

Reports
(C 8)

October 13, 1916.

Mr. W. E. Hodges,
Railway Exchange,
80 Jackson Blvd.,
Chicago, Ill.

Dear Sir:-

At the request of Mr. Fletcher, I have to make the following report as to the available water supply of Carroll Reservoir when built to the 315 foot contour (elevation above sea or a 100 ft. dam).

The water shed consists of 196 square miles below the site of Pamo Dam. An allowance is made for the wastes in various years which must necessarily occur over Pamo Dam in certain years. This report also includes 250 Miners Inches pumped from the sands of the San Dieguito Rancho whenever needed and also includes 300 Miners Inches from the gravels of the Bernardo Valley within the Carroll Reservoir Site. These gravels of the Bernardo Rancho and the lands directly above Carroll site contain a stored supply of 20,000 acre feet which is available in the emergency of an extraordinary dry season. Under the present conditions this storage can not and does not drain out. The variation of the water plane or water table at the Bernardo Bridge is not over 3 feet from the river bed to permanent ground water in the dryest season. The depth of the coarse gravels is 60 feet, and the total gravel storage area tributary is 3,000 acres.

Mr. Kellogg has suggested that the irrigation service period unit adopted is to be 1 miners inch// flowing for 200 days which is equivalent to 8 acre feet per year. During periods of

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extreme drought in Southern California all irrigation companies provide in their contracts and do reduce their supply during such extremely dry seasons. In this connection I quote a statement of my report to the State Railroad Commission in behalf of the Lake Hemet Water Company.

NET SAFE YIELD

Definition:

For a domestic supply the net safe yield of a system is the absolutely dependable amount during the period of greatest known drought.

In Southern California it is generally agreed that such a definition is too drastic for irrigation purposes. To secure a theoretical uniform full supply is prohibitive from a financial and practical standpoint. Therefore the irrigation safe yield is defined as the dependable quantity during ordinary low rainfall years, but requiring a reduction of supply in years of extraordinary drought, such reduction being not so great as to permanently injure orchards although perhaps not sufficient to secure a crop. The economic condition of such an extraordinary low year is one in which the rancher, the water company, the merchant and the banker all suffer financial loss.

In practical terms the writers shall adopt a full irrigation supply in ordinary low years, when runoff is one-half of the average runoff, and a $3/4$ supply in unusually low seasons, when the runoff is $1/3$ or less than the average.

SAFE IRRIGATION YIELD OF CARROLL DAM EXCLUDING THE WATER SHED ABOVE PAMO DAMSITE.

The writer has had this watershed under observation for the last seven years and for the last five years has maintained for the Volcan Land & Water Company, in co-operation with the United States Geological Survey, three gaging stations upon the river at which observations were made at least twice a day. Hence the water available is absolutely known for the last five years and

Mr. W. E. Hodges,
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has been extended backward into the past by well known methods of hydraulic computation to cover the period of greatest known drought in California. This study has been made in detail and the results are as follows:

My estimate of the dependable amount of water defined as above as irrigation safe yield for the Carroll Dam built to the 315 foot contour and figuring only the 196 square miles of drainage area below Pamo Dam site is 10,400 acre feet annually or 1,300 "water right" Miners Inches.

In ordinary cycles of years there would be a surplus wasted over the dam of about 5,000 acre feet equivalent to 600 "water right" Miners Inches. Reference has been made to pumping from the Bernardo gravels where I estimate there is a dependable supply of 300 Miners Inches.

ESCONDIDO CREEK WATER SHED.

I feel that I should at this time call your attention to the possibilities of an additional supply of water from Escondido Creek. From an examination of the maps it appears that this can be diverted within two miles of the San Dieguito Ranch at an elevation of 400 feet and this water can be utilized for the high service line. There would be no necessity of high service pumping except in the dryest years and the San Dieguito Mutual Water Company should acquire the damsite and reservoir site even if not immediately utilized.

This creek has a drainage area of 48 square miles. It has a lower altitude than the Carroll water shed and flatter slopes, both indicating a less runoff per square mile. As no stream flow observations have been maintained upon this water shed, I can only approximate the probable average supply from this source. If regulated by storage, I should anticipate a dependable supply to 150 Miners Inches from this source.

FUTURE INCREASE OF HEIGHT OF CARROLL DAM

As heretofore indicated during a normal rainfall cycle of 10 years, there will be a considerable surplus of water wasted into the ocean which would not be conserved by a dam at Carroll built to the 515 foot contour or 100 feet in height. In order to conserve all of the water, which it would be good economics to conserve, might require a dam of 140 feet in height, and a maximum storage capacity of 100,000 acre feet. Under these conditions the safe

irrigation yield would increase at least 50%. An exact calculation has not been made and I should advise that the dam be built at present only to the 315 foot contour or 100 feet in height, but so constructed that eventually it can be increased to 140 feet in height. The reasons for not extending it to full height are several. An irrigation project requires a definite period to reach to its full demand for water depending on the settlement of active irrigators and the less use of water on young orchards. The exact amount to which the dam should be raised can be much more accurately computed after the stream measurements have been continued for 3 or 4 more years. The interest charge of construction not utilized for the first few years is saved.

SUMMARY

To summarize, in my opinion, you may safely contract for 1,300 "water right" Miners Inches defined as 8 acre feet furnished annually for each water right Miners Inch, reserving the right in dry years to reduce this quantity to three-fourths. This will be accomplished by building Carroll Dam to the 315 foot contour.

By the development of a pumping plant on the Bernardo gravels and on San Dieguito Rancho, the dependable supply becomes, in my opinion, 1,850 "water right" Miners Inches.

By the construction of a reservoir and connection with reservoir on Escondido Creek and a connection with this system, you

Mr. W. E. Hodges,
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would probably secure an additional 150 Miners Inches, making a total available supply of 2,000 "water right" Miners Inches.

By raising the dam to 140 feet in height, you will increase the quantity of water available by at least 600 Miners Inches, or a total of 2,600 Miners Inches.

Very sincerely yours,

William S. Post

WSP:K

SAN DIEGO WATER PROJECT

PROPERTY STATEMENT

September 1st, 1916

<u>Order</u>	<u>Original Owners</u>	<u>Map Number</u>	<u>Serial Number</u>
<u>Properties not fully paid up</u>			
A	Smith -----	10	19
B	Rice - Roberts -----	8	17
C	Anderson - Bonsall -----	3	10
D	Craig -----	3	5
E	Marston -----	12	32
F	Lucy G. Stevens -----	3 & 4	11
G	Hindle -----	1	4
H	Howman - S L Rey across Winston ----	3	7
I	Wakeham -----	1	2
J	Bryan -----	3	8
K	Geo. Stevens -----	3 & 4	12
L	Hermans -----	1 & 2	3
M	Nulton -----	7	16
<u>Properties Clear</u>			
N	Froelich - San Clemente -----	10	20
O	Buttemer - " -----	10	21
P	Roarke - " -----	10	22
Q	Butler - " -----	10	23
R	Rice - " -----	10	24
S	McCray - Below Warner Dam -----	5	13
T	Hooper - S L Rey -----	3	6
U	Ellithorpe - San Clemente -----	10	25
O	Buttemer " -----	10	26
V	Peters - S L Rey near Oceanside ----	1	1
W	Clancy - S L Rey -----	3	9
X	Nelson - Linda Vista Mesa -----	11	27
Y	Ferlin - S C -----	10	28
Z	Booth -----	9	18
AA	Stoddard -----	10	29
BB	Miller -----	10	30
CC	Blochman -----	10	31
FF	Pamo -----	13	33
<u>In addition to above there are</u>			
DD	Tom Carroll -----	6	14
EE	J B Carroll -----	6	15

TOWNSHIP 10 SOUTH

<u>Map No.</u>	<u>Serial Number</u>	<u>Range</u>	<u>Section</u>	<u>Description</u>	<u>Acres</u>	<u>Order</u>	<u>Name of Orig. Owner</u>
3	10	3 W	29	E $\frac{1}{2}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$, Pt. SW $\frac{1}{4}$ NW $\frac{1}{4}$, E $\frac{1}{2}$ NW $\frac{1}{4}$, WE SW $\frac{1}{4}$, NE $\frac{1}{2}$ SW $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$,	259.43	C	Anderson
3	10	3 W	30	SW $\frac{1}{4}$ NE $\frac{1}{4}$, Pt. SE $\frac{1}{4}$ NE $\frac{1}{4}$, & SE $\frac{1}{4}$	235.87	C	Anderson
3	9	3 W	31	N $\frac{1}{2}$ NE $\frac{1}{4}$,	80.	W	Clancy
3	7	4 W	35	NW $\frac{1}{4}$ SE $\frac{1}{4}$, E $\frac{1}{2}$ SE $\frac{1}{4}$	120.	H	Bowman
3	6	4 W	35	SW $\frac{1}{4}$ SE $\frac{1}{4}$	40.	T	Hooper

