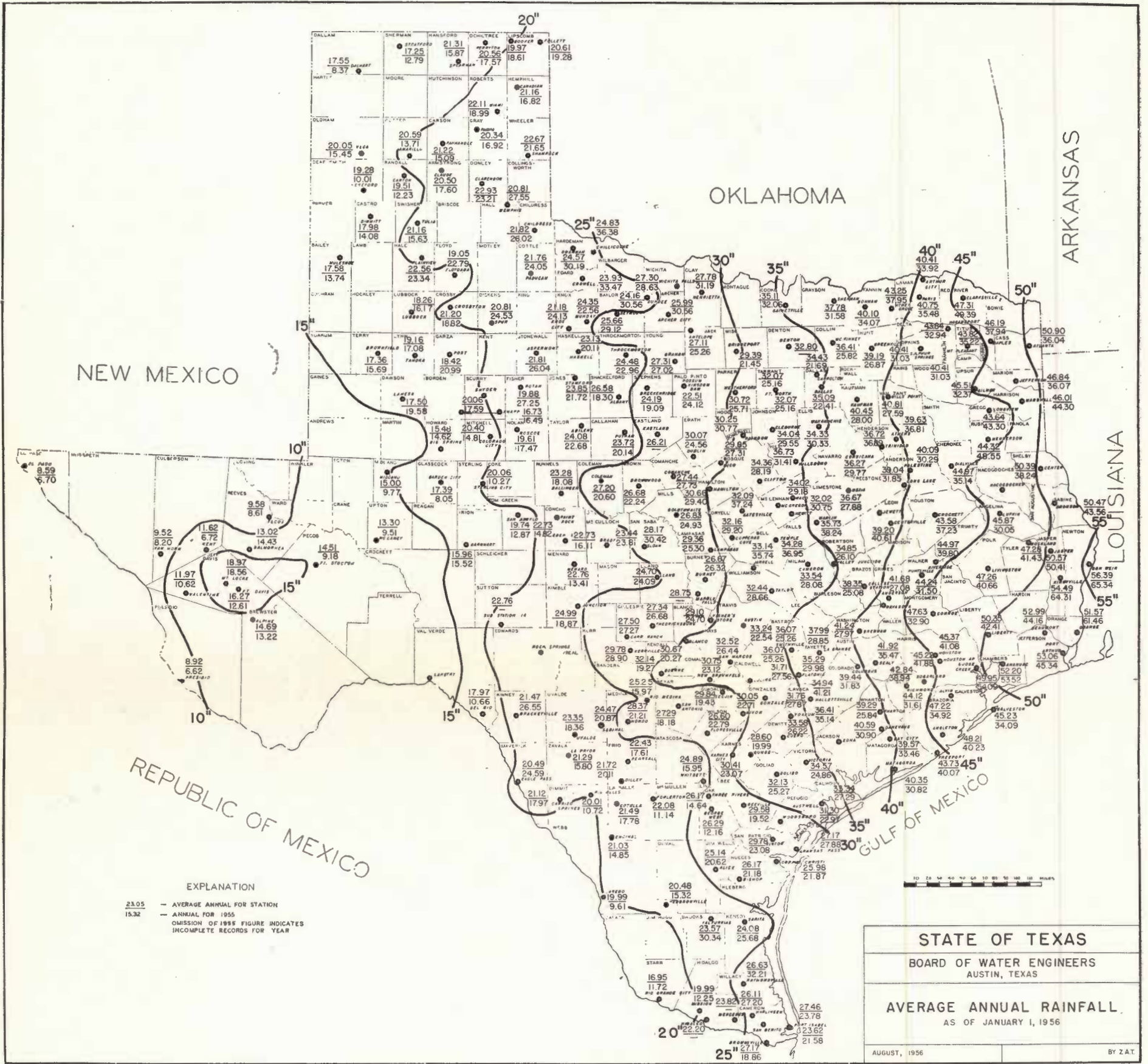
comes more valuable, and certain conservation and developmental measures can be undertaken in the future which at the present may be uneconomical. Measures that need to be considered in evaluating and providing for our water supply in the future are: Reduction of nonbeneficial use by native vegetation, such as in the middle Rio Grande Valley and along the Pecos; conservation of present supplies by increasingly efficient use of water, such as by using closed conduits in irrigation; utilization of non-potable water for certain industrial processes, such as water flooding of oil fields; reclaiming waste waters such as sewage in certain areas for other uses; substitution of low-water-requirement industries for irrigation in some areas; utilizing additional water supplies, such as water from the San Juan and ground water in areas presently undeveloped; utilizing underground storage to conserve surface waters; and conversion of saline

water for municipal and industrial use. There also remain the possibilities, which as yet are only remote, of artificially increasing the precipitation and increasing the percentage of runoff.

Solution to these problems will not come easily or in a short time and will require a consistent, continuous effort to collect and interpret water facts. Further, effective solution will depend upon concentrated effort on the part of many agencies and individuals, actively supported by the public.

The foregoing, which is the greater part of a paper presented May 3, 1956 by Mr. Conover, at a Seminar on "Water Resources and Their Importance in New Mexico," is reprinted in an effort to inform our readers of the problems in our neighboring state of New Mexico and of the possible solutions to these problems. We hope that an understanding of the problems of others may help us in working with our own problems.

—Editor.





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

Volume 3—No. 4

"THERE IS NO SUBSTITUTE FOR WATER"

October 1956

WATER DISTRICT SEEKS CONSERVATION ASSISTANCE FOR HIGH PLAINS FARMERS AND RANCHERS

Geologic & Hydrologic Facts Presented

In an early report prepared by the Department of the Interior entitled "Water Supply Paper 889-F—Underground Water in the High Plains of Texas," prepared by W. N. White, W. L. Broadhurst (who is now Chief Hydrologist for the Water District) and J. W. Lang, in cooperation with the Texas Board of Water Engineers, some very interesting facts are presented on a subject that is often discussed. Below is an excerpt from the report:

"The beds of the Ogallala formation once extended from the mountains of New Mexico eastward far into Texas, but they have been removed by erosion from much of the territory they once occupied. The areas in which this formation is still present stand up almost like islands, being bounded by the escarpments of the High Plains, both on the east and on the west, and being separated in Texas by the Canadian River, which is deeply entrenched in the older rocks. The Ogallala formation has been completely eroded away west of the western escarpment and east of the eastern one and from the canyon-like valley of the Canadian River. The water-bearing sands and gravels of the Ogallala in both of these segments, therefore, are cut off in all directions from any underground connection except through the underlying older rocks, which contain highly mineralized water entirely unlike the fresh water in the Ogallala."

"In parts of the High Plains, wells in the Ogallala yield large quantities of water and in some localities many such wells have been used for years. It is not surprising therefore that a popular theory has developed to the effect that the wells are tapping an inexhaustible supply of water in an underground river which flows beneath the High Plains and has its source in the Rocky Mountains far to the west. As a matter of fact the high yield of the wells is explained by the relatively high permeability of the sands and gravels from which they draw water. The water is contained in interstices between the particles of gravel and grains of sand. Although it is moving, generally in a southeasterly direction, the movement is very slow, perhaps at an average rate of 200 to 300 feet a year, and therefore, is scarcely comparable to that of a river. *Inasmuch as the water*

(Continued on Page 4)

Former District Board Member Resigns Bank Post

An era has passed in the history of Muleshoe and Bailey County — with the resignation of Jesse M. Osborn as Chairman of the Board of the Muleshoe State Bank.

Mr. Osborn's resignation was an-



JESSE M. OSBORN

nounced by Walter A. Woodrum, president of the bank. He stated, "Jesse Osborn's work and services are greatly appreciated by the Muleshoe State Bank and his resignation as Chairman of the Board of Directors is accepted with deep regret."

"After serving as head of this bank over 20 years, Jesse continues in his service to this community. Jesse Osborn is a genuine servant of the people, signified by his Legislative work, his farming and cattle activities, the financial assistance and guidance to his fellowmen, and above all the humanitarian principles which he practices."

"It has been a pleasure to be associated with Jesse Osborn since the ownership of the Muleshoe State Bank has changed."

Mr. Osborn was one of the early members of the Board of Directors of the High Plains Water District. He has always struggled for private ownership of underground water and for the rights of the individual to develop

Educational Programs Go Forward

The High Plains Water District's water resources information and educational program is getting underway.

An illustrated brochure is being prepared and will soon be ready for distribution. The brochure will depict the story of development in the Southern High Plains of agricultural, industrial and municipal water supplies. It will explain the geology and hydrology of the area and enter briefly into a discussion of the Water District and some of the more important programs of conservation that are being practiced. Lastly, the brochure will attempt to look into the future of the Southern High Plains region.

The brochure will be very attractive and we hope a useful tool in advising interested persons of the facts as we now know them.

The Water District is also working with our public schools in presenting to the Superintendents and Vocational Agricultural teachers the story of water supply, development, and conservation. Eventually it is hoped that with the assistance of the schools' personnel a comprehensive educational program for the students will include fundamental principals of soil and water conservation.

NRA Meeting To Be In Salt Lake City

The 25th Annual Meeting of the National Reclamation Association will be held in Salt Lake City on November 14, 15 and 16. Convention headquarters will be Hotel Utah.

Those planning to attend should make their reservations early by writing Mr. William Backman, Convention Bureau, Chamber of Commerce, 207 South Main Street, P. O. Box 329, Salt Lake City, Utah. No reservations will be accepted directly by the hotels.

W. L. Broadhurst, Chief Hydrologist for the Water District, is a member of the Water Policy Committee of the NRA and will attend the November convention.

his own water. He has done this as a private citizen and as a Representative in the Texas Legislature. He has recently been renominated to the House of Representatives by the Democratic party.

Mr. Osborn moved to Muleshoe in February 1931.

