DON PEDRO PROJECT
FERC NO. 2299

DRAFT LICENSE APPLICATION

EXHIBIT F – GENERAL DESIGN DRAWINGS
(Public)



Prepared by:
Turlock Irrigation District
P.O. Box 949
Turlock, CA 95381

And
Modesto Irrigation District
P.O. Box 4060
Modesto, CA 95352

November 2013

No changes to Project facilities are proposed at this time. With this Draft License Application, the Districts are filing the existing 20 Exhibit F drawings as Critical Energy Infrastructure Information (CEII). For the Final License Application, the Districts will submit updated Exhibit F drawings for Project facilities in the format required by the current FERC guidance, *Managing Hydropower Project Exhibits: Guidance Document*.

(The Exhibit F Drawings have been removed and are being filed separately as CEII.)

DON PEDRO PROJECT
FERC NO. 2299

DRAFT LICENSE APPLICATION

EXHIBIT G – PROJECT MAPS



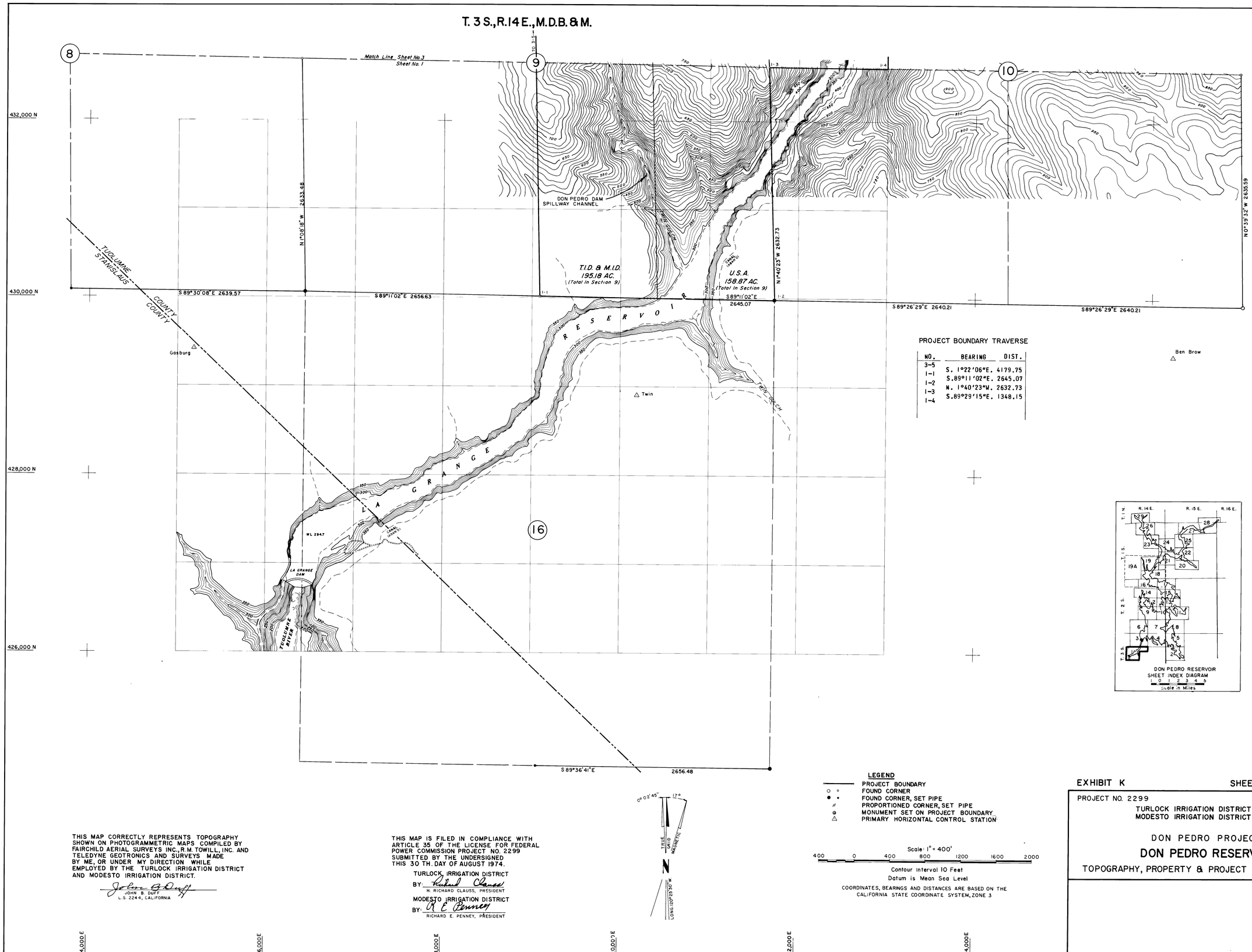
Prepared by:
Turlock Irrigation District
P.O. Box 949
Turlock, CA 95381

And
Modesto Irrigation District
P.O. Box 4060
Modesto, CA 95352

November 2013

No changes to the Project Boundary have been identified at this time. With this Draft License Application, the Districts are filing the existing Exhibit K maps showing the Project Boundary. For the Final License Application, the Districts will submit updated Exhibit G maps and GIS shapefiles per the current FERC guidance, *Managing Hydropower Project Exhibits: Guidance Document*.

T. 3 S., R. 14 E., M.D.B. & M.



PROJECT BOUNDARY TRAVERSE

NO.	BEARING	DIST.
3-5	S. 1°22'06"E.	4179.75
1-1	S.89°11'02"E.	2645.07
1-2	N. 1°40'23"W.	2632.73
1-3	S.89°29'15"E.	1348.15
1-4		

THIS MAP CORRECTLY REPRESENTS TOPOGRAPHY SHOWN ON PHOTOGRAMMETRIC MAPS COMPILED BY FAIRCHILD AERIAL SURVEYS INC., R.M. TOWILL, INC. AND TELEDYNE GEOTRONICS AND SURVEYS MADE BY ME, OR UNDER MY DIRECTION WHILE EMPLOYED BY THE TURLOCK IRRIGATION DISTRICT AND MODESTO IRRIGATION DISTRICT.

John B. Duff
JOHN B. DUFF
L.S. 2244, CALIFORNIA

THIS MAP IS FILED IN COMPLIANCE WITH ARTICLE 35 OF THE LICENSE FOR FEDERAL POWER COMMISSION PROJECT NO. 2299 SUBMITTED BY THE UNDERSIGNED THIS 30 TH. DAY OF AUGUST 1974.

TURLOCK IRRIGATION DISTRICT
BY: Richard Clauss
H. RICHARD CLAUSS, PRESIDENT

MODESTO IRRIGATION DISTRICT
BY: R E Penney
RICHARD E. PENNEY, PRESIDENT

LEGEND

- PROJECT BOUNDARY
- FOUND CORNER
- FOUND CORNER, SET PIPE
- PROPORTIONED CORNER, SET PIPE
- MONUMENT SET ON PROJECT BOUNDARY
- PRIMARY HORIZONTAL CONTROL STATION

Scale: 1" = 400'

400 0 400 800 1200 1600 2000

Contour Interval 10 Feet

Datum is Mean Sea Level

COORDINATES, BEARINGS AND DISTANCES ARE BASED ON THE CALIFORNIA STATE COORDINATE SYSTEM, ZONE 3

EXHIBIT K SHEET 1

PROJECT NO. 2299 CALIFORNIA

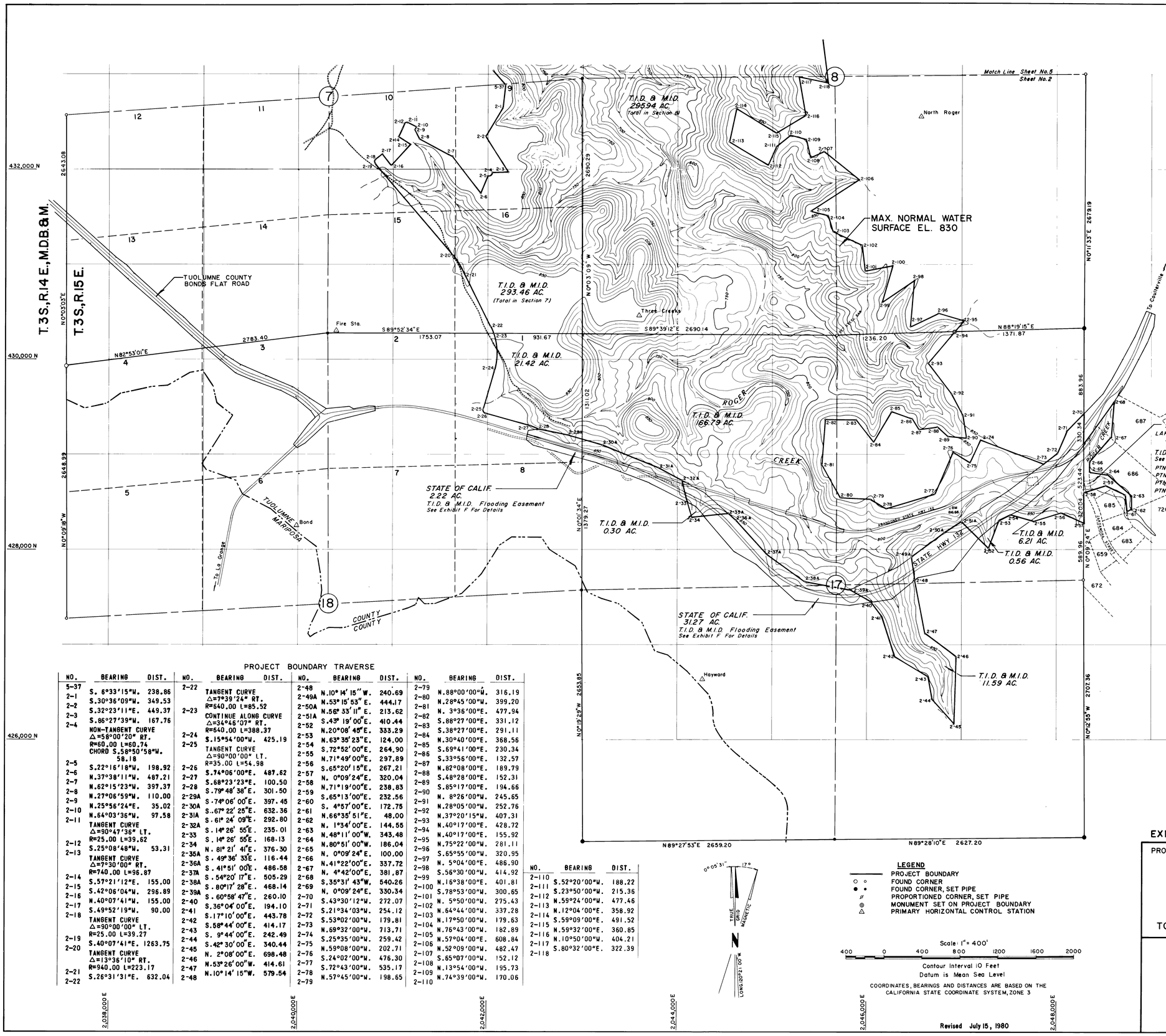
TURLOCK IRRIGATION DISTRICT
MODESTO IRRIGATION DISTRICT

DON PEDRO PROJECT

DON PEDRO RESERVOIR

TOPOGRAPHY, PROPERTY & PROJECT BOUNDARY

2299-85



PROJECT BOUNDARY TRAVERSE

NO.	BEARING	DIST.
5-37	S. 6°33'15"W.	238.86
2-1	S.30°36'09"W.	349.53
2-2	S.32°23'11"E.	449.37
2-3	S.86°27'39"W.	167.76
2-4	NON-TANGENT CURVE Δ=56°00'20" RT. R=60.00 L=60.74 CHORD S.58°50'58"W. 58.18	
2-5	S.22°16'18"W.	198.92
2-6	N.37°38'11"W.	487.21
2-7	N.62°15'23"W.	397.37
2-8	N.27°06'59"W.	110.00
2-9	N.25°56'24"E.	35.02
2-10	N.64°03'36"W.	97.58
2-11	TANGENT CURVE Δ=90°47'36" LT. R=25.00 L=39.62	
2-12	S.25°08'48"W.	53.31
2-13	TANGENT CURVE Δ=7°30'00" RT. R=740.00 L=96.87	
2-14	S.57°21'12"E.	155.00
2-15	S.42°06'04"W.	296.89
2-16	N.40°07'41"W.	155.00
2-17	S.49°52'19"W.	90.00
2-18	TANGENT CURVE Δ=90°00'00" LT. R=25.00 L=39.27	
2-19	S.40°07'41"E.	1263.75
2-20	TANGENT CURVE Δ=13°36'10" RT. R=940.00 L=223.17	
2-21	S.26°31'31"E.	632.04
2-22	TANGENT CURVE Δ=7°39'24" RT. R=640.00 L=85.52	
2-23	CONTINUE ALONG CURVE Δ=34°46'07" RT. R=640.00 L=388.37	
2-24	S.15°54'00"W.	425.19
2-25	TANGENT CURVE Δ=90°00'00" LT. R=35.00 L=54.98	
2-26	S.74°06'00"E.	487.62
2-27	S.68°23'23"E.	100.50
2-28	S.79°48'38"E.	301.50
2-29A	S.74°06'00"E.	397.45
2-30A	S.67°22'25"E.	632.36
2-31A	S.61°24'09"E.	292.80
2-32A	S.14°26'55"E.	235.01
2-33	S.14°26'55"E.	168.13
2-34	N.81°21'41"E.	376.30
2-35A	S.49°36'33"E.	116.44
2-36A	S.41°51'00"E.	486.58
2-37A	S.54°20'17"E.	505.29
2-38A	S.80°17'28"E.	468.14
2-39A	S.60°58'47"E.	260.10
2-40	S.36°04'00"E.	194.10
2-41	S.17°10'00"E.	443.78
2-42	S.58°44'00"E.	414.17
2-43	S.9°44'00"E.	242.49
2-44	S.42°30'00"E.	340.44
2-45	N.2°08'00"E.	698.48
2-46	N.53°26'00"W.	414.61
2-47	N.10°14'15"W.	579.54
2-48	N.10°14'15"W.	240.69
2-49A	N.53°15'53"E.	444.17
2-50A	N.56°33'11"E.	213.62
2-51A	S.43°19'00"E.	410.44
2-52	N.20°08'48"E.	333.29
2-53	N.63°35'23"E.	124.00
2-54	S.72°52'00"E.	264.90
2-55	N.71°49'00"E.	297.89
2-56	S.65°20'15"E.	267.21
2-57	N. 0°09'24"E.	320.04
2-58	N.71°19'00"E.	238.83
2-59	S.65°13'00"E.	232.56
2-60	S. 4°57'00"E.	172.75
2-61	N.66°35'51"E.	48.00
2-62	N. 1°34'00"E.	144.55
2-63	N.48°11'00"W.	343.48
2-64	N.80°51'00"W.	186.04
2-65	N. 0°09'24"E.	100.00
2-66	N.41°22'00"E.	337.72
2-67	N. 4°42'00"E.	381.87
2-68	S.35°31'43"W.	540.26
2-69	N. 0°09'24"E.	330.34
2-70	S.43°30'12"W.	272.07
2-71	S.21°34'03"W.	254.12
2-72	S.53°02'00"W.	179.81
2-73	N.69°32'00"W.	713.71
2-74	S.25°35'00"W.	259.42
2-75	N.59°08'00"W.	202.71
2-76	S.24°02'00"W.	476.30
2-77	S.72°43'00"W.	535.17
2-78	N.57°45'00"W.	198.65
2-79	N.88°00'00"W.	316.19
2-80	N.28°45'00"W.	399.20
2-81	N. 3°36'00"E.	477.94
2-82	S.88°27'00"E.	331.12
2-83	S.38°27'00"E.	291.11
2-84	N.30°40'00"E.	368.56
2-85	S.69°41'00"E.	230.34
2-86	S.33°56'00"E.	132.57
2-87	N.82°08'00"E.	189.79
2-88	S.48°28'00"E.	152.31
2-89	S.85°17'00"E.	194.66
2-90	N. 8°26'00"W.	245.65
2-91	N.28°05'00"W.	252.76
2-92	N.37°20'15"W.	407.31
2-93	N.40°17'00"E.	428.72
2-94	N.40°17'00"E.	155.92
2-95	N.75°22'00"W.	281.11
2-96	S.65°55'00"W.	320.95
2-97	N. 5°04'00"E.	486.90
2-98	S.56°30'00"W.	414.92
2-99	N.16°38'00"E.	401.81
2-100	S.78°53'00"W.	300.65
2-101	N. 5°50'00"W.	275.43
2-102	N.64°44'00"W.	337.28
2-103	N.17°50'00"W.	179.63
2-104	N.76°43'00"W.	182.89
2-105	N.57°04'00"E.	608.84
2-106	N.52°09'00"W.	482.47
2-107	S.65°07'00"W.	152.12
2-108	N.13°54'00"W.	195.73
2-109	N.74°39'00"W.	170.06
2-110	S.52°20'00"W.	188.22
2-111	S.23°50'00"W.	215.36
2-112	N.59°24'00"W.	477.46
2-113	N.12°04'00"E.	358.92
2-114	S.59°09'00"E.	491.52
2-115	N.59°32'00"E.	360.85
2-116	N.10°50'00"W.	404.21
2-117	S.80°32'00"E.	322.39
2-118		

0°05'31" 17°
TRUE SAID MERIT
LONG 120°21'00" W

LEGEND
- PROJECT BOUNDARY
- FOUND CORNER
- FOUND CORNER, SET PIPE
- PROPORTIONED CORNER, SET PIPE
- MONUMENT SET ON PROJECT BOUNDARY
- PRIMARY HORIZONTAL CONTROL STATION

Scale: 1" = 400'
400 0 400 800 1200 1600 2000
Contour Interval 10 Feet
Datum is Mean Sea Level
COORDINATES, BEARINGS AND DISTANCES ARE BASED ON THE CALIFORNIA STATE COORDINATE SYSTEM, ZONE 3
Revised July 15, 1980

EXHIBIT K SHEET 2

PROJECT NO. 2299 CALIFORNIA

TURLOCK IRRIGATION DISTRICT
MODESTO IRRIGATION DISTRICT

DON PEDRO PROJECT

DON PEDRO RESERVOIR

TOPOGRAPHY, PROPERTY & PROJECT BOUNDARY

2299-136

T. 2 S., R. 14 E., M.D.B.&M.

T. 3 S., R. 14 E.

Match Line Sheet No. 6

Sheet No. 3

MEXICAN GULCH RECREATION AREA

TUOLUMNE COUNTY BONDS FLAT ROAD

MAX. NORMAL WATER SURFACE EL. 830

TUOLUMNE COUNTY BONDS FLAT ROAD EASEMENT

T.I.D. & M.I.D. An Easement and Right of Way for the Flow of Water SEE EXHIBIT F FOR DETAILS

EMERGENCY SPILLWAY CREST EL. 800

CONTROLLED SPILLWAY CREST EL. 800

DON PEDRO RECREATION HEADQUARTERS & PONTOON CENTER

DIKE A

DON PEDRO DAM

DIKE B

DIKE C

POWER INTAKE N 438,200.97 E 2,023,705.54

TUOLUMNE CO. BONDS FLAT RD. ROW EASEMENT

FLEMING MEADOWS RECREATION AREA

PERSONNEL HOUSING

POWER TUNNEL

POWERHOUSE

M.I.D. TRANSMISSION LINES

T.I.D. TRANSMISSION LINES

TUOLUMNE COUNTY BONDS FLAT ROAD EASEMENT

GASBURG CREEK DIVERSION DIKE TOP OF DIKE EL. 725

DON PEDRO DAM SPILLWAY CHANNEL

GASBURG CREEK

T.I.D. & M.I.D. 437.63 AC.

T.I.D. & M.I.D. 314.48 AC.

T.I.D. & M.I.D. 193.18 AC. (Total in Section 9)

T.I.D. & M.I.D. 41.35 AC.

T.I.D. & M.I.D. 30.00 AC.

U.S.A. 160.65 AC.

U.S.A. 41.73 AC.

U.S.A. 41.35 AC.

U.S.A. 158.87 AC. (Total in Section 9)

U.S.A. 40.92 AC.

Match Line Sheet No. 3 Sheet No. 1

Match Line Sheet No. 4 Sheet No. 3

PROJECT BOUNDARY TRAVERSE

NO.	BEARING	DIST.
3-1	S. 2° 46' 11" E.	1454.75
3-1.1	S. 34° 40' 25" E.	880.42
3-1.2	TANGENT CURVE Δ=22° 41' 35" RT. R=1158.52 L=458.85	
3-1.3	S. 11° 58' 50" E.	1244.05
3-1.4	TANGENT CURVE Δ=75° 21' 33" LT. R=459.95 L=604.96	
3-1.5	S. 87° 20' 23" E.	863.16
3-1.6	TANGENT CURVE Δ=33° 02' 34" LT. R=659.93 L=380.59	
3-1.7	N. 59° 37' 03" E.	720.06
3-1.8	S. 30° 22' 57" E.	80.00
3-1.9	S. 59° 37' 03" W.	720.06
3-1.10	TANGENT CURVE Δ=33° 02' 34" RT. R=739.93 L=426.72	
3-1.11	N. 87° 20' 23" W.	863.16
3-1.12	TANGENT CURVE Δ=75° 21' 33" RT. R=539.95 L=710.18	
3-1.13	N. 11° 58' 50" W.	1244.05
3-1.14	TANGENT CURVE Δ=22° 41' 35" LT. R=1078.52 L=427.17	
3-1.15	N. 34° 40' 25" W.	751.92
3-1.16	S. 2° 46' 11" E.	3447.20
3-2	S. 80° 52' 22" W.	1323.26
3-3	S. 1° 15' 11" E.	1316.11
3-4	N. 80° 52' 22" E.	1331.62
3-5	N. 1° 03' 45" W.	1316.01
1-4	S. 89° 29' 30" E.	1362.18
3-6	N. 0° 27' 05" W.	523.80
3-7	S. 89° 29' 46" E.	1650.00
3-8	N. 0° 27' 05" W.	792.00
3-9	S. 89° 29' 46" E.	1017.73
3-10	N. 4° 41' 33" W.	216.54
3-11	S. 82° 25' 53" W.	32.12
3-11.1	S. 77° 14' 21" W.	104.94
3-11.2	N. 86° 11' 05" W.	261.24
3-11.3	N. 74° 30' 08" W.	104.33
3-11.4	N. 71° 54' 44" W.	156.31
3-11.5	N. 61° 29' 22" W.	156.61
3-11.6	N. 59° 45' 46" W.	105.43
3-11.7	N. 83° 09' 27" W.	64.02
3-11.8	N. 61° 55' 51" W.	110.39
3-11.9	N. 45° 00' 00" W.	200.00
3-11.10	N. 16° 55' 40 W.	170.00
3-11.11	N. 58° 51' 06" W.	103.82
3-11.12	N. 40° 18' 46" W.	258.61
3-11.13	N. 36° 30' 00" W.	250.00
3-11.14	N. 27° 58' 10" W.	101.12
3-11.15	N. 31° 49' 01" W.	122.48
3-11.16	N. 43° 07' 17" W.	241.81
3-11.17	N. 50° 44' 09" W.	237.09
3-11.18	N. 69° 51' 23" W.	237.09
3-11.19	N. 83° 23' 13" W.	187.96
3-11.20	N. 87° 33' 46" W.	198.20
3-11.21	N. 2° 20' 00" E.	105.00
3-11.22	N. 89° 28' 22" E.	100.12
3-11.23	S. 84° 36' 57" E.	101.26
3-11.24	S. 83° 04' 47" E.	208.89
3-11.25	S. 71° 45' 20" E.	104.95
3-11.26	S. 66° 01' 53" E.	104.95
3-11.27	S. 66° 01' 11" E.	160.10
3-11.28	S. 53° 34' 17" E.	227.26
3-11.29	S. 28° 13' 51" E.	201.36
3-11.30	S. 33° 50' 00" E.	322.42
3-11.31	S. 47° 48' 36" E.	50.99
3-11.32	S. 30° 47' 21" E.	100.50
3-11.33	S. 40° 18' 29" E.	244.35
3-11.34	S. 64° 18' 34" E.	105.43
3-11.35	S. 45° 00' 00" E.	50.00
3-11.36	S. 41° 11' 09" E.	300.67
3-11.37	S. 28° 13' 09" E.	51.69
3-11.38	S. 58° 18' 36" E.	332.01
3-11.39	S. 67° 01' 46" E.	190.77
3-11.40	S. 85° 50' 25" E.	286.92
3-11.41	N. 76° 43' 38" E.	95.98
3-11.42	N. 67° 56' 08" E.	42.60
3-11.43		
3-12		

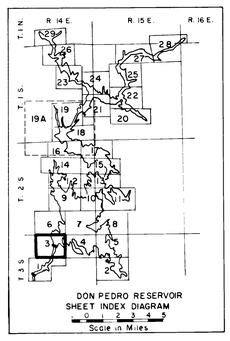
THIS MAP CORRECTLY REPRESENTS TOPOGRAPHY SHOWN ON PHOTOGRAMMETRIC MAPS COMPILED BY FAIRCHILD AERIAL SURVEYS INC., R.M. TOWILL INC. AND TELEDYNE GEOTRONICS AND SURVEYS MADE BY ME, OR UNDER MY DIRECTION WHILE EMPLOYED BY THE TURLOCK IRRIGATION DISTRICT AND MODESTO IRRIGATION DISTRICT.

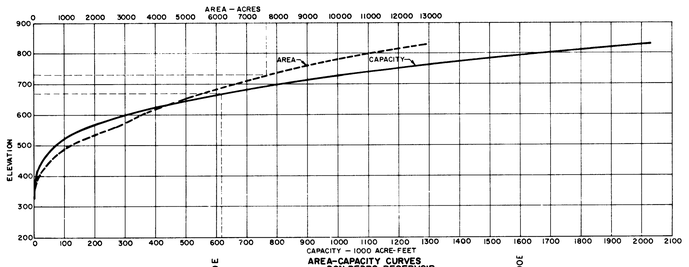
JOHN B. DUFF
L.S. 2244, CALIFORNIA

THIS MAP IS FILED IN COMPLIANCE WITH ARTICLE 35 OF THE LICENSE FOR FEDERAL POWER COMMISSION PROJECT NO 2299 SUBMITTED BY THE UNDERSIGNED THIS 30 TH. DAY OF AUGUST 1974.

TURLOCK IRRIGATION DISTRICT
BY: H. RICHARD CLAUSS, PRESIDENT

MODESTO IRRIGATION DISTRICT
BY: R. E. PENNEY, PRESIDENT





AREA-CAPACITY CURVES
DON PEDRO RESERVOIR

LEGEND
- PROJECT BOUNDARY
- FOUND CORNER
- FOUND CORNER, SET PIPE
- PROPORTIONED CORNER, SET PIPE
- MONUMENT SET ON PROJECT BOUNDARY
- PRIMARY HORIZONTAL CONTROL STATION

Scale 1" = 400'

Contour Interval 10 Feet
Datum is Mean Sea Level

COORDINATES, BEARINGS AND DISTANCES ARE BASED ON THE CALIFORNIA STATE COORDINATE SYSTEM, ZONE 3

Revised July 15, 1980

EXHIBIT K SHEET 3

PROJECT NO. 2299 CALIFORNIA

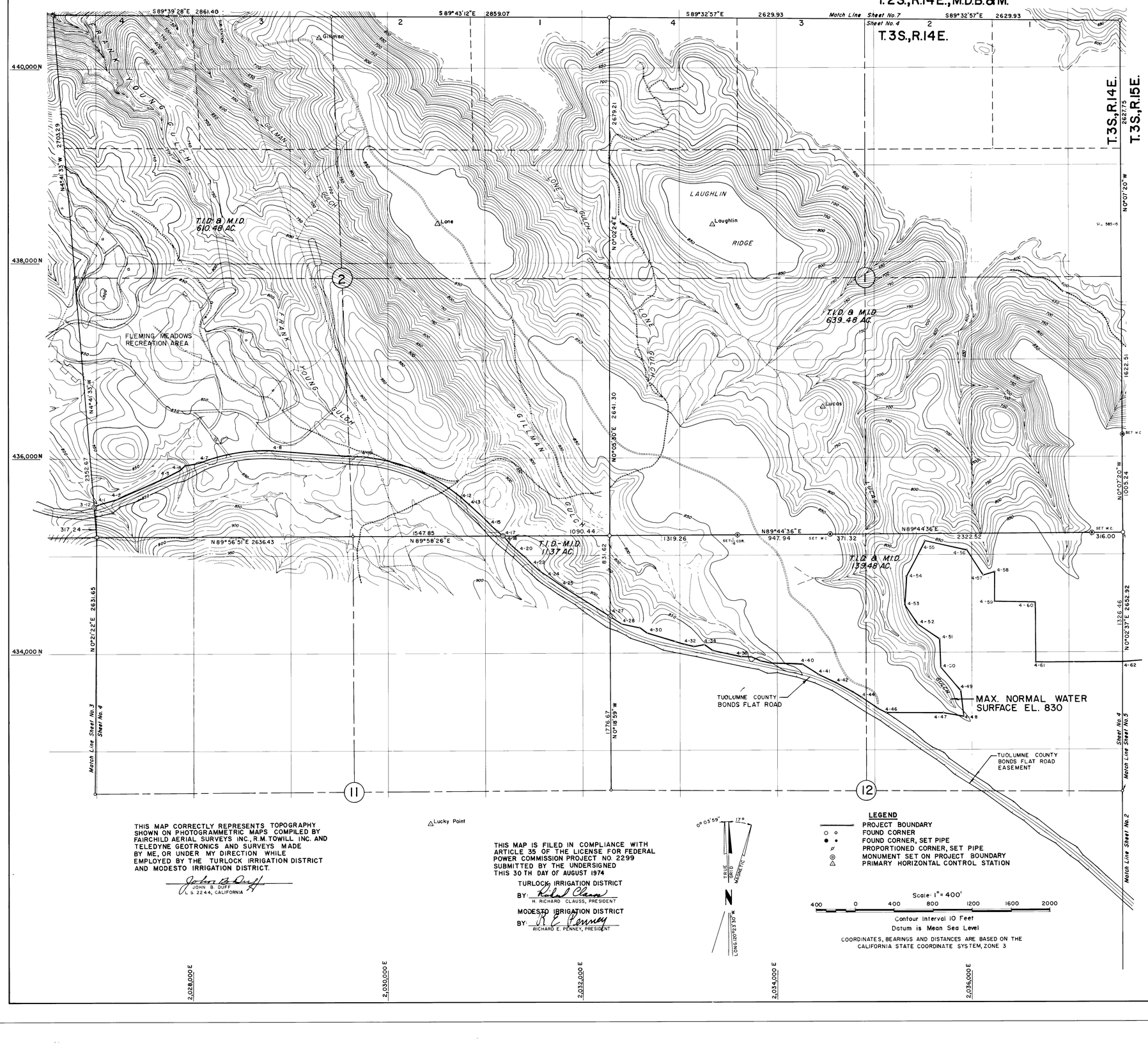
TURLOCK IRRIGATION DISTRICT
MODESTO IRRIGATION DISTRICT

DON PEDRO PROJECT

DON PEDRO RESERVOIR

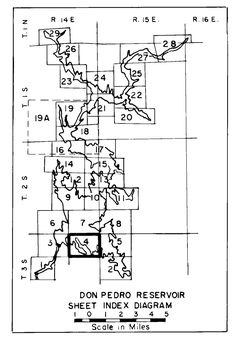
TOPOGRAPHY, PROPERTY & PROJECT BOUNDARY

2299-137



PROJECT BOUNDARY TRAVERSE

NO.	BEARING	DIST.	NO.	BEARING	DIST.
3-12	N.67°56'08"E.	52.79	4-26	S.77°40'00"E.	198.12
4-1	N.76°13'35"E.	193.43	4-29	S.54°44'07"E.	99.16
4-2	N.66°00'00"E.	550.00	4-30	S.73°24'18"E.	293.13
4-3	N.62°11'10"E.	150.33	4-31	S.72°07'22"E.	100.50
4-4	N.46°20'45"E.	74.33	4-32	S.77°50'00"E.	100.00
4-5	N.79°21'43"E.	135.32	4-33	N.80°21'55"E.	107.70
4-6	N.74°30'07"E.	51.42	4-34	S.56°01'55"E.	107.70
4-7	NON-TANGENT CURVE △=23°52'24" RT. R=1840.00 L=766.67 CHORD N.81°39'17"E. 761.14		4-35	S.77°50'00"E.	300.00
			4-36	S.89°08'36"E.	101.98
			4-37	S.66°31'25"E.	101.98
			4-38	S.77°50'00"E.	100.00
4-8	S.86°10'06"E.	800.25	4-39	S.87°11'11"E.	332.45
4-9	S.88°49'24"E.	100.94	4-40	S.57°51'03"E.	188.48
4-10	S.80°42'13"E.	102.47	4-41	S.65°51'01"E.	204.68
4-11	NON-TANGENT CURVE △=31°49'52" RT. R=1840.00 L=1022.22 CHORD S.65°59'32"E. 1009.12		4-42	S.60°52'55"E.	204.34
			4-43	S.58°57'18"E.	102.09
			4-44	S.55°00'00"E.	200.00
			4-45	S.63°31'51"E.	101.12
4-12	S.51°16'53"E.	102.47	4-46	S.89°52'53"E.	589.34
4-13	S.46°50'01"E.	200.05	4-47	S.78°58'00"E.	208.87
4-14	S.43°58'15"E.	100.12	4-48	N. 7°17'00"W.	268.16
4-15	S.46°50'00"E.	100.00	4-49	N.40°12'00"W.	312.93
4-16	S.49°41'45"E.	76.03	4-50	N. 2°10'00"W.	291.21
4-17	S.49°41'45"E.	24.10	4-51	N.55°32'00"W.	266.84
4-18	S.43°58'15"E.	100.12	4-52	N.34°05'00"W.	246.29
4-19	S.46°50'00"E.	100.00	4-53	N. 4°37'00"E.	285.93
4-20	S.49°41'45"E.	100.12	4-54	N.26°38'00"E.	408.31
4-21	S.43°58'15"E.	100.12	4-55	S.77°37'00"E.	447.42
4-22	S.47°35'14"E.	98.46	4-56	S.32°29'15"E.	297.68
4-23	S.56°28'44"E.	98.00	4-57	N.74°54'00"E.	123.19
4-24	S.55°20'34"E.	195.15	4-58	S. 0°00'40"E.	306.49
4-25	S.56°14'04"E.	200.06	4-59	N.89°59'10"E.	420.00
4-26	S.57°30'56"E.	364.05	4-60	S. 0°00'40"E.	622.29
4-27	S.57°30'56"E.	133.28	4-61	N.89°59'10"E.	897.98
4-28			4-62		



THIS MAP CORRECTLY REPRESENTS TOPOGRAPHY SHOWN ON PHOTOGRAMMETRIC MAPS COMPILED BY FAIRCHILD AERIAL SURVEYS INC., R.M.TOWILL INC. AND TELEDYNE GEOTRONICS AND SURVEYS MADE BY ME, OR UNDER MY DIRECTION WHILE EMPLOYED BY THE TURLOCK IRRIGATION DISTRICT AND MODESTO IRRIGATION DISTRICT.

JOHN B. DUFF
L.S. 2244, CALIFORNIA

△Lucky Point

THIS MAP IS FILED IN COMPLIANCE WITH ARTICLE 35 OF THE LICENSE FOR FEDERAL POWER COMMISSION PROJECT NO. 2299 SUBMITTED BY THE UNDERSIGNED THIS 30 TH DAY OF AUGUST 1974

TURLOCK IRRIGATION DISTRICT
BY: H. RICHARD CLAUSS, PRESIDENT

MODESTO IRRIGATION DISTRICT
BY: RICHARD E. PENNEY, PRESIDENT

0° 03'59" 17°
TRUE
MAGNETIC
N
LONG 120°23'30"W

LEGEND

- PROJECT BOUNDARY
- FOUND CORNER
- FOUND CORNER, SET PIPE
- PROPORTIONED CORNER, SET PIPE
- MONUMENT SET ON PROJECT BOUNDARY
- PRIMARY HORIZONTAL CONTROL STATION

Scale: 1"= 400'

400 0 400 800 1200 1600 2000

Contour Interval 10 Feet
Datum is Mean Sea Level

COORDINATES, BEARINGS AND DISTANCES ARE BASED ON THE CALIFORNIA STATE COORDINATE SYSTEM, ZONE 3

EXHIBIT K SHEET 4

PROJECT NO. 2299 CALIFORNIA

TURLOCK IRRIGATION DISTRICT
MODESTO IRRIGATION DISTRICT

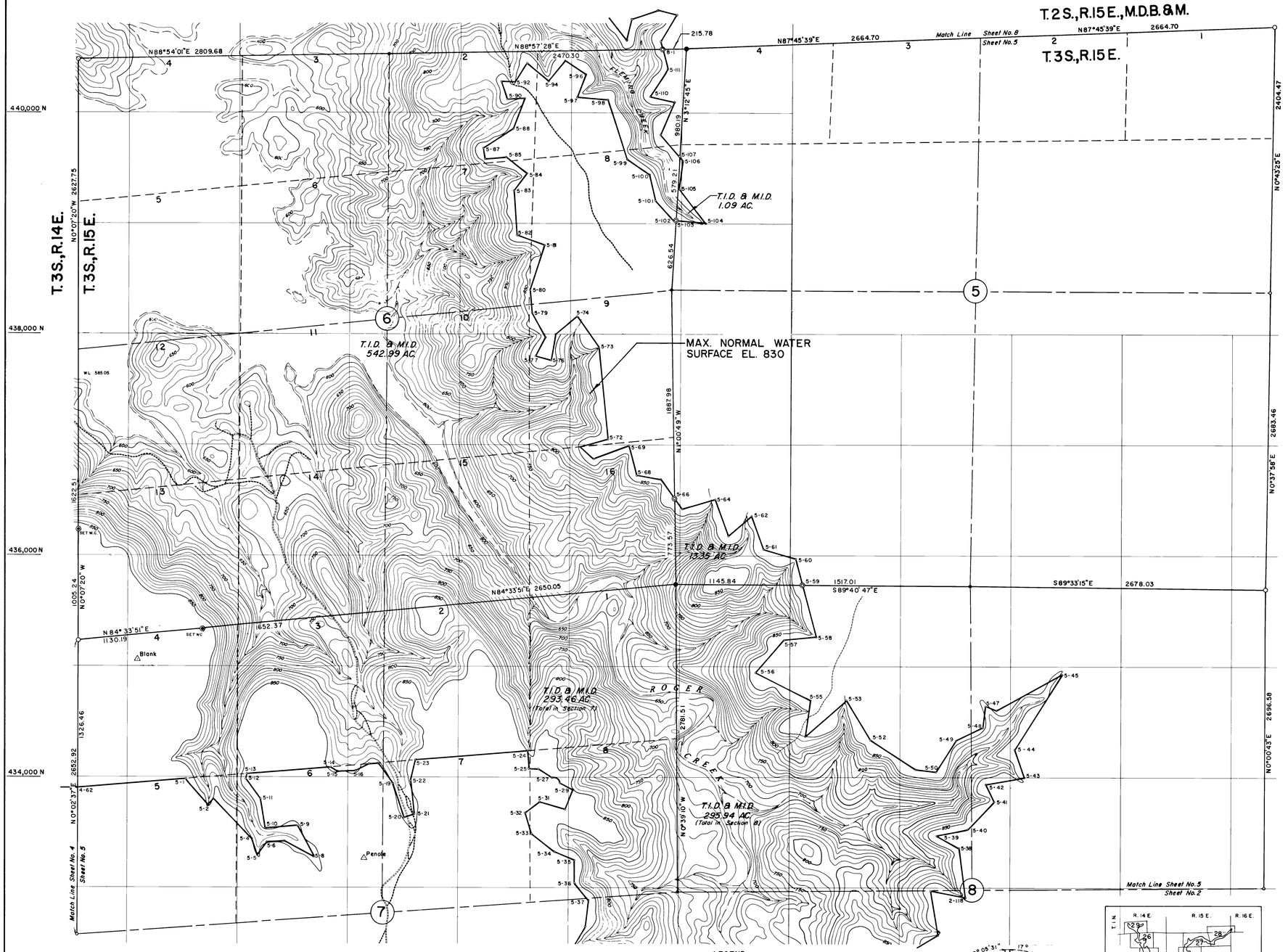
DON PEDRO PROJECT

DON PEDRO RESERVOIR

TOPOGRAPHY, PROPERTY & PROJECT BOUNDARY

2299-88

2299-88



PROJECT BOUNDARY TRAVERSE

NO.	BEARING	DIST.
4-62		
5-1	N.85°15'04"E.	983.09
5-2	S.41°43'00"E.	318.87
5-3	N.39°30'00"E.	73.88
5-4	S.43°37'00"E.	498.65
5-5	S.19°02'00"E.	150.22
5-6	N.38°36'00"E.	145.87
5-7	N.86°19'00"E.	155.32
5-8	S.62°31'00"E.	305.49
5-9	N.28°11'00"W.	317.65
5-10	S.85°57'00"W.	296.74
5-11	N. 8°29'00"W.	270.97
5-12	N.37°28'45"W.	226.78
5-13	N.14°42'00"E.	41.55
5-14	N.85°15'04"E.	759.26
5-15	S.60°21'00"E.	68.82
5-16	N.89°20'00"E.	170.01
5-17	N.62°50'15"E.	133.74
5-18	N.85°15'04"E.	82.35
5-19	S.36°06'30"E.	225.84
5-20	S.18°47'00"E.	322.55
5-21	N.71°12'00"E.	99.30
5-22	N. 6°51'00"W.	302.15
5-23	N.13°27'00"E.	189.16
5-24	N.85°15'23"E.	1016.39
5-25	S. 3°32'03"E.	155.65
5-26	S.86°26'11"E.	90.30
5-27	S.56°16'19"E.	144.06
	NON-TANGENT CURVE Δ =94°39'57" RT. R=60.00 L=99.13 CHORD S.57°19'58"E. 88.24	
5-28	S.61°44'19"E.	132.57
5-29	S.21°59'21"W.	190.44
5-30	N.72°30'26"W.	239.66
5-31	S.52°09'06"W.	161.44
5-32	S.16°07'38"E.	198.15
5-33	S.51°51'42"E.	271.45
5-34	S.68°05'51"E.	191.12
5-35	S. 0°32'42"E.	210.32
5-36	S.39°27'30"E.	198.10
5-37		
2-118	N. 7°40'00"W.	450.02
5-38	N.61°13'00"W.	230.49
5-39	N.78°34'00"E.	287.70
5-40	N.43°57'00"E.	345.83
5-41	N.25°51'00"W.	178.90
5-42	N.80°31'00"E.	351.81
5-43	N.19°19'00"W.	269.14
5-44	N.32°29'00"E.	802.55
5-45	S.61°42'00"W.	676.95
5-46	N.69°07'00"W.	103.82
5-47	S. 7°45'00"W.	192.76
5-48	S.63°15'00"W.	273.25
5-49	S.32°36'00"W.	335.93
5-50	N.83°23'00"W.	182.21
5-51	N.56°36'00"W.	495.90
5-52	N.31°36'00"W.	412.14
5-53	S.48°46'00"W.	496.04
5-54	N. 7°54'00"E.	327.11
5-55	N.62°50'00"W.	556.36
5-56	N.40°50'00"E.	389.94
5-57	N.83°46'00"E.	294.74
5-58	N.15°14'00"W.	479.00
5-59	N.15°14'00"W.	247.39
5-60	N.73°55'00"W.	302.97
5-61	N.20°18'00"W.	319.88
5-62	S.49°43'00"W.	275.29
5-63	N.19°54'00"W.	343.54
5-64	S.74°29'15"W.	310.38
5-65	N.34°54'00"W.	116.06
5-66	N.34°54'00"W.	214.34
5-67	N.80°37'00"W.	227.00
5-68	N.14°36'00"W.	273.84
5-69	S.69°33'00"W.	340.47
5-70	N.49°44'00"W.	162.48
5-71	N.72°48'00"E.	263.80
5-72	N. 5°42'00"W.	826.08
5-73	N.35°18'00"W.	344.33
5-74	S.50°36'00"W.	253.65
5-75	S.10°13'00"W.	236.76
5-76	N.75°12'00"W.	144.81
5-77	N.28°34'00"E.	192.42
5-78	N.28°44'00"W.	247.49
5-79	N. 6°12'00"W.	213.24
5-80	N.17°46'00"E.	429.47
5-81	N.71°14'00"W.	267.22
5-82	N. 4°15'00"W.	404.12
5-83	N.38°06'00"E.	194.45
5-84	N.51°23'00"W.	241.91
5-85	S.85°44'00"W.	188.52
5-86	N. 9°22'00"W.	98.31
5-87	N.56°54'00"E.	318.69
5-88	N.21°09'00"E.	293.79
5-89	S.87°50'00"W.	158.11
5-90	N.20°33'00"W.	170.88
5-91	S.86°52'00"E.	128.19
5-92	N.29°34'00"E.	196.60
5-93	S.50°19'00"E.	252.11
5-94	N.40°39'00"E.	242.53
5-95	S.55°54'00"E.	231.87
5-96	S.21°07'00"W.	216.54
5-97	S.85°39'00"E.	276.80
5-98	S.17°52'00"E.	567.34
5-99	S.55°32'00"E.	247.42
5-100	S.13°03'00"E.	239.18
5-101	S.42°06'00"E.	240.02
5-102	S.84°35'00"E.	27.43
5-103	S.84°35'00"E.	268.90
5-104	N.37°20'00"W.	392.40
5-105	N. 7°48'15"E.	257.32
5-106	N.41°15'00"W.	48.86
5-107	N.41°15'00"W.	265.06
5-108	N.23°36'00"E.	319.74
5-109	N.77°17'00"W.	231.68
5-110	N.32°37'45"E.	300.42
5-111	N.15°40'00"W.	185.32
8-1		

THIS MAP CORRECTLY REPRESENTS TOPOGRAPHY SHOWN ON PHOTOGRAMMETRIC MAPS COMPILED BY FAIRCHILD AERIAL SURVEYS INC., R.M. TOWILL INC. AND TELEDYNE GEOTRONICS AND SURVEYS MADE BY ME, OR UNDER MY DIRECTION WHILE EMPLOYED BY THE TURLOCK IRRIGATION DISTRICT AND MODESTO IRRIGATION DISTRICT.

JOHN B. DUFF
L.S. 2244, CALIFORNIA

THIS MAP IS FILED IN COMPLIANCE WITH ARTICLE 35 OF THE LICENSE FOR FEDERAL POWER COMMISSION PROJECT NO. 2299 SUBMITTED BY THE UNDERSIGNED THIS 30 TH. DAY OF AUGUST 1974.

TURLOCK IRRIGATION DISTRICT
BY: Richard Clauss
H. RICHARD CLAUSS, PRESIDENT

MODESTO IRRIGATION DISTRICT
BY: R E Penney
RICHARD E. PENNEY, PRESIDENT

LEGEND

- PROJECT BOUNDARY
- FOUND CORNER
- FOUND CORNER, SET PIPE
- PROPORTIONED CORNER, SET PIPE
- MONUMENT SET ON PROJECT BOUNDARY
- PRIMARY HORIZONTAL CONTROL STATION

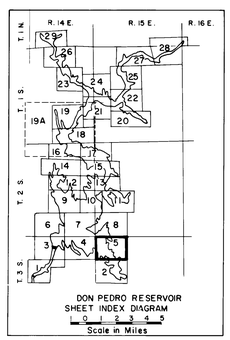
Scale: 1" = 400'

400 0 400 800 1200 1600 2000

Contour Interval 10 Feet
Datum is Mean Sea Level

COORDINATES, BEARINGS AND DISTANCES ARE BASED ON THE CALIFORNIA STATE COORDINATE SYSTEM, ZONE 3

0° 05' 31" 17°
TRUE NORTH
MAGNETIC
N
LONG. 120° 02' 00" W



DON PEDRO RESERVOIR
SHEET INDEX DIAGRAM
0 1 2 3 4 5
Scale in Miles

EXHIBIT K SHEET 5

PROJECT NO. 2299 CALIFORNIA

TURLOCK IRRIGATION DISTRICT
MODESTO IRRIGATION DISTRICT

DON PEDRO PROJECT

DON PEDRO RESERVOIR

TOPOGRAPHY, PROPERTY & PROJECT BOUNDARY

2299-89

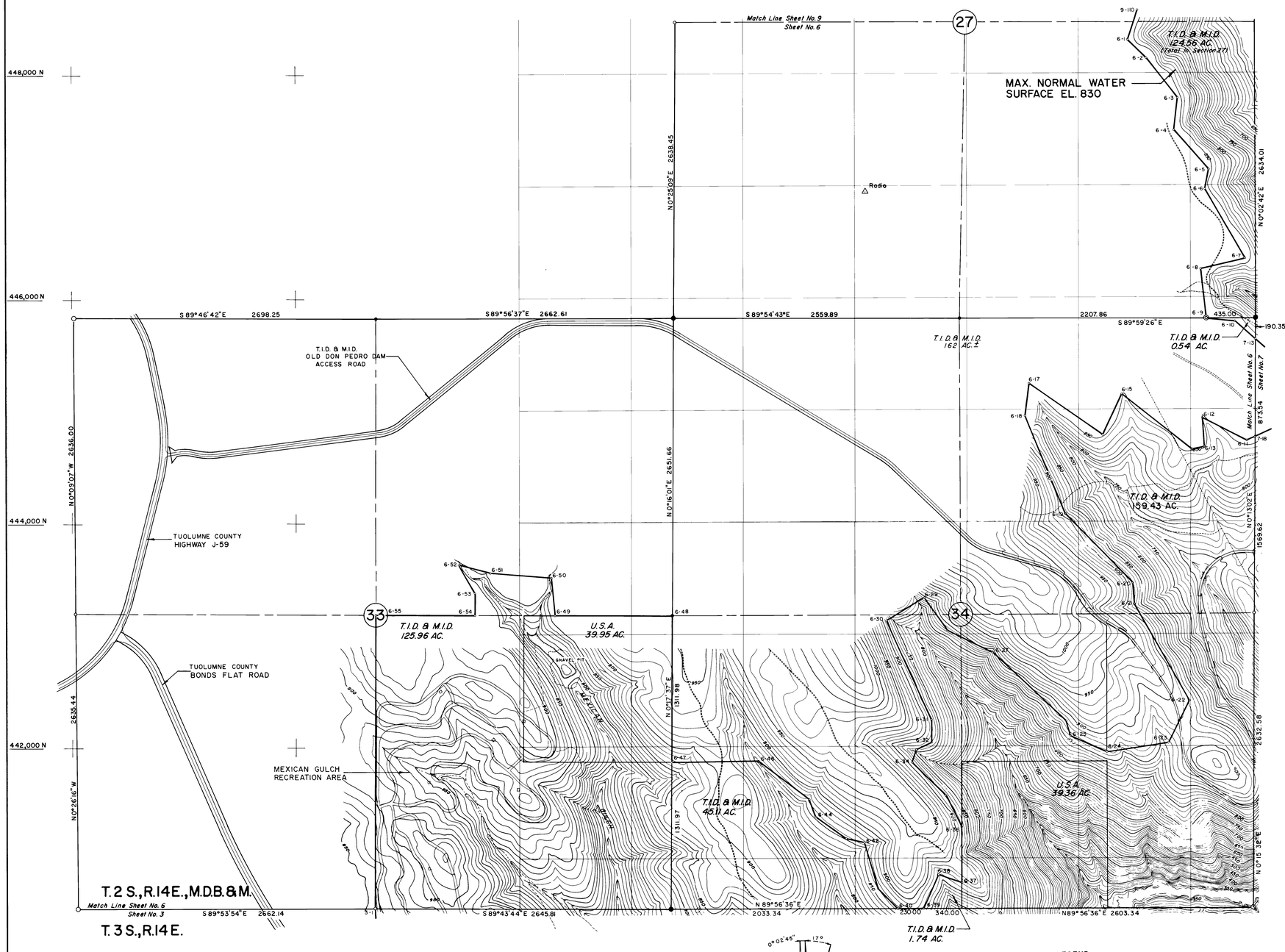
TRUE LINE

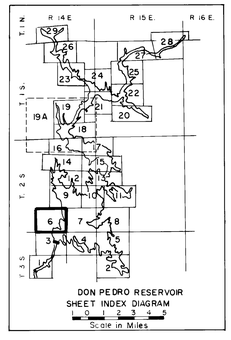
5

2299-89

PROJECT BOUNDARY TRAVERSE

NO.	BEARING	DIST.	NO.	BEARING	DIST.
9-110	S.18°54'00"W.	274.81	6-28	N.35°12'00"W.	357.35
6-1	S.45°21'00"E.	236.18	6-29	S.58°41'00"W.	394.45
6-2	S.38°28'00"E.	446.97	6-30	S.24°29'00"E.	972.44
6-3	S. 5°51'00"W.	294.53	6-31	S. 0°17'00"W.	201.00
6-4	S.41°19'00"E.	472.62	6-32	S.65°39'00"W.	150.37
6-5	S.11°26'00"W.	176.50	6-33	S.16°39'00"W.	122.12
6-6	S.30°09'00"E.	714.71	6-34	S.46°04'00"E.	420.21
6-7	S.76°36'00"W.	410.15	6-35	S.25°52'00"E.	312.37
6-8	S. 6°44'00"E.	440.90	6-36	S. 0°11'31"E.	504.00
6-9	S.83°59'00"E.	249.68	6-37	N.69°35'00"W.	219.47
6-10	S.48°33'00"E.	248.12	6-38	S.23°31'00"W.	334.70
7-13			6-39	S.89°56'36"W.	230.00
7-18	S.65°28'00"W.	79.81	6-40	N.44°34'00"W.	248.61
6-11	N.62°38'00"W.	443.68	6-41	N.17°27'00"W.	440.25
6-12	S. 3°34'00"E.	257.50	6-42	N.79°27'00"W.	163.77
6-13	S.78°23'00"W.	109.24	6-43	N.53°53'00"W.	334.23
6-14	N.51°39'00"W.	805.87	6-44	N.20°17'00"W.	167.37
6-15	S.25°02'00"W.	403.98	6-45	N.53°16'00"W.	570.20
6-16	N.54°52'00"W.	800.97	6-46	S.89°05'58"W.	774.24
6-17	S. 6°49'00"W.	295.08	6-47	N. 0°17'37"E.	1311.98
6-18	S.22°22'00"E.	946.16	6-48	N.89°41'32"W.	1050.00
6-19	S.44°21'00"E.	862.73	6-49	N. 5°22'00"W.	338.06
6-20	S. 3°26'00"E.	183.33	6-50	N.85°16'45"W.	546.88
6-21	S.29°40'00"E.	1000.00	6-51	N.75°16'00"W.	294.65
6-22	S.26°53'11"W.	418.32	6-52	S.29°58'00"E.	294.31
6-23	S.81°30'00"W.	554.05	6-53	SOUTH	197.72
6-24	N.66°55'00"W.	354.33	6-54	N.89°41'32"W.	890.19
6-25	N.16°10'00"W.	143.68	6-55	S. 0°05'51"W.	2625.67
6-26	N.47°07'00"W.	896.52	3-1		
6-27	N.64°07'00"W.	453.51			
6-28					





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JOHN B. DUFF
L.S. 2244, CALIFORNIA

THIS MAP IS FILED IN COMPLIANCE WITH ARTICLE 35 OF THE LICENSE FOR FEDERAL POWER COMMISSION PROJECT NO. 2299
SUBMITTED BY THE UNDERSIGNED
THIS 30 TH. DAY OF AUGUST 1974.