TOWNSHIP 11 SOUTH

5	13	2 E	4	W $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$, S $\frac{1}{2}$ SE $\frac{1}{4}$,	200.	S	McCray
3	8	4 W	1	N $\frac{1}{2}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$,	220.	J	Bryan
3	5	4 W	1	Lot 4 Guajome	270.	D	Craig
3	6	4 W	2	Lot 2	25.	T	Hooper
1	4	4 W	3	W $\frac{1}{2}$ SW $\frac{1}{4}$,	57.75	G	Hindle
1	4	4 W	4	SW $\frac{1}{4}$ SE $\frac{1}{4}$, E $\frac{1}{2}$ SE $\frac{1}{4}$,	120.	G	Hindle
1	2	4 W	7	E $\frac{1}{2}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$,	160.	I	Wak eham
1 & 2	3	4 W	8	Pt. SE $\frac{1}{4}$ NE $\frac{1}{4}$, Pt. NE $\frac{1}{4}$ SE $\frac{1}{4}$,	28.75	L	Herman
5	13	2 E	9	NE $\frac{1}{4}$ NE $\frac{1}{4}$,	40.	S	McCray
5	13	2 E	10	Lot 1 Pt. Lot D Agua Hedionda et al as follows:	50.95	S	McCray
12	32	4 W	27		17.	E	G W Marston
12	32	4 W	28		2.	E	do
12	32	4 W	33	Pt. NE $\frac{1}{4}$	46.	E	do
12	32	4 W	34	NW $\frac{1}{4}$, WE NE $\frac{1}{4}$,	240.	E	do
					305.		
1	1	5 W	13	NW $\frac{1}{4}$ SW $\frac{1}{4}$,	40	V	Peters

TOWNSHIP 12 SOUTH

<u>Map No.</u>	<u>Serial Number</u>	<u>Range</u>	<u>Section</u>	<u>Description</u>	<u>Acres</u>	<u>Order</u>	<u>Name of Orig. Owner</u>
8	17	1 W	29	SE $\frac{1}{4}$ NE $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$,	160.	B	Rice-Roberts
8	17	1 W	32	E-2/3, E $\frac{1}{3}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$, Pt E $\frac{1}{2}$ NW $\frac{1}{4}$ SE $\frac{1}{4}$,	113.	B	do
8	17	1 W	33	NW $\frac{1}{4}$, W $\frac{1}{2}$ SW $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$,	280.	B	do
9	18	2 E	16	SE $\frac{1}{4}$ SE $\frac{1}{4}$,	40.	Z	Booth
9	18	2 E	21	SW $\frac{1}{4}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ & SE $\frac{1}{4}$,	400.	Z	Booth
9	18	2 E	28	NE $\frac{1}{4}$ NE $\frac{1}{4}$,	40.	Z	do
6	15	2 W	32	SW $\frac{1}{4}$ SW $\frac{1}{4}$, E $\frac{1}{2}$ SW $\frac{1}{4}$,	120.	FF	J B Carroll
13	33	1 E	14	W $\frac{1}{2}$	320	FF	Pamo
13	33	1 E	23	NW $\frac{1}{4}$, S $\frac{1}{2}$ NE $\frac{1}{4}$, N $\frac{1}{2}$ S $\frac{1}{2}$, SW $\frac{1}{4}$ SW $\frac{1}{4}$,	440	FF	do
13	33	1 E	26	W $\frac{1}{2}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$,	160	FF	do
13	33	1 E	27	NE $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, N $\frac{1}{2}$ SW $\frac{1}{4}$,	280	FF	do

TOWNSHIP 13 SOUTH

7	16	2 W		Pt. San Bernardo Rancho	469	M	Nulton
6	15	2 W	5	Pt. Lot 5 & Pt. 6, Pt. NW $\frac{1}{4}$ & Pt. SW $\frac{1}{4}$	365 ⁺	EE	JB Carroll
6	15	2 W	6	Pt E $\frac{1}{2}$ NE $\frac{1}{4}$, Pt. E $\frac{1}{2}$ SE $\frac{1}{4}$,		EE	do
6	15	2 W	8	Pt Lots 1-2-3-4		EE	do
6	14	2 W	7	Pt E $\frac{1}{2}$ NE $\frac{1}{4}$, Pt E $\frac{1}{2}$ SE $\frac{1}{4}$	167 ⁺	DD	Thos. Carroll
6	14	2 W	8	Pt W $\frac{1}{2}$ NW $\frac{1}{4}$, Pt W $\frac{1}{2}$ SW $\frac{1}{4}$,		DD	do
6	14	2 W	18	Pt NE $\frac{1}{4}$ NE $\frac{1}{4}$,		DD	do

TOWNSHIP 14 SOUTH

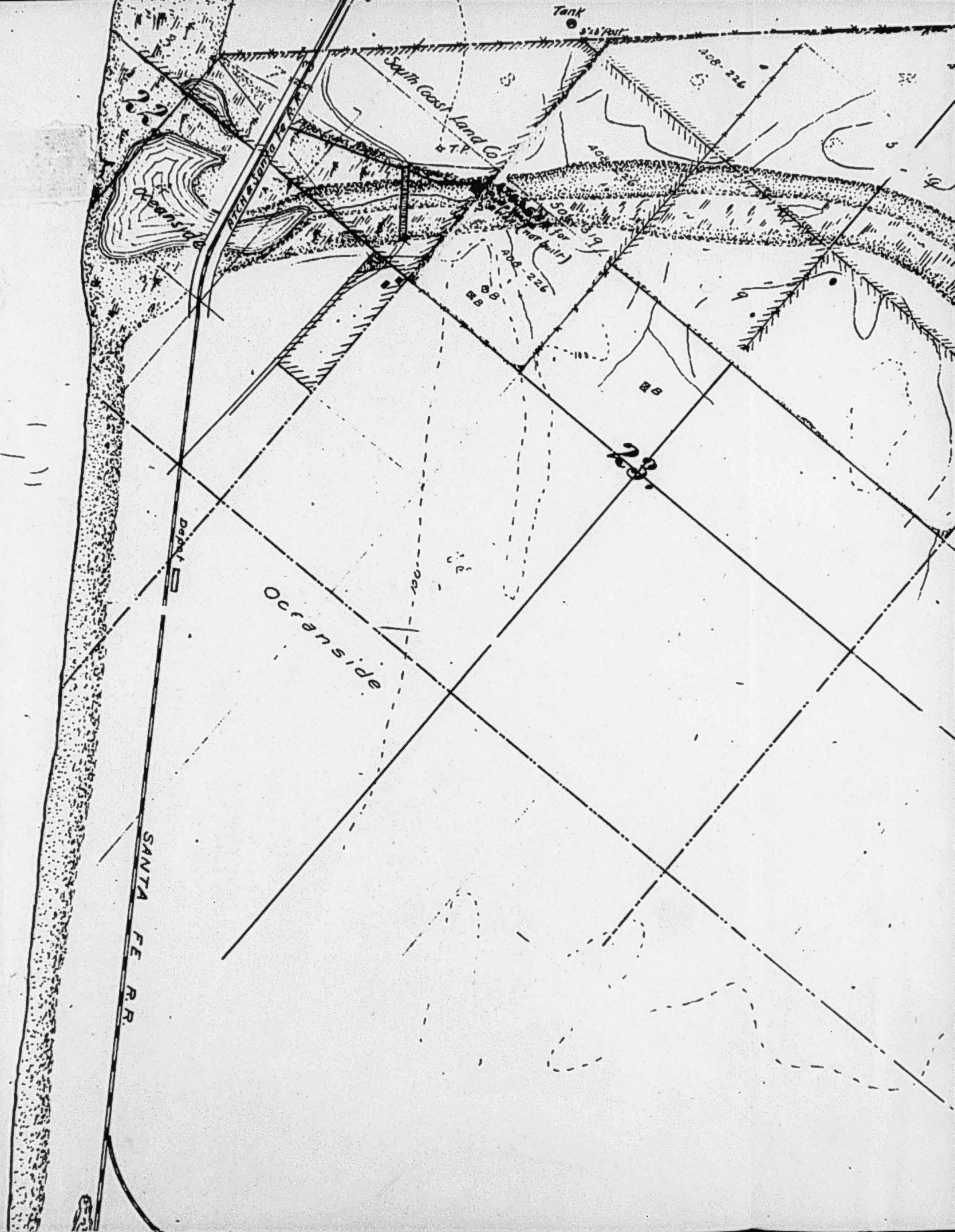
10	25	2 W	36	N $\frac{1}{2}$	320	U	Ellithorpe
11	27	2 W	31	SE $\frac{1}{4}$	160	X	Marsh-Nelson

TOWNSHIP 15 SOUTH

10	23	2 W	2	SW $\frac{1}{4}$ NW $\frac{1}{4}$, W $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$, SW $\frac{1}{4}$,	160	Q	Butler
10	19	2 W	3	All SE $\frac{1}{4}$,	160	A	H N Smith
10	30	2 W	9	NE $\frac{1}{4}$ SE $\frac{1}{4}$,	40	BB	Miller
10	30	2 W	10	S $\frac{1}{2}$ S $\frac{1}{2}$	160	BB	Miller
10	31	2 W	9	SE $\frac{1}{4}$ NE $\frac{1}{4}$	40	CC	Blochman
10	31	2 W	10	SW $\frac{1}{4}$ NW $\frac{1}{4}$	40	CC	Blochman
10	22	2 W	10	SE $\frac{1}{4}$ NW $\frac{1}{4}$, E 3/4 NE $\frac{1}{4}$ SW $\frac{1}{4}$,	70	P	Roarke
10	20	2 W	10	N $\frac{1}{2}$ SE $\frac{1}{4}$	80	N	Froelich
10	24	2 W	10	NW $\frac{1}{4}$ NE $\frac{1}{4}$, E $\frac{1}{2}$ NE $\frac{1}{4}$,	120	R	Rice

TOWNSHIP 15 SOUTH (Continued)

<u>Map No.</u>	<u>SERIAL Number</u>	<u>Range</u>	<u>Section</u>	<u>Description</u>	<u>Acres</u>	<u>Order</u>	<u>Name of Orig. Owner</u>
10	28	2 W	10	N $\frac{1}{2}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$,	120	Y	Ferlin
10	29	2 W	10	NW $\frac{1}{4}$ SW $\frac{1}{4}$, W 10 ac. NE $\frac{1}{4}$ SW $\frac{1}{4}$,	50	AA	Stoddard
10	21 & 26	2 W	11	NW $\frac{1}{4}$ NW $\frac{1}{4}$,	40	0	Buttemer



Food

508 226

14.