Public Law 1021, which was enacted by the 84th Congress and recently signed by the President, amends the Soil Conservation and Domestic Allotment Act by adding a subsection, which in general is as follows: Notwithstanding any other provision of the law, the Secretary of Agriculture is authorized to enter into contracts of not to exceed ten years with producers in the Great Plains area, which shall be designed to assist farm and ranch operators to make changes in their cropping systems and land uses which are needed to conserve the soil and water resources on their farms and ranches and to install the soil and water conservation measures needed under such changed systems and uses.

The program authorized under this subsection shall be in addition to, and not in substitution of, other programs in such areas authorized by this or any other Act.

There was authorization to be appropriated without fiscal year limitations, such as may be needed to carry out this subsection: Provided, that the total cost of the program shall not exceed \$150,000,000 and for any program year payments shall not exceed \$25,000,000.

As a result of the law discussed above, the Directors of the High Plains Underground Water Conservation District have recommended to the State Agricultural Stabilization and Conservation Committee that multi-purpose wells, which shall be designed to drain lake water into the underground reservoirs, be included as an integral part of the State wide program.

STATISTICS FOR SEPTEMBER

During the month of September 99 wells were registered with the District office and 166 permits were issued by the County Committees. These new permits issued and completed wells follow by county:

County	Permits Issued	Completed Wells
Armstrong	0	0
Bailey	22	11
Castro	24	8
Cochran	0	5
Deaf Smith	24	6
Floyd	19	14
Hockley	21	6
Lamb	7	16
Lubbock	18	15
Lynn	16	4
Parmer	15	12
Potter	0	0
Randall	1	2



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

Published monthly by the High Plains Underground Water Conservation District No. 1
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Telephone PO2-8088

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ALLAN WHITE
Editor

BOARD OF DIRECTORS

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Gus Parish Box 67, Springlake, Texas

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Precinct 4

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Allan White Office Manager
Y. F. Snodgrass Field Representative
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COUNTY COMMITTEEMEN

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Floyd B. Adams Wayside, Texas
Guy Watson Wadside, Texas
H. C. Newsome Wayside, Texas

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Haskell Milligan Morton, Texas

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George K. Muse Box 574, Hereford, Texas
Ed Dziuk, Sr. Route 2, Hereford, Texas
Ralph Hastings Route 4, Hereford, Texas
Floyd Walton Route 5, Hereford, Texas
George T. Turrentine Route 5, Hereford, Texas
Committeemen meet the first Monday of each month in the Farm Bureau Office, Hereford, 7:30 p. m.

Floyd County

Mrs. Ida Puckett, 319 South Main Street, Floydada

Tate Jones Floydada, Texas
J. R. Belt Lockney, Texas
R. C. Mitchell Lockney, Texas
Robert L. Smith Lockney, Texas
Ernest Lee Thomas Route 1, Floydada, Texas



Hockley County

Z. O. Lincoln, 913 Houston, Levelland, Texas

Henry Schmidley Route 3, Levelland, Texas
Cecil Pace Levelland, Texas
J. J. Hobgood Route 2, Anton, Texas
H. C. Jones Route 4, Levelland, Texas
Joe W. Cook, Jr. Route 1, Ropesville, Texas
Committeemen meet first and third Fridays of each month at 1:30 p. m., 913 Houston, Levelland, Texas.

Lamb County

Jess Everett, Chamber of Commerce Office, Littlefield, Texas

J. B. Davis Route 1, Amherst, Texas
Elmer McGill Olton, Texas
Roy McQuatters Route 1, Anton, Texas
Price Hamilton Earth, Texas
Bill Nix Sudan, Texas

Lubbock County

Mrs. Gladys Huffhines, 1628-B 15th Street, Lubbock

Earl Weaver Idalou, Texas
Earl Reasoner Box 335, Slaton, Texas
Leroy Johnson Shallowater, Texas
Howard Alford Route 4, Lubbock, Texas
Vernice Ford 3013 20th St., Lubbock, Texas
Committeemen meet the first and third Mondays of each month at 2:00 p. m. in the District Office, 1628-B 15th Street, Lubbock, Texas.

Lynn County

Mrs. Gladys Huffhines, 1628-B 15th Street, Lubbock

Roger Blakney Route 1, Wilson, Texas
E. L. Blankenship Route 2, Wilson, Texas
H. D. Dean Route 6, Lubbock, Texas
Lit H. Moore, Jr. Route 1, Wilson, Texas
Aubrey Smith Route 1, Wilson, Texas
Committeemen meet the first and third Tuesdays of each month at 10:00 a. m. in the District Office, 1628-B 15th Street, Lubbock.

Parmer County

Aubrey Brock, Bovina, Texas

John Gammon Friona, Texas
Walter Kaltwasser Rt. 1, Farwell, Texas
Carl Schlenker Route 2, Friona, Texas
Dick Rocky Friona, Texas
Matt Jesko Rt. 1, Muleshoe, Texas
Committeemen meet first and third Thursday nights at 8:00 p. m. in Bovina.

Potter County

Jim Line, Box 87, Bushland, Texas

James W. Walton Bushland, Texas
Earl Barclay Bushland, Texas
Jim Line Box 87, Bushland, Texas
E. L. Milhoan Box 45, Bushland, Texas
W. J. Hill, Sr. Bushland, Texas

Randall County

Mrs. Eutha Hamblen, 1710 5th Avenue, Canyon, Texas

J. L. Weick Rt. 1, Canyon, Texas
Frank Begert Rt. 1, Canyon, Texas
L. E. Mason Wildorado, Texas
W. C. Angel Route 2, Canyon, Texas
John Butler Route 2, Happy, Texas
Committeemen meet first Monday night each month at 8:00 p. m., County Agent's Office, Canyon, Texas



MEET JOHN L. WIECK of Route 1, Canyon, who is a member of the Randall County Committee. His present term of office will expire during January 1958.

Mr. Wieck attended school at Umberger and Price College in Amarillo. He served in Africa and Italy with the U. S. Forces during World War II, where he received the Purple Heart decoration.

Mr. Weick and his wife, Edna, have six children, Larry, 13; Linda, 10; Marilyn and Carolyn, 7 year old twins; Stanley, 5; and Mike, 4. The family attends the Umberger Catholic Church.

During 1947, Mr. Wieck, drilled the first of two wells that he uses to irrigate 200 acres of land. He also farms 160 acres of dry land.

Mr. Wieck does not have a hobby. He does take part in many civic projects for betterment of his community. He belongs to the Knights of Columbus.

MEET FLOYD B. ADAMS who lives in the Wayside community and serves as a member of the Armstrong County Committee. His present term of office will expire in January 1957.

Mr. Adams attended public school at Wayside and college at West Texas State College in Canyon. He and his wife, Aline, are members of the Baptist Church.

In 1947, Adams drilled his first irrigation well. He farms 320 acres of irrigated land and 640 acres of dry land. He is a member of the Farm Bureau and the Happy Wheat Growers.

For relaxation and enjoyment, Mr. Adams likes to go on an occasional hunting trip with his neighbors and friends.

Mr. Adams has been one of the pioneer water conservationists in his area.

MEET JAMES W. WALTON, who lives in Bushland, which is west of Amarillo. Mr. Walton serves as a member of the Potter County Committee.

Mr. Walton attended both elementary and high schools in Amarillo.

He and his wife, Irene, have two children, Donald, 15 and Carroll, 11. They attend church at the Baptist Church.

Mr. Walton farms on rather an extensive basis — 580 acres of irrigated land and 481 acres of dry land. He drilled his first

well in April 1954. Mr. Walton is chairman of the Boy Scout troop in Bushland and has a vital interest in all projects which are designed to aid in the progress of his area and community.

He has a hobby which is very unique, and very gratifying, in this day of television and fast living—reading.

In January 1959, Mr. Walton's present term of office on the County Committee will expire.

MEET RALPH HASTINGS, who lives on Route 4, Hereford. He is a member of the Deaf Smith County Committee, and his present term of office expires in January 1958.

Mr. Hastings attended the Hereford public schools and the University of Texas in Austin. He is a member of the Masonic Lodge, and a past president of the Deaf Smith County Chamber of Commerce in Hereford.

Mr. Hastings and his wife, Mitt, have one son, Wayne, who is 11 years old. The family attends the Presbyterian Church in Hereford.

Operating 5 irrigation wells and 925 acres of land keeps Mr. Hastings from having much idle time, however he does manage to work in a hunting trip from time to time. He drilled his first irrigation well in 1943.

The enjoyment of sports events is Mr. Hastings' principle way of relaxing.

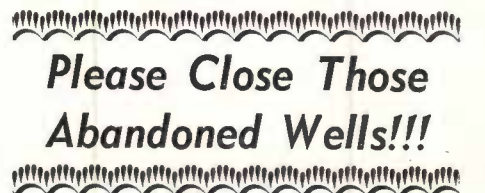
MEET FRANK BEGERT, who lives on Route 1, Canyon. He is a member of the Randall County Committee and his present term of office will expire during January 1957.

Mr. Begert attended public school and then completed a business course. Afterwards he entered into the grocery and mercantile business. He only began farming in 1946.

Mr. Begert and his wife, Verna Lee, have one daughter, Hila Fae, 22, and two sons, Fred R., 24 and Robert F., 11. The family attends church at the Methodist Church.

Buying and selling cattle takes most of the time that remains from Mr. Begert's duties of farming 400 acres of irrigated land. In 1946, he drilled the first of his three irrigation wells. He has one 8-inch well and two 6-inch.

For relaxation, Mr. Begert enjoys most every kind of sport, both as a participant and as a spectator.



ARE YOU PLANNING TO DRILL A WELL?

If so, you will be interested to know what is necessary for you to do in order to obtain a well drilling permit.

For the purposes of this presentation when the word "well" is used it will refer only to those wells which are to be drilled with the intent of producing in excess of 69.4 gallons of water per minute. Smaller wells do not come under the jurisdiction of the Water District.

First of all, you need to measure from the new well site to the two nearest property lines. Then, measure from the new well site to the nearest three wells that are within a quarter mile (440 yards).

The next step is to take this information, along with the legal description and ownership of the land upon which the well is to be drilled, to

your County Committee Secretary.

The information will then be transferred to an application form furnished by the Water District. A sample form is pictured on the left below. You will note that it is filled out using fictitious names and information.

