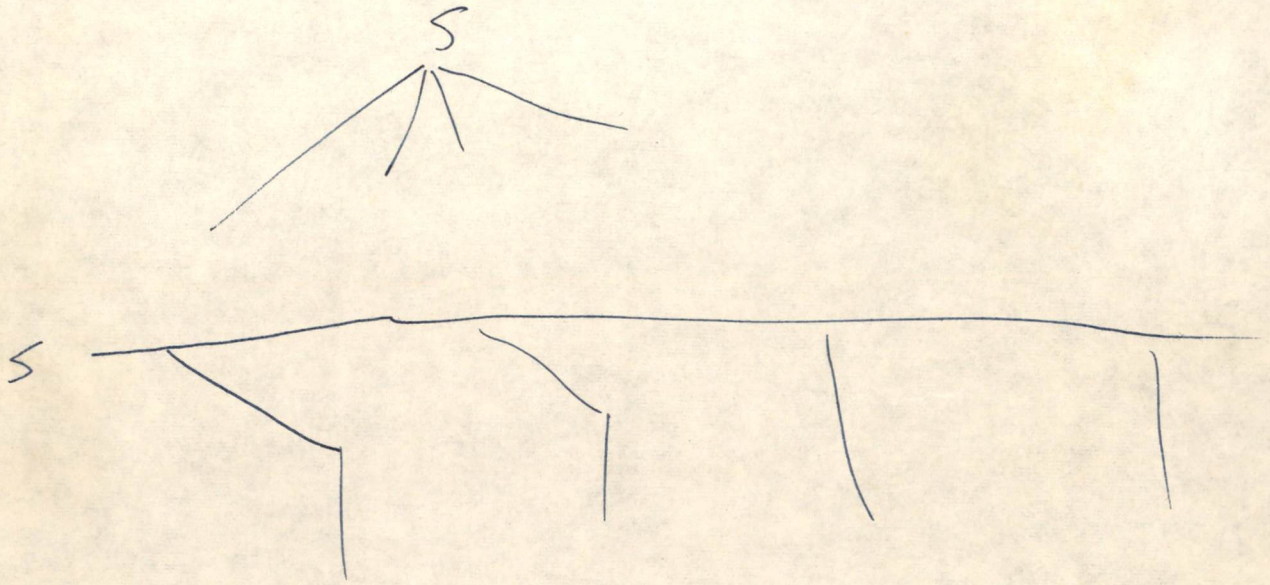
alB4 E sd, Am R-SJR

Crawford on Modesto; etc.



So to Secto., get water rts on various streams. Cf to acreage served.

Make rough est. of wastes, figure roughly how much more cd be done w. water.

!! all fm advisors I ever met say opposite. Is Meikle biased?

Meikle – fm advisers always tell'g firms to use more water. He thinks they use too much.

Unirrigated land in S.D. deteriorates, alkali rises, bes is never enuf water to push it down.

Crawford dislikes Engel, bes Th Mod. buys from S.F. at low rates, he fears higher rates if another gets in – bes they will have to ~~buy~~

pay S.J. some rent – sounds confused.

Districts differ in that Turlock recognizes more individ. prop. in water, at least in thy.

Turlock, law requires they distr. & taxes. But they adjust, to alloc. by MP, & no one complains bcs all have surplus, & taxes are very low. Why don't larger taxpayers claim annual payment for water they send to cheap clover land? Generosity?

Crawf. thinks irrig. season too long – now, stuff is green, but not growing. More waste.

Qns for Merced:

Is there a schedule of diversions? Hardly.

Water charges? Means of alloc-g water? Principle, criterion, basis of alloc-n. Xfrable? – No.

Use whole Merced R.? All the time? → almost.

Effect of Munic. B. Act on credit?

Sell outside distr.? – yes Expand distr.? No

Serve ea. 160 acres. No imp. districts.

Tax water rts? No

Did town push it thru? Yes.

Are rts to rate of flow, or amount? 4 ft, gravity. But in antic. dry spell, cut 'em down early.

Charge & length of canal? No

Discourage hi water – consg running crops? No

all ditches always full? yes

McMurry, Joe

Merced. Just starting conservation, this yr. Much waste – 15%
goes out distr.'s own canals, just from poor scheduling. Fmrs are
lavish.

~~Informally,~~ All get 4 a-f., gratis, unless shortage. If less,
cut all back alg. (fractional rts). Crude msrem't methods. – time, &
presumed rate of flow, w/o observation.

Those who want more pay tolls.

A short yr., voluntary cons-n program, saved much.

Still lose much flood water. Dreaming of Horseshoe Bend
new dam. But some say why pay for that – stop wasting what
have.

Not admitting new lands now.

Ragged fringe here & there, much waste of extra canals &
channel losses.

No attempt to charge for distr. costs. Even where
pump.

Serve ea. 160 a. Individs take from there. Informal &
not very satisfactory ditch mntnce of these pvt. systems.
Individ fmr notifies ditch man wants water, d.m. sees he
gets it.

All canals always full, summer.

Is record of ea. service, checked vs how much went in ditch.

Distn. system not quite up to peak loads

"Squeeze ~~some~~ half water out of super saturated I.D.s & they're better off, & others more so."

Stevenson & el Nido I.D.s get some of their waste.

No xfrs by sale, as Turlock. If one fellow takes less he gets no credit. But can buy more, from distr. Imagine grow's rice here!

Crocker-Huffman still op. City of Merced water supply.

Figs take very little water. Others much.

Rts are by acreage, not value.

Secara, Madera, Watermaster — good man

Anxious to extend boundaries, bcs water now seeps over them & neighbors pump it, they feel neighbors shd pay. Esp., it seeps toward valley center. Gravelly ford area. Neighbors may come in, to get surface water.

Secara, like other i.d. men, takes somewhat patronizing attitude toward fmrs. If catch them at something, shut off water to punish e.g. Theft, some have done it, they prosecute & publicize, works fine.

Buy from BR, $2.25; sell for $2.50. Tax. Economize on water closer. Irrig. c. 45,000 a. In '53, Merced wasted more than Madera used.

BR fixed their distr. system. But not w/o int. Only the best - & hi cost. (but may outlast cheaper systems) Lined waterways! Duplicated wing ~~reinf.~~ (?)

Serve any acreage, however small.

From fmr, get yrly est. of needs. Then daily. From BR buy by yr. Also give mo. by & daily est. Can vary ~~$~~ w-in the mo., & sometimes between mo.s, by grace.

Bureau a bit hard to deal w. Won't change flow on Sun. Dump class II water capriciously, w/o good forecasting, & ~~the~~ MID must take.

Melody of Love

10-55

Mr. Cranford, Water Engineer, Modesto I.D. Fairly reactionary

They have "absolute control" of rate of flow ~~at~~ in canals - but hold back during ~~day~~ nite esp., bcs power gen. then can be bought cheap from Hetch Hetchy - then they buy kw-hrs, in day have to buy kws. (i.e. firm power?)

They waste lots & lots of water, many ways.

1. Need more storage. That means some must run over in hi seasons

2. Individual farms waste water. They can take all

they want. Emly agree they overirrigate

(Some crops need more water them others, & more freq.

1 a-f, nic 10. They make no effort to limit ~~use of~~ water consumptive acreage.) (Sometimes they limit use a little by informal rationing) (in early season, to save for late)

3. Ea. canal has a spillway on end. They evidently have no very close system of coordinating input & output, so considerable wastes into S.J. - which has lots of

water in it today Oct 5 1955. Calls it "inevitable in a large system".

The ditch tender tells 'em when to take water — nites, Sundays, 1st day of hunting, etc. Takes many hrs for head of water to get from end to end of canal, & is enough storage in canal to handle a farm or so.

But at nite irrig-n takes just enuff to make bubbles in glass at main canal outlet, & ditch tender doesn't check how much. So much water spills down to waste. ~~But~~ Then next a.m. asks for

more time. Those on end say can always get water at nite, & in day up canallers steal from them.

Mod. has 8 or so ditchmen; Tul. c. 40.

Mod. doesn't sell surplus water, tho it cd. Too much trouble.

Both admit to surplus water, but occasionally a dry yr comes, want plenty for that. Are now putting up inter-year storage. — can do, w. little loss. Still lose floodwaters

10-55

Meikle

Water swaps. ~~One~~
Ea. farm has a rt. to water, & taxes by law, but actually adjusted for need. If someone needs more water — e.g. due to bad checking, most common cause, + his Δs time needed to irrig. an acre from 12 min. to 1 hr. — someone else, on another ditch, can sell him water by pumping in, (or taking less than his due?), effect exch. on books of distr., which switches at source

Marvelous. Multilateral exch.

Many minute one-foot in agric. acre tracts "down by river"; grow subsistence crops. Tried to get ~~ditch tender~~ them to split water by voluntary gate openings, passing a card along, natch didn't work, now assign ditch tender.

Waste water. This yr, '55, short yr. Saw it coming, & by voluntary economizing saved c. 80,000 a-f, enough to finish season -- Oct. 15.

Output from high water crops not enuff more to justify

much extra water. But at $.30/a-f who cares.

Modesto & Merced grew, while Turlock didn't, bcs are city seats. So!?

Crawford Modesto land sells c. $1,000/acre. Ass. <$100, 1% tax, neglig. Power pays. Have own distr. system, buy from S.T.

—

Meikle - Turlock has pumps, to reg. water table Pump back into canals. c. 150,000 ft., or c. 1 ft per acre in distr.

Serve c. 3 ft., gravity. Clover takes 5. On poor

land, SW, not good for much else, take much more water bcs of clover. On better land, NE, don't mind, have all they need.

Flexible; informal arrangements prevail. No rigid schedule of diversions. Maybe no schedule of any kind. All canals full all time, in season.

S.S.J. distr. serves to every 40 a. Mod & Turlock don't, but have myriad little improvem't distrs, by 1928 law,

that do, & TDs mother them along. - free eng. services, & Fed. guarantees their credit. & ditch tenders regulate flows to individ. firms.

CVP now selling to little valleys, W. side, in coast range, very good soil, hi yields

Why is Mod-Tech. building Greater Den P.? Not for water, clearly. Probly to get power revenues.

Or maybe never really plan to start.

Maybe primarily preclusive.

Plummer says, 6-25-59, "We hope to start in 1964."

TRI-DAM TO OPEN NEW VISTAS OF DEVELOPMENT

LAST MONTH'S "Water News" carried an announcement of the signing of the 45-year $112,000,000 Tri-Dam Project power contract between the South San Joaquin and Oakdale Irrigation Districts and the Pacific Gas and Electric Company.

The importance of this stirring news to the people of that area merits some elaboration of the purposes of this extensive development and the benefits which will accrue from it.