40 AC

M. PETERS

18.

Pumping plant

Pumping Plant A

City Reservoir

B B = N

1/4 SC

200

57+15

200

30
55

Line 35.2
wa 34.9

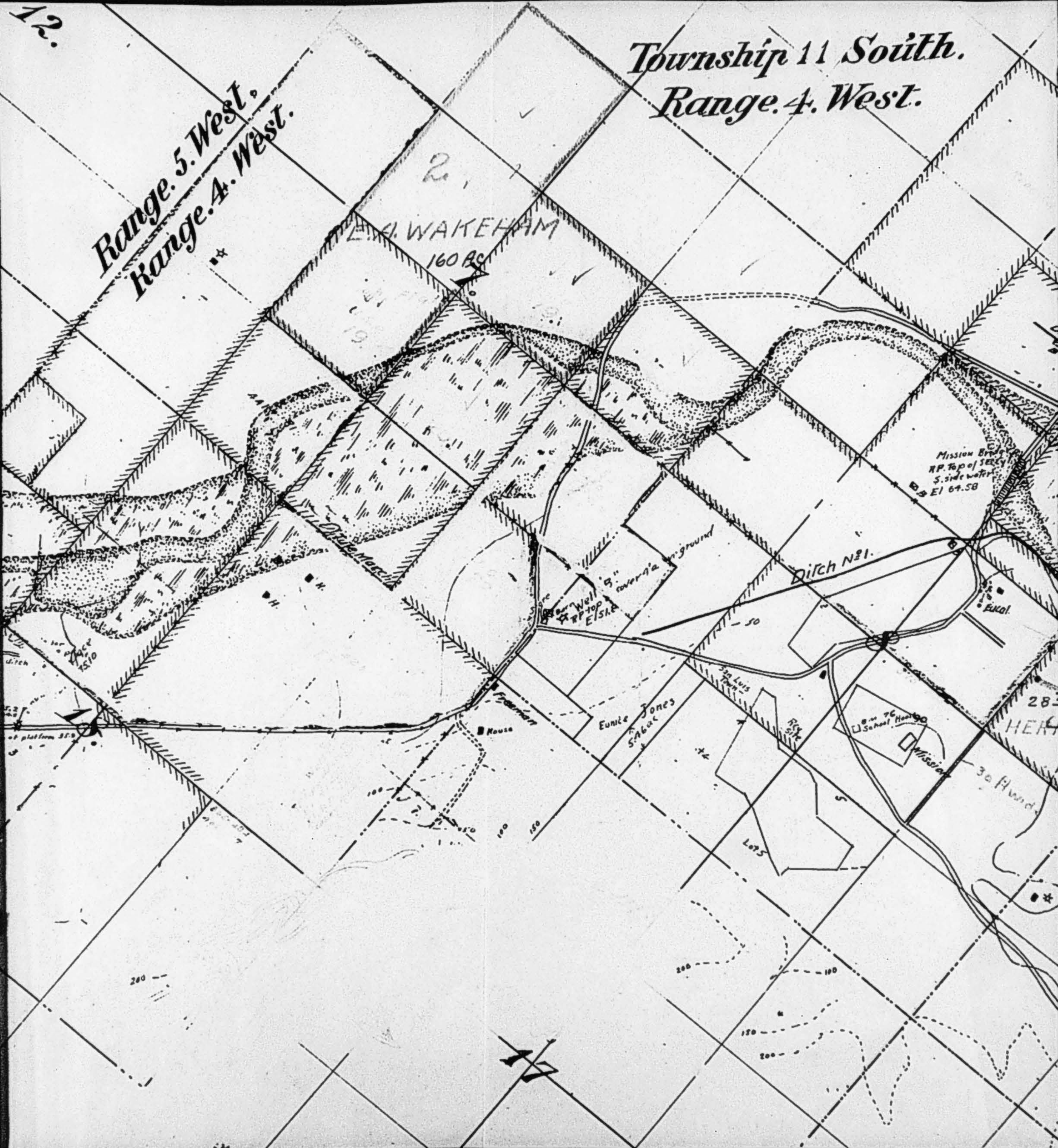
Top of platform 35.9

B



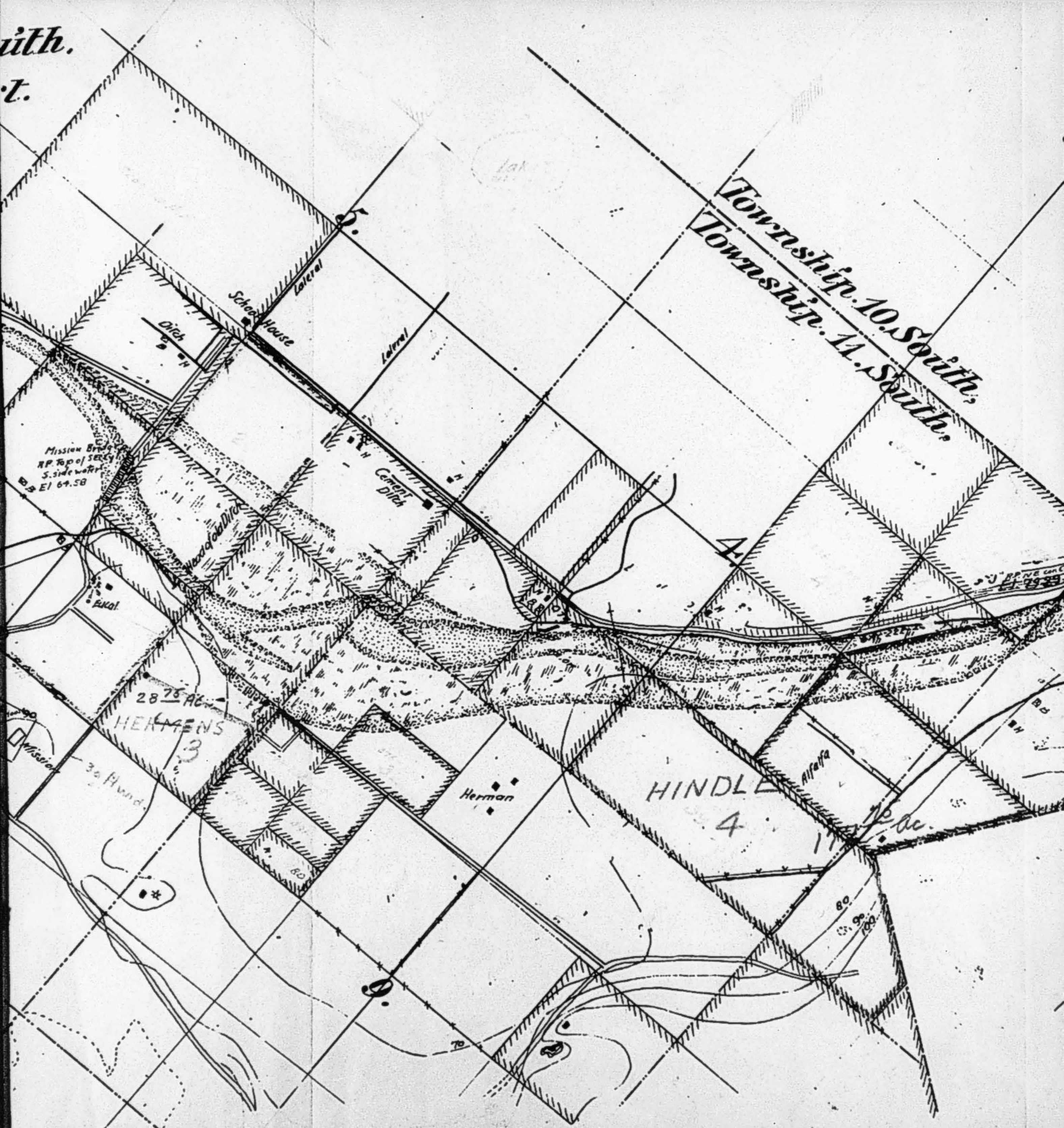
Township 11 South.
Range 4. West.

Range 5. West.
Range 4. West.



with.
t.

Township 10. South
Township 11. South



Mission Bridge
RP Top of S.E.C. 4
S. side water
E1 64.58

School House

Cement Ditch

2875 AC
HERMANS
3

Herman

HINDLE
4

Alfalfa

Ac.

33.

Township 10. South,
Township 11. South,

Faint handwritten notes, possibly describing survey details or dates.



Guajome Rancho,

54
89

T. 11 S. R. 4 W. S. 8 M



County Road

C. of Road N 72° 80' E 1343.5'

915.3'

28.753 Acres
Hermens

3

30 ft wide

VOLCAN LAND & WATER CO.

SCALE 1 IN = FT.

W. S. POST CHIEF ENGR

REFERENCE MAP
FIELD BOOK NO.