When the application is filled in, signed by the applicant and the required \$10 is deposited with the County Committee, then a number is given the application and the application is submitted to the Committee for approval. This approval may be obtained by leaving the application with the secretary for the Committee to act upon at its next regular meeting; or, the approval may be obtained by the applicant personally carrying the application to any three of the five committeemen for their signatures.

When the Committee approval is ob-

tained, then you are ready to drill the well.

Upon completion of the drilling, casing and testing of the well, a log of the formation, a description of the permanent equipment installed and details on well construction shall be submitted to the County Committee. The information will then be transferred to a "log and registration" form, which is furnished by the Water District. A sample form is shown on the right below. It is completed with fictitious names and information merely to acquaint you with the completed form.

At this point the applicant has fulfilled his contract with the Committee and the \$10 deposit which was placed with the Committee will be refunded in full.

The table which follows sets out the

spacing requirements for various sized wells:

4-inch well or smaller must be a minimum of 200 yards from the nearest well.

5-inch well must be a minimum of 250 yards from the nearest well.

6-inch well must be a minimum of 300 yards from the nearest well.

8-inch well must be a minimum of 400 yards from the nearest well.

10-inch well or larger must be a minimum of 440 yards from the nearest well.

We hope that the information presented will help in familiarizing you with the procedure of obtaining a well drilling permit. Should you have questions that this discussion does not answer, your County Committeemen will be glad to go into the matter as thoroughly as is needed.

FORM NO. 355 AWP

Duplicate—File Copy

District File No. _____

FOR USE OF DISTRICT OFFICE ONLY

High Plains Underground Water Conservation District No. 1

Application for Water Well Permit

INSTRUCTIONS: Fill out in quadruplet. Submit all copies to County Committee for approval. (PLEASE TYPE OR PRINT.)

I, John J. Doe Box 10, Dimmitt, Texas

NAME OF LANDOWNER LANDOWNER'S ADDRESS

hereby make application to HIGH PLAINS UNDERGROUND WATER CONSERVATION DISTRICT NO. 1. for a permit to drill the hereinafter described water well at the location indicated:

1. County Castro

2. NW 1/4, NE 1/4, SW 1/4, SE 1/4 of Section 14 Block X

MARK OUT ONES THAT DO NOT APPLY

Survey San Augustine Co. School Land

3. Labor _____ League _____

4. Proposed Use (MARK OUT ONES THAT DO NOT APPLY)

5. Drilling to start about October 25, 1956

This well will be located: { 3 miles N or S and 3 miles E or W of the

Permit good for 120 days only from date of approval. town of Dimmitt, Texas

FORM NO. 354R-LW

Duplicate—File Copy

District File No. _____

FOR USE OF DISTRICT OFFICE ONLY

High Plains Underground Water Conservation District No. 1

REGISTRATION and LOG OF WELL

INSTRUCTIONS: Fill out in quadruplet. Submit all copies to County Committeeman for registration. (Please type or print.)

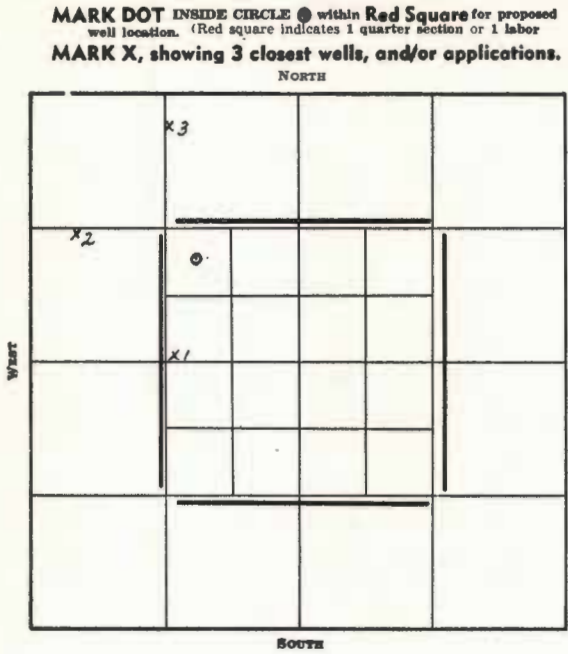
1. Well Owner John J. Doe Address Box 10, Dimmitt, Texas

2. Well located _____ miles N, 3 miles S, _____ miles E, 3 miles W of the town of Dimmitt, Texas

3. County Castro Labor _____ League _____ Homestead _____

4. NW 1/4, NE 1/4, SW 1/4, SE 1/4 Section 14 Block X Survey San Augustine Co. Sch. Land

5. ACTUAL LOCATION OF THIS WELL IS { 100 measured yards from N or S line of this tract of land. 100 measured yards from E or W line of this tract of land.



Please Make Sure Your Measurements Are Correct—They Will Be Checked for Accuracy

Location of Proposed Well as submitted by applicant is 100 measured yards from (N 3) and 100 measured yards from (E 3) property line, quarter section line, or labor line.

Number the three adjacent wells, and/or applications, on the plat as 1, 2 and 3, to correspond with the following:

Well 1 330 measured yards from proposed well. Owned by Applicant Address _____

Well 2 400 measured yards from proposed well. Owned by George Roe Address Rt. 1, Dimmitt, Texas

Well 3 440 measured yards from proposed well. Owned by Robert Loe Address Rt. 1, Dimmitt, Texas

SCALE FOR ABOVE PLAT

1 1/10 inches	440 yards	Minimum for 10-inch well
1 inch	400 yards	Minimum for 8-inch well
3/4 inch	300 yards	Minimum for 6-inch well
5/8 inch	250 yards	Minimum for 5-inch well
1/2 inch	200 yards	Minimum for 3 or 4-inch well

I agree that this well will be drilled within ten (10) yards of the location specified and not elsewhere, and that I will furnish my County Committee the completed well registration and log immediately upon completion of this well and prior to the production of water. I hereby certify that I have read the foregoing statements, and that all data therein contained are true and correct to the best of my knowledge and belief.

This notice given by: William Wae Tenant, Route 1, Dimmitt, Texas

This permit approved subject to the rules for spacing from existing wells and or prior permits

1. J.C. Pausade 2. James Townes 3. Robert Downs

Check here when well is located on the County map.

SMITH PRINTING CO. : DIAL 909-9619 LUBBOCK

DRILLER'S LOG OF WELL

Method of Drilling: Rotary

FROM (FEET)	TO (FEET)	DESCRIPTION OF FORMATION MATERIAL	FROM (FEET)	TO (FEET)	DESCRIPTION OF FORMATION MATERIAL
0	4	Top Soil	390	392	Red Bed
4	30	Caliche			
30	100	Clay			
100	170	Sandy Clay			
170	200	Tight Sand			
200	230	Coarse Sand and Gravel			
230	232	Rock			
232	300	Coarse Sand			
300	302	Rock			
302	390	Coarse Sand and Gravel			

I hereby certify that this well was drilled by me (or under my supervision), and that each and all of the statements herein are true to the best of my knowledge and belief.

Driller Jack Tiller Address Dimmitt, Texas Date Drilled 10-22, 1956

DESCRIPTION OF WELL

6. Casing: new, used, gas line, or shop made. Diameter 16 in. Total length 392 ft.

7. Casing perforations: from 200 ft to 390 ft. Size 1/4" X 12". Number per foot 6 rows

8. Pump Column: Size 6 in. Total length 200 ft. Suction pipe: Size 6 in. Length 10 ft.

9. Pump bowls: Size 10. Number of stages 5. Pump discharge pipe: Size 6 in.

10. Depth to water level 104 ft. Pump discharge 525 GPM. Pumping level: 175 ft.

11. Power Unit: Electrical, Natural Gas, Butane, Other _____ Horsepower 55

Signature William Wae Tenant, Route 1, Dimmitt, Texas

Final Completion of Well — Date 10-29, 1956.

A LITTLE LIFE IS WORTH MORE THAN A LITTLE TIME—CLOSE THOSE ABANDONED WELLS!

LEGISLATIVE BRIEFS



CONSERVATION CONVERSATION

The Texas Water Resources Committee has drafted thirteen bills to be presented to the Legislature during the next legislative session. These bills are designed to combat the growing water problems of our State.

Mr. Joe Carter, attorney for the Resources Committee has been very helpful in furnishing "The Cross Section" with a brief resume of each of these thirteen drafts.

—Editor.

1. Certified Mail Act: This act was originally intended to reduce the expense of making application for a water permit. It was broadened to allow all State agencies to avail themselves of the reduction in fees from using certified instead of registered mail. It is believed that the saving will be approximately \$.25 for each letter mailed.

2. Cancellation Act: This will permit the Board to cancel those portions of certified filings and permits which have not been put to use for a period of ten years. In it, the Legislature declares that such unused filings and permits are presumed to have been abandoned after such time period. Provision is made for public hearings and notice. Its enactment should result in many cancellations of unused rights which now confuse the picture by giving a false impression that all appropriate rights are being put to use.

3. Waste Disposal by Injection Act: This requires the obtaining of a permit from the Board of Water Engineers to dispose of industrial and municipal waste by injecting it underground. Regulatory authority rests in the Railroad Commission where the waste being disposed arises from oil or gas operations. Disposal of waste by injection is not too prevalent at the present time, but it is anticipated that this practice will grow in the future. This bill is a step forward to protect underground water from pollution.

4. Water District Directors' Residence Act: This will require that the directors of all types of water districts shall be property owning residents of such districts. The present law permits a person to serve as director if he owns land but does not reside within the district.

5. Water District Name Act: This suggested amendment is designed to allow water districts to adopt a name which is descriptive of the locale of the district or of the principal powers to be exercised. Thus, instead of designating a district as a Water Control and Improvement District, it may be known, for example, as a Municipal and Industrial Water District.

6. Forbidding Negotiated Contracts

Act: This deletes from the present law the provision permitting the negotiations of contracts by a water district without having published bids.

