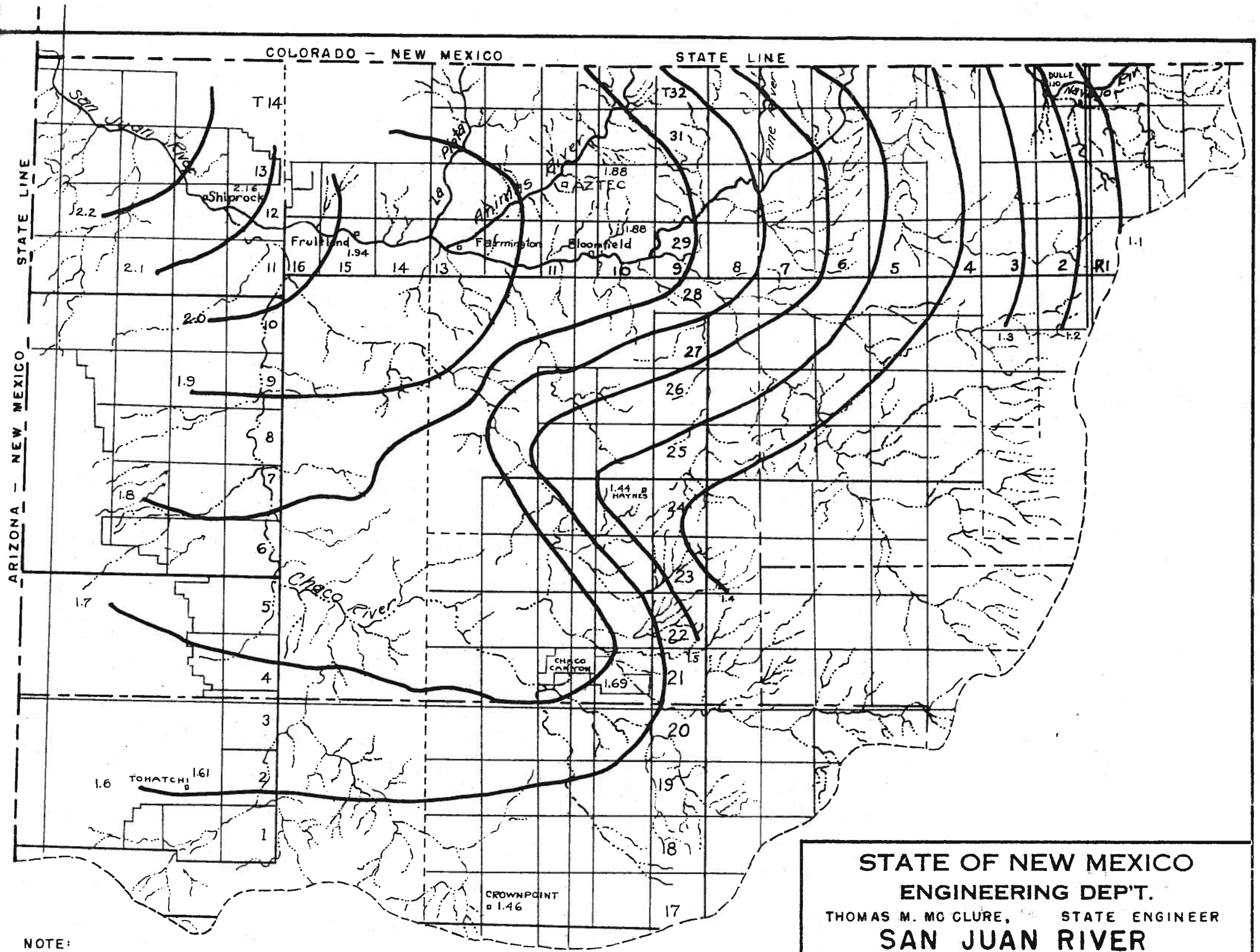


NOTE:

LINES REPRESENT EQUAL IRRIGATION REQUIREMENT OF WATER.
DEPTH OF WATER IS IN FEET.