DRAWN BY

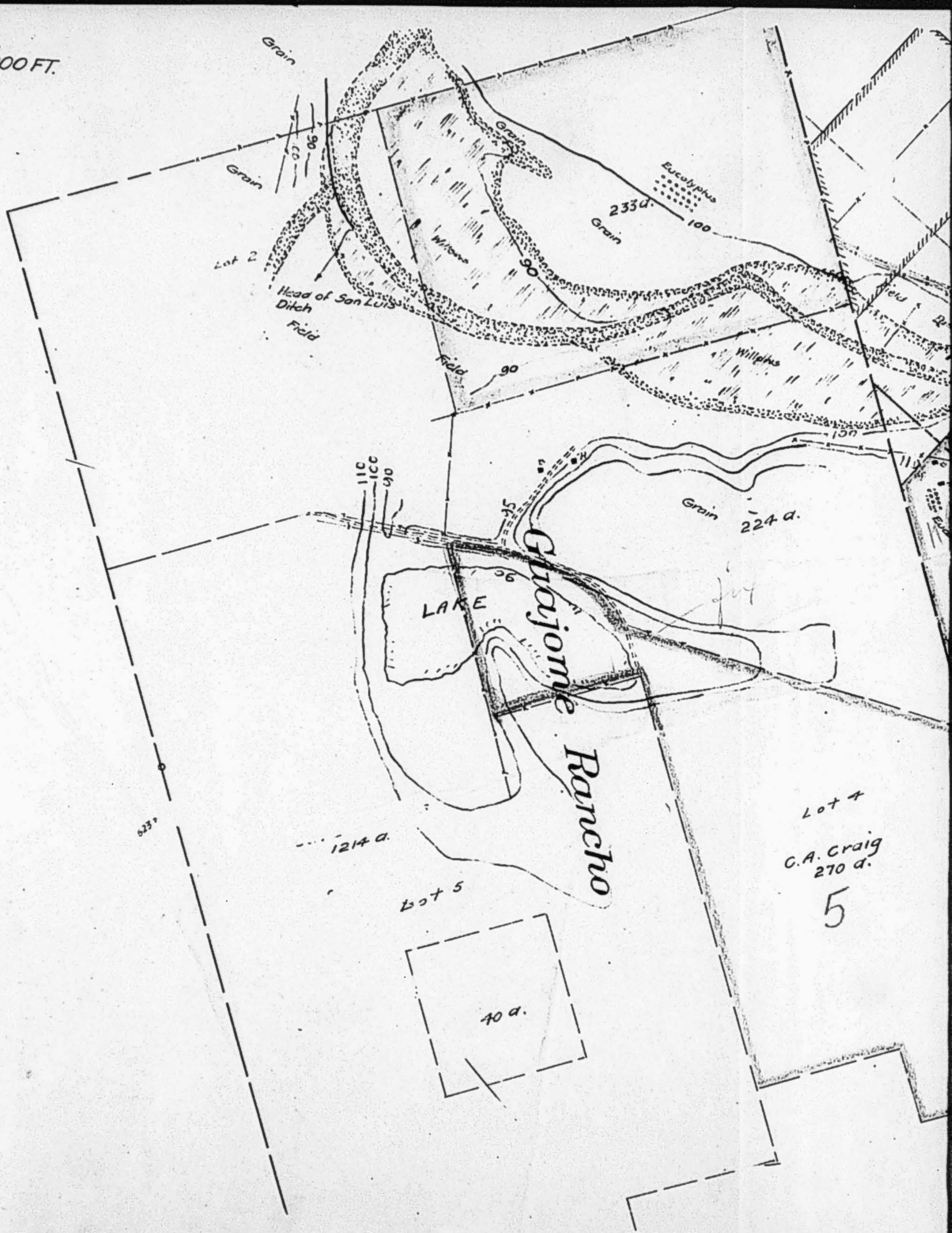
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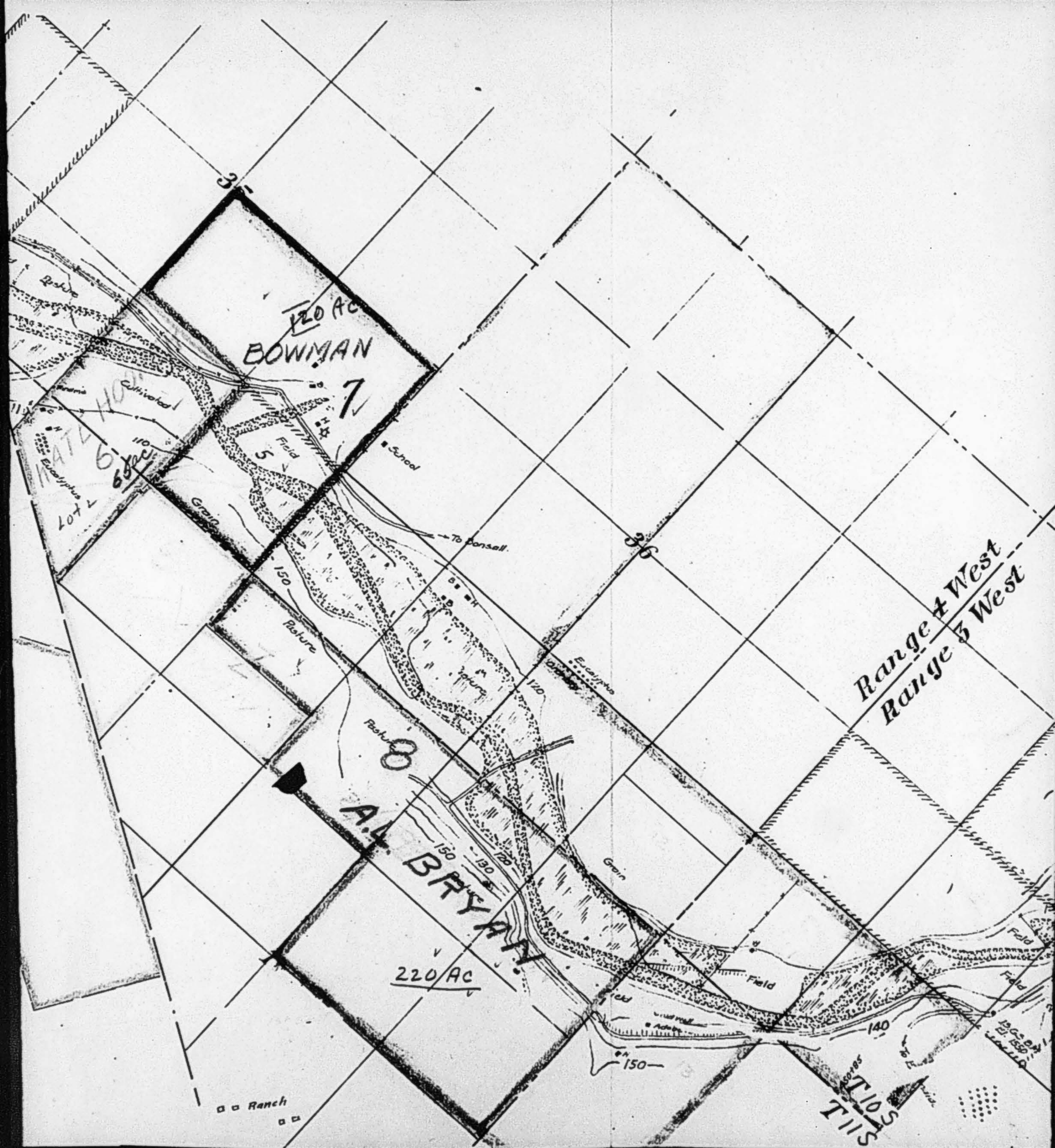
DATE

DRAWING NO.

FILE NO.

SCALE: 1 INCH = 1000 FT.