7. Exclusion Hearings Appeal Act: The language of the present law forbids appeals as it relates to the granting or refusing of an application to exclude land from the district. The suggested new law provides for appeals from such decisions by resort to a trial de novo in the District Court.

8. Granting or Refusing Petition Act: This will permit the Commissioners' Court or Board to refuse to grant powers which will not be exercised by a proposed Water Control and Improvement District. It will also permit the Court or Board to exclude from the proposed district lands which the evidence at the public hearing indicates will not be benefited by such inclusion. The present law insofar as it relates to underground water districts is not disturbed.

9. Contest of Creation Act: This bill provides for a trial de novo in appeals from decisions of the Commissioners' Court or Board granting or refusing a petition to create a Water Control and Improvement District.

10. Master Plan Hearings Act: This bill will require the Board of Water Engineers to hold a public hearing when a river authority submits a master plan for watershed development. The committee felt that a matter of such great importance should have a public hearing.

11. Proposed Constitutional Amendment: This will authorize the Legislature to provide for the issuance of bonds in amounts not to exceed \$100,000,000.00, the proceeds of which may be used to purchase bonds of other Texas public agencies issued for the purpose of water conservation and development. No express provision for a tax is included in this resolution. Discretion will rest in the Legislature as to the manner, means and source for raising the required funds.

12. Enabling Act: This sets up the machinery for carrying into effect the constitutional amendment if adopted. As presently written it provides for a water development board to approve all bond issues. Before it can authorize such an issue, the Board of Water Engineers must approve the project which will receive assistance from the Texas Water Development Fund.

13. A Proposed Bill, which will permit the Legislature to appropriate funds (not to exceed \$10,000,000.00 per annum for a period of time not to exceed five years) to purchase conservation storage space in federally constructed dams, is now being prepared.

Also being prepared is a bill to in-

The Water District has received from the Board of Water Engineers in Austin, a paper entitled, "Water Rights in Texas." This paper was written by the Board's legal adviser, Joe D. Carter. It presents a very concise story of both surface and ground water.

Those interested in receiving a copy of this paper, please write to us. We will be happy to forward one to you.

—Editor.

In an October 11 news release by the Texas Board of Water Engineers, it is reported that according to preliminary figures furnished by the U. S. Agricultural Marketing Service, cooperating with the Texas Agricultural Extension Service, from data collected by the U. S. Weather Bureau for about 120 selected rainfall gauging stations, the statewide average rainfall was 0.53 inch or 18 percent of normal.

Areal average rainfall in all regions

crease the powers and functions of the Water Pollution Advisory Council in the field of pollution control.

Marvin C. Nichols, Fort Worth engineer and lay member of the Texas Water Resources Committee, proposed a resolution during the October meeting of the Resources Committee, that a constitutional amendment be drafted which would place a 3-cent ad valorem tax on all Texans for money to be spent on water conservation and water development projects.

The Committee approved the resolution and advised its staff to draw up a draft which would cover the amendment. Representative Leroy Saul, Kress, did not vote on the resolution.

Rep. Saul stated that he would have to "wait and see" the proposed ad valorem tax amendment before he could commit his vote.

A similar bill was defeated during the last session of the Legislature.

of the State was less than one-fourth normal except in the northeast and in the lower Rio Grande Valley. The Brownsville areal average was 2.36 inches or 48 percent of normal, and the northeast Texas areal average was 1.22 inches or 40 percent of normal.

In the report of the President's Advisory Committee on Water Resources Policy, Clarence A. Davis, Under Secretary of Interior, Washington, D. C., made the following comments:

"I should like to impress four things in the beginning, first, there is not a water problem, but there are many water problems; second, while these problems are nationwide, they are not necessarily national; third, that there is no magic formula which can be applied nationwide as a solution of these problems. Lastly, the policies we adopt go to the heart of our national economy and ultimately to our very form of government."

"The concentration of the control of water in the federal government means ultimately the control of the land, the power and consequently, the whole economy of the region." . . .

Geology—

(Continued from Page 1)

bearing beds are cut off in all directions from outside sources of water except through underlying rocks containing poor water, it follows that the source of the fresh water must be entirely within the High Plains Area and must be the rain and snow that fall on its surface."

When you move, please notify "The Cross Section" on Post Office Form 22S obtainable from your local postmaster, giving old as well as new address, to insure no interruption in the delivery of your paper.

EDITOR
THE CROSS SECTION
1628-B 15th Street
Lubbock, Texas

Dear Sir:

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High Plains Underground Water
Conservation District No. 1
1628-B Fifteenth Street
Lubbock, Texas



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

Volume 3—No. 5

"THERE IS NO SUBSTITUTE FOR WATER"

November 1956

GILCHRIST PLAN IS PRESENTED AS A STATE WATER PROGRAM

The "Texas Water Report" presented a plan by Mr. Gibb Gilchrist for the development of Texas water resources in its September 20 issue. The plan is presented below.

"In a day when there's lots of talk about water, but all of it in generalities, the speech of Gibb Gilchrist, head of the Water Research & Information Center at A. & M., was out of the routine. He told the A. & M. water conference that what Texas needs is a 5-cent Statewide ad valorem tax to finance water matters; a new water commission with three members and an administrative engineer, patterned after the Highway Commission; and a price on water somewhere near what it's really worth. These tough proposals from the former State highway engineer and A. & M. chancellor are admittedly hard to achieve, but he thought they could be. He also advocated, in more guarded fashion, a revision in Federal water policy, to channel Federal water funds through this new State Water Commission, as Federal highway aid is spent by the State Highway Dept. Gilchrist made it clear that he does not merely favor renaming the Board of Water Engineers. He wants a Commission with far broader powers, placing together all the State's water functions. He termed this No. 1 on his program, especially if it could be given the spending of Federal money. He said it would accomplish State responsibility for the proper co-ordinated water development of Texas, and again cited the history of the Texas Highway Commission to show how it could grow and work as the people gain confidence in it. It does a good, respected job, he

said, because it has proper organization with sound policies. The channeling of Federal money through the Highway Commission has been under the supervision of a small force of Federal experts, and has been "a remarkable example of good will and cooperation. It should be the pattern for any cooperative agreement between the State and Federal government."

"Gilchrist suggested that the three-member part-time policy-making Commission and the full-time engineer should divide the State into 25 watershed "districts," with an engineer in charge of each. The present Water Board members would be the first personnel of the new Commission, which would arrange for consultation and advice from other agencies like the Health Dept., Soil Conservation Board and Railroad Commission. On his plan for a 5-cent ad valorem tax to finance water projects, Gilchrist said he believes the people would vote it if properly presented. At the start, only two cents could be levied, but as public consciousness was aroused, the full five cents would be needed. As for the "price on water," he said he wasn't advocating a water use tax, but he thought such a charge will be coming in the future, to help finance water conservation projects.

"Gilchrist gave some statistics on the total water picture. He said over 50 years to 1934 an average of 325 million ac. ft. fell on Texas, of which 15 percent is put to beneficial use, 36 percent to plant life, 17 percent evaporates from land, 22 percent evaporates from plants, and the other 10 percent runs into the Gulf. He reviewed various controversies and area quarrels and said there will be more unless Texas gets a broad, comprehensive water policy, a State water master plan and a one-body administration. However, he wasn't for an all-powerful State agency. He would retain "local control of big and little watersheds and underground water districts," in accord with broad policies established by law and administered by a central body. Gilchrist conceded that his plan would not be adopted by the 1957 Legislature, as long as the present lines of battle are maintained. But the differences aren't insurmountable. Like everyone else with a water idea, Gilchrist proposed that a committee be set up to thrash out the differences on the Water Commission idea until an acceptable compromise is reached, and then to submit it to the Legislature. Water Board Chmn. R. M. Dixon endorsed the Com-

(Continued on Page 4)

WATER RESOURCES COMMITTEE HOLDS HEARING ON NEW BILLS

At the November meeting of the Texas Water Resources Committee in Austin several groups from various areas of the State were on hand to hear discussed the thirteen or fourteen water bills which will be presented to the next Legislature. Representatives from municipal, industrial and agricultural groups expressed suggestions concerning the bills.

Of this group of bills probably the

Resolution Presented To The N. R. A.

The High Plains Water Conservation District presented a Resolution to the National Reclamation Association Meeting last week, calling for more recognition of ground water as a supply separate from surface water and ask that it be given more recognition as such.

It is the opinion of our District Board that ground water be considered by ground-water reservoirs and not by river basins as it was discussed by advocates of a National Water Policy for the United States.

The resolution is outlined below:

WHEREAS, efforts are being made to establish a national water policy for the United States based on major river basins as the sole units for ground water and surface water development programs; and

WHEREAS, in many regions the conservation and development of ground water, using a major river basin as the unit, is generally impracticable because in many areas a single river basin crosses several ground-water reservoirs and in other areas a single ground-water reservoir underlies several major river basins; many conservation measures appropriate for ground water are not appropriate for surface water; and basic ground water laws conflict sharply among some states touched or crossed by one river.

NOW, THEREFORE, BE IT RESOLVED; that

1. Each State, which has not already done so, be urged to enact appropriate and comprehensive legislation, consistent with established property rights of such state, providing for the conservation, protection, preservation, and recharge of the ground water within such state.

2. Such legislation provide for the conservation, development, regulation and recharge of the ground water by ground water reservoirs or sub-divisions thereof.

3. The ownership of such ground
(Continued on Page 4)

ones of most importance to our Southern High Plains area are: (1) The bill which will make it mandatory for a municipality or industry to obtain a permit before drilling an injection well into which waste will be disposed of.

Since our area is experiencing some alleged salt-water pollution from industrial waste to our fresh water supply, it seems that this bill will tend to give us some additional protection. (2) The bill which would place a 3-cent ad valorem tax on all Texans for money to be spent on water conservation and water development projects. No final action by the Committee has been taken on this bill. It has been under fire from various groups.

A new draft was introduced and discussed which provides for the formation of a State Stream Pollution Control Board. The primary function of such a board would be to establish "classifications" of the extent to which pollution would be permitted in each Texas stream, and to see to it that the standard is maintained.