TURLOCK IRRIGATION DISTRICT
BY: H. RICHARD CLAUSS, PRESIDENT

MODESTO IRRIGATION DISTRICT
BY: RICHARD E. PENNEY, PRESIDENT

0°02'45" 17°
TRUE GRID MAGNETIC
N
LONG. 120°52'30" W.

LEGEND

- PROJECT BOUNDARY
- FOUND CORNER
- FOUND CORNER, SET PIPE
- PROPORTIONED CORNER, SET PIPE
- MONUMENT SET ON PROJECT BOUNDARY
- PRIMARY HORIZONTAL CONTROL STATION

Scale: 1" = 400'

400 0 400 800 1200 1600 2000

Contour Interval 10 Feet
Datum is Mean Sea Level

COORDINATES, BEARINGS AND DISTANCES ARE BASED ON THE CALIFORNIA STATE COORDINATE SYSTEM, ZONE 3

EXHIBIT K SHEET 6

PROJECT NO. 2299 CALIFORNIA

TURLOCK IRRIGATION DISTRICT
MODESTO IRRIGATION DISTRICT

DON PEDRO PROJECT

DON PEDRO RESERVOIR

TOPOGRAPHY, PROPERTY & PROJECT BOUNDARY

2299-90

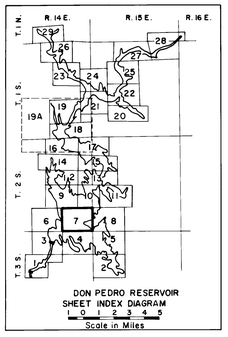
TRUE LINE

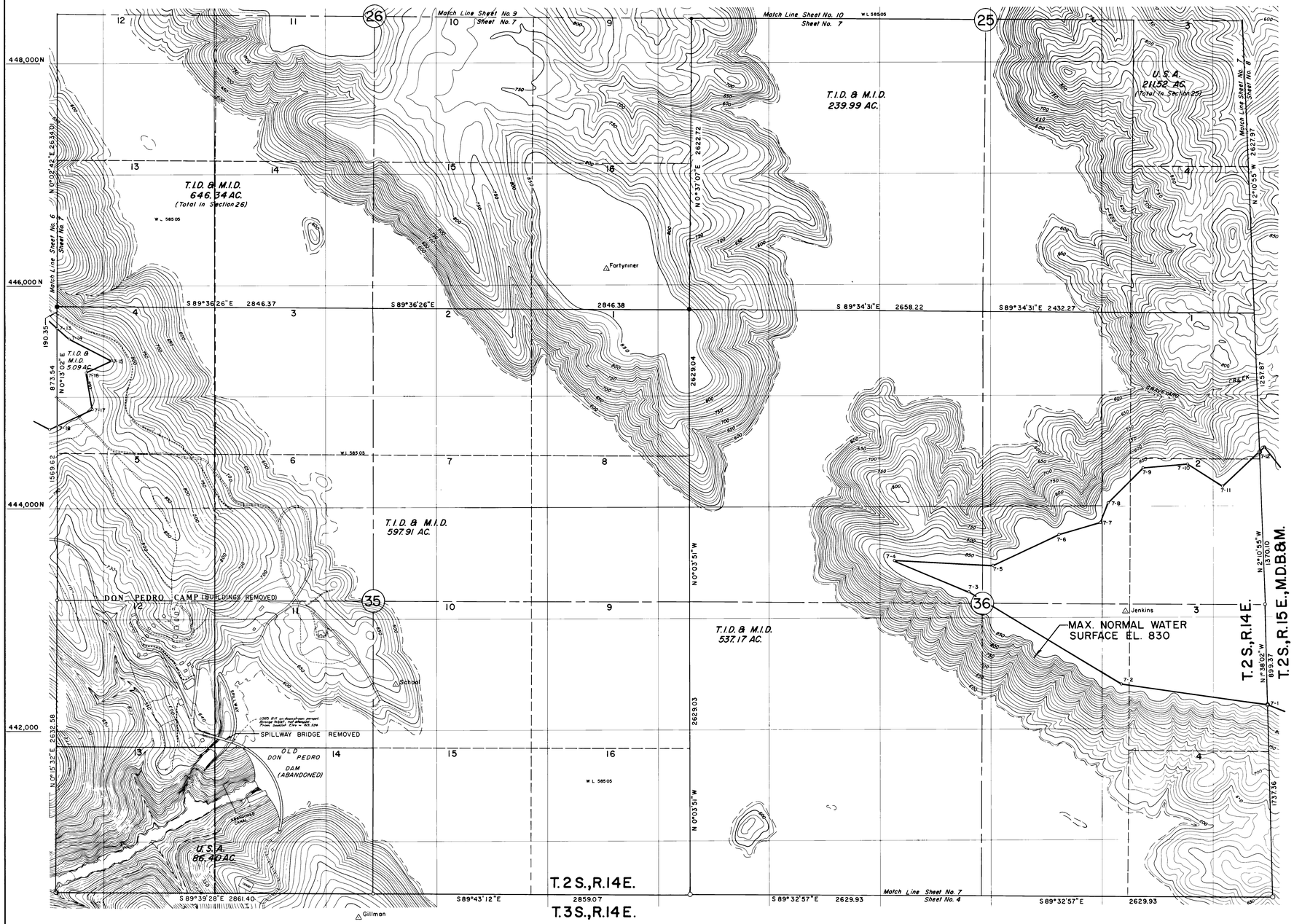
2299-90

6

PROJECT BOUNDARY TRAVERSE

NO.	BEARING	DIST.	NO.	BEARING	DIST.
7-1	N.81°39'00"W.	1333.51	7-7		
7-2	N.58°54'00"W.	1601.12	7-8	N.21°01'00"E.	189.61
7-3	N.67°29'00"W.	728.54	7-9	N.45°22'00"E.	446.90
7-4	S.86°59'00"E.	892.24	7-10	N.85°07'00"E.	399.45
7-5	N.64°48'00"E.	655.35	7-11	S.57°37'00"E.	375.35
7-6	N.74°17'00"E.	387.50	7-12	N.46°49'00"E.	449.23
7-7			7-13	S.48°33'00"E.	140.12
			7-14	S.61°44'00"E.	434.89
			7-15	S.66°18'00"W.	251.20
			7-16	S. 9°40'00"E.	333.73
			7-17	S.65°28'00"W.	348.89





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JOHN B. DUFF
L.S. 2244, CALIFORNIA

THIS MAP IS FILED IN COMPLIANCE WITH ARTICLE 35 OF THE LICENSE FOR FEDERAL POWER COMMISSION PROJECT NO. 2299 SUBMITTED BY THE UNDERSIGNED THIS 30 TH. DAY OF AUGUST 1974.

TURLOCK IRRIGATION DISTRICT
BY: Richard Clauss
H. RICHARD CLAUSS, PRESIDENT

MODESTO IRRIGATION DISTRICT
BY: R E Penney
RICHARD E. PENNEY, PRESIDENT

LEGEND

- PROJECT BOUNDARY
- FOUND CORNER
- FOUND CORNER, SET PIPE
- PROPORTIONED CORNER, SET PIPE
- MONUMENT SET ON PROJECT BOUNDARY
- PRIMARY HORIZONTAL CONTROL STATION

Scale: 1"=400'
400 0 400 800 1200 1600 2000

Contour Interval 10 Feet
Datum is Mean Sea Level

COORDINATES, BEARINGS AND DISTANCES ARE BASED ON THE CALIFORNIA STATE COORDINATE SYSTEM, ZONE 3

EXHIBIT K SHEET 7

PROJECT NO. 2299 CALIFORNIA

TURLOCK IRRIGATION DISTRICT
MODESTO IRRIGATION DISTRICT

DON PEDRO PROJECT

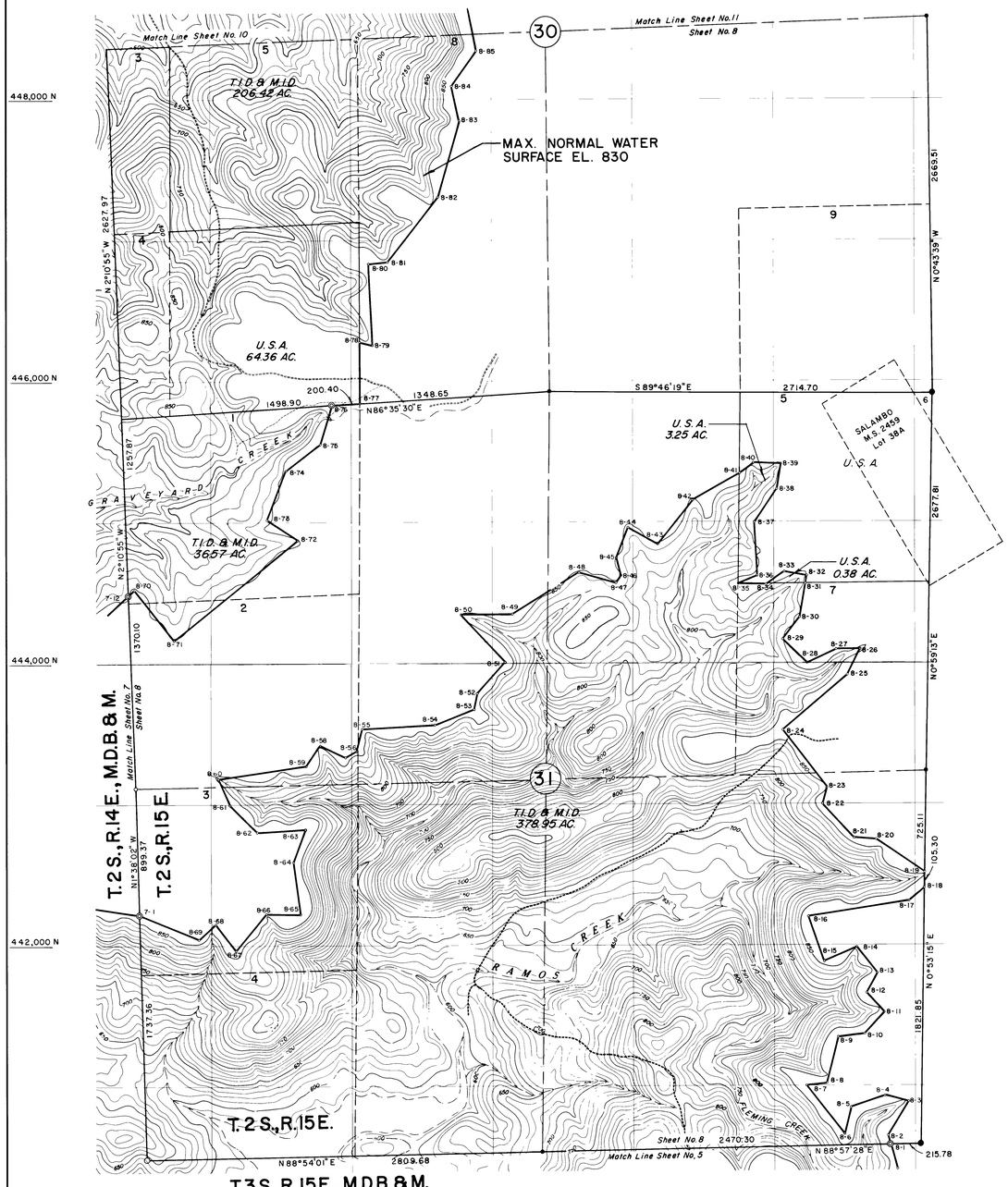
DON PEDRO RESERVOIR

TOPOGRAPHY, PROPERTY & PROJECT BOUNDARY

2299-91

TBM LINE

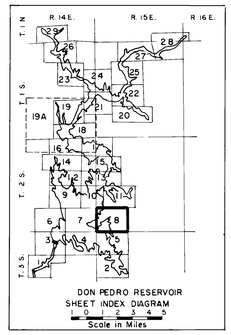
2299 — 91



△ Solambo

PROJECT BOUNDARY TRAVERSE

NO.	BEARING	DIST.	NO.	BEARING	DIST.
8-1	N.15°40'00"W.	70.17	8-44	S.21°02'00"W.	222.85
8-2	N.32°16'00"E.	279.10	8-45	S.12°58'00"E.	129.29
8-3	N.74°36'00"W.	173.22	8-46	S.35°44'00"W.	70.21
8-4	S.70°08'00"W.	253.06	8-47	N.73°39'00"W.	269.92
8-5	S.14°49'00"W.	195.50	8-48	S.58°06'00"W.	561.91
8-6	N.37°52'00"W.	438.27	8-49	N.89°32'00"W.	365.01
8-7	N.82°35'00"E.	147.23	8-50	S.42°43'00"E.	459.99
8-8	N.13°52'00"E.	333.73	8-51	S.41°43'00"W.	296.06
8-9	N.82°26'00"E.	189.65	8-52	S.11°07'00"W.	114.14
8-10	N.41°16'00"E.	206.21	8-53	S.68°23'00"W.	301.20
8-11	N.41°56'00"W.	185.53	8-54	S.86°27'00"W.	516.99
8-12	N.28°47'00"E.	162.01	8-55	S.14°59'00"W.	162.52
8-13	N.39°03'00"W.	231.77	8-56	S.61°17'00"W.	83.24
8-14	S.67°06'00"W.	251.85	8-57	N.64°28'00"W.	199.49
8-15	N.19°49'00"W.	339.10	8-58	S.34°33'00"W.	183.35
8-16	N.80°56'00"E.	716.96	8-59	S.81°59'30"W.	632.16
8-17	N.53°29'00"E.	147.92	8-60	S.23°19'00"E.	204.71
8-18	N. 0°53'15"E.	105.30	8-61	S.46°02'00"E.	273.68
8-19	N.54°29'00"W.	419.59	8-62	N.87°10'00"E.	343.42
8-20	N.87°06'00"W.	158.20	8-63	S.21°30'00"W.	248.28
8-21	N.43°08'00"W.	324.74	8-64	S. 8°01'00"E.	372.65
8-22	N.14°35'00"E.	127.08	8-65	N.89°02'00"W.	238.03
8-23	N.37°58'00"W.	513.69	8-66	S.39°20'00"W.	336.11
8-24	N.49°45'00"E.	606.69	8-67	N.38°55'00"W.	240.35
8-25	N.25°26'00"E.	204.86	8-68	S.47°31'00"W.	161.38
8-26	S.88°19'00"W.	170.07	8-69	N.67°55'15"W.	452.80
8-27	S.64°59'00"W.	231.74	7-1		
8-28	N.45°20'00"W.	241.83	7-12	N.46°49'00"E.	65.09
8-29	N.37°50'30"E.	198.82	8-70	S.37°33'00"E.	457.83
8-30	N. 9°56'00"E.	242.10	8-71	N.51°15'00"E.	1129.61
8-31	N. 9°56'00"E.	59.42	8-72	N.57°20'00"W.	264.91
8-32	N.81°28'00"W.	161.80	8-73	N.21°50'00"E.	379.19
8-33	S.56°55'00"W.	155.62	8-74	N.52°39'00"E.	308.21
8-34	S.89°30'30"W.	196.00	8-75	N.15°47'00"E.	286.30
8-35	N.67°15'00"E.	148.97	8-76	N.86°35'30"E.	200.40
8-36	N. 3°28'00"W.	379.70	8-77	N. 0°14'36"W.	437.00
8-37	N.33°38'00"E.	287.06	8-78	S.77°05'00"E.	95.00
8-38	N. 9°08'00"E.	176.24	8-79	N. 2°20'00"W.	580.40
8-39	N.87°01'45"W.	192.27	8-80	N.85°40'00"E.	132.38
8-40	S.55°45'00"W.	118.93	8-81	N.37°55'00"E.	584.30
8-41	S.60°19'00"W.	382.08	8-82	N.16°06'00"E.	566.20
8-42	S.38°04'00"W.	405.02	8-83	N.13°12'00"W.	249.60
8-43	N.61°21'00"W.	233.60	8-84	N.35°38'00"E.	303.87
8-44			8-85		



THIS MAP CORRECTLY REPRESENTS TOPOGRAPHY SHOWN ON PHOTOGRAMMETRIC MAPS COMPILED BY FAIRCHILD AERIAL SURVEYS INC., R.M. TOWILL INC. AND TELEDYNE GEOTRONICS AND SURVEYS MADE BY ME, OR UNDER MY DIRECTION WHILE EMPLOYED BY THE TURLOCK IRRIGATION DISTRICT AND MODESTO IRRIGATION DISTRICT.

JOHN B. DUFF
L.S. 2244, CALIFORNIA

THIS MAP IS FILED IN COMPLIANCE WITH ARTICLE 35 OF THE LICENSE FOR FEDERAL POWER COMMISSION PROJECT NO. 2299 SUBMITTED BY THE UNDERSIGNED THIS 30TH. DAY OF AUGUST 1974.

TURLOCK IRRIGATION DISTRICT
BY: Richard Clauss
H. RICHARD CLAUSS, PRESIDENT

MODESTO IRRIGATION DISTRICT
BY: R E Penney
RICHARD E. PENNEY, PRESIDENT

0°05'31" 17°
TRUE GRID MAGNETIC
LONG CHORD N 0°00'12" W

LEGEND

- PROJECT BOUNDARY
- FOUND CORNER
- FOUND CORNER, SET PIPE
- PROPORTIONED CORNER, SET PIPE
- MONUMENT SET ON PROJECT BOUNDARY
- △ PRIMARY HORIZONTAL CONTROL STATION

Scale: 1" = 400'

400 0 400 800 1200 1600 2000

Contour Interval 10 Feet
Datum is Mean Sea Level

COORDINATES, BEARINGS AND DISTANCES ARE BASED ON THE CALIFORNIA STATE COORDINATE SYSTEM, ZONE 3

EXHIBIT K SHEET 8

PROJECT NO. 2299 CALIFORNIA

TURLOCK IRRIGATION DISTRICT
MODESTO IRRIGATION DISTRICT

DON PEDRO PROJECT

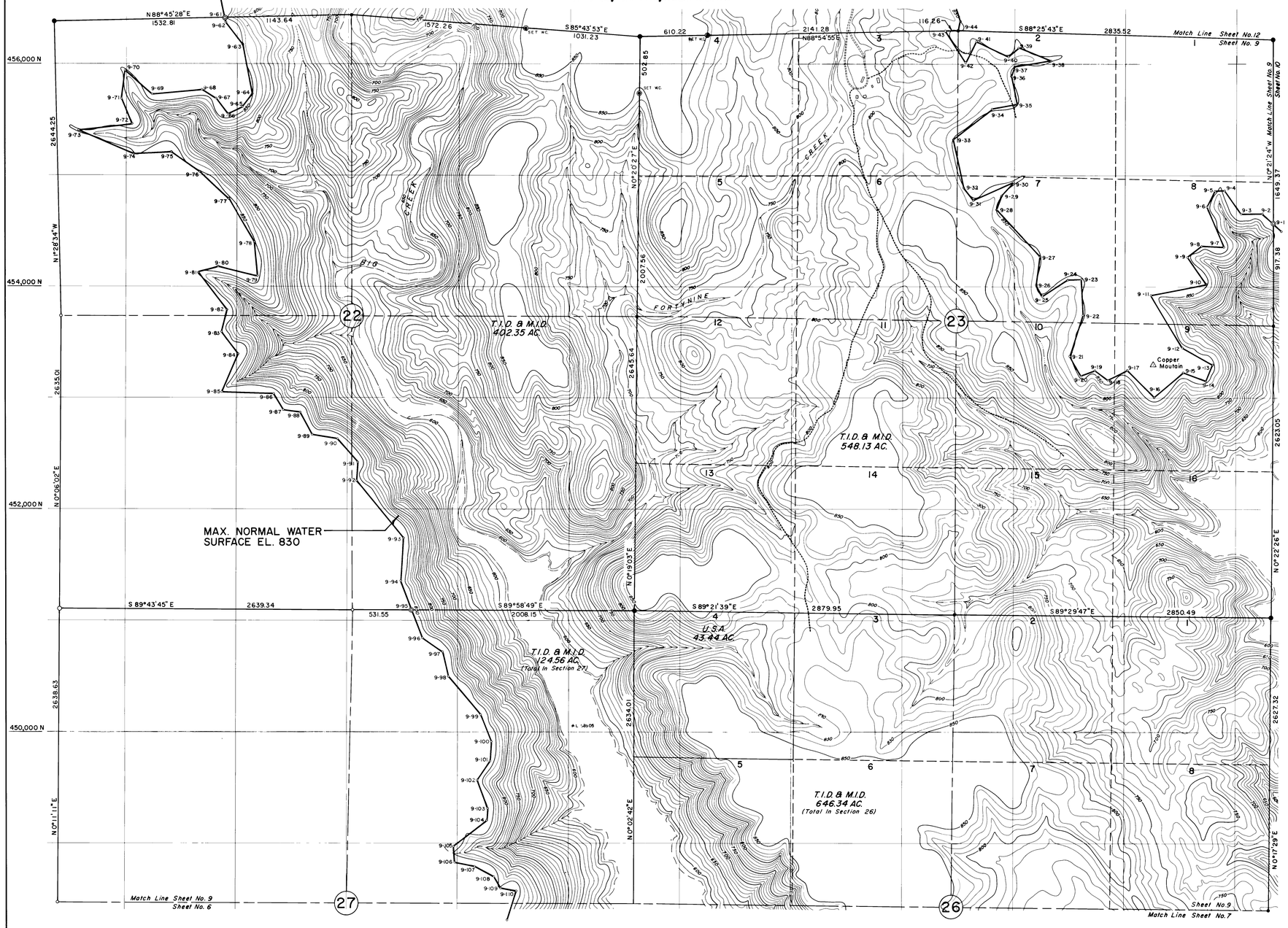
DON PEDRO RESERVOIR

TOPOGRAPHY, PROPERTY & PROJECT BOUNDARY

2299-92

2299-92

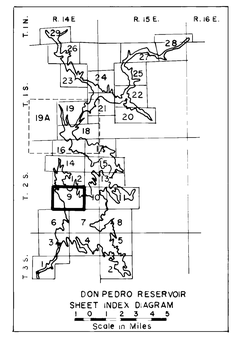
T. 2 S., R. 14 E., M.D.B.&M.



PROJECT BOUNDARY TRAVERSE

NO.	BEARING	DIST.
9-1		
9-2	N.47°37'00"W.	134.60
9-3	S.88°47'00"W.	188.04
9-4	N.35°59'00"W.	257.03
9-5	N.86°11'00"W.	90.20
9-6	S.26°06'00"W.	165.92
9-7	S.22°57'00"E.	397.47
9-8	N.86°15'00"W.	198.43
9-9	S.52°39'00"W.	164.81
9-10	S.34°39'00"E.	299.03
9-11	S.79°11'00"W.	506.00
9-12	S.31°01'00"E.	553.08
9-13	S.60°49'00"E.	313.82
9-14	S.23°40'00"W.	159.41
9-15	N.69°38'00"W.	215.47
9-16	S.48°45'00"W.	345.81
9-17	N.44°53'00"W.	344.36
9-18	S.62°54'00"W.	193.20
9-19	N.52°54'00"W.	149.20
9-20	S.66°51'00"W.	134.85
9-21	N.29°29'00"W.	211.36
9-22	N.18°04'00"E.	387.07
9-23	N. 3°23'00"W.	322.56
9-24	S.86°17'00"W.	123.26
9-25	S.56°29'00"W.	273.47
9-26	N.29°26'00"W.	115.97
9-27	N. 7°46'00"E.	261.35
9-28	N.42°54'00"W.	578.80
9-29	N.20°53'00"E.	140.22
9-30	N.42°09'00"E.	156.46
9-31	S.65°35'00"W.	394.27
9-32	N.38°11'00"W.	148.84
9-33	N.12°22'00"W.	439.18
9-34	N.52°09'00"E.	443.27
9-35	N.78°38'00"E.	228.48
9-36	N.12°14'00"W.	254.79
9-37	N.21°13'00"E.	91.18
9-38	N.80°29'00"E.	333.40
9-39	N.68°52'00"W.	316.26
9-40	S.48°24'00"W.	119.00
9-41	N.65°27'00"W.	317.72
9-42	S.27°18'00"W.	211.55
9-43	N.32°58'00"W.	341.01
9-44	N.88°54'55"E.	116.26
9-45		
9-46	NOT USED	
9-47		
9-48		
9-49		
9-50		
9-51		
9-52		
9-53		
9-54		
9-55		

NO.	BEARING	DIST.
9-56		
9-57	NOT USED	
9-58		
9-59		
9-60		
9-61	S.12°08'00"E.	38.92
9-62	S.38°21'00"E.	256.28
9-63	S.10°53'00"E.	445.00
9-64	S.35°05'00"W.	147.87
9-65	S.64°17'00"W.	149.83
9-66	N.35°55'00"W.	179.03
9-67	N.59°34'00"W.	146.12
9-68	S.84°55'00"W.	450.78
9-69	N.48°52'00"W.	325.30
9-70	S. 7°24'00"W.	256.14
9-71	S.21°40'00"E.	251.80
9-72	S.83°36'00"W.	485.02
9-73	S.67°28'00"E.	540.23
9-74	N.87°49'00"E.	341.25
9-75	S.54°50'00"E.	310.74
9-76	S.48°12'00"E.	354.11
9-77	S.29°58'00"E.	460.54
9-78	S. 6°00'00"E.	296.62
9-79	N.77°05'00"W.	362.17
9-80	S.73°13'00"W.	186.97
9-81	S.37°48'00"E.	422.65
9-82	S.13°54'00"W.	203.97
9-83	S.36°55'00"E.	251.40
9-84	S.23°20'00"W.	373.57
9-85	S.87°47'00"E.	464.35
9-86	S.31°34'00"E.	164.30
9-87	S.82°14'00"E.	155.43
9-88	S.28°53'00"E.	231.85
9-89	S.81°02'00"E.	230.82
9-90	S.41°56'00"E.	278.29
9-91	S. 4°04'00"W.	169.43
9-92	S.39°26'00"E.	664.27
9-93	S. 4°08'00"W.	389.01
9-94	S.21°16'00"E.	261.84
9-95	S. 2°18'00"W.	174.14
9-96	S.35°08'00"W.	210.30
9-97	S.20°50'00"E.	272.83
9-98	S. 5°12'00"W.	110.45
9-99	S.53°06'00"W.	371.40
9-100	S. 3°52'00"E.	148.34
9-101	S.76°38'00"E.	186.04
9-102	S.62°38'00"E.	191.43
9-103	S.32°24'00"E.	123.17
9-104	S.79°00'00"E.	146.70
9-105		
9-106		
9-107		
9-108		
9-109		
9-110		



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JOHN B. DUFF
L.S. 2244, CALIFORNIA

THIS MAP IS FILED IN COMPLIANCE WITH ARTICLE 35 OF THE LICENSE FOR FEDERAL POWER COMMISSION PROJECT NO. 2299 SUBMITTED BY THE UNDERSIGNED THIS 30 TH. DAY OF AUGUST 1974.

TURLOCK IRRIGATION DISTRICT
BY: H. RICHARD CLAUSS, PRESIDENT

MODESTO IRRIGATION DISTRICT
BY: RICHARD E. PENNEY, PRESIDENT

LEGEND

- PROJECT BOUNDARY
- FOUND CORNER
- FOUND CORNER, SET PIPE
- PROPORTIONED CORNER, SET PIPE
- MONUMENT SET ON PROJECT BOUNDARY
- PRIMARY HORIZONTAL CONTROL STATION

Scale: 1" = 400'

400 0 400 800 1200 1600 2000

Contour interval 10 Feet

Datum is Mean Sea Level

COORDINATES, BEARINGS AND DISTANCES ARE BASED ON THE CALIFORNIA STATE COORDINATE SYSTEM, ZONE 3

EXHIBIT K SHEET 9

PROJECT NO. 2299 CALIFORNIA

TURLOCK IRRIGATION DISTRICT
MODESTO IRRIGATION DISTRICT

DON PEDRO PROJECT

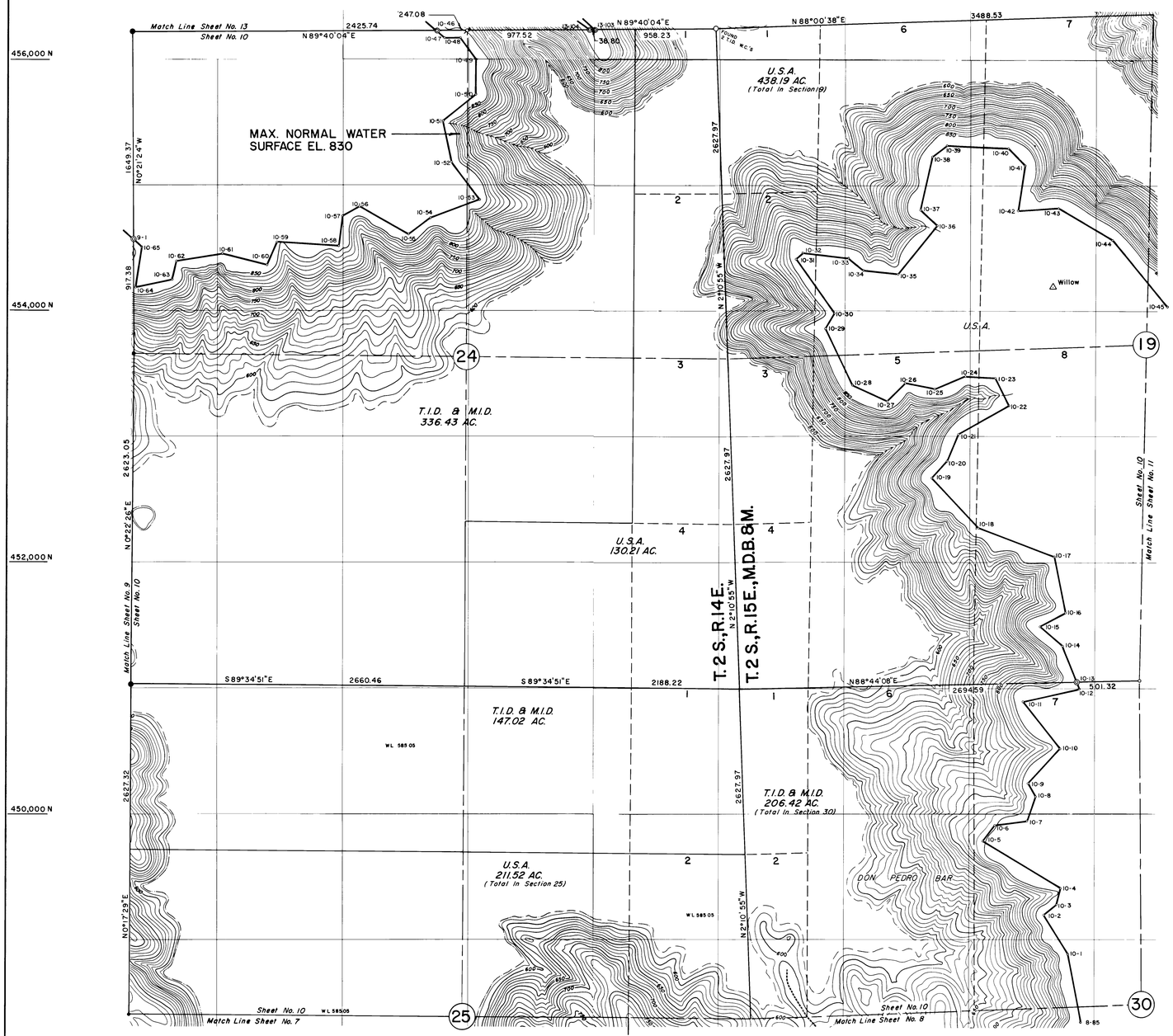
DON PEDRO RESERVOIR

TOPOGRAPHY, PROPERTY & PROJECT BOUNDARY

2299-93

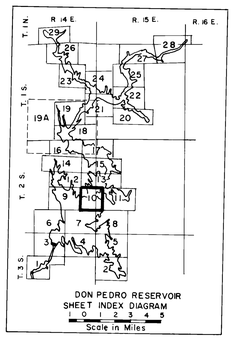
TAN LINE

2299-93



PROJECT BOUNDARY TRAVERSE

NO.	BEARING	DIST.	NO.	BEARING	DIST.
8-85	N.10°59'00"W.	551.10	10-33	S.51°44'00"E.	156.65
10-1	N.31°19'00"W.	367.53	10-34	S.83°11'00"E.	269.90
10-2	N.51°20'00"E.	128.06	10-35	N.39°04'00"E.	499.77
10-3	N.13°56'00"E.	132.91	10-36	N.47°41'00"W.	181.22
10-4	N.58°16'00"W.	724.30	10-37	N.12°17'00"E.	427.79
10-5	N.36°15'00"E.	148.81	10-38	N.50°32'00"E.	154.16
10-6	N.82°13'00"E.	258.38	10-39	S.87°12'00"E.	491.59
10-7	N.20°33'00"E.	205.06	10-40	S.43°44'00"E.	192.38
10-8	N.27°11'00"W.	124.78	10-41	S. 8°51'00"W.	364.33
10-9	N.42°43'00"E.	372.94	10-42	N.85°39'00"E.	329.95
10-10	N.38°31'00"W.	475.39	10-43	S.58°55'00"E.	499.75
10-11	N.76°41'00"E.	460.37	10-44	S.39°24'00"E.	688.47
10-12	N.21°25'00"W.	59.07	10-45		
10-13	N.21°25'00"W.	310.00	10-46	S.50°02'00"E.	83.00
10-14	N.50°07'00"W.	236.26	10-47	N.87°51'00"E.	123.65
10-15	N.60°39'00"E.	230.59	10-48	S.34°57'00"E.	226.93
10-16	N.11°02'00"W.	444.21	10-49	S. 1°50'00"W.	280.14
10-17	N.69°07'00"W.	650.76	10-50	S.51°19'00"W.	327.96
10-18	N.43°13'00"W.	547.56	10-51	S.11°35'00"E.	333.79
10-19	N.42°46'00"E.	181.16	10-52	S.37°22'22"E.	372.41
10-20	N.23°12'00"E.	228.47	10-53	S.69°01'00"W.	418.79
10-21	N.60°24'00"E.	465.75	10-54	S.53°30'00"W.	220.20
10-22	N.26°21'00"W.	247.76	10-55	N.60°08'00"W.	449.75
10-23	N.87°37'00"W.	240.21	10-56	S.61°27'00"W.	154.83
10-24	S.67°38'00"W.	262.77	10-57	S. 6°41'00"W.	240.63
10-25	N.78°36'00"W.	242.79	10-58	N.86°45'00"W.	494.79
10-26	S.45°00'00"W.	200.82	10-59	S.22°40'00"W.	197.23
10-27	N.65°58'00"W.	304.41	10-60	N.75°31'00"W.	367.70
10-28	N.25°15'00"W.	506.35	10-61	S.80°38'00"W.	368.91
10-29	N.30°54'00"E.	142.17	10-62	S.13°51'00"W.	154.50
10-30	N.35°25'00"W.	531.37	10-63	S.78°23'00"W.	298.76
10-31	N.49°29'00"E.	72.35	10-64	N. 9°39'00"E.	319.62
10-32	S.83°34'00"E.	366.30	10-65	N.47°37'00"W.	98.28
10-33			9-1		



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JOHN B. DUFF
L.S. 2244, CALIFORNIA

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TURLOCK IRRIGATION DISTRICT
BY: Richard Clauss
H. RICHARD CLAUSS, PRESIDENT

MODESTO IRRIGATION DISTRICT
BY: R E Penney
RICHARD E. PENNEY, PRESIDENT

0°04'36" 17°
TRUE GRID MAGNETIC
N
LONG 120°22'30" W

LEGEND

- PROJECT BOUNDARY
- FOUND CORNER
- FOUND CORNER, SET PIPE
- PROPORTIONED CORNER, SET PIPE
- MONUMENT SET ON PROJECT BOUNDARY
- PRIMARY HORIZONTAL CONTROL STATION

Scale: 1" = 400'

400 0 400 800 1200 1600 2000

Contour interval 10 Feet
Datum is Mean Sea Level

COORDINATES, BEARINGS AND DISTANCES ARE BASED ON THE CALIFORNIA STATE COORDINATE SYSTEM, ZONE 3

EXHIBIT K SHEET 10

PROJECT NO. 2299 CALIFORNIA

TURLOCK IRRIGATION DISTRICT
MODESTO IRRIGATION DISTRICT

DON PEDRO PROJECT

DON PEDRO RESERVOIR

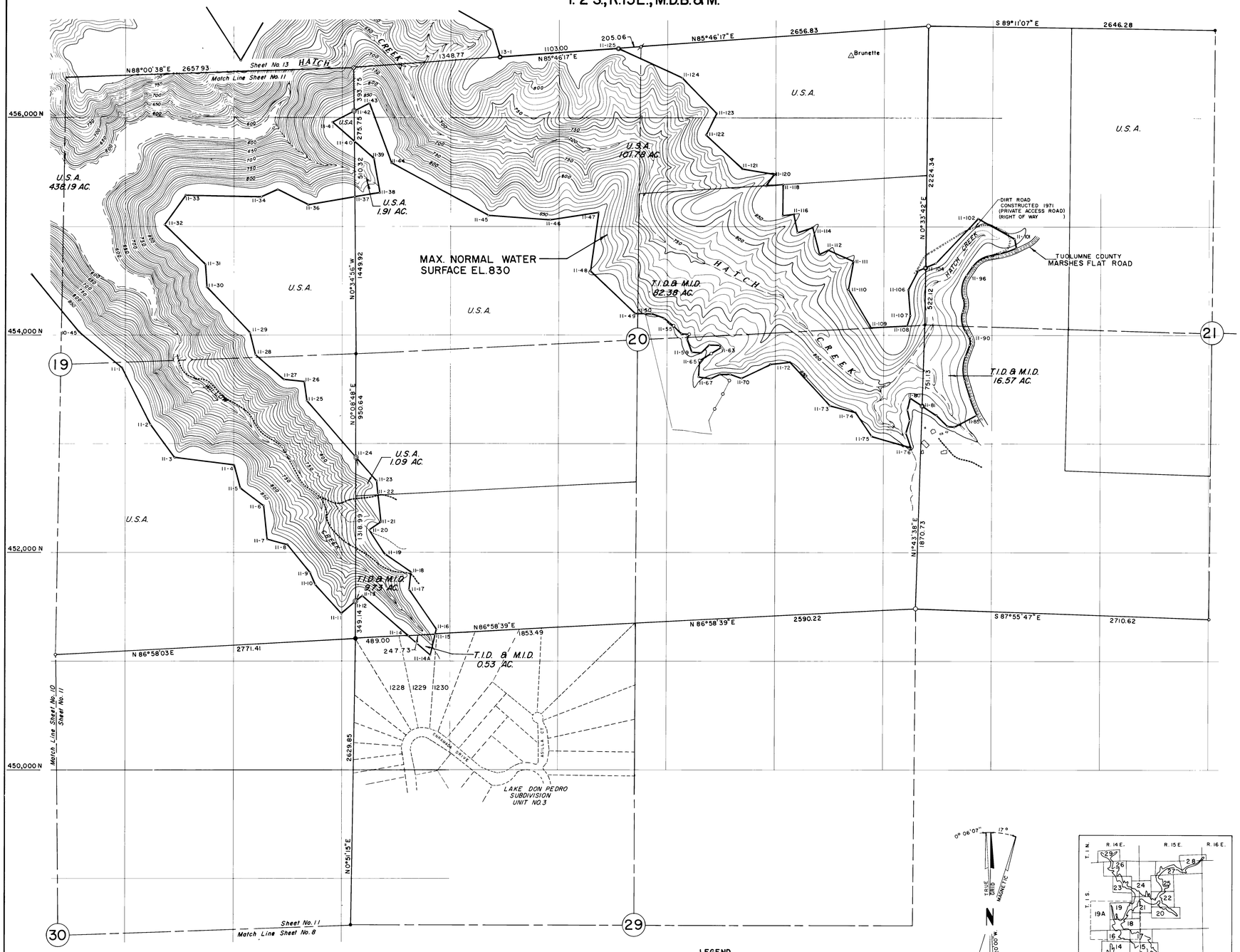
TOPOGRAPHY, PROPERTY & PROJECT BOUNDARY

2299-94

2299-94

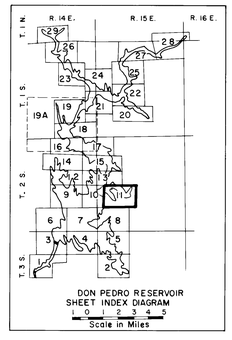
10

T. 2 S., R. 15 E., M.D.B.&M.



PROJECT BOUNDARY TRAVERSE

NO.	BEARING	DIST.	NO.	BEARING	DIST.
10-45	S.50°31'00"E.	514.33	11-69	S.68°29'00"E.	111.79
11-1	S.26°22'00"E.	592.52	11-70	N.63°31'00"E.	296.06
11-2	S.36°24'00"E.	369.01	11-71	N.84°57'00"E.	181.71
11-3	S.83°00'00"E.	558.16	11-72	S.42°52'00"E.	549.80
11-4	S.14°47'00"E.	223.39	11-73	S.75°17'00"E.	244.01
11-5	S.52°52'00"E.	268.40	11-74	S.33°27'00"E.	261.27
11-6	S. 6°01'00"E.	305.68	11-75	S.74°36'00"E.	371.74
11-7	S.73°42'00"E.	195.88	11-76	N.18°26'00"W.	136.28
11-8	S.39°39'00"E.	325.98	11-77	N.17°28'00"E.	122.36
11-9	S.22°09'00"E.	122.00	11-78	N.13°44'00"W.	99.54
11-10	S.42°24'00"E.	357.46	11-79	N.13°57'00"E.	114.43
11-11	N.49°59'00"E.	173.63	11-80	S.57°10'00"E.	131.86
11-12	N.49°59'00"E.	78.35	11-81	S.57°10'00"E.	160.14
11-13	S.48°50'00"E.	567.77	11-82	S.43°16'00"E.	145.58
11-14	S.48°50'00"E.	269.19	11-83	S.87°56'00"E.	62.26
11-14A	N.13°14'00"E.	195.45	11-84	N.64°09'35"E.	237.51
11-15	N.13°14'00"E.	44.93	11-85	NON-TANGENT CURVE Δ =10°30'45" RT. R=920.00 L=168.80 CHORD N.22°24'22"W. 168.56	
11-16	N.34°28'00"W.	448.79			
11-17	N. 8°04'00"E.	162.46			
11-18	N.55°20'00"W.	291.82	11-86	N.17°09'00"W.	179.56
11-19	N.33°06'00"W.	270.99	11-87	TANGENT CURVE Δ =36°54'00" RT. R=345.00 L=222.19	
11-20	N.57°11'00"E.	127.32			
11-21	N. 6°12'00"W.	246.11			
11-22	N. 6°12'00"W.	133.11	11-88	N.19°45'00"E.	114.17
11-23	N.41°10'00"W.	286.49	11-89	TANGENT CURVE Δ =52°00'00" LT. R=80.00 L=72.61	
11-24	N.41°10'00"W.	695.06			
11-25	N. 7°08'00"W.	177.37			
11-26	N.83°46'00"W.	184.09	11-90	N.32°15'00"W.	61.98
11-27	N.49°15'00"W.	352.40	11-91	TANGENT CURVE Δ =47°50'00" RT. R=220.00 L=183.67	
11-28	N.14°43'00"W.	204.71			
11-29	N.43°11'00"W.	577.29	11-92	N.15°35'00"E.	30.51
11-30	N. 3°15'00"W.	211.34	11-93	TANGENT CURVE Δ =32°50'00" LT. R=170.00 L=97.42	
11-31	N.46°32'00"W.	527.69			
11-32	N.35°33'00"E.	340.49			
11-33	S.88°07'00"E.	700.38	11-94	N.17°15'00"W.	8.70
11-34	N.65°12'00"E.	159.73	11-95	TANGENT CURVE Δ =52°30'00" RT. R=245.00 L=224.49	
11-35	S.64°41'00"E.	313.17			
11-36	N.80°40'00"E.	439.00	11-96	N.35°15'00"E.	91.53
11-37	N.80°40'00"E.	232.90	11-97	TANGENT CURVE Δ =42°50'00" RT. R=245.00 L=183.16	
11-38	N. 9°40'00"W.	321.57			
11-39	N.49°20'00"W.	238.64	11-98	N.78°05'00"E.	112.82
11-40	N.49°20'00"W.	267.68	11-99	TANGENT CURVE Δ =13°26'00" LT. R=680.00 L=159.43	
11-41	N.63°10'00"E.	224.41			
11-42	N.63°10'00"E.	158.86			
11-43	S.20°14'00"E.	584.04	11-100	N.16°27'00"W.	82.55
11-44	S.61°47'00"E.	1013.36	11-101	N.60°35'00"W.	386.87
11-45	S.85°55'00"E.	575.46	11-102	S.43°43'00"W.	570.07
11-46	N.81°19'00"E.	445.23	11-103	S.66°11'00"W.	97.89
11-47	S. 7°34'00"W.	546.73	11-104	S.66°11'00"W.	70.45
11-48	S.47°00'00"E.	569.16	11-105	S.26°57'00"W.	198.57
11-49	S.86°55'22"E.	30.72	11-106	S. 4°10'00"E.	233.62
11-50	S.86°55'22"E.	61.28	11-107	S.18°23'00"W.	97.14
11-51	S.86°55'22"E.	56.89	11-108	S.86°59'54"W.	331.07
11-52	S.72°22'32"E.	125.27	11-109	N.31°19'00"W.	405.57
11-53	S.54°01'35"E.	65.60	11-110	N.10°43'00"E.	263.59
11-54	S.50°43'15"E.	47.08	11-111	N.66°02'00"W.	256.07
11-55	S.42°59'34"E.	100.53	11-112	S.65°58'00"W.	90.87
11-56	S.88°28'51"E.	76.07	11-113	N.13°32'00"W.	252.00
11-57	S.20°30'09"W.	56.65	11-114	S.72°10'00"W.	150.22
11-58	S.20°39'28"E.	123.57	11-115	N.11°46'00"W.	171.61
11-59	S.84°39'12"E.	88.48	11-116	S.83°29'00"W.	103.96
11-60	N.43°09'32"E.	104.28	11-117	N. 0°30'48"E.	287.72
11-61	S.87°03'00"E.	96.89	11-118	S.86°23'02"W.	153.71
11-62	S.24°36'20"E.	22.74	11-119	N.33°18'00"E.	131.35
11-63	S.58°06'35"W.	104.28	11-120	N.81°29'00"W.	297.27
11-64	S.59°06'35"W.	124.03	11-121	N.46°47'00"W.	455.60
11-65	S. 3°22'50"W.	151.58	11-122	N.27°23'00"E.	217.36
11-66	S.83°56'00"E.	114.11	11-123	N.44°34'00"W.	458.96
11-67	N.66°51'00"E.	93.28	11-124	N.65°21'00"W.	646.65
11-68	N.88°49'00"E.	92.83	11-125		
11-69					



LEGEND

- PROJECT BOUNDARY
- FOUND CORNER
- FOUND CORNER, SET PIPE
- PROPORTIONED CORNER, SET PIPE
- MONUMENT SET ON PROJECT BOUNDARY
- PRIMARY HORIZONTAL CONTROL STATION

Scale: 1" = 400'

400 0 400 800 1200 1600 2000

Contour Interval 10 Feet

Datum is Mean Sea Level

COORDINATES, BEARINGS AND DISTANCES ARE BASED ON THE CALIFORNIA STATE COORDINATE SYSTEM, ZONE 3

THIS MAP CORRECTLY REPRESENTS TOPOGRAPHY SHOWN ON PHOTOGRAMMETRIC MAPS COMPILED BY FAIRCHILD AERIAL SURVEYS INC., R.M. TOWILL INC. AND TELEDYNE GEOTRONICS AND SURVEYS MADE BY ME, OR UNDER MY DIRECTION WHILE EMPLOYED BY THE TURLOCK IRRIGATION DISTRICT AND MODESTO IRRIGATION DISTRICT.

JOHN B. DUFF
L.S. 2244, CALIFORNIA

THIS MAP IS FILED IN COMPLIANCE WITH ARTICLE 35 OF THE LICENSE FOR FEDERAL POWER COMMISSION PROJECT NO. 2299 SUBMITTED BY THE UNDERSIGNED THIS 30 TH. DAY OF AUGUST 1974.

TURLOCK IRRIGATION DISTRICT
BY: H. RICHARD CLAUSS, PRESIDENT

MODESTO IRRIGATION DISTRICT
BY: RICHARD E. PENNEY, PRESIDENT

2,042,000 E 2,044,000 E 2,046,000 E 2,048,000 E 2,050,000 E

EXHIBIT K SHEET 11

PROJECT NO. 2299 CALIFORNIA

TURLOCK IRRIGATION DISTRICT
MODESTO IRRIGATION DISTRICT

DON PEDRO PROJECT

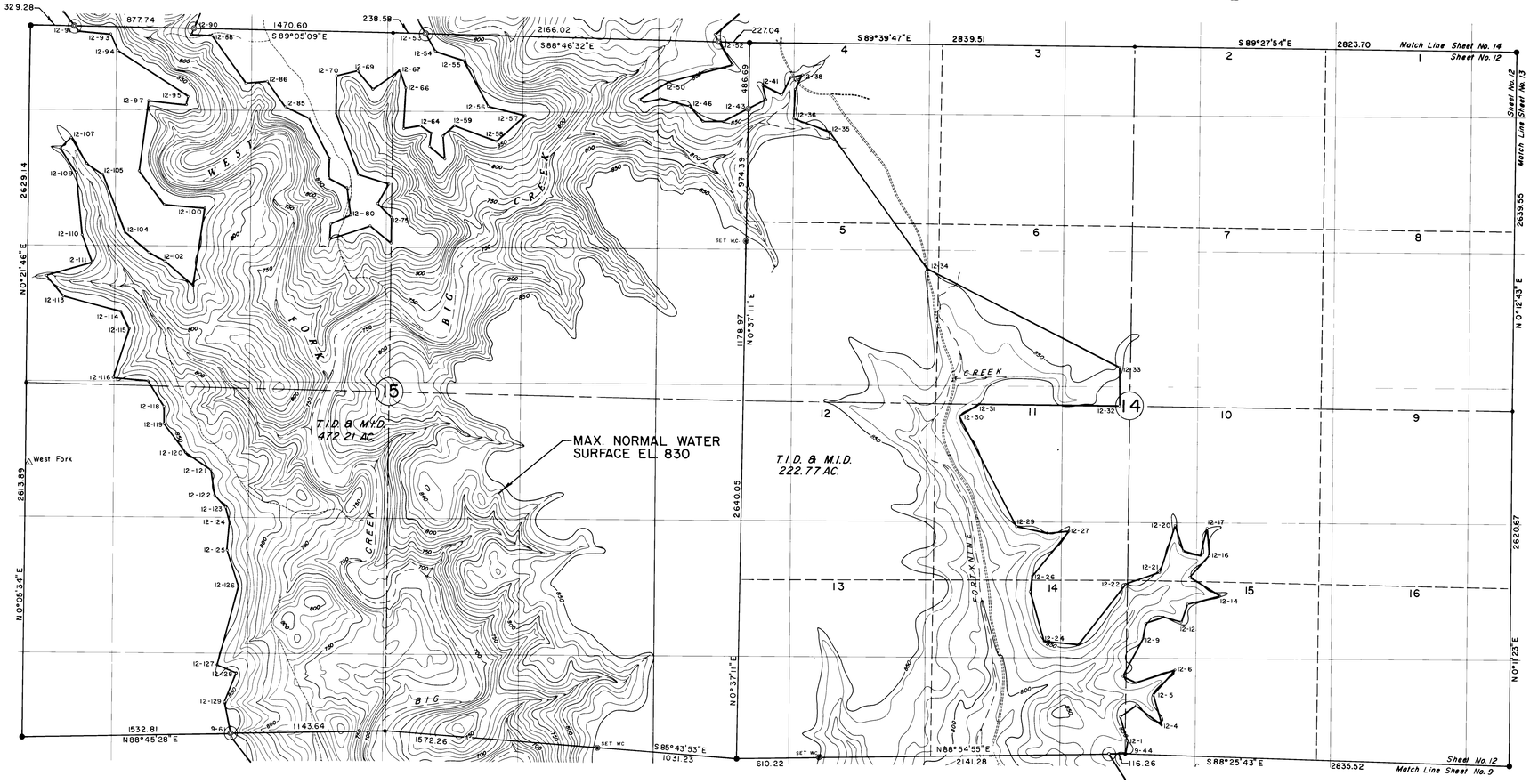
DON PEDRO RESERVOIR

TOPOGRAPHY, PROPERTY & PROJECT BOUNDARY

2299-95

2299-95

T. 2 S., R. 14 E., M.D.B. & M.



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JOHN B. DUFF
L.S. 2244, CALIFORNIA

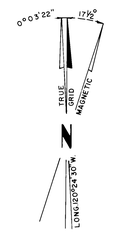
THIS MAP IS FILED IN COMPLIANCE WITH ARTICLE 35 OF THE LICENSE FOR FEDERAL POWER COMMISSION PROJECT NO. 2299 SUBMITTED BY THE UNDERSIGNED THIS 30 TH. DAY OF AUGUST 1974.