STATE OF NEW MEXICO
ENGINEERING DEP'T.
THOMAS M. MC CLURE, STATE ENGINEER

SAN JUAN RIVER HYDROGRAPHIC SURVEY

ENGINEER W.C. SMITH	SHEET NO.	FILE NO.
DRAWN BY J.N. VAN SANT		C-4

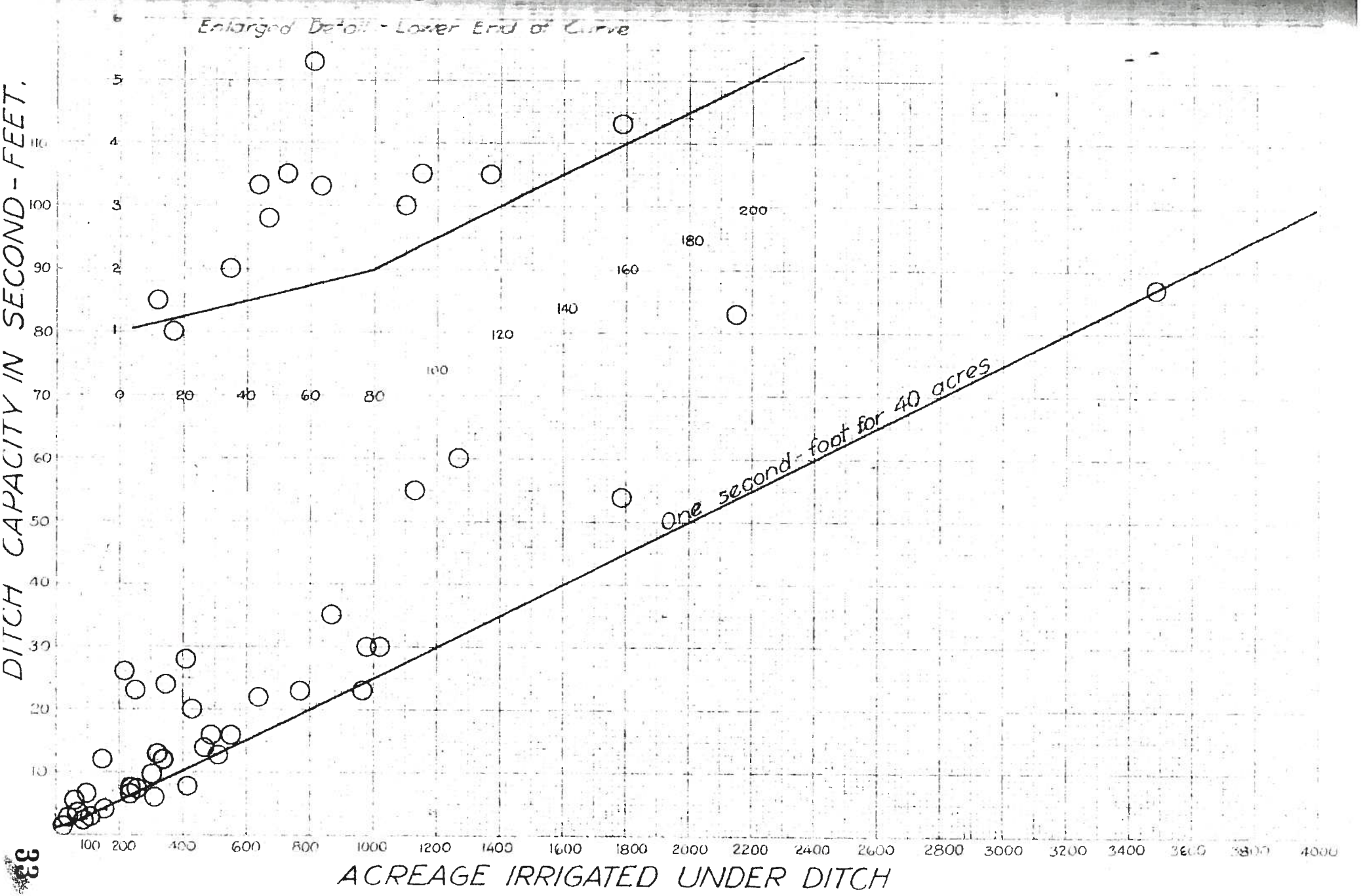
CONSUMPTIVE USE OF WATER BY DITCHES

NAME OF DITCH	STREAM	IRRIGATION REQUIREMENT Acre Feet*	FARM DELIVERY REQUIREMENT Acre Feet*	DIVERSION REQUIREMENT Acre Feet*
Crowley	Spring Draw	1.0	1.59	2.65
Garcia #1	Navajo River	1.1	1.75	2.92
Garcia #2	" "	1.1	1.75	2.92
Gomez	" "	1.1	1.75	2.92
Dulce Highline	" "	1.1	1.75	2.92
Pine River Canal So. Lat	Pine River	1.45	2.30	3.84
Espinosa	San Breolto Arroyo	1.45	2.30	3.84
Heath Horner Miller Lateral	" " "	1.45	2.30	3.84
Rosa Community	San Juan River	1.45	2.30	3.84
Sargent (Abandoned)	" " "	1.45	2.30	3.84
Indian-Hersch Lateral	Pine River	1.55	2.46	4.10
Martinez	" "	1.55	2.46	4.10
Bates	" "	1.55	2.46	4.10
Lucero	" "	1.55	2.46	4.10
Florita	" "	1.55	2.46	4.10
Wilmer	" "	1.55	2.46	4.10
Ulibarri	" "	1.7	2.70	4.50
Old Martinez	San Juan River	1.7	2.70	4.50
Lower Martinez	" " "	1.75	2.78	4.63
Archuleta	" " "	1.75	2.78	4.63
B. I. D. Citizens	" " "	1.9	3.02	5.03
La Pumpa	" " "	1.80	2.86	4.77
Jacquez	" " "	1.85	2.94	4.90
Turley	" " "	1.8	2.86	4.77
Martin-Valencia	" " "	1.82	2.88	4.80
Bloomfield Porter	" " "	1.88	2.98	4.97
Andres Medina	" " "	1.9	3.02	5.03
Lawson	" " "	1.91	3.03	5.05
Twin Rocks	Animas River	1.75	2.78	4.63
Ralston (East Side)	" "	1.75	2.78	4.63
Cedar Hill	" "	1.75	2.78	4.63