120 AC
BOWMAN

7

66 AC
Cultivated
Eucalyptus

8
A. L. BRYANT

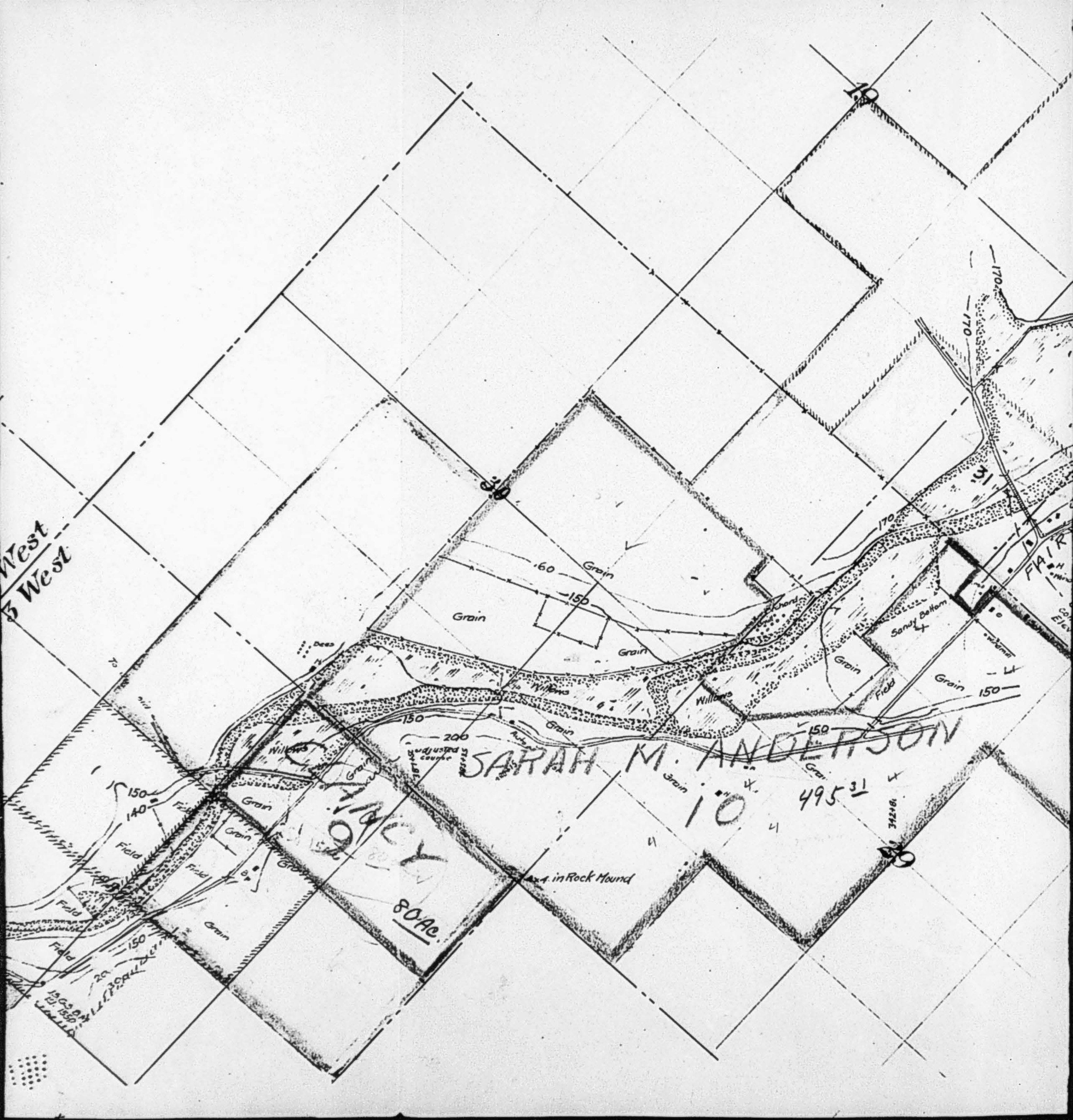
220 AC

Range 4 West
Range 3 West

T10 S
T11 S

□ □ Ranch

West
West



SARAH M. ANDERSON

100 AC
80 AC

495 31

34218

Ax in Rock Mound

Grain
Grain
Grain

Sandy Bottom

Grain

Willows

Willows

150
140

150
200

150

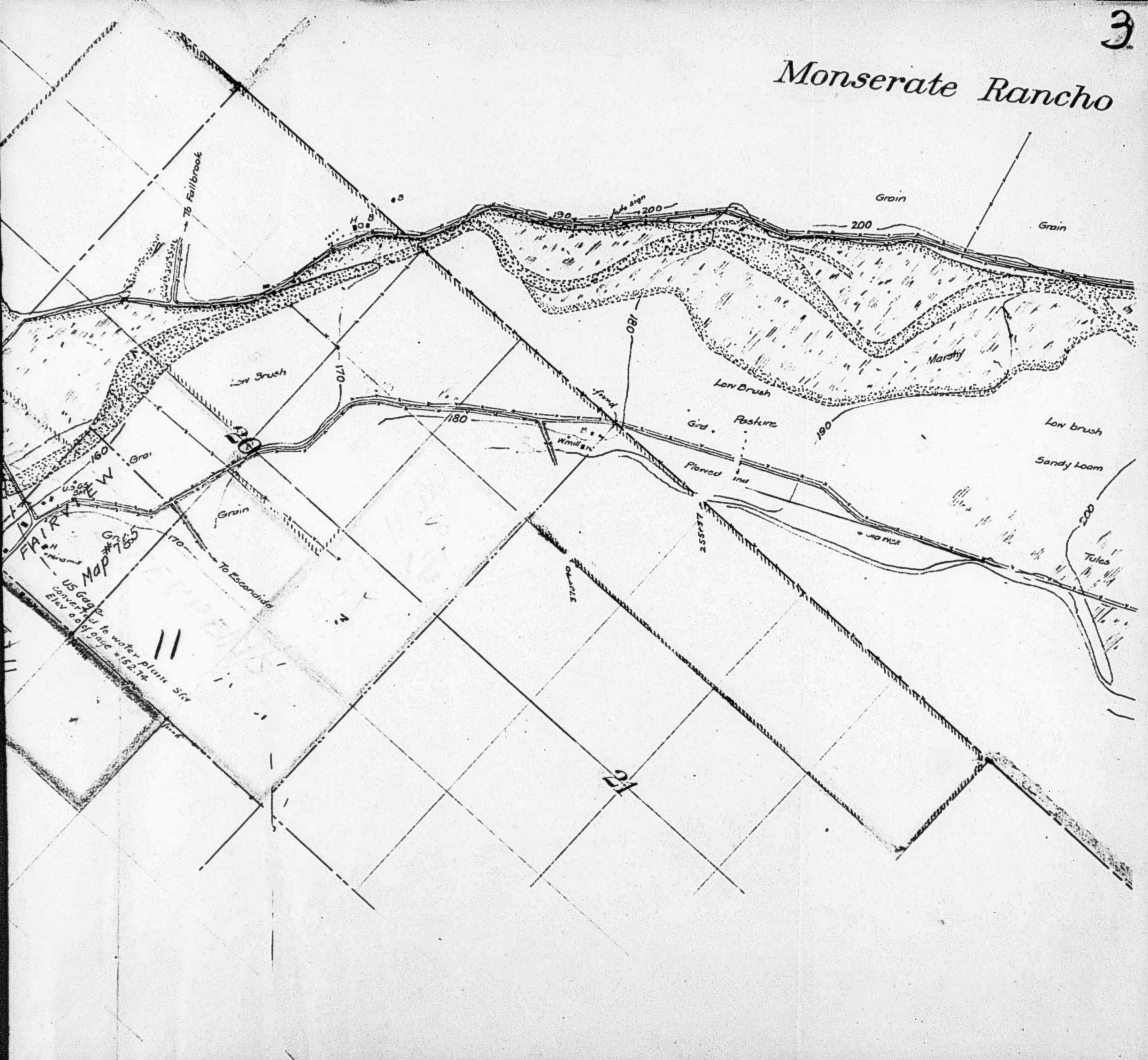
150

1863
1850
1855

FAIR

CO
Etc

Monserate Rancho



T. 10 S.

T. 11 S. R 2 E S B M

4

San Luis Rey River

290 95

13
McCray

9

9 10

Rancho Valle de San Jose



T13S R2W

J.B. CARROLL
15

Net
485.2±

T12S
T13S

TOM CARROLL
Net 167 Ac ±
14

San Dieguito River
Desc. 24
315' Contour

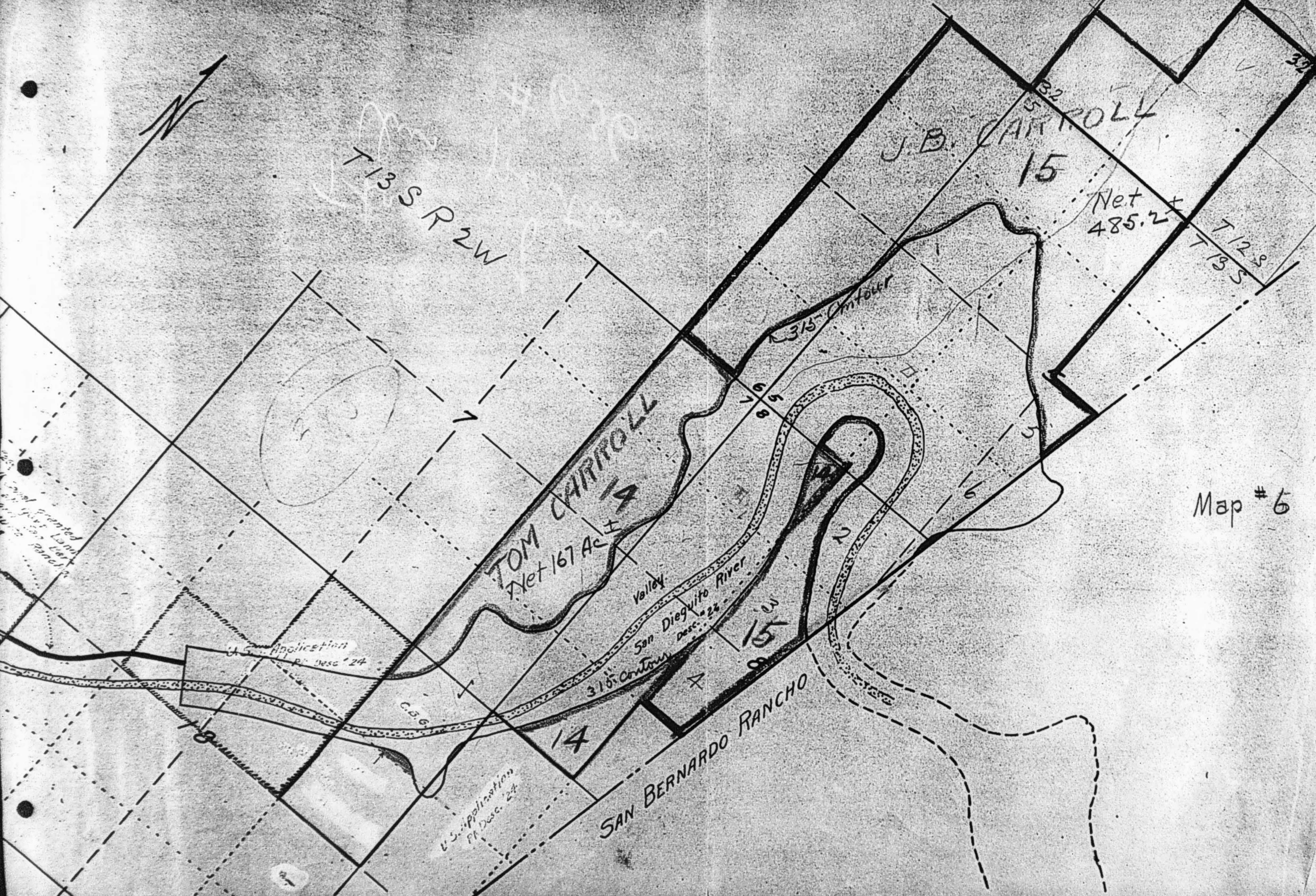
SAN BERNARDO RANCHO

Map # 6

Land granted
to the
San Bernardino
Ranch

U.S. Application
P. Desc. 24

U.S. Application
P. Desc. 24



T13S R2W



Nulton 16
469 Acres

315 Contour

Santa Ysabel Creek

SAN BERNARDO RANCHO

Cement monument

Cement monument

N 11° 36' E
1235.5

Cement monument W.C.