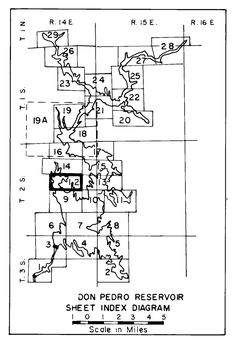
TURLOCK IRRIGATION DISTRICT
BY: Richard Clauss
H. RICHARD CLAUSS, PRESIDENT

MODESTO IRRIGATION DISTRICT
BY: R E Penney
RICHARD E. PENNEY, PRESIDENT

PROJECT BOUNDARY TRAVERSE

NO.	BEARING	DIST.
9-44		
12-1	N. 11°36'00"E.	91.76
12-2	N. 16°52'00"W.	190.00
12-3	N. 52°59'00"E.	147.80
12-4	S. 51°18'00"E.	238.32
12-5	N. 16°13'00"W.	229.12
12-6	N. 41°32'00"E.	245.81
12-7	S. 72°17'00"W.	305.50
12-8	N. 64°22'00"W.	110.92
12-9	N. 28°11'00"E.	317.65
12-10	N. 10°04'00"E.	108.67
12-11	N. 71°49'00"E.	141.04
12-12	S. 76°29'00"E.	132.67
12-13	N. 19°44'00"E.	139.18
12-14	N. 75°20'00"E.	244.98
12-15	N. 58°52'00"W.	262.85
12-16	N. 42°03'00"E.	219.49
12-17	N. 4°28'00"W.	205.62
12-18	S. 14°10'00"W.	212.46
12-19	N. 74°59'00"W.	127.35
12-20	N. 18°21'00"W.	206.50
12-21	S. 17°30'00"W.	365.92
12-22	S. 70°08'00"W.	264.77
12-23	S. 37°47'00"W.	568.07
12-24	N. 86°10'00"W.	254.57
12-25	N. 15°07'00"W.	387.40
12-26	N. 4°56'00"E.	116.43
12-26	N. 39°38'00"E.	431.10
12-27	S. 83°10'00"W.	168.19
12-28	N. 77°46'00"W.	231.25
12-29	N. 27°46'00"W.	921.01
12-30	N. 59°18'00"E.	170.11
12-31	S. 89°34'10"E.	1037.57
12-32	NORTH	288.88
12-33	N. 62°55'00"W.	1600.00
12-34	N. 36°29'27"W.	1230.96
12-35	N. 69°55'00"W.	285.36
12-36	N. 2°08'00"E.	214.15
12-37	N. 26°08'00"E.	118.07
12-38	S. 76°48'00"W.	83.20
12-39	S. 28°08'00"W.	146.29
12-40	N. 64°26'00"W.	155.21
12-41	S. 11°57'00"E.	106.30
12-42	S. 62°11'00"W.	141.01
12-43	S. 62°11'00"W.	206.11
12-44	S. 89°14'00"W.	150.01
12-45	N. 43°08'00"W.	152.11
12-46	N. 74°58'00"W.	223.65
12-47	S. 76°54'00"W.	119.10
12-48	N. 63°26'00"W.	42.49
12-49	N. 58°37'00"E.	255.37
12-50	N. 75°08'00"E.	487.30
12-51	N. 31°28'00"W.	200.09
12-52		
12-53	S. 29°59'00"E.	150.13
12-54	S. 73°06'00"E.	223.65
12-55	S. 28°27'00"E.	382.13
12-56	S. 76°37'00"E.	276.40
12-57	S. 47°17'00"W.	283.07
12-58	N. 69°58'00"W.	329.95
12-59	S. 50°23'00"W.	112.93
12-60	S. 4°56'00"E.	174.65
12-61	N. 50°26'00"W.	149.16
12-62	N. 6°01'00"E.	95.52
12-63	N. 55°59'00"W.	96.52
12-64	S. 80°00'00"W.	120.84
12-65	N. 2°42'00"E.	297.33
12-66	N. 20°57'00"W.	137.06
12-67	S. 53°56'00"W.	241.22
12-68	N. 39°26'00"W.	174.77
12-69	S. 77°02'00"W.	155.98
12-70	S. 1°03'00"W.	274.05
12-71	S. 20°10'00"E.	469.81
12-72	S. 71°57'00"E.	238.76
12-73	S. 25°03'00"W.	167.76
12-74	S. 42°46'00"E.	131.98
12-75	S. 0°14'56"W.	193.00
12-76	N. 49°43'00"W.	196.31
12-77	S. 72°02'00"W.	314.34
12-78	N. 3°40'00"E.	109.22
12-79		
12-79	N. 65°30'00"E.	161.55
12-80	N. 8°38'00"W.	206.34
12-81	N. 62°14'00"W.	150.30
12-82	N. 1°38'00"E.	140.06
12-83	N. 27°01'00"W.	336.76
12-84	N. 66°29'00"W.	193.02
12-85	N. 34°57'00"W.	226.93
12-86	S. 86°47'00"W.	160.25
12-87	N. 35°35'00"W.	427.91
12-88	N. 86°42'00"W.	156.26
12-89	N. 20°42'00"E.	45.37
12-90		
12-91	S. 38°49'00"E.	45.60
12-92	S. 84°38'00"E.	235.03
12-93	S. 24°27'00"E.	132.91
12-94	S. 57°00'00"E.	618.81
12-95	S. 21°10'00"W.	66.48
12-96	N. 83°23'00"W.	268.79
12-97	S. 7°24'00"W.	520.33
12-98	S. 36°12'00"E.	309.82
12-99	S. 85°52'00"E.	305.79
12-100	S. 8°00'00"W.	581.67
12-101	N. 49°57'00"W.	278.23
12-102	N. 61°56'00"W.	136.00
12-103	N. 49°00'00"W.	233.21
12-104	N. 21°26'00"W.	459.79
12-105		
12-105	N. 58°45'00"W.	136.86
12-106	N. 31°00'00"W.	225.18
12-107	S. 46°29'00"W.	108.93
12-108	S. 32°45'00"E.	219.97
12-109	S. 5°37'00"E.	459.21
12-110	S. 21°36'00"E.	206.49
12-111	S. 72°57'00"W.	354.59
12-112	S. 40°04'00"E.	197.31
12-113	S. 75°26'00"E.	441.19
12-114	S. 25°10'00"E.	145.84
12-115	S. 18°01'00"W.	378.58
12-116	S. 83°47'00"E.	258.52
12-117	S. 32°54'00"E.	222.73
12-118	S. 1°23'00"E.	124.04
12-119	S. 35°40'00"E.	265.86
12-120	S. 57°04'00"E.	229.94
12-121	S. 7°14'00"E.	190.52
12-122	S. 43°23'00"E.	125.21
12-123	S. 17°21'00"E.	100.58
12-124	S. 5°03'00"W.	214.83
12-125	S. 18°34'00"E.	279.55
12-126	S. 14°45'00"W.	600.81
12-127	S. 68°45'00"E.	154.48
12-128	S. 23°18'00"W.	235.18
12-129	S. 12°08'00"E.	232.14
9-61		





LEGEND

- PROJECT BOUNDARY
- FOUND CORNER
- FOUND CORNER, SET PIPE
- PROPORTIONED CORNER, SET PIPE
- MONUMENT SET ON PROJECT BOUNDARY
- PRIMARY HORIZONTAL CONTROL STATION

Scale: 1" = 400'

400 0 400 800 1200 1600 2000

Contour Interval 10 Feet
Datum is Mean Sea Level

COORDINATES, BEARINGS AND DISTANCES ARE BASED ON THE CALIFORNIA STATE COORDINATE SYSTEM, ZONE 3

EXHIBIT K SHEET 12

PROJECT NO. 2299 CALIFORNIA

TURLOCK IRRIGATION DISTRICT
MODESTO IRRIGATION DISTRICT

DON PEDRO PROJECT

DON PEDRO RESERVOIR

TOPOGRAPHY, PROPERTY & PROJECT BOUNDARY

2299-96

12

2299-96

T. 2 S., R. 14 E. | T. 2 S., R. 15 E., M.D.B. & M.

Match Line Sheet No. 15 / Sheet No. 13

S 89°27'26" E 2636.39 — 192.55 — 1521.10 — S89°27'26"E — 1239.12 — 753.68 — 1760.40 — N 88°39'20" E — 248.00 — 1953.05 — N88°39'20" E — 499.09 — 1842.38 — N 87°32'03" E — 599.52 — 227.94

T.I.D. & M.I.D. 29.48 AC.

MAX. NORMAL WATER SURFACE EL. 830

U.S.A.

U.S.A. 531.86 AC.

U.S.A. 1.12 AC.

Kurzi △

T.I.D. & M.I.D. 18.49 AC.

T.I.D. & M.I.D. 23.03 AC.

T.I.D. & M.I.D. 34.48

T.I.D. & M.I.D. 22.02 AC.

U.S.A. 19.47 AC

CREEK

460,000 N — 458,000 N

N 0°12'43" E 2639.55 — N 3°04'33" W 2115.60 — 484.16 — 271.20 — 1152.05 — 364.80 — 604.68 — N 1°05'56" W 2597.28 — N 1°48'00" E 1574.34 — N 0°11'23" E 2620.67

Match Line Sheet No. 12 / Sheet No. 13

Sheet No. 13 — N 89°40'04" E 2425.74 — 247.08 — 977.52 — 38.80 — 958.23 — N 89°40'04" E — N 88°00'38" E 3488.53 — N 88°00'38" E 2657.93 — Sheet No. 13 - HATCH — 1348.77 — N 85°46'17" E 1103.00 — 205.06

Match Line Sheet No. 10 — Match Line Sheet No. 11

2 FOUND P.K.'s

PROJECT BOUNDARY TRAVERSE

NO.	BEARING	DIST.
11-125	S.85°46'17"W.	1103.00
13-1	N.15°56'00"W.	266.89
13-2	N.59°42'00"W.	1274.15
13-3	S.74°31'00"W.	146.91
13-4	S.74°31'00"W.	684.28
13-5	S.29°57'00"W.	817.15
13-6	N.33°12'48"W.	2008.06
13-14	N.58°41'00"E.	927.14
13-15	N.18°26'00"W.	543.91
13-16	N.30°53'00"E.	701.43
13-17	N.20°17'00"W.	375.44
13-18	N.33°09'00"E.	351.14
13-19	N.16°21'00"E.	486.68
13-20	N.77°13'00"E.	524.00
13-21	N.43°29'00"E.	425.83
13-22	N.53°42'00"W.	390.86
13-23		
13-24	S.39°08'00"E.	124.22
13-25	N.84°36'00"E.	520.31
13-26	N. 2°00'00"E.	73.22
13-27		
13-28	S.14°48'00"W.	358.34
13-29	S.44°48'00"W.	197.28
13-30	S.22°11'00"E.	169.54
13-31	S.47°40'00"W.	334.12
13-32	S.71°44'00"W.	207.45
13-33	N.68°17'21"W.	1378.74
13-43	N.22°58'00"W.	356.24
13-44	N.25°06'00"E.	53.33
13-45		
13-46	S.17°33'00"E.	231.39
13-47	S.29°55'00"W.	198.46
13-48	S.21°55'00"E.	281.33
13-49	S.54°45'00"E.	183.67
13-50	S.41°48'00"W.	139.52
13-51	S. 9°57'00"E.	133.00
13-52	S. 9°24'00"W.	165.22
13-53	N.86°29'00"W.	358.68
13-54	N.48°34'00"W.	569.61
13-55	N.39°31'00"W.	311.13
13-56	N.16°12'00"W.	315.53
13-57	N.57°49'00"W.	350.35
13-58		
13-59	S.36°20'00"E.	39.75
13-60	N.89°41'00"E.	373.03
13-61	S.30°54'00"E.	331.07
13-62	SOUTH	180.00
13-63	S.48°05'00"E.	538.89
13-64	S.17°24'00"W.	314.38
13-65	S.73°09'00"E.	241.41
13-66	S. 1°13'00"W.	190.07
13-67	S.26°16'00"E.	167.25
13-68	S.50°09'00"E.	418.16
13-69	S.25°13'00"E.	326.07
13-70	S. 3°04'33"E.	484.16
13-71	N.88°38'37"E.	385.40
13-72	S.12°01'00"E.	416.83
13-73	S.42°15'00"E.	132.38
13-74	S.83°34'00"W.	214.35
13-75	N.49°05'00"W.	377.14
13-76	N.86°47'00"W.	48.61
13-77	N.86°47'00"W.	165.73
13-78	N.23°14'00"W.	200.24
13-79	N.63°09'00"W.	354.20
13-80	S.56°28'00"W.	195.53
13-81	N.63°51'00"W.	186.05
13-82	S.82°41'00"W.	109.90
13-83	N.74°42'00"W.	568.16
13-84	S.41°01'00"E.	326.06
13-85	S.45°39'00"E.	620.89
13-86	S.89°14'00"E.	225.02
13-87	S.54°44'00"E.	505.80
13-88	S.18°45'00"E.	286.19
13-89	S.30°38'00"E.	435.22
13-90	S. 3°04'33"E.	364.80
13-91	N.57°02'00"W.	205.38
13-92	S.88°46'00"W.	140.03
13-93	S.45°13'00"W.	181.73
13-94	N.38°53'00"W.	255.38
13-95	N.62°07'00"W.	361.71
13-96	S.76°40'00"W.	216.84
13-97	N.44°18'00"W.	459.65
13-98	S.47°55'00"W.	125.32
13-99	S.11°20'00"W.	585.41
13-100	S.48°56'00"E.	289.18
13-101	S.30°18'00"E.	230.19
13-102	S.46°35'00"E.	567.46
13-103	S.89°40'04"W.	38.80
13-104	N.53°43'00"W.	532.69
13-105	N.49°11'00"W.	1549.87
13-106	N.80°32'00"W.	152.07
13-107	S.12°15'00"W.	108.47
13-108	S.11°58'00"E.	376.18
13-109	S.72°33'00"E.	110.06
13-110	S.13°39'00"E.	360.17
13-111	S.59°25'00"E.	127.77
13-112	S.21°17'00"E.	184.59
13-113	S. 2°41'00"W.	171.19
13-114	S.50°02'00"E.	148.51
10-46		

THIS MAP CORRECTLY REPRESENTS TOPOGRAPHY SHOWN ON PHOTOGRAMMETRIC MAPS COMPILED BY FAIRCHILD AERIAL SURVEYS INC., R.M. TOWILL INC. AND TELEDYNE GEOTRONICS AND SURVEYS MADE BY ME, OR UNDER MY DIRECTION WHILE EMPLOYED BY THE TURLOCK IRRIGATION DISTRICT AND MODESTO IRRIGATION DISTRICT.

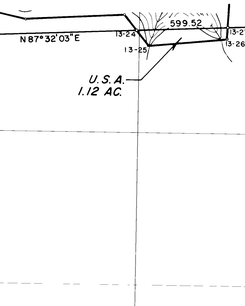
JOHN B. DUFF
L.S. 2244, CALIFORNIA

THIS MAP IS FILED IN COMPLIANCE WITH ARTICLE 35 OF THE LICENSE FOR FEDERAL POWER COMMISSION PROJECT NO. 2299 SUBMITTED BY THE UNDERSIGNED THIS 30 TH. DAY OF AUGUST 1974.

TURLOCK IRRIGATION DISTRICT
BY: H. RICHARD CLAUSS, PRESIDENT

MODESTO IRRIGATION DISTRICT
BY: RICHARD E. PENNEY, PRESIDENT

0° 04' 54" E — 17½° — TRUE — MAGNETIC — N — LONG. 120° 25' 00" W



LEGEND

- PROJECT BOUNDARY
- FOUND CORNER
- FOUND CORNER, SET PIPE
- PROPORTIONED CORNER, SET PIPE
- MONUMENT SET ON PROJECT BOUNDARY
- PRIMARY HORIZONTAL CONTROL STATION

Scale 1" = 400'

400 0 400 800 1200 1600 2000

Contour Interval 10 Feet
Datum is Mean Sea Level

COORDINATES, BEARINGS AND DISTANCES ARE BASED ON THE CALIFORNIA STATE COORDINATE SYSTEM, ZONE 3

2,034,000 E — 2,036,000 E — 2,038,000 E — 2,040,000 E — 2,042,000 E

EXHIBIT K — SHEET 13

PROJECT NO. 2299 — CALIFORNIA

TURLOCK IRRIGATION DISTRICT
MODESTO IRRIGATION DISTRICT

DON PEDRO PROJECT

DON PEDRO RESERVOIR

TOPOGRAPHY, PROPERTY & PROJECT BOUNDARY

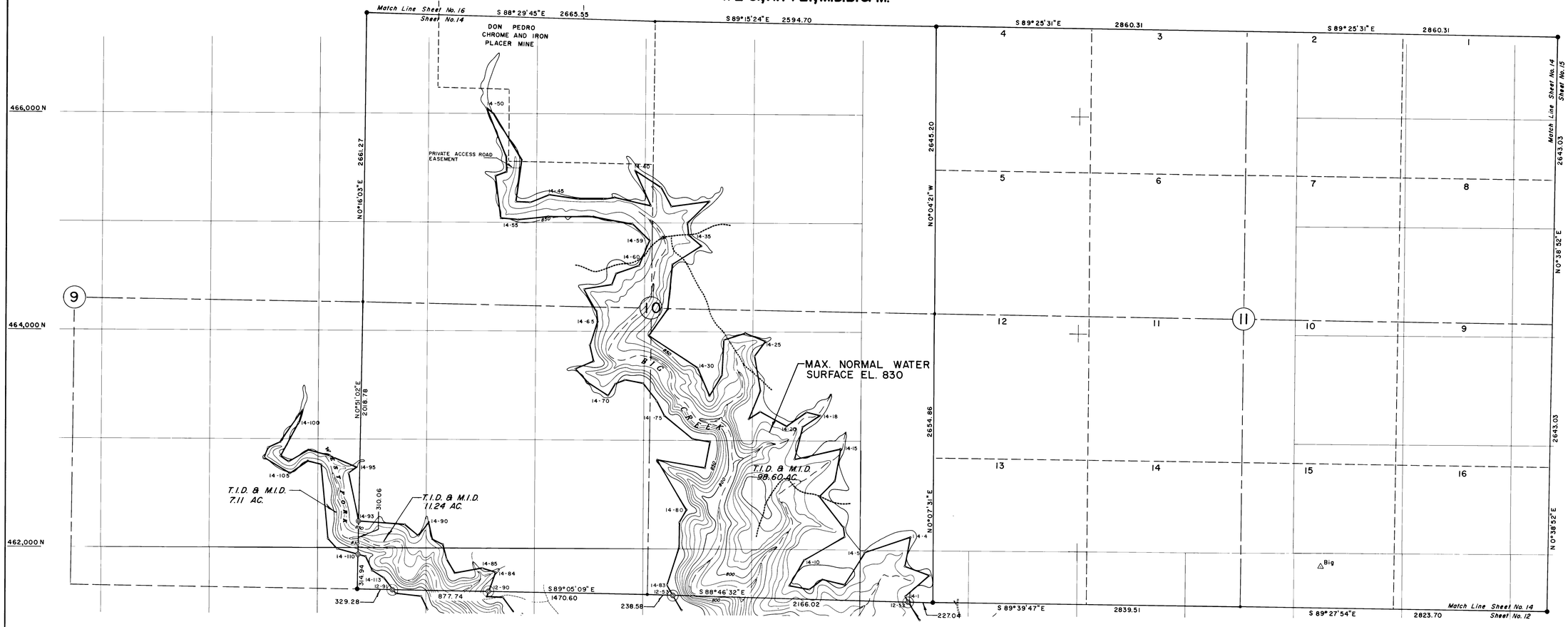
2299-97

2299-4

13

TERM LINE

T. 2 S., R. 14 E., M.D.B. & M.



PROJECT BOUNDARY TRAVERSE

NO.	BEARING	DIST.
12-52		
14-1	N. 31°28'00"W.	56.65
14-2	N. 48°49'00"E.	297.64
14-3	N. 69°56'00"W.	244.86
14-4	N. 11°06'00"E.	275.15
14-5	S. 70°31'00"W.	446.59
14-6	S. 32°06'00"W.	348.21
14-7	N. 77°21'00"W.	210.10
14-8	S. 52°31'00"W.	151.21
14-9	N. 80°03'00"W.	190.87
14-10	N. 30°34'00"E.	275.26
14-11	N. 60°12'00"E.	428.66
14-12	N. 7°36'00"W.	90.80
14-13	N. 38°24'00"W.	357.15
14-14	N. 45°12'00"E.	202.94
14-15	N. 9°22'00"E.	301.01
14-16	S. 76°54'00"W.	432.26
14-17	N. 13°19'00"E.	312.41
14-18	N. 57°08'00"E.	191.57
14-19	N. 78°20'00"W.	128.51
14-20	S. 55°09'00"W.	220.54
14-21	N. 62°04'00"W.	279.59
14-22	S. 58°03'00"W.	128.47
14-23	N. 22°32'00"E.	279.31
14-24	N. 9°54'00"W.	325.85
14-25	N. 36°12'00"E.	171.01
14-26	N. 68°48'00"W.	196.29
14-27	S. 72°46'00"W.	212.55
14-28	S. 2°30'00"W.	321.31
14-29	S. 30°47'00"W.	224.66
14-29	N. 24°05'00"W.	279.32
14-30	N. 56°12'00"W.	539.17
14-31	N. 35°27'00"E.	306.89
14-32	N. 5°06'00"E.	404.60
14-33	N. 56°54'00"E.	318.69
14-34	N. 49°02'00"W.	150.99
14-35	N. 4°51'00"W.	118.42
14-36	N. 46°01'00"E.	279.49
14-37	S. 83°25'00"W.	357.36
14-38	N. 30°02'00"W.	191.76
14-39	N. 57°02'00"W.	288.47
14-40	S. 24°15'00"E.	355.38
14-41	N. 77°19'00"W.	337.22
14-42	S. 79°25'00"W.	108.85
14-43	WEST	234.00
14-44	N. 82°21'00"W.	270.41
14-45	S. 69°22'00"W.	190.19
14-46	N. 87°48'00"W.	130.10
14-47	N. 8°03'00"E.	392.87
14-48	N. 31°49'00"W.	498.94
14-49	N. 48°53'00"W.	83.63
14-50	S. 21°52'00"E.	485.97
14-51	S. 3°19'00"E.	138.23
14-52	S. 69°04'00"W.	109.12
14-53	S. 6°56'00"E.	397.91
14-54	S. 84°22'00"E.	162.79
14-55	N. 83°09'00"E.	285.04
14-56	S. 89°52'00"E.	413.00
14-57	S. 79°51'00"E.	368.77
14-58	S. 47°50'00"E.	214.52
14-59	S. 23°15'00"W.	255.79
14-60	S. 70°11'00"W.	224.27
14-61	S. 20°51'00"W.	112.36
14-62	S. 81°33'00"W.	258.80
14-63	S. 29°39'00"E.	232.44
14-64	S. 6°17'00"E.	100.60
14-65	S. 17°43'00"W.	226.75
14-66	S. 14°40'00"E.	154.02
14-67	S. 66°44'00"W.	187.24
14-68	S. 44°02'00"E.	168.32
14-69	S. 57°10'00"E.	221.35
14-70	N. 31°33'00"E.	127.92
14-71	N. 64°14'00"E.	96.61
14-72	S. 80°03'00"E.	173.61
14-73	S. 37°09'00"E.	207.00
14-74	S. 27°46'00"E.	150.30
14-75	S. 50°36'00"E.	340.33
14-76	S. 81°07'00"E.	161.94
14-77	S. 9°25'00"W.	244.30
14-78	N. 81°06'00"W.	452.45
14-79	S. 30°49'00"E.	536.79
14-80	S. 31°11'00"W.	133.26
14-81	S. 0°15'00"E.	231.00
14-82	S. 17°10'00"W.	359.01
14-83	S. 29°59'00"E.	111.96
12-53		
12-90	N. 20°42'00"E.	195.15
14-84	N. 74°14'00"W.	124.77
14-85	S. 78°34'00"W.	262.21
14-86	N. 28°16'00"W.	149.88
14-87	N. 17°24'00"W.	140.43
14-88	N. 65°28'00"W.	113.22
14-89	N. 11°02'00"W.	161.99
14-90	S. 36°08'00"W.	156.01
14-91	N. 49°01'00"W.	161.57
14-92	N. 86°18'00"W.	429.46
14-93	N. 12°02'00"W.	453.23
14-94	N. 56°52'00"E.	85.98
14-95	N. 66°06'00"W.	269.07
14-96	N. 74°48'00"W.	202.07
14-97	S. 58°34'00"W.	210.95
14-98	N. 54°03'00"W.	98.81
14-99	N. 29°37'00"E.	343.95
14-100	N. 16°26'00"E.	127.20
14-101	S. 34°48'00"W.	359.24
14-102	S. 64°14'00"W.	126.55
14-103	S. 21°42'00"W.	100.09
14-104	S. 58°41'00"E.	280.92
14-105	N. 55°36'00"E.	203.59
14-106	S. 75°04'00"E.	124.19
14-107	S. 5°37'00"E.	685.28
14-108	S. 43°03'00"E.	124.52
14-109	S. 74°31'00"E.	195.97
14-110	S. 74°31'00"E.	73.82
14-111	S. 25°17'00"E.	140.46
14-112	S. 57°24'00"E.	131.76
14-113	S. 38°49'00"E.	131.50
12-91		

THIS MAP CORRECTLY REPRESENTS TOPOGRAPHY SHOWN ON PHOTOGRAMMETRIC MAPS COMPILED BY FAIRCHILD AERIAL SURVEYS INC., R.M. TOWILL INC. AND TELEDYNE GEOTRONICS AND SURVEYS MADE BY ME, OR UNDER MY DIRECTION WHILE EMPLOYED BY THE TURLOCK IRRIGATION DISTRICT AND MODESTO IRRIGATION DISTRICT.

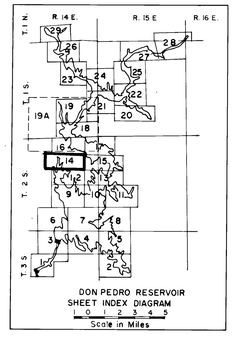
JOHN B. DUFF
L.S. 2244, CALIFORNIA

THIS MAP IS FILED IN COMPLIANCE WITH ARTICLE 35 OF THE LICENSE FOR FEDERAL POWER COMMISSION PROJECT NO. 2299 SUBMITTED BY THE UNDERSIGNED THIS 30 TH. DAY OF AUGUST 1974.

TURLOCK IRRIGATION DISTRICT
BY: H. RICHARD CLAUSS, PRESIDENT

MODESTO IRRIGATION DISTRICT
BY: RICHARD E. PENNEY, PRESIDENT

0°03'22" EAST
17½°
TRUE NORTH
MAGNETIC
N
LONG. 120°24'30" W.



LEGEND

- PROJECT BOUNDARY
- FOUND CORNER
- FOUND CORNER, SET PIPE
- PROPORTIONED CORNER, SET PIPE
- MONUMENT SET ON PROJECT BOUNDARY
- PRIMARY HORIZONTAL CONTROL STATION

Scale: 1" = 400'

400 0 400 800 1200 1600 2000

Contour Interval 10 Feet
Datum is Mean Sea Level

COORDINATES, BEARINGS AND DISTANCES ARE BASED ON THE CALIFORNIA STATE COORDINATE SYSTEM, ZONE 3

EXHIBIT K SHEET 14

PROJECT NO. 2299 CALIFORNIA

TURLOCK IRRIGATION DISTRICT
MODESTO IRRIGATION DISTRICT

DON PEDRO PROJECT

DON PEDRO RESERVOIR

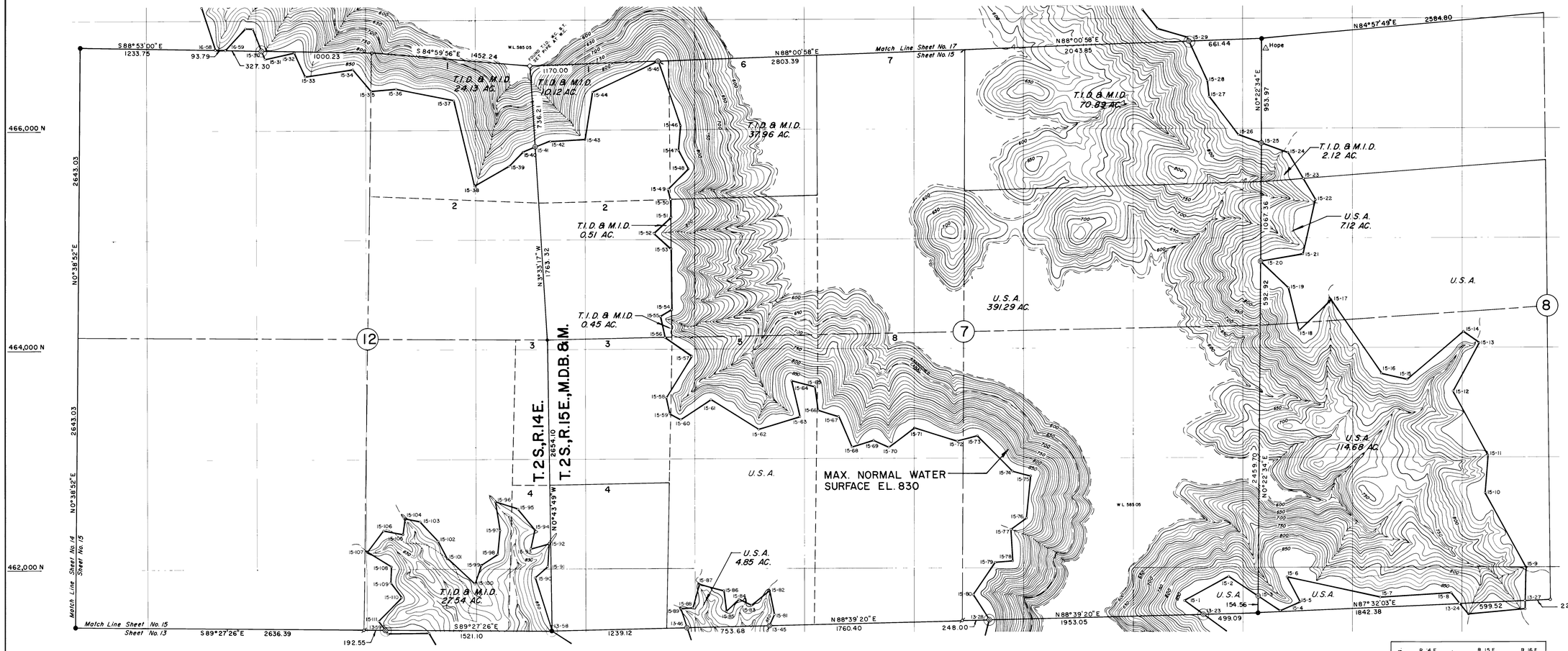
TOPOGRAPHY, PROPERTY & PROJECT BOUNDARY

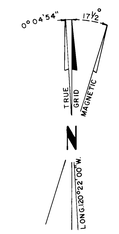
2299-98

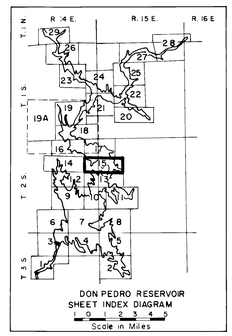
2299-98

14

TRIM LINE







PROJECT BOUNDARY TRAVERSE

NO.	BEARING	DIST.
13-23	N.53°42'00"W.	212.17
15-1	N.61°42'00"E.	457.71
15-2	S.56°39'00"E.	320.78
15-3	S.56°39'00"E.	243.08
15-4	N.67°07'00"E.	195.39
15-5	N.27°45'00"W.	259.89
15-6	S.77°34'00"E.	873.47
15-7	N.86°43'00"E.	647.06
15-8	S.39°08'00"E.	124.57
13-24		
13-27	N. 2°00'00"E.	300.01
15-9	N.29°03'00"W.	782.62
15-10	N. 4°11'00"E.	342.91
15-11	N.28°27'00"W.	667.60
15-12	N.28°52'00"E.	501.28
15-13	N.54°53'00"W.	177.28
15-14	S.49°44'00"W.	676.18
15-15	N.77°14'00"W.	239.93
15-16	N.34°00'00"W.	815.42
15-17	S.46°17'00"W.	408.10
15-18	N.14°06'00"W.	402.12
15-19	N.45°41'00"W.	355.21
15-20	N.80°40'00"E.	394.91
15-21	N.13°21'00"E.	504.38
15-22	N.30°29'00"W.	219.88
15-23	N.30°29'00"W.	275.96
15-24	N.71°00'00"W.	261.87
15-25	N.71°00'00"W.	213.67
15-26	N.36°58'00"W.	450.60
15-27	N. 6°59'00"W.	148.10
15-28		

NO.	BEARING	DIST.
15-28	N.24°48'00"W.	390.47
15-29		
15-30	S.22°01'00"E.	83.29
15-31	N.76°50'00"E.	276.19
15-32	S.23°02'00"E.	245.54
15-33	N.81°15'00"E.	441.13
15-34	S.39°56'00"E.	253.40
15-35	N.86°10'00"E.	227.21
15-36	S.78°39'00"E.	538.16
15-37	S.13°31'00"E.	800.16
15-38	N.60°25'00"E.	364.54
15-39	N.43°39'00"E.	179.66
15-40	N.68°31'00"E.	123.74
15-41	N.68°31'00"E.	143.85
15-42	N.87°52'00"E.	321.22
15-43	N. 8°44'00"E.	441.08
15-44	N.65°28'00"E.	661.54
15-45	S.18°58'00"E.	622.34
15-46	S. 4°41'00"W.	220.86
15-47	S.27°06'00"E.	190.97
15-48	S.44°32'00"W.	259.50
15-49	S.14°15'00"E.	95.70
15-50	S. 0°40'15"E.	168.13
15-51	S.46°37'00"W.	209.89
15-52	S.47°31'00"E.	211.40
15-53	S. 0°40'15"E.	552.11
15-54	S.59°29'00"W.	122.32
15-55	S.12°51'00"E.	195.95
15-56	S.54°32'00"E.	296.40
15-57	S.32°21'00"W.	439.18
15-58		

NO.	BEARING	DIST.
15-58	S.12°09'00"E.	161.62
15-59	S.64°07'00"E.	112.26
15-60	N.56°12'00"E.	323.59
15-61	S.58°02'00"E.	517.49
15-62	N.72°51'00"E.	396.65
15-63	N.13°16'00"W.	340.07
15-64	S.74°38'00"E.	218.83
15-65	S. 8°35'00"E.	214.40
15-66	S.71°28'00"E.	191.95
15-67	S.24°13'00"E.	304.81
15-68	N.71°50'00"E.	208.40
15-69	S.64°28'00"E.	148.50
15-70	N.53°29'00"E.	297.41
15-71	S.72°03'00"E.	412.06
15-72	N.75°01'00"E.	189.45
15-73	S.44°49'00"E.	448.31
15-74	S.73°05'00"E.	178.73
15-75	S. 6°33'00"W.	385.52
15-76	S.53°12'00"W.	168.60
15-77	S. 2°59'00"E.	288.39
15-78	S.86°29'00"W.	163.31
15-79	S.34°10'00"W.	352.73
15-80	S.32°54'00"E.	273.40
13-28		
13-45	N.25°06'00"E.	104.59
15-81	N.11°45'00"W.	225.74
15-82	S.51°20'00"W.	211.30
15-83	N.63°38'00"W.	126.12
15-84	S.45°15'00"W.	164.85
15-85		

NO.	BEARING	DIST.
15-85	N. 6°50'00"W.	193.37
15-86	N.75°21'00"W.	229.45
15-87	S.16°35'00"W.	224.32
15-88	S.87°12'00"W.	102.12
15-89	S.17°33'00"E.	179.75
13-46		
13-58	N.17°39'00"W.	512.58
15-90	N.51°10'00"E.	151.49
15-91	N. 4°06'00"E.	209.54
15-92	S.75°20'00"W.	177.79
15-93	N.13°04'00"E.	172.47
15-94	N.37°37'00"W.	247.42
15-95	N.71°59'00"W.	219.78
15-96	S. 8°52'00"W.	272.26
15-97	S. 5°26'00"W.	210.95
15-98	S.56°34'00"W.	183.33
15-99	S.19°34'00"W.	176.17
15-100	N.47°38'00"W.	338.35
15-101	N.25°59'00"W.	178.00
15-102	N.42°49'00"W.	241.30
15-103	N.78°32'00"W.	140.81
15-104	S. 8°28'00"W.	142.56
15-105	N.78°48'00"W.	180.44
15-106	S.37°14'00"W.	251.21
15-107	S.59°11'00"E.	253.82
15-108	S. 3°08'00"W.	146.22
15-109	S.36°56'00"E.	166.40
15-110	S.45°25'00"W.	296.29
15-111	S.36°20'00"E.	110.46
13-59		

THIS MAP CORRECTLY REPRESENTS TOPOGRAPHY SHOWN ON PHOTOGRAMMETRIC MAPS COMPILED BY FAIRCHILD AERIAL SURVEYS INC., R.M. TOWILL INC. AND TELEDYNE GEOTRONICS AND SURVEYS MADE BY ME, OR UNDER MY DIRECTION WHILE EMPLOYED BY THE TURLOCK IRRIGATION DISTRICT AND MODESTO IRRIGATION DISTRICT.

JOHN B. DUFF
L.S. 2244, CALIFORNIA

THIS MAP IS FILED IN COMPLIANCE WITH ARTICLE 35 OF THE LICENSE FOR FEDERAL POWER COMMISSION PROJECT NO. 2299 SUBMITTED BY THE UNDERSIGNED THIS 30 TH. DAY OF AUGUST 1974.

TURLOCK IRRIGATION DISTRICT
BY: H. RICHARD CLAUSS, PRESIDENT

MODESTO IRRIGATION DISTRICT
BY: RICHARD E. PENNEY, PRESIDENT

LEGEND

- PROJECT BOUNDARY
- FOUND CORNER
- FOUND CORNER, SET PIPE
- PROPORTIONED CORNER, SET PIPE
- MONUMENT SET ON PROJECT BOUNDARY
- PRIMARY HORIZONTAL CONTROL STATION

Scale: 1" = 400'

400 0 400 800 1200 1600 2000

Contour Interval 10 Feet
Datum is Mean Sea Level

COORDINATES, BEARINGS AND DISTANCES ARE BASED ON THE CALIFORNIA STATE COORDINATE SYSTEM, ZONE 3

EXHIBIT K SHEET 15

PROJECT NO. 2299 CALIFORNIA

TURLOCK IRRIGATION DISTRICT
MODESTO IRRIGATION DISTRICT

DON PEDRO PROJECT

DON PEDRO RESERVOIR

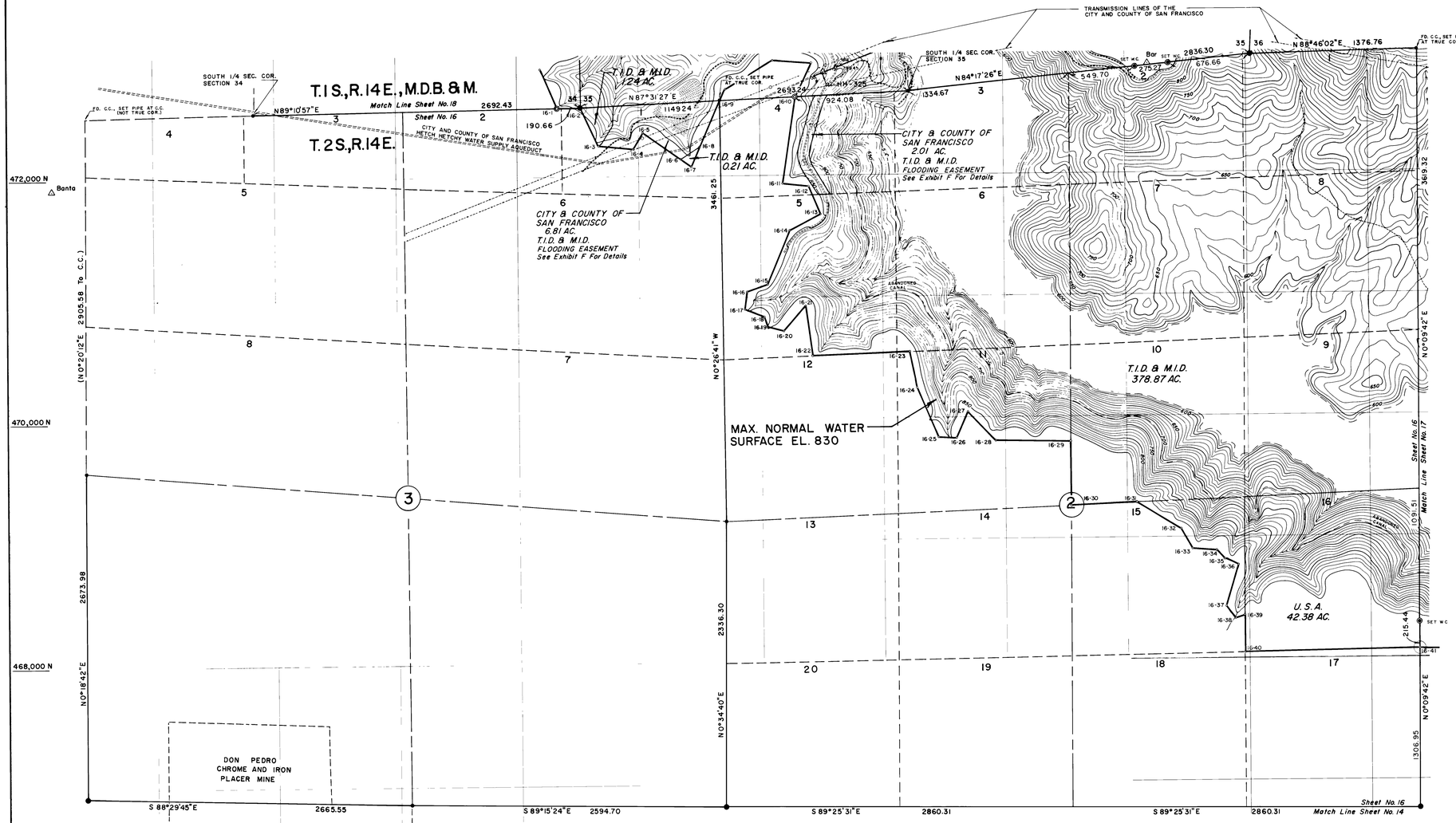
TOPOGRAPHY, PROPERTY & PROJECT BOUNDARY

2299-99

2299-99

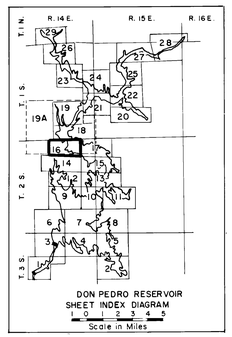
15

Tom Lane



PROJECT BOUNDARY TRAVERSE

NO.	BEARING	DIST.	NO.	BEARING	DIST.
16-1	N.89°10'57"E.	190.66	16-21	S. 7°53'00"E.	421.95
16-2	S.24°07'00"E.	347.53	16-22	N.88°00'06"E.	800.94
16-3	S.84°47'00"E.	289.46	16-23	S.11°26'00"E.	300.68
16-4	N.29°58'00"E.	154.63	16-24	S.22°33'00"E.	441.03
16-5	S.54°52'00"E.	379.92	16-25	S.86°27'00"E.	145.28
16-6	S.54°52'00"E.	106.68	16-26	N.24°04'00"E.	235.18
16-7	N.24°14'00"E.	178.18	16-27	S.43°36'00"E.	325.50
16-8	N.24°14'00"E.	413.16	16-28	S.88°45'00"E.	624.46
16-9			16-29	S. 0°04'05"W.	529.63
16-10	S. 9°13'00"W.	718.28	16-30	N.87°47'17"E.	540.24
16-11	S.83°36'00"E.	215.34	16-31	S.58°48'00"E.	422.09
16-12	S.22°47'00"E.	250.54	16-32	S.29°42'00"E.	187.66
16-13	S.62°32'00"W.	286.25	16-33	S.85°40'00"E.	198.57
16-14	S.22°22'00"W.	483.39	16-34	S.42°39'00"E.	103.32
16-15	S.71°03'00"W.	178.68	16-35	S.66°44'00"E.	116.47
16-16	S. 7°50'00"W.	139.30	16-36	S.16°35'00"W.	353.73
16-17	S.68°16'00"E.	170.10	16-37	S.36°57'00"E.	131.40
16-18	S.19°37'00"E.	92.36	16-38	N.71°10'00"E.	88.18
16-19	S.75°33'00"E.	136.31	16-39	S. 0°06'58"W.	303.42
16-20	N.40°34'00"E.	276.57	16-40	N.89°10'47"E.	1431.34
16-21			16-41		



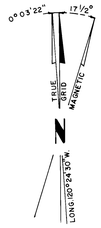
THIS MAP CORRECTLY REPRESENTS TOPOGRAPHY SHOWN ON PHOTOGRAMMETRIC MAPS COMPILED BY FAIRCHILD AERIAL SURVEYS INC., R.M.TOWILL INC. AND TELEDYNE GEOTRONICS AND SURVEYS MADE BY ME, OR UNDER MY DIRECTION WHILE EMPLOYED BY THE TURLOCK IRRIGATION DISTRICT AND MODESTO IRRIGATION DISTRICT.

JOHN B. DUFF
L.S. 2244, CALIFORNIA

THIS MAP IS FILED IN COMPLIANCE WITH ARTICLE 35 OF THE LICENSE FOR FEDERAL POWER COMMISSION PROJECT NO. 2299 SUBMITTED BY THE UNDERSIGNED THIS 30TH. DAY OF AUGUST 1974.

TURLOCK IRRIGATION DISTRICT
BY: H. RICHARD CLAUSS, PRESIDENT

MODESTO IRRIGATION DISTRICT
BY: RICHARD E. PENNEY, PRESIDENT



LEGEND

- PROJECT BOUNDARY
- FOUND CORNER
- FOUND CORNER, SET PIPE
- PROPORTIONED CORNER, SET PIPE
- MONUMENT SET ON PROJECT BOUNDARY
- PRIMARY HORIZONTAL CONTROL STATION

Scale: 1" = 400'

400 0 400 800 1200 1600 2000

Contour Interval 10 Feet

Datum is Mean Sea Level

COORDINATES, BEARINGS AND DISTANCES ARE BASED ON THE CALIFORNIA STATE COORDINATE SYSTEM, ZONE 3

2,022,000 E | 2,024,000E | 2,026,000 E | 2,028,000E | 2,030,000E | 2,032,000E

EXHIBIT K SHEET 16

PROJECT NO. 2299 CALIFORNIA

TURLOCK IRRIGATION DISTRICT
MODESTO IRRIGATION DISTRICT

DON PEDRO PROJECT

DON PEDRO RESERVOIR

TOPOGRAPHY, PROPERTY & PROJECT BOUNDARY

2299-100

16

2299-100

T.1S.,R.14E.

T.1S.,R.15E.,M.D.B.&M.

T.2S.,R.14E.

T.2S.,R.15E.

Match Line Sheet No.16 Sheet No.17

Match Line Sheet No.17 Sheet No.15

CITY AND COUNTY OF SAN FRANCISCO-HETCH HETCHY WATER SUPPLY AQUEDUCT

TRANSMISSION LINES OF THE CITY AND COUNTY OF SAN FRANCISCO

MAX. NORMAL WATER SURFACE EL. 830

Hughes

Hope

U.S.A. 1883 AC.

U.S.A. 6.88 AC.

U.S.A. 0.26 AC.

U.S.A. 38.43 AC.

U.S.A. 40.87 AC.

U.S.A. 122.69 AC.

U.S.A. 54.90 AC.

U.S.A.

T.I.D.& M.I.D. 29.83 AC.

T.I.D.& M.I.D. 399.63 AC.

T.I.D.& M.I.D. 162.96 AC.

T.I.D.& M.I.D. 173.82 AC.

T.I.D.& M.I.D. 39.23 AC.

472,000 N

470,000 N

468,000 N

2,034,000 E

2,036,000 E

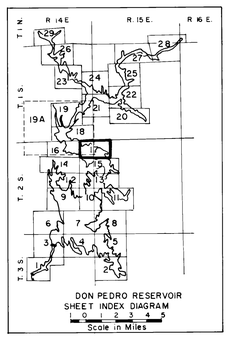
2,038,000 E

2,040,000 E

2,042,000 E

PROJECT BOUNDARY TRAVERSE

NO.	BEARING	DIST.	NO.	BEARING	DIST.
15-29	N.24°48'00"W.	45.77	17-32	N.71°20'00"W.	699.88
17-1	N.75°04'00"W.	279.44	17-33	S.67°48'00"W.	582.28
17-2	N.37°58'00"W.	219.44	17-34	N.82°03'00"W.	129.62
17-3	N.25°29'00"W.	450.87	17-35	N.82°03'00"W.	383.32
17-4	N.60°20'00"W.	727.34	17-36	S.35°21'00"W.	172.86
17-5	N. 8°28'00"E.	454.96	17-37	S.31°27'00"E.	220.38
17-6	S.88°07'00"E.	274.15	17-38	S.19°45'00"W.	275.19
17-7	S.74°57'00"E.	465.98	17-39	S.10°06'00"E.	176.74
17-8	N.28°58'00"E.	320.04	17-40	S.82°54'00"W.	493.78
17-9	N.45°59'00"W.	657.71	17-41	N. 0°11'00"E.	323.00
17-10	N.55°37'00"W.	391.37	17-42	N.57°08'00"W.	175.03
17-11	N.38°51'00"W.	825.70	17-43	N.23°18'00"E.	470.34
17-12	N.24°05'00"W.	619.97	17-44	N.59°13'00"W.	164.12
17-13	N.63°32'00"W.	279.64	17-45	S.54°04'00"W.	206.23
17-14	N.63°32'00"W.	99.20	17-46	N.29°16'00"W.	237.29
17-15	N.10°12'00"W.	242.84	17-47	S.85°02'00"W.	228.89
17-16	N.32°02'00"W.	384.57	17-48	N.36°38'00"W.	238.00
17-17	N.61°49'00"W.	158.82	17-49	N.66°23'00"W.	164.79
17-18	S.50°45'00"W.	169.14	17-50	N.76°15'00"W.	417.37
17-19	N.64°55'00"W.	537.73	17-51		
17-20	S.85°47'00"W.	314.00	16-41	S.88°18'57"E.	352.93
17-21	N. 1°31'58"W.	689.81	17-52	S. 0°40'00"W.	153.10
17-22	S.88°29'00"W.	773.72	17-53	S.36°25'00"E.	502.02
17-23	N. 6°01'00"W.	38.14	17-54	S.52°06'00"E.	332.05
17-24	N.86°54'00"W.	148.22	17-55	S.87°47'00"E.	258.19
17-25	S.73°17'00"W.	190.53	17-56	S.21°19'00"W.	176.04
17-26	S.88°29'00"W.	482.62	17-57	S.17°56'00"E.	405.28
17-27	N.43°59'00"W.	139.82	17-58	S.88°53'00"E.	93.79
17-28	N.74°23'00"W.	141.21	17-59	N.42°26'00"E.	267.47
17-29	N.29°57'00"W.	150.09	17-60	S.86°32'00"E.	66.11
17-30	S.79°18'00"W.	425.84	17-61	S.22°01'00"E.	215.50
17-31	N.53°00'00"W.	525.16	15-30		
17-32					



DON PEDRO RESERVOIR
SHEET INDEX DIAGRAM
1 0 1 2 3 4 5
Scale in Miles

THIS MAP CORRECTLY REPRESENTS TOPOGRAPHY SHOWN ON PHOTOGRAMMETRIC MAPS COMPILED BY FAIRCHILD AERIAL SURVEYS INC., R.M. TOWILL INC. AND TELEDYNE GEOTRONICS AND SURVEYS MADE BY ME, OR UNDER MY DIRECTION WHILE EMPLOYED BY THE TURLOCK IRRIGATION DISTRICT AND MODESTO IRRIGATION DISTRICT.

JOHN B. DUFF
L.S. 2244, CALIFORNIA

THIS MAP IS FILED IN COMPLIANCE WITH ARTICLE 35 OF THE LICENSE FOR FEDERAL POWER COMMISSION PROJECT NO. 2299 SUBMITTED BY THE UNDERSIGNED THIS 30 TH. DAY OF AUGUST 1974.

TURLOCK IRRIGATION DISTRICT
BY: H. Richard Clauss
H. RICHARD CLAUSS, PRESIDENT

MODESTO IRRIGATION DISTRICT
BY: R. E. Penney
RICHARD E. PENNEY, PRESIDENT

0° 04' 36" 12½°
TRUE GRID MAGNETIC
N
LONG. 120° 52' 30" W.