This bill is designed to assist surface-water users in pollution problems.

The South Texas Chamber of Commerce announced that it is thinking of preparing a bill which would amend the ground-water laws of the State. These amendments will be designed to overcome some special local problems in clearing the way to recharge the Edwards Limestone reservoir by using surface waters.

(Mr. Herschel Nix of the South Texas Chamber has advised that drafts of their proposed bill will be presented to our Water District for comment when prepared.)

The Water Resources Committee will probably meet only once or twice more before the Legislature convenes.

We would like to congratulate the Committee publicly for the fine work they have done during the interim and for the democratic manner in presenting their proposals and allowing any individual or group to voice his or their opinion on these proposals.

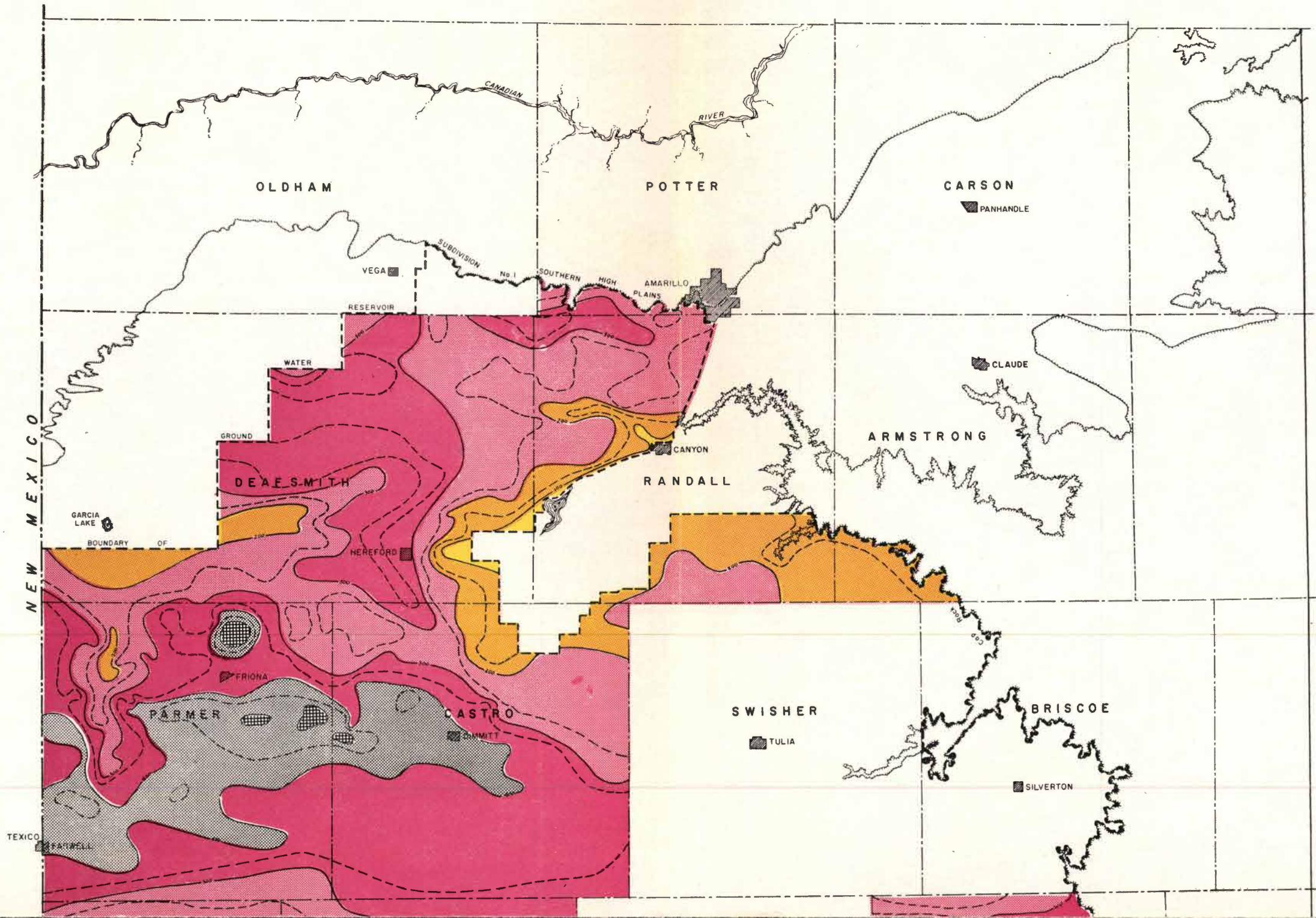
The nine man Committee is made up of Senator George Parkhouse of Dallas, Chairman; Rep. Leroy Saul of Kress, Vice-Chairman; O. G. McClain of Corpus Christi, Secretary; Senator Frank Owen III of El Paso; Senator Ray Roberts of McKinney; Rep. Bill Wood of Tyler; Rep. Stanley Banks, Jr. of San Antonio; Marvin C. Nichols of Fort Worth; and Howard Boswell of Temple. Ed Felder is Executive Secretary of the Committee; Joe D. Carter is its legal counsel, and Dorothy Meadows its Secretary.

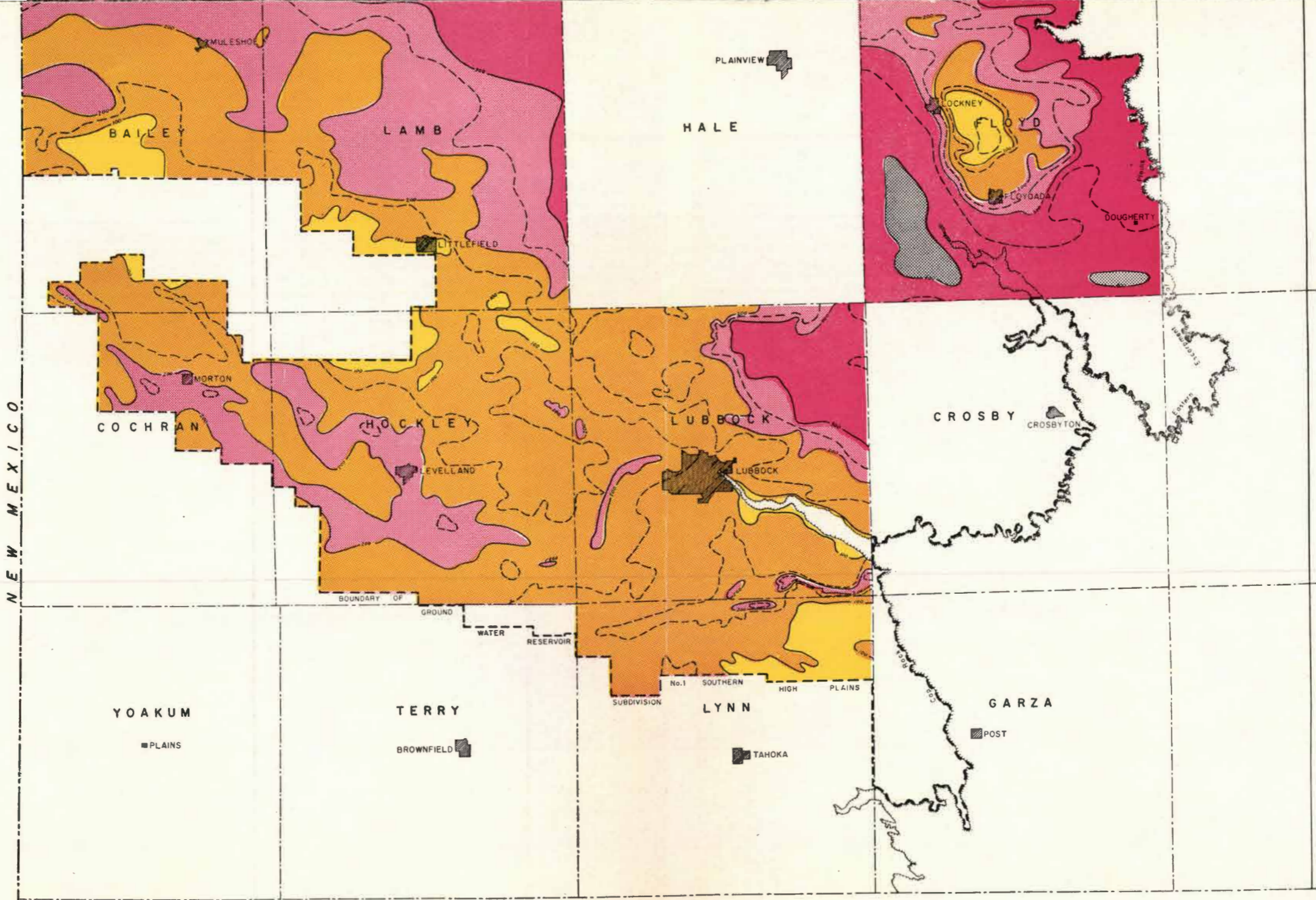
Statistics For October

During the month of October 135 wells were registered with the District office and 219 permits were issued by the County Committees. These new permits issued and completed wells follow by county:

County	Permits Issued	Completed Wells
Armstrong	1	0
Bailey	11	4
Castro	16	14
Cochran	5	1
Deaf Smith	18	23
Floyd	25	22
Hockley	25	10
Lamb	21	7
Lubbock	56	22
Lynn	18	13
Parmer	17	17
Potter	0	0
Randall	6	2

THICKNESS OF THE OGALLALA FORMATION

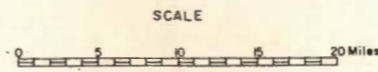
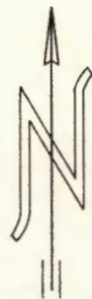




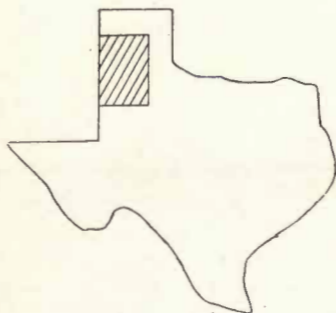
NEW MEXICO

EXPLANATION	
	LESS THAN 100 FEET
	FROM 100 FEET TO 200 FEET
	FROM 200 FEET TO 300 FEET
	FROM 300 FEET TO 400 FEET
	FROM 400 FEET TO 500 FEET
	MORE THAN 500 FEET

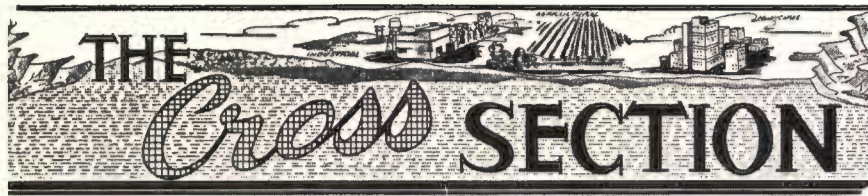
(DASHED LINES INDICATE 50-FOOT INTERVAL)



PREPARED FROM RECORDS OF THE HIGH PLAINS UNDERGROUND WATER CONSERVATION DISTRICT NO. 1, THE UNITED STATES GEOLOGICAL SURVEY, AND THE STATE BOARD OF WATER ENGINEERS. SUBJECT TO REVISION WHEN ADDITIONAL DATA ARE AVAILABLE.