Prime Purpose

In simple terms the prime purpose of Tri-Dam is to make available to the landowners of the District storage space for 230,000 acre feet of water for many additional fertile but now thirsty acres of land.

The terms of the contract, covering purchase of the power developed at the project by the PG&E from the Districts at a price of $112,000,000 over the 45-year period, make construction of the various phases of the project possible and, in a sense, without cost to the landowners.

Financing

Construction costs, estimated to approximate $48,000,000, would be financed through the sale of revenue bonds secured by the ability of the project to produce, and by firm contract sell, the available hydroelectric energy during the bond amortization period.

The bonds, thus secured, would be of the type which would not constitute a lien on the lands of the Districts, or become a financial risk to the taxpayers.

Sound Contract

When speaking in behalf of both Districts on the benefits of the contract for the sale of power, OID President Edwin Koster said: **"Assuming the Districts will be able to build the project within the present estimates and that the interest rate on the revenue bonds will be approximately 3%, the project will produce a substantial income each year to the Districts."**

Declaring that the contract was a sound document for both the Districts and the Company, PG&E Vice-President and General Manager N.

(Continued on Page 8, Col. 1)

as large farmers—have cautiously commented on the contract which forced the directors to violate their trust, violate state laws and bow to the will of the Secretary of the Interior. The fact that farmers who were desperate for water voted for the nefarious agreement does not make it a good contract.

"The water users of the CVP and those in other parts of the state who will eventually be involved with the Bureau of Reclamation owe a debt of gratitude to Harry Horton, W. R. Bailey and Reginald Knox who carried the brunt of the battle in behalf of Courtney McCracken through the many hearings and the lengthy briefs.

"It should be noted, too, that Arvin Shaw, of the Attorney General's office made a substantial contribution to the case when he made the original presentation in the fall of 1949 that the contract was invalid. Alvin Rockwell of Brobeck, Phleger and Harrison of San Francisco and Henry Holsinger of the State Division of Water Resources also made substantial contributions to the case.

Farmers Fear Bureau

"In the efforts of the Water Users Defense Fund to generate financial support for carrying on the litigation we have found numerous farmers—small farmers as well as large farmers—who supported our cause with enthusiasm and cash. However, we have been disturbed by the substantial number of farmers who criticize the contract and want it changed but fear to support our cause lest the Bureau of Reclamation find out and apply some type of sanction—retaliation to them for trying to protect their own interests in the courts.

Intend to Continue in Case

"Judge Jones' opinion should give new heart and new encouragement to the many, many people who believe in the integrity of the State water rights statutes, and in the sacredness of the Directors' trust. We intend to carry on with the case with all the vigor at our command."

Members of the Water Users Defense Fund Committee are: Warren Ocheltree, Madera, chairman; Evan T. Hewes, El Centro; Albert Armor, Corcoran; Robert Schmeiser, Fresno; George Henderson, Bakersfield; E. W. Merritt, Porterville, and Hugh Baber of Chico. Fred Brown of San Francisco is the agent and Bert L. Smith is the secretary.

Trinity Dam, p 2

PG&E to pay:

a. $2,204.000/yr for bonds.

b, M&O, fluctuating w. cost of labor.

Renegotiation after bonds retired.

Tulloch Dam, 68,000 at & pwr house
stan. R between Knight's Ferry & Melones

Beardsley Dam, on middle Tk
91,500 at + pwr hse.

Donnells Dam, above Beardsley, near Hell's Half Acre
64,500 at + pwr hse.

7-mile tunnel, Donnells Dam to Donnells Pwr Hse.

& pwr, 81,000 kw

Tulloch, cost	$9.2m,	17,000 kw
Beardsley,	10.1m,	10,000 kw
Donnells,	24.6m	54,000 kw

Not yet approved by DSC

Stan. Cty Plng Dpt, Modesto. '57. a W Need Study for Stan Cty for the yr 2050. Martin Schueller, Director.

(Visit new CCID & Patterson ID, ask why became IDs)

Stan. Cty W Study Comm. Milo Bradshaw, Supervisor, Distr. No 1, Chmn.

also Abner Crowell TID
Merkle
Garrett von Konynenburg MID Director
Clifford Plummer, MID Eng
Chas O Crawford
CW Quimby, OID Dir.
Allen C Holbrook, OID Supt
I S Basher, WID Dir.
Ray Klopping Patterson ID Mgr
Frank Dompe, W Stan. ID Dir
John Creiling, Chief Eng. SSJID.
2 Farm Bureau & 1 Grange rep.

p i, xmtl ltr, need all wtr, esp for Oakdale & W side
a ES helped, got data on wtr use.

p2 Tri-Dam completed, 6-57. Solved City-of-origin problem. (SSJ in SJ Cty. Oakdale in Stan & straddles Stan R) Stan. rises in Calaveras & Tuol. Cties. What kind of settlement?

p8 '40-'57, grnd w in Oakdale area dropped circ. 15'; 8-32'. Depth 67'. Engrs pro raising it by 10' — Holbrook. But Tri-dam means more surface, less pump. & may solve.

p10. ES study, "Ground w conditions & storage capacities in the SJV Cal" In coop w Dpt W Resc. Is 1st since '16. Not clear if published.
Cities Mgr Shelton. Deputy Director DWR

Stan. Cty. 2

p 10 '45 '57 rpt says 93m af gross gnd w storage, SJV;

10-200' diff.

7.8m of this in Stan. Cty.

Stan Cty storage not available for use, tho, bec hi w table.

TID plans stable w table, not draw it down in dry years

Stands ~~to rec~~ mostly c. 6', min. 2.0, max over 10

MID a little lower, not much — p 12

(MID shd get w from n. Note this wd not require major change of dists. system — just main canal)

p11 "Deep well drainage" pumps spotted even over TID, w blanks between Turl & ~~Dom~~ Hughson, Hughson-Ceres, & along SJ. Thickest in se corner.

TID highline canal dumps into Merced R.

p12, MID drain wells also evenly spaced, blank e of Mod.

p12-13 At Oakdale-Mod ID line, which is Mod main canal, table jumps suddenly down from c. 10' to c. 40'. Cd the canal have so much effect on such level ground?

OID w table jumps up & down, 30-100'.

p14, Waterford jump too, 30-87

Stan. Cty 3

p15 Patt-n Irr Co, rectangle e. of Patt-n, also ~~##~~ hi table - c. 5'

p28 Stan. R, w full dev-mt, can provide 859,000 af wtr/yr, + 300,000 af flood control. Cites Cal Bull 3, vol III, p10-75.

p29 New Melones cap. to be 1.1m af. To submerge present Melones.

~~SSJ~~ SSJ & OID now irrte. c. 117,000 net acres.

p30 Tuol. yield ave. 1.85 m afa.

340,000 af storage in New Don P is for floods. To protect 8,000a. along Tuol, + helps lower SJ & Delta. — (is it worth it? Flood control may be like downstream rip. rts, ancient priority w/o el. excess)

p31 Tuol. plans are to have plenty of wtr for Typ dry spell like '28-'34 w/o drawing down wtr table. — (not the slightest inconvenience will they undergo, while others expire on the hot sand).

Not enough storage now for another '28-'34 (check on crop rpts, what happened then?)

(Mrs. Radtke mentions Coalinga is experimenting w. reclaiming brackish wtr, now)

p54 Soil map. Best soils along rivers, way up. Get worse going away from Tuol R, & toward SJ R. Then W side is high qy. Cl I, even near R

p60 Some grains grown in winter, require just one spring irrign.

· Stan Cty 4

p 66 Rolling lands of Turl & Hickman, can't be levelled, but sprinkled.

20 - 25,000 a. under, cd be by sprinklers.

p 67 TID, large pop gain, '40 - '56, but no Δ wtr use. (So why do they predict it will Δ later?) But irrd acres ho Δd, & wtr use in α.

p 69 TID extends into Merced Cty, c. 40,000 a. This segment 1956 takes $\frac{120{,}000 \text{ af}}{39{,}000 \text{ a}} = 3'$. cf Stan sect,

$\frac{400{,}000 \text{ af}}{130{,}000 \text{ a}} = 3'$. "Consumptive" use.

~~Wtr ×pired & evap = 540,000 af. If add this to cons use~~

~~get 6?~~

'56, 18,898 a double cropped. Ave 2' cons use,

or 38,000 af.

p 70 TID '56

Wtr deliv to ditch tenders, gravity (510,000) & wells (150,000): 660,000

Deliv to farms by ditch tenders, receipts 492,000

Loss, ditch tender to irrig'r 168,000

Spilled from system during yr (96,000 during irrn season) 144,000

Loss from La Grange Dam thru Turl. Lake 27,000

" Turl L. to Division Gates 7,405

Stain Cty 5

1. Diversion by Main Canal at La Grange,

+ (negligible) release from storage at Turl L.	588,000 a-f
Less Loss, La Grange Dam to Turl L.	27,000
Leaves Release from Turl L. to Lower Main Canal:	561,000
Less loss from Turl L to Division Gates	7,000
Leaves Diversion at Division Gates	553,000
+ pumped into system during irrign season (another 57,000 is pumped in out of season)	158,000
Makes total irrn season diversions	711 000
✡ Less losses 43,000 gravity + 8,000 wells during irrign season	51,000
Leaves delivered to ditchtenders, gravity & wells, during irrn season	660,000
Less "Loss ditchtender to irrigr less spill"	168,000
Leaves delivered to farms, ditchtenders receipts	492,000

✡ Diversion at Division Gates 553,000

Less deliv to ditchtenders by gravity 510000
43,000

Leaves

Pumped during irrign season 158,000

Less deliv. ditch tenders by wells 150,000
8,000

Leaves

Well pumping counts, since they have to do it anyway, & wtr wasted in system doesn't recharge grnd wtr. So it cd all be exported if ~~not~~ were not wasted.

Stan Cty 6

3 aspects to waste of Turl. wtrs:

a, Uncaptured stream flows

b. Losses in ID system

c. Losses on fm

d. Loss of return flows, since grnd wtr is full.

Take b alone. Totals irrn season diversions, 711,000

Out-season pumping 51,000

768,000

Less fm delivs 492,000

Leaves system waste 276,000.

Enough to irrigte 100,000 a down so, easy.

Cf. how many acres actually irrigd from TIR. How much wtr actually used.

This wtr irrigd 168,000 a, of which 19,000 double cropped.

Return flows helped downstream, they claim — but I say SJ has plenty anyway, or cd easily supply them from Sacto thru Delta.

p68 TID

	Irrigd acres	Releas from Owen Res. into TID ☆	Spilled during irrign season	Pumped into canals
1940	148,000 a	496,000	67,000	109,000
1956	168,000	560,000	91,000	158,000
Ave, '40-'56	158,000	534,000	70,000	132,000

Steady growth in between.