506.1

N 72° 12' W
710.3

S 50° W 1052.3

N 68° W 1200.1

N 75° W 1120.1

N 85° W 820.1

N 85° W 420.1

Cement mon. W.C.

Cement mon. W.C.

615.8

566.2

501.1

N 85° W 420.1

570.8

N 42° 35' W

680.1

570.1

S

17

RICE-ROBERTS
160 AC

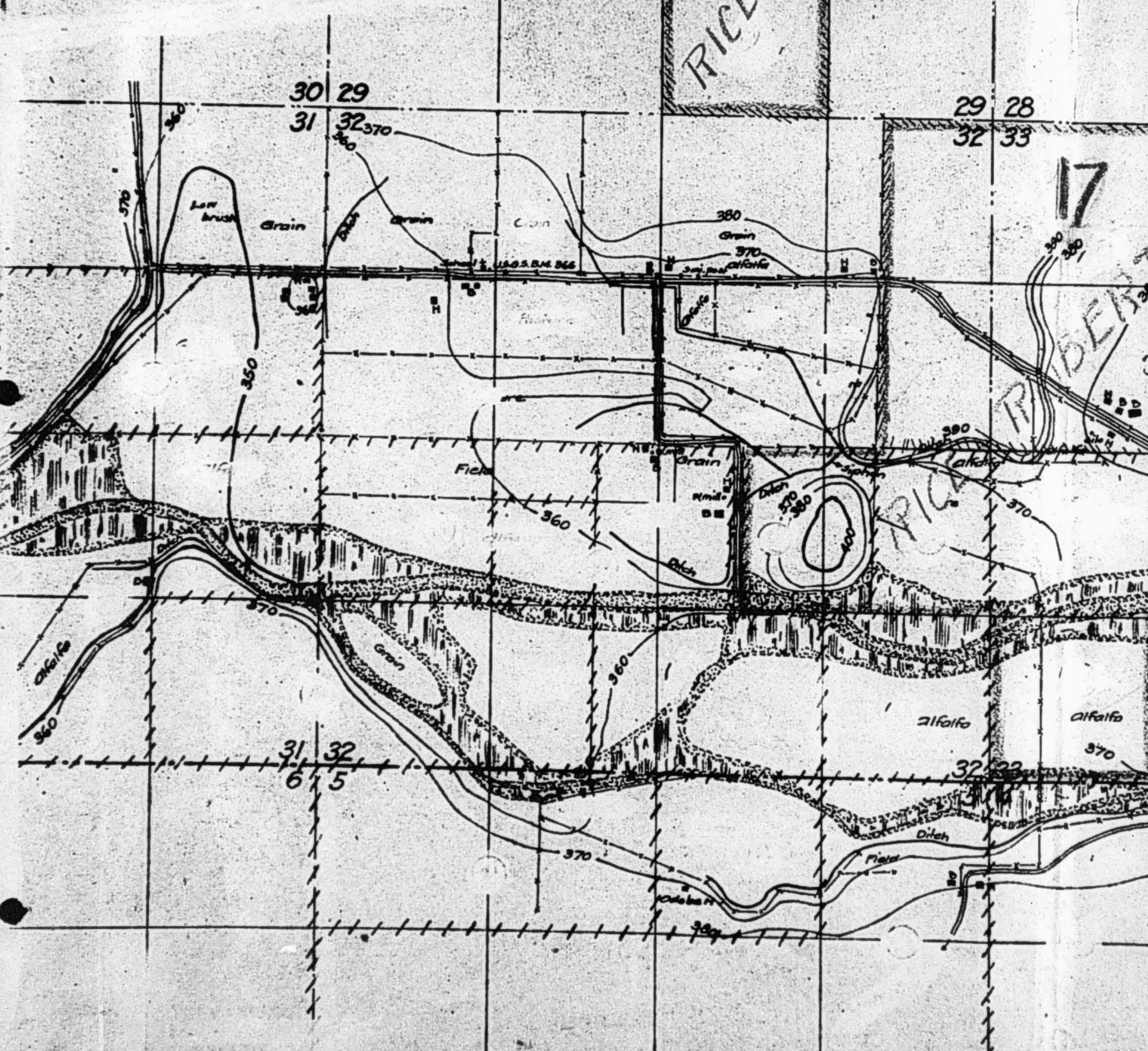
30 29

31 32

29 28

32 33

17

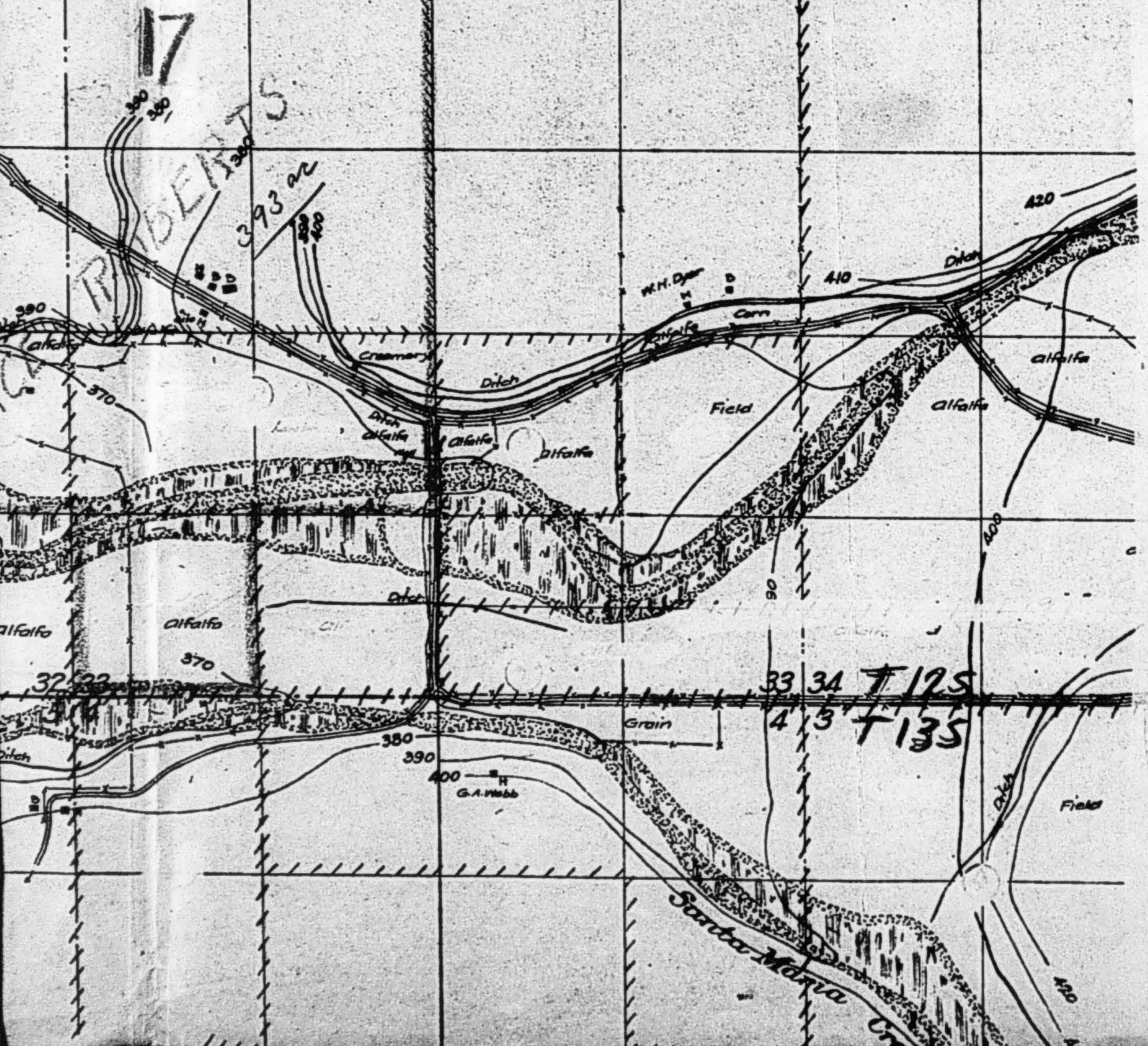


T 12 S R 1 W S 3 M

29 28
32 33

28 27
33 34

17



33 34 T 12 S
4 3 T 13 S

Santa Maria

T 125 R 2 E 5 B M

20

20

21

21

480 ac

18

BOOTH

Dam Site

210

Creek

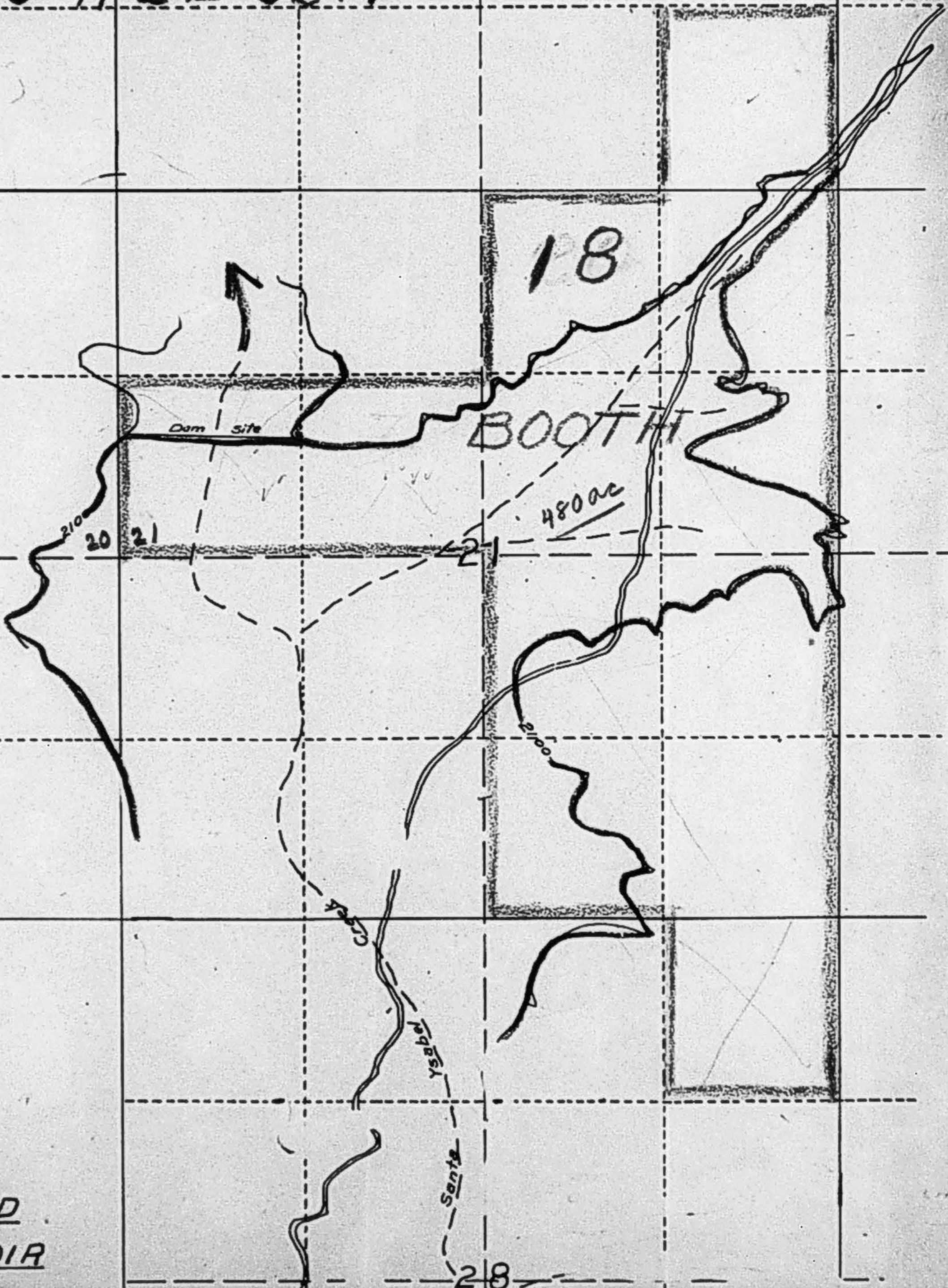
Ysabel

Santa

20



SUTHERLAND
RESERVOIR



MARIE HENSER

CHAS. KEMP Est.

U.S.

33

JNO. W. VASEY

GEO. B. VASEY

34

SCHIPPS

SCHIPPS