HIGH PLAINS UNDERGROUND WATER CONSERVATION DISTRICT
 MANAGER
 THOMAS J. McFARLAND
 CHIEF HYDROLOGIST
 WILLIAM L. BROADHURST
 PREPARED BY
 GORDON W. WILLIS
 CONSULTING GROUND-WATER GEOLOGIST
 SEPTEMBER 1956



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

Published monthly by the High Plains Underground Water Conservation District No. 1
1628-B 15th Street, Lubbock, Texas

Telephone PO2-8088

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ALLAN WHITE
Editor

BOARD OF DIRECTORS

Precinct 1

W. O. Fortenberry, Secretary — 1123 Lubbock National Bank Building, Lubbock, Texas

Precinct 2

Gus Parish Box 67, Springlake, Texas

Precinct 3

W. M. Sherley, Vice Pres. Lazbuddy, Texas

Precinct 4

V. E. Dodson, Secretary Hereford, Texas

Precinct 5

Marvin Shurbet, President Route 1, Petersburg, Texas



District Office
Tom McFarland General Manager
W. L. Broadhurst Chief Hydrologist
Allan White Office Manager
Y. F. Snodgrass Field Representative
Mrs. M. McVay Secretary-Bookkeeper
Dana Abbott General Office

Gilchrist Plan—

(Continued from Page 1)

mission idea at a forum discussion.”
The Gilchrist plan presents a tremendous amount of deep thinking on the subject of water development for the State of Texas. The plan could perhaps be workable if Mr. Gilchrist would incorporate some thinking of underground-water users.

One point that can not be overlooked is that surface water and underground water from the standpoint of development and conservation must be treated separately.

Since underground water-bearing aquifers have definite ascertainable boundaries, and since whatever is done in one part of an aquifer affects, either directly or indirectly, other parts of that aquifer, then it seems impractical to not develop the aquifer as a unit.

If surface watersheds were the unit of development for ground water as well as surface water then there would probably not be even one major underground water reservoir in our State which would be wholly under only one surface watershed or river basin. This would mean that several river authorities would probably be interested in the development of one underground reservoir. This manner of development would undoubtedly cause many disputes and create other insurmountable obstacles.

We go along with the thinking of those in our State who believe underground water can best be developed on an underground water reservoir basis rather than on a surface watershed basis.

Water problems in our State include many intricate matters of utmost importance. They include human and legal aspects as well as the engineering element, and for this reason copying a water commission after the highway commission could perhaps lead to serious conflicts. The highway commission primarily deals with engineering problems whereas the engineering problems in dealing with waters of the State are not the only considerations. Therefore, if a single individual is de-

manded as administrative head, it would appear that a competent administrator should be sought, be he an engineer, lawyer, or of any other background.

Considering the varied nature of water problems — legal, engineering and human—it might be that the best type of administration would be an appointive three-man board, not all engineers, with a competent administrator as chairman.

Resolving water problems can hardly be paralleled with building highways.

The matter of financing the Gilchrist Plan deserves much thought. The expenses of a central administrative agency must of necessity be paid for with State funds. Our State should be able to help put over worthy improvements; however, from a practical standpoint, it is not likely that the Legislature will authorize a new tax of any nature until the people of our State have been educated thoroughly on the matter of water.

Much can be said in favor of each watershed area and each underground water reservoir, or designated subdivision thereof paying its own way—much as our own High Plains Underground Water Conservation District No. 1 pays all of its own expenses, without calling on the remainder of the State to assist.

Mr. Gilchrist has offered a bold approach to difficult problems. He recognizes the necessity of various groups and interests getting together and resolving their differences. Mr. Gilchrist and his Plan deserve an understanding and intelligent hearing.

When more men of our State become interested in our water problems, as Mr. Gilchrist has then with a composite of all thinking can come a practical and realistic approach to these problems.

Resolution Presented—

(Continued from Page 1)

water within each State, whether it be public or private, be respected by the respective Legislatures and by the Federal Government.



CONSERVATION CONVERSATION

In reading through “Progress Report No. 7,” published by the Texas Board of Water Engineers in March 1949, we came across some very interesting facts concerning the development of our High Plains area.

—Editor.

“The High Plains in northwestern Texas, first settled in the decade following the Civil War, has been one of the most rapidly developed regions of Texas. The remarkably level surface and large proportion of tillable land make the region well adapted for farming especially where ground water is available for irrigation. In recent years, the development of irrigation from wells has substantially reduced crop failures resulting from drouths and has materially increased the yield of farm products in a large part of the High Plains. Thus, a stable long-range economy is greatly dependent upon continued withdrawals of ground water to supplement rainfall.

“The first settlers in the High Plains in Texas were supplied water by the springs issuing from the eastern escarpment and from the intermittent and water-table ponds in the interior of the Plains. The first communities sprang up in the vicinity of

the larger springs and ponds. Probably the first domestic wells to tap the water-bearing sands were drilled between 1880 and 1890. Irrigation from ground water was first begun at Plainview in 1911. Drilling then spread to the Hereford and Muleshoe districts, and by 1914 about 140 wells had been completed. The development as a whole was only moderately successful, and during the next 20 years, 1914-34, about 160 additional pumping plants were installed, many of the older ones being unused during that period. A part of the lack of success was due to the high cost and relatively low efficiency of the low-speed pumps and oil-burning power units then in use. After the advent of the moderately priced high-speed turbine pumps powered by small automobile engines with direct drive, the efficiency of the pumping plants rose sharply.

“A series of dry years from 1927 to 1934 caused an increase in the drilling of irrigation wells. Beginning about 1935, the development increased steadily except for declines in the rate of installations in 1938-39 and 1941-42; and since 1943 the expansion of irrigation in the High Plains has been spectacular.”

EDITOR
THE CROSS SECTION
1628-B 15th Street
Lubbock, Texas

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

Volume 3—No. 6

"THERE IS NO SUBSTITUTE FOR WATER"

December 1956

CHEMICAL QUALITY STANDARDS FOR IRRIGATION WATERS

By BURDGE IRELAN

Mr. Irelan, District Chemist, U. S. Geological Survey, Austin, Texas, has prepared this article especially for publication in "The Cross Section."

The rapid expansion of irrigation in the Southern High Plains and other parts of Texas has resulted in many inquiries as to the limitations water quality may place on continued irrigation. Since discussions of water quality generally appear in technical publications, information on the subject is not readily available to the average farmer. The following discussion has been prepared at the suggestion of W. L. Broadhurst so that readers of the Cross Section may be better informed on how quality of water may affect irrigation farming.

Continued successful operation of irrigated farms involves not only supplying of irrigation water to the land but also control of the salinity and alkalinity of the soil. The quality of irrigation water, irrigation practices, and drainage conditions are involved in salinity and alkali control. Soil that was originally nonsaline and nonalkali may become unproductive if excessive soluble salts or exchangeable sodium are allowed to accumulate because of improper irrigation and soil-management practices or inadequate drainage.

In areas of sufficient rainfall and ideal soil conditions, the soluble salts originally present in the soil or added to the soil with water are carried downward by the water and ultimately reach the water table. The process of removal of soluble material by the passage of water through the soil is called leaching. If the amount of water applied to the soil is not in excess of the amount needed by plants, there will be no downward percolation of water below the root zone and an accumulation of mineral matter will form in that zone. Likewise, impermeable soil zones near the surface can retard the downward movement of water, resulting in waterlogging of the soil and deposition of

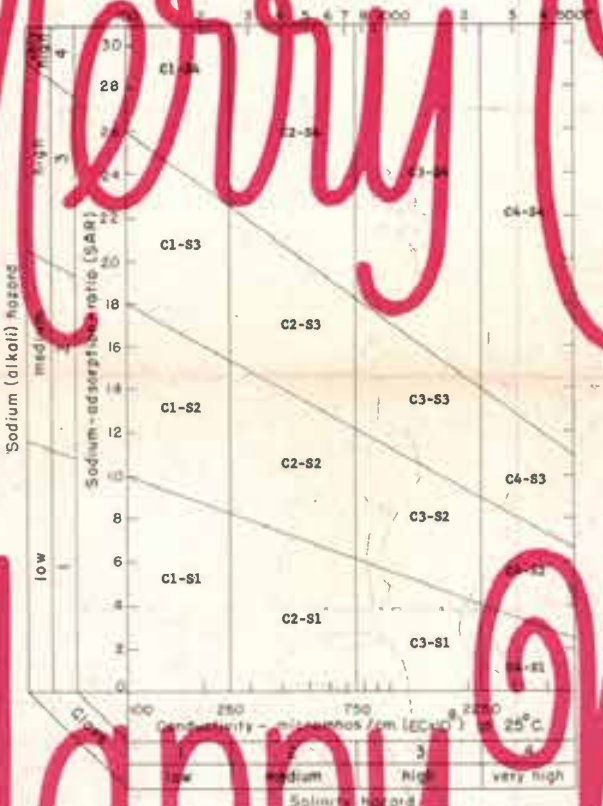


FIGURE — Diagram for the classification of irrigation water (U. S. Salinity Laboratory Staff)

salts. Unless drainage is adequate, attempts at leaching may not be successful, because leaching requires the free passage of water through and away from the root zone.