☆ Owen Res. same as Turl L.

Stan City 7

Just how they lose it not too clear. But clear they do.

(Instead of reusing perc. wtr, they pump it away - a definite waste)

Take total diversion + pumpg ÷ irrig acres, consider excess over 3' expertable. Get same result.

p 72 MID

c. 10,000 a. adjacent MID cd be added, but is already irrigd from Rivers or wells.

p 73:	acres irrd	Diverted Tuol R	Pumped irrn wells	Sum	Spills during irrn season	Pumped into canals to control w table	Deliv. to irrn.
1940	10,000	307,000	—	307,000	57,000	64,000	197,000
1956	69,000	365,000	268	365,000	73,000	69,000	243,000

no trend, tho, '56 is eccentric

erratic

→ so MID & TID do differ — MID developed earlier

p 74 Irrn consumes 211,000 a f, of deliv. of 243,000

Rice in MID, only a little, but uses only 54". — & Walnuts here take ~~Return p 75~~ 48". Hypoth: all acres get so much wtr, can grow rice w it, + just a little extra.

· Stan Cty 8

p75 OID has bn short of wtr before Tri-Dam (yet cdn't get it from MID)

New Tri-dam resrs: Donnells, Hartley L., Tullock, ≤ 230,500 af,

+ Melones 112,500 = 343,000

OID net irrigable land 61,666 a.

"Vested wtr rts to Knights Ferry, 336 a"

p76

Resr	Capac.	Net usable Capac.	OID share (50%)
Melones	112,500	101,822	50,911
Donnells	64,500	62,354	31,177
Hartley L.	97,500	77,597	38,798
Tullock	68,500	51,124	28,562
	343,000	298,897	149,448

Hope tri-dam raise wtr table 10'

Cons. use, '56, Stan Cty 197,000 af
50,000 a

SJ Cty 31,000 af
7,600 a

· Stan Cy p 9

p 77 OID cont

Yr.	Irrd Acres	Diverted Stan R	Pumped to Canals from Wells — not for drainage, but wtr.	Σ w divd
1940	41,392	190,755	17,395	208,150
'56	51,504	270,125	47,659	317,784

Irrd area grows steadily; wtr div-n varies — see next sheet. & ask why.

Note that they pumped solely to get irrn w, not for drainage, despite diverting almost 5' from Stan! Why? Waste in system?

		af	af/acre
p. 78	Gross w div.d '56	270,125	4.6
	Net w delivered for irrn, 65% of gross	175,581 ☆	3.0
	Pumped, deep wells & recl.	47,658	0.8
	Net w divd + pumped	223,239	3.9
	Gross w divd + pumped w "for irrn & regulation"	317,784	

This is 1st time they've mentioned "regulation"!

☆ In text reads "75,581"; evidently error, 175 checks out ok w all other figs.

Stan Cty 10

Wtr Need Study Stan Cty

OID, p 77 | MID p 73 (000) | TID p 68

Year	(000) Div. from Stan.	Pumped to canals from wells (000)	Σ (000)	Div. from Tuol	Pumped from irrn wells	Σ	Spills during irrn season	Pumped for drainage	Deliv. to irrn	Release Owen Res. to TID	Spilled during season	Pumped to canals for drainage
1940	191.	17	208	307		do	57	64	197	496	69	109
1	196	21	217	317		"	63	71	186	480	95	123
2	199	26	225	345		"	83	71	178	523	104	117
3	194	32	226	325		"	66	60	210	525	69	120
4	193	35	228	342		"	64	68	228	564	94	121
5	204	38	241	344		"	79	69	224	546	89	120
6	191	56	252	372		"	60	74	226	567	83	129
7	180	59	239	258		"	9	51	193	485	20	122
8	163	49	213	303	4	307	42	49	203	464	45	118
9	185	51	236	297	13	310	33	72	238	565	55	136
1950	226	54	280	330	19	350	54	82	249	552	61	162
1	210	50	260	305	19	324	43	72	246	535	46	140
2	270	46	316	308	12	321	67	71	230	548	81	141
3	245	50	294	309	22	331	40	80	259	598	69	147
4	196	50	247	324	22	346	44	76	264	572	74	148
5	194	51	245	258	33	291	21	73	241	504	46	133
6	270	48	318	364	.3	365	73	69	243	560	96	158
7												
Average										534	70	132

· Stan Cty p~~80~~ 11

p 80 4,000 a more in distr. cd be deliv.

\+ 20-30,000 a ne of it.

Wtfd has open canals, hence "substantial losses", but will line "in the future."

p 82 Pasture, decid. fruit, Walnuts, & vines, biggest acreages.

'56 Cons. use 25,311 (cf. 43,666 gross div-n)

p 83 Wtfd double cropped $\frac{411}{7000}$ a.

71% wtr ~~diverted~~ delivered to fms is used consumptively. OID same.

∴ This fig. reps extreme care in the use of w by the District & the fms that it serves." $\frac{25,311 \text{ cons. use}}{35,458 \text{ delivered fms}} = 71\%$?

The "cons. use" they figure from these standards: (p 82)

'56 Crop	Acres Irrd WID	"Calc. Cons Use"	Cons. use af
Pasture	3396	50"	
Walnuts, berries	722	48"	
alf	145	46	
Decid fruit	1902	38	
Tomatoes, vines	452	30	
Field crops & garden	257	24	
Grain	34	12	
	6908		

Stan Co 12

	Wtfd ID p81					Patterson ID, p 86			
	Div. @ La Grange	Spilled During season	Losses in MID Canal	Losses in WID Canal	Div. minus Spills & Losses	From CVP	Pumped	Lost	Delivered
1						—	50,529	14,124	36,404
1952	43,197	2210	3059	3319	34,549	—	41,639	10,101	31,537
3	41,400	301	3017	2518	35,498	—	51,282	14,707	42,575
4	39,857	1039	2843	1831	34,138	600	53,348	13,558	40,391
5	34,028	94	2466	1860	29,608	1957	49,604	12,942	38,619
6	43,666	2620	3121	2464	35,458	2542	42,105	9,047	35,600
7									
Ave, 52-6 →	40,430	1266	2901	2412	33,850				37,521 ← Ave, '51-56
↓ 7,012 acres									

They don't mention how much cons. use comes from rain.

Nor tell origin of figs "Calc. cons. use"? Yes, from p 60, from "atmometer instruments", but don't say who did the testing.

p 83 WID wtr table steady.

---

p 84 CCID, Stan Cty.

157 acres.

Alf.	7291
Beets	5358
Grains	1689
Sudan Grass	1070
Corn	915
Tomatoes	886
Walnuts	815
Misc	
	19,472

Wtr delin. to farms ~~served~~:

'55, — 55,741

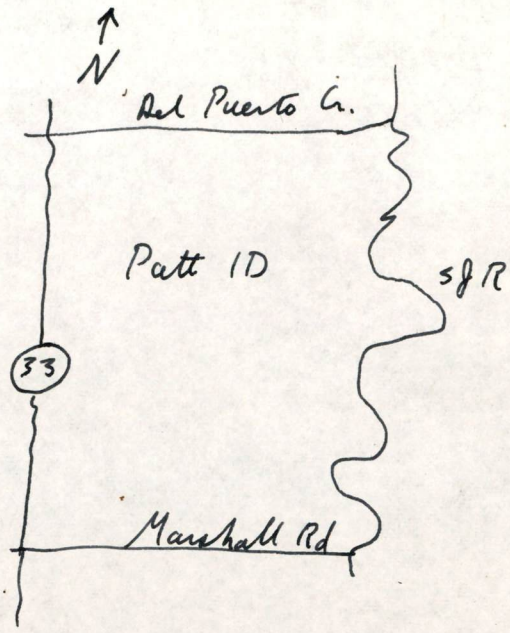
'56, — 54,205 (incl. 921 from ID wells)

p 85 Figure cons. use, from crop pattern, at 53,322.

Assume 30% waste by evap., spill & perc., so figure 21,000 af wtr pumped prtly. Best is no record. (This may be index to their overstatement of cons. use)

Stan Cty 14

p 86 Patterson ID



Before '54, all w from SJR & wells. Since '54, Sg amt from CVP. (Why no record by Tag?)

See sheet 12

"Continuously lowering quality" SJR wtr, esp. low season. E-side distrs must spill enough to keep it pure — they claim.

p 87 Est. cons. use 43,821 af, on 15,810 ind acres net, '56. w. 2,000 double cropped not figured in as double.

p 88 W Stan ID. 24,800 a ind, thru series of 6 pump lifts. Divert from SJ at Tuol. jn. by grav. to pump 1 c. 2 mi west SJR, lift to hi side ID near DM Canal.

'56, irrn season 3-1 to 12-31, pumped 70,622 af. Suppl. w 10,310 af DM. Σ = 80,932 af diverted into lateral canal distrib system. Of this 93% was delivered to the land, or 93% of diversion. (The more noteworthy bes fms are larger, probly scattered. Ask W.F. Woolley, Chief Engr. how

Stan Cty 15

he does so much better than T & Mod.

Rain aves. 9.5" — (e. side higher, so there is another reason why e. side needs less)

p 89 $\frac{\text{Wtr delivered } 75,504}{\text{Irrd. acres } 25,586}$ = 2.95'

(Incl. 2242 double cropped)

p 90 Calc. com. use at 69,641 af.

to 92.5 % wtr deliv. to fields" is consumptively used by the growing crops." — bs.

p 61 "Some w must be spilled in order to maintain an efficient irrig-n op-n."

Small W.D.s - see p 16

p 94 Rock Crk. ID 1951 a in pasture & alf. NE of cty.

11,000 af cap. resr e. of Milton. Stan. R.

p 95 c. 5-7,000 a. irrig pvt ws Tuol. wshed outside IDs. Est.