LEGEND

- PROJECT BOUNDARY
- FOUND CORNER
- FOUND CORNER, SET PIPE
- PROPORTIONED CORNER, SET PIPE
- MONUMENT SET ON PROJECT BOUNDARY
- PRIMARY HORIZONTAL CONTROL STATION

Scale: 1" = 400'
400 0 400 800 1200 1600 2000
Contour Interval 10 Feet
Datum is Mean Sea Level

COORDINATES, BEARINGS AND DISTANCES ARE BASED ON THE CALIFORNIA STATE COORDINATE SYSTEM, ZONE 3

EXHIBIT K SHEET 17

PROJECT NO. 2299 CALIFORNIA

TURLOCK IRRIGATION DISTRICT
MODESTO IRRIGATION DISTRICT

DON PEDRO PROJECT

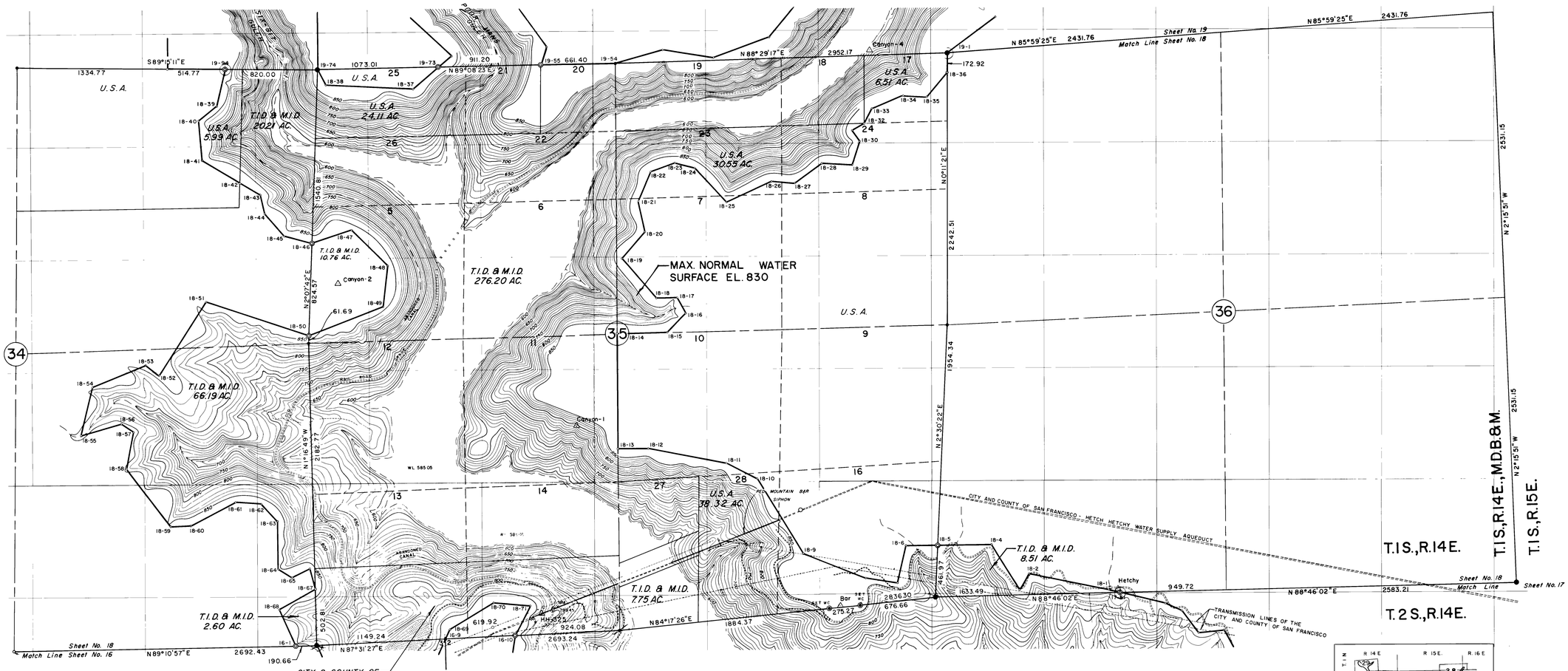
DON PEDRO RESERVOIR

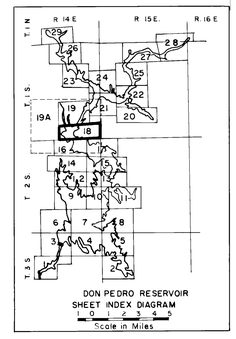
TOPOGRAPHY, PROPERTY & PROJECT BOUNDARY

2299-101

17

2299-101





PROJECT BOUNDARY TRAVERSE

NO.	BEARING	DIST.	NO.	BEARING	DIST.	NO.	BEARING	DIST.
17-51			18-26			18-48	S. 6°08'00"W.	365.24
18-1	N.76°15'00"W.	112.82	18-27	S.84°14'00"E.	209.06	18-49	S.68°24'00"W.	711.08
18-2	N.78°17'00"W.	713.88	18-28	N.53°50'00"E.	294.82	18-50	N.71°41'00"W.	966.81
18-3	S.30°58'00"W.	169.10	18-29	S.87°27'00"E.	269.27	18-51	S.32°43'00"W.	771.42
18-4	N.31°14'00"W.	472.48	18-30	N.18°26'00"E.	218.20	18-52	N.51°42'00"W.	151.65
18-5	S.89°28'00"W.	472.34	18-31	N.37°09'00"W.	118.09	18-53	S.67°23'00"W.	512.38
18-6	S.89°28'00"W.	285.69	18-32	N.60°01'00"E.	135.76	18-54	S.14°23'00"W.	434.63
18-7	S.13°37'00"W.	335.44	18-33	N.26°01'00"E.	140.52	18-55	N.75°07'00"E.	377.67
18-8	N.81°32'00"W.	285.11	18-34	N.67°31'00"E.	305.29	18-56	S.55°27'00"E.	128.71
18-9	N.68°08'13"W.	593.75	18-35	S.86°06'00"E.	205.48	18-57	S.11°21'00"W.	335.55
18-10	N.31°46'00"W.	784.51	18-36	N.40°40'00"E.	290.84	18-58	S.37°20'00"E.	646.42
18-11	N.64°01'00"W.	310.35	19-1	N. 0°11'21"E.	172.92	18-59	N.86°47'00"E.	178.28
18-12	N.78°29'00"W.	706.22	19-73			18-60	N.62°55'00"E.	448.13
18-13	S.88°36'00"W.	265.72	18-37	S.50°02'00"W.	300.77	18-61	S.86°26'00"E.	225.44
18-14	N. 0°10'26"W.	1014.63	18-38	N.87°02'00"W.	777.10	18-62	S.42°09'00"E.	213.10
18-15	N.88°42'46"E.	442.03	19-74	N.25°51'00"W.	152.09	18-63	S. 0°57'00"E.	421.06
18-16	N.42°43'00"E.	242.91	19-94			18-64	S.57°52'00"E.	142.89
18-17	N.29°42'00"W.	151.32	18-39	S.13°26'00"W.	338.85	18-65	N.64°36'00"E.	177.13
18-18	S.88°09'00"W.	186.10	18-40	S.50°12'00"W.	210.88	18-66	S.16°10'00"E.	183.91
18-19	N.40°14'00"W.	467.60	18-41	S. 4°46'00"E.	349.21	18-67	S.60°32'00"W.	372.49
18-20	N.41°51'00"E.	308.77	18-42	S.59°15'00"E.	388.45	18-68	S.24°13'00"E.	353.25
18-21	N.12°36'00"W.	279.73	18-43	S.59°15'00"E.	211.97	16-1		
18-22	N.22°47'00"E.	291.77	18-44	S.13°04'00"E.	172.47	16-9	N.24°14'00"E.	100.00
18-23	N.71°24'00"E.	222.63	18-45	S.40°40'00"E.	262.38	18-69	N.58°28'00"E.	454.33
18-24	S.76°52'00"E.	184.84	18-46	S.75°35'00"E.	256.52	18-70	S.85°03'00"E.	324.25
18-25	S.42°22'00"E.	414.09	18-47	N.71°07'00"E.	370.49	18-71	S.25°43'00"W.	304.18
18-26	N.65°35'00"E.	442.60	18-48	S.45°00'00"E.	451.13	16-10		

THIS MAP CORRECTLY REPRESENTS TOPOGRAPHY SHOWN ON PHOTOGRAMMETRIC MAPS COMPILED BY FAIRCHILD AERIAL SURVEYS INC., R.M.TOWILL INC. AND TELEDYNE GEOTRONICS AND SURVEYS MADE BY ME, OR UNDER MY DIRECTION WHILE EMPLOYED BY THE TURLOCK IRRIGATION DISTRICT AND MODESTO IRRIGATION DISTRICT.

JOHN B. DUFF
L.S. 2244, CALIFORNIA

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TURLOCK IRRIGATION DISTRICT
BY: H. Richard Clauss
H. RICHARD CLAUSS, PRESIDENT

MODESTO IRRIGATION DISTRICT
BY: R E Penney
RICHARD E. PENNEY, PRESIDENT

0°03'40" 17½°
TRUE NORTH
MAGNETIC
N
LONG. 120°24'00" W.

LEGEND

- PROJECT BOUNDARY
- FOUND CORNER
- FOUND CORNER, SET PIPE
- PROPORTIONED CORNER, SET PIPE
- MONUMENT SET ON PROJECT BOUNDARY
- PRIMARY HORIZONTAL CONTROL STATION

Scale 1" = 400'
400 0 400 800 1200 1600 2000
Contour Interval 10 Feet
Datum is Mean Sea Level

COORDINATES, BEARINGS AND DISTANCES ARE BASED ON THE CALIFORNIA STATE COORDINATE SYSTEM, ZONE 3

EXHIBIT K SHEET 18

PROJECT NO. 2299 CALIFORNIA

TURLOCK IRRIGATION DISTRICT
MODESTO IRRIGATION DISTRICT

DON PEDRO PROJECT

DON PEDRO RESERVOIR

TOPOGRAPHY, PROPERTY & PROJECT BOUNDARY

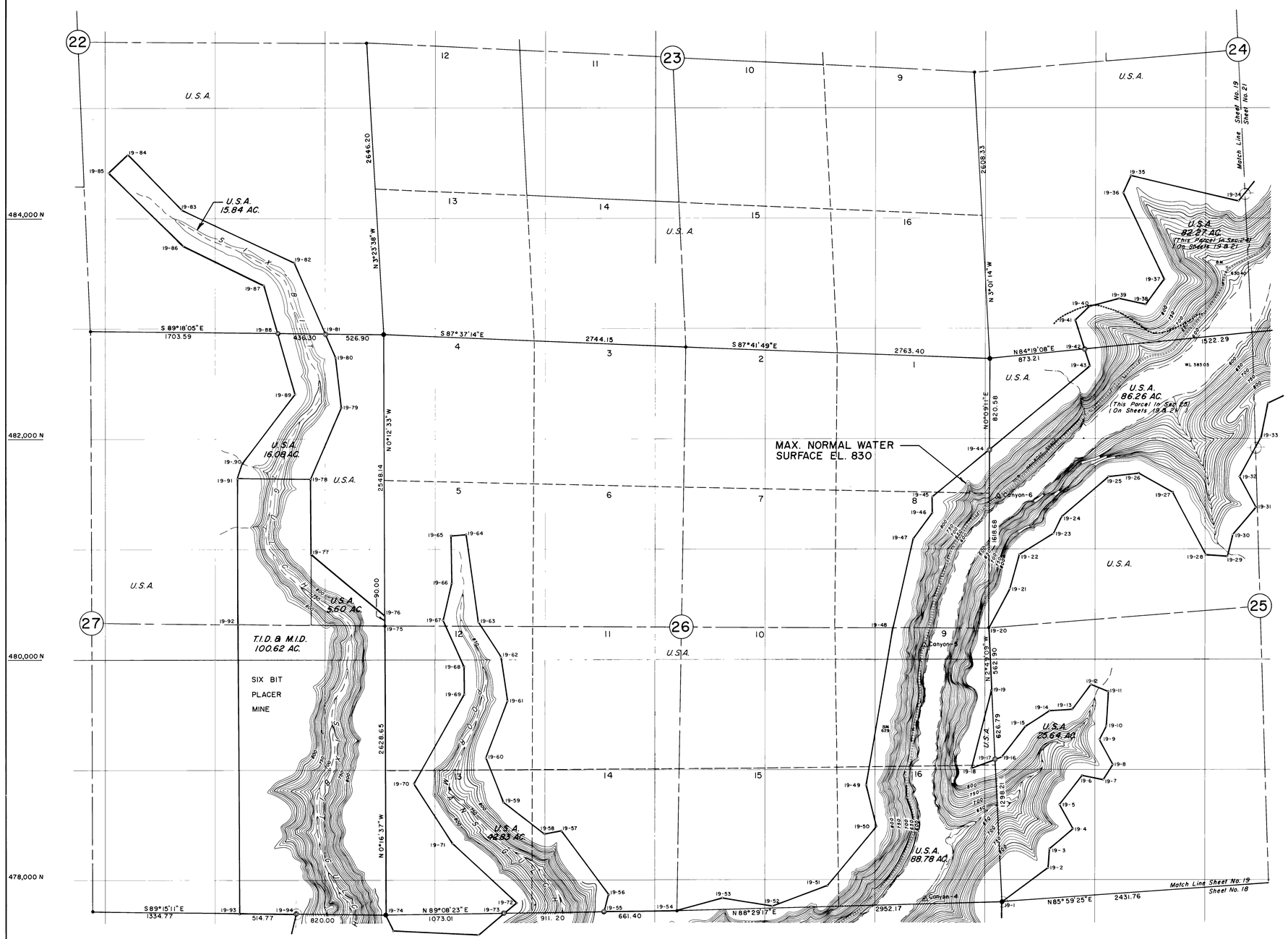
2299-102

Town Line

2299 — 102

18

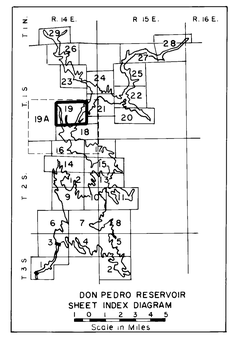
T.1S., R.14E., M.D.B. & M.



PROJECT BOUNDARY TRAVERSE

NO.	BEARING	DIST.
19-1		
19-2	N.53°31'00"E.	526.85
19-3	N. 4°27'00"E.	171.71
19-4	N.49°09'11"E.	282.86
19-5	N.29°43'00"W.	252.20
19-6	N.38°27'00"E.	334.53
19-7	S.79°24'00"E.	190.25
19-8	N.33°00'00"E.	159.77
19-9	N.26°52'00"W.	256.70
19-10	N.26°45'00"E.	135.51
19-11	N. 3°04'00"E.	317.46
19-12	N.68°08'00"W.	169.17
19-13	S.36°50'00"W.	283.60
19-14	S.86°39'00"W.	205.35
19-15	S.55°47'00"W.	268.49
19-16	S.38°29'00"W.	342.33
19-17	S.69°31'00"W.	71.17
19-18	S.69°31'00"W.	224.64
19-19	N.14°18'00"E.	727.18
19-20	N. 2°49'09"W.	562.90
19-21	N.28°53'00"E.	408.61
19-22	N.15°17'00"E.	322.20
19-23	N.58°49'00"E.	361.14
19-24	N.26°00'00"E.	180.24
19-25	N.49°53'00"E.	555.69
19-26	N.83°13'00"E.	270.90
19-27	S.60°35'00"E.	360.45
19-28	S.27°57'00"E.	644.18
19-29	S.87°37'00"E.	192.17
19-30	N.13°58'00"E.	198.88
19-31	N.40°25'00"E.	327.02
19-32	N.28°02'00"W.	312.71
19-33	N.28°40'00"E.	402.32
19-34		
19-35	N.76°36'00"W.	1005.37
19-36	S.24°22'00"W.	174.54
19-37	S.25°34'00"E.	871.30
19-38	S.36°11'00"W.	286.22
19-39	N.77°30'00"W.	244.81
19-40	S.75°28'00"W.	278.93
19-41	S.47°02'00"W.	179.01
19-42	S.17°49'00"E.	281.32
19-43	S.17°49'00"E.	153.52
19-44	S.50°21'00"W.	1192.38
19-45	S.50°21'00"W.	663.39
19-46	S. 1°09'00"W.	150.03
19-47	S.36°22'00"W.	291.81
19-48	S.12°55'00"W.	836.18

NO.	BEARING	DIST.
19-48	S. 9°33'00"W.	1433.89
19-49	S.13°28'00"E.	386.62
19-50	S.39°37'00"W.	701.01
19-51	S.69°33'00"W.	532.54
19-52	N.80°27'00"W.	459.37
19-53	S.74°00'00"W.	429.17
19-54	S.89°08'23"W.	661.40
19-55	N.15°33'00"E.	165.40
19-56	N.36°44'00"W.	722.36
19-57	S.79°32'00"W.	159.66
19-58	N.51°50'00"W.	475.72
19-59	N.21°27'00"W.	426.55
19-60	N.20°45'00"E.	556.07
19-61	N. 8°48'00"W.	398.69
19-62	N.33°31'00"W.	376.64
19-63	N. 7°46'00"W.	807.39
19-64	S.86°14'00"W.	137.30
19-65	S. 1°04'00"E.	433.07
19-66	S.13°33'00"W.	345.63
19-67	S.24°11'00"E.	461.48
19-68	S. 1°34'00"E.	255.10
19-69	S.29°21'00"W.	936.24
19-70	S.33°09'00"E.	643.76
19-71	S.47°18'00"E.	790.48
19-72	S.50°02'00"W.	150.69
19-73		
19-74	N. 0°16'37"W.	2628.65
19-75	N. 0°12'33"W.	90.00
19-76	N.50°10'00"W.	870.69
19-77	N. 0°12'37"W.	678.43
19-78	N.22°48'00"E.	710.98
19-79	N. 6°10'00"W.	457.52
19-80	N.23°43'00"W.	227.30
19-81	N.23°43'00"W.	709.87
19-82	N.64°50'00"W.	1131.34
19-83	N.44°01'00"W.	698.02
19-84	S.45°51'00"W.	238.32
19-85	S.45°23'00"E.	942.59
19-86	S.63°49'00"E.	820.21
19-87	S.15°36'00"E.	454.47
19-88	S.15°36'00"E.	571.36
19-89	S.37°28'00"W.	779.12
19-90	S.16°55'00"W.	154.62
19-91	S. 0°12'41"E.	1321.15
19-92	S. 0°14'43"E.	2623.35
19-93	S.89°15'11"E.	514.77
19-94		



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JOHN B. DUFF
L.S. 2244, CALIFORNIA

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TURLOCK IRRIGATION DISTRICT
BY: H. Richard Clauss
H. RICHARD CLAUSS, PRESIDENT

MODESTO IRRIGATION DISTRICT
BY: R E Penney
RICHARD E. PENNEY, PRESIDENT

0°03'40" 17½° TRUE GRID MAGNETIC N LONGITUDE 120°54'00" W

LEGEND

- PROJECT BOUNDARY
- FOUND CORNER
- FOUND CORNER, SET PIPE
- PROPORTIONED CORNER, SET PIPE
- MONUMENT SET ON PROJECT BOUNDARY
- PRIMARY HORIZONTAL CONTROL STATION

Scale 1" = 400'

400 0 400 800 1200 1600 2000

Contour Interval 10 Feet

Datum is Mean Sea Level

COORDINATES, BEARINGS AND DISTANCES ARE BASED ON THE CALIFORNIA STATE COORDINATE SYSTEM, ZONE 3

EXHIBIT K SHEET 19

PROJECT NO. 2299 CALIFORNIA

TURLOCK IRRIGATION DISTRICT
MODESTO IRRIGATION DISTRICT

DON PEDRO PROJECT

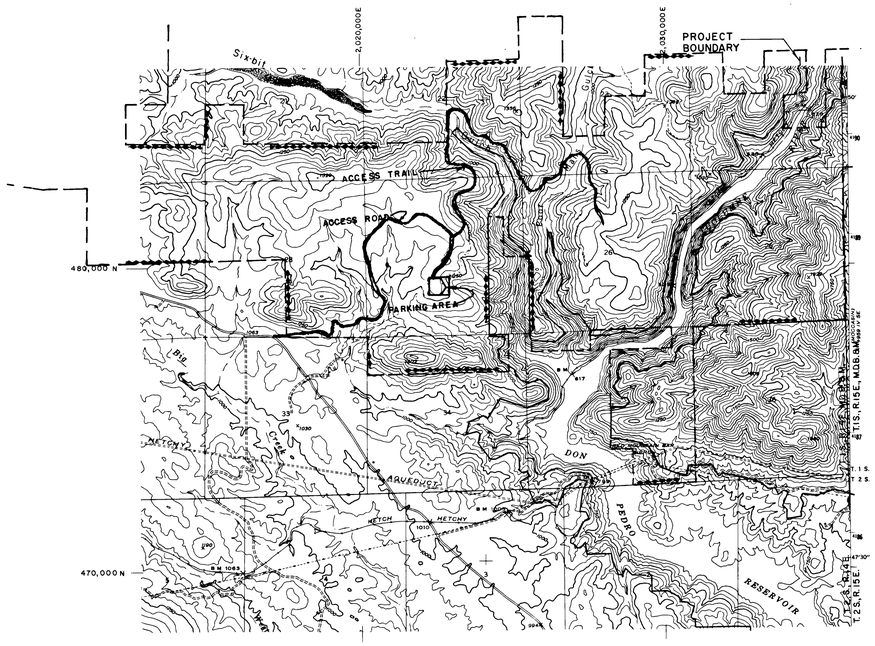
DON PEDRO RESERVOIR

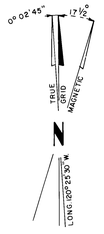
TOPOGRAPHY, PROPERTY & PROJECT. BOUNDARY

2299-103

TEHAMA LINE

2299 - 103





Scale: 1" = 2000'

2000 0 2000 4000 6000 8000 10,000

Contour Interval 50 Feet

Datum is Mean Sea Level

COORDINATES, BEARINGS AND DISTANCES ARE BASED ON THE CALIFORNIA STATE COORDINATE SYSTEM, ZONE 3

LEGEND

PROJECT BOUNDARY

BOUNDARY OF PUBLIC LAND

PROPOSED HUNTING ACCESS RD.

PROPOSED HUNTING ACCESS TRAIL

PROPOSED PARKING LOT

THIS MAP IS FILED IN COMPLIANCE WITH ARTICLE 35 OF THE LICENSE FOR FEDERAL POWER COMMISSION PROJECT NO. 2299 SUBMITTED BY THE UNDERSIGNED THIS 30 TH. DAY OF AUGUST 1974.

TURLOCK IRRIGATION DISTRICT

BY: Richard Clauss

H. RICHARD CLAUSS, PRESIDENT

MODESTO IRRIGATION DISTRICT

BY: R. E. Penney

RICHARD E. PENNEY, PRESIDENT

ADDITIONAL LAND TO BE INCLUDED WITHIN PROJECT BOUNDARY TO PROVIDE HUNTING ACCESS.

TO BE ACQUIRED FROM PRIVATE OWNERSHIP.

Beginning at the S quarter section corner of section 28 TWP 1S, R. 14E M.D. B+M; thence along the south line of said section N 89° 08' 48" W 689. 91 feet; thence N 0° 51' 12" E 40 feet; thence S 89° 08' 48" E 612.11 feet, thence on a tangent curve of which the radius is 280 feet, through a central angle of 12° 38' 42" a distance of 61.80 feet; thence N 78° 12' 30" E 15.78 feet to a point on the North - South quarter section line of said section 28; thence along said quarter section line S 0° 25' 28" E 50.21 feet to the point of beginning.

CONTAINING 0.64 ACRES.

OVER GOVERNMENT LAND.

Access Road.

A strip of land 40 feet wide on a curved location, the center of which (described to the point of intersection of the tangents) is as follows.

P.I. NO.	BEARING	DISTANCE	COORDINATES NORTH	EAST
2.	N. 78°12'34"E.	45.00'	477,718.39	2,017,560.21
		363.88' — Enter Government Land		
3.	N. 81°58'26"E.	157.40'		
4.	S. 84°30'42"E.	173.64'		
5.	N. 75°46'40"E.	153.81'		
6.	N. 85°37'47"E.	158.40'		
7.	N. 82°24'09"E.	112.15'		
8.	S. 85°39'29"E.	90.12'		
9.	S. 55°14'22"E.	67.39'		
10.	S. 39°56'15"E.	108.67'		
11.	N. 78°25'58"E.	91.91'		
12.	N. 49°17'17"E.	129.09'		
13.	N. 29°12'22"E.	67.16'		
14.	N. 02°12'01"E.	241.72'		
15.	N. 36°37'23"W.	57.08'		
16.	N. 40°24'12"E.	83.01'		
17.	S. 42°26'56"E.	236.47'		
18.	S. 63°42'34"E.	158.35'		
19.	N. 44°04'18"E.	103.14'		
20.	N. 87°18'56"E.	189.54'		
21.	N. 58°19'03"E.	204.46'		
22.	N. 11°56'25"E.	210.18'		
23.	N. 85°37'02"E.	88.04'		
24.	S. 39°34'17"E.	55.78'		
25.	S. 56°17'55"E.	208.25'	478,370.94	2,020,075.46
26.	S. 76°04'16"E.	77.71'	478,255.39	2,020,248.71
27.	N. 82°59'53"E.	194.58'		
28.	N. 43°56'02"E.	158.26'		
29.	N. 27°51'41"E.	294.57'		
30.	N. 18°23'35"E.	279.16'		
31.	N. 19°40'16"W.	84.52'		
32.	N. 43°36'23"W.	192.00'		
33.	N. 23°30'00"W.	749.96'		
34.	N. 08°03'22"W.	385.69'		
35.	N. 18°39'47"W.	285.44'	480,187.95	2,020,338.83
36.	S. 33°55'33"E.	403.96'	480,740.11	2,020,152.33
37.	N. 41°50'38"E.	548.26'		
38.	N. 33°29'58"E.	175.65'		
39.	N. 72°57'18"E.	107.29'		
40.	S. 43°05'52"E.	147.74'		
41.	S. 68°10'02"E.	140.89'		
42.	S. 79°04'42"E.	343.61'		
43.	N. 72°17'38"E.	126.17'		
44.	N. 43°05'58"E.	302.63'		
45.	N. 74°50'18"E.	282.23'		
46.	S. 56°29'23"E.	442.14'	481,769.42	2,022,111.57
47.	S. 49°45'19"E.	799.86'		
48.	S. 14°53'30"W.	777.98'	481,008.57	2,023,090.75
49.	S. 41°59'19"W.	695.77'		
50.	S. 09°29'22"E.	56.97'	479,683.38	2,022,434.75

CONTAINING APPROX. 10.62 AC.

Parking Area.

The southeast quarter of the northeast quarter of the southwest quarter of section 27, TWP 1S, R. 14E M.D. B+M.

Cty. 10 acres

Access Trail.

A strip of land 30 feet wide beginning at approximately P.I. no. 46 of the access road and running Northerly, Easterly and Southerly around the resevoir arms in Six Bit Gulch and Poor Mans Gulch, a distance of approximately 14,500 feet to a point on the ridge North of the center of Section 26, TWP 1S, R. 14E.

Cty. Approx. 10 acres

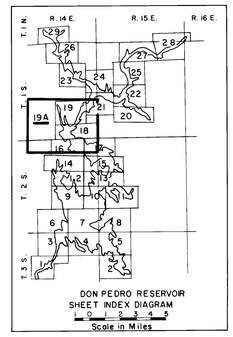


EXHIBIT K SHEET 19A

PROJECT NO. 2299 CALIFORNIA

TURLOCK IRRIGATION DISTRICT
MODESTO IRRIGATION DISTRICT

DON PEDRO PROJECT

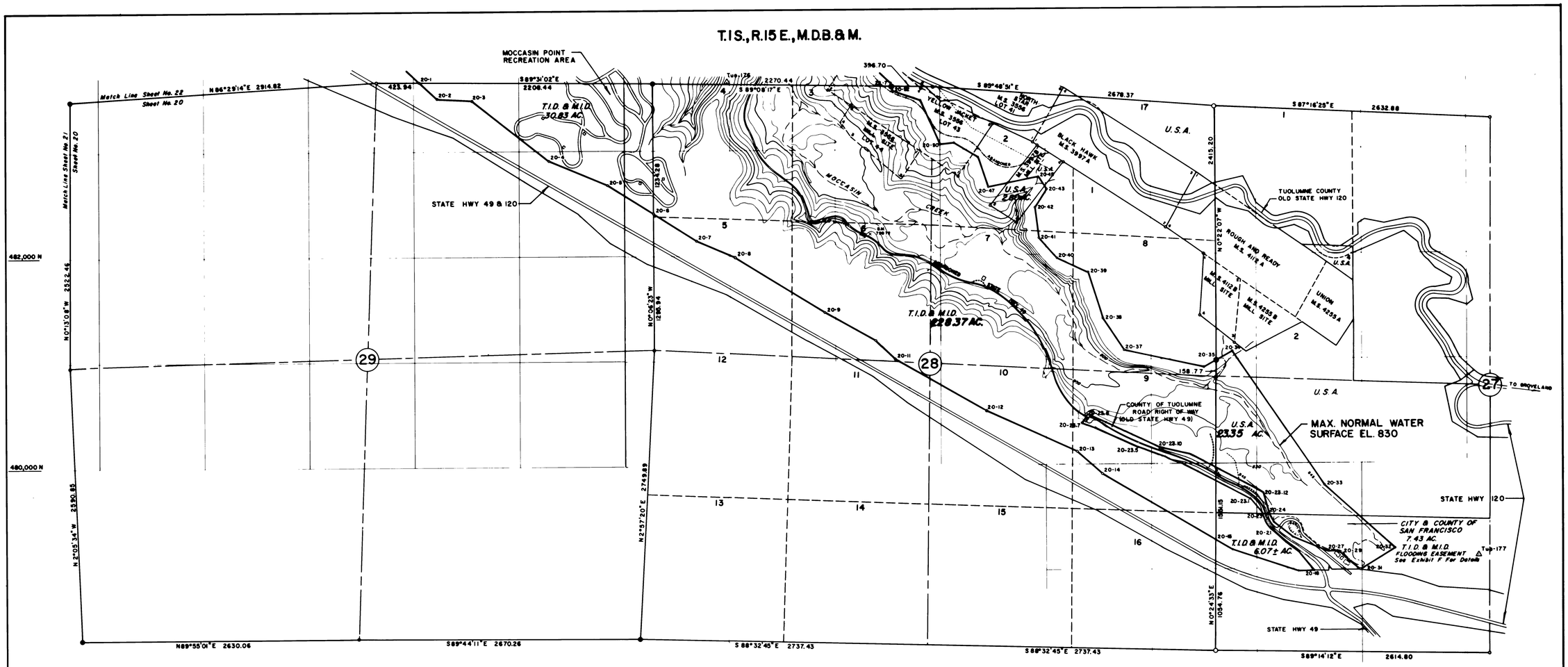
DON PEDRO RESERVOIR

TOPOGRAPHY, PROPERTY & PROJECT BOUNDARY

2299-104

2299 - 104

T.1S., R.15 E., M.D.B.& M.



PROJECT BOUNDARY TRAVERSE

NO.	BEARING	DIST.
20-1	S.46°36'12"E.	226.97
20-2	S.87°01'43"E.	330.95
20-3	S.51°43'42"E.	929.85
20-4	S.67°12'05"E.	604.67
20-5	S.57°47'09"E.	505.63
20-6	S.57°47'09"E.	495.17
20-7	S.67°12'06"E.	403.11
20-8	S.58°21'29"E.	1000.45
20-9	S.60°04'35"E.	555.00
20-10	S.46°18'57"E.	252.24
20-11	S.60°04'35"E.	1000.00
20-12	S.65°32'44"E.	944.30
20-13	S.49°17'31"E.	320.66
20-14	S.59°22'00"E.	1239.11
20-15	S.59°22'00"E.	188.08
20-16	S.72°15'20"E.	653.36
20-17	S.89°26'29"E.	152.56
20-18	N.37°35'39"W.	223.20
20-19 ①	N.53°21'24"W.	161.11±
20-20 ②	N.49°27'12"W.	168.91±
20-21	● TANGENT CURVE 26°27'12" RT. R=250.00 L=115.42	
20-22	● N.23°00'00"W.	62.43±
20-23	● SEE RIGHT COLUMN	
20-24	S.28°42'32"E.	81.97
20-25	S.52°17'00"E.	228.82
20-26		

NO.	BEARING	DIST.
20-26	S.66°31'00"E.	366.35
20-27	N.86°03'00"E.	58.14
20-28	S.68°37'46"E.	74.10
20-29	S.46°18'43"E.	92.66
20-30	S.56°02'27"E.	143.99
20-31	N.57°38'00"E.	381.86
20-32	N.48°13'00"W.	905.56
20-33	N.34°20'00"W.	1545.97
20-34	S.60°30'00"W.	170.00
20-35	S.60°30'00"W.	138.81
20-36	N.77°37'00"W.	774.01
20-37	N.33°31'00"W.	385.83
20-38	N.17°11'00"W.	460.54
20-39	N.65°53'00"W.	325.42
20-40	N.41°03'00"W.	266.51
20-41	N. 6°54'00"W.	291.11
20-42	N.34°23'00"E.	207.20
20-43	N.34°54'00"W.	32.75
20-44	N.34°54'00"W.	112.34
20-45	S.78°18'00"W.	294.35
20-46	S.78°18'00"W.	193.79
20-47	N.17°58'00"W.	304.85
20-48	N.60°20'00"W.	264.69
20-49	S.85°16'00"W.	133.45
20-50	N.24°20'00"W.	458.74
20-51	N.71°04'00"W.	277.92
20-52	N.11°37'00"W.	42.78
22-7		

NO.	BEARING	DIST.
20-23	N. 39° 55' 04" W.	182.32
20-23.1	N. 62° 11' 12" W.	730.00
20-23.2	N. 69° 40' 37" W.	143.96
20-23.3	N. 61° 06' 48" W.	33.12
20-23.4	N. 69° 28' 08" W.	268.02
20-23.5	N. 65° 32' 04" W.	439.46
20-23.6	N. 68° 51' 02" W.	146.89
20-23.7	N. 33° 50' 43" E.	102.34
20-23.8	S. 69° 30' 29" E.	197.80
20-23.9	S. 63° 17' 46" E.	556.34
20-23.10	S. 77° 08' 45" E.	305.66
20-23.11	S. 62° 11' 12" E.	780.13
20-23.12	S. 15° 24' 52" E.	205.49
20-24		

① TO SWLY BDY OF COUNTY RD R/W(OLD STATE HWY 49)
② ALONG COUNTY RD R/W
③ ALONG COUNTY RD R/W
④ ALONG COUNTY RD R/W
⑤ ALONG COUNTY RD R/W
● TO NORTH LINE S.1/2 OF THE SW 1/4 OF SEC. 27

THIS MAP CORRECTLY REPRESENTS TOPOGRAPHY SHOWN ON PHOTOGRAMMETRIC MAPS COMPILED BY FAIRCHILD AERIAL SURVEYS INC., R.M. TOWILL INC. AND TELEDYNE GEOTRONICS AND SURVEYS MADE BY ME, OR UNDER MY DIRECTION WHILE EMPLOYED BY THE TURLOCK IRRIGATION DISTRICT AND MODESTO IRRIGATION DISTRICT.

JOHN B. DUFF
L.S. 2244, CALIFORNIA

THIS MAP IS FILED IN COMPLIANCE WITH ARTICLE 35 OF THE LICENSE FOR FEDERAL POWER COMMISSION PROJECT NO. 2299 SUBMITTED BY THE UNDERSIGNED THIS 30 TH. DAY OF AUGUST 1974.

TURLOCK IRRIGATION DISTRICT
BY: H. RICHARD CLAUSS, PRESIDENT

MODESTO IRRIGATION DISTRICT
BY: RICHARD E. PENNEY, PRESIDENT

LEGEND

- PROJECT BOUNDARY
- ○ FOUND CORNER
- ● FOUND CORNER, SET PIPE
- ⌐ PROPORTIONED CORNER, SET PIPE
- ● MONUMENT SET ON PROJECT BOUNDARY
- △ PRIMARY HORIZONTAL CONTROL STATION

400 0 400 800 1200 1600 2000

Contour Interval 10 Feet
Datum is Mean Sea Level

COORDINATES, BEARINGS AND DISTANCES ARE BASED ON THE CALIFORNIA STATE COORDINATE SYSTEM, ZONE 3

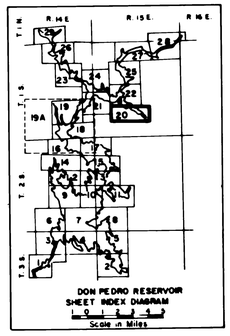


EXHIBIT K SHEET 20

PROJECT NO. 2299 CALIFORNIA
TURLOCK IRRIGATION DISTRICT
MODESTO IRRIGATION DISTRICT

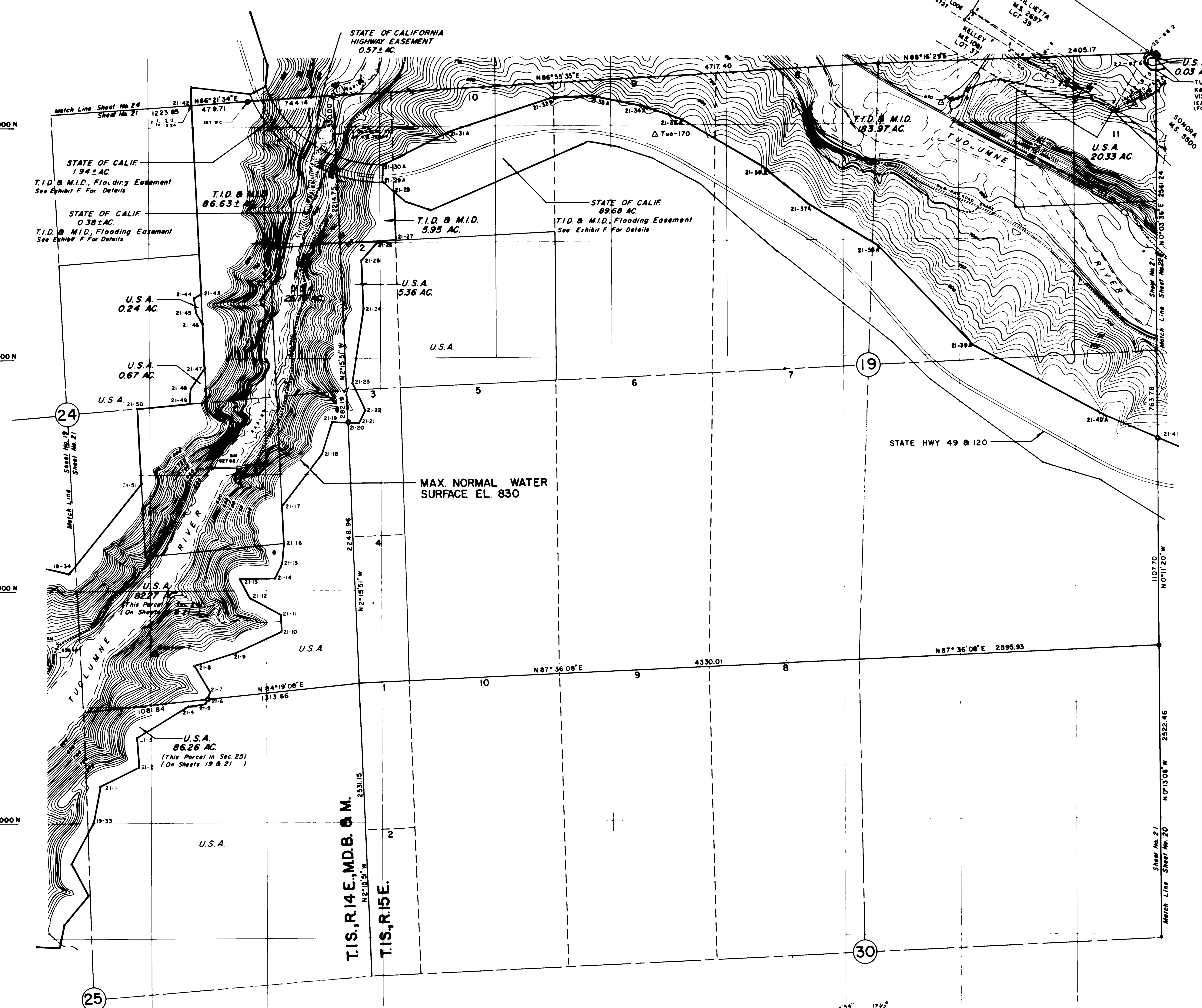
DON PEDRO PROJECT

DON PEDRO RESERVOIR

TOPOGRAPHY, PROPERTY & PROJECT BOUNDARY

Revised July 15, 1980

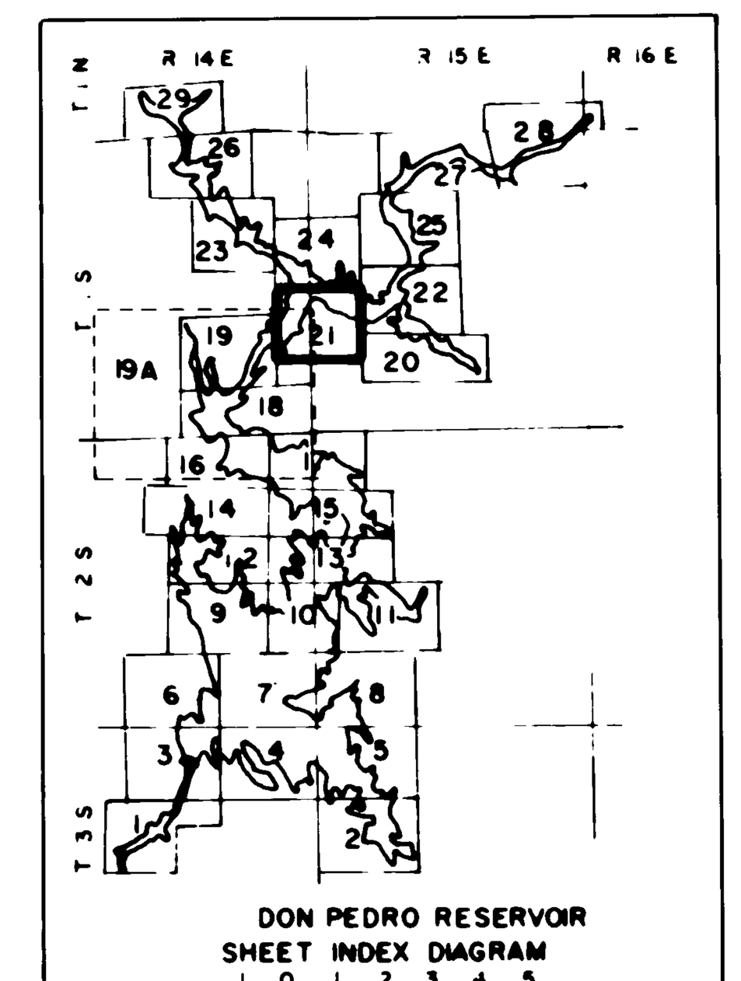
2299-141



PROJECT BOUNDARY TRAVERSE

NO.	BEARING	DIST.	NO.	BEARING	DIST.
19-33	N.11°17'00"E.	322.22	21-27	N. 01°32'30"W.	432.02
21-1	N.64°25'00"E.	368.11	21-28	N. 47°21'25"W.	114.34
21-2	N. 3°20'00"W.	257.44	21-29A	N. 00°22'10"W.	146.00
21-3	N.58°45'00"E.	514.67	21-30A	N. 62°48'05"E.	619.25
21-4	N.82°36'00"E.	155.29	21-31A	N. 72°19'27"E.	960.18
21-5	N.19°56'00"E.	42.52	21-32A	N. 88°11'23"E.	343.76
21-6	N.19°56'00"E.	65.98	21-33A	S. 78°27'26"E.	459.24
21-7	N.30°20'00"W.	265.32	21-34A	S. 70°06'03"E.	346.57
21-8	N.73°00'00"E.	373.26	21-35A	S. 59°21'38"E.	829.53
21-9	N.64°58'00"E.	437.08	21-36A	S. 49°31'59"E.	506.36
21-10	N. 2°26'00"W.	141.13	21-37A	S. 59°00'35"E.	686.24
21-11	N.60°57'00"W.	298.57	21-38A	S. 43°25'40"E.	1180.65
21-12	N.27°22'00"W.	191.43	21-39A	S. 61°26'43"E.	1311.71
21-13	N.89°49'00"E.	302.00	21-40A	S. 67°2'23"E.	481.35
21-14	N.26°06'00"E.	136.79	21-41		
21-15	N. 2°56'00"E.	175.28	21-42	S. 2°34'36"E.	1625.16
21-16	N. 2°25'14"W.	322.00	21-43	S.56°43'00"W.	70.40
21-17	N.37°50'00"E.	572.91	21-44	S. 7°01'00"E.	130.98
21-18	N.16°57'00"E.	281.22	21-45	S.32°00'00"E.	102.56
21-19	S.87°36'00"E.	141.07	21-46	S. 2°34'36"E.	388.00
21-20	S.87°36'00"E.	98.14	21-47	S.34°47'00"W.	213.56
21-21	N.28°26'00"E.	123.94	21-48	S. 4°54'00"W.	135.71
21-22	N.24°37'00"W.	264.01	21-49	S.85°15'22"W.	457.96
21-23	N. 8°45'00"E.	631.34	21-50	S. 2°43'49"E.	646.00
21-24	N. 2°06'00"W.	436.29	21-51	S.38°54'00"W.	991.61
21-25	N.42°11'00"E.	213.72	19-34		
21-26	N.87°07'11"E.	150.75			
21-27					

22-87.5 TO 22-88.2 SEE SHEET 22



DON PEDRO RESERVOIR
SHEET INDEX DIAGRAM
1 0 1 2 3 4 5
Scale in Miles

THIS MAP CORRECTLY REPRESENTS TOPOGRAPHY SHOWN ON PHOTOGRAMMETRIC MAPS COMPILED BY FAIRCHILD AERIAL SURVEYS INC., R.M. TOWILL INC. AND TELEDYNE GEOTRONICS AND SURVEYS MADE BY ME, OR UNDER MY DIRECTION WHILE EMPLOYED BY THE TURLOCK IRRIGATION DISTRICT AND MODESTO IRRIGATION DISTRICT.

John B. Duff
JOHN B. DUFF
L.S. 2244, CALIFORNIA

THIS MAP IS FILED IN COMPLIANCE WITH ARTICLE 35 OF THE LICENSE FOR FEDERAL POWER COMMISSION PROJECT NO. 2299 SUBMITTED BY THE UNDERSIGNED THIS 30 TH. DAY OF AUGUST 1974.

TURLOCK IRRIGATION DISTRICT
BY: Richard Clauss
H. RICHARD CLAUSS, PRESIDENT

MODESTO IRRIGATION DISTRICT
BY: R E Penney
RICHARD E. PENNEY, PRESIDENT

LEGEND

- PROJECT BOUNDARY
- FOUND CORNER
- FOUND CORNER, SET PIPE
- PROPORTIONED CORNER, SET PIPE
- MONUMENT SET ON PROJECT BOUNDARY
- △ PRIMARY HORIZONTAL CONTROL STATION

Scale: 1" = 400'
400 0 400 800 1200 1600 2000

Contour Interval 10 Feet
Datum is Mean Sea Level

COORDINATES, BEARINGS AND DISTANCES ARE BASED ON THE CALIFORNIA STATE COORDINATE SYSTEM, ZONE 3

Revised July 15, 1980

EXHIBIT K **SHEET 21**

PROJECT NO. 2299 CALIFORNIA

TURLOCK IRRIGATION DISTRICT
MODESTO IRRIGATION DISTRICT

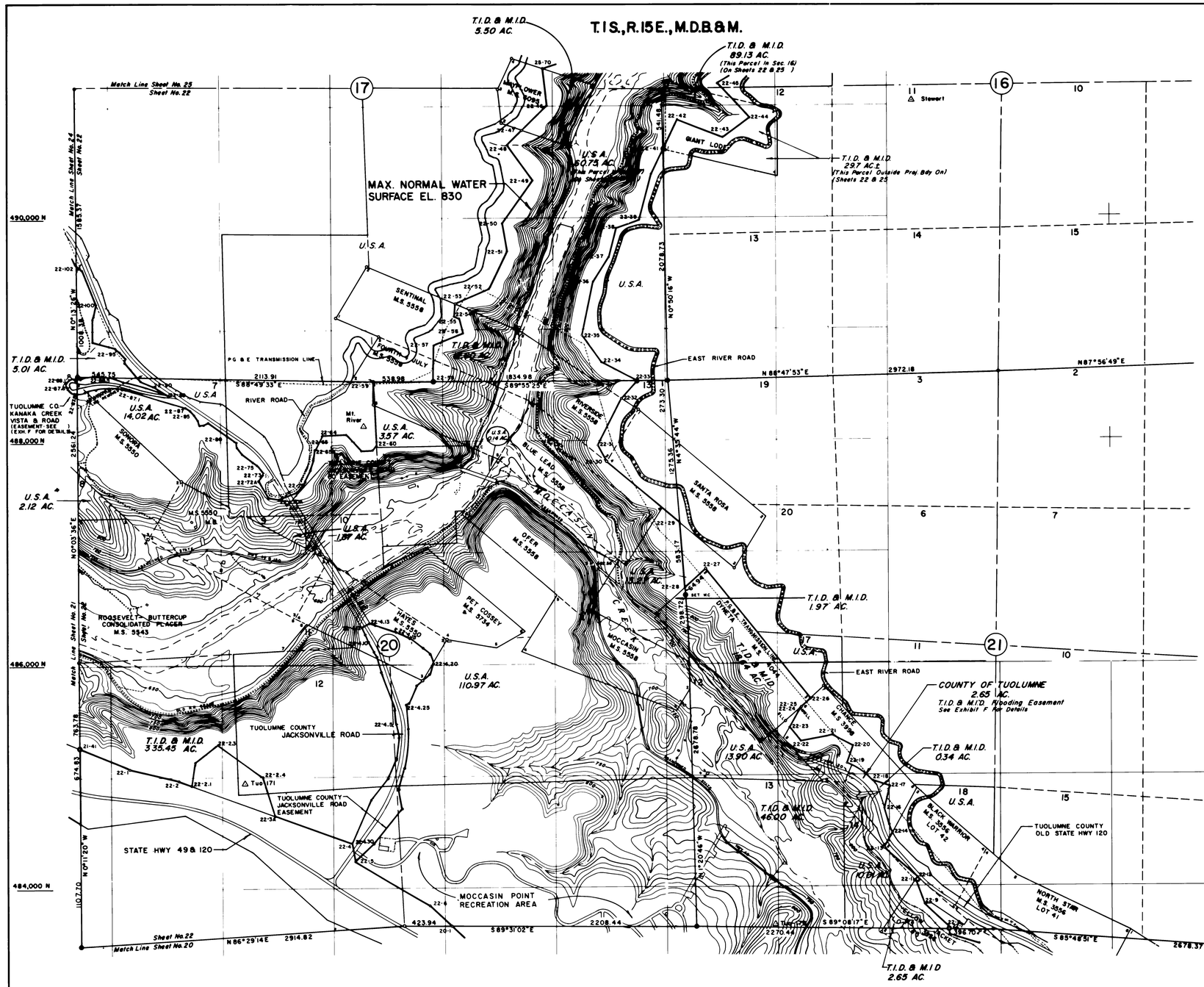
DON PEDRO PROJECT

DON PEDRO RESERVOIR

TOPOGRAPHY, PROPERTY & PROJECT BOUNDARY

2299-142

T.1S., R.15E., M.D.B.&M.

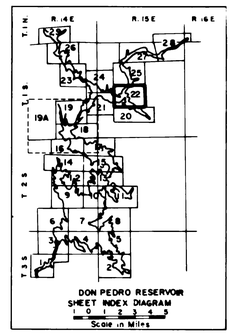


PROJECT BOUNDARY TRAVERSE

NO.	BEARING	DIST.
22-2	S. 6°41'44"E.	122.50
22-2.1	N. 11°59'09"E.	200.00
22-2.2	N. 49°29'09"E.	260.00
22-2.3	S. 55°34'38"E.	500.00
22-2.4	S. 13°33'37"E.	357.62
22-3A	S. 7°40'27"E.	759.37
22-4	N. 24°14'29"E.	408.56
22-4.1	N. 39°19'15"E.	251.86
22-4.2	N. 22°18'51"E.	194.19
22-4.3	N. 8°10'38"E.	194.79
22-4.4	N. 10°54'15"W.	116.37
22-4.5	N. 6°16'36"W.	131.96
22-4.6	N. 20°04'20"W.	358.14
22-4.7	N. 15°17'50"W.	144.42
22-4.8	N. 29°06'45"W.	50.85
22-4.9	N. 29°26'13"W.	99.30
22-4.10	N. 19°47'31"W.	62.45
22-4.11	N. 26°41'10"W.	83.46
22-4.12	N. 58°30'15"E.	80.00
22-4.13	S. 67°34'21"E.	60.63
22-4.14	S. 71°23'45"E.	195.88
22-4.15	S. 65°55'31"E.	127.66
22-4.16	S. 54°03'23"E.	151.04
22-4.17	S. 50°21'11"E.	79.30
22-4.18	S. 16°01'46"E.	86.15
22-4.19	S. 16°14'38"E.	4.36
22-4.20	S. 19°36'45"W.	94.71
22-4.21	S. 48°10'19"W.	92.92
22-4.22	S. 50°18'46"W.	67.92
22-4.23	S. 22°52'36"W.	173.51
22-4.24	S. 57°01'28"W.	31.02
22-4.25	S. 4°23'46"E.	216.92
22-4.26	NON-TANGENT CURVE Δ=13°59'48"RT. R=1440 L=351.77 CHORD S. 6°31'34"W 350.90	
22-4.27	S. 16°13'47"W.	205.96
22-4.28	S. 11°36'30"E.	170.12
22-4.29	S. 38°12'55"W.	406.48
22-4.30	S. 49°52'00"W.	102.02
22-4.31	S. 48°07'16"W.	121.56
22-5		
22-87		
22-87.1	N. 74°29'26"W.	608.10
22-87.2	N. 87°12'29"W.	116.94
22-87.3	S. 80°38'24"W.	113.84
22-87.4	S. 79°15'46"W.	97.46
22-87.5	S. 85°01'21"W.	103.32
22-87.6	NON-TANGENT CURVE Δ=101°39'28"RT. R=65 L=115.35 N. 6°40'56"E.	38.73
22-88.1	TANGENT CURVE Δ=133°33'25"RT. R=55 L 128.21	
22-88.2	TANGENT CURVE Δ= 58°02'04"LT. R= 30 L 30.39	
22-88.3	N. 82°12'17"E.	157.58
22-88.4	S. 88°49'40"E.	115.00
22-88.5	S. 68°35'09"E.	125.02
22-88.6	S. 73°47'54"E.	429.24
22-89		

NO.	BEARING	DIST.
21-41	S. 67°02'23"E.	485.97
22-1	S. 76°07'19"E.	451.26
22-2	S. 69°41'44"E.	554.56
22-3	S. 70°40'27"E.	1109.37
22-4	SEE LEFT COLUMN	
22-5	S. 58°56'52"E.	777.35
22-6	S. 48°36'12"E.	266.61
20-1		
22-7		
22-8	N. 11°37'00"W.	31.70
22-9	N. 47°27'00"W.	285.39
22-10	N. 22°09'10"W.	226.91
22-11	N. 42°52'44"W.	1.71
22-12	N. 33°23'34"E.	39.06
22-13	N. 48°43'15"W.	399.65
22-14	NON-TANGENT CURVE Δ=10°31'36" RT. R= 429.88 L= 78.98 CHORD N. 19°08'32"W. 78.87	
22-15	N. 17°48'03"W.	147.25
22-16	N. 13°56'00"E.	210.38
22-17	N. 71°53'00"W.	166.96
22-18	NON-TANGENT CURVE Δ=27°30'11" LT. R= 584.83 L=280.73 CHORD N. 55°37'38"W. 278.04	
22-19	N. 19°21'00"E.	169.70
22-20	N. 63°04'00"W.	211.98
22-21	S. 78°49'00"W.	283.45
22-22	N. 38°03'00"W.	159.04
22-23	N. 29°13'24"E.	186.24
22-24	N. 29°13'24"E.	16.70
22-25	N. 47°55'35"E.	112.18
22-26	N. 38°49'00"W.	1495.76
22-27	S. 47°57'36"W.	248.46
22-28	N. 4°35'44"W.	583.17
22-29	N. 50°05'09"W.	854.08
22-30	N. 26°13'00"W.	175.09
22-31	N. 27°21'00"E.	462.96
22-32	N. 42°53'00"E.	211.98
22-33	N. 61°36'00"W.	362.59
22-34	N. 35°39'00"E.	300.27
22-35	N. 11°49'00"E.	493.45
22-36	N. 32°46'00"E.	256.86
22-37	N. 15°44'00"E.	269.09
22-38	N. 71°44'00"E.	216.93
22-39	N. 14°57'00"E.	427.12
22-40	N. 25°46'00"E.	247.65
22-41	N. 25°46'00"E.	295.68
22-42	S. 68°21'00"E.	436.36
22-43	N. 54°05'00"E.	300.04
22-44	N. 42°59'00"W.	422.40
22-45		
25-70		
22-46	S. 7°14'00"E.	339.33
22-47	S. 45°48'00"W.	318.50
22-48	S. 45°48'00"W.	183.60
22-49	S. 35°31'00"E.	390.65
22-50	S. 35°51'00"W.	471.27
22-51	S. 9°34'00"E.	258.68

NO.	BEARING	DIST.
22-51	S. 26°13'00"W.	373.33
22-52	S. 66°18'00"W.	334.58
22-53	S. 4°54'36"W.	110.41
22-54	S. 66°56'15"E.	50.00
22-55	S. 15°40'30"E.	134.50
22-56	S. 67°13'27"W.	282.59
22-57	S. 2°38'00"W.	327.36
22-58	N. 89°55'25"W.	538.98
22-59	S. 3°00'21"E.	587.00
22-60	S. 55°19'00"W.	48.36
22-61	S. 88°14'00"W.	97.05
22-62	N. 42°20'00"W.	197.50
22-63	S. 87°22'00"W.	217.23
22-64	S. 27°56'57"W.	147.20
22-65A	S. 9°27'44"W.	91.24
22-66A	S. 17°31'32"W.	99.62
22-67A	S. 21°48'05"W.	107.70
22-68A	S. 38°17'25"W.	121.04
22-69A	S. 70°01'01"W.	175.57
22-70A	N. 83°39'35"W.	90.55
22-71A	N. 30°27'56"W.	177.51
22-72A	N. 32°47'51"E.	77.45
22-73	N. 40°50'19"E.	7.44
22-74	N. 41°13'33"W.	95.21
22-75	N. 53°14'52"W.	46.09
22-76	N. 52°07'47"W.	111.27
22-77	N. 40°04'50"W.	82.18
22-78	N. 8°00'42"W.	47.63
22-79	N. 55°18'34"W.	105.61
22-80	N. 55°18'34"W.	201.39
22-81	S. 70°13'41"W.	43.01
22-82	S. 79°41'29"W.	35.36
22-83	N. 18°26'22"W.	50.00
22-84	N. 36°52'28"W.	63.24
22-85	N. 43°59'59"W.	50.99
22-86	N. 55°18'34"W.	50.00
22-87	SEE LEFT COLUMN	
22-89	N. 57°49'57"W.	154.78
22-90	N. 67°47'25"W.	119.45
22-91	N. 40°22'14"W.	43.11
22-92	N. 40°22'14"W.	179.86
22-93	N. 14°29'09"E.	37.10
22-94	N. 44°24'47"W.	82.13
22-95	N. 46°57'27"W.	47.82
22-96	N. 75°38'12"W.	206.88
22-97	N. 1°00'57"W.	209.24
22-98	N. 26°20'46"E.	26.90
22-99	N. 12°55'30"E.	105.69
22-100	N. 21°40'00"W.	343.00
22-101	N. 48°13'56"W.	73.39
22-102		



THIS MAP CORRECTLY REPRESENTS TOPOGRAPHY SHOWN ON PHOTOGRAMMETRIC MAPS COMPILED BY FAIRCHILD AERIAL SURVEYS INC., R.M. TOWILL, INC AND TELEDYNE GEOTRONICS AND SURVEYS MADE BY ME, OR UNDER MY DIRECTION WHILE EMPLOYED BY THE TURLOCK IRRIGATION DISTRICT AND MODESTO IRRIGATION DISTRICT.