Inca	" "	1.8	2.86	4.77

* Also Depth in Feet

NAME OF DITCH	STREAM	IRRIGATION REQUIREMENT Acre Feet	FARM DELIVERY REQUIREMENT Acre Feet	DIVERSION REQUIREMENT Acre Feet
Stacey	Animas River	1.8	2.86	4.77
Aztec	" "	1.8	2.86	4.77
Sargent	" "	1.86	2.94	4.90
Lower Animas & Lower Animas Ext.	" "	1.89	3.00	5.00
Farmer's	" "	1.86	2.98	4.97
Hledge Hill	" "	1.9	3.02	5.03
Hello Blancett	" "	1.9	3.02	5.03
Halford-Independent	" "	1.93	3.06	5.11
Terrell	" "	1.90	3.02	5.03
Star	" "	1.94	3.08	5.13
Echo	" "	1.93	3.06	5.11
Farmington (Allen)	" "	1.93	3.06	5.11
North Farmington-Wright Leggett	" "	1.93	3.06	5.11
Willett	" "	1.93	3.06	5.11
Farmer's Mutual	" "	1.99	3.16	5.27
Jewett Valley	San Juan River	2.00	3.18	5.30
Pioneer	La Plata River	1.86	2.94	4.90
Enterprise	" " "	1.86	2.94	4.90
Hillside Thomas	" " "	1.87	2.97	4.95
Greenhorn	" " "	1.87	2.97	4.95
Highland Park	" " "	1.88	2.98	4.97
La Plata Indian	" " "	1.87	2.97	4.95
Cunningham	" " "	1.89	3.00	5.00
Larkin Reynolds	" " "	1.88	2.98	4.97
McDermett	" " "	1.89	3.00	5.00
Left Hand	" " "	1.89	3.00	5.00
Helton	" " "	1.90	3.02	5.03
Jackson	" " "	1.92	3.05	5.08
Pickering	" " "	1.92	3.05	5.08
Crane	" " "	1.93	3.06	5.10
Tanner	Tanner Reservoir	1.76	2.78	2.78
Westbrook Spreaders (Kin Lanin Wash)		1.70	2.70	2.70
Westbrook Spreaders (Indian Creek)		1.65	2.62	2.62
Tanner	Indian Creek	1.70	2.70	2.70
Pitt Ranch Spreaders	Seven Lakes Draw	1.60	2.54	2.54
Farris	Farris Reservoir	1.58	2.51	2.51