E.C. EMERSON ET. AL.
(Boston Mass.)

SCHIPPS

U.S.

4

DAVID SEAMAN

SCHIPPS

5

19
ANNA W SMITH
(Whittier)

5

2

U.S.

35

SCHIPPS

U.S.

De BURN
180 a.

U.S.

N ET. AI.
ass.)

U.S.

Mrs. FITCH
140 a.

U.S.

U.S.

F.C. TOWER
20 a.

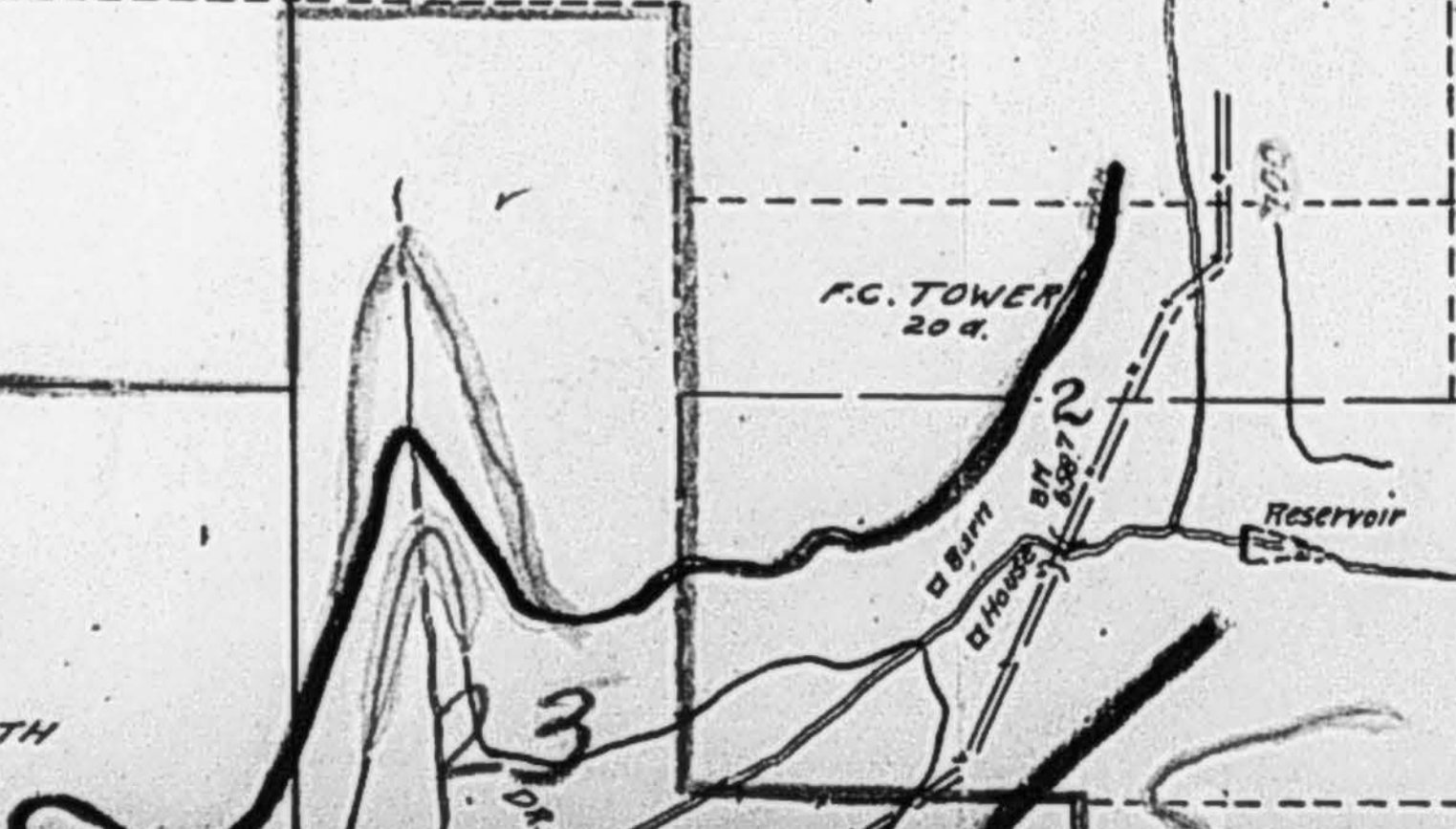
Reservoir

V. A TOWER

V. A TOWER

19
ANNA W SMITH
(Whittier)

3
D.R.E.



25

ELITHORPE
320 a.

CK

36

FERRAND
320 a.

R 2 W
R 1 W

Oil Well
X

T 14 S
T 15 S

V. A. TOWER

1

US

U.S.

U.S.

IER

SCHIPPS

SCHIPPS

DAVID SEAMAN

U.S.

BETMAN

EILEEN BARRETT

28 FERLIN
80 a.

31 BLOCHMAN
80 ac.

BRYSON
100 a.

MILLER
40 a.

STODDARD

29 clemente

Orchard

70

Creek

San Diego Road

VAUOTAIN Est. 10

30

DERRENBECKER
160 a.