JOHN B. DUFF
L.S. 2244, CALIFORNIA

THIS MAP IS FILED IN COMPLIANCE WITH ARTICLE 36 OF THE LICENSE FOR FEDERAL POWER COMMISSION PROJECT NO. 2299 SUBMITTED BY THE UNDERSIGNED THIS 30 TH. DAY OF AUGUST 1974.

TURLOCK IRRIGATION DISTRICT
BY: H. Richard Clauss
H. RICHARD CLAUSS, PRESIDENT

MODESTO IRRIGATION DISTRICT
BY: R E Penney
RICHARD E. PENNEY, PRESIDENT

0° 08' 07" 17½° TRUE MID MAGNETIC N LONG 120° 50' 00" W

LEGEND
- PROJECT BOUNDARY
- FOUND CORNER
- FOUND CORNER, SET PIPE
- PROPORTIONED CORNER, SET PIPE
- MONUMENT SET ON PROJECT BOUNDARY
- PRIMARY HORIZONTAL CONTROL STATION

400 0 400 800 1200 1600 2000

Contour Interval 10 Feet
Datum is Mean Sea Level

COORDINATES, BEARINGS AND DISTANCES ARE BASED ON THE CALIFORNIA STATE COORDINATE SYSTEM, ZONE 3

Revised July 15, 1980

EXHIBIT K SHEET 22

PROJECT NO. 2299 CALIFORNIA

TURLOCK IRRIGATION DISTRICT
MODESTO IRRIGATION DISTRICT

DON PEDRO PROJECT

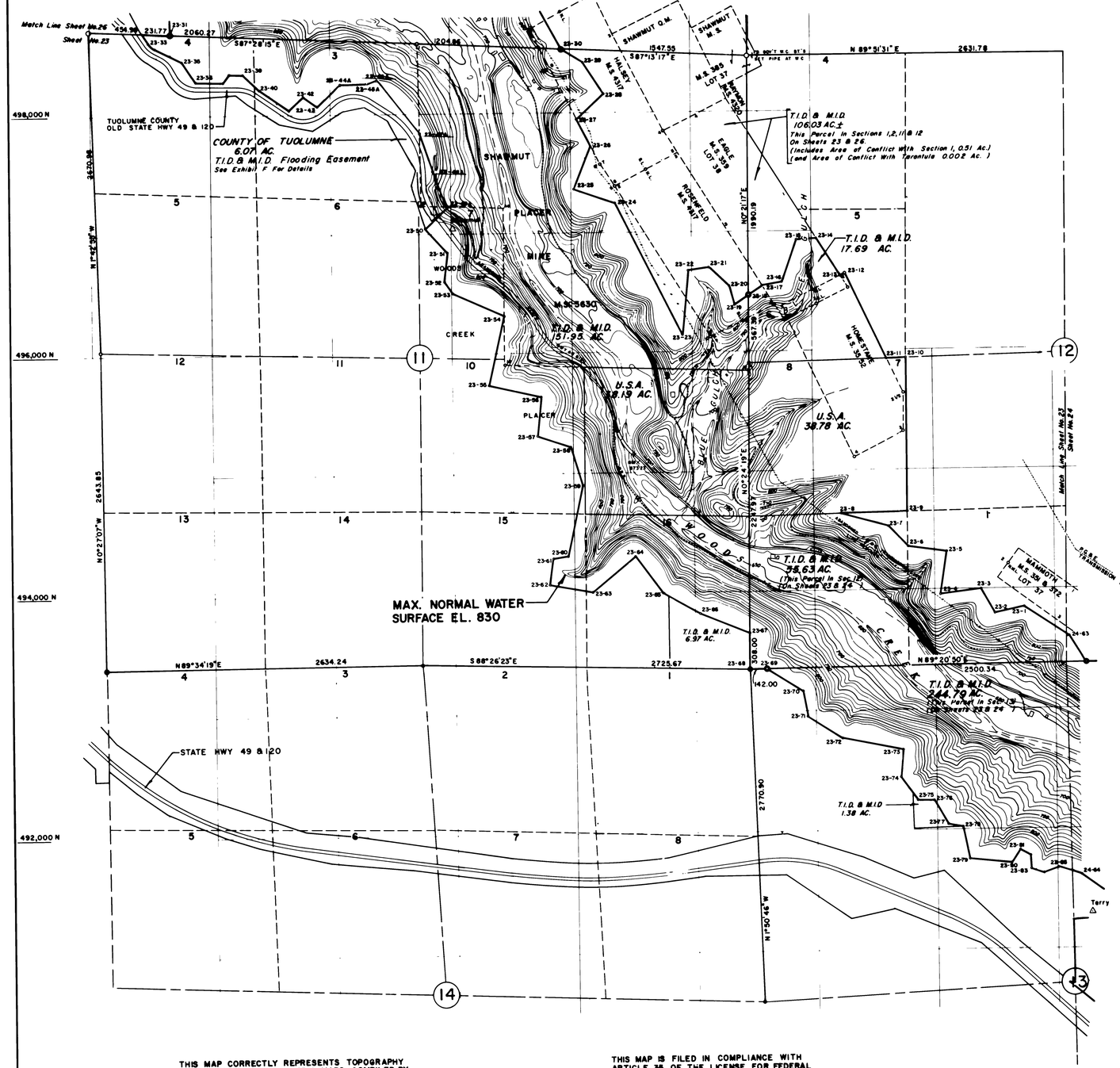
DON PEDRO RESERVOIR

TOPOGRAPHY, PROPERTY & PROJECT BOUNDARY

2299-143

11/12

T.1S., R.14E., M.D.B.& M.

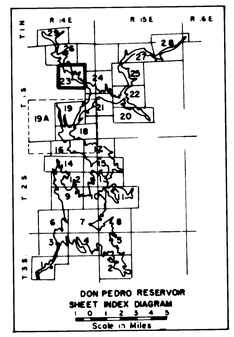


PROJECT BOUNDARY TRAVERSE

NO.	BEARING	DIST.
24-63		
23-1	N.57°28'00"W.	446.70
23-2	S.77°46'00"W.	251.15
23-3	N.28°10'00"W.	234.55
23-4	S.82°12'00"W.	345.45
23-5	N. 9°00'00"E.	364.48
23-6	N.82°22'00"W.	322.30
23-7	N.43°10'00"W.	236.18
23-8	N.73°58'00"W.	408.75
23-9	N.89°04'15"E.	556.23
23-10	N. 0°20'05"E.	1284.33
23-11	S.88°47'38"W.	168.97
23-12	N.25°30'13"W.	789.52
23-13	S.63°17'32"W.	44.91
23-14	N.32°01'48"W.	375.48
23-15	S.84°42'00"W.	166.37
23-16	S.19°36'00"W.	372.59
23-17	S.81°11'00"W.	164.64
23-18	S.56°06'00"W.	136.16
23-19	S.56°06'00"W.	144.94
23-20	N.15°10'00"W.	160.59
23-21	N.47°39'00"W.	230.05
23-22	S.82°55'00"W.	170.30
23-23	S. 6°07'00"W.	543.13
23-24	N.26°09'00"W.	1234.34
23-25	N.70°40'00"W.	365.60
23-26	N.22°13'00"E.	382.85
23-27	N.27°03'12"W.	254.00
23-28	N.47°22'00"E.	313.56
23-29	N.33°14'00"W.	312.03
23-30	N.56°47'00"W.	208.17

NO.	BEARING	DIST.
23-30		
23-31	N.87°28'15"W.	231.77
23-32	S.33°26'00"E.	95.83
23-33	TANGENT CURVE Δ=30°10'00"LT. R =150.00 L=78.98	
23-34	S.64°45'25"E.	241.15
23-35	S.32°52'30"E.	207.04
23-36	S.88°37'00"E.	225.15
23-37	N.36°54'55"E.	86.03
23-38	S.88°37'00"E.	115.87
23-39	S.45°59'40"E.	192.33
23-40	S.54°30'00"E.	295.14
23-41	N.46°19'00"E.	163.42
23-42	S.56°18'55"E.	145.98
23-43	N.45°45'11"E.	265.24
23-44A	N.88°27'44"E.	214.14
23-45A	N.71°42'10"E.	105.30
23-46A	S.38°13'17"E.	528.92
23-47A	S.18°48'40"E.	455.33
23-48A	S.19°58'32"E.	200.00
23-49A	S.35°50'24"W.	267.65
23-50	S.42°47'00"E.	266.45
23-51	S. 6°23'00"W.	242.96
23-52	S.34°36'00"E.	121.49
23-53	S.65°06'00"E.	469.62
23-54	S.13°24'00"W.	586.23
23-55	S.76°31'00"E.	446.22
23-56	S. 5°51'00"W.	323.69
23-57	S.71°00'00"E.	291.89
23-58		

NO.	BEARING	DIST.
23-58	S.16°29'00"E.	334.76
23-59	S.12°12'00"W.	605.68
23-60	S.81°56'00"W.	128.27
23-61	S. 8°03'00"W.	221.18
23-62	S.79°24'00"E.	364.22
23-63	N.49°34'00"E.	470.31
23-64	S.35°57'00"E.	386.65
23-65	S.61°01'00"E.	349.11
23-66	S.67°42'00"E.	451.28
23-67	S. 0°24'19"W.	308.00
23-68	N.89°20'50"E.	142.00
23-69	S.58°17'00"E.	348.35
23-70	S.10°29'00"E.	219.71
23-71	S.58°05'00"E.	340.47
23-72	S.78°22'00"E.	515.60
23-73	S. 4°59'00"W.	229.87
23-74	S.35°39'00"E.	235.05
23-75	S.87°28'00"E.	136.13
23-76	S.30°37'00"E.	229.17
23-77	S.77°58'00"E.	124.57
23-78	S.11°59'00"E.	268.69
23-79	S.84°15'00"E.	349.44
23-80	N.34°43'00"E.	122.89
23-81	S.62°23'00"E.	97.06
23-82	S. 4°33'00"E.	113.36
23-83	S.71°24'00"E.	109.73
23-84	N.68°26'00"E.	133.33
23-85	S.71°23'00"E.	197.33
24-64		



LEGEND

- PROJECT BOUNDARY
- FOUND CORNER
- FOUND CORNER, SET PIPE
- PROPORTIONED CORNER, SET PIPE
- MONUMENT SET ON PROJECT BOUNDARY
- PRIMARY HORIZONTAL CONTROL STATION

Scale: 1" = 400'

400 0 400 800 1200 1600 2000

Contour Interval 10 Feet

Datum is Mean Sea Level

COORDINATES, BEARINGS AND DISTANCES ARE BASED ON THE CALIFORNIA STATE COORDINATE SYSTEM, ZONE 3

THIS MAP CORRECTLY REPRESENTS TOPOGRAPHY SHOWN ON PHOTOGRAMMETRIC MAPS COMPILED BY FAIRCHILD AERIAL SURVEYS INC., R.M. TOWILL INC. AND TELEDYNE GEOTRONICS AND SURVEYS MADE BY ME, OR UNDER MY DIRECTION WHILE EMPLOYED BY THE TURLOCK IRRIGATION DISTRICT AND MODESTO IRRIGATION DISTRICT.

JOHN B. DUFF
L.S. 2244, CALIFORNIA

THIS MAP IS FILED IN COMPLIANCE WITH ARTICLE 35 OF THE LICENSE FOR FEDERAL POWER COMMISSION PROJECT NO. 2299 SUBMITTED BY THE UNDERSIGNED THIS 30 TH. DAY OF AUGUST 1974.

TURLOCK IRRIGATION DISTRICT
BY: H. Richard Clauss
H. RICHARD CLAUSS, PRESIDENT

MODESTO IRRIGATION DISTRICT
BY: R. E. Penney
RICHARD E. PENNEY, PRESIDENT

Revised July 15, 1980

EXHIBIT K SHEET 23

PROJECT NO. 2299 CALIFORNIA

TURLOCK IRRIGATION DISTRICT
MODESTO IRRIGATION DISTRICT

DON PEDRO PROJECT

DON PEDRO RESERVOIR

TOPOGRAPHY, PROPERTY & PROJECT BOUNDARY

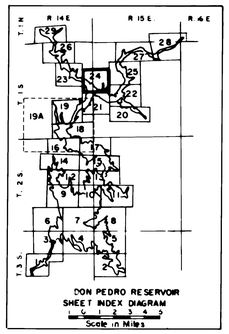
2299-144

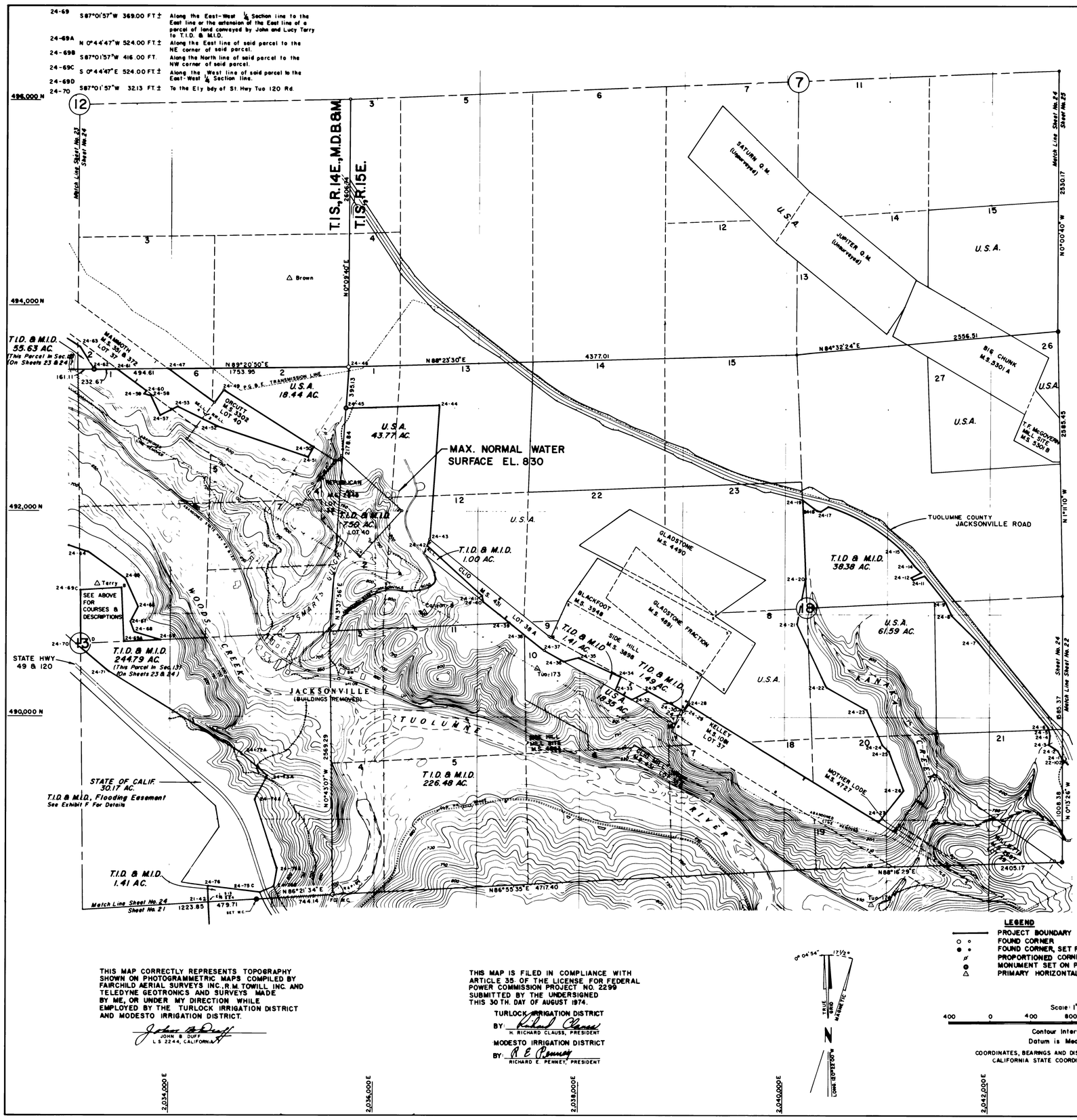
24-69	S 87°01'57" W 369.00 FT.±	Along the East-West ¼ Section line to the East line or the extension of the East line of a parcel of land conveyed by John and Lucy Terry to T.I.D. & M.I.D.
24-69A	N 0°44'47" W 524.00 FT.±	Along the East line of said parcel to the NE corner of said parcel.
24-69B	S 87°01'57" W 416.00 FT.	Along the North line of said parcel to the NW corner of said parcel.
24-69C	S 0°44'47" E 524.00 FT.±	Along the West line of said parcel to the East-West ¼ Section line.
24-69D	S 87°01'57" W 32.13 FT.±	To the E'ly bdy of St. Hwy Tuo 120 Rd.
24-70		

PROJECT BOUNDARY TRAVERSE

NO.	BEARING	DIST.	NO.	BEARING	DIST.
22-102	N.48°13'56"W.	4.87	24-37	N.51°19'46"W.	242.58
24-1	N.25°59'43"W.	85.44	24-38	N.51°19'46"W.	193.53
24-2	N.58°09'08"W.	111.28	24-39	N.51°19'46"W.	332.00
24-3	N. 7°40'03"E.	89.34	24-40	N. 9°07'00"W.	54.00
24-4	N.12°51'38"W.	57.25	24-41	N.47°28'00"W.	722.72
24-5	N.12°51'38"W.	22.77	24-42	N.22°16'05"E.	61.89
24-6	N.39°30'00"W.	1080.00	24-43	N. 3°37'56"E.	1310.65
24-7	N.44°12'45"W.	365.24	24-44	S.88°23'30"W.	907.26
24-8	N.27°34'04"W.	145.14	24-45	N. 3°37'56"E.	395.13
24-9	N.39°30'00"W.	329.00	24-46	S.89°20'50"W.	1753.95
24-10	S.70°28'58"W.	117.05	24-47	S.53°52'39"E.	554.85
24-11	N.39°30'00"W.	30.00	24-48	N.36°56'11"E.	148.75
24-12	N.63°18'28"E.	112.80	24-49	S.57°49'04"E.	1025.50
24-13	N.45°16'38"W.	99.34	24-50	S.24°16'00"W.	111.21
24-14	N.39°47'17"W.	196.31	24-51	N.71°18'00"W.	932.25
24-15	NON-TANGENT CURVE Δ=27°25'54" LT. R=1760.00 L=842.64 CHORD N.59°37'12"W. 834.62		24-52	N.63°51'00"W.	431.13
			24-53	S.62°33'00"W.	58.83
			24-54	N.53°52'39"W.	11.96±
			24-55 ⑤ ⑥	S.37°00'00"W.	24.86±
24-16	S.57°22'56"W.	93.82	24-56	S.62°33'00"W.	110.58
24-17	N.75°53'57"W.	27.83	24-57	N.25°16'00"W.	217.83
24-18	N.53°45'37"W.	169.36	24-58	N.72°56'00"W.	63.25±
24-19	S. 2°20'18"E.	761.82	24-59 ⑦ ⑧	N.37°00'00"E.	40.22±
24-20	S.10°57'00"W.	452.51	24-60 ⑧	N.53°52'39"W.	246.80
24-21	S.25°12'00"E.	690.69	24-61	S.89°20'50"W.	232.67
24-22	S.61°26'00"E.	449.72	24-62	N.31°52'00"W.	263.19
24-23	S.23°47'00"E.	377.00	24-63		
24-24	S.47°22'00"E.	85.63	24-64	S.54°26'00"E.	448.68
24-25	S.21°09'00"E.	407.33	24-65	S.24°27'00"E.	202.08
24-26	S.38°33'00"W.	391.55	24-66	S.27°21'00"W.	165.25
24-27	N.58°30'38"W.	2185.01	24-67	S.21°25'00"E.	109.68
24-28	S.32°04'42"W.	74.56	24-68	S.73°24'00"E.	269.69
24-29	N.61°01'18"W.	27.58	24-69	SEE DRAWING FOR BEAR. & DISTANCES	
24-30	N.61°01'18"W.	376.00	24-70	S.49°48'55"E.	410.11
24-31	S.62°33'00"W.	178.87	24-71	S.58°25'16"E.	1506.88
24-32	N.60°56'32"W.	193.00	24-72A	S.49°04'13"E.	34'.81
24-33	N.26°16'00"E.	138.44	24-73A	S.27°43'12"W.	257.17
24-34	N.65°04'00"W.	455.46	24-74A	S.17°38'28"E.	713.92
24-35	S.74°46'00"W.	151.12	24-75A	S. 7°27'39"W.	175.01
24-36	N.60°56'32"W.	215.00	24-75B	S.67°58'51"W.	146.00
			24-75C	N.83°05'27"W.	512.45
			24-76	S. 0°43'57"E.	166.13
			21-42		

① TO THE MOST EASTERLY CORNER OF A PARCEL OF LAND IN DEED RECORDED MARCH 21/1960 IN BOOK 113 PAGE 34 OFFICAL RECORDS, TUOLUMNE COUNTY
② ALONG THE SOUTHEASTERLY LINE OF ABOVE PARCEL
③ TO THE NORTHWESTERLY LINE OF ABOVE PARCEL
④ ALONG THE NORTHWESTERLY LINE OF ABOVE PARCEL
⑤ TO THE MOST NORTHERLY CORNER OF ABOVE PARCEL





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JOHN B. DUFF
L.S. 2244, CALIFORNIA

THIS MAP IS FILED IN COMPLIANCE WITH ARTICLE 35 OF THE LICENSE FOR FEDERAL POWER COMMISSION PROJECT NO. 2299 SUBMITTED BY THE UNDERSIGNED THIS 30 TH. DAY OF AUGUST 1974.

TURLOCK IRRIGATION DISTRICT
BY: H. Richard Clauss
H. RICHARD CLAUSS, PRESIDENT

MODESTO IRRIGATION DISTRICT
BY: R E Penney
RICHARD E. PENNEY, PRESIDENT

LEGEND

- PROJECT BOUNDARY
- FOUND CORNER
- FOUND CORNER, SET PIPE
- PROPORTIONED CORNER, SET PIPE
- MONUMENT SET ON PROJECT BOUNDARY
- PRIMARY HORIZONTAL CONTROL STATION

Scale: 1" = 400'

400 0 400 800 1200 1600 2000

Contour Interval 10 Feet
Datum is Mean Sea Level

COORDINATES, BEARINGS AND DISTANCES ARE BASED ON THE CALIFORNIA STATE COORDINATE SYSTEM, ZONE 3

Revised July 15, 1980

EXHIBIT K SHEET 24

PROJECT NO. 2299 CALIFORNIA

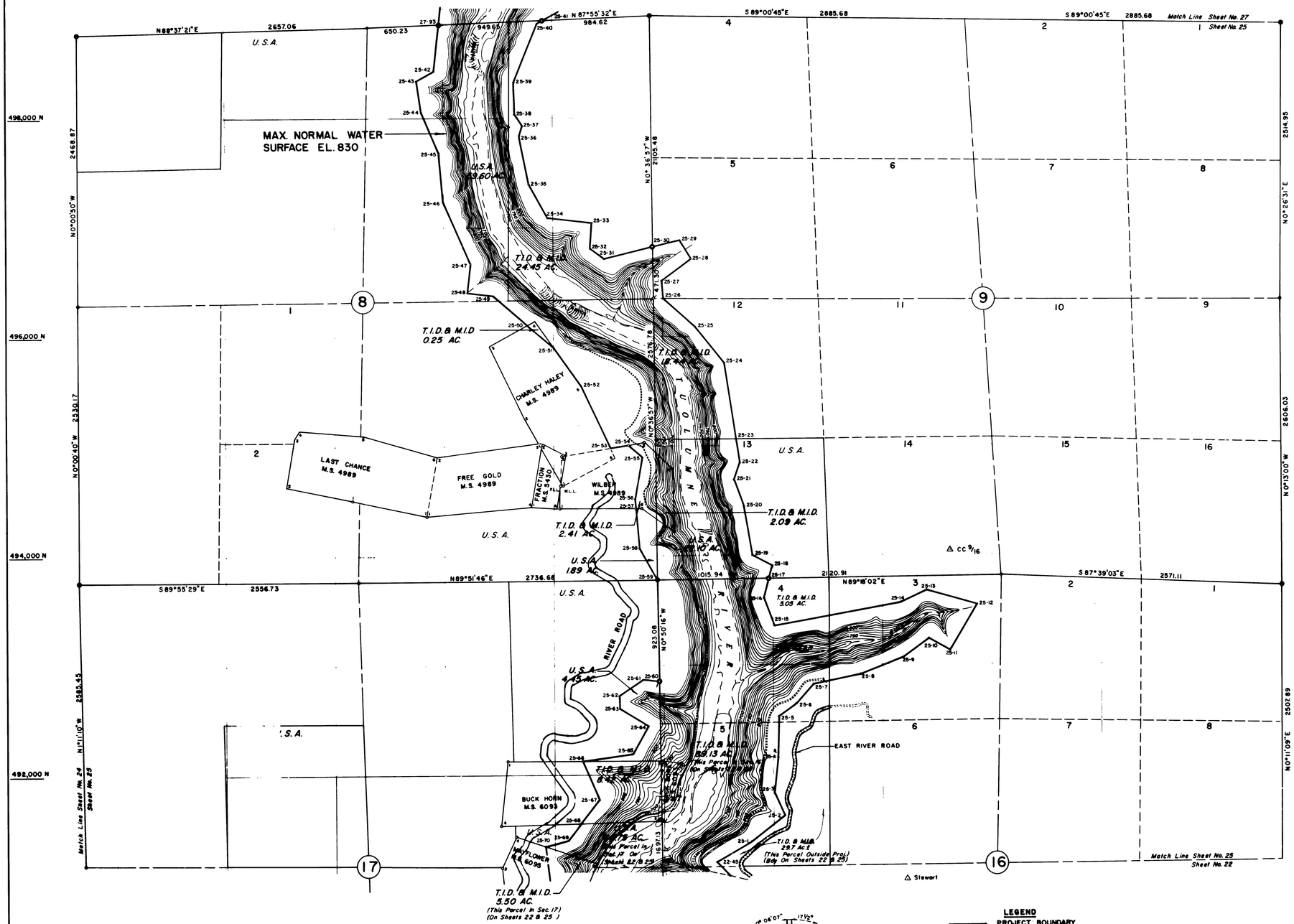
TURLOCK IRRIGATION DISTRICT
MODESTO IRRIGATION DISTRICT

DON PEDRO PROJECT

DON PEDRO RESERVOIR

TOPOGRAPHY, PROPERTY & PROJECT BOUNDARY

T.1S., R.15E., M.D.B. & M.

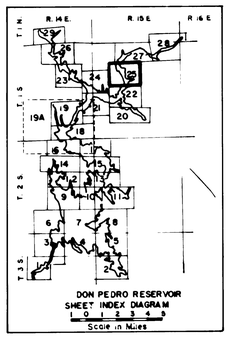


PROJECT BOUNDARY TRAVERSE

NO.	BEARING	DIST.
22-45		
25-1	N.59°26'00"E.	365.82
25-2	N.52°04'00"E.	385.47
25-3	N.23°31'00"W.	230.18
25-4	N. 5°42'00"E.	322.62
25-5	N. 0°56'00"E.	369.05
25-6	N.53°48'00"E.	203.21
25-7	N.60°52'00"E.	236.78
25-8	N.78°34'00"E.	433.61
25-9	N.68°34'00"E.	429.71
25-10	N.53°51'00"E.	284.82
25-11	S.60°31'00"E.	219.42
25-12	N.30°28'00"E.	487.25
25-13	N.74°16'00"W.	475.82
25-14	S.64°45'00"W.	253.19
25-15	S.79°55'00"W.	1177.43
25-16	N.21°41'00"W.	273.24
25-17	N.15°46'00"E.	182.16
25-18	N.15°46'00"E.	122.30
25-19	N.61°20'00"W.	211.65
25-20	N. 9°15'00"W.	447.83
25-21	N.20°47'00"W.	262.06
25-22	N.18°59'00"E.	166.03
25-23	N. 8°36'00"W.	216.86
25-24	N. 8°36'00"W.	708.38
25-25	N.39°01'00"W.	120.90
25-26	N.47°51'00"W.	287.53
25-27	N. 9°15'00"W.	162.52
25-28	N.52°25'00"E.	220.87
25-29	N.20°37'00"W.	198.27
25-30	S.75°00'00"W.	252.51
25-31	S.75°00'00"W.	158.50
25-32	N.52°59'00"W.	182.80
25-33	N. 0°55'00"E.	330.20
25-34	N.82°22'00"W.	299.95
25-35	N.20°10'00"W.	255.24
25-36	N.10°18'00"W.	177.21
25-37	N.15°10'00"E.	95.75

NO.	BEARING	DIST.
25-37	N.35°16'00"W.	121.25
25-38	N. 1°20'00"W.	300.08
25-39	N.22°06'00"E.	574.18
25-40	N.61°55'00"E.	52.43
25-41		
27-93	S. 6°13'00"W.	426.78
25-42	S.59°19'00"W.	180.25
25-43	S. 8°28'00"E.	285.11
25-44	S.23°00'00"E.	401.93
25-45	S. 4°40'00"E.	455.51
25-46	S.23°44'00"E.	613.88
25-47	S. 4°59'00"W.	265.00
25-48	S.83°20'00"E.	232.57
25-49	S.49°30'00"E.	419.06
25-50	S.49°30'00"E.	308.25
25-51		
25-52	S.35°14'00"E.	447.28
25-53	S.25°19'00"E.	621.15
25-54	N.80°38'13"E.	160.26
25-55	S.48°01'00"E.	165.74
25-56	S. 9°53'00"W.	384.70
25-57	S. 4°59'00"E.	84.87
25-58	S. 4°59'00"E.	361.90
25-59	S.29°12'00"E.	343.71
25-60	S. 0°50'16"E.	923.08
25-61	N.82°07'00"W.	152.66
25-62	S.55°42'00"W.	262.67
25-63	S. 1°57'00"E.	117.07
25-64	S.58°14'00"E.	305.81
25-65	S.28°25'00"W.	289.95
25-66	S.82°17'00"W.	469.84
25-67	S.23°39'00"E.	383.03
25-68	S.37°28'00"W.	284.04
25-69	S.37°28'00"W.	179.58
25-70	S.72°50'00"W.	221.60

① TO LINE 3-4
② TO LINE 4-5
③ ALONG LINE 4-5
④ TO CORNER NO 5
⑤ ALONG LINE 5-6
⑥ TO LINE 2-3



THIS MAP CORRECTLY REPRESENTS TOPOGRAPHY SHOWN ON PHOTOGRAMMETRIC MAPS COMPILED BY FAIRCHILD AERIAL SURVEYS INC., R.M. TOWILL INC. AND TELEDYNE GEOTRONICS AND SURVEYS MADE BY ME, OR UNDER MY DIRECTION WHILE EMPLOYED BY THE TURLOCK IRRIGATION DISTRICT AND MODESTO IRRIGATION DISTRICT.

JOHN B. DUFF
L.S. 2244, CALIFORNIA

THIS MAP IS FILED IN COMPLIANCE WITH ARTICLE 36 OF THE LICENSE FOR FEDERAL POWER COMMISSION PROJECT NO. 2299 SUBMITTED BY THE UNDERSIGNED THIS 30TH. DAY OF AUGUST 1974.

TURLOCK IRRIGATION DISTRICT
BY: H. Richard Clauss
H. RICHARD CLAUSS, PRESIDENT

MODESTO IRRIGATION DISTRICT
BY: R E Penney
RICHARD E. PENNEY, PRESIDENT

LEGEND
- PROJECT BOUNDARY
- FOUND CORNER
- FOUND CORNER, SET PIPE
- PROPORTIONED CORNER, SET PIPE
- MONUMENT SET ON PROJECT BOUNDARY
- PRIMARY HORIZONTAL CONTROL STATION

Scale:
400 0 400 800 1200 1600 2000
Contour Interval 10 Feet
Datum is Mean Sea Level

COORDINATES, BEARINGS AND DISTANCES ARE BASED ON THE CALIFORNIA STATE COORDINATE SYSTEM, ZONE 3

EXHIBIT K SHEET 25

PROJECT NO. 2299 CALIFORNIA

TURLOCK IRRIGATION DISTRICT
MODESTO IRRIGATION DISTRICT

DON PEDRO PROJECT

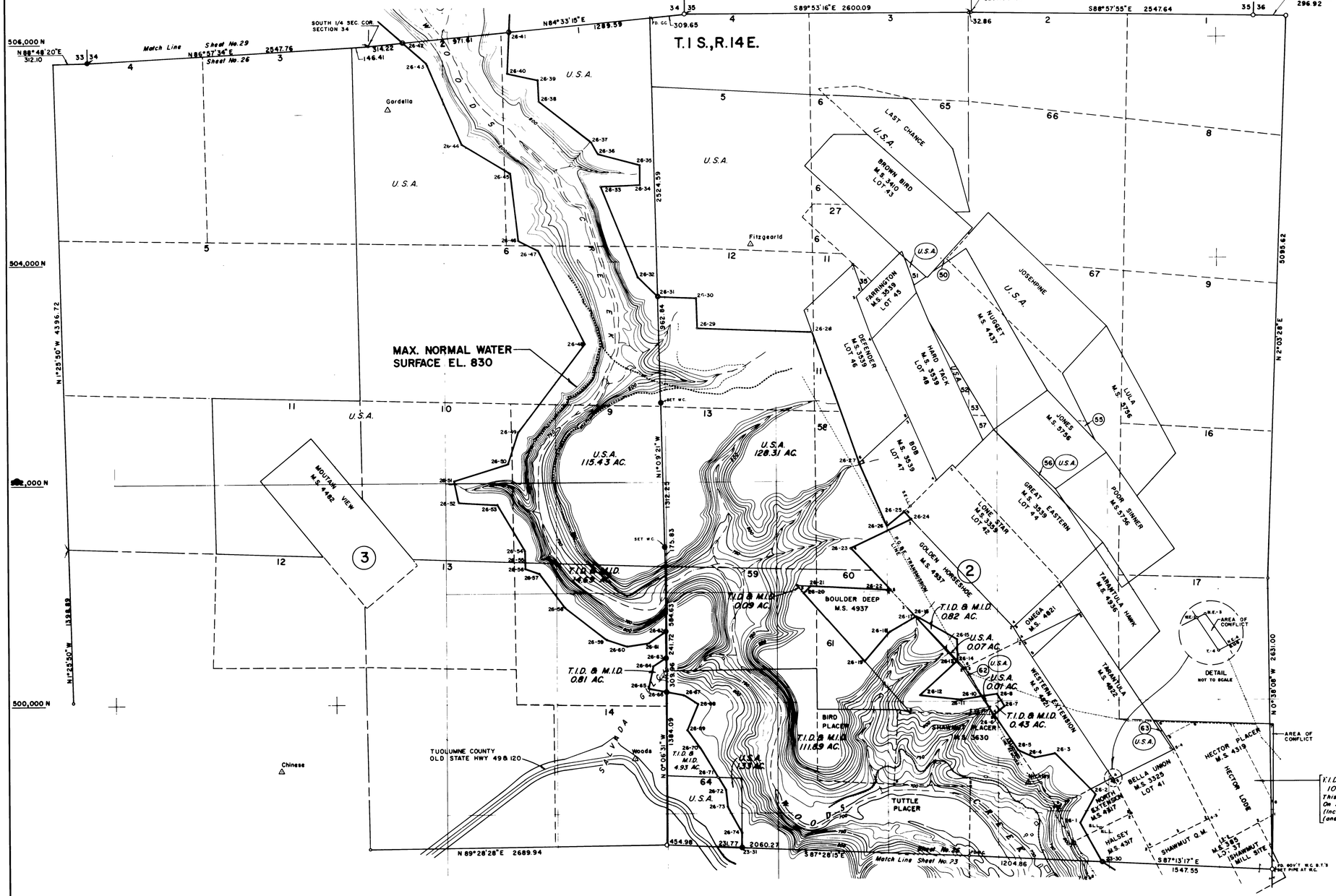
DON PEDRO RESERVOIR

TOPOGRAPHY, PROPERTY & PROJECT BOUNDARY

2299-110

T. 1 N., R. 14 E., M.D.B. & M.

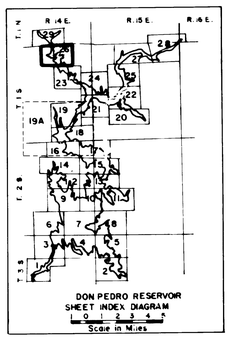
T. 1 S., R. 14 E.



PROJECT BOUNDARY TRAVERSE

NO.	BEARING	DIST.
23-30		
26-1	N.28°53'00"W.	405.38
26-2	N.28°15'00"E.	287.26
26-3	N.44°09'00"W.	525.45
26-4	S.79°08'00"W.	180.24
26-5	N.66°07'00"W.	161.56
26-6	N.33°41'52"W.	389.47
26-7	N.48°58'00"E.	115.05
26-8	N.31°12'00"W.	127.42
26-9	S.82°30'00"W.	128.61
26-10	S.82°30'00"W.	4.44
26-11	S.82°30'00"W.	188.70
26-12	N.84°37'00"W.	383.69
26-13	N.47°37'00"E.	457.42
26-14	N.47°37'00"E.	9.23
26-15	N. 1°06'00"W.	191.48
26-16	N.60°52'00"W.	430.90
26-17	S.59°47'00"W.	1.72
26-18	S.59°47'00"W.	272.53
26-19	S.40°17'00"W.	349.85
26-20	N.41°25'13"W.	830.02
26-21	N.46°37'00"E.	86.99
26-22	S.86°46'24"E.	726.35
26-23	N.43°01'43"W.	527.84
26-24	N.64°51'14"E.	608.39
26-25	N.42°18'36"W.	95.67
26-26	S.48°20'32"W.	210.28
26-27	N.23°21'28"W.	634.14
26-28	N.19°25'11"W.	1262.15
26-29	N.87°38'44"W.	1037.89
26-30	N. 0°59'11"W.	274.36
26-31	N.87°38'44"W.	352.37
26-32	N.46°40'00"W.	251.44
26-33	N.21°32'00"W.	891.16
26-34	N.88°43'00"E.	355.09
26-35	N. 0°19'00"E.	180.00
26-36	N.74°59'00"W.	390.22
26-37	N.31°27'00"W.	120.74

NO.	BEARING	DIST.
26-37	N.51°20'00"W.	608.30
26-38	N. 1°30'00"W.	192.07
26-39	N.77°54'00"W.	286.36
26-40	N. 2°55'00"E.	376.52
26-41		
26-42	S.48°22'00"E.	279.86
26-43	S.23°19'00"E.	805.89
26-44	S.59°19'00"E.	511.46
26-45	S. 6°05'00"E.	613.45
26-46	S.64°34'00"E.	204.86
26-47	S.26°11'00"E.	951.69
26-48	S.37°31'00"W.	1004.86
26-49	S.18°08'00"W.	305.16
26-50	S.73°28'00"W.	516.37
26-51	S.12°51'00"E.	197.95
26-52	S.86°44'00"E.	350.51
26-53	S.30°36'00"E.	503.04
26-54	SOUTH	95.81
26-55	SOUTH	61.19
26-56	S.69°39'00"E.	132.26
26-57	S.37°01'00"E.	382.00
26-58	S.52°29'00"E.	477.83
26-59	S.70°55'00"E.	195.76
26-60	N.80°46'00"E.	199.58
26-61	N.55°10'00"E.	184.50
26-62	S. 0°06'31"E.	241.72
26-63	S.56°12'00"W.	139.52
26-64	S.12°58'00"W.	209.34
26-65	S.80°10'00"E.	165.93
26-66	S.80°10'00"E.	161.89
26-67	S.56°42'00"E.	153.16
26-68	S.22°56'00"W.	254.08
26-69	S.36°24'00"E.	193.81
26-70	S.31°25'00"E.	317.34
26-71	S.31°25'00"E.	137.32
26-72	S. 5°54'00"E.	155.82
26-73	S.29°17'00"E.	270.07
26-74	S. 0°01'54"E.	134.10
23-31		



Y.I.D. & M.I.D. 106.03 AC.± This Parcel In Sections 1, 2, 11 & 12 On Sheets 25 & 26. (Includes Area of Conflict With Section 1, 0.51 Ac.) (and Area of Conflict With Tarantula, 0.002 Ac.)

THIS MAP CORRECTLY REPRESENTS TOPOGRAPHY SHOWN ON PHOTOGRAMMETRIC MAPS COMPILED BY FAIRCHILD AERIAL SURVEYS INC., R.M. TOWILL INC. AND TELEDYNE GEOTRONICS AND SURVEYS MADE BY ME, OR UNDER MY DIRECTION WHILE EMPLOYED BY THE TURLOCK IRRIGATION DISTRICT AND MODESTO IRRIGATION DISTRICT.

JOHN B. DUFF
L.S. 2244, CALIFORNIA

THIS MAP IS FILED IN COMPLIANCE WITH ARTICLE 35 OF THE LICENSE FOR FEDERAL POWER COMMISSION PROJECT NO. 2299 SUBMITTED BY THE UNDERSIGNED THIS 30TH. DAY OF AUGUST 1974.

TURLOCK IRRIGATION DISTRICT
BY: H. RICHARD CLAUSS, PRESIDENT

MODESTO IRRIGATION DISTRICT
BY: RICHARD E. PENNEY, PRESIDENT

0° 03'04" 17½° TRUE GRID MAGNETIC N LONG. 120°25'00" W.

LEGEND

- PROJECT BOUNDARY
- FOUND CORNER
- FOUND CORNER, SET PIPE
- PROPORTIONED CORNER, SET PIPE
- MONUMENT SET ON PROJECT BOUNDARY
- PRIMARY HORIZONTAL CONTROL STATION

Scale: 400 0 400 800 1200 1600 2000

Contour Interval 10 Feet
Datum is Mean Sea Level

COORDINATES, BEARINGS AND DISTANCES ARE BASED ON THE CALIFORNIA STATE COORDINATE SYSTEM, ZONE 3

EXHIBIT K SHEET 26

PROJECT NO. 2299 CALIFORNIA
TURLOCK IRRIGATION DISTRICT
MODESTO IRRIGATION DISTRICT

DON PEDRO PROJECT

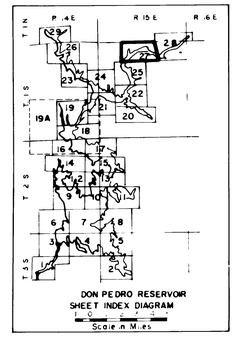
DON PEDRO RESERVOIR

TOPOGRAPHY, PROPERTY & PROJECT BOUNDARY

2299—111

T.1N., R.15E., M.D.B.& M.

T.1S., R.15E.



THIS MAP CORRECTLY REPRESENTS TOPOGRAPHY SHOWN ON PHOTOGRAMMETRIC MAPS COMPILED BY FAIRCHILD AERIAL SURVEYS INC., R.M. TOWILL INC. AND TELEDYNE GEOTRONICS AND SURVEYS MADE BY ME, OR UNDER MY DIRECTION WHILE EMPLOYED BY THE TURLOCK IRRIGATION DISTRICT AND MODESTO IRRIGATION DISTRICT.

JOHN B. DUFF
L.S. 2244, CALIFORNIA

THIS MAP IS FILED IN COMPLIANCE WITH ARTICLE 35 OF THE LICENSE FOR FEDERAL POWER COMMISSION PROJECT NO. 2299 SUBMITTED BY THE UNDERSIGNED THIS 30 TH. DAY OF AUGUST 1974.

TURLOCK IRRIGATION DISTRICT
BY: H. RICHARD CLAUSS, PRESIDENT

MODESTO IRRIGATION DISTRICT
BY: RICHARD E. PENNEY, PRESIDENT

MAX. NORMAL WATER SURFACE EL. 830

T.I.D. & M.I.D. 0.50 AC.

T.I.D. & M.I.D. 2.96 AC.

T.I.D. & M.I.D. 37.88 AC.

T.I.D. & M.I.D. 0.41 AC.

U.S.A. 101.32 AC.

U.S.A.

TURLOCK IRRIGATION DISTRICT

MODESTO IRRIGATION DISTRICT

TUOLUMNE RIVER

PONDEROSA WAY

F-350

Match Line Sheet No. 28

Sheet No. 27

Match Line Sheet No. 29

Sheet No. 27

PROJECT BOUNDARY TRAVERSE

NO.	BEARING	DIST.
25-41	N.61°55'00"E.	251.33
27-1	N.10°04'00"E.	171.64
27-2	N.49°01'00"E.	494.06
27-3	N.76°48'00"E.	200.48
27-4	N.16°01'00"E.	245.74
27-5	N.76°10'00"E.	271.91
27-6	N.19°51'00"E.	141.40
27-7	N.47°24'00"E.	641.20
27-8	N.71°51'00"E.	256.78
27-9	N. 1°51'00"W.	341.18
27-10	N.49°00'00"E.	202.73
27-11	N.19°24'00"E.	373.20
27-12	N.40°42'00"E.	236.13
27-13	N.78°00'00"E.	273.99
27-14	N. 8°15'00"E.	202.09
27-15	S.69°27'00"E.	205.06
27-16	N.31°41'00"E.	205.64
27-17	N.64°11'00"E.	645.39
27-18	N.81°05'00"E.	103.25
27-19	N.65°10'00"E.	592.83
27-20	N.83°44'00"E.	366.25
27-21	N.31°13'00"E.	115.76
27-22	N.71°49'00"E.	557.56
27-23	N.71°49'00"E.	284.53
27-24	N.71°49'00"E.	276.74
27-25	S.80°58'00"E.	656.13
27-26	S.51°45'00"E.	110.89
27-27	S.51°45'00"E.	297.83
27-28	S. 8°28'00"E.	971.58
27-29	S.44°30'00"E.	328.11
27-30	S. 2°53'00"E.	218.28
27-31	S.73°08'00"E.	392.90
27-32	S.11°42'00"E.	202.20
27-33	S.84°29'00"E.	394.83
27-34	N.28°04'00"E.	187.00
27-35	N.73°41'00"E.	668.96
27-36	N.89°03'00"E.	364.05
27-37	S.63°34'00"E.	379.69
27-38	S.42°25'00"E.	594.58
27-39	S.55°52'00"E.	393.85
27-40	S.59°32'00"E.	1073.11
27-41	S.84°23'00"E.	500.49
27-42	N.76°49'00"E.	156.20
27-43	N.71°50'00"W.	323.90
27-44	N.75°58'00"W.	428.80
27-45	N.59°46'00"W.	343.72
27-46	N.18°16'00"W.	309.59
27-47	N.62°19'00"W.	368.12
27-48	N.28°25'00"W.	118.40
27-49	N.76°43'00"W.	611.08
27-50	N.28°25'00"W.	459.97
27-51	S.77°52'00"W.	504.27
27-52	S.73°34'00"W.	717.32
27-53	N.63°29'00"W.	472.70
27-54	N. 7°16'00"W.	899.23
27-55	N. 7°16'00"W.	57.45
27-56	N.17°48'00"W.	575.57
27-57	N.51°06'00"W.	366.23
27-58	N.67°18'00"W.	357.69
27-59	N.80°53'00"W.	296.75
27-60	S.88°18'00"W.	540.24
27-61	S.65°37'00"W.	569.46
27-62	S.65°37'00"W.	72.93
27-63	S.80°25'00"W.	366.12
27-64	S.73°40'00"W.	558.52
27-65	S.69°37'00"W.	889.75
27-66	S.63°01'00"W.	473.26
27-67	S.63°01'00"W.	479.34
27-68	S.59°39'00"W.	732.34
27-69	S.30°51'00"W.	639.53
27-70	N.53°44'00"W.	302.62
27-71	N.12°37'00"W.	205.98
27-72	N. 4°09'00"W.	580.52
27-73	N.54°52'00"W.	312.63
27-74	N.54°52'00"W.	224.21
27-75	S.50°08'00"W.	200.68
27-76	S.50°08'00"W.	28.63
27-77	S.44°54'00"E.	405.17
27-78	S.14°50'00"W.	351.71
27-79	S.14°41'00"E.	512.75
27-80	S.54°18'00"W.	245.05
27-81	S.41°38'00"W.	276.96
27-82	S.35°31'00"E.	626.57
27-83	S.49°21'00"W.	414.31
27-84	S.49°21'00"W.	824.58
27-85	S.69°13'00"W.	115.52
27-86	S.46°07'00"W.	435.66
27-87	S.37°24'00"W.	299.61
27-88	N.47°29'00"W.	160.20
27-89	S.66°08'00"W.	323.69
27-90	S. 4°22'00"W.	118.34
27-91	S.48°06'00"E.	196.16
27-92	S. 6°13'00"W.	209.97
27-93		

0°08'26" E TRUE GRID MERIDIAN 17½° N LONG. SCALE 1:30,000

LEGEND

- PROJECT BOUNDARY
- FOUND CORNER
- FOUND CORNER, SET PIPE
- PROPORTIONED CORNER, SET PIPE
- MONUMENT SET ON PROJECT BOUNDARY
- PRIMARY HORIZONTAL CONTROL STATION

Scale:
400 0 400 800 1200 1600 2000

Contour interval 10 Feet
Datum is Mean Sea Level

COORDINATES, BEARINGS AND DISTANCES ARE BASED ON THE CALIFORNIA STATE COORDINATE SYSTEM, ZONE 3

2,046,000 E 2,048,000 E 2,050,000 E 2,052,000 E 2,054,000 E 2,056,000 E

506,000 N 504,000 N 502,000 N 500,000 N

EXHIBIT K SHEET 27

PROJECT NO. 2299 CALIFORNIA

TURLOCK IRRIGATION DISTRICT
MODESTO IRRIGATION DISTRICT

DON PEDRO PROJECT

DON PEDRO RESERVOIR

TOPOGRAPHY, PROPERTY & PROJECT BOUNDARY

2299-112

PROJECT BOUNDARY TRAVERSE

NO.	BEARING	DIST.
27-43		
28-1	N.76°49'00"E.	199.15
28-2	N.69°31'00"E.	700.26
28-3	S.66°28'00"E.	708.94
28-4	N.31°48'00"E.	176.49
28-5	N.58°10'00"W.	959.30
28-5A	N.13°34'59"E.	451.56
28-6A	N.24°46'31"E.	143.18
28-6B	N.33°41'24"E.	252.39
28-7A	S.87°49'08"E.	84.34
28-8	N.21°36'00"E.	260.00
28-9	N.38°19'00"E.	1017.55
28-10	N.46°55'00"E.	199.57
28-11	N.46°55'00"E.	456.45
28-12	N.62°21'00"E.	564.49
28-13	N.75°37'00"E.	1252.23
28-14	S.87°31'00"E.	450.57
28-15	S.87°31'00"E.	220.06
28-16	N.76°19'00"E.	507.39
28-16	N.43°45'00"E.	682.52
28-17	N.38°31'00"E.	1159.28
28-18	N.62°02'00"E.	985.06
28-19	N.55°56'00"E.	1214.71
28-20	N.35°22'00"E.	305.17
28-21	N.35°22'00"E.	2901.63
28-22	N.55°33'00"W.	378.22
28-23	S.35°18'00"W.	2347.48
28-24	S.35°18'00"W.	809.92
28-25	S.35°18'00"W.	97.39
28-26	S.62°54'00"W.	723.66
28-27	S.50°59'00"W.	508.36
28-28	S.71°25'00"W.	473.71
28-29	S.55°11'00"W.	420.27
28-30	S.43°50'00"W.	485.18
28-31	S.37°12'00"W.	865.01
28-32	S.58°54'00"W.	503.35
28-33	N.77°32'00"W.	604.15
28-34	N.77°32'00"W.	211.08
28-35	S.72°14'00"W.	491.45
28-36	S.66°38'00"W.	496.73
28-37	S.72°49'00"W.	592.44
28-38	S.60°27'00"W.	642.63
28-39	S.48°30'00"W.	232.50
28-40	S.48°30'00"W.	436.28
28-41	S.37°50'00"W.	1320.59
28-42	S.31°38'00"W.	183.80
28-43	S.52°38'56"E.	89.78
28-43A	S.28°18'03"W.	147.65
28-43B	S.47°43'35"W.	74.33
28-43C	S.27°00'46"W.	286.23
28-44A	S.33°49'47"W.	200.31
28-44B	S.17°56'00"W.	255.00
28-45	S.60°54'00"W.	283.81
28-46	N.71°50'00"W.	214.96
28-47		

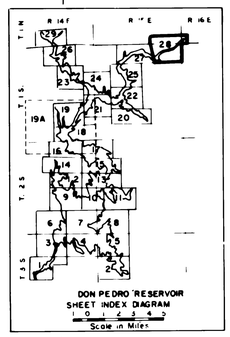
THIS MAP CORRECTLY REPRESENTS TOPOGRAPHY SHOWN ON PHOTOGRAMMETRIC MAPS COMPILED BY FAIRCHILD AERIAL SURVEYS INC., R.M. TOWILL INC. AND TELEDYNE GEOTRONICS AND SURVEYS MADE BY ME, OR UNDER MY DIRECTION WHILE EMPLOYED BY THE TURLOCK IRRIGATION DISTRICT AND MODESTO IRRIGATION DISTRICT.