Irrigation waters, whether diverted from surface streams or pumped from wells, carry certain chemical substances in solution, dissolved from the rocks or soils over which the waters have passed. The concentration and nature of these dissolved constituents determine the quality of the water for irrigation use.

Accurate chemical analyses of irrigation waters identify the more important substances that are present and show their concentration. From such analyses, it is possible to classify waters in terms of their suitability for irrigation and to anticipate with some assurance the effect of the water on crops and on soils.

The characteristics of an irrigation water that seem to be most important in determining its quality are: (1) total concentration of soluble salts;

WATER DISTRICT TO HOLD ELECTION

The High Plains Water District will hold its annual elections on the 8th of January, 1957, throughout the thirteen counties comprising the District.

District Director Precincts' No. 1, 3 and 4 will each elect a Director for a two-year term. Precinct No. 1 is made up of Lubbock and Lynn Counties. Precinct No. 3 consists of Castro, Bailey and Parmer Counties. Precinct No. 4 is composed of Deaf Smith, Armstrong, Potter and Randall Counties.

Each county will also have one man from its respective five-man Committee whose term of office will expire.

The names of those who have been duly nominated to fill the various vacancies appear below:

FOR DISTRICT DIRECTOR:

(One to be elected for each precinct)

PRECINCT No. 1 (Lubbock and Lynn Counties)

Elmer Blankenship, Route 1 Wilson.
Earl Reasoner, Box 335, Slaton.

PRECINCT No. 3 (Bailey, Castro and Parmer Counties)

W. M. Sherley, Lazbuddy

PRECINCT No. 4 (Deaf Smith, Armstrong, Potter and Randall Counties)

V. E. Dodson, Route 1 Hereford.
Anton Handing, Route 1 Canyon.

For County Committeemen:

(One to be elected for each county)

ARMSTRONG COUNTY

Jack McGehee, Wayside
Gordell Mahler, Wayside

(2) relative proportion of sodium to other principal cations (magnesium, calcium, and potassium); (3) concentration of boron or other elements that may be toxic; and (4) under some conditions, the bicarbonate concentration as related to the concentration of calcium plus magnesium. These have been termed the salinity hazard, the sodium (alkali) hazard, the boron hazard, and the bicarbonate ion hazard.

For purposes of diagnosis and classification, the total concentration of soluble salts (salinity hazard) in irrigation water can be adequately expressed in terms of specific conductance. Specific conductance is the measure of the ability of the ionized inorganic salts in solution to conduct an electrical current, and usually expressed in terms of micromhos per centimeter at 25 degrees C. Where a conductance determination is not a part of the analysis, a rough approximation of the specific conductance values can be obtained by multiplying the sum of the equivalent per million

(Continued on Page 4)

BAILEY COUNTY
Ross Goodwin, Route 2, Muleshoe
Joe Smallwood, Box 604, Muleshoe

CASTRO COUNTY
Rodney Smith, Hart

DEAF SMITH COUNTY
Jack Brown, 233 Ave. B, Hereford
Austin S. Ross, Jr., 106 Beach St., Hereford

FLOYD COUNTY
Chester W. Mitchell, Lockney
Forrest Mickey, Lockney
Leo Trice, Route 1, Floydada

HOCKLEY COUNTY
J. J. Hobgood, Route 2, Anton

LAMB COUNTY
Roy McQuatters, Route 1, Littlefield
Jay Phillips, Route 1, Littlefield
L. J. Swanson, Route 1, Littlefield

LUBBOCK COUNTY
Bill Alspaugh, Box 555, Slaton
Carter Caldwell, Route 1, Slaton

LYNN COUNTY
Walter Macker, Route 2, Wilson
Erwin Sander, Route 1, Wilson
Peter Rhoads, Route 2, Wilson

PARMER COUNTY
Lee Jones, RFD, Farwell
Dick Gerris, RFD, Farwell

POTTER COUNTY
Eldon Plunk, Route 1, Amarillo

RANDALL COUNTY
Wesley Cox, 2503 5th Ave., Canyon

We urge each of you to cast your vote in this election. There will be a polling place near you. Consult your local paper for polling place locations.