* Also Depth in Feet


Enlarged Detail - Lower End of Curve
DITCH CAPACITY IN SECOND-FEET.
ACREAGE IRRIGATED UNDER DITCH
One second-foot for 40 acres
0 20 40 60 80 100 120 140 160 180 200
100 200 400 600 800 1000 1200 1400 1600 1800 2000 2200 2400 2600 2800 3000 3200 3400 3600 3800 4000
10 20 30 40 50 60 70 80 90 100 110
1 2 3 4 5 6

were adjusted, since discharge measurements for these months were meager or non-existent.

The following figures are believed to be representative of average monthly water requirements within the San Juan basin in New Mexico:

Estimated Monthly Distribution in Percent of Annual Water Requirement

April	May	June	July	August	September	October	Annual
0%	20%	25%	23%	17%	7%	8%	100%

The above percentage requirements for the months of April and October are excessive for ditches in the higher areas, in some of which the growing seasons are so short that no irrigation is practicable in either of these months. It should be emphasized that the above figures are merely averages. Actual monthly diversions in any year may vary widely therefrom with variations in precipitation, temperature, run-off, etc. Changes in crops, the construction of reservoirs, etc., would also tend to modify monthly distributions.

Rate of Diversion

In the diversion and distribution of irrigation water two controls are necessary to regulate the available supply: (1) the total amount of water which may be diverted during an irrigation season, and (2) the maximum rate at which it may be diverted from the stream. The first control has been discussed in an earlier part of this section under "Diversion Requirements".

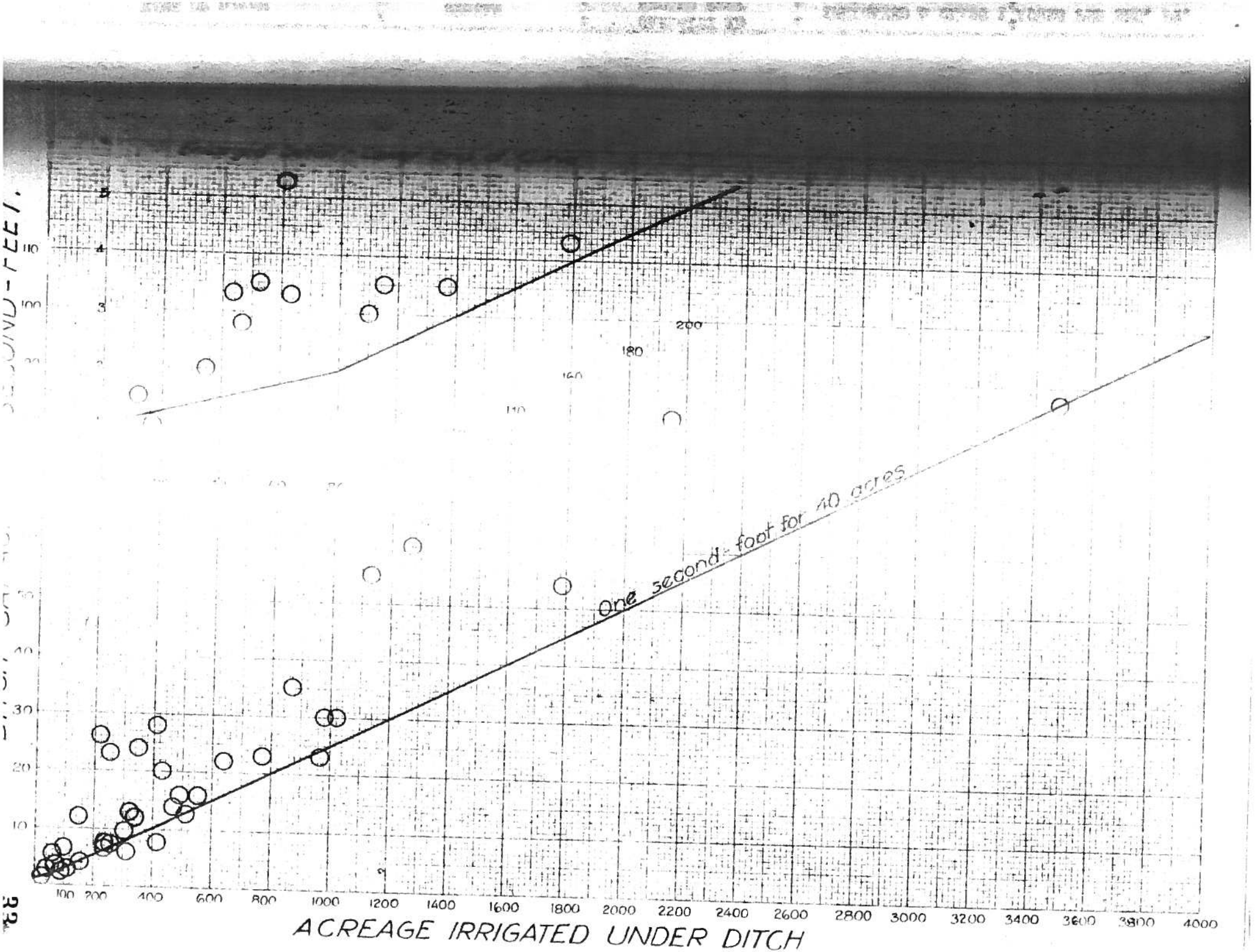
It is necessary to control the maximum amount of water which a ditch may divert at any time when the available water supply is deficient. In arriving at a reasonable figure for rate of diversion,