550

550

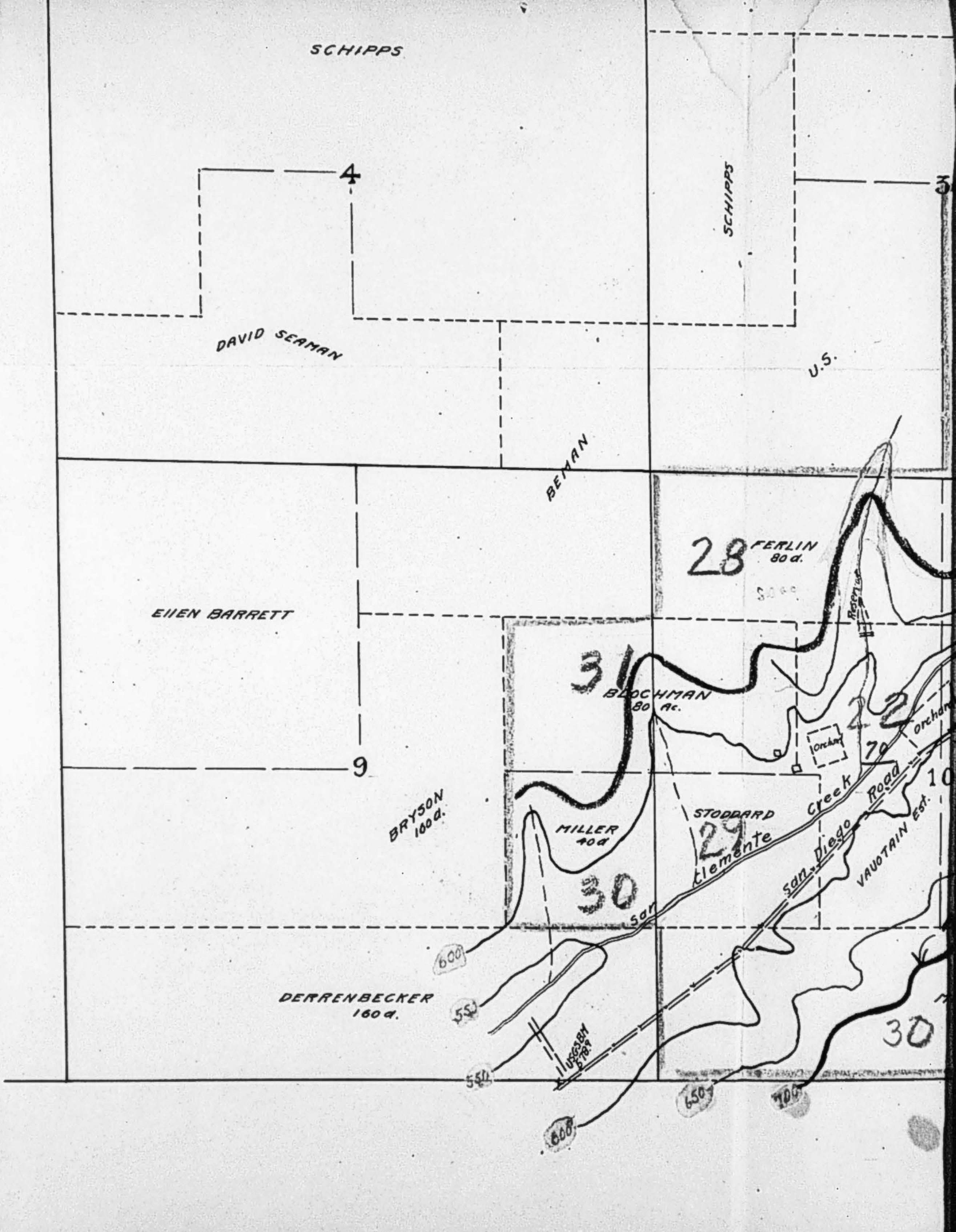
UGGSBY
57 a.

600

650

700

30



U.S.

Mrs. FITCH
140 a.

F.C. TOWER
20 a.

19
ANNA W SMITH
(Whittier)

3
DR. BUTLER
100 a.

V. ATOWER

U.S.

2
ASN BUTEMER
4 a.

26
BUTTEMER'S SONS
6 a.c.

M.C. NASON
or
BENJ. JUDKINS

M.C. NASON
or
BENJ. JUDKINS

U.S.

BUTTEMER'S friend in England
PAME HANNON

U.S.

DOMENIE & BBIDGET
SPELLMAN
Tax Title to State

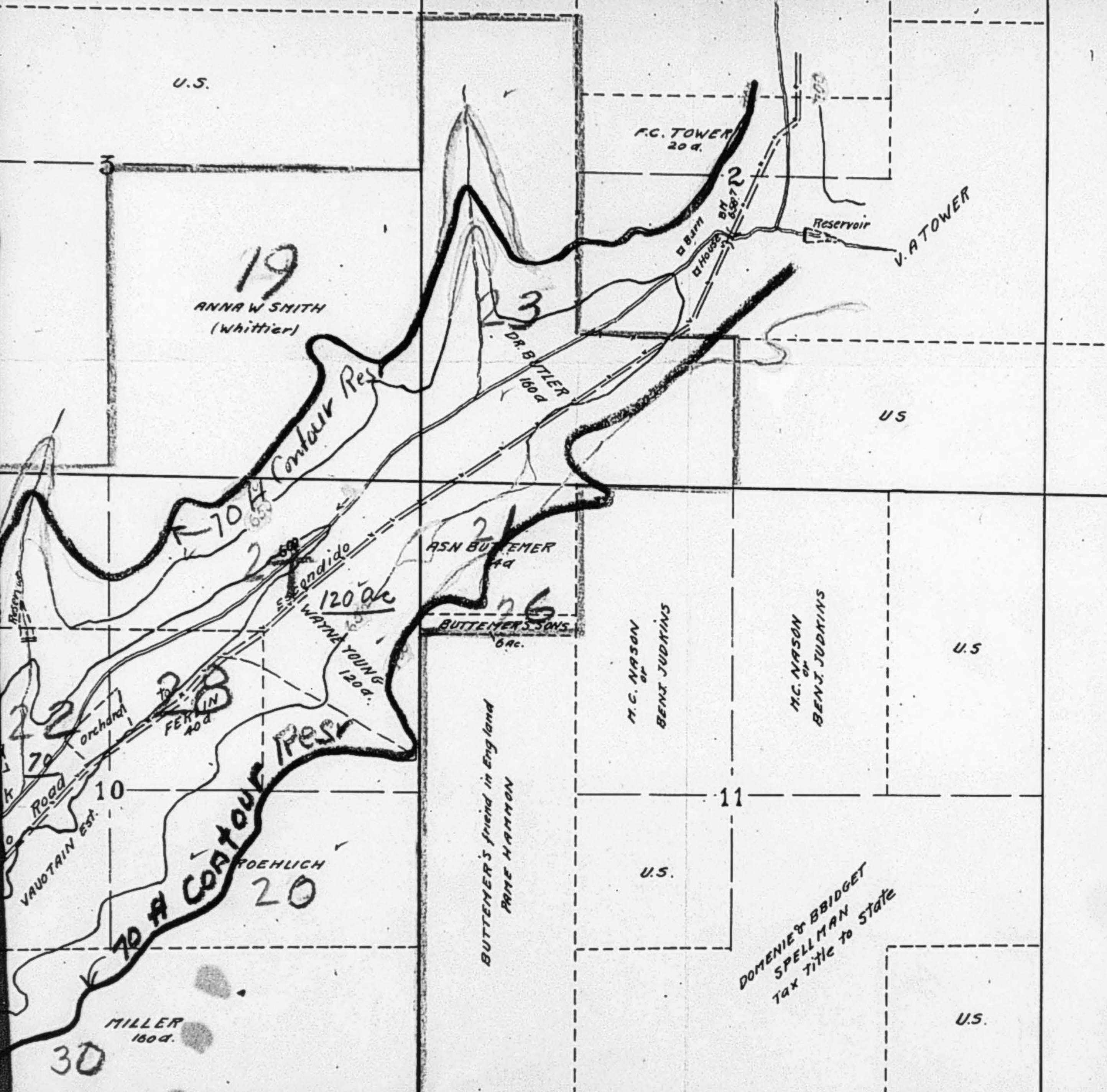
U.S.

MILLER
160 a.

30

Ex. Mission Grant Line

FORTUNA RANCH



V. ATOWER

1

US

U.S.

U.S.

12

VOLCAN LAND & WATER CO.

Miniature Map

SHOWING OWNERSHIPS IN VICINITY

of

SAN CLEMENTE RESERVOIR

Scale 1" = 1000'

Top Contour 700'

July 1912

77

31

31

Sec 31 T. 14 S, R. 2 W. SBM

MARCH -
NELSON

27

160 Ac.

31

31

Serial #33

Desc. #10

Desc. #10

PAMO RESERVOIR SITE



Desc. #10

T12S, R1E, S.B.M

22 23

Not included

27 26

Desc. #10

Desc. #9

Desc. #9

Desc. #10

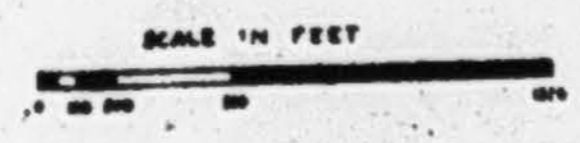
985' contour

Not Included

27

26

Desc. #9



PAMO
1200 Ac. ±

Ed Fletcher Papers

1870-1955

MSS.81

Box: 41 Folder: 16

Business Records - Reports - Post, W.S - "Property Statement, San Diego Water Project, Maps and Index"



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