Spacing Rules Of Water District

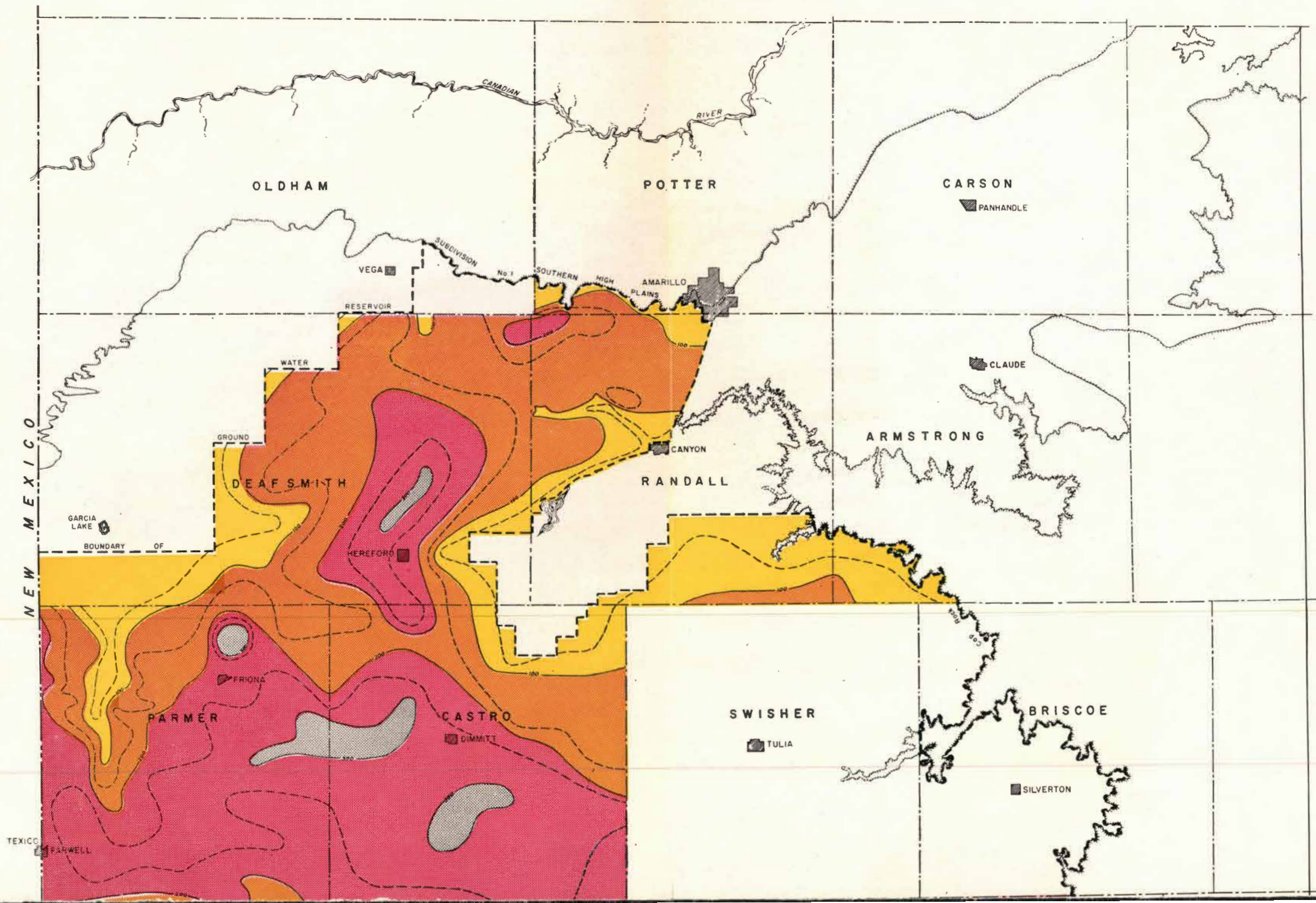
Remain Valid

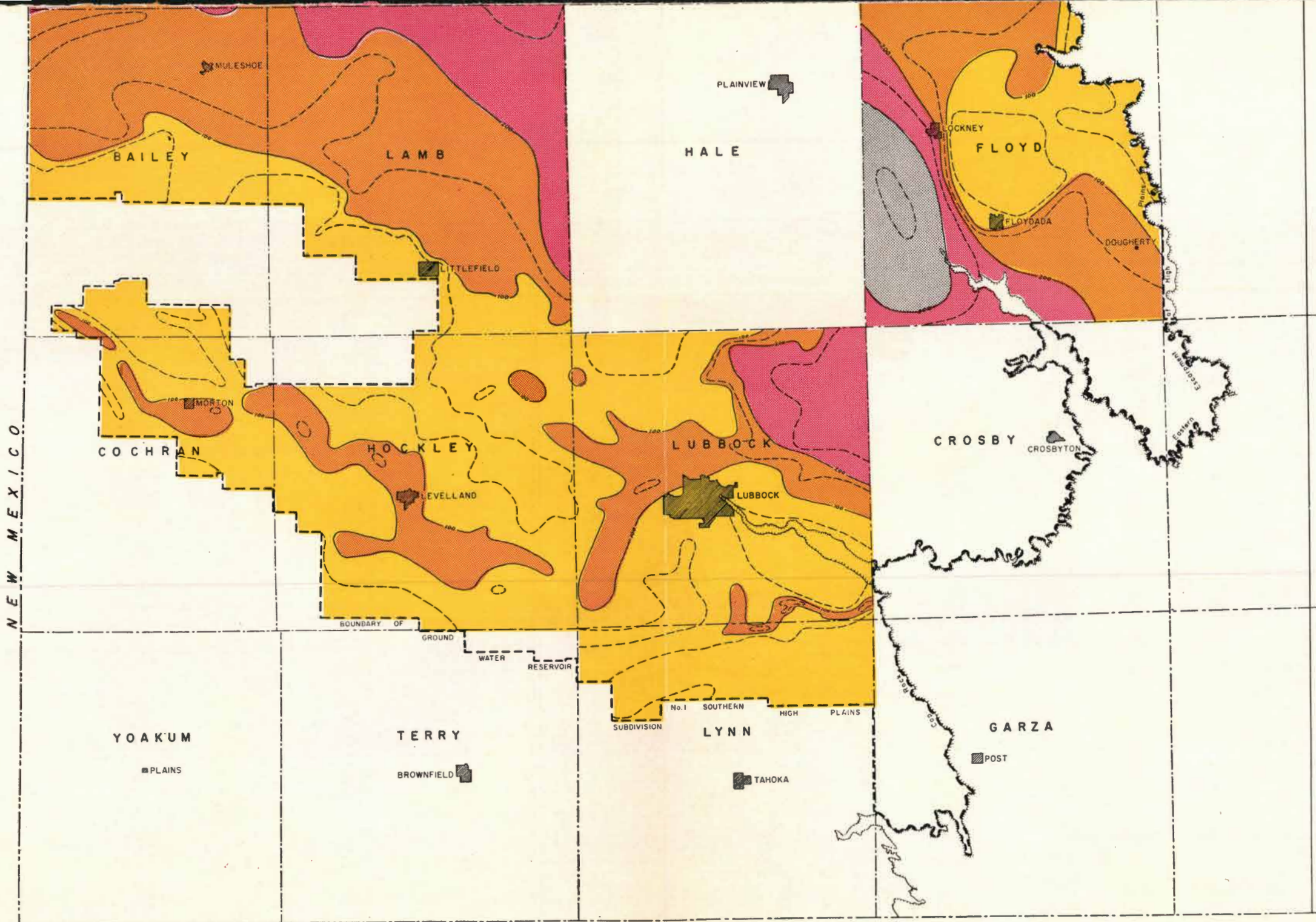
The State Supreme Court dismissed an appeal by F. J. Bryson of Hockley County, appealing a decision of the 72nd District Court which enjoined the producing of a well in excess of 100,000 gallons of water per day (69.4 gallons per minute) drilled in violation of the spacing rules of the High Plains Underground Water Conservation District No. 1.

The District refused to approve a permit at 74 yards from an existing well; however, Bryson drilled the well without a permit.

After the trial court issued a permanent injunction against Bryson, he made a direct appeal to the Supreme Court of Texas. The high court said that it lacked jurisdiction to take the case on direct appeal; thereby ruling against the appeal and dismissing the case.

THICKNESS OF THE WATER-BEARING STRATA 1938

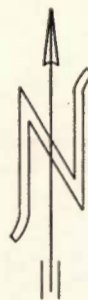




NEW MEXICO

EXPLANATION

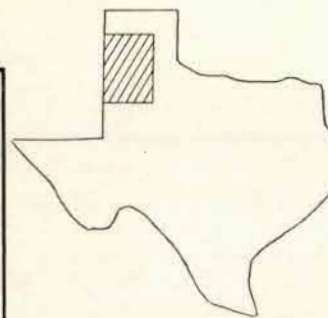
- LESS THAN 100 FEET
- FROM 100 FEET TO 200 FEET
- FROM 200 FEET TO 300 FEET
- MORE THAN 300 FEET
- DASHED LINES INDICATE 50-FOOT INTERVAL



SCALE



PREPARED FROM RECORDS OF THE HIGH PLAINS UNDERGROUND WATER CONSERVATION DISTRICT NO. 1, THE UNITED STATES GEOLOGICAL SURVEY, AND THE STATE BOARD OF WATER ENGINEERS. SUBJECT TO REVISION WHEN ADDITIONAL DATA ARE AVAILABLE.



HIGH PLAINS UNDERGROUND WATER CONSERVATION DISTRICT

MANAGER
 THOMAS J. McFARLAND
 CHIEF HYDROLOGIST
 WILLIAM L. BROADHURST

PREPARED BY
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ALLAN WHITE
Editor

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Chemical Standards—

(Continued from Page 1)

of the principal cations (calcium, sodium, magnesium, and potassium) by 100, or by dividing the dissolved solids in parts per million by a factor of 0.6 to 0.7. In general, water having a conductance below 750 micromhos per centimeter is satisfactory for irrigation insofar as salt content is concerned, although salt-sensitive crops such as strawberries, green beans, and red clover may be adversely affected by irrigation water having a conductance in the range of 250 to 750 micromhos per centimeter. Water in the range of 750 to 2,250 micromhos per centimeter is widely used, and satisfactory crop growth is obtained under good management and favorable drainage conditions, but saline conditions will develop if leaching and drainage are inadequate. Use of water for irrigation having a conductance of more than 2,250 micromhos per centimeter is not common, although such water has been used for many years in the Pecos Valley in Texas with considerable success.

In the past, the relative proportion of sodium to other cations (sodium hazard) in irrigation water usually has been expressed simply as the percentage of sodium among the princi-

pal cations (expressed in equivalents), or simply the percent sodium. Irrigation waters were divided into three classes, based on the percent sodium. Water with a percent sodium less than 60 was considered excellent to good; water with a percent sodium between 60 and 75 was considered good to injurious; while water with a percent sodium greater than 75 was considered injurious to unsatisfactory. According to the U. S. Department of Agriculture, the sodium-adsorption ratio, used to express the relative activity of sodium ions in exchange reactions with soil, is a better measure of the suitability of water for irrigation with respect to the sodium hazard. The sodium-adsorption ratio is easily computed from the data determined in the usual water analysis, and is now frequently included with the analytical data.

When the sodium-adsorption ratio and the specific conductance of a water are known, the classification of the water for irrigation can be determined by graphically plotting these values on the diagram shown in Figure 1. Low-sodium water (S1) can be used for irrigation on almost all soils with little danger of the development of harmful levels of exchangeable sodium. Medium-sodium water (S2) will present an appreciable sodium hazard in certain fine-textured

or organic soils having good permeability. High sodium water (S3) may produce harmful levels of exchangeable sodium in most soils and will require special soil management such as good drainage and leaching and additional organic matter. Very high sodium water (S4) is generally unsatisfactory for irrigation unless special action is taken, such as addition of gypsum to the soil.

Low salinity water (C1) can be used for irrigation of most crops on most soils with little likelihood that soil salinity will develop. Medium-salinity water (C2) can be used if a moderate salt tolerance, such as potatoes, corn, wheat, oats, and alfalfa, can be irrigated with C2 water without special practices. High-salinity water (C3) cannot be used on soils of restricted drainage. Very high-salinity water (C4) is not suitable for irrigation under ordinary conditions. It can be used only on very salt-tolerant crops and then only if special practices are followed, including a high degree of leaching.

Boron is essential to the normal growth of all plants, but the quantity required is very small. A deficiency of boron produces striking symptoms in many plant species. Boron is very toxic to certain plant species and the concentration that will injure these sensitive plants is often approximately that required for normal growth of very tolerant plants. For instance, lemons show definite and, at times, economically important injury when irrigated with water containing 1 ppm of boron, while alfalfa will make maximum growth with 1 to 2 ppm of boron.

In water having high concentrations of bicarbonate, there is a tendency for calcium and magnesium to precipitate as the water in the soil becomes more concentrated. This reaction ordinarily does not go to completion, but insofar as it does proceed, there is a reduction in the concentration of calcium and magnesium and therefore a relative increase in sodium, resulting in an increase in the alkalinity of the soil water. The calcium and mag-

nesium are precipitated as the carbonates, and any carbonate or bicarbonate left in solution is termed "residual sodium carbonate."

On the basis of limited data and using the "residual sodium carbonate" concept described above, it is concluded by the Department of Agriculture that water having more than 2.5 equivalents per million (epm) residual sodium carbonate is not suitable for irrigation purposes because of the possible adverse effects on soil structure such as puddling and solution of organic materials. Water containing 1.25 to 2.50 epm of residual sodium carbonate is marginal, and water containing less than 1.25 epm is safe. Where not given with the analysis, the residual sodium carbonate can be computed from the usual complete water analysis.

In appraising the quality of an irrigation water, first consideration must be given to salinity and sodium hazards by reference to Figure 1. Then consideration should be given to independent characteristics such as boron and bicarbonate, either of which may change the quality rating. The use of water of any quality must first take into account such factors as drainage and management practices.

The foregoing discussion of the affects of water quality were developed from experience in arid areas where rainfall is low and most of the water used by crops is applied by irrigation. In portions of East Texas, supplemental irrigation is being recommended to insure crop production during low rainfall years.

Supplemental irrigation is probably less affected by water quality, but information and experience are not sufficient to classify irrigation waters for high rainfall areas. However, it is known that serious leaf burn has occurred in areas where saline irrigation waters have been applied by sprinklers. Boron poisoning of sensitive plants may also occur. Hence, even in East Texas, farmers should make certain that water quality is satisfactory when developing new irrigation supplies.

Significance Of Color Maps

The colored map in the November 1956 issue showed the entire thickness of the Ogallala formation—the entire section of sediments from the surface of the ground to the bottom of the water-bearing sands. From it one can determine the approximate depth to which a well must be drilled in order to penetrate the entire section of Ogallala.

The colored map in this issue shows the thickness of the saturated section as of 1938. In other words it shows that portion of the Ogallala formation

from the water levels in wells to the bottom of the water-bearing sands.

The January 1957 issue will have another colored map which will show the approximate decline of the water levels in wells during the 18-year period from 1938 to January 1956. It will show the number of feet of the Ogallala formation that has been unwatered as a direct result of pumping. A comparison of the map in this issue with the map to be published in January will reveal the thickness of the saturated section as of January 1956.