" " Westside, alf-fruit-tomatoes.

p 96 c. 1740 a

Stan Cty ~~15~~ 16

W. Stan ID

Probby 1956

Crop	Irrd a.	Wtr "Delivered" per a.
alf	5699	3.92
Tomatoes	4613	3.59
Beans (dry)	3301	2.59
Melons →	2381	2.36
alf. seed:		
Common	2139	3.20
Certified	1615	3.09
Pears	1505	0.75
Orchard	1213	2.97
~~Corn~~ (Milo)	735	1.90
~~Melons~~		
Other		
Σ	25,586	2.95

p 91 Small distrs oped by W. Stan ID. 1956 Data from L.D. Harrison, Secy W St ID

WD	Gross acres irrd	Acres double cropped	Net acres irrd	Acres outside distr irrd	HQ	Wtr deliv 1956	Gross acres	acres not fmd
Hospital	3854	431	3423	—	Westley	22028		nd
Kern Canon	~~1665~~		2665	—	Westley	2651		269
Del Puerto	3656	438	3218	—	Patt-n	11563		432
Salado	2812	25	2847	130	"	5098		13
Sunflower			2731	382	Crows Ldg	9145		8
Orestimba	5254	275	4919	—	"	6597	5135	156
Foothill			1831		Newman	3778	1965	134
Davis			910		"	2495	3537	2627
Mustang (St. Cty part)			180		Gustine	6550	790	810
						69,911	27,476	

Stan Cty 17

p 97 55J 1D

156	Irrd net	59,360 a
	Double crop	(4 323)
	Est cons. use	184,952 af
	Σ divns, St.R '56	243,840 af

No record of losses & deliveries

BR Madera ID Factual rpt. '50.

p. 16 '48, cons. use w 2.41', for 79,703 a, a 192,000 a-f.

Ult. 2.72, 109,188 a., a 291,000 a-f.

less Precip. .40'

Yields Net crop irrig-n req., 2.01' '48, ult. 2.32'.

p 17 "Irrig-n eff." is w. utilized as crop irrig-n req. / w. deliv. fm headgate.

Is 73%, Madera '48, will rise to 74%

Fm del req. now 2.73'/ac.

Now irrig 80,000
Ult " 109,000

24% demand is in July, 0.66'.

Ult, 23%, 0.71'. (Price desirable to encourage crops taking offseason w.)

p. 18 District system shd deliv. 1 cfs to 75 gross a. That wd be enuff for 0.90'/mo., cover July. (On farm storage wd permit smaller distrib. system.)

Large outlets in open ditches, can build for little extra cost, so recommend 10 cfs for ea. 160 a.

p 19 Madera ID owns Fresno R., erratic, ~~mean~~ 22,000 a-f.
"dependable annual supply"; Feb-June.

Madera Facts p 2

p 20 2,000 pumps in distr, pvt. Table falls.
Now SJR helps recharge, but when table rises this will reverse.

p 22 MID sold rts & got rt to ~~buy~~ buy up to 270,000 a-f.
MID assigned to Chowchilla WD ~~22~~ rt. to buy 52,000 a-f.
✓ (for what price? Find out!)

Item	Cl 1	Cl 2 ave.	Cl 2 max
MID '39 contract	120,000	150 —	320 —
Chowchilla share	15,000	37 —	80 —
MID '50 contract BR	105 —	113 —	240 —

(Note Chowch. gets risky stuff)

p 24. 100 miles canals already. Ult. 459 mi. $9.5m.
Or $1.80/acre yr int free.

p 27 Gross crop inc. from 80,000 a. irrig-d '48 = $11.3m,
or $142/acre. Cotton, 33% irrig-d acres, 42% gross inc.
Dry land grain, gross $16.50/acre. — & suitable for irrig-n
dev.

p. 30 But in fig repayment cap., they fig cap. charge on value of
irrig land. also taxes
assessor puts top of $60 on best orchard-vineyard land,
plus ~~&~~ $50/acre for bearing trees & vines. Pumps, bldgs taxed
alf. & perm. pasture not taxed as growing improvements. Bias.

Madera facts p 3

p 30 Mkt values run up to ~~$355~~ $350/a w. peach & plum trees,

Cl. 1 & 2 land. Field crops, same land, 225.

p 31 Acre taxes, '50, Cty: Field crops etc $2.50

Orchards etc 5.00

p 32 Payment capac. $26/a.

Cl 1 & 2, on 62% irrig'ble area, $32./a

Cl 3 16/a

Cl 4 4

Crop	Payment cap Cl 1 & 2
Alfalfa	$29/a
Cotton	35
Im. pasture	39
Melons	36
Tomatoes	64
Orch.	31
Barley	11
Milo	12
Grapes	25
Dairy	49

(Do these diffs suggest methods of analysis ng?)

Madera Factual, '50

p. 12 Ctn reached hi of 43,000 a, '37
26,000 a, '38 (controls?)
17,000 a, '45 (no wartime expansion here)
26,000 '48

alf. was nothing, '37.
16,000 a, '48

Grapes 17,000 a, '37
23,000 '48

p. 8 Lenders have made few long term loans in MID bec uncertain water supply.

p. 10 Ctn & alf. are alkali-tolerant; grapes & decid. fruits are not.
Hardpan lands of cl. 2 ok for all save deeper-rooted crops: alf. & some decid. fruits.
Shallower hardpans cl. 3, best for irrd. pasture.
Cl. 4, strong alkali, ok for irrd. pasture, rice, grain.

p. 11-12 Canal banks overgrown w. weeds, prime source infestation.
Where individ. pumps, rather than canals, were fewer weeds.
Dry-farmed areas, too, freer of weeds.
So here is a definite cost of canals.

Length of Canals, area served, cost, & computed ratios.

Madera ID Factual Rpt, '50, p. 25.

(Estimates of proposal, not nec. constructed)

Miles from Friant

	Gross Area Served	Length	Est. Cost			Acres served per mile of canal	Cost per mile	Cost per acre
			Earth-work & struc-tures	Rt of Way	Total			
	Acres	Miles	$000	$000	$000	Acres	$000/mile	$/acre
6.2	31,200	104	1,733	257	1990	300	19.13	63.78
19.2	3,600	13	234	26	260	277	20.000	72.–
21.3	45,500	171	1942	341	2283	266	13.351	50.–
24.7	22,500	76	912	89	1001	296	13.171	44.–
32.8	19,200	63	831	56	888	305	14.095	46.–
34.2	9,800	32	414	15	429	306	13.406	44.–
Total	131,800	459	6066	784	6851	287	14.926	52.–

Note that acres served per mile of canal are remarkably constant, averaging 287 acres/mile, or say 300 acres/mile, a almost a half-section per mile, or 2 miles/section – as though canals had to run around 2 sides of each section.

Cost per mile is a good deal more variable. Probably this represents differences in terrain. And ideally I wonder if modifications in layout should not be made, according to terrain, so that cost per mile does not increase any more than acres served per mile?

Madera Factual Rpt.

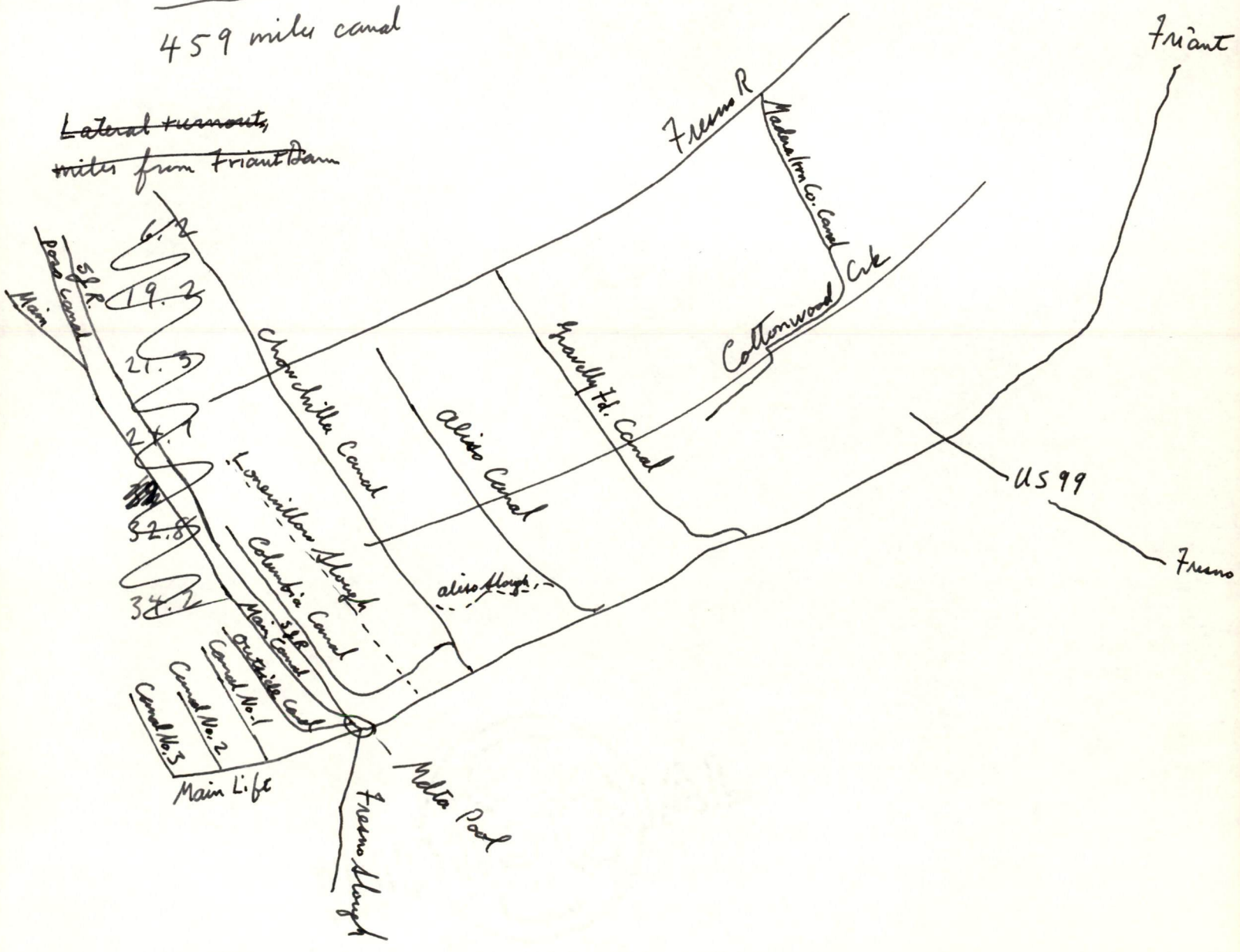
p. 25 Min. canal capac., 15 sf, + the standard ¼ section turnout head.

Cap. cost est. of distribu system, $9.5m, for 132,000 a, or

$72/a. $1.80/a/y over 40 yrs, 0-interest.

or $87/irrigable acre, of which 109,000.

$$\frac{103{,}000 \text{ acres}}{459 \text{ miles canal}} = 224 \text{ acres/mile}$$



Madera Factual Rpt, 1950

Crop & soil maps, 1948

'48 crop map shows grapes mostly so. of Madera, mixed w ctn.

E. of Madera, all ctn.

up Fresno R. " "

There are the good soils.