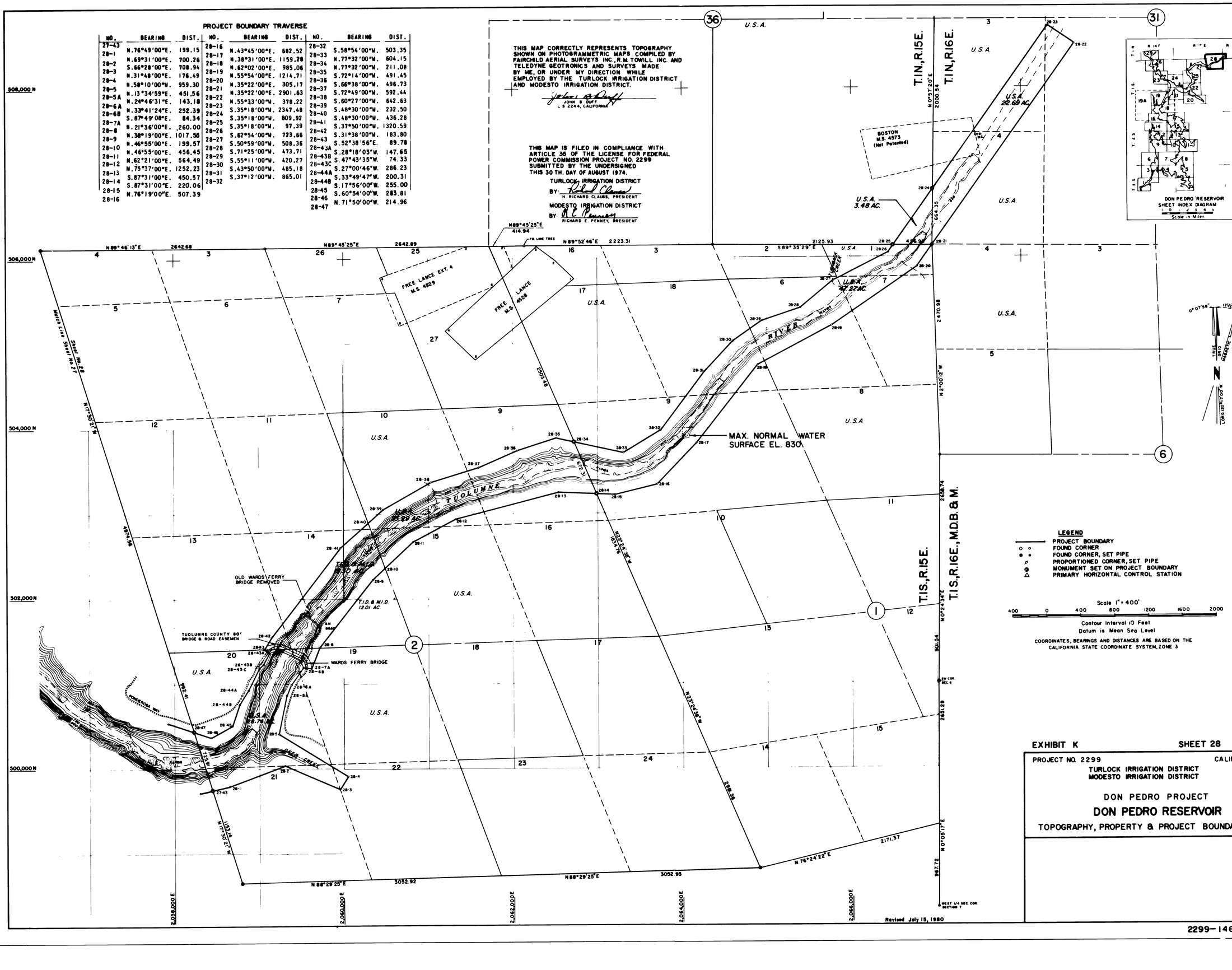
JOHN B. DUFF
L.S. 2244, CALIFORNIA

THIS MAP IS FILED IN COMPLIANCE WITH ARTICLE 35 OF THE LICENSE FOR FEDERAL POWER COMMISSION PROJECT NO. 2299 SUBMITTED BY THE UNDERSIGNED THIS 30 TH. DAY OF AUGUST 1974.

TURLOCK IRRIGATION DISTRICT
BY: H. RICHARD CLAUSS, PRESIDENT

MODESTO IRRIGATION DISTRICT
BY: RICHARD E. PENNEY, PRESIDENT





LEGEND
- PROJECT BOUNDARY
- FOUND CORNER
- FOUND CORNER, SET PIPE
- PROPORTIONED CORNER, SET PIPE
- MONUMENT SET ON PROJECT BOUNDARY
- PRIMARY HORIZONTAL CONTROL STATION

Scale 1" = 400'
400 0 400 800 1200 1600 2000
Contour Interval 10 Feet
Datum is Mean Sea Level

COORDINATES, BEARINGS AND DISTANCES ARE BASED ON THE CALIFORNIA STATE COORDINATE SYSTEM, ZONE 3

Revised July 15, 1980

EXHIBIT K SHEET 28

PROJECT NO. 2299 CALIFORNIA

TURLOCK IRRIGATION DISTRICT
MODESTO IRRIGATION DISTRICT

DON PEDRO PROJECT

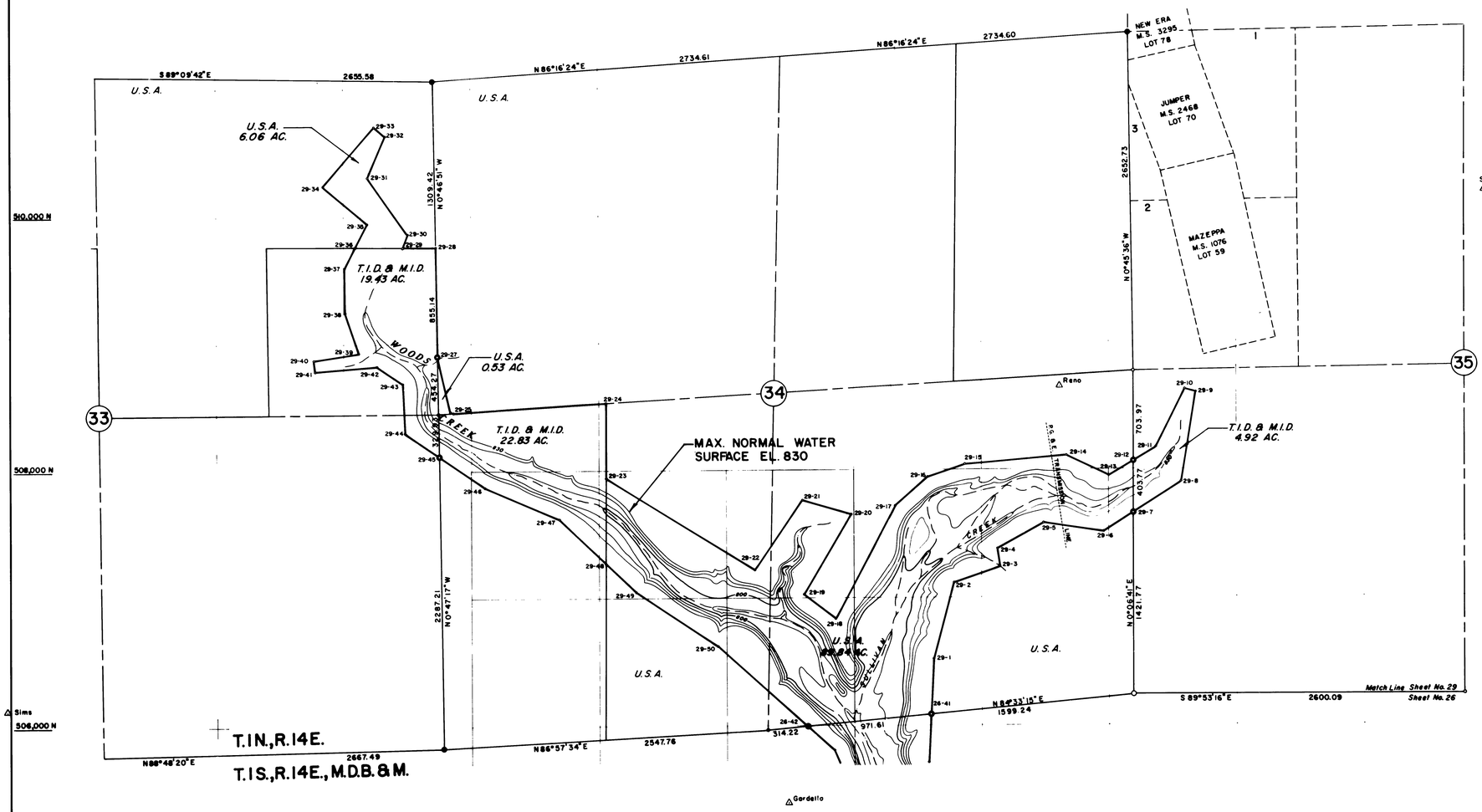
DON PEDRO RESERVOIR

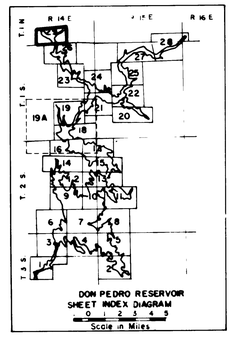
TOPOGRAPHY, PROPERTY & PROJECT BOUNDARY

2299-146

PROJECT BOUNDARY TRAVERSE

NO.	BEARING	DIST.	NO.	BEARING	DIST.
26-41			29-26	N.13°37'00"W.	454.65
29-1	N. 2°55'00"E.	431.52	29-27	N. 0°46'51"W.	855.14
29-2	N.15°03'00"E.	620.26	29-28	N.89°39'57"W.	256.48
29-3	N.71°37'00"E.	380.42	29-29	N.21°17'00"E.	119.45
29-4	N. 8°27'00"W.	149.63	29-30	N.35°40'00"W.	545.32
29-5	N.61°48'00"E.	408.47	29-31	N.23°23'00"E.	355.19
29-6	S.81°45'00"E.	480.98	29-32	N.50°53'00"W.	117.29
29-7	N.57°22'00"E.	281.14	29-33	S.40°27'00"W.	615.00
29-8	N.57°22'00"E.	441.81	29-34	S.49°54'00"E.	454.92
29-9	N. 9°13'00"E.	711.20	29-35	S.26°58'00"W.	214.48
29-10	N.75°18'00"W.	82.71	29-36	S.26°58'00"W.	173.71
29-11	S.27°07'00"W.	508.95	29-37	S. 0°19'00"E.	359.01
29-12	S.58°54'00"W.	202.27	29-38	S.18°23'00"E.	332.99
29-13	S.58°54'00"W.	227.50	29-39	S.81°33'00"W.	353.84
29-14	N.64°54'00"W.	367.73	29-40	S. 6°25'00"E.	89.50
29-15	S.85°25'00"W.	799.57	29-41	N.85°22'00"E.	481.58
29-16	S.71°34'00"W.	309.90	29-42	S.55°12'00"E.	243.56
29-17	S.48°51'00"W.	337.34	29-43	S. 2°57'00"E.	389.51
29-18	S.28°19'00"W.	999.54	29-44	S.55°13'00"E.	320.80
29-19	N.51°41'00"W.	309.70	29-45	S.55°13'00"E.	440.11
29-20	N.31°03'00"E.	727.15	29-46	S.67°02'00"E.	633.17
29-21	N.73°41'00"W.	402.20	29-47	S.46°40'00"E.	501.07
29-22	S.33°49'00"W.	659.54	29-48	S.46°40'00"E.	329.42
29-23	N.58°28'00"W.	1374.80	29-49	S.56°01'00"E.	769.38
29-24	N. 0°13'22"E.	586.38	29-50	S.48°22'00"E.	939.16
29-25	S.86°37'40"W.	1205.30			
29-26	N.68°38'00"W.	15.30			





THIS MAP CORRECTLY REPRESENTS TOPOGRAPHY SHOWN ON PHOTOGRAMMETRIC MAPS COMPILED BY FAIRCHILD AERIAL SURVEYS INC., R.M. TOWILL INC. AND TELEDYNE GEOTRONICS AND SURVEYS MADE BY ME, OR UNDER MY DIRECTION WHILE EMPLOYED BY THE TURLOCK IRRIGATION DISTRICT AND MODESTO IRRIGATION DISTRICT.

JOHN P. DUFF
L.S. 2244, CALIFORNIA

THIS MAP IS FILED IN COMPLIANCE WITH ARTICLE 36 OF THE LICENSE FOR FEDERAL POWER COMMISSION PROJECT NO. 2299 SUBMITTED BY THE UNDERSIGNED THIS 30 TH. DAY OF AUGUST 1974.

TURLOCK IRRIGATION DISTRICT
BY: H. RICHARD CLAUSS, PRESIDENT

MODESTO IRRIGATION DISTRICT
BY: RICHARD E. PENNEY, PRESIDENT

LEGEND

- PROJECT BOUNDARY
- FOUND CORNER
- FOUND CORNER, SET PIPE
- PROPORTIONED CORNER, SET PIPE
- MONUMENT SET ON PROJECT BOUNDARY
- PRIMARY HORIZONTAL CONTROL STATION

Scale:
400 0 400 800 1200 1600 2000

Contour Interval 10 Feet
Datum is Mean Sea Level

COORDINATES, BEARINGS AND DISTANCES ARE BASED ON THE CALIFORNIA STATE COORDINATE SYSTEM, ZONE 3

EXHIBIT K SHEET 29

PROJECT NO. 2299 CALIFORNIA

TURLOCK IRRIGATION DISTRICT
MODESTO IRRIGATION DISTRICT

DON PEDRO PROJECT

DON PEDRO RESERVOIR

TOPOGRAPHY, PROPERTY & PROJECT BOUNDARY

2299-114

DON PEDRO PROJECT
FERC NO. 2299

DRAFT LICENSE APPLICATION

EXHIBIT H - PLANS AND ABILITY OF APPLICANT TO OPERATE THE PROJECT



Prepared by:
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And
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Modesto, CA 95352

November 2013

Table of Contents

List of Tables

List of Figures

List of Appendices

List of Acronyms

ac .....acres
ACEC.....Area of Critical Environmental Concern
ACHP.....Advisory Council for Historic Preservation
ACOE.....U.S. Army Corps of Engineers
ADA.....Americans with Disabilities Act (ADA/ABAAG)
AED .....automated external defibrillator
AF .....acre-feet
AGR .....agricultural supply
AGS.....Annual Grasslands
ALJ.....Administrative Law Judge
AMF .....Adaptive Management Forum
APE .....Area of Potential Effect
APEA .....Applicant-Prepared Environmental Assessment
ARMR.....Archaeological Resource Management Report
AWQC .....Ambient Water Quality Criteria
BA .....Biological Assessment
BDCP .....Bay-Delta Conservation Plan
BLM.....U.S. Department of the Interior, Bureau of Land Management
BLM-S .....Bureau of Land Management – Sensitive Species
BMI .....Benthic macroinvertebrates
BMP .....Best Management Practices
BO .....Biological Opinion
BOR .....Bureau of Reclamation
BOW .....Blue Oak Woodland
ºC.....celsius
CalCOFI.....California Cooperative Oceanic Fisheries Investigations
CalEPPC .....California Exotic Pest Plant Council
CalSPA.....California Sports Fisherman Association
CAS.....California Academy of Sciences
CBDA .....California Bay-Delta Authority
CCC.....Criterion Continuous Concentrations

CCIC .....Central California Information Center
CCSF.....City and County of San Francisco
CCVHJV .....California Central Valley Habitat Joint Venture
CD .....Compact Disc
CDBW.....California Department of Boating and Waterways
CDEC.....California Data Exchange Center
CESA .....California Endangered Species Act
CDFA.....California Department of Food and Agriculture
CDFG.....California Department of Fish and Game (as of January 2013, CDFW)
CDFW .....California Department of Fish and Wildlife
CDMG.....California Division of Mines and Geology
CDOF.....California Department of Finance
CDPH.....California Department of Public Health
CDPR .....California Department of Parks and Recreation
CDSOD .....California Division of Safety of Dams
CDWR.....California Department of Water Resources
CE .....California Endangered Species
CEC.....California Energy Commission
CEII.....Critical Energy Infrastructure Information
CEQA.....California Environmental Quality Act
CESA .....California Endangered Species Act
CFR.....Code of Federal Regulations
cfs.....cubic feet per second
CGS.....California Geological Survey
cm.....centimeters
CMAP .....California Monitoring and Assessment Program
CMC.....Criterion Maximum Concentrations
CNDDB.....California Natural Diversity Database
CNPS.....California Native Plant Society
CORP .....California Outdoor Recreation Plan
CPR.....cardiopulmonary resuscitation
CPUC .....California Public Utilities Commission
CPUE .....Catch Per Unit Effort

CRAM.....California Rapid Assessment Method
CRC.....Chamise-Redshank Chaparral
CRLF.....California Red-Legged Frog
CRRF .....California Rivers Restoration Fund
CSAS.....Central Sierra Audubon Society
CSBP.....California Stream Bioassessment Procedure
CSU.....California State University
CT .....California Threatened Species
CTR.....California Toxics Rule
CTS .....California Tiger Salamander
CVP.....Central Valley Project
CVRWQCB .....Central Valley Regional Water Quality Control Board
CWA .....Clean Water Act
CWD .....Chowchilla Water District
CWHR.....California Wildlife Habitat Relationship
CZMA .....Coastal Zone Management Act
DDT .....dichlorodiphenyltrichloroethane
Districts.....Turlock Irrigation District and Modesto Irrigation District
DLA .....Draft License Application
DO.....Dissolved Oxygen
DOI .....Department of Interior
DPRA.....Don Pedro Recreation Agency
DPS .....Distinct Population Segment
DSE.....Chief Dam Safety Engineer
EA .....Environmental Assessment
EBMUD .....East Bay Municipal Utilities District
EC .....Electrical Conductivity
EFH.....Essential Fish Habitat
EIR .....Environmental Impact Report
EIS.....Environmental Impact Statement
EL.....Elevation
ENID.....El Nido Irrigation District
ENSO .....El Niño Southern Oscillation

EPA.....U.S. Environmental Protection Agency
ESA.....Federal Endangered Species Act
ESRCD.....East Stanislaus Resource Conservation District
ESU.....Evolutionary Significant Unit
EVC.....Existing Visual Condition
EWUA.....Effective Weighted Useable Area
°F.....fahrenheit
FERC.....Federal Energy Regulatory Commission
FFS.....Foothills Fault System
FL.....Fork length
FLA.....Final License Application
FMP.....Fishery Management Plan
FMU.....Fire Management Unit
FOT.....Friends of the Tuolumne
FPA.....Federal Power Act
FPC.....Federal Power Commission
FPPA.....Federal Plant Protection Act
ft.....feet
ft/mi.....feet per mile
FWCA.....Fish and Wildlife Coordination Act
FWUA.....Friant Water Users Authority
FYLF.....Foothill Yellow-Legged Frog
g.....grams
GIS.....Geographic Information System
GLO.....General Land Office
GORP.....Great Outdoor Recreation Pages
GPS.....Global Positioning System
HCP.....Habitat Conservation Plan
HSC.....Habitat Suitability Criteria
HHWP.....Hetch Hetchy Water and Power
HORB.....Head of Old River Barrier
hp.....horsepower
HPMP.....Historic Properties Management Plan

IFIM .....Instream Flow Incremental Methodology
ILP.....Integrated Licensing Process
in .....inches
ISR .....Initial Study Report
ITA.....Indian Trust Assets
IUCN.....International Union for the Conservation of Nature
KOPs.....Key Observation Points
kV.....kilovolt
KVA.....kilowatt-amps
kW.....kilowatt
LTAM .....Ladenburg Thalmann Asset Management
LWD .....large woody debris
m .....meters
mm .....millimeter
M&I.....Municipal and Industrial
MCL.....Maximum Contaminant Level
mg/kg .....milligrams/kilogram
mg/L.....milligrams per liter
mgd .....million gallons per day
MGR .....Migration of Aquatic Organisms
MHW .....Montane Hardwood
mi .....miles
mi^2.....square miles
MID.....Modesto Irrigation District
MOA .....Memorandum of Agreement
MOU .....Memorandum of Understanding
MPN.....Most Probable Number
MPR.....market price referents
MSCS.....Multi-Species Conservation Strategy
msl.....mean sea level
MUN .....municipal and domestic supply
MVA .....Megavolt Ampere
MW .....megawatt

MWh .....megawatt hour
mya.....million years ago
NAE .....National Academy of Engineering
NAHC .....Native American Heritage Commission
NAS.....National Academy of Sciences
NAVD 88.....North American Vertical Datum of 1988
NAWQA .....National Water Quality Assessment
NCCP .....Natural Community Conservation Plan
NGVD .....National Geodetic Vertical Datum
NEPA .....National Environmental Policy Act
NERC.....North American Electric Reliability Corporation
NGOs .....Non-Governmental Organizations
NHI .....Natural Heritage Institute
NHPA.....National Historic Preservation Act
NISC .....National Invasive Species Council
NMFS.....National Marine Fisheries Service
NOAA .....National Oceanic and Atmospheric Administration
NOI .....Notice of Intent
NPS .....U.S. Department of the Interior, National Park Service
NRCS .....National Resource Conservation Service
NRHP.....National Register of Historic Places
NRI.....Nationwide Rivers Inventory
NTU .....Nephelometric Turbidity Unit
NWI.....National Wetland Inventory
NWIS .....National Water Information System
NWR .....National Wildlife Refuge
NGVD 29.....National Geodetic Vertical Datum of 1929
O&M.....operation and maintenance
OEHHA.....Office of Environmental Health Hazard Assessment
OID .....Oakdale Irrigation District
ORV .....Outstanding Remarkable Value
OSHA.....Occupational Safety and Health Administration
PA .....Programmatic Agreement

PAD.....Pre-Application Document
PDAW.....Project Demand of Applied Water
PDO.....Pacific Decadal Oscillation
PEIR.....Program Environmental Impact Report
PGA.....Peak Ground Acceleration
PG&E.....Pacific Gas and Electric
PHABSIM.....Physical Habitat Simulation
PHG.....Public Health Goal
PM&E .....Protection, Mitigation and Enhancement
PMF.....Probable Maximum Flood
POAOR.....Public Opinions and Attitudes in Outdoor Recreation
ppb.....parts per billion
ppm .....parts per million
PRISM.....Probabilistic Symbolic Model Checker
PSP.....Proposed Study Plan
PWA.....Public Works Administration
QA.....Quality Assurance
QC.....Quality Control
RA.....Recreation Area
RBP.....Rapid Bioassessment Protocol
REC-1 .....water contact recreation
REC-2 .....water non-contact recreation
Reclamation .....U.S. Department of the Interior, Bureau of Reclamation
RM .....River Mile
RMP .....Resource Management Plan
RP.....Relicensing Participant
RPM.....Rotations per minute
RPS .....Renewable Portfolio Standard
RSP .....Revised Study Plan
RST .....Rotary Screw Trap
RWF.....Resource-Specific Work Groups
RWG .....Resource Work Group
RWQCB.....Regional Water Quality Control Board

SC.....State candidate for listing under CESA

SCADA.....Supervisory Control and Data Acquistion

SCD.....State candidate for delisting under CESA

SCE.....State candidate for listing as endangered under CESA

SCT.....State candidate for listing as threatened under CESA

SD1.....Scoping Document 1

SD2.....Scoping Document 2

SE.....State Endangered Species under the CESA

SEED.....U.S. Bureau of Reclamation's Safety Evaluation of Existing Dams

SFP.....State Fully Protected Species under CESA

SFPUC.....San Francisco Public Utilities Commission

SHPO.....State Historic Preservation Officer

SJRA.....San Joaquin River Agreement

SJRGA.....San Joaquin River Group Authority

SJTA.....San Joaquin River Tributaries Authority

SM.....Standard Method

SMUD.....Sacramento Municipal Utility District

SPAWN.....spawning, reproduction and/or early development

SPD.....Study Plan Determination

SRA.....State Recreation Area

SRMA.....Special Recreation Management Area or Sierra Resource Management Area (as per use)

SRMP.....Sierra Resource Management Plan

SRP.....Special Run Pools

SSC.....State species of special concern

ST.....California Threatened Species under the CESA

STORET.....Storage and Retrieval

SWAMP.....Surface Water Ambient Monitoring Program

SWE.....Snow-Water Equivalent

SWP.....State Water Project

SWRCB.....State Water Resources Control Board

TAC.....Technical Advisory Committee

TAF.....thousand acre-feet

TCP .....Traditional Cultural Properties
TCWC.....Tuolumne County Water Company
TDS.....Total Dissolved Solids
TID.....Turlock Irrigation District
TMDL .....Total Maximum Daily Load
TOC.....Total Organic Carbon
TRT.....Tuolumne River Trust
TRTAC .....Tuolumne River Technical Advisory Committee
UC.....University of California
USBR.....U.S. Bureau of Reclamation
USDA.....U.S. Department of Agriculture
USDOC.....U.S. Department of Commerce
USDOI .....U.S. Department of the Interior
USFS.....U.S. Department of Agriculture, Forest Service
USFWS .....U.S. Department of the Interior, Fish and Wildlife Service
USGS .....U.S. Department of the Interior, Geological Survey
USR.....Updated Study Report
UTM.....Universal Transverse Mercator
VAMP.....Vernalis Adaptive Management Plan
VELB.....Valley Elderberry Longhorn Beetle
VES.....visual encounter surveys
VRM .....Visual Resource Management
VRO.....Visual Resource Objective
WBWG .....Western Bat Working Group
WECC.....Western Electricity Coordinating Council
WPA.....Works Progress Administration
WPT.....Western Pond Turtle
WQCP.....Water Quality Control Plan
WSA.....Wilderness Study Area
WSIP.....Water System Improvement Program
WSNMB .....Western Sierra Nevada Metamorphic Belt
WUA.....weighted usable area
WWTP .....Wastewater Treatment Plant

WY .....water year

yd^3 .....cubic yard

yr .....year

µS/cm .....microSeimens per centimeter

µg/L.....micrograms per liter

µmhos.....micromhos

EXHIBIT H - PLANS AND ABILITY OF APPLICANT TO OPERATE THE PROJECT

The following excerpt from the Code of Federal Regulations (CFR) at 18 CFR § 5.18(c) describes the required content of this Exhibit.

(i) Information to be supplied by all applicants. All Applicants for a new license under this part must file the following information with the Commission:

(A) A discussion of the plans and ability of the applicant to operate and maintain the project in a manner most likely to provide efficient and reliable electric service, including efforts and plans to:

(1) Increase capacity or generation at the project;

(2) Coordinate the operation of the project with any upstream or downstream water resource projects; and

(3) Coordinate the operation of the project with the applicant's or other electrical systems to minimize the cost of production.

(B) A discussion of the need of the applicant over the short and long term for the electricity generated by the project, including:

(1) The reasonable costs and reasonable availability of alternative sources of power that would be needed by the applicant or its customers, including wholesale customers, if the applicant is not granted a license for the project;

(2) A discussion of the increase in fuel, capital, and any other costs that would be incurred by the applicant or its customers to purchase or generate power necessary to replace the output of the licensed project, if the applicant is not granted a license for the project;

(3) The effect of each alternative source of power on:

(i) The applicant's customers, including wholesale customers;

(ii) The applicant's operating and load characteristics; and

(iii) The communities served or to be served, including any reallocation of costs associated with the transfer of a license from the existing licensee.

(C) The following data showing need and the reasonable cost and availability of alternative sources of power:

(1) The average annual cost of the power produced by the project, including the basis for that calculation;

(2) The projected resources required by the applicant to meet the applicant's capacity and energy requirements over the short and long term including:

(i) Energy and capacity resources, including the contributions from the applicant's generation, purchases, and load modification measures (such as conservation, if considered as a resource), as separate components of the total resources required;

(ii) A resource analysis, including a statement of system reserve margins to be maintained for energy and capacity;

(iii) If load management measures are not viewed as resources, the effects of such measures on the projected capacity and energy requirements indicated separately;

(iv) For alternative sources of power, including generation of additional power at existing facilities, restarting deactivated units, the purchase of power off-system, the construction or purchase and operation of a new power plant, and load management measures such as conservation: The total annual cost of each alternative source of power to replace project power; the basis for the determination of projected annual cost; and a discussion of the relative merits of each alternative, including the issues of the period of availability and dependability of purchased power, average life of alternatives, relative equivalent availability of generating alternatives, and relative impacts on the applicant's power system reliability and other system operating characteristics; and the effect on the direct providers (and their immediate customers) of alternate sources of power.

(D) If an applicant uses power for its own industrial facility and related operations, the effect of obtaining or losing electricity from the project on the operation and efficiency of such facility or related operations, its workers, and the relate community.

(E) If an applicant is an Indian tribe applying for a license for a project located on the tribal reservation, a statement of the need of such Indian tribe for electricity generated by the project to foster the purposes of the reservation.

(F) A comparison of the impact on the operations and planning of the applicant's transmission system of receiving or not receiving the project license, including:

(1) An analysis of the effects of any resulting redistribution of power flows on line loading (with respect to applicable thermal, voltage, or stability limits), line losses, and necessary new construction of transmission facilities or upgrading of existing facilities, together with the cost impact of these effects;

(2) An analysis of the advantages that the applicant's transmission system would provide in the distribution of the project's power; and

(3) Detailed single-line diagrams, including existing system facilities identified by name and circuit number, that show system transmission elements in relation to the project and other principal interconnected system elements. Power flow and loss data that represent system operating conditions may be appended if applicants believe such data would be useful to show that the operating impacts described would be beneficial.

(G) If the applicant has plans to modify existing project facilities or operations, a statement of the need for, or usefulness of, the modifications, including at least a reconnaissance-level study of the effect and projected costs of the proposed plans and any alternate plans, which in conjunction with other developments in the area would conform with a comprehensive plan for improving or developing the waterway and for other beneficial public uses as defined in Section 10(a)(1) of the Federal Power Act.

(H) If the applicant has no plans to modify existing project facilities or operations, at least a reconnaissance level study to show that the project facilities or operations in conjunction with other developments in the area would conform with a comprehensive plan for improving or developing the waterway and for other beneficial public uses as defined in Section 10(a)(1) of the Federal Power Act.

(I) A statement describing the applicant's financial and personnel resources to meet its obligations under a new license, including specific information to demonstrate that the applicant's personnel are adequate in number and training to operate and maintain the project in accordance with the provisions of the license.

(J) If an applicant proposes to expand the project to encompass additional lands, a statement that the applicant has notified, by certified mail, property owners on the additional lands to be encompassed by the project and governmental agencies and subdivisions likely to be interested in or affected by the proposed expansion.

(K) The applicant's electricity consumption efficiency improvement program, as defined under Section 10(a)(2)(C) of the Federal Power Act, including:

(1) A statement of the applicant's record of encouraging or assisting its customers to conserve electricity and a description of its plans and capabilities for promoting electricity conservation by its customers; and

(2) A statement describing the compliance of the applicant's energy conservation programs with any applicable regulatory requirements.

(L) The names and mailing addresses of every Indian tribe with land on which any part of the proposed project would be located or which the applicant reasonably believes would otherwise be affected by the proposed project.

(ii) Information to be provided by an applicant licensee. An existing licensee that applies for a new license must provide:

(A) The information specified in paragraph (c)(1) of this section.

(B) A statement of measures taken or planned by the licensee to ensure safe management, operation, and maintenance of the project, including:

(1) A description of existing and planned operation of the project during flood conditions;

(2) A discussion of any warning devices used to ensure downstream public safety;

(3) A discussion of any proposed changes to the operation of the project or downstream development that might affect the existing Emergency Action Plan, as described in subpart C of part 12 of this chapter, on file with the Commission;

(4) A description of existing and planned monitoring devices to detect structural movement or stress, seepage, uplift, equipment failure, or water conduit failure, including a description of the maintenance and monitoring programs used or planned in conjunction with the devices; and

(5) A discussion of the project's employee safety and public safety record, including the number of lost-time accidents involving employees and the record of injury or death to the public within the project boundary.

(C) A description of the current operation of the project, including any constraints that might affect the manner in which the project is operated.

(D) A discussion of the history of the project and record of programs to upgrade the operation and maintenance of the project.

(E) A summary of any generation lost at the project over the last five years because of unscheduled outages, including the cause, duration, and corrective action taken.

(F) A discussion of the licensee's record of compliance with the terms and conditions of the existing license, including a list of all incidents of noncompliance, their disposition, and any documentation relating to each incident.

(G) A discussion of any actions taken by the existing licensee related to the project which affects the public.

(H) A summary of the ownership and operating expenses that would be reduced if the project license were transferred from the existing licensee.

(I) A statement of annual fees paid under part I of the Federal Power Act for the use of any Federal or Indian lands included within the project boundary.

1.0 EFFICIENT AND RELIABLE ELECTRIC SERVICE

Pursuant to 18 CFR § 5.18(c), the Federal Energy Regulatory Commission (FERC) requires the Turlock Irrigation District (TID) and the Modesto Irrigation District (MID) (collectively, the Districts) as joint licensees of the Don Pedro Hydroelectric Project (Project) to provide certain information concerning its plans and abilities to operate, maintain, and improve the Project in support of its application for a new license. Also required is a description of the Districts' record of operating and managing the Don Pedro Project under the current license.

1.1 Efficiency and Reliability

The Districts are co-licensees of the Don Pedro Project on the Tuolumne River in the Central Valley area of California. Each of the Districts are authorized under California law to provide water supply for irrigation and municipal and industrial (M&I) purposes and retail electric service within their designated service territories in Stanislaus and Merced counties.

The Don Pedro Project is a vital and essential resource for the Districts' customers and the Central Valley. TID, as Project operator on behalf of the Districts, is responsible for the day-to-day operation and maintenance of the Project and has done so since completion of Project construction in 1971. For over 40 years, both Districts have consistently demonstrated their capability to jointly manage and maintain the Don Pedro Project in a manner that delivers efficient, reliable, renewable electricity and reliable water supplies to their service areas while consistently meeting or exceeding their responsibilities related to resource protection and recreation opportunity.

The primary purposes of the Don Pedro Project are to provide reliable water supplies to their irrigation and M&I water customers, provide for flood management on the Tuolumne and San Joaquin rivers, and create a 570,000 acre-foot (AF) "water bank" credit for the City and County of San Francisco and its 2.6 million water customers in the San Francisco Bay Area. Renewable hydropower generation at the Project is an important, but secondary, benefit to the Districts and the region. The Don Pedro powerhouse sits immediately below Don Pedro Dam and contains four turbine-generator units with a total hydraulic capacity of 5,500 cubic feet per second (cfs) and a FERC-authorized installed capacity of 168 megawatt (MW). Maximum output under favorable reservoir level and flow conditions can exceed 200 MW, but these conditions occur relatively infrequently.

Flow releases from the reservoir through the powerhouse are scheduled based upon requirements for (1) flood flow management, including "pre-releases" in advance of anticipated high flows during wet years, (2) Districts' irrigation and M&I demands, including flows to maintain sufficient water storage in Turlock Lake and Modesto Reservoir for those purposes, and (3) anadromous fish protection in the lower Tuolumne River in accordance with the FERC license terms. Once the weekly and daily flow schedules are established based on these demands, then outflows from the Don Pedro powerhouse are scheduled to deliver the appropriate flows. During periods of greater electrical demand, outflows may be shaped to generate more electricity during on-peak periods and less during off-peak periods, subject to meeting the requirements of the pre-established flow schedule for delivering water supplies or pre-releases for flood flow management. In accordance with the Districts' "water-first" policy, Don Pedro flow releases are

scheduled to satisfy the three requirements listed above, then delivered via the generation units up to their capacity and availability. Hydropower generation at Don Pedro is a secondary consideration with respect to overall reservoir management.

More precisely, the Don Pedro Project serves the following primary purposes and functions:

- Provide water storage for the beneficial use of irrigation of over 200,000 acres (ac) of farmland served by the Districts in California's San Joaquin River Valley. Combined, the Districts supply, on average, over 850,000 acre-feet (AF) of irrigation water per year to their customers.
- Provide water storage for the beneficial use of M&I customers. MID provides treated water to the City of Modesto (population: 210,000), and TID and MID jointly provide treated water to the community of La Grange. The Districts provide up to a maximum of 67,500 AF of water per year for M&I use. In addition, consistent with the requirements of the Raker Act and agreements between the Districts and the City and County of San Francisco (CCSF), the Project provides a water bank of up to 570,000 AF that CCSF uses to help manage the water supply from its Hetch Hetchy water system while meeting the senior water rights of the Districts. CCSF's water bank within Don Pedro Reservoir provides significant benefits for CCSF's 2.6 million customers in the Bay Area.
- Provide storage for flood management on the Tuolumne and San Joaquin rivers. In cooperation with the U.S. Army Corps of Engineers (ACOE), the Don Pedro Project provides up to 340,000 AF of storage for the purpose of flood control.

Other important uses supported by the water storage and water supply of the Project are clean and renewable hydroelectric power production, recreation at Don Pedro Reservoir, and flows to benefit the aquatic resources of the lower Tuolumne River. Regarding the generation of hydroelectric power, the four turbine-generator units and the balance of plant at Don Pedro have operated with consistently high reliability and performance over the 40-plus years of the Project's commercial operation. Other than scheduled outages, there has been no prolonged forced outages and all plant equipment and materials are well maintained and serviced in accordance with manufacturer specifications.

As a demonstration of the Districts' continuing commitment to investing in the efficiency, reliability and performance of hydropower generation at the Project, the Districts added a fourth generating unit in 1989, after receiving FERC approval. This unit increased the authorized capacity by approximately 35 MW to the current 168 MW. This was a significant investment and demonstrates the Districts' commitment to improving energy production and efficiency at the Project.

1.1.1 Increase in Capacity or Energy Generation

The Districts are not proposing any changes to Project operations at this time. However, several studies are continuing to be performed by the Districts to investigate the feasibility of increasing the generating capability of the existing Units 1, 2, and 3 at the plant. If the results of these studies indicate project feasibility, the Final License Application (FLA) will contain the Districts' proposals for future Project upgrades.

1.1.2 Coordination with any Upstream or Downstream Water Resource Projects

The Don Pedro Project is operated and managed as a multi-purpose water resource development providing water storage for irrigation, municipal and industrial, flood control, recreation, power generation, and fisheries protection and enhancement purposes. TID is the Project operator and is also the majority owner of the Project holding title to 68.46 percent with MID owning the remaining 31.54 percent. The Districts are authorized and obligated under California law to provide both water supply and retail electric service. Over 200,000 ac of highly productive Central Valley farmland are dependent upon the irrigation water provided by the Districts.

The original planning and design of the Don Pedro Project, and its current operation, provides an excellent example of a coordinated approach to water resource planning. Incorporated into the design and operation of the facility are considerations to maximize the benefits of the Project for a number of parties and resources. All of the Project's multiple purposes which collectively demonstrate a high degree of basin-wide cooperation and coordination are described below.

1.1.2.1 Coordination with the City and County of San Francisco's Hetch Hetchy Water Supply System.

The entire development of the Don Pedro water resource project was a coordinated effort between the Districts and the CCSF, owners and operators of the upstream Hetch Hetchy water supply system which supplies M&I water to 2.6 million customers in the Bay Area delivered through its San Joaquin Pipeline. The waters of the Tuolumne River are shared by the Districts and CCSF in accordance with the Raker Act passed by Congress in 1913 to address the allocation of the waters of the Tuolumne River between the Districts and CCSF. Over the ensuing years, the Districts and CCSF entered into various agreements implementing the Raker Act. The two most recent of these agreements, the Third Agreement (1949) and the Fourth Agreement (1966), established the scope of and responsibilities for the cooperative development of the Tuolumne River by CCSF and the Districts. While the Third Agreement set the stage for the building of the new Don Pedro Project, the Fourth Agreement defines the allocation of the waters of the river. The Fourth Agreement is provided as Appendix H-1. A main component of the Fourth Agreement is water accounting. A running account of the water bank balance is computed daily, in accordance with the Fourth Agreement and other implementing agreements. In accordance with the Fourth Agreement, CCSF is not allowed to run a "negative" balance without the consent of the Districts. The Fourth Agreement and its amendments also acknowledge the role of CCSF's water bank account related to increases in FERC-required flows for the lower Tuolumne River. Approximately fifty-two percent (51.7%) of all incremental FERC-flows above those of the original Don Pedro license are assigned as CCSF's responsibility. Reservoir storage capacity, flood control operations, and water releases are also addressed in the Fourth Agreement. In and of itself, the existence of the Fourth Agreement demonstrates the Districts commitment to coordination with upstream water resource developments. Exhibit B provides a more detailed discussion of the Fourth Agreement.

1.1.2.2 Coordination with the US Army Corps of Engineers

The Don Pedro Project was also developed and is operated in coordination with the ACOE. Joint efforts to provide additional flood control on the Tuolumne River date back to the 1930s,

all resulting in an agreement between the ACOE and Districts in 1944 where the ACOE would abandon its efforts to build a flood control dam at Jacksonville if the Districts would build New Don Pedro and design it to provide the same amount of flood control space, 340,000 AF, as the ACOE planned for its Jacksonville reservoir. The agreement reached with ACOE led to its incorporation into the Flood Control Act of 1944 passed by Congress. By agreement, ACOE contributed financially to the construction of the Don Pedro Project in exchange for 340,000 AF of seasonal flood control storage in Don Pedro.

Flood flow management coordination is implemented in accordance with the 1972 ACOE Flood Control Manual (see Exhibit B of this application for more information). The management of flood flows at Don Pedro also assists ACOE with its overall mission of flood control on the entire San Joaquin River.

1.1.2.3 Water Quality Control Plan and Vernalis Adaptive Management Plan

In addition to cooperation with in-basin water resource developments and flood management on the Tuolumne and San Joaquin rivers, the Districts have demonstrated their willingness to cooperate voluntarily with federal and state fishery resource agencies to benefit anadromous fish in the lower Tuolumne River and downstream in the San Joaquin and Bay-Delta. For example, the Districts reached an agreement with resource agencies and conservation groups in 1995 which led to FERC issuing in 1996 an amendment to the existing Don Pedro license that increased minimum and pulse flows to the lower Tuolumne River to benefit fall-run Chinook salmon and rainbow trout/steelhead (*O.mykiss).* The Districts also participated in the recently completed Vernalis Adaptive Management Plan (VAMP), more fully described below.

The California State Water Resources Control Board's (SWRCB) adoption of the 1995 Water Quality Control Plan (WQCP) for the Sacramento-San Joaquin Delta and Estuary was tracked with great interest by the Districts, given that the Districts hold senior appropriative water rights on the Tuolumne River.

The Districts were particularly concerned since (1) the 1995 WQCP required additional flow for the San Joaquin River at Vernalis, and (2) it was extremely unlikely that such water could be obtained from any source other than the Districts and other San Joaquin Basin tributaries. Since there are no large tributaries to the San Joaquin River capable of providing the quantity of water necessary to meet the flows at Vernalis required by the 1995 WQCP other than the Stanislaus, Tuolumne and Merced rivers, it was clear that the vast majority of the water necessary to meet the new Vernalis flow requirements would have to come from the Districts along with other water right holders on the Merced and Stanislaus rivers.

Given their joint interest in the water quality standards contained in the 1995 WQCP, TID and MID, CCSF, along with the other major water right holders on the Merced and Stanislaus rivers formed the San Joaquin Tributaries Association (SJTA). The SJTA felt that there was not enough scientific evidence in the administrative record regarding the relationship of Chinook salmon survival and increased flow in the San Joaquin River to justify the adoption of the specific flow objectives for the San Joaquin River contained in the 1995 WQCP.

The SWRCB suggested that the SJTA should attempt to resolve its concerns about the adequacy of the scientific underpinnings of the Vernalis flow requirements contained in the 1995 WQCP through the development of an implementation strategy which would provide for the acquisition of data regarding the effect such flow would have on Chinook salmon survival. The SJTA's members were interested in making certain that the Vernalis flow requirements were based upon sound science.

Therefore, in response to the SWRCB's invitation to water right holders to develop and present agreed-upon implementation plans, the SJTA decided to seek a broader coalition, one which was not based solely upon senior water right holders in the San Joaquin River Basin, but one which also included other stakeholders and parties interested in issues associated with the San Joaquin River. As a result, the SJTA joined with the Friant Water Users Authority (FWUA) and the San Joaquin River Exchange Contractors to form the San Joaquin River Group Authority (SJRGA), which then entered into an 18 month process of broad discussions to develop a package of scientifically based flow and non-flow actions designed to benefit outmigrating salmon smolts and other aquatic species. Such meetings and discussions brought together and included other water right holders, such as CCSF and East Bay Municipal Utilities District (EBMUD), the state and federal export contractors, the U.S. Bureau of Reclamation (USBR) and California Department of Water Resources (CDWR), various federal and state resources agencies, including the Environmental Protection Agency (EPA), U.S. Department of the Interior, Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), California Department of Fish and Wildlife (CDFW), and private groups dedicated to the preservation of the environment, including the Natural Heritage Institute (NHI) and the Bay Institute.

Two scientists, Dr. Bruce Herbold of EPA and Dr. Charles Hanson, an expert retained by the State Water Contractors, took the lead role in developing an experiment to evaluate the role that flow in the lower San Joaquin River and exports had on the survival of outmigrating Chinook salmon smolts. Development of the experiment was an iterative process. As various drafts of the experiment, which became known as the VAMP, were prepared, they were reviewed and revised by researchers and scientists from all sectors, including water users, universities, the state and federal resource agencies and the environmental community.

In developing the experiment, Dr. Herbold and Dr. Hansen were guided by three principles. First, the experiment had to be designed and conducted in such a way as to protect salmon at least as well as would strict compliance with the 1995 WQCP. Second, the experiment had to provide scientific results that actually reflected upon the relationship between flow, exports, and salmon smolt survival during the spring out migration period. Third, the scientific results had to be verifiable, reliable and usable so that future decisions based upon them would have the confidence of all of the affected parties. Utilizing these three principles, the VAMP experiment was designed in two phases. The first phase was analytical and focused on identifying what the experiment should be in terms of flow and exports. The second phase was logistical, and focused on the method by which the impact that the experiment had on salmon smolts could be determined.

The analytical framework of the experiment was identified by an examination of the various physical and regulatory constraints on the system. These included the existing limitation that the ratio of flow to exports be 2:1, a ceiling on flows of 7500 cfs at Vernalis due to the installation of

a barrier at the head of Old River, and minimum export requirements. Once this framework was in place, additional flow to export ratios were added in an effort to avoid the problem, seen in the historical data, that the flow and export numbers would vary together. Similarly, additional flow rates were added to assist in determining the interaction between flow rate, exports and salmon smolt survival. The result was a matrix of flows and export rates that enabled an evaluation of four levels of flow and three levels of export.

Relying upon the seasonal pattern of outmigration and factors influencing such migration, including water temperature, the scientists identified April 15 through May 15 as the time during which the experiment should be conducted. During this time period, the flows and exports would be managed in accordance with the matrix discussed above. By managing the flow and exports, the reliability of the data would be increased, since variation in both was identified as a primary weakness of prior studies regarding the impact that flows and exports had on smolt survival. Further, it would enable the researchers to differentiate between the impact that flows and export rates had individually, which prior studies could not due to the variability of each.

In addition to the consistent management of flows and exports in accordance with the protocols of the experiment, the experiment relies upon the consistent installation and operation of a barrier at the head of Old River. The primary benefit of the barrier is that it directs outmigrating smolts away from the Old River channel and the state and federal export pumps, and keeps them in the main stem of the San Joaquin River, greatly increasing their chance of survival. However, while the installation and operation of the barrier is an integral aspect of the experiment, the researchers recognized that the barrier might not be installed under all conditions. As such, they developed a contingency plan for those years in which the barrier is not installed and operated which will enable the experiment to take place and to still provide valuable data utilizing the general protocols of the overall experiment.

Having identified the time frame for the experiment, as well as the flow and export rates that would be used, all that remained was the process by which the level of smolt survival could be evaluated. After reviewing past efforts and identifying their strengths and weaknesses, the researchers decided to release salmon smolts containing coded wire tags from four locations in the southern and eastern Delta during the April-May pulse flow period and to sample/recapture such smolts at two locations in the western Delta. Results of the recapture, identifying the number caught from each release location, as well as general operating and environmental conditions occurring during the recapture, were documented.

To manage the flow at Vernalis in accordance with the experiments' matrix, one needed the participation of several water right holders located upstream of Vernalis. To manage the exports, one needed the participation of the USBR and DWR. To install and operate the barrier at the head of Old River required the consent and cooperation of the DWR. The transport, release and recapture of the coded-wire tagged salmon smolts required the participation and consent of the State Water Project, CDFW, and USFWS.

It was at this point that the members of the SJRGA stepped in and made an offer. They, as the holders of the largest and most senior water rights to the Stanislaus, Tuolumne and Merced rivers, would make the water available necessary to achieve the April-May pulse flow called for in the experiment as their contribution to the 1995 WQCP. In exchange, the USBR and DWR

would agree to meet all other flow related requirements of the San Joaquin Basin and to limit exports as called for in the experiment. Additionally, the DWR would install the barrier at the head of Old River, and CDFW and USFWS would assist in the release and recapture of the test smolts. The parties agreed in concept to this idea, and began to draft an agreement that could then be presented to the SWRCB for review and consideration at the SWRCB's water right hearings. This became the San Joaquin Rive Agreement (SJRA).

The SJRA was a 12-year performance agreement that contained a package of flow and non-flow actions that was undertaken by the parties to implement the VAMP experiment. First, it established a schedule by which the SJRGA's members provided up to 110,000 AF of water each year, in excess of the existing flow, to meet the April-May pulse flow. Second, the SJRA required the USBR and DWR to reduce exports during the pulse flow period, with the level of reduction based upon the flow at Vernalis. Third, the SJRA provided that DWR install the barrier at the head of Old River each year.

In addition to providing the framework by which the VAMP experiment was conducted, the SJRA also called for additional water to be made available for environmental benefits in other parts of the year. The Merced ID and the Oakdale ID provided this water. The SJRA contained far more than just the basics of the actions taken; it created a comprehensive process by which the experiment was conducted. It established a technical committee, comprised of one technical specialist designated by each party, whose purpose was to meet each year to develop the flow and export rates, to determine the best management of flow released during the pulse flow period, and to coordinate the flow releases, export reductions, and release and recapture of salmon smolts. The technical committee was also responsible for conducting the sampling and monitoring effort, including the protocols for the transport, tagging, release, and recapture of salmon smolts, and compilation and evaluation of the data. The SJRA also included detailed requirements for dealing with any disputes. The performance of the SJRA was contingent upon approval of certain conditions by the SWRCB. Specifically, the SWRCB had to find that the USBR and DWR were responsible for meeting all of the flow requirements for the San Joaquin Basin established in the 1995 WQCP, and that the sole responsibility of the SJRGA's members was to assist the USBR and DWR in meeting their requirements by performing in accordance with the flow provisions of the SJRA. The SWRCB also had to agree to amend the water rights of the SJRGA's members in accordance with Water Code sections 1707 and 1735 to enable them to release water for the environmental purpose of meeting the pulse flow requirements at Vernalis. Thus, prior to becoming an enforceable contract, the parties to the SJRGA had to submit the SJRA to the SWRCB for review and consideration at its water rights hearing.

The VAMP experimental plan began in 1999 and extended through 2011. The Districts provided their share of the water to the lower Tuolumne River to support meeting the called for pulse flow of up to an additional 110,000 AF per year at Vernalis. The VAMP experiment was not extended beyond 2011.

1.1.3 Coordination of Operations with Electrical Systems

As public utilities, the Districts provide reliable electric retail energy to homes, farms, and businesses in the Central Valley area of California. The Project switchyard is located atop the powerhouse at elevation 340 ft. The switchyard provides power delivery and electrical

protection to the Districts' transmission systems. The switchyard includes isolated phase buses, circuit breakers, and four transformers that raise the 13.8 kilovolt (kV) generator voltage to 69 kV transmission voltage. Transformers 1 through 3 are rated at 55 megavolt amperes (MVA) and Unit 4 at 44 MVA. While units 1, 2, and 4 are direct connected to TID's system and unit 3 to the MID system, the switchyard has recently been configured to allow interconnection across the two systems when needed. This system, when operating in an interconnected fashion, acts as a pathway for electricity flows across the two systems, providing system benefits to both districts.

TID operates as its own Control Area operator responsible for meeting applicable North American Electric Reliability Council (NERC) standards. MID has contracted with the Sacramento Municipal Utility District (SMUD) to provide certain control area responsibilities through its interconnection with the CAISO. As required by the CAISO, both Districts, as power generators, must meet certain electrical system performance and monitoring requirements as part of their role in supporting the interconnected grid. Both TID and MID have fully met and complied with all such requirements.

1.2 Need for Project Electricity

The Don Pedro Project serves a wide customer base including residential, commercial, industrial, and agricultural customers. The need for electricity is expected to increase over the term of the new license. The California Energy Commission (CEC) issued an Updated California Energy Demand Forecast 2011-2022 in May 2011. The staff report presented an update to the 2009 California Energy Demand electricity forecast adopted for the 2009 Integrated Energy Policy Report in December 2009. The updated forecast was meant to provide the CEC's best estimate of the effect of worsened economic conditions on energy demand since the 2009 forecast was published. The updated forecast presents low, mid, and high forecasts for the state. Average annual growth rates for electricity consumption for 2010-2022 is 1.13 percent, 1.28 percent, and 1.53 percent, respectively (CEC 2011).

Historical and projected numbers of MID and TID electricity sales by customer class are presented in the sections below.