all available capacities of San Juan basin canals were compared against the acreages irrigated. Maximum usable capacities were determined from the discharge records as the average peak discharges for periods of a week or more.

Maximum usable ditch capacities have been plotted against irrigated acreages and are shown on the following chart, the basic data being given in the table. Ditches in the San Juan area vary greatly in their rate of diversion, some averaging one second foot to as little as 9 acres, while others divert but 1 second foot for fifty or more acres. The average for 45 ditches is 1 second foot for each 25 acres.

Statutory limits of rate of diversion and those fixed by court decrees in the western states are not standard. The legal limit in New Mexico fixed by the 1907 water code is 1 second foot for each 70 acres. Some early Colorado decrees allowed a rate of 1 second foot per 40 acres, but this rate was changed in later decrees so that 1 secondfoot was required to serve 80 or more acres. In some areas, particularly on storage projects, 1 second foot must supply 100 to 120 or more acres of land.

One second foot is ample to serve 40 acres of irrigated land in the San Juan basin in all cases excepting those small ditches where the irrigation head based upon such a rate would be too small to permit economical irrigation of the lands. It is believed that, excepting for small tracts and gardens, an irrigation head of less than 1 second foot is not economical. If the irrigation head used is too small, the irrigation period is unduly prolonged and too much water is consumed in forcing the water across the fields. It is believed therefore, that the rate of diversion for ditches


One second-foot for 40 acres
ACREAGE IRRIGATED UNDER DITCH
100 200 400 600 800 1000 1200 1400 1600 1800 2000 2200 2400 2600 2800 3000 3200 3400 3600 3800 4000
10 15 20 30
100 110
180 200

covering less than 80 acres should be modified. A suggested formula is:

For ditches under 80 acres, divert a rate of 1 second foot for each 80 acres plus 1 additional second foot.

In the case of floodwater ditches, the rate of diversion is not restricted, provided that the total amount of water diverted during the season shall not exceed the annual requirement.

Winter Water

Water is sometimes diverted during the winter season to perennial crops such as alfalfa and orchards and occasionally to bare lands for the purpose of building up soil moisture. The need for or desirability of such diversions is questionable, however, since with the possible exception of the La Plata valley, the supply during the early irrigation season is more than adequate to build up soil moisture and prepare the lands for spring cultivation. In some areas winter water is diverted for cattle and domestic requirements but this practice, too, is often unnecessary. In many areas in the basin potable water of better quality and purity than ditch water can be secured from wells at small expense. Any reduction in the amount of winter water carried by ditches would tend to lessen the seepage problem in these areas.

It is believed that the use of winter water should be limited to those areas where it can be shown to be necessary. The amount of such diversions, too, should be limited to actual needs. It is suggested that winter uses, when and if required, be limited to "not to exceed 0.5 acre foot per acre" during the non-irrigation season.