Poor soil is n. & ne. part, around Fairmead & Sharon, but pushing so. nearly to Madera. This is not irrd, '48, but in grain hay, native pasture, etc.

Dubious wisdom of extending Madera Canal many miles beyond Fresno R., to hit, hi ne corner of this Sharon area, which is not so far so. of Le Grand, & thus cd. get Merced R. wtr., &/or wtr from various small streams of s-n Merced Co. & Chowchilla R.

Why grapes in so., & ctn alone in e. section? Same good soils. Probly better ground wtr in so. near SJR.

Map of proposed distribn. system. Full of st. angles, seemingly unnec. length, conforms to propty lines rather than functional & natural ones. Thus the tyranny of surveying!

Not a perfect grid. Follows bottoms of Ctnwd Crk., & nameless slough cutting sw thru Madera. But there are works of old Madera Canal & Irr Co. RR plans are rectilinear, except down Fresno R.

Seasonal Water requirements, Madera I.D., from '50 Tactical Rpt., p.17

	afa	% of total
Mar	.13	4
apr	.28	9
May	.38	12
June	.50	16
July	.71	23
Aug	.59	19
Sep	.41	13
Oct	.13	4

Under "ultimate" conditions.

Note unequal distribn - cf. Modesto diversions.

Crops assumed are largely 4. in = ~~proportion~~ acreages.

Und. pasture	4.4 afa
alf.	3.7
Ctn	2.6
Grapes	2.6

p. 23 10,000 a Madera ID get partial surface supply, Fresno R., thru distribn system of District-owned Madera Canal & Irrn Co. This is c. 100 miles of open, unlined canals. (or 100 a/mile of canal)

BR to rehabilitate this & integrate w. new system.

p. 24 Gnrl slope in MID is to sw. So system delivers to hi pt. of each quarter-section, usually n.e. corner.

Entire system to comprise 459 miles open unlined canals, located generally along section & half-section lines. (So that's how they plan layout! Our survey system forces our distribn nets into ~~the~~ its Procrustean ~~bed~~ mould. No wonder no one has figured a geometrically ideal way. Likewise for roads.

We need a usable system of curvilinear survey.

Madera Factual Rpt, '50

p. 14 Expect grape acres not to Δ, bec price outlook unfavorable.

But pasture will Δ.

Since then, to '55, grape prices have about held their own, by Bull. 763, p. 160-61. So maybe their price outlook was pretty good. How about animal product prices? Taggart's price trends on value of AUM on irrigd pasture drops from $10., '51-8 '52, to c. $6, '56-8 '57.

Alf. hay is down after '51, grapes are up, by Tag. Barley, corn, sorghum — all down.

So all this expert counsel re going into animal production turned out poorly?

p. 14, forecast Δ alfalfa acres, due to Δ demand for dairy products. This has occurred — but perhaps rather due to ctn. curtailments than Δd demand for dairy. Price of alf. hay has dropped, from Tag. data.

p. 14 Irrd. pasture has devd. rapidly in recent years, & "Δ is expected to continue at an accelerated pace." But it hasn't Δd at all. Suggesting to me that alf. can stand hi wtr cost better than pasture can. But in Chowchilla I.D. it is Irr. pasture that has Δd!!

Factual Rpt., Madera I.D., Technical Supplement. July 15, 1958.
Lindsay (sic) office. Revised 9-18-58.

p. 2 Basic criteria:

15 sf min capac. of laterals

15 sf lateral serves max. 900 acres

30 " " 900 - 2100 "

45 " " 2100 - 3600 "

60 " " 3600 - 5100 "

Note increasing returns.

p. 3 Turnouts: 15 sf for 160 a. tract.

p. 4 "Manning's Formula" is for flow retarding in pipe.

Cost estimate for 68 miles of earth canals & 10 mi. of "monolithic cast-in-place" concrete pipe, from 15 sf to 60 sf capac.

These proposed extensions to serve 30,200 acres.

Only part of distribn lateral system of orig. factual rpt was built.

Costs:

Land:	$750,000	(500 acres, incl. 50 acres borrow pits)
Clearing	36,000	
Waterways	1,883,640	(Excavating, compacting, & lining canals, etc)
Structures	1,341,240	(Underpasses, laying pipe, turnouts, joints, etc. ? judge)
Misc.	35,560	(Meters)
	4,046,000	
Overhead	1,131,000	
	5,177,000	

Madera Suppl., 2

"Overhaul", which seems to mean trucking dirt, is big item under waterways: $495,000

Concrete is big cost of structures: $378,000

Map:

New area to be served is many blocs, + the "Storey" area east of Madera; & a larger block nw Madera, straddling 99.

MID has built many laterals. BR. laterals wd be tacked onto them. New area to get service is scattered.

Some lands immed. e. of Madera do not want service now.

Spec?

Cost per acre of distribn. system:

$\frac{\$5\,m}{30{,}000\,a} = \frac{500}{3} = \$166.$ per acre. That's a lot.

Considering how much else is already provided.

Why not export water from Cosumnes, Calaveras, Mokelumne?

Diversions are small. Almost no I.D.s.

Probly dogs in manger can block, now, on "ultimate needs" of co.-of-origin basin. Relatively undeveloped lands, could take the water some day.

River	Mean annual flow WSP	Mean annual diversions
Cosumnes	300,000?	~~6,000?~~ 9,000
Calaveras	140,000?	20,000 ~~100,000~~
Mokelumne	741,000 incl. EBMUD	111,000 + EBMUD (c. 130,000?)
Dry Crk near Galt	80,000?	nd
French Camp Slough		nd

Occasional surpluses must be stored near point of variability.

Move them South for secular storage in underground res.

N.B., minor rivers in Stan. etc cos, appreciable flows, in aggreg.

Dry Crk (Stan.) 40 - 80,000 a-f-y

Chowchilla

Fresno

etc etc

And their stability wd. be vastly enhanced by intn.

Littlejohn's Crk (French Camp Slough)

etc etc. etc. !!!

Qu. whether Oakdale 10 should get any wtr. It uses lots, yet requires still more – BAE p. 102. Is Ladino worth it?

Ask Matt Crawford why don't use Dry Crk? 80,000 afy



~~Tulare ID Factual, 49, p 2~~

Factual Rpt, Chowchilla WD, 3-50. Rodner.

p. 2 $\frac{2}{3}$ land withdrew from Madera bcs wanted recharge wtr immedly, but no district system.

(thus they got wtr rt? Were in MID origly)

p 13 Major crops: Ctn, Alf, pasture,

p 25 Use ind values of land as costs, before figure payment capac.

Madera ID Factual Rpt. 3-50. Rodman

p 2 5-24-39, contract, US got damsite & wtr rts; MID got cash, plus option to contract supplemental CVP wtr, 270,000 a fa ave.

8-24-49, MID assigned 52,000 a fa to Chowchilla.

BR contracted to build open ditch system, $9.5 m.

p 3 First MID org. 1888, to build Friant Dam. 280,000 a.
Dissolved 1896, downstream litigants killed it.

1920, new ID, 352,000 a.

1928 reorgd, 172,000 a.

'49 Chowchilla withdrew, left 172,500
− 43,500
= 129,000 a.

2,000 pumps in ID now. Overdraft.

Madera, Factual. '50

'48 crops.

& ind 80,000 net a.

Ctn	26,000	33%
Vines	22,000	27%
alf	12,000	15%
Past.	5.6	
Hay & grain	4.5	

etc.

13% irrn eff., '48.

p 32 Payment capacs. $/a

-62% irrble area.

Crop	Cl 182	Cl 384
alf	29	12
Ctn	35	8.8
Past.	39	20
Melons	36	29
Tomat.	64	30
Orch.	31	31
Barley	11	4
Milo	12	2
Grapes	25	2
Dairy, A, 50 cows	49	30
B, 36 cows	—	17

Etch 394 ltr 6-15-20 from Etch to J D Galloway, engr Merced ID. Re canal capacities Modesto, Turlock, & recommendations for Merced.

In mo. of max diversions, ditches are brimful 24 hrs & 31 days. Capac. is c. 1 sf to 70 acres ind. -- & more gross acres. Main Laterals, 1 sf to 50 a.

Merced will have better storage, needs ∴ less capac. in main.

Notes slow dev. of Mod - Turl, -- 67% Mod. gross area dev. now after 16 yrs, & ~~67~~ 58% for TID after 19 yrs. Growth very small, last 6 yrs.

395 - '33
p 9 Mod has better drainage than Turl, can use more wtr.

p 12 Mod & Turl can take c. ave. 800,000 afa. More "wd produce excessive w/o logging"

396 ~~return~~ Memo on Losses & Disposal of Irrn Wtr, Turlock ID. By B.A. Etch.

Big losses at Owen Davis Res., seepage.
Repeats material on spillway losses.

Etch 420 Thos. Means. Summary of Wtr Reqs incl. waste, Mod & Turl IDs.

~~898~~ 758 afa, w. canal waste as in past
686 afa, w/o canal waste

Etch, 310

Ltr 12-24-34 to MJ Bartell, HH Wa Supply, SF, from Thos H. Means, consulting engr, 111 Sutter St SF.

SF has recognized IDs hv prior rts to irrte 300,000 a, or 37,500 a more than now contained in districts. No such acreage exists within reach of 2 IDs.

p5 Foresees IDs will improve practices, need less wtr. Ha!

Modesto uses a little more/a than Turl bcs better drainage.

Etch 310

Etch's suggestions, 12-18-34, for postponing litign so IDs may find they are using too much wtr; SF storage helps them; their foothill resrs are ineffic of wtr; integrated devmt, coopg w SF, is best; hi wtr damaging crops & soil.

Etch 312 Losses from Owen Davis resr., Turl ID. nd, probly '34

p3 Ave an. useful stored wtr, 35,000 af

Ave an. seepage & evapn loss from:

resr 32,000 af

diversion canal 6,000

p4 Spillway discharge or operation waste, "is the vol. of unused wtr discharged at the spillways & the wasteways at the ends of laterals. It is surplus wtr carried in the system to facilitate opn & is gnrly larger when an abundant supply is available ..." In TID are 2 spillways, at head of distribn system & at Ceres Main. Outlets for excess wtr not needed by laterals below.

Etch 372, continued

p5 1923-32 figs on spillway waste, TID. Big wastes, but in "low flow years such as '24 & '31 the waste was largely prevented." So "with reasonable care in opn the spillway waste shd not exceed c. 5% of the vol released from Owens Res."

Table. 1921-32, seepage, evapn, & spillway loss were 43% total supply - includ'g pumped grndwtr as supply. 1924 was 39%
1931 was 34%.

So even in these dry yrs they didn't improve much, when add seepage & evapn to spillway loss. 1931, spillway loss was very small, but seepage & evapn % losses probly same — (absolute losses less bcs less diversion).