1.2.1 Turlock Irrigation District

TID serves 100,345 customer accounts across 14 communities in a service area of 662 mi^2 in Stanislaus, Merced, Tuolumne, and Mariposa counties. The communities served include Ballico, Ceres, Crows Landing, Delhi, Denair, Diablo Grande, Hickman, Hilmar, Hughson, Keyes, La Grange, Patterson, South Modesto, and Turlock. The composition of these accounts is shown in Table 1.2-1.

Table 1.2-1. TID customer accounts, by type of account.

Type of Account	Number of Accounts	Percent of Accounts
Residential	72,033	72%
Municipal/street lighting	16,367	16%
Commercial	6,983	7%
Agricultural	2,508	2%
Other	1,656	2%
Industrial	798	1%
Total	**100,345**	**100%**

TID's historical and projected electricity sales by customer class are presented in Table 1.2-2. As depicted in Table 1.2-2, electricity needs are projected to increase over time.

Table 1.2-2. TID historical and projected electricity sales by customer class.

Year	Residential (MWh)	Commercial (MWh)	Industrial (MWh)	Agricultural (MWh)	Other (MWh)	Total Customers (MWh)
2011	693,659	124,820	729,239	199,331	196,628	1,943,677
2012	713,915	126,608	738,693	221,584	222,577	2,023,376
2013	728,912	128,695	760,690	223,722	213382	2,055,402
2014	742,166	130,277	776,686	226,774	214,736	2,090,639
2015	755,477	131,531	782,603	229,898	216,123	2,115,632
2016	768,819	132,798	793,937	233,091	217,605	2,146,251
2017	782,246	133,630	804,653	236,507	219,051	2,176,087
2018	795,778	134,311	815,504	240,152	220,655	2,206,400
2019	809,378	135,540	827,206	243,889	222,218	2,238,230
2020	823,016	137,603	840,016	247,717	223,807	2,272,158
2021	836,762	139,533	852,913	251,800	225,491	2,306,499
2022	850,508	140,536	864,712	255,988	227,202	2,338,947
2023	864,274	141,890	877,233	260,433	228,940	2,372,780
2024	878,099	143,733	890,359	264,857	230,707	2,407,755
2025	891,864	145,642	903,844	269,725	232,503	2,443,579
2026	905,649	147,887	917,796	274,554	234,329	2,480,215
2027	919,413	149,858	931,609	279,694	236,255	2,516,820
2028	933,138	151,593	945,377	284,979	238,141	2,253,228
2029	946,781	153, 318	959,359	290,417	240,133	2,590,008
2030	960,344	155,227	973,697	296,200	242,157	2,627,625
2031	973,936	157,323	988,425	301,963	244,217	2,665,864
2032	987,447	159,470	1,003,431	308,289	246,327	2,704,965
2033	1,000,918	161,976	1,018,990	314,611	248,481	2,744,976

1.2.2 Modesto Irrigation District

MID provides electrical service to seven communities in Stanislaus and San Joaquin counties, comprising about 114,000 customer accounts in a service territory of 560 mi^2. The composition of these accounts is shown in Table 1.2-3.

Table 1.2-3. MID customer accounts, by type of account.

Type of Account	Number of Accounts	Percent of Accounts
Residential	94,119	82.6%
Commercial	12,265	10.8%

Type of Account	Number of Accounts	Percent of Accounts
Industrial	157	0.1%
Agricultural	1,819	1.6%
Other	5,571	4.9%
Total	113,931	100.0%

MID's historical and projected electricity sales by customer class are presented in Table 1.2-4. As depicted in Table 1.2-4, electricity needs are expected to increase over time.

Table 1.2-4. MID historical and projected energy sales by customer class.

Year	Residential (MWh)	Commercial (MWh)	Industrial (MWh)	Agricultural (MWh)	Other (MWh)	Total Customers (MWh)
2011	857,822	717,323	758,316	96,869	15,562	2,445,892
2012	905,523	731,011	762,398	98,208	15,698	2,512,838
2013	914,763	738,127	763,717	99,350	15,836	2,531,791
2014	927,602	744,669	770,907	100,499	15,975	2,559,653
2015	944,537	751,324	771,780	101,657	16,116	2,585,413
2016	962,513	759,147	772,023	102,822	16,259	2,612,764
2017	983,313	768,596	774,077	103,995	16,403	2,646,384
2018	1,004,089	779,604	780,928	105,176	16,548	2,686,344
2019	1,025,865	792,059	785,978	106,365	16,695	2,726,962
2020	1,047,536	805,381	790,955	107,561	16,844	2,768,277
2021	1,073,450	827,709	798,294	108,767	16,994	2,825,215
2022	1,100,794	851,359	806,292	109,980	17,146	2,885,572
2023	1,129,429	876,217	815,153	111,202	17,300	2,949,300
2024	1,159,413	902,389	824,127	112,431	17,455	3,015,816
2025	1,190,680	929,758	832,817	113,669	17,613	3,084,538
2026	1,223,331	958,646	840,826	114,916	17,771	3,155,489
2027	1,257,329	988,979	848,254	116,171	17,932	3,228,665
2028	1,292,665	1,020,921	855,405	117,434	18,094	3,304,519
2029	1,329,501	1,054,521	862,380	118,706	18,258	3,383,367
2030	1,367,764	1,089,757	869,283	119,986	18,424	3,465,214
2031	1,410,558	1,127,922	876,254	121,277	18,592	3,554,604
2032	1,455,012	1,168,402	883,361	122,576	18,762	3,648,113
2033	1,501,069	1,211,101	894,819	123,884	18,934	3,749,808

1.2.3 Cost and Availability of Alternative Sources of Power

The Don Pedro Project provides reliable, flexible, and affordable electricity to TID's and MID's customers in the San Joaquin River Valley area of California. In addition to electricity, the Project provides water storage for the beneficial use of irrigation of over 200,000 ac of prime San Joaquin River Valley farmland and for the use of M&I customers in the City of Modesto.

If the Project's license is not renewed, the Don Pedro Project's 168 MW output, based on current FERC authorized installed capacity, would need to be replaced with an alternative source. One possible alternative source of power would be the construction of a combined-cycle, natural gas-fired generating facility. A combined-cycle natural gas-fired generating facility generates electricity using both a natural gas cycle and a steam cycle. Construction of a combined-cycle

natural gas-fired generating facility would be expected to result in substantially greater cost than the cost of Don Pedro power (Table 1.2-5).

The California Public Utilities Commission (CPUC) published Market Price Referents (MPR) in 2011 (Table 1.2-5). The rates are set and adjusted by Time of Use (TOU) factors as authorized by CPUC. The MPR in Table 1.2-5 is the predicted annual average cost of production for a combined-cycle natural gas fired generating facility.

Table 1.2-5. Adopted 2011 market price referents based on combined-cycle facility (nominal – dollars/kWh)

Contract Start Date	10-Year	15-Year	20-Year	25-Year
2012	0.07688	0.08353	0.08956	0.09274
2013	0.08103	0.08775	0.09375	0.09695
2014	0.08454	0.09151	0.09756	0.10081
2015	0.08804	0.09520	0.10132	0.10464
2016	0.09156	0.09883	0.10509	0.10848
2017	0.09488	0.10223	0.10859	0.11206
2018	0.09831	0.10570	0.11218	0.11572
2019	0.10186	0.10928	0.11587	0.11946
2020	0.10550	0.11296	0.11965	0.12326

Source: CPUC 2012.

California's Renewable Portfolio Standard (RPS) was initially established in 2002 under Senate Bill 1078, accelerated under Senate Bill 107, and expanded in 2011 under Senate Bill 2. The RPS requires investor-owned utilities, electric service providers, and community choice aggregators to increase procurement from eligible renewable energy resources to 33 percent of total procurement by 2020 (see CA Health and Safety Code 38500-38599). To meet the 33 percent total procurement, required entities must adopt the new RPS goals of 20 percent of retail sales from renewables by the end of 2013, 25 percent by the end of 2016, and 33 percent by the end of 2020. Under California law, large hydropower such as Don Pedro does not qualify as a renewable. Therefore, both the existing Don Pedro generation and generation from a natural gas source would be required to purchase greenhouse gas allowances, the current price of which is about $7/MWh (http://arb.ca.gov/cc/capandtrade/auction/auction.htm).

1.2.4 Replacement Power Costs

Based on CPUC's published MPR in 2011 (Table 1.2-5) for a combined-cycle natural gas fired generating facility, replacement power would be costly compared to the current Project power costs. The Project's current 2012 total estimated annual cost of power production is $8.5 million with the current value of the power approximately $14/MWh. Including a greenhouse gas allowance price of $7/MWh, the cost of Don Pedro generation would be about $21/MWh. Therefore replacement power costs with a combined-cycle natural gas fired generating facility would be approximately 4 to 5 times greater than the current cost of power, thus significantly and adversely impacting the Districts' customers. Exhibit D of this application provides additional information on Project Costs and Financing.

Another potential power source to replace the generation provided by the Don Pedro hydroelectric production would be wind power. To replace the 622,440 MWh, the Districts

estimate that a wind plant with an installed capacity of approximately 400 MW, operating at a plant factor between 15 and 20 percent. The capital cost of such a plant would be between $1 billion and $1.2 billion and cost of energy is estimated to be roughly $140/MWh, exclusive of incentives. This cost would be about 7 times greater than the current cost of the Don Pedro generation.

1.2.5 Effects of Alternative Sources of Power

1.2.5.1 Effects on Customers

Alternatives to Project power would impact the local and regional economy, since alternative sources may be significantly more costly as indicated in Section 1.2.2 above. The additional direct cost to the Districts' electricity customers have not been estimated at this time pending further assessment of the least cost alternative. However, industries that are sensitive to electricity costs (i.e., food processing industry) would be disproportionately impacted by any increase in cost.. Employment in these industries is generally lower wage; therefore, low income families would also likely be disproportionately impacted. In addition, given that the renewable Don Pedro generation emits no greenhouse gases, the increase in greenhouse gas emissions would also be substantial.

However, it is important to note that the primary purpose of the Don Pedro Project is to provide water storage for irrigation of over 200,000 ac of high-value farmland served by the Districts; water for municipal and industrial purposes; flood control; fisheries protection and enhancement; and support for CCSF's water supply for the Bay Area. All of these Project functions would continue even if the hydropower generation was ceased.

1.2.5.2 Effects on the Applicant's Operating and Load Characteristics

The Districts' operating and load characteristics would be minimally affected by increasing purchases of replacement power or installing a combined cycle unit. Some flexibility would be lost because a combined cycle unit does not possess the same rapid-response characteristics (upramping and downramping capabilities) as hydropower. However, the Districts do not use the Don Pedro units as load-following units because water flows are determined by water system and water customer demands.

1.2.5.3 Effects on Communities Served

Alternatives to Project power would impact the local and regional economy, since alternative sources may be significantly more costly. The effects on the communities served would reflect this loss of income to its citizens, potential increased unemployment, and lower tax revenues in proportion to the higher costs absorbed by local businesses.

1.3 Cost of Production and Alternative Sources of Power

1.3.1 Average Annual Cost of Power

The Project's average annual energy production since 1997 is 622,440 MWh. Based on the 2012 total estimated annual cost of power of $8.5 million, the current annual value of the Project power is approximately $14/MWh. This increases to $21/MWh when the current approximate cost of greenhouse gas allowance of $7/MWh is included, as California's regulations require large hydropower facilities to purchase greenhouse gas allowances. The FLA will include costs associated with the Districts' proposed future operating plan and any addition Protection, Mitigation, and Enhancement (PM&E) measures. Exhibit D of this application provides a further description of the costs of generation at the Project.

1.3.2 Projected Resources Required to Meet Capacity and Energy Requirements

The Districts operate the Project primarily for purposes of providing reliable water supplies and flood flow management. In operating the Project, the Districts also ensure dam safety and comply with all license requirements.

1.3.2.1 Turlock Irrigation District

TID forecasts its total load requirements over the short and long term. These load requirements are identified in Table 1.3-1 through 2032.

Table 1.3-1. TID total load requirements.

Year	Total Requirement (MW)
2013	535.45
2014	545.15
2015	551.90
2016	560.06
2017	568.08
2018	576.21
2019	584.66
2020	593.53
2021	602.51
2022	611.11
2023	619.98
2024	629.10
2025	638.37
2026	647.82
2027	657.26
2028	666.64
2029	676.09
2030	685.69
2031	695.42
2032	705.32

TID meets load requirements through a variety of resources varying between low demand period and high demand period. These load requirements are depicted by TID's resource plan for

January (Figure 1.3-1), a low demand period, and resource plan for July (Figure 1.3-2), a high demand period. TID maintains system reserve margin requirements in accordance with the Western Electricity Coordinating Council (WECC) Regional Standard "BAL-STD-002-0" which states that the minimum operating reserve is the sum of regulating reserve, contingency reserve, additional reserves for interruptible imports and additional reserves for on-demand obligations. TID also complies with NERC Standard "BAL-002-1a" and is an active participant of the NWPP Reserve Sharing Group. TID is required to carry enough contingency reserve to be able to properly respond to qualifying events. The Don Pedro Project, together with other TID resources, provides for these systems reserve margin requirements.

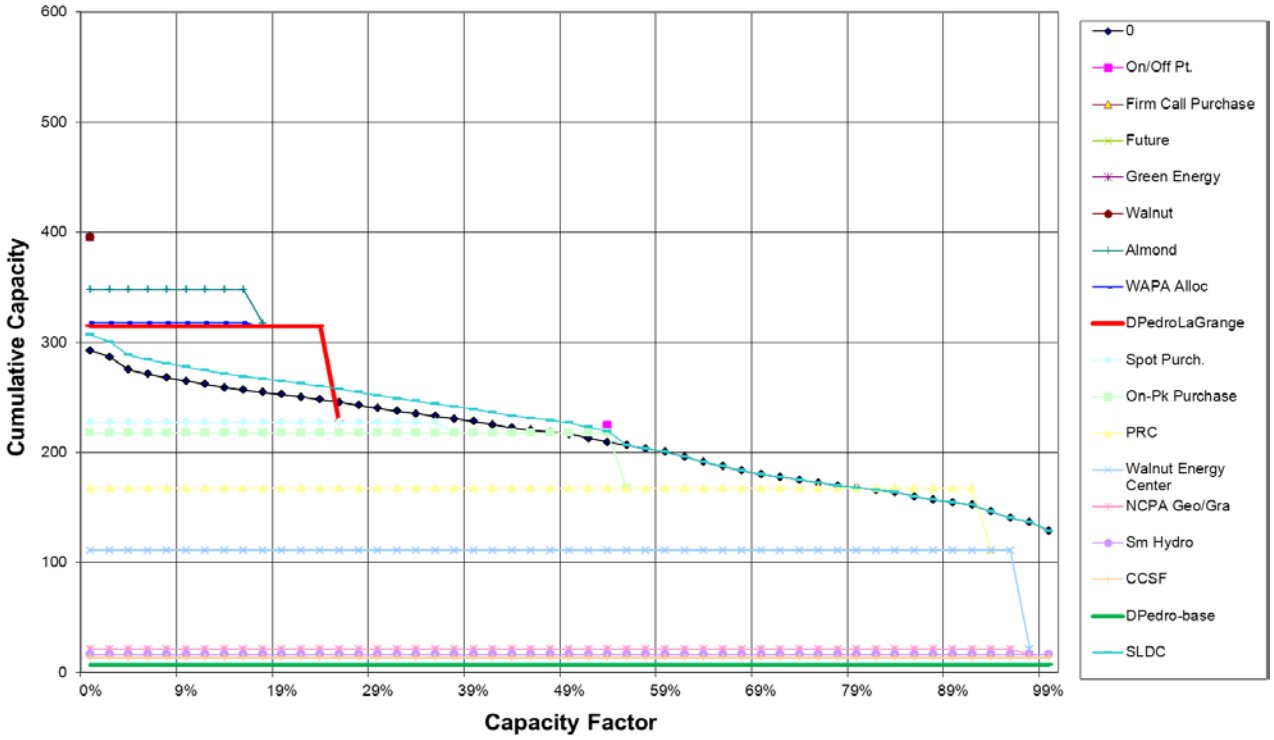

Figure 1.3-1. Load requirements - January resource plan.

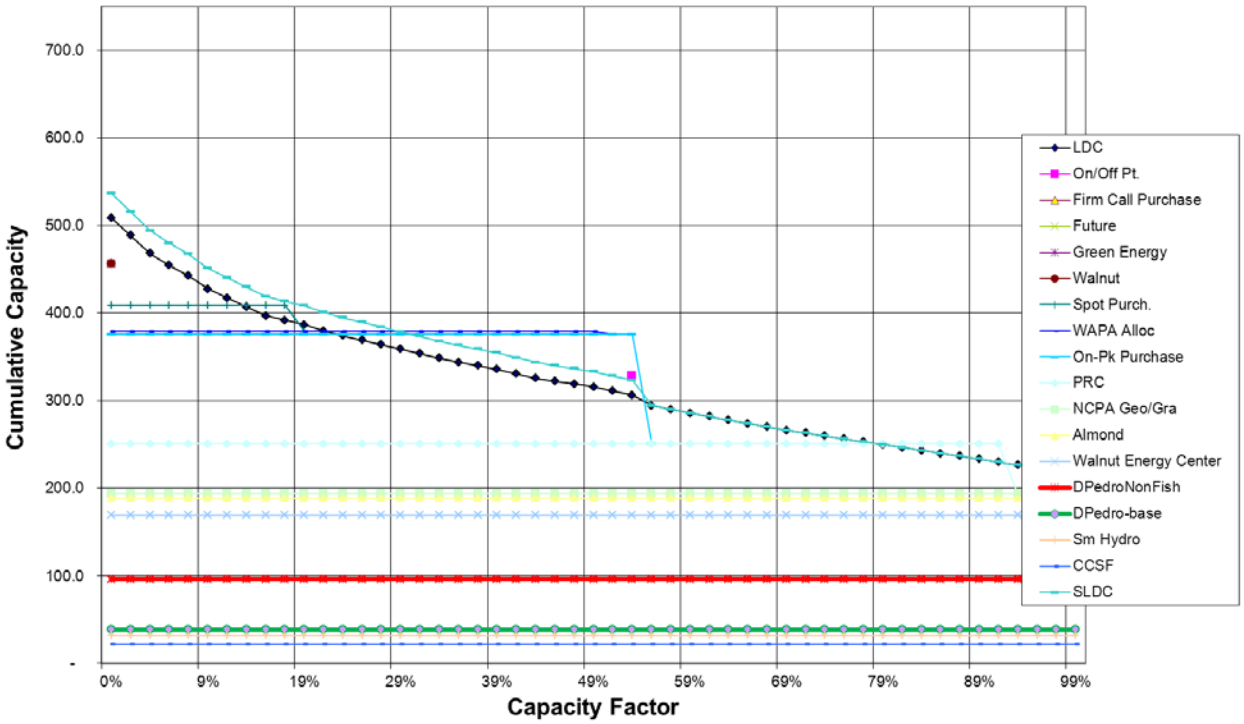

Figure 1.3-2 Load requirements - July resource plan.

1.3.2.2 Modesto Irrigation District

MID projects gross demand, energy efficiency, net load requirements, reserves, and total load requirements over the long and short term. Total load requirement is met through a combination of short term purchases, long term purchases, hydroelectric, natural gas, and coal. Table 1.3-2 identifies these loads through 2032.

Table 1.3-2. MID capacity balance - demand and supply.

Year	Projected Gross Demand (MW)	Energy Efficiency (MW)	Reduction (Solar) (MW)	Net Load Requirement (MW)	Reserves (MW)	Total Requirement (MW)
2014	709	31	9	669	94	763
2015	722	35	10	677	96	773
2016	736	38	11	686	97	783
2017	749	40	12	698	99	796
2018	763	42	13	709	100	809
2019	778	43	14	721	102	823
2020	793	47	14	731	104	835
2021	809	48	15	746	106	852
2022	826	49	16	761	108	869
2023	844	50	17	777	110	887
2024	862	51	18	793	113	906
2025	880	52	19	809	115	925
2026	899	53	19	826	118	944
2027	918	55	20	843	120	963
2028	938	56	21	861	123	983

Year	Projected Gross Demand (MW)	Energy Efficiency (MW)	Reduction (Solar) (MW)	Net Load Requirement (MW)	Reserves (MW)	Total Requirement (MW)
2029	958	58	22	878	126	1004
2030	979	60	23	896	128	1025
2031	1022	61	24	917	131	1049
2032	1026	63	25	938	135	1073

1.4 Use of Power for Applicant-Owned Industrial Facility

The Districts do not use power generated at the Project to supply their own industrial facilities or related operations. Therefore, this section is not applicable.

1.5 Need for Power if Applicant is an Indian Tribe

The Districts are not Indian tribes applying for a license for a project on a tribal reservation; therefore, this section is not applicable.

1.6 Effect on Transmission System

The Districts each own and operate transmission systems. The Project switchyard is designed to permit flexibility in how the units are interconnected to the two transmission systems. Based on previous transmission studies, contingency analysis, and the projected TID load forecast, there would be a variety of effects on the transmission system if a license was not received for the Don Pedro Project. If a license was not received, TID would not be able to serve its entire customer load during June, July, August, and September whenever load exceeds 600 MW. To meet customer demand, without the Don Pedro Project, new, firm generation of approximately 100 MW would be needed on the east side of the TID transmission system to mitigate transmission delivery shortfalls. MID would have similar issues and would need firm replacement capacity of approximately 50 MW.

1.6.1 Effects of Redistribution of Power Flows

The Don Pedro Project generation also provides system benefits to both TID and MID by its location near the end of their electrical systems. System stability and control is strengthened by having a significant, reliable, and flexible source of generation at this location. The loss of Don Pedro generation may require some transmission system changes to maintain stability and power quality for both the TID and MID systems.

1.6.2 Don Pedro Project Single-Line Diagram

The Don Pedro Project Single-Line Diagram is attached as Appendix H-2.

1.7 Project Modifications Conforming with Comprehensive Plans

This section discusses Comprehensive Plans relevant to the Don Pedro Project. Section 10(a)(2) of the Federal Power Act (FPA) requires FERC to consider the extent to which a project is consistent with federal or state comprehensive plans for improving, developing, or conserving a waterway or waterways affected by a project. The Districts are not proposing any modifications to the Project or Project operations at this time. The Districts have reviewed the FERC's Revised List of Comprehensive Plans dated April 2013 and identified certain plans as topically or geographically relevant to the Don Pedro relicensing. Project consistency with these plans is discussed in further detail in Exhibit E, Section 3.0.

1.8 Impact of Plan to Modify the Project

The Districts are not proposing any changes to Project operations at this time as several studies continue to be performed by the Districts and reviewed by relicensing participants. The FLA may contain proposals for changes in future Project operations or increases in capacity.

1.9 Financial and Personnel Resources

The Districts are in a superior position to continue operation and maintenance of the Don Pedro Project. The Districts have owned and operated the Project for over 40 years. TID was established in June 1887 and was California's first publicly-owned irrigation district and MID was established in July 1887. The Districts' and the Project's excellent record of performance demonstrates that the Districts possess the financial and personnel resources to meet the operation, maintenance, and capital requirements of the Project. The Districts have been producing hydroelectric power on the Tuolumne River since 1923 when Old Don Pedro was constructed.

1.9.1 Financial Resources

The Districts' principal interests are to operate the Project in a safe, efficient, and environmentally responsible manner to provide water storage for irrigation and municipal use, flood control, recreation, fish and wildlife, and power generation. The Project's past performance demonstrates that the Districts have the financial resources to meet the operation, maintenance, and capital requirements of the Project. The financial resources of each District is described below. The net book value of the Project is provided in Exhibit D of this application.

1.9.1.1 Turlock Irrigation District

As a municipal public entity, TID financing is primarily through the issuance of bonds. TID's most recent bond offering was in 2011 for $206,940,000. The 2011 Bonds were issued for a variety of purposes including (1) providing funds to retire the $190,950,000 outstanding principal amount of TID's Series 2010 notes, (2) to make a deposit into the 2011 Debt Service Reserve Fund, and (3) to fund capitalized interest on the 2011 bonds. Standard and Poor, Moody's, and Fitch have assigned ratings of "A", "A2" and "A+", respectively to TID's 2011 Bonds. TID's Project costs are included in TID's rate bases for water and power services.

1.9.1.2 Modesto Irrigation District

As a municipal public entity, MID financing is primarily through the issuance of bonds. MID's most recent bond offering was also in 2011 for $141,455,000 comprised of $125,380,000 electric system refunding revenue bonds (Series 2011A) and $16,075,000 taxable electric system refunding revenue bonds (2011B). MID also has $32,840,000 electric system refunding revenue bonds (Series 2011C).

Standard & Poor's Ratings Services, a Standard & Poor's Financial Services LLC business and Moody's Investors Service, Inc. assigned MID's 2011 Bonds the ratings of "A+" and "A2", respectively. MID's Project costs are included in MID's rate bases for water and power services.

1.9.2 Personnel Resources

Employees of TID are responsible for the day-to-day operation and maintenance of the Don Pedro Project, including ensuring compliance with obligations under the current license. Both TID and MID provide management oversight of the Project through a joint operations committee. The Districts have operated and maintained the Project in a safe, reliable and efficient manner since operations began in 1971. Its superior performance during this term has demonstrated the Districts ability to operate the Project in accordance with the license terms and conditions.

1.9.2.1 Turlock Irrigation District

As of 2013, TID employs 6 dedicated employees to support hydropower production at the Don Pedro Project. This total includes one Power Plant Supervisor and five Power Plant Technicians. Project support is also provided by various engineering, technical, and administrative departments of TID, as needed. TID's power supply administration employs a total of 81 employees. A number of these employees may at times support and coordinate Don Pedro Project operations and power supply. The following is a breakdown of power supply administration division personnel resources at TID:

- Assistant General Manager, Power Supply;
- Administrative Assistant;
- Civil Engineering Department Manager;
- Combustion Turbine Department Manager;
- Hydroelectric Department Manager;
- Energy Strategy Department Manager;
- Director of Energy Markets;
- Strategic ISS & Plan Department Manager;
- Resource Planning Department Manager; and
- Senior Electrical Engineer.

Support personnel are under the management of the above power supply administration division personnel resources.

The Don Pedro Recreation Agency (DPRA), an agency of TID, employs 48 full and part-time employees with the following breakdown:

- 1 Recreation Department Manager,
- 1 Administrative Assistant,
- 1 Customer Service Rep,
- 2 Recreation Division Managers,
- 1 Chief Ranger,
- 5 Rangers,
- 1 Park Maintenance Division Manager,
- 1 Sewer/Water Treatment Technician,
- 1 Park Maintenance Worker, and
- 34 Seasonal personnel.

These employees support and coordinate daily Project operations, maintenance and recreation. TID's employees are certified and trained in their relevant and appropriate fields to ensure the reliable continued operations of the Don Pedro Project. Training courses completed by personnel are discussed in further detail in Section 2.1.1 below.

1.9.2.2 Modesto Irrigation District

As of 2013, MID employed a total of 72 employees in the electric resources division. A number of these employees may at times support and coordinate Don Pedro Project operations and electricity supply and distribution. Below is a breakdown of electric division personnel resources at MID:

- 1 Assistant General Manager of Electric Resources and 1 Secretary,
- 7 employees in Resource Planning,
- 28 employees in Operations,
- 34 employees in Generation, and
- 1 Power Contract Specialist.

MID's employees are certified and trained as appropriate to ensure the reliable supply and delivery of retail electric service to its customers. Training courses completed by personnel are discussed in further detail in Section 2.1.2.

1.10 Project Expansion Notification

The Districts are not proposing to expand the Project to encompass additional lands; therefore this section is not applicable.

1.11 Electricity Consumption Efficiency Improvement Program

The Districts offer and promote a number of energy efficiency programs to help customers save both money and energy. Both MID and TID offer customers a variety of educational materials to better understand and manage home energy use and costs. TID and MID's energy efficiency and conservation programs are described below.

1.11.1 Turlock Irrigation District

1.11.1.1 TID Energy Efficiency Rebates Program

The energy efficiency rebates program was implemented after the TID Board of Directors adopted an aggressive 10-year plan to promote conservation. TID offers rebates to residential and business customers to promote conservation. Rebates for residential customers include he following: compact fluorescent light rebate, room air conditioner rebate, refrigerator rebate, clothes washer rebate, sun screen rebate, whole house fan rebate, solar attic fan rebate, radiant barrier and living green residential new construction rebate. Rebates available to business customers include the following: custom rebate, network PC management software rebate, commercial lighting rebate, residential new construction rebate, commercial motors rebate, commercial refrigeration rebate, dairy design assistance program, and advance power strip program.

1.11.1.2 TID Energy Audits and Meter Manager

TID offers free on-site energy audits to commercial, industrial, and agricultural customers who have concerns, questions, or an interest in implementing measures to manage their usage and reduce consumption. Energy audits are also available to residential customers. Additionally, TID offers an on-line energy management tool for business customers so they can monitor their energy usage and utilize that information to more efficiently manage their energy consumption.

1.11.1.3 Vending/Cooling Misers for Commercial Customers

TID has a contracted with service providers to install cooler misers for customers with refrigerated vending machines and/or glass front coolers. Additionally, the program aids in the installation of spray valves, aerators and showerheads for customers who have electric water heating.

1.11.2 Modesto Irrigation District

1.11.2.1 MID Weatherization Program

The Weatherization Program provides energy efficient measures to rental or owner occupied low-income customer homes. Work may include replacement of broken windows, refrigerator, microwave, swamp coolers, and the installation of sunscreens, weather-stripping, and some repairs.

1.11.2.2 MID Shave the Energy Program

Shave the Energy Program (STEP) is a voluntary program for MID residential customers with central air conditioners to help reduce energy use at peak times during hot summer days. With this program, MID installs a small "load control" device on the customer's air conditioner unit at no cost to the customer. When STEP is needed, MID will signal the air conditioner to cycle off. Overall power usage is reduced through the controlled cycling of thousands of air conditioners. Customers enrolled in STEP receive a $5 a month discount for the four-month period June through September each year.

1.11.2.3 MID Free Energy Audit Program

MID offers free energy audits for its customers. Through this program, a MID energy specialist will visit the customer's residence and help the customer learn ways to save energy in the home. The audit allows the customer to see how electricity is used in the home including the most and least-cost effective uses. At the conclusion of the audit, the MID energy specialist offers suggestions on ways to reduce energy consumption including no cost and low cost measures.

1.12 Indian Tribe Names and Mailing Addresses

There are no Indian reservation lands within the Project Boundary or immediate Project vicinity. Based on the Districts' extensive outreach program to tribes as a part of relicensing, the following tribes have been identified as potentially having an interest in Project relicensing:

Central Sierra Me-Wuk
Reba Fuller, Spokesperson
P.O. Box 699
Tuolumne, CA 95379

Southern Sierra Miwuk Nation
Lois Martin, Chairperson
P.O. Box 1200
Mariposa, CA

Southern Sierra Miwuk Nation
Anthony Brochini
Cultural Resources Representative
P.O. Box 1200
Mariposa, CA 95338

Southern Sierra Miwuk Nation
Les James, Spiritual Leader
PO Box 1200
Mariposa, CA 95338

Tuolumne Band of Me-Wuk Indians
Rob Cox, Cultural Resources Department
P.O. Box 699
Tuolumne, CA 95379

Tuolumne Band of Me-Wuk Indians
Reba Fuller, Spokesperson
P.O. Box 699
Tuolumne, CA 95379

Chicken Ranch Rancheria of Me-Wuk
Melissa Powell
Cultural Resources Coordinator
P.O. Box 1159
Jamestown, CA 95327

Buena Vista Rancheria
Rhonda Morningstar Pope, Chairperson
1418 20th Street, Suite 200
Sacramento, CA 95811

Picayune Rancheria of the Chukchansi Indians
Nancy Ayala, Chairperson
46575 Road 417, #A
Coarsegold, CA 93614

Picayune Rancheria of the Chukchansi Indians
Mary Motola, Cultural Specialist
46575 Road 417, #A
Coarsegold, CA 93614

Southern Sierra Miwuk Nation
Jay Johnson, Spiritual Leader
5235 Allred Road
Mariposa, CA 95338

Tuolumne Band of Me-Wuk Indians
Kevin Day, Chairperson
P.O. Box 699
Tuolumne, CA 95379

Tuolumne Band of Me-Wuk Indians
Vicki Stone, Cultural Coordinator
P.O. Box 699
Tuolumne, CA 95379

Chicken Ranch Rancheria of Me-Wuk
Lloyd Mathiesen, Chairperson
P.O. Box 1159
Jamestown, CA 95327

Buena Vista Rancheria
Roselynn Lwenya, Ph.D.
Environmental Resources Director
1418 20th Street, Suite 200
Sacramento, CA 95811

2.0 INFORMATION TO BE SUPPLIED BY APPLICANTS THAT ARE EXISTING LICENSEES

2.1 Safe Management, Operation, and Maintenance

Safe management, operation, and maintenance of the Don Pedro Project are top priorities of the Districts. The Districts provide employees with all necessary training and equipment to operate the Project safely. Specific training programs are described below.

2.1.1 Turlock Irrigation District

As the operating entity of the Don Pedro Project, TID cooperates fully with FERC during inspections of Project facilities such as the annual FERC inspections, five-year Part 12 Dam Safety Inspections, and Environmental and Public Use Inspections, and in other similar safety-related areas such as the development and provision of the appropriate Emergency Action Plan (EAP) and Public Safety Plan.

Don Pedro Project facilities are maintained to ensure safe and reliable operations. TID operates the Project consistent with their commitment to public and employee safety by taking advantage of their resources to satisfy these concerns. TID achieves their safety goals by:

1) training operations and maintenance personnel,
2) inspecting all Project facilities regularly and monitoring indicators of Project condition and safety,
3) implementing a rigorous inspection and maintenance program for operating equipment and facilities vital to safety,
4) limiting public access and providing warning signs where Project operations could endanger the public, and
5) complying with all applicable local, state, and federal laws and regulations regarding the safe operation of industrial and electric utility facilities.

TID recognizes that it is important for the key individuals who are ultimately responsible for dam safety and the day-to-day operation and general maintenance of the Project to be well educated in the field of dam safety. As a result, it is the policy of TID that the Chief Dam Safety Engineer (DSE), Hydro Department Manager, and Power Plant Supervisor shall complete the USBR's Safety Evaluation of Existing Dams (SEED) training seminar. The Chief DSE, Hydro Department Manager, and Power Plant Supervisor will also attend some form of dam safety refresher course every five years at a minimum (Mead & Hunt 2012).

In addition to formal training discussed above, the Chief DSE, Hydro Department Manager, and Power Plant Supervisor will receive training updates and refreshers with respect to issues related to dam safety through active participation in the following exercises:

- annual EAP updates,
- annual FERC inspections,
- annual Division of Safety of Dams inspections, and
- review of Potential Failure Modes in conjunction with the Part 12D Inspection.

TID encourages the sharing of information learned from outside seminars and training courses among all individuals who are accountable for dam safety. As a result, the Chief DSE, Hydro Department Manager, and Power Plant Supervisor will debrief these individuals regarding key aspects of the SEED training and refresher courses after completion (Mead & Hunt 2012).

TID recognizes the importance of plant technicians having a good understanding of dam safety because they see the Project on a daily basis and are the first line of defense in identifying potential concerns. In addition to the information passed on by the Chief DSE, Hydro Department Manager, and Power Plant Supervisor, plant technicians shall receive hands-on dam safety training through participation in an informal mentoring program (Mead & Hunt 2012). Training includes:

- review of organizational policies regarding dam safety and regulatory compliance,
- general and site-specific training focused on dam safety awareness,
- review of project elements to be addressed during surveillance,
- potential signs of structural distress or movement, and
- purpose of instrumentation and rationale for established threshold values and action levels.

Dam safety training for new employees is administered by the Chief DSE. The Chief DSE will ensure that training of all individuals is documented with records kept to ensure that training goals and requirements are being met, and also to assure regulators, inspectors, and other responsible parties can assess the training that has taken place (Mead & Hunt 2012).

TID's employees complete a variety of trainings to ensure safe management and maintenance of the Project. These trainings include the following:

- accident investigation,
- accident review,
- aerial lift safety,
- American Heart Association- first aid, cardiopulmonary resuscitation (CPR), automated external defibrillator (AED),
- basic industrial electricity I and II,
- bently 3500 operation and maintenance,
- bloodborne pathogens,
- Cal/ Occupational Safety and Health Administration (OSHA) inspections,

- combi-laser operations,
- confined space,
- confined space entrant attendant and supervisor,
- confined space rescue,
- exposure and access to medical records,
- fire prevention and extinguishers,
- forklift,
- hazard communications,
- hazpower 40-hour,
- heat illness prevention,
- hot work permit,
- hydraulics training and troubleshooting,
- infra-red camera operation,
- labview training,
- ladder safety,
- lifting and rigging,
- lockout/tagout/blockout,
- machinery diagnostics - vibration,
- managers and supervisors conference,
- NERC compliance,
- overhead crane and hoist operator,
- propane handling,
- qualified electrical worker,
- qualified work training-substation,
- respirator fit test,
- respirator medical clearance,
- sexual harassment, drug free work place, and IT acceptable use,
- troubleshooting electrical control circuits, and
- valve and instrument technician.

2.1.2 Modesto Irrigation District

MID's employee trainings and dedication to employee and public safety illustrate MID's top priorities of safe management, operations, and maintenance at the Project. MID's journeyman

dispatchers, dispatching shift supervisors, and power system schedulers are NERC certified as transmission operators. Additionally, all of the employees in these positions are required to receive 32 continuing education hours (CEHs) in emergency operations annually, as well as receive a total of 140 CEHs of training pertaining to NERC standards of the three year certification period. The dispatchers and dispatching shift supervisors are required to review the Don Pedro EAP each year and participate in the annual Don Pedro EAP drill.

2.1.3 Operations During Flood Conditions

The Don Pedro Project is located about four miles upstream of the town of La Grange and 30 miles east of Modesto, California in the foothills of the Sierra Nevada. The Project dam and reservoir are on the Tuolumne River, which rises in the high elevations of Yosemite National Park and discharges into the San Joaquin River southwest of Modesto. The reservoir is designed to reach elevation 852 ft under design flood conditions. Don Pedro Dam is constructed across a deep canyon of the Tuolumne River. The reservoir covers approximately 13,000 ac of surface area and contains 2,030,000 AF of storage at a water level of 830 ft.

Flood management operations and flood control is managed by guidelines in the 1972 ACOE Flood Control Manual (Appendix H-3). The ACOE participated financially in the building of the Don Pedro Dam in exchange for the Districts setting aside 340,000 AF of flood control storage space. This space occurs between elevations 801.9 and 830.0 ft and is kept vacant from October 7 through at least April 27 of the next year. Encroachment into the flood storage zone is allowed during the flood control period, but must be evacuated within a short period of time. The maximum reservoir level experienced at Don Pedro during the term of the initial license was 831.4 feet which occurred on January 2, 1997.

Reservoir flood management at Don Pedro allows for winter and spring capture of both rain and snowmelt floods, and is part of the ACOE system for flood control operations along the San Joaquin River which includes the other “rim reservoirs” that surround the eastern rim of California’s Central Valley. Don Pedro Reservoir’s flood control storage requirements increase from zero on September 8 to the maximum reservation of 340,000 AF by October 7. The flood control storage is maintained at 340,000 AF through April 27 after which, unless additional reserved space is indicated by snowmelt parameters, it can decrease uniformly to zero by June 3. Exhibit B provides a detailed graphical depiction of the flood control rule curve for the Project.

In addition to flood control space needs within the reservoir, downstream flow restrictions also affect Project operations from a flood management perspective. The primary downstream flow guideline cited in the 1972 ACOE Flood Control Manual is that flow in the Tuolumne River at Modesto (as measured at the 9th Street Bridge) should not exceed 9,000 cfs. Flows in excess of 9,000 cfs have the potential to cause significant damage to property in this area of the Tuolumne River and Dry Creek, a tributary of the Tuolumne River. Between La Grange Dam and 9th Street in Modesto, the single largest contributor of local flow to the Tuolumne River is Dry Creek. The Dry Creek watershed has its headwaters in the foothills just northeast of Don Pedro Dam. It is a flashy watershed; once the soil is saturated, any rainfall results in a rapid response in runoff. Significant flows, on the order of 6,000 cfs or higher, can occur when there is significant rainfall between Modesto and the upper end of the Dry Creek watershed. Because these flows from Dry Creek enter the Tuolumne River above the Modesto 9th Street U.S. Department of the Interior,

Geological Survey (USGS) river gage, Dry Creek flows must be taken into account when making releases from Don Pedro that when combined should keep total flow at Modesto below 9,000 cfs. Flood flow management operations are further discussed in Exhibit B.

Controlled and uncontrolled emergency spillways are located west of the main dam on the right abutment ridge between the Tuolumne River and Gasburg Creek. The discharge capacity of the controlled spillways, with the three gates fully open, is 78,000 cfs with water surface at elevation 830 ft, and 172,500 cfs with reservoir water surface at elevation 850 ft. The discharge capacity of the uncontrolled emergency spillway is 300,000 cfs with reservoir water surface at elevation 850 ft. In addition to the main dam, the Don Pedro reservoir has four dikes identified as Dikes A, B, and C and the Gasburg Creek Dike located downstream of the main spillway, southwest of the Don Pedro Dam. Gasburg Creek Dike is not an impounding structure, but was constructed to direct spillway flows toward the Tuolumne River and prevent flooding along Gasburg Creek during times of spill.

An EAP for the Don Pedro Project has been filed with FERC to comply with requirements of 18 CFR § 12.25. The EAP includes plant operating directives, definition of supervisor-in-charge hierarchy, and communications flowcharts to be followed during an emergency at the Project. The primary purpose of the EAP is to define the requirements needed to warn the public, public safety agencies, and property owners in the event of an imminent or occurring failure (Condition A); potentially hazardous situation developing (Condition B); or a non-failure flood emergency (Condition C). In general, the notification of an emergency, and the implementation of the EAP, will be made by the Senior District Official of TID. The EAP is, and will continue to be, reviewed annually, with respect to conditions both upstream and downstream of the Project that may necessitate changes in the plan. Implementation of the plan requires cooperation and clear communication among different agencies. The Districts will continue to work in coordination with these officials to ensure that the plan is responsive to any change in uses or conditions below or in the vicinity of the Project.

2.1.4 Downstream Warning Devices

Public access immediately below the Project is discouraged. A floating boom located approximately 1,000 ft downstream of the powerhouse is in place year round to keep river users out of harm's way near the powerhouse. The boom extends completely across the river channel and each is labeled "Restricted Area-Keep Out."

2.1.5 Operational Changes that Might Affect the Emergency Action Plan

No operational changes are proposed that might affect the existing EAP at the Project. The plan is reviewed and tested annually, and updated as required. There are no known or planned changes to the plant facilities that would affect the EAP either.

2.1.6 Monitoring Devices

The Project has remote sensing instruments located throughout the Project, and downstream, to detect abnormal conditions. Headwater level, tailwater level, and seepage weir level signals are values that are part of the Supervisory Control and Data Acquisition (SCADA) system. This

information is transmitted to the Power Control Center every ten minutes or immediately upon an event (digital alarms) or every four seconds (analog data). The Districts' engineers, hydrographers, and senior management officials evaluate the data supplied by visual observation, real-time dam instrumentation, manually inspected dam instrumentation, watershed data, and downstream river flow data. Alarms are triggered when the following happens:

- When the reservoir elevation exceeds 825.0 ft, which is five feet below the top elevation of the ungated ogee spillway, the "Don Pedro Reservoir High Water Level Alarm" is sounded.
- When the reservoir level falls at a rate greater than .084 inches per minute (10 ft in a 24-hour period), the "Don Pedro Reservoir High Rate of Change Alarm" is sounded.
- When the tailwater level below the dam exceeds 304.5 ft, the Don Pedro Tailwater High Level Alarm" is sounded.
- When the tailwater level rises at a rate greater than three feet per minute, the "Don Pedro Tailwater High Rate of Change Alarm" is sounded.
- If the seepage weir elevation is less than 0.2 ft, the "Seepage Weir Low Level Alarm" is sounded.

When any of the above alarms occur, the alarm is displayed in flashing mode on the Power Control Center screen, an audible bell is sounded in the Power Control Center, as well as at the Project site. The alarm stays in effect until the condition is corrected at the site. An alarm is also sounded if communication is lost between the Project site and the Power Control Center. This condition is known as a "response alarm" and triggers the Power Control Center to dispatch the on-site, on-call technician to the plant until communication is restored.

The current instrumentation monitoring program measures seepage, deformation, and hydrostatic pressure within the dam and foundation. Currently, dam safety related instrumentation at the Project consists of the following:

2.1.6.1 Piezometers

Located in the dam and in the spillway structure, the piezometer devices are used to measure the hydrostatic pressure within the dam. The piezometers are read four times each year and these results, along with reservoir elevation readings, are compared to previously collected data. The data provides information on the pore pressures in the core, the rapidity of drainage of the upstream shell under draw down conditions, the effectiveness of the downstream drain, the pore pressures along the embankment/foundation interface and the pore pressures in the foundation. Combined, the collected data evaluates the effectiveness of the grout curtain. There are 33 operating piezometers in the Don Pedro Dam and dikes and four spillway piezometers at the Project.

2.1.6.2 Crossarms

Located in the dam, these devices are used to measure internal settlement of the dam. The crossarms are read once a year and are compared to previous data. There are a total of seven crossarm settlement devices at the Project.

2.1.6.3 Surface Markers

Located on both the upstream and downstream faces of the dam, survey triangulation of these devices is used to measure dam surface movement. The surface markers are measured once each year and compared to previous data. There are a total of 63 surface markers at the Project.

2.1.6.4 Seepage Measuring Weir

Located in the powerhouse, this device measures the total flow of water through the dam and foundations. The weir is read twice each month and is continuously monitored by the Power Control Center. The flow is correlated with the reservoir elevation and rainfall, and the data is compared to previous data. In addition, the elevation of water going through the weir is read every four seconds by the SCADA and checked for alarm conditions. There is one seepage measuring weir at the Project.

2.1.7 Employee Safety and Public Safety Record

The Districts manage the Project consistent with their long-standing commitment to employee safety. This commitment begins with compliance with applicable local, state, and federal regulations regarding the safe operation of industrial and electrical facilities. As a result of the rigorous safety programs implemented, TID, the operator of the Don Pedro Project, has not received a single OSHA citation for or related to the Don Pedro Project.

The DPRA manages resources while providing for recreational opportunities at the Don Pedro Recreation Area. The Don Pedro Recreation Agency promotes the safety and security of visitors and employees. In an effort to assure safety and security of visitors, the Don Pedro Recreation Area has a set of regulations and ordinances to govern its facilities addressing topics of general regulations, safety, vehicles, recreation area use, and natural resources. These regulations and ordinances are attached as Appendix H-4.

The Don Pedro Reservoir is a large, active and popular recreation area that allows for boating, fishing, and swimming within the reservoir. As described above, the Districts have various warning devices in place to inform the public of dangers relative to boating, swimming, and fishing in the immediate vicinity of Project facilities. Fatalities have occurred in the reservoir, the majority of which were typically due to boating accidents or mishaps. A record of fatalities that occurred between 1995 and 2013 is provided in Table 2.1-1.

Table 2.1-1. Serious injuries and fatalities occurring within the Don Pedro Project Boundary (1995-2013).

Date	General Location	Remarks
August 13, 2013	Lone Gulch	Fatality- drowning while attempting to tie two boats together
October 13, 2012	Stent Jacksonville Bridge	Fatality- jump from bridge, drowning
July 21, 2012	Gardner Falls	Serious injury- shoreline fall, broken wrist, laceration to abdomen
September 8, 2011	Moccasin Bay	Fatality- drowning
July 20, 2011	Fleming Meadows Campsite	Fatality- heart attack
June 28, 2011	Gardner Falls	Fatality- drowning
June 27, 2011	Green Bay	Serious injury- vessel accident
July 25, 2010	Kanaka Creek	Serious injury- fall on a houseboat
June 27, 2010	South Bay	Serious injury- vessel fall, back/neck injury
November 28, 2009	Moccasin/Tuolumne River Arm	Fatality- drowning
July 4, 2009	Lake Don Pedro Marina (Fleming Meadows)	Serious Injury- hand contact with boat propeller
June 26, 2009	Graveyard Creek	Serious injury- jump from houseboat, spinal injury
May 31, 2009	Lake near Moccasin Point	Serious injury- personal water craft accident, head injury
August 8, 2008	School House Point	Fatality- drowning
August 3, 2007	Big Creek	Serious Injury- high speed vessel accident, multiple injuries to driver
June 16, 2007	Lake near Fleming Meadows	Serious injury- boat/tube accident, neck injury
June 14, 2007	Middle Bay	Serious injury- personal water craft accident, head injury
July 28, 2006	Hatch Creek	Serious injury- wakeboard accident, fractured femur
June 10, 2006	Six-Bit Gulch	Serious injury- wakeboard accident, head/face injuries in collision with shore
May 31, 2006	Gardner Falls Upper Bay	Serious injury- wakeboard accident, fractured femur
June 6, 2005	Railroad Canyon	Serious injury- boat collision, head injury
June 24, 2004	Kanaka Creek	Serious injury- near drowning while swimming with friend
May 29, 2004	Blue Oaks Campground	Serious injury- fall into campfire, 2nd and 3rd degree burns
November 28, 2003	Highway 120/49 bridge	Fatality- jump from bridge
September 5, 2003	Gardner Falls	Fatality- jump/fall from rocks
July 20, 2003	Lake near Fleming, Private Houseboat Dock	Serious injury- contact with boat propeller, severe leg laceration
June 29, 2003	Lake near Fleming Meadows	Serious injury- wakeboard accident, profuse bleeding, concussion
September 30, 2000	Tuolumne River Arm	Fatality- presumed drowned
August 8, 2000	Moccasin	Fatality- possible heart attack
July 2, 2000	South Bay	Fatality- presumed drowned
July 24, 1999	West Bay	Fatality- drowning
July 12, 1999	Gardner Falls	Fatality- houseboat, injuries resulting from fall

Date	General Location	Remarks
July 3, 1999	Fleming Meadows	Fatality- heart attack
May 30, 1999	Blue Oaks Ramp	Fatality- possible heart attack
June 24, 1995	Blue Oaks Ramp	Fatality- heart attack

2.2 Current Operations

In general, the Don Pedro Project operates on an annual cycle consistent with managing for and providing a reliable water supply for consumptive use purposes, providing flood flow management, and ensuring delivery of downstream flows to protect anadromous fish. By October 6 of each year, the Don Pedro reservoir must be lowered to at least elevation 801.9 ft to provide the 340,000 AF of flood control benefits acquired by the ACOE through its financial contribution to Project construction. Beginning on October 1 of each year, minimum flows provided by the Project to the lower Tuolumne River, as measured at the USGS gage at La Grange, are adjusted to meet license requirements to benefit upmigrating adult Chinook salmon. This includes providing a pulse flow, the amount of which varies depending on the water year type.

Minimum flows to the lower Tuolumne River are adjusted on October 16, the rate of flow dependent on water year type, and these flows are maintained through May 31 of the following year to protect egg incubation, emergence, fry and juvenile development, and smolt outmigration of fall Chinook salmon. A spring pulse flow is provided each year to aid smolt outmigration, the amount again depending upon water year type. Irrigation deliveries normally begin in early March, but can begin as early as February to provide early growing season soil moisture in dry winters. Irrigation deliveries ramp up considerably by April and normally reach their peak in July and August.

Throughout the winter months, Project operators maintain a constant assessment of snow conditions in the upper Tuolumne River watershed and, during years with heavy snow accumulation, may reduce reservoir levels to balance forecasted inflows, outflows, and reservoir storage. The goal of operations is to fill the reservoir by early June; however, greater snowpack volumes can extend this filling into early July if needed for maintenance of the required ACOE flood control space. ACOE flood control guidelines also provide for maintenance of downstream flows on the lower Tuolumne River to less than 9,000 cfs as measured at the USGS gage at Modesto River Mile (RM) 16, almost 40 miles below the Don Pedro Project.

Minimum flows to the lower Tuolumne River are adjusted again on June 1 and extend through September 30. Irrigation and M&I deliveries normally continue through October, but may also extend through November depending on soil moisture conditions. M&I deliveries occur year-round.

Delivery of Project benefits—irrigation water, M&I water, water for the protection of aquatic life, recreation, production of renewable energy, and flood protection—requires careful and skillful management of water. Project operations involve the continuous assessment of known and unknown variables, hydrologic risk assessment, coordination with other water systems, and the balancing of demands and resources. Project operations are discussed in further detail in Exhibit B.

2.3 Project History

Construction of the Project began in 1967 and reservoir filling began in November 1970. Commercial operation commenced in 1971 and the reservoir first filled to the flood storage space of 801.9 feet on March 1974. The current Don Pedro Dam was built approximately 1.5 miles downstream of the original, and much smaller, Don Pedro Dam which had been in operation since 1923.

TID provides irrigation water to 150,000 ac of land and serves approximately 100,000 electric customers in a 662 mi^2 electric service area (TID 2010). MID provides irrigation water to almost 60,000 ac of land and serves approximately 114,000 electric customers in a 560 mi^2 electric service area (MID 2010). MID also supplies treated municipal water to the City of Modesto, and TID and MID provide treated drinking water to the community of La Grange.

On behalf of both Districts, TID operates the four-unit, 168 MW Don Pedro Project. The original powerhouse was constructed with three 45.5 MW units; a fourth, slightly smaller unit was added in 1989. One of the three original units is directly connected to MID's transmission system and the other three units are connected to TID's transmission system. However, the Don Pedro Project switchyard is designed to permit flexibility in delivering Project generation to the two transmission systems.

Numerous capital improvements have occurred at the Project since commencement of Project operations in 1971. The largest single improvement was the addition of the fourth unit in 1989.

2.4 Generation Losses Due to Outages Over Previous Five Years

Table 2.4-1 presents the unscheduled outages for the Don Pedro Project. Outages are presented for a six-year period of time (2008 through 2013). In order to efficiently provide energy production from the facility, the Districts have a consistent record of addressing outages immediately and taking preventative measures to prevent future occurrences.

Table 2.4-1. Outage history of the Don Pedro Project 2008-2013.