Etch 373 10-33 Memo on Wtr Supply Available for Mod & Turl. Distrs & 57.

By B.A. Etcheverry.

p.5 "... we cd show that with the reduction of what in our opinion is wasteful use of wtr, the wtr requirements wd. be materially reduced. However, it is very doubtful that the courts wd. rule that such waste shd be prevented."

(So those who see Mod-Turl. from outside agree. Only ones claiming otherwise are those inside.) (But Etch. testifyg for 57?)

Etch 378 Summary of Rpt The Wtr Supply of SF & the So. Bay Area. from the Bay Region & Tuol. R. sources. S.A. Elliott, consulting engr. SF. 11-34.

SF's San Antonio resr is undeveloped. 4.8 mgd, of Calaveras 29 mgd.

L. Merced, & 2.5 mgd, & Sunset Wells, 6.0 mgd, shd be retired & held for emergencies when get Tuol. Wtr. (Heard someone say L. Merced is now so held, unused). (Note how SF retires local sources – e.g. pleasanton wells. Like ~~San Jose~~ SCVWCD. Hold in reserve ~~trapped~~ the captive sources, compete for remote ones)

p13-14. Elliott also opines that Mod-Tuol-Wtrd waste wtr.

Etch 379 Thos. H. Means, eng.

p 6 Tuol distrs "suffer from lacked resr capac.", SF storage wd help them.

Etch file 360. Testimony R.V. Meikle, Some HH case, c. 1933

p 65 Mod ID ccn't find mkt for all pwr cd gen. Jan-May, 50

stops wheels. 50 m kwh/yr go ungenerated.

Crawford, 8-4-58

MID avoids truck hrs needs more freq. irrn than they give. Have to keep veg. growing or they turn bitter.

So here they hv storage, yet poor control hrs storage so far from fmr. – &, implied, inadequate canal capac.

In Superior Ct, Cal, SJ Co., 5-8-35. In re Stan. decision of '29.

'29 gave ~~S~~ Sierra & SF Pwr Co. rt to divert 185 sf, 1908 priority, Middle Fk, gen. pwr, return to river. Provided ~~to~~ finish by 12-31-30. Extension granted, '30-34. But failed to ask for further extension, so ~~extd~~ denied, cancelled thert. Judge D.M. Young.

Specifies pts of diversion.

Specifies rights in continuous flow, but may vary it within any 30-day pd- i.e. must not exceed continuous =nt in any 30 day pd; nor infringe other rt.

Specifies rates of flow to 61 parties, mostly very small ... e.g. 0.875 sf to Mrs. Miranda Wood, priority 1886.

Utica Mining Co. (Emma Rose & Hobart Estate) gets a good deal.

Oakdale & SSJ IDs jointly may divert 1046 sf, mostly priority 1909, some earlier. Also 771 sf more, provided put to ben. use by 1930.

Madera ID

1. Opns? Demand system require extra capac.?
2. How much "lost & spilled" is recharge?
3. Δ land irrigd?
   Δ output?
   change crop pattern?
4. Price for admitting new lands?
5. Price to Chowchilla.
6. Why subject 160a law, unlike CCID?
7. Merced surplus?
8. CCID " ?
9. Grnd wtr up?
   Try encourage surface use?
   Recharge?
   Quality?
10. SJ hrgs jeopardize them?
11. No. ditch men?

Entry is free & open. Have extra BR wtr they can buy. 3-4 new fons enter last yr -- Gomez, Deulton. (This must make for scattered service. LSID & Merced also show ragged fringe)
Remarkable, how Madera is open, while CCID, with much more wtr, won't let anyone in.

Mr. Pezalla says they charge $4.68/a; plus $2.50/af to July, & 2.15 after.

Mc Swain.

New proj., Tudor Engrs, to dev. 600,000 af a firm supply, using 1,600,000 af storage space. Extra storage space is for power. Now pwr is incident to irrn, get 4.5 mills, sell it when they have it is all.

Plan is gen. pwr, firm, winter & summer. Get higher rate, & pay for free wtr. — thus politically, can say wtr dev. is for irrn.

Farmers wdn't support single purpose pwr project, wd say their wtr going to PGE etc.

Plan is to use 600,000 af firm supply on present MID + 10,000 a only.

Maybe much wtr now stored for irrn shd be used for pwr? How much pwr does one af grnte?

Pasture requires frequent irrn — MID sets 9 day min. freq. bes hr so much pasture. On poorer land, too, L takes more than its share of ditch work — & wtr.

Rice requires constant flow, they give. Used to use 16', so added $1. or so rate over 4'. Now pasture sometimes uses more wtr than rice, but surcharge is just for rice.

El Nido takes just 2,000 af or so. To get rest of discharge wd cost $5/af or so, they aren't ready, pump for less.
Had very complex rate schedule, too troublesome, changed to flat 15¢/af.

Hi line canal, rough country, rocky, pretty costly even as the worm winds. State considering tunnel, to So 7k, 13 miles or so, then introduce wtr from so.

Hi cost on Merced R bes can't touch Nat Pk. Best Exchequer

Merced ID.

K. McSwain, chief eng. (McMurry talked to me last trip)

1-55 announced tent. plans, filed on unapprop. wtrs Merced. — 900,000 af. max. in any one year. Now has 281,000 af, stored, + 2,000 sf. + Horseshoe Bend Dam.

$46m, incl. $4.5m pwr house.

Cyclic storage — yet want enough wtr to care for selves in dry year, driest on record, '31. Will admit little new land.

New Va. Pt. resv plan, 58. $50m. Now, it's Bagby, + New Exch., & Snelling

Qus:

~~1. Why need~~

1. Plans to use resv wtr supply.
2. Use of pumps for drainage. Drainage problem?
3. How much flow of Merc. R do they lose to city-of-origin & prior rts?
4. Where is the 387,000 − 163,000 = 224,000 acres in Merced Co. needing wtr & w/o prior rts?
5. Possibilities of using grnd wtr resv for cyclic storage?
6. What 10,000 new acres to join MID after Va Pt. built. On what terms?
7. Length, capacity, & cost of hi line canal, Merced Falls to e. of Le Grande. ✓ Book ests good.
8. McSw. opposes co.-of-origin law. But cd Merced Co be one? Probly not, bes wtr origs in Mariposa Co.
9. Is $14/af for the supply developed on Merced R? If so, why so hi? Or is this imported wtr?
10. Can keep filings w/o developing?

McAwain, 2

same elev-n as Don P & Melones, same cost.

(Are already diverting 400,000 at or so. New plan adds to 600,000 — lots of wtr for small ID.* Just gives them cyclical insurance, at no cost, i's their interest.

I wd say, gnte pwr, then expect so.

Wtr level now rises until c. June, drain pumps going strong. Hence need more pumps.

Plan to use gnd rese for cyclic storage is only "ultimate". Immediate plan contemplates none such, all surface.

Admitting no new acreage. 7K IDs can bes hv more wtr source. MID has no more wtr. (Cbs — cd conserve some)

1930s, much land was very poor, had hard time paying $8.90/acre. ID took over 20,000 a or so. Some, sw boundary, they sold & excluded from ID.

Doesn't expect all area of his plan to take surface wtr in his lifetime. Much mgnl. Much pumps, & satisfied.

But land they thought 10 yrs ago was ng is being reclaimed, & soon will produce etc. s of Merc.

Now I see why pwr filing nec — might store, release in winter — then pwr *is* a cons use. Ask Sac. — pwr filings permit single purpose use, non-coopn?

Merced, 2

✓ 11. area irrd declined, 1930, 124,000 a
37 103,000
43 91,000
55 110,000.

Irrble area in ID, 143,000.
assessed area slightly higher.

12. Why include so much non-irrigable land? 163,000 - 143,000 = 20,000.
City?

13. How did fmrs get wtr when stopped paying taxes? Pump?
I suspect they had little motive to pay, bcs cd get wtr easily by pumping from shallow wtr table. Had old pre-ID pumps yet. Probly large motive of ID was forestall export, & in depression hardly seemed worth supporting. of LSID, where hillsiders were strongest boosters for ID — they had to have it.

✓ 14. Price to El Nido? 75¢, no guarantee, spill.

~~15. 12-54 or so Rpt by Mc Swain to Directors, on future plans & needs.~~

16. See fnd rpt in file.

✓ 17. Comment on Bull 2, giving them 45% effic.

18. Instead of lining canals, why not divert less wtr.

19. Do fmrs pump. No.

20. Why need assured late-season surface supply, when hv pumps all set to go? Wdn't it save pwr next yr, to open the underground resr?

21. Tomatoes coming in, create new opnl problems bcs need wtr sooner?

Twice in hist, MID irrn season ended in July. No trouble then, bcs fmrs had old pre-ID pumps, & prices low, crops worth little anyway.

Now, doesn't want use pumps for emergency bcs wd stand idle most of time. So wd surface storage. But surface produces electricity, he has to fall back on, is essence.

I shd say pumps not only cheaper, but quicker to install, & cd wait until need, may never come.

Merced, 3

22. How many ditch tenders? Cf. other IDs. 27 9 day rotation. Worked out by ditch tender w/ from by crop. Pasture gets 9 days; peaches need 4 x/yr.

23. Now hv 156 wells – 200 wd not cause overdraft. So what have they now.

24. Lose much to pumpers outside? Don't know.

25. Why not rely on groundwtr for disaster insurance, save cost of Va. Pt. Dam? Electricity & flood control pay for dams.

✓ 26. Merced R. costlier to develop? Why?

✓ 27. Va. Pt store 1m af; admit 10,000 a ... why the disparity? ½

✓ 28. Why not sell more spill wtr to El Nido etc? 75¢/af.

✓ 29. If going to admit only 10,000 a more, why speak of us of R. for all e-n Merc. co?

~~J. Ian Stewart. Mon. H.~~

Ian Stewart, Merced Co. Fm adviser.

Best-of-all-possible-worlds attitude. Let every man fight for his own wtr, things will work out right.

Soils n El Nido are hardpan. Alkali forms bec natural rain & flooding can't drain. Leaching likewise impossible. Blasting rare, for individ trees. Are fmg some, by levelling, hillocks, lets you get at pan on hi spots, break it up. Mgmt, tho — $150/a or so.

Merc. wtr opns are especially sloppy. No mere or control of wtr. Theoretically change something after 4 af free, but rarely do. Mod & Turl. are more careful, ditch-tenders apply pressure.

Rotate, basically, but give some response to demand — 3 days maybe, depending on ditch.

Must release some flow down Merc. for Stevinson, rip rt. Sometimes they don't use it. But in gen'l Stev. needs more wtr, & wd. join ID to use tailwastes --- already use them somewhat.

Gives lowest land prices I have heard. $1,000/a tops, down to $200 for poor lands in MID, less outside

Few farms pump in MID.

Gustine, walnut land, may reach $2,000 for very best, he agrees after my mentioning it, but origly said less for whole W-n Mer. Co.

W-n MID, drainage becoming worse, something more must be done.

Note contrast of attitudes — when one tries to show good land not developed, then they say ng; when try prove need for wtr, all land is good.

Farland E. May. Frm Advisor, Modesto.

Frmrs use too much wtr, lose plants. W side, despite paying much for wtr.

E. side, compaction a problem. Drive heavy equipment on wet soil, stops drainage.

L.v. about same, e & w side.

W side warmer. Esp. W. of Rte 33. Satyo trees were blunder - big outfit, friend of family to manage.

Trees going onto stony soils in past, but now taking best soil, w side. Stones ruin cultg equipmt fast.

Sorrento soils, w side.
Hanford " , e. " .

Light e side soils better for grapes.

Crawford

Rotation? Yes. Limits crops. Few supplemental pumps. Demand system impossible bec storage so far from farm, system so big. Truck needs more frequent irrn.

Lv? $2,000

Effic?

Bull 2 ng.

Not much truck in MID.

MID has drained, but W side can't, soil too thick.

Cheap w/ MID means very hi l.v., offsetting.

New Don Pedro in talk stage — more storage for driest years. Holdover capacity — have none now.

Ground storage n.g. + his area — bes all wells based on hi table.

New DP won't cause any $ tax rate. Power pays. + 578 ac.

Cement - lined canals
Modesto, Turlock, &
Merced IDs.

This, in conjunction
with drainage problem, &
gen'l harsh water use, is
anomaly. One lines
ditches at great expense,
when if used
less wtr, expense not nec.

To what extent is mnpy
holding back citrus expansion?

Appln 14126, 1-16-51. Power.

Mod-Turl, Tuol. Est. complete 1965.

Appln 14127, 1-16-51. Irrig-n. Permit 9320. 3-21-57. Est. use on 300,000 a. – where?

a. Is appln for new Don Pedro, storage 2 m af, final unit comprehensive plan Tuol. Will be owned by Mod-Turl, – fncg help from SF & fed. flood control funds.

Permit for 1,568,300 afa, not to exceed.

Complete constr-n 12-58

" appl-n of w to proposed use 12-68.

Acreage 260,568 a.

Capac. of conduit, Turl Main, 2500 cf
Mod " 2000 cf

Access is on gov. land, which has been withdrawn for pwr dev.

---

b. Viola Prothero et al, upstream at Chinese Camp, protested fearing interference w their use of w on numerous mining claims in T 1 S, R 14 & 15 E. Dismissed bec upstream. Rip. basis.

Applin 14121, p 2

c. Ltr of 1-31-52 from St. Hydraulic Eng of — — —, W.R. Gianelli, to Zander & Smitherman I think.

Harry Lloyd of SF supplied fotostat of "Drawing C-2076", "Wa rts owned by SF in Tuol. Cty."

& C-826.1, rts on Tuol R. attached.

3rd agreement of SF w Mod Turl is to supply 1.1 m afa for IDs & 400 mgd for SF

The Meridian Decision, cts said "some of the old appr. rts issued by the City & cty of SF", in Tuol. Cty records, "are adequate rights" for HH proj. (but how about others?)

New Don Pedro proj., SF rts are "old approp. rts not of record with this office" (p 2 of ltr), but IDs hv to file w. office, bec "apparently" they hv no old claims.

SF legal staff believe rts are "firm" & verified by Md. case.

So Gian. not insist SF file w his office.

Applin 14121 p3

El Solyo Co. sued S7 & IDs, late '30s, & ct. upheld H.H. rts.
(Ltr says "El Soyo", twice)

---

d. 3d agreement, S7 & IDs. 6-30-49, to coop. on New Don Pedro.

IDs now control site. Wd make res-r cap. not less than 1.2m af, including old Don P. This is cheapest way for S7 to get storage it needs.

Will begin on 5 yrs notice from either — ~~at~~ at or after S7 diversions reach an. ave 200 mgd

Cap to be not less than 1.2m af, incl. 290— to replace old DP, 510— for "City" exchange storage space", 340,000 flood control. City & IDs share 50-50 any unused flood space. Oblig-n to op. exist'g ress for flood control are terminated, space released for storage.

S7 to pay for new DP, over Fed. $, & up to 1.2m af.
IDs give site.

IDs may build it above 1.2m af, their expense, & w/ all their.

IDs own & op it, their expense.

IDs get all power.

Applin 14121 p4

e. The applin form.

Use – irrign in Mod-Turl IDs., 1,568,300 af

Crops: alf 80,000 a
Orchard 30,000
Grain 82,—
Pasture 78,—

Land to be irrig has another water rt, 1,090,000 af "when runoff permits. Holdover storage planned."

Keep grndw 8' down.

Applns 13563, 2-3-50. Permit 9317

a. Ltr, 12-5-51, from HE Lloyd, Mgr & Chief Eng, SF PUC, 425 Mason St, to Bianelli.

Includes Deed List, Tuol. Cty, wtr rts assigned to city. 1902-11.

Many individ items, c. 80.

Those on Cherry Cr. & Eleanor Cr. mostly from Tuol. W Supply Co., orig. filed by Wm. Ham. Hall, & Sierra Ditch & Wtr Co. ... c. 40 separate diversions, given in M.I., c. 20,000 apiece.

Recorded in "Claims book 1, vol. 10, 11.

not wtr. { Some of the Cherry Cr. res-r sites & "Canal R/w" rts are "under applns made to the U.S. Not recorded in Tuol. Cty." [R/w probly means rt of way]

Others are from Wm Ham. Hall, orig. filed by Th. R. Hanna.

" " " Marsden Manson " " " M. Manson.

Also some of which ~~they were~~ S.F. was approp.

Form of conveyance was by deed, consideration not mentioned, or rather left blank.

Qu: does holder of pre-'13 rt hv pwr to convey it? Esp. for faraway use. Does it not revert to State?

Applns 13563, 12

~~a, f, 2~~

b. Deeds for ea. of above ~~pts~~ rts.

W H Hall lives in SF. Deed specifies $10, & is just quit claim, for whole bunch of them.

Leo H. Sussman owned Sierra Ditch & Wtr.

Tuol. W Supply was Jesse Lilienthal, ~~Alex. Mear, & Albert Raymond~~ & John C. Hays, of N.Y.
accepted $400,000 for L. Eleanor lands & rts, incl. rip rts.

Also a 2d deed for $652,000. Tuol. W Supply had SF as place of bus.

James Phelan & Marsden Manson posted for city, then xfrd.

c. Permits. Tuol Mod.

500 sf, 3-15 to 10-15

264,000 afa stored, 3-1 to 6-30.

Complete 12-55

Source Cherry & Eleanor Cr.

Use irrig.

d. Hecto. of 63d, 1st, HR, Rpt 41, HH Grants to SF, 8-5-13, printed. Long discussion re Raker Act. Read in Mo.

e. Sonora is cap. of Tuol. Co?

March 25, 1947

East of Escalon noticeable change to dairying from orchards - Stanislaus Co. line quick change back to orchards. (Not such a sharp contrast after all!)

Oakdale mostly dairying. Large holdings - especially so. of Oakdale. Hilly + unlevelled. Underground pipe systems. Just before Waterford small river and dry canal. noticeable change to horticulture.

Waterford a primitive slap dash wide open town

So. S. J. Same strip (narrow) between railroad tracks + fence being cultivated.

W. of Waterford Intensive horticulture. Large holdings than S. S. J.

Empire A little better than Waterford (not much!)

Manteca I was very pleased. Prosperous. Two good schools.

Escalon Smaller + less wealthy

Modesto Pleasant little place. Clean. Something like Manteca.

Turlock I.D. #1 fewer orchards by far. More meadows. Holdings fairly small. Houses fine. (Colloquially!) General aspect more trashy than Modesto area. Migratory labor in evidence.

Turned right toward Paterson. After 203 miles of pasture + meadow came to considerable raw land. Some being levelled. Very large holdings. Very large ranches near S. J. Relatively undeveloped. Completely unleveled. Fence growing at random. Used for pasture. Small parts being developed, not separated by fence from rest of tract.

S. J. River West of S. J. R. land levelled. Alfalfa or clover. Very green. Holdings large for about a mile or two. Getting smaller.

W. Stanislaus D. Horticulture begins. No sharp dividing line. Peaches pleased. Nice houses. Plantings along street.

Paterson In north scattered orchards. Mostly field crops. Holdings quite large. One tremendous holding on left.

W. Stanislaus D. Begins where W. S. D. ends. (Royal) near Paterson lots of orchards.

W. Stanislaus D. Beans. Very large holdings. Some small used. A few scattered orchards. Few small holdings & small homes. Migratory labor camps. One tract for sale by Bill Lewis, Realt. Near border of Banta - Carbona.

Banta Carbona D. Migratory labor more in evidence. Somewhat poorer housing than in Stanislaus. Some general picture. Seems a little less heavily cropped, but this is tenuous. Here Bill Lewis land for sale.

Manteca → Tracy

Must admit westside districts, save for E. C-C, are very much un-subdivided. They are improved, true. But not with orchards. Subdivision seems to be characteristic of orchards more than of IDs. Maybe tho — well, surely — tax on trees discourages them.

Westside ID was noticeably more subdiv. than Livermore Valley, which latter was dry farmed, despite standing water. But still it isn't heaven. But I'd hesitate to say these westside IDs were more subdivided than the Tracy - Manteca drive recommended by JRM.

Write IDs for reports.

Ollie Lilland.

His ass't says e side canal may be twice as costly as W, per mile as crow flies. Lilland is supremely cagey, won't say anything.

State Bull 3 proposed E side alternate. Yuba wd. be a main source. & Stanislaus & Tuol.

Planning on basis of no exchanges. Not challenging local wtr rts, Stan. & Tuol.

New plan wd keep on e. side by series of pump lifts. Higher costs per mile — mainly cost of crossing rivers, & winding.

The State mentioned this in Bull 3, as one alternative. Has cost estimates.

Winter surplus Sacto wtrs. above delta, regulate it en route perhaps at south end. More Yuba R. export - State agrees. Cosumnes, & possibly Stanislaus, swap from Am R wtr by Folsom So Canal. Overdraft no. of SSJID wd be relieved.

No plans on Merced now. Bes IDs have plans.

Leapfrog Am R system.

---

4 lifts to ~~SJ~~ FK canal + 1 from Sacto. R to E Side canal, 0-465' aggreg, & 500'.

Variability of supply & demand equally great, so doesn't much matter where put storage.

Unit	Wtr delivered	Gross output	area irrigated	Gross output per acre	Major Crops & acreages.
Delano-Earlim.			48,052		

Applcn 13604 Permit 9318

Turl Mod., Chem & El. Crk, 2-21-50

500 sf + 264,000 afa

Pwr

~~Applcn 1537 Permit 758 License 419~~

App 14126, Permit 9319

Turl Mod, Turl. R, 1-16-51, 1,568,300 afa, pwr.

App 6711 Permit 4271, License 2425

Turl Mod

108,000 af. c. 10% diversions at La Grange dam to irr. 238,000 a.

Permit states 800 cfs, 2-1 to 11-30, 181,556 acres

App 3139 Permit 1699 License 2580

603 sf, 1-1 to 12-30 Pwr.

"No rts to w, except stored w, are to be acquired under this license which may in the future op to disadv. of irrig dev."

Info from files.

Appl nos. for La Grange Pwr plant

3139. Pwr. for a. Ltr from WR Gianelli, supervis hydraulic eng., to Meikle, 8-11-55, listing all appl-ns that Mod., Turl., & Watford IDs hold: (X means cancelled)

~~X~~5,	1232	1233	1258
X1259	1456	1532	1568
X1599	1600	3139	3312
✓3648	5094	5266	6711
~~X~~810	6811	6829	9996
✓9991	13563	13604	14126
✓14127			

b. Sketch map of ~~so~~ lands irrig-ble from Turl. A large area e. of Mod & Turl. IDs, up to a line thru P.H. below La Grange Res. Also above Don Pedro, around Jamestown & Groveland.

c. Use of wtr c. 240,000 afa, '56. Less in other yrs. Less in summer — must be a natch flow permit.

d. License issued 3-43, (orig. appl-n was '22, got several extensions. Blair says new wtr rts bd is much less lenient of coasting along) for 603 sf, 1-1 to 12-31. But no rts allowed which may in future op. to disadv. of irrig-n dev.

Appl No Permit
3648 3026

a. Wtaford filed, but Mod-Turl refused delivery. Suit in Stan. Cty Ct., late '30, but probly compromised out of ct.

b. ~~Stfd~~ Amt, 100 sf, 3-1 to 10-31
From La Grange dam,
To 185,000 a. in TID
& 81,203a MID

c. Date of priority 9-24-23

d. Wtafd assigned to M-& T-, 5-11-40.
68.46% to Turlock, & 31.54% to Mod.

e. W. in qn is waste above normal flow from L. Eleanor & HH.

f. Orig. permit went to Wtafd, ~~Return, read conveyance, on onion skin.~~

Wtaford on 10-18-39, contracted to buy surplus w of Turlock, & Turl. to use money to pump wtr in lieu thereof, when they wish. And xfrd Appl 3648 to Turl-Mod., 5-11-40.

Price not specified. But agreement specs $1/af, pays to Turlock. And puts penalties on Turl ~~for~~ if it sells to others 1st, any of its w, since Wtafd gets wtr only after TID all satisfied. But if Wtafd gets max 12,500 af. Wtafd gets 0 for 2yrs, it gets permit back. — 2yrs out of any ten.

Wtafd evidently won its law suit

Mr. Blair

Application No.

Cross out small ones.

Tuol

Below Modesto

↓

~~15835~~

~~9225~~

~~4061~~

~~12262~~

~~15371~~

~~9573~~

~~6574~~

~~13496~~

~~1633~~

~~4607~~

~~5269~~

~~12396~~

~~9301~~

~~12674~~

~~9124~~

Mod-Tuol. ✓9996 1200 s.t pwr

✓9997 1200 s.t, 2-11

X✓ 13604 Tuol.-Mod, pwr

X✓ 6711 Tuolock et al, 800 s.t, 2-11

X✓ 3139. Tuolock ID pwr, 11-26-22

X✓ 3648 Mod-Tuol, 100 s.t + 14110 a.t

X 1233 } Tuol 600,000 a.t

X✓ 1232 } 600,000 a.t pwr 4-'19

X✓ 1532 Mod Tuol, 600,000 a.t pwr, 11-19

~~Waste~~

X ✓14126 Tuol-Mod., 1.5m, pwr

X ✓14127 irrig.

X 13563 - They brought me this file, altho not on this list. Contained 57 deed list.

~~But I didn't get down facts re applm 13563 itself. Do so.~~

One item they give is est. cost. Get some recent est costs to dev. so much w — after checking by

Spencer: 57. has no filings on Tuol., but some old county filings, which are in Mod-Tuol. files.

In studying failure of IDs to develop, note the desire of those already producing to prevent competition in specialty crop. v. Land Use Survey of Stanislaus Cty, 1940, by farmers committees HD 211 C2 C3

D4

They want: no further easy credit; no further use of land in existing kinds of crops – only in other kinds; cheaper xport; more coop. mktng etc. pp. 9-13

Patterson area was 'colonized', c. 1913-14, very successful.

5-59

Chowchilla WD borrows
$2.6m from BR for new mains,
laterals, & =n resr.

Will pay in 40 = annual installments,
w/o Ag wtr rates.

Voters approve 5-1

Will eliminate Berenda Slough,
Ash Slough, & Chowch. R as
distribn. channels, save seepage
losses. (But what about recharging
ground?)

New holding resr is on Berenda
Slough. Has recrn possibilities. Provides
6-hr control over flow of wtr in laterals.

What happened in 1931? A drought year – yet diversions per acre were at max., on Merced (5.4 of ave. 3.2)

Tuol. (4.0 of ave. 2.0)

Stan. (6.2 " " 3.4)

It is diversions that were higher — not acreages lower.

Not so strikingly max. on SJ reaches.

Why hi diversions?

1. Depression? 1931 is first year of record. Perhaps before '31, per acre diversions were also high. In depression it ceased to be worth cost to pump, either to increase output, or establish history.

But is only a weak trend to data toward 1955. So dubious.

2. Alternative sources ~~dried~~ dried up.

3. Long growing season?

4. Growers antic.g drought take more spring wtr. This is so on Sacto., q.v. But not on Stan., Merced, Tuol., from table excluding large I.D.s. Nor seemingly do I.D.s. ff. this pattern, tho that calls for more study.

check this - summary says they used 2.4 only. Is right due to Oakdale 10 pumps.

In 1941, Stan. R. diverters used lots of wtr percale — 5 afa or so. Likewise in '53. A few use much less, a few more.

Conclusion: use summary figures with great caution. They are rather arbitrary.

1950, irrn. supplies below normal, but calendar runoff above normal, due to Nov-Dec. floods, SJ Valley. 1950 Rpt, p. 25

Applⁿ 1233 ~~4-8-19~~ 325,000 afa. Permit 1165 ~~'22~~ Mod-Turl.
approved for license 5308, 6-17-58. Along w some others.

Applns	Permits	Licenses	
1233	1165	5308	325,000 afa irrn
9996	5909	09	1200 sf, allyp, pwr
9991	5910	10	1200 sf, ~~allyp~~, irrn. (2-1 to 11-30)
1232	1164	11	325,000 afa, pwr drain-n
1532	1166	12	2558 sf, allyp, pwr

Applⁿ 1532, License is a little less than permit, only time.

Larry Spencer mentioned if munic. files, it takes priority over other pending applns — but not over permits. So it is good to ripen into permit.

8-60

for NRA Meet

Sacramento Sells Bonds

The City of Sacramento received seven syndicate bids for the $6,000,000 **City of Sacramento Water Revenue Bonds Series A,** which sold July 12. Bids were closely competitive, net interest costs ranging between 3.893% and 3.989%. Syndicates include many Eastern and Western underwriters of quality issues. **Halsey-Stuart & Co., Inc.** of Chicago and New York represented the syndicate which submitted the winning bid. Other syndicates were headed by **Smith, Barney & Co.** of New York; **F. S. Smithers & Co.** of San Francisco; **Blyth & Co., Inc.** of New York; **Harriman Ripley & Co., Inc.** of New York; **First Boston Corporation, and Glore, Forgan and Company** of New York and Chicago.

Schwabacher & Company of San Francisco and Los Angeles are financial advisors to the City. The firm states that Sacramento officials were particularly pleased with the sale, which represented more favorable terms than had been attracted by any of three general obligation issues offered by the State of California on June 28, despite the fact that the City's bonds will mature over a period of forty years, fourteen years longer than the State bonds sold on that date; have an average life of approximately eleven years longer; and are subject to call as early as 1963.

The bonds sold were the first series of a total of $25,000,000 revenue bonds authorized for improvement of the City's long-established municipal water system. Series B, in the amount of approximately $16,000,000, may be offered in the Spring of 1961.

paralleled improvements in agricultu
victim of hunger, disease and pove
ile half of the world's population s
ir resourcefulness and diligence are
tion, speaking at the recent meeting



TERN NEW

IFORNIA, AUGUST, 1960

• THE CONSULTA

Schulz To Retire

Announcement has been made that **Walter G. Schulz,** Chief of the Division of Design and Construction, **California State Department of Water Resources,** will leave State service November 15.



WALTER SCHULZ

While his retirement will be effective in November, Schulz will actually leave his position early in September to enjoy a deferred vacation before taking up his new assignment with **Leeds, Hill and Jewett,** consulting engineers of Los Angeles. Schulz will open a new office of the firm in San Francisco.

A veteran of 30 years of State service, Schulz's responsibilities have covered a wide range of assignments in the Department of Water Resources including not only the

9. F. = c. 490

Cal. State credit must be pretty strained if a city has better credit than the State.

This suggests it is high time for ~~city to~~ State to stop lending its credit to municipalities !!!

... Porterville Trip, 5-14 & 15-58

Procedure

Cf. gross outputs/w. Then as index to costs, take l.v. ? of l.v. a gross output/acre, shows costs do not Δ more than in a gross.

Meikle, May 14 '58. - suggest Willa interview

TID use flood irrig-n.
Pump 200,000 a-f-a, or ¼ total applic-n.
W that passes La Grange they consider free w — anyone can take it. I ask if they wd estab. rt, replies they cd file on it.
Says TID "will have to" take in more land, to use w.
TID is not heavily improved, as it looks.

By cfson, ¼ stretch from US 99 to Reedley is solid raisins — probly in Consol.

SJR flood'g, e of its channel, w of Modesto.

El Solyo Ranch, c. 2 mi w. SJR. In gnrl, few orchards w side, but are some, around Cardona. Perhaps uncertainty of w supply has blocked.

Many young orchards ... Madera?