Start Date	Duration	Unit	Cause	Corrective Action Taken
July 26, 2013	1 hour	2	Relay failure on high pressure oil lift pump circuit	Replaced relay on high pressure oil lift pump circuit
July 9, 2013	6 hours	2	Transformer nitrogen leak	Substation crew reduced the leak. TID will continue to supply nitrogen until the transformer can be brought out of service for repairs.
January 1, 2013	19 hours	4	Field flashing breaker failure to fully open	Contractor called out to service the field flash breaker for smooth operation
November 15, 2012	4 hours	1,2,3,4	Unit shutdown to facilitate an investigative dive near the power tunnel intake	No corrective action necessary
September 28, 2012	10 hours	3	Testing for autosynchronizer	Test followed new installation
May 31,	24 hours	4	Make hollow jet valve fully available	No corrective action necessary

Start Date	Duration	Unit	Cause	Corrective Action Taken
2012			to reduce river flow required	
April 30, 2012	19 hours	1	Bad power setter board on mod II governor	Replaced setter board with spare
April 2, 2012	31 hours	3	Excessive vibration	Reduce output 15 MW until further diagnosis
February 24, 2012	2 hours	1	Water leak near the generator air cooler	Repaired the pipe fitting
November 13, 2011	Outage varies by unit from approx. 625 hours for Unit 4 to 3,200 hours for Unit 2. Not all units required for water delivery purposes.	1,2,3,4	All four units were removed from service to allow replacement of high pressure valve in the main power conduit; during powerhouse outage, an oil leak was found in the fixed wheel gate hydraulic system. Unit 4 was placed back in service on December 9; Unit 1 on January 9, 2012; Unit 3 on January 19, 2012; and Unit 2 on March 27, 2012.	High pressure valve cavitation was repaired; oil leak was repaired by fill welds and sleeving the damaged area. Runner repairs on Unit 2 were undertaken to address cavitation.
November 9, 2011	21 hours	4	Cooling water pressure regulating valve problem	Replaced faulty valve
November 4, 2011	84 hours	4	Cooling water piping leak	Removed and repaired piping
July 26, 2011	1 hour	2	Relay failure on high pressure oil lift pump circuit	Repaired relay
July 19, 2011	4 hours	4	Brush rigging carbon buildup	Cleaned the entire collector ring and brush housing
April 17, 2011	24 hours	4	Water leak on one generator air cooler	Isolate cooler, derate generation, remove and repair
April 8, 2011	8 hours	3	Abnormal air gap reading	Verify sensor installation and repair proximeter
March 21, 2011	4 hours	4	Brush rigging carbon buildup	Cleaned the entire collector ring and brush housing
February 4, 2011	82 hours	1	Carbon dioxide discharge	Change out fire detector
February 4, 2011	81 hours	4	Carbon dioxide discharge	Change out fire detector
January 14, 2011	4 hours	4	Brush rigging carbon buildup	Cleaned the entire collector ring and brush housing
November 19, 2010	22 hours	1	Excitation problem	Replaced a bad relay and timer for the field breaker
August 4, 2010	4 hours	2	Excitation problem	Reset
February 6, 2010	31 hours	2	Wicket gate shear pin	Replaced shear pin
January 25, 2010	1 hour	1,2,3	Battery charger powered down for auxiliary equipment installation	No corrective action necessary
January 5, 2010	34 hours	1,2,3	Blown seal on cooling water line	Repaired seal
November 22, 2009	2,616 hours	4	Field ground trip; stator and rotor contamination from carbon brushes	Unit was taken apart and cleaned thoroughly
March 25, 2008	10.25 hours	1,2,3,4	Inverter failure	Install station power to inverter output until repair was made

2.5 Compliance with Terms and Conditions of Existing License

The Districts have consistently executed their obligations and responsibilities under the current license. Many of the FERC license articles required the Districts to undertake extensive environmental studies, often under challenging deadlines. The Districts have met every one of these requirements and schedules. The Districts maintain complete Project records of its operations and compliance. The Districts proactively cooperate with other river managers and users, including the ACOE, CCSF, U.S. Department of the Interior, Bureau of Land Management (BLM), CDFG, USFWS, and Non-Governmental Organizations (NGOs). The Districts have been in full compliance with the terms of its FERC license throughout the initial license term.

2.6 Actions Affecting the Public

The Districts play a prominent role in ensuring the efficient, productive use of the Project's resources for a number purposes and functions. As a result, the Districts' actions pertaining to the Don Pedro Project affect the public.

The Don Pedro Reservoir provides 2,030,000 AF of total water storage. The Project provides water storage for the beneficial use of irrigation of over 200,000 ac of prime farmland in California's Central Valley served by the Districts. Combined, the Districts supply, on average, approximately 850,000 AF of irrigation and M&I water per year to their customers.

The Project provides water storage for the beneficial use of M&I customers. MID provides treated water to the City of Modesto (population: 210,000), and TID and MID jointly provide treated water to the community of La Grange. The Districts provide up to a maximum of 67,500 AF of water per year for M&I use. Consistent with the requirements of the Raker Act and agreements between the Districts and the CCSF, the Project also provides a "water bank" of up to 570,000 AF of storage that CCSF may use to help manage the water supply from its Hetch Hetchy water system while meeting the senior water rights of the Districts. CCSF's "water bank" within Don Pedro Reservoir provides significant benefits for its 2.6 million customers in the Bay Area.

Another primary use of the Project is providing storage for flood management on the Tuolumne and San Joaquin rivers. In cooperation with the ACOE, the Don Pedro Project provides up to 340,000 AF of storage for the purpose of flood control.

Other important uses supported by the water storage and water supply of the Project are recreation; power generation; and of special concern to the Districts, protection of the downstream anadromous fishery. The Project includes three developed recreation areas and other small recreation facilities (restrooms and buoys) outside of the developed areas. The three developed recreation areas are Fleming Meadows Recreation Area, Blue Oaks Recreation Area, and Moccasin Point Recreation Area. In addition to these developed recreation areas, there is boat-in access to much of the shoreline and to the islands within the reservoir. Water-based activities within the Project include water skiing and wake boarding, boat fishing, jet skiing, canoeing, flat water kayaking, windsurfing, sailing, and whitewater rafting and kayaking take-out areas. The Project also supports land-based recreation activities such as camping and fishing.

2.7 Ownership and Operating Expense Reductions if the Project License was Transferred

If the Districts' ability to generate hydropower at the Don Pedro Project were transferred to another entity, the Districts would have to continue to operate the Don Pedro Project just as it is now in order to continue to deliver water to meet existing and expected irrigation and M&I needs. The Project is primarily a water supply project; hydropower is a secondary function. Further, the Districts do not agree that the hydropower operating license could be transferred to another entity without interfering in the Districts' water rights. Operation and maintenance (O&M) expense reduction associated with transfer of hydropower production to another entity would be approximately $3 million.

2.8 Annual Fees for Federal or Indian Lands

The Districts do not pay annual charges for Indian tribal reservation lands because the Project does not occupy any such lands.

The Project occupies approximately 4,040 ac of federal land within the Bureau of Land Management's Sierra Resource Management Unit. The fee for this land has been $289,168.01 annually from 2008-2012.

3.0 LITERATURE CITED

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Turlock Irrigation District (TID). 2010. Report 2009-7: 2010 Lower Tuolumne River Annual Report. Report filed with FERC March 2010, for FERC Project 2299.

DON PEDRO PROJECT
FERC NO. 2299

DRAFT LICENSE APPLICATION

EXHIBIT H - PLANS AND ABILITY OF APPLICANT TO OPERATE THE PROJECT

APPENDIX H-1
FOURTH AGREEMENT

AGREEMENT #4

May 16, 1966

F O U R T H A G R E E M E N T

Between

THE CITY AND COUNTY OF SAN FRANCISCO

and

THE TURLOCK IRRIGATION DISTRICT
AND THE
MODESTO IRRIGATION DISTRICT

JUNE, 1966

FOURTH AGREEMENT

TABLE OF CONTENTS

F O U R T H A G R E E M E N T

Between

THE CITY AND COUNTY OF SAN FRANCISCO

and

THE TURLOCK IRRIGATION DISTRICT
AND THE
MODESTO IRRIGATION DISTRICT

THIS AGREEMENT, made by and between the CITY AND COUNTY OF SAN FRANCISCO, a municipal corporation, acting by and through its Public Utilities Commission, hereinafter called "City," and the TURLOCK IRRIGATION DISTRICT and the MODESTO IRRIGATION DISTRICT, organized pursuant to the Irrigation District Law of the State of California, acting by and through their respective Board of Directors, hereinafter called "Districts,"

WITNESSETH THAT:

1. WHEREAS, districts and City own and operate certain water conservation facilities on the Tuolumne River for the purposes of domestic, municipal and industrial water supply, irrigation, flood control and the generation of electric power, and have operated said facilities effectively and harmoniously for many years; and

2. WHEREAS, in that certain agreement dated February 29, 1940, known as the "First Agreement," Districts and City did

formally agree to continue to cooperate in a program of conservation of the waters of the Tuolumne River for their mutual benefit, and to recognize the provisions of the Act of Congress of December 19, 1913, known as the Raker Act (38 Stat. 242), as

applying to Districts and City without waiving any of their rights; and,

3. WHEREAS, in that certain agreement dated November 22, 1943, known as the "Second Agreement," Districts and City did formally agree to continue the development of the Tuolumne River by cooperating in the building of the Cherry River Project and New Don Pedro Project and all appurtenant projects involving the use of Tuolumne River water; and,

4. WHEREAS, in that certain agreement dated June 30, 1949, known as the "Third Agreement," **Districts and City did formally agree that the Districts have existing prior rights to the waters of the Tuolumne River and its tributaries**, and agreed to provide for the storage, management and control of the waters of the Tuolumne River and its tributaries in such a manner as to assure, insofar as feasible, the availability of sufficient water to meet the requirements of Districts and City; and that toward this end City would first construct the Cherry Valley project, after which the New Don Pedro Project, to be owned by Districts, would be constructed as provided by supplemental agreement; and did

further agree upon their respective flood control responsibilities under a proposed contract with the United States through its Corps of Engineers, U. S. Army; and

5. WHEREAS, the United States of America, pursuant to the Flood Control Act of December 22, 1944, has entered into a contract with Districts and City dated August 29, 1949,

and certified by the Federal Government on September 26, 1949, as supplemented by Supplemental Agreement No. 1, dated June 4, 1956, hereinafter called "Federal Contract," under which, in consideration for certain financial contributions to be made by the Federal Government, Districts and City agreed to provide for Tuolumne River flood control by making certain modifications in their then existing facilities and operations and by constructing the Cherry Valley Reservoir and the New Don Pedro Reservoir with New Don Pedro to provide not less that 340,000 acre feet for floor control; and

6. WHEREAS, the Cherry Valley Reservoir has been successfully completed by the City; and

7. WHEREAS, the Legislature of the State of California has, pursuant to Chapter 282, Statutes of 1965, authorized a Davis-Grunsky Act grant of up to Seven Million Dollars ($7,000,000) for recreational functions and enhancement of fish and wildlife in

connection with the construction of the New Don Pedro Reservoir; the above amount to be further increased by an estimated amount of Five Hundred Thousand Dollars ($500,000) for the provision of initial water supply and sanitary facilities under the provisions of said Davis-Grunsky Act, thereby making a grant of approximately Seven Million Five Hundred Thousand Dollars ($7,5000,000) available from the State of California; and

8. WHEREAS, studies indicate that further conservation of Tuolumne River flows to provide for the needs of the Districts and the City can be accomplished by building the New Don Pedro

Reservoir to its maximum capacity of approximately 2,030,000 acre feet; and

9. WHEREAS, the electors of the Districts and of the City have authorized the issuance of bonds to secure the estimated funds necessary to construct the New Don Pedro Project; and

10. WHEREAS, following application by the Districts and a hearing, the Federal Power Commission has ordered the issuance of a license to the Districts for the New Don Pedro Project (Turlock Irrigation District and Modesto Irrigation District Project No. 2299, 31 FPC510, 1128 (1964), containing certain conditions, including the filing of an agreement between Districts and City for Commission approval relating to the allocation of the total cost of the project and the acquisition of storage space in the

reservoir, which proceedings have been affirmed by the United States Court of Appeals for the Ninth Circuit (California, et al. v. FPC 345 F2d 917 (1965); and

11. WHEREAS, it is now necessary to set forth the respective responsibilities of the Districts and the City in the New Don Pedro Project;

NOW, THEREFORE, the parties hereto do mutually agree as follows:

ARTICLE 1. SCOPE OF AGREEMENT

This agreement is intended to supplement and, to the extent of any inconsistency therewith, amend the provisions contained in the aforementioned First, Second and Third Agreements between Districts and City, to the end that the New Don Pedro Project,

hereinafter called Project, may be constructed for the purpose of conserving water for the irrigation, domestic, municipal and industrial use requirements of the parties hereto; for flood control; for the generation of hydroelectric power; and for recreation, fish and wildlife. This Agreement shall continue in force until modified or canceled by mutual consent of the parties hereto.

ARTICLE 2. RIGHTS OF PARTIES

This Agreement does not, nor is it intended to, affect, alter, or impair in any manner the rights of the respective

parties hereto in or to the waters or the use of waters of the Tuolumne River or its watershed acquired or existing under the laws of the State of California. Districts and City agree to recognize and abide by the provisions of the Raker Act as applying to Districts and City.

ARTICLE 3. THE BOARD OF REVIEW

Districts and City agree to cooperate fully to expedite the early completion of the Project, the planning and construction of which shall be under the general supervision and control of Districts. In order to keep the parties hereto fully advised regarding design progress and construction a Board of Review is hereby created. The Board shall be composed of three persons, one to be appointed by each of the parties hereto. The Board shall establish its own operating procedures. At least once each month the Board shall meet with Districts; project representatives and review progress and scheduling of the

construction work, the expenditure and availability of funds, proposed contract modifications, and the matters falling within paragraphs I A, I D, and II of Appendix A of this Agreement. The Board shall arrange to have minutes kept for each of its meetings, and shall report the results of each of such meetings to the parties. The Board shall also make such recommendations to the parties as it sees fit to the end that a high level of

cooperation is maintained among the parties and each is kept fully informed.

ARTICLE 4. FISCAL PROTECTION AND HOLD HARMLESS CLAUSES

Districts shall not award any construction contracts prior to the execution of this Agreement and its certification pursuant to Section 86 of City's Charter, nor prior to City's review and approval of the plans and specifications of such construction contracts, which approval shall not be unreasonably withheld. Districts shall proceed with planning and construction expeditiously and diligently until completion thereof, and City shall cooperate with Districts at all times to that end.

It is mutually understood and agreed that the program and conditions of this Agreement are subject on the part of City and Districts to such action as may be required by law or as required by applicable fiscal budgetary provisions of law governing City and Districts or by the necessity of bond issues, and further subject to execution of the supplemental agreement to the Federal Contract provided in Article 3b therein.

Districts agree to assume any City obligations under the

Federal Contract for the construction of the New Don Pedro Project and further agree to assume all of City's obligations under the Federal Contract for flood control operation when the New Don Pedro Project is completed, provided City has made its

contribution to the cost of the Project as set forth herein. Districts shall hold and save harmless City, its officers, agents, and employees, from liability of any nature or kind for and on account of any claim for damages arising as a result of the work performed or failure to meet the terms of the Federal contract respecting the New Don Pedro Project. The New Don Pedro project shall be owned solely by Districts, and Districts agree to maintain and operate it at their own expense, all in accordance with the terms and conditions herein.

The Districts shall have no liability for damages and shall be relieved of any obligations under this Agreement, if such damage is caused, or the performance of such obligations is prevented, by war, strikes, inability to obtain required materials, acts of God, or other causes beyond their control.

ARTICLE 5. RESERVOIR STORAGE CAPACITY

The New Don Pedro Reservoir shall be constructed to a capacity of approximately 2,030,000 acre feet; which capacity shall include 1,120,000 acre feet of Districts' storage, of which 309,000 acre feet is below minimum power pool; 570,000 acre feet storage space for use by City; and 340,000 acre feet for flood control storage space. Such portion of the 340,000 acre feet flood control storage space as is not reserved for flood control at any time shall be available 50% to Districts and 50% to City

for conservation storage, thereby entitling City to a maximum of 740,000 acre feet of storage space, hereinafter called "exchange storage space."

ARTICLE 6. FLOOD CONTROL OPERATIONS

(a) Until the Project is constructed and in operation, both Districts and City agree to operate their existing reservoirs for purposes of flood control, in addition to conservation, in accordance with the provisions of the Federal Contract. City shall have the right to intercept and store water due Districts under the Raker Act and shall endeavor to maintain, insofar as feasible, sufficient storage in its reservoirs to protect Districts from loss of both irrigation and power water by reason of Districts' flood control operations. Upon demand of Districts, City agrees to release from City's reservoirs, through its powerhouses or otherwise, any or all water due Districts under the Raker Act: provided that all storage credits shall be terminated at such times as existing Don Pedro Reservoir spills or on October 31 of each year, at which time City shall own all water stored in its reservoirs.

(b) Upon completion of the New Don Pedro Reservoir, all obligations of the City and the Districts to operate any of their other reservoirs for flood control shall be terminated, and the entire flood control operation shall be transferred to the New Don Pedro Reservoir.

(c) Districts shall operate New Don Pedro Reservoir for flood control in accordance with the requirements of the Federal

Contract and the applicable and valid regulations and orders of the Corps of Engineers of the United States Army. The maximum amount of space in the reservoir to be reserved for such flood control purposes is 340,000 acre feet.

ARTICLE 7. WATER ACCOUNTING

It is agreed that a principal benefit to be derived by City in return for its payment of a substantial part of the cost of the project shall be the right of City to release water to Districts when it can be stored in New Don Pedro Reservoir in advance of the time when a release thereof is required under the Racker Act and the right of City subsequently to intercept or divert equivalent quantities of water which would otherwise be required to be released to Districts, the City's advance releases being stored by Districts in New Don Pedro Reservoir and withdrawn therefrom by Districts for use in place of natural flow subsequently intercepted by City. The following provisions shall take effect upon the completion of New Don Pedro Reservoir and shall continue in effect thereafter throughout the term of this Agreement:

(a) A "Water Bank Account" shall be established and maintained by the parties in a manner to be approved by them from

time to time. The Water Bank Account shall contain a detailed record of all advance releases credited to City and all debits charged to City as hereinafter provided, together with the new balance, if any, remaining to the credit of the City at all times. The Water Bank Account shall be maintained on a daily

basis or such other basis as the parties may agree upon from time to time.

(b) Whenever the inflow to the New Don Pedro Reservoir from all sources exceeds whichever of the following is the smaller:

(1) The computed daily natural flow of the Tuolumne River at LaGrange Dam (as defined in the Raker Act), or

(2) The entitlement of the Districts under the Raker Act plus sixty-six (66) cubic feet per second,

then the excess shall be deemed to be natural flow of the Tuolumne River released by City to Districts in advance of the time when the release thereof is required under the Raker Act, and such excess shall be credited to City as "advance releases" and shall be treated as hereinafter provided.

(c) Whenever and to the extent that City has a credit balance in its Water Bank Account City may intercept and divert waters of the Tuolumne River above New Don Pedro Reservoir in quantities which will reduce the inflow into New Don Pedro Reservoir to less than the smaller of the two quantities

hereinabove defined in paragraph (b) hereof, and the amount by which such inflow is so reduced below the smaller of said two quantities shall be charged to City in its Water Bank Account.

(d) The losses of water in storage in New Don Pedro Reservoir through evaporation and seepage shall be computed on a daily basis, and on each day when the City has a net credit balance in its Water Bank Account there shall be deducted from such balance that proportion of the day's evaporation and seepage

losses which is equal to the proportion that the City's net credit balance in the Water Bank Account at the beginning of the day bears to the total volume of water then in storage in New Don Pedro Reservoir.

(e) Except with the prior consent of Districts, City shall never by entitled to have a debit balance in its Water Bank account. With the Districts' prior approval City may create debit balances in its Water Bank Account on a temporary basis for the purpose of securing water which is necessary to maintain City's operations, but such debit balances shall be restored by City through advance releases as soon as practicable, and City shall compensate Districts in a manner to be mutually agreed upon for any damages or losses which may be suffered or incurred by Districts as a result of such action by City.

(f) The net credit balance of the City in its Water Bank

Account shall never be permitted to exceed at any one time 570,000 acre feet plus one-half of the permitted encroachment in the flood control space. Whenever the City's net credit in its Water Bank Account shall equal or exceed the above, then, and so long as that condition continues, there shall be no credit to the City for advance releases pursuant to paragraph (b) hereof.

(g) Districts shall own and have exclusive control and use of all water released by City to Districts in advance pursuant to paragraph (b) hereof, may store such water in and withdraw such water from New Don Pedro Reservoir at such times and in such amounts as Districts shall see fit from time to time.

(h) For the purposes of computation, the daily natural flow of the Tuolumne River shall be deemed to be that flow which would have occurred at LaGrange Dam had facilities of City and Districts been constructed on the Tuolumne River watershed.

(i) All computations, schedules, records and formulae used in measuring advance releases and establishing the net balance in the City's Water Bank Account from time to time shall be subject to examination and review by authorized representatives of the parties hereto at all reasonable times. Monthly reports shall be made to the parties showing the results of all such computations and the status of the Water Bank Account on a daily basis. The correctness of each such monthly report shall be deemed to be

conclusively established as between the parties in the absence of objection by any party within ninety (90) days after the delivery of such report. In the event of any objection within said period the parties shall endeavor to resolve the objection by mutual agreement, but if they are unable to do so within a reasonable time then upon request of any party the matter shall be referred to a panel of three qualified arbitrators, one appointed by City, one by Districts, and the third by the two so chosen, and the decision of a majority of the arbitrators shall be final and binding upon all parties.

ARTICLE 8. WATER RELEASES; APPORTIONMENTS.

the Districts and City recognize that Districts, as licensees under the Federal Power Commission license for the New Don Pedro Project, have certain responsibilities regarding the

water release conditions contained in said license, and that such responsibilities may be changed pursuant to further proceedings before the Federal Power Commission. As to these responsibilities, as they exist under the terms of the proposed license or as they may be changed pursuant to further proceedings before the Federal Power Commission, Districts and City agree:

(a) That any burdens or changes in conditions imposed on account of benefits accruing to City shall be borne by City.

(b) That at any time Districts demonstrate that their water

entitlements, as they are presently recognized by the parties, are being adversely affected by making water releases that are made to comply with Federal Power Commission license requirements, and that the Federal Power Commission has not relieved them of such burdens, City and Districts agree that there will be a re-allocation of storage credits so as to apportion such burdens on the following basis: 51.7121% to City and 48.2879% to Districts.

In the event City and Districts cannot agree that there has been such an adverse effect and the extent thereof, these issues shall be determined by arbitration as provided in Article 7 (i) above.

(c) That in the event of such adverse effects on Districts' water entitlements, and the consequent necessity for distribution of burden therefor as provided in the foregoing subparagraph b, Districts shall forthwith seek modification by the Federal Power Commission of the water release conditions of said license.

ARTICLE 9. DETERMINATION OF COSTS AND COST ACCOUNTING

(a) Estimated Costs. Estimated Project costs made in March 1966 form the basis for the allocations of costs to the parties as made herein. The parties, however, recognize and agree that the costs to be defrayed in accordance with the allocations made shall be the actual costs of construction of the Project.

(b) Actual Costs. Actual costs of construction shall be those expenditures required in order to build the Project. In addition to the actual costs of all physical facilities, including lands, together with any relocations or replacements of facilities which Project construction may require, actual costs shall include but not be restricted to, the costs of administration, preliminary investigation, engineering, legal services and construction management.

(c) Accounting and Procedures. The Districts shall set up an accounting procedure for the Project satisfactory to the City, which shall be in accordance with the uniform system of accounts of the Federal Power Commission. Prior to awarding of any contracts for construction of the New Don Pedro Project the Districts shall select a bank or banks in which to establish accounts for all funds received and paid out in connection with the Project. Such funds shall be kept in bank accounts separated from all other funds of the Districts. Funds covering the cost of the Project shall be deposited in these accounts by the Districts and City prior to awarding of contracts. Any interest accruing shall be credited to the City and Districts as their pro

rata share of deposits earned. All payments for the Project shall be disbursed from these funds and any unused amounts at the completion of the Project shall be returned to the City and

Districts as their credits indicate. The Districts shall render monthly statements to the City showing the distribution of all funds and the City's share of same. In addition, the Controller of the City shall have the right to make any investigation, inspection or audit which he may deem necessary. For the purpose of simplification, contracts awarded for construction work shall be itemized so far as practical, to separate items for City participation from items in which City does not participate.

(d) Reporting. Each party agrees that at any time, upon written request by any of the other parties, it will report the amount of funds it has available for disbursement under the terms of this Agreement. Districts agree that at any time upon written request they will furnish to City up-to-date Project cost estimates, certified statements as to Project costs actually incurred, and information as to their budgetary programs for the New Don Pedro Project.

ARTICLE 10. RESPONSIBILITIES AS TO PROJECT COSTS.

(A) Separable Costs. Of the total Project costs, Districts shall pay the costs of acquiring the site for the New Don pedro Dam and all lands and interests in lands to be occupied by the New Don Pedro Reservoir. Districts shall also pay all costs of the project facilities installed for the purpose of generation hydroelectric power and for operation and maintenance activity at the New Don Pedro Dam.

The costs of any modification to City's structures at Red Mountain Bar which may be necessary as a result of the construction of the New Don Pedro Project shall be borne by City. Estimates of these costs are set forth in Section I, Groups B, C and E of Appendix A incorporated herein by this reference. Each agency shall bear its own cost of interest charges during construction.

(b) Common Cost. All Project costs other than those set forth in Article 10a above shall be considered "Common Costs" to be shared by Districts and City as agreed upon herein. For purposes of cost sharing determination, common costs shall be in three general categories as follows:

(1) Construction Costs Allocated by Third Agreement- which shall include costs of: construction of a dam and appurtenances to impound a reservoir, including site clearing, of approximately 2,030,000 acre feet of capacity; including all access roads.

(2) Construction and Related Costs of Additions to Project Not Anticipated at Time of Third Agreement which shall include costs of the relocation and reconnection, to include right of way acquisition, of all State and County highways and roads; the relocation, including right of way acquisition, or removal of any power and telephone lines or other facilities public or private; fishery studies; utilizing or

acquiring, or gaining access to public lands; a recreational use plan together with facilities provided thereunder as approved by the Federal Power Commission; and any reconstruction which may be required by State or Federal authority at some future time.

(3) Other Costs- which shall include but not be restricted to costs of: preliminary engineering, legal and administrative activity; insurance, construction bonds; taxes; permits and inspections; accounting; public relations; and administration, engineering, legal and management of construction. Estimates of common costs, insofar as these items have been identified or are available, are set forth in Sections IA, ID and II of Appendix A.

(c) Sharing of Common Costs. The sharing of Common Costs, as defined in Article 10b, shall be as follows with regard to both "construction" and "other" costs:

(1) Construction Costs Allocated by Third Agreement- shall be shared in the ratio of the estimated cost of constructing a 1,200,000 acre foot dam and reservoir to a 2,030,000 acre foot dam and reservoir, which on the basis of past studies and cost estimates yields percentages of 82.1582 % for the City and 17.8418% for the Districts.

(2) Construction and Related Costs of Additions to Project Not Anticipated at Time of Third Agreement shall be shared in the ratio of City's additional storage achieved to Districts; additional storage achieved after

deductions for original Don Pedro Reservoir and minimum power pool, which yields percentages of 51.7121% for the City and 48.2879% for the Districts. Any continuing costs to the Project which might result form the Districts; deficit operation of recreational facilities required to be constructed under terms of the Federal Power Commission license will be shared by the City and Districts in the ratio established under this section.

(3) Other Costs- Shall be shared in the ratio of the estimated cost of building the Project without hydroelectric power facilities to building it with such facilities, yielding percentages of 62.0201% for the City and 37.9799% for the Districts; except that items applicable to separable costs listed in this article, section (a) above, shall be borne separately by the individual agencies.

(d) Sharing of Project Costs. The sharing of presently estimated Project costs under sections a, b, and c of this Article 10 is anticipated by the parties to be approximately as shown in Appendix A, incorporated herein by this reference.

ARTICLE 11. DISPOSITION OF CONTRIBUTED FUNDS

The Federal payments for the 340,000 acre-feet of flood control storage space in the New Don Pedro Reservoir, as provided for under Article 3b of the Federal Contract, shall be made to City. Any payments by the State or Federal Government for acquiring lands or interests in lands or for the demolition,

abandonment, relocation, or removal of buildings, and other structures, shall be made to Districts. Any payment by the State or Federal Government for recreation and fish and wildlife benefits shall be credited to the parties in the same percentage utilized for common construction costs under Article 10c2 hereof; provided, however, that the use of any money disbursed by the State of California to Districts pursuant to the portions of the Davis-Grunsky Act which provide for grants to public agencies shall be subject to the provisions of the grant contract to be

executed between Districts and the State of California under that Act which regulates the use of the grant money. Any other Federal or State payments which regulates the use of the grant money. Any other Federal or State payments which may be made available for the New Don Pedro Project shall be allocated to Districts and City by supplemental agreement when and if they become available.

ARTICLE 12. LICENSE CONDITIONS

As a consequence of Districts' responsibilities as licensees for the New Don Pedro Project, as such responsibilities exist or may be changed pursuant to any further proceedings, City and Districts agree:

(a) To share as provided in Article 10c2 in the costs of such studies relating to the fishery of the Tuolumne River as may

be required; in any proceedings resulting therefrom; and in the costs of any facilities or program instituted as a consequence of such fishery studies or proceedings.

(b) To share as provided in Article 10c1, 10c2, or 10c3, as appropriate, other costs arising out of Districts; responsibilities as licensees of the New Don Pedro Project.

ARTICLE 13. BONDS AND INSURANCE

Districts agree that City will be named as an additional obligee, as its interests may appear, on all labor, material, and performance bonds obtained in construction of the subject Project, as an additional insured on liability policies in force during and after construction and as an additional insured as its

interests may appear on any casualty policy covering the New Don Pedro Dam and its appurtenances.

ARTICLE 14. PROJECT DESIGN ENGINEERING

As soon as practicable, following the execution of this Agreement, the Districts shall direct Bechtel Corporation to proceed with project design engineering, and preparation of plans and specifications for (a) a single construction contract with unit prices, and (b) separate supply contracts for turbines and valves, generators and busses, transformers and circuit breakers, gantry crane and gate hoist, gates and penstock and liner, and allied work necessary for the calling for bids for the construction of the New Don pedro Project. The estimated cost of

this work by Bechtel Corporation is $500,000.00. The City shall pay to the Districts, 82.1582% of the cost of the work contemplated by this paragraph relating to the construction of those items specified in Paragraph I A, of Appendix hereto. Such payment shall be made on demand of the Districts. The Districts shall pay 100% of the cost of the work contemplated by this paragraph relating to those items specified in Paragraph I B of said Appendix.

ARTICLE 15. CONSTRUCTION CONTRACTS, BIDS

upon completion of the work contemplated by Article 14 hereof, the Districts shall call for bids for the construction under a single construction contract with unit prices and separate supply contracts for the New Don Pedro project.

ARTICLE 16. STATE HIGHWAY RELOCATION

The Districts shall enter into an agreement with the State of California, acting through the Division of Highways of the Department of Public Works, calling for a portion of the engineering and design work necessary for the State to proceed with the State highway relocations at a cost not to exceed $160,000.00 for the first year. The City shall pay 51.7121% of the cost thereof to the Districts at the time required by the Districts pursuant to said agreement.

ARTICLE 17. COUNTY HIGHWAY RELOCATION

The Districts shall take whatever action they may deem desirable in order to more accurately estimate the cost of relocating county highways. Provided the Districts have the prior written approval of the City for any expenditures in this regard, the City agrees to reimburse the Districts on demand 51.7121% of such expenditures.

ARTICLE 18. RECREATION PLAN

The Districts shall proceed with reasonable diligence to prepare the recreation plan required by the Federal Power Commission License and to prepare a feasibility report in support of an application for construction and facilities grants under the provisions of the Davis-Grunsky Act and to make an application for such grants. The City shall reimburse the Districts upon demand for the cost of such plan, feasibility report and application to the extent of 51.7121%, provided the cost thereof does not exceed $100,000.00.

ARTICLE 19. EVALUATION OF BIDS

Upon the receipt of bids for the construction of the New Don Pedro Project, each party shall make an estimate of the cost of the Project to it in accordance with the allocation of costs as provided herein.

In the event that (a) the estimated costs of the New Don

Pedro Project to the Turlock Irrigation District, based on all factors known at that time, exceeds $28,216,904.00, the Turlock Irrigation District, at its option, may declare that the cost of the project exceeds the benefits; (b) the estimated costs of the New Don Pedro Project to the Modesto Irrigation District, based on all factors known at that time, exceeds $15,881,658.00, the Modesto Irrigation District, at its option, may declare that the cost of the project exceeds the benefits; (c) the estimated costs of the new Don Pedro Project to the City, based on all factors known at that time, exceeds $48,423,538.00, the City, at its option, may declare that the cost of the project exceeds the benefits; and upon any such declaration the parties hereto agree that no party shall be bound by this agreement except as to the provisions of Articles 14 to 19 inclusive.

ARTICLE 20. RESERVATIONS

Except with respect to Articles 14 to 19 inclusive, this Agreement is subject to (a) the approval of the Federal Power Commission, (b) the approval of the California District Securities Commission, and (c) the Districts; ability with reasonable efforts to make satisfactory arrangements for necessary county highway abandonment and relocation.

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed by their respective officers thereunto duly authorized this 23rd day of May, 1966.

TURLOCK IRRIGATION DISTRICT

_____
President

_____
Secretary

APPROVED AS TO FORM:

_____
Chief Engineer

_____
Attorney

MODESTO IRRIGATION DISTRICT

President

Secretary

APPROVED AS TO FORM:

Chief Engineer

Attorney

CITY AND COUNTY OF SAN FRANCISCO

APPROVED AS TO FORM:

THOMAS M. O'CONNOR, City Attorney

By _____
Public Utilities Counsel

General Manager
of Public Utilities

APPROVED
Accounts Bureau Director

Authorized by Resolution No. 359 66
of the Board of Supervisors of the
City and County of San Francisco

Authorized by Resolution No. 66-0378
of the Public Utilities Commission
of the City and County of
San Francisco

Attest
Secretary and Assistant
General Manager, Administrative,
Public Utilities

March, 1966,
Page 1 or 4

NEW DON PEDRO ESTIMATE

APPENDIX A
DISTRIBUTION OF COSTS

I. PER THIRD AGREEMENT	TOTAL COSTS	CITY	MODESTO	TURLOCK
A. Construction Items Allocated by Third Agreement				
1. Reservoir	$ 1,420,000			
2. Dam	32,639,000			
3. Dikes	401,000			
4. Controlled Spillway	1,540,000			
5. Emergency Spillway	840,000			
6. Spillway Discharge Channel	117,000			
7. Structure Power and Lighting	162,000			
8. Diversions-Outlet Tunnel & Appurtenances	6,000,000			
9. Access Roads	780,000			
10. Visitors and Dam Headquarters	250,000			
11. Direct Costs for City and Districts	44,149,000			
12. Omissions and Contingencies	4,690,000			
13. Escalations	4,720,000			
14. Total	$ 53,559,000	$ 44,003,110	$ 3,013,926	$ 6,541,964
B. Construction Items for Districts Only - Power Facilities				
15. Power Plant Structures and Improvements	$ 2,100,000			
16. Power Tunnel, Penstock and Appurtenances	5,170,000			
17. Trailrace	41,000			
18. Turbines and Generators	4,549,000			
19. Accessory Electrical Equipment	1,133,000			
20. Miscellaneous Power Plant Equipment	616,000			
21. Switchyard Structures	160,000			
22. Switchyard Equipment	1,416,000			

23.	Communications		80,000		
24.	Direct Costs for Districts Only		15,265,000		
25.	Omissions and Contingencies		1,270,000		
26.	Escalation		1,560,000		
27.	Total	$	18,095,000	$ 5,707,163	$12,387,837

NEW DON PEDRO ESTIMATE (Cont'd.)

			DISTRIBUTION OF COSTS		
		TOTAL COSTS	CITY	MODESTO	TURLOCK
C.	Construction Items for City Only				
28.	Modification of Red Mountain Bar Siphon---	$ 1,000,000			
29.	Omissions and Contingencies	100,000			
30.	Escalation	50,000			
31.	Total	1,150,000	$ 1,150,000		
32.	Total Construction Cost of Dam, Reservoir and Power Facilities and Red Mountain Bar Modification	$ 72,804,000	$45,153,110	$ 8,721,089	$18,929,801
D.	Administrative Items Applicable to Construction Costs Allocated by Third Agreement				
33.	Administration, Legal, Taxes & General Expense	1,000,000			
34.	Engineering & Management of Construction---				
35.	On Specific Construction Costs	5,370,000			
36.	From Project Delay	550,000			
37.	Total	6,920,000	4,291,791	828,940	1,799,269
38.	Total Construction & Related Costs to City and Districts	$ 79,724,000			
E.	Other Districts' Costs				

39.	Reservoir Lands	$ 3,406,000			
40.	Omissions, Contingencies, Engineering & Administration	340,600		1,181,678	2,564,922
41.	Transmission Lines (Incl. O&C, Escal., Eng. Administration)	4,337,000		3,215,000	1,122,000
42.	Buildings & Grounds for Project Operation & Maintenance	250,000		78,850	171,150
43.	Total Other Districts' Costs	$ 8,333,600		$ 4,475,528	$ 3,858,072
II.	ADDITIONS TO PROJECT COSTS NOT ANTICIPATED AT TIME OF THIRD AGREEMENT				
44.	Relocation of State and County Roads	$ 8,200,000			
45.	Omissions, Contingencies, Eng. & Admin.	820,000			
46.	Recreation	1,250,000			
47.	Omissions, Contingencies, Eng. & Admin.	100,000			
48.	Total	$ 10,370,000	$ 5,362,545	$ 1,579,351	$ 3,428,104
49.	Net Project Estimate	$ 98,427,600	$54,807,446	$15,604,908	$28,015,246

March, 1966

NEW DON PEDRO ESTIMATE (Cont'd.)

			DISTRIBUTION OF COSTS		
III.	FINANCING COSTS	TOTAL COSTS	CITY	MODESTO	TURLOCK
50.	city's Interest During Construction (3%)	$ 2,958,500	$ 2,958,500		
51.	Districts' Interest During Construction (3-3/4%)	4,100,000		$ 1,419,000	$ 2,681,000
52.	Total Financing Cost	7,058,500	2,958,500	1,419,000	2.681.000
53.	Gross Project Estimate	$105,486,100	57,765,946	17,023,908	30,696,246
54.	Flood Control		- 5,464,000		
55.	Davis-Grunsky		- 3,878,408	- 1,142,250	- 2,479,342
56.	Net		$48,423,538	$15,881,658	$28,216 904

NOTES:

1. The ratio of 0.821582 for City participation is taken from the comparison of the 1959 Bechtel estimate of a 1,200,000 acre feet reservoir to a 2,030,000 acre feet reservoir as estimated on September 28, 1962 for the FPC hearing. ($35,853,000) $43,639,000 = 0.821582).

2. The ratio of 0.620201 for City participation in the administrative items applicable to construction costs allocated by Third Agreement is determined by comparison of City's participation in the construction of the dam, reservoir, power facilities and Red Mountain Bar Siphon modification to the Districts' participation in these costs. ($45,153,110) 72,804,000 = 0.620201).

3. The ratio of 0.517121 for City participation in Additions to Project Costs Not Anticipated At Time of Third Agreement is determined by comparison of City's additional storage achieved to Districts' additional storage achieved after deductions for original Don Pedro Reservoir, and minimum power pool. (740,000) 1,431,000 = 0.517121). (691,000) 1,431,000 = 0.482879).

4. The Legislature has authorized a Davis-Grunsky grant of up to $7,500,000 which will accrue as a contribution to the Project. This amount will be distributed to the City and Districts in proportion to the amounts of additional storage achieved. (See Note 3 for ratios.)

RESOLUTION AUTHORIZING EXECUTION
OF FOURTH AGREEMENT

BE IT RESOLVED, by the Board of Directors of the Modesto Irrigation District that the President and Secretary be, and each of them is, hereby authorized to execute on behalf of the Modesto Irrigation District that certain FOURTH AGREEMENT between the CITY AND COUNTY OF SAN FRANCISCO and TURLOCK IRRIGATION DISTRICT and MODESTO IRRIGATION DISTRICT.

The foregoing resolution was introduced by Director Penney, who moved its adoption, seconded by Director Kidd, and adopted unanimously by a vote of all Directors present.

oOo

I, H. L. BROOKS, Secretary of the Board of Directors of the MODESTO IRRIGATION DISTRICT, do hereby CERTIFY that the foregoing is a full, true, and correct copy of a resolution duly adopted at an adjourned meeting of said Board of Directors held on the 16th day of May, 1966.

Secretary of the Board of Directors
of the Modesto Irrigation District

RESOLUTION AUTHORIZING EXECUTION OF FOURTH AGREEMENT

IT IS HEREBY RESOLVED by the Board of Directors of the Turlock Irrigation District that the President and the Secretary be, and each of them is, hereby authorized to execute on behalf of the Turlock Irrigation District that certain FOURTH AGREEMENT between THE CITY AND COUNTY OF SAN FRANCISCO and THE TURLOCK IRRIGATION DISTRICT and THE MODESTO IRRIGATION DISTRICT.

Moved by Director Clark, seconded by Director Fernandes, that the foregoing Resolution be adopted.

Upon Roll Call the following vote was had:

Ayes: Directors Crowell, Clark, Fernandes, Kronberg

Noes: Directors None

Absent: Director Tomlinson

I, R. S. Tillner, Secretary of the Board of Directors of the TURLOCK IRRIGATION DISTRICT, do hereby CERTIFY that the foregoing is a full, true and correct copy of a Resolution adopted at a regular adjourned meeting of the board of Directors held on the 16th day of May, 1966.

R S. TILLNER, Secretary of the Board of Directors of the Turlock Irrigation District.

Your attention is hereby directed to the following, passed by the Board of Supervisors of the City and County of San Francisco:

AUTHORIZING THE EXECUTION OF A CONTRACT WITH TURLOCK IRRIGATION DISTRICT AND MODESTO IRRIGATION DISTRICT

RESOLUTION NO. 359-66

Whereas, By its Resolution No. 66-0378 the Public Utilities Commission of the City and County of San Francisco has submitted to this Board a proposed contract to be executed by City and County of San Francisco with Turlock Irrigation District and Modesto Irrigation District, now on file with this Board; and

WHEREAS, This Board finds that the public interest and necessity demand the acquisition, construction and completion of the New Don Pedro Dam and Reservoir contemplated by said contract; now, therefore, be it

RESOLVED, That the Public Utilities Commission of the City and County of San Francisco, by and through its General Manager of Public Utilities, is hereby authorized to execute for and on behalf of, and in the name of the City and County of San Francisco, the said contract.

I hereby certify that the foregoing resolution was adopted by the Board of Supervisors of the City and County of San Francisco at its meeting of May 23, 1966.

ROBERT J. DOLAN, Clerk
Approved: May 24, 1966
JOHN F. SHELLEY, Mayor
May 27, 1966-1t

PUBLIC UTILITIES COMMISSION

CITY AND COUNTY OF SAN FRANCISCO

RESOLUTION No. 66-0378

WHEREAS, this Commission by its Resolution No. 20,925 of February 7, 1961, has recommended to the Board of Supervisors of the City and County of San Francisco that proceedings be initiated by said Board to submit to the electorate of the City and County of San Francisco a proposition to incur a bonded indebtedness in the principal amount of $115,000,000 to be sold to finance funds for projects to develop and improve water resources and facilities; and

WHEREAS, One of said projects is participation by the City and County of San Francisco with the Turlock Irrigation District and the Modesto Irrigation District in the construction of the New Don Pedro Dam Project, which said project will replace the existing Don Pedro Dam and provide 570,000 acre feet of firm storage space on the Tuolumne River for the City and County of San Francisco and a one-half interest in an additional 340,000 acre feet of storage subject to flood control operation of the Federal Government; now, therefore, be it

RESOLVED, that the Mayor and the Board of Supervisors be requested to authorize the Public Utilities Commission, by and through the General Manager of Public Utilities, to execute contract on behalf of, and in the name of the City and County of San Francisco, with the Turlock Irrigation District and the Modesto Irrigation District defining the respective rights and

obligations of the parties with respect to New Don Pedro Dam and Reservoir, a copy of said contract being attached hereto as a part of this resolution and market Exhibit "A."

May 10, 1966

DON PEDRO PROJECT
FERC NO. 2299

DRAFT LICENSE APPLICATION

EXHIBIT H - PLANS AND ABILITY OF APPLICANT TO OPERATE THE PROJECT

APPENDIX H-2
SINGLE LINE DIAGRAM
(***PUBLIC)***

The following pages have been removed as they contain Critical Energy Infrastructure Information (CEII).

DON PEDRO PROJECT
FERC NO. 2299

DRAFT LICENSE APPLICATION

EXHIBIT H - PLANS AND ABILITY OF APPLICANT TO OPERATE THE PROJECT

APPENDIX H-3
1972 ARMY CORPS OF ENGINEERS FLOOD CONTROL MANUAL

DON PEDRO LAKE

Tuolumne River, California

RESERVOIR REGULATION FOR FLOOD CONTROL

AUGUST 1972

DEPARTMENT OF THE ARMY

SACRAMENTO DISTRICT, CORPS OF ENGINEERS
SACRAMENTO, CALIFORNIA

DON PEDRO DAM AND LAKE

PERSONNEL CONCERNED WITH THE PROJECT OPERATION

LOCATION	OFFICE PHONE(S)	NAME	HOME PHONE(S)
PROJECT OWNERS/OPERATORS			
TURLOCK IRRIGATION DISTRICT			
333 East Canal Drive Turlock CA 95381-0949	Ofc (209) 883-8210 Ofc2 (209) 883-8211	Chris L. Kiriakou Interim General Mgr.	Hm (209) 634-3294
	Ofc (209) 883-8325 Ofc2 (209) 883-8431	Robert Hondeville Energy Resources Admin.	
	Ofc (209) 883-8431	Ron Butcher Operations	Hm (209) 667-2438
	Ofc (209) 883-8214	Robert Nees Administrator	Hm (209) 632-7321
	Ofc (209) 883-8478	Tim Gormley tmgormley@tid.org	
	Ofc (209) 883-8321 Fax (209) 656-2147	Wes Monier Utility Analyst fwmonier@tid.org	Hm (209) 357-3143 Pgr (209) 341-1307 Cell (209) 602-2463
Control Center 901 N. Broadway Street Turlock CA 95380-3012	Ofc (209) 883-8480	Staffed 24 Hours	
U.S. ARMY CORPS OF ENGINEERS			
Sacramento District 1325 J Street Sacramento CA 95814-2922	Ofc (916) 557-7490*	Col. Michael J. Walsh District Engineer mwalsh@spk.usace.army.mil	
Water Management Section	Ofc (916) 557-7101* Fax (916) 557-7863	Paul E. Pugner Chief ppugner@spk.usace.army.mil	Hm (916) 965-6669

U.S. ARMY CORPS OF ENGINEERS			
Water Management Section	Ofc (916) 557-7105* Fax (916) 557-7863	Tom Patton Water Manager tpatton@spk.usace.army.mil	Hm (916) 454-0449
	Ofc (916) 557-7110* Fax (916) 557-7863 Ofc2 (916) 557-7120	Ralph H. Johonnot Hydrologic Data rjohonnot@spk.usace.army.mil	Hm (916) 723-7252
* For Emergencies During Non-Duty Hours Call:	Emer (916) 452-1535	EMERGENCY NUMBER	

ADDITIONAL POINTS OF CONTACT			
CALIFORNIA/NEVADA RIVER FORECAST CENTER			
3310 El Camino Ave. Ste 227 Sacramento CA 95821-	Ofc (916) 979-3056 Fax (916) 979-3067	Rob Hartman	Hm (916) 786-4697
NATIONAL WEATHER SERVICE			
3310 El Camino Ave. Ste 228 Sacramento CA 95821-	Ofc (916) 979-3051 Fax (916) 979-3067 Emer (916) 979-3049		
OFFICE OF EMERGENCY SERVICES			
1100 H Street Modesto CA 95354-	Ofc (209) 525-4650 Fax (209) 525-5008	Russ Richards For Stanislaus County	
SACRAMENTO FLOOD CENTER			
California DWR P. O. Box 219000 Sacramento CA 95821-9000	Emer (800) 952-5530	Eric Butler Chief	

Revised 10-Dec-99

DON PEDRO DAM AND SPILLWAY

Furnished by Modesto and Turlock Irrigation Districts.

DON PEDRO LAKE

TUOLUMNE RIVER, CALIFORNIA

PERTINENT DATA

GENERAL

Drainage Areas (sq. mi.)

Tuolumne River at Don Pedro Dam	1,533
Eleanor Creek at Lake Eleanor	78
Cherry Creek at Cherry Valley Dam	117
Tuolumne River at Hetch Hetchy Dam	455
Tuolumne River at LaGrange Dam	1,537
Tuolumne River at mouth	1,958

Flow at Don Pedro Dam

Mean annual runoff (1896-1969)	1,851,000 ac-ft
Average flow (1896-1969)	2,555 c.f.s.
Minimum of record (27 Dec. 1922)	2.1 c.f.s.
Maximum of record (18 Dec. 1950)	61,000 c.f.s.
Maximum natural during record (23 Dec. 1955)	160,000 c.f.s.
Standard project peak inflow (snowmelt)	28,400 c.f.s.
Standard project peak inflow (rainflood)	260,000 c.f.s.
Spillway design peak inflow	602,000 c.f.s.

DON PEDRO DAM AND LAKE

Main Dam (Earth and Rockfill)

Crest elevation	855 ft
Crest width	40 ft
Crest length	1,900 ft
Maximum height above foundation (approx.)	585 ft
Freeboard above spillway design flood pool	5 ft
Volume of fill (approx.)	16,750,000 cu yd

Spillways

Gated, ogee section

Crest length	135 ft
Crest elevation	800 ft
Gates (Tainter)	3 - 45'-0"x30'0"
Capacity (elev. 830')	78,000 c.f.s.
Capacity (elev. 850')	172,500 c.f.s.

Ungated, ogee section

Crest length	995 ft
Crest elevation	830 ft
Capacity (elev. 850')	300,000 c.f.s.
Total capacity (elev. 850')	472,500 c.f.s.

Reservoir

Elevation

Minimum power pool	600.0 ft
Bottom of flood control pool	802.0 ft
Gross pool	830.0 ft
Spillway design flood pool	850.0 ft

Area

Minimum power pool	3,520 ac
Bottom of flood control pool	11,260 ac
Gross pool	12,960 ac
Spillway design flood pool	14,240 ac

Storage capacity

Minimum power pool	309,000 ac-ft
Bottom of flood control pool	1,690,000 ac-ft
Gross pool	2,030,000 ac-ft
Spillway design flood pool	2,301,000 ac-ft

OUTLET WORKS

Type	Lined tunnel controlled by slide gates
Tunnel length	3,500 ft (approx.)
Tunnel diameter	12 ft concrete lined enlarging to 30 ft
Upstream inlet invert elev.	342 ft
Downstream ℄ elev. of outlet	310 ft
Outlet controls	3 parallel outlets, each with two 8'x5' slide gates in tandem
Capacity (at elev. 830')	7,370 c.f.s.

POWER CONDUIT

Length along ℄	2,960 ft
Tunnel diameter	18'6" concrete-lined 16'6" and 16'0" steel-lined
Inlet invert elev.	525 ft
Outlet portal ℄ elev.	299 ft
Bulkhead gate	22'0" high x 14'0" wide hydraulically operated
Emergency closure gate	21'0" high x 12'0" wide hydraulically operated fixed wheel gate

POWERHOUSE

Number of units	3
Turbines	70,000 HP at 450' NEH (Francis-type)
Generators	47,900 KVA at .95 p.f.
Elevation of ℄ of distributor	299.0 ft
Maximum static head (830-299)	531.0 ft
Full gate discharge	1,500 c.f.s./gate
Maximum discharge through turbines	4,500 c.f.s.
Turbine shut-off valve	115" horiz. shaft (Butterfly-type)
Pressure regulator valve	50" fixed-cone dispersion type
Flood control valve	72" hollow-jet type
Maximum discharge through F.C. valve	3,140 c.f.s.

DON PEDRO DAM AND LAKE
TUOLUMNE RIVER, CALIFORNIA

REPORT ON RESERVOIR REGULATION FOR FLOOD CONTROL

APPENDIX IV
TO
MASTER MANUAL OF RESERVOIR REGULATION
SAN JOAQUIN RIVER BASIN, CALIFORNIA

AUGUST 1972

Department of the Army
Sacramento District, Corps of Engineers
Sacramento, California

REPORT ON RESERVOIR REGULATION
FOR FLOOD CONTROL

DON PEDRO DAM AND LAKE
TUOLUMNE RIVER, CALIFORNIA

TABLE OF CONTENTS

TABLE OF CONTENTS (Cont'd)

LIST OF CHARTS

LIST OF CHARTS (Cont'd)

REPORT ON RESERVOIR REGULATION FOR FLOOD CONTROL DON PEDRO DAM AND LAKE TUOLUMNE RIVER, CALIFORNIA

CHAPTER I - GENERAL INFORMATION

1. AUTHORITY AND SCOPE

This report on reservoir regulation for flood control, Don Pedro Dam and Lake, is an appendix to the Master Manual of Reservoir Regulation, San Joaquin River Basin, California, and is prepared in accordance with instructions contained in ER 1110-2-240, EM 1110-2-3600, and EC 1110-2-67, which pertain to requirements for reports on reservoir regulation for flood control for projects subject to provisions of Section 7 of the Flood Control Act of 1944 (58 Stat. 890). The pertinent portion of that act reads as follows:

> "Hereafter it shall be the duty of the Secretary of War to prescribe regulations for the use of storage allocated for flood control or navigation at all reservoirs constructed wholly or in part with Federal funds provided on the basis of such purposes, and the operation of any such project shall be in accordance with such regulations . . . . . ."

This report contains detailed descriptive information about the project, the method of operation, and a draft of proposed regulations for flood control operation. A portion of the material used in the preparation of this report was supplied by the Modesto and Turlock Irrigation Districts, and some of the charts showing technical features of the project were furnished by Bechtel Corporation, consulting engineers for the design and construction of Don Pedro Dam and appurtenances, for the Modesto and Turlock Irrigation Districts. Detailed hydrologic data and analysis for the Tuolumne River are contained in Appendix A, and detailed flood-control data and criteria for the Tuolumne River are incorporated as Appendix B to "Report on Cost Allocation for Flood Control, Tuolumne River Reservoirs, Tuolumne River, California" dated 10 October 1961 (Revised 1 June 1962). These appendices are referred to herein as the Hydrology Report and the Flood-Control Reservoir Operation Report, respectively.

A description of the overall San Joaquin River Basin plan of flood control is given in the Master Manual of Reservoir Regulation, San Joaquin River Basin, California.

2. AUTHORIZATION FOR FLOOD CONTROL ALLOCATION

a. The Tuolumne River Project was authorized by the Flood Control Act of 22 December 1944. The plan of improvement authorized for Tuolumne River

was specified as that plan recommended by the Chief of Engineers in Committee Document No. 2, Committee on Flood Control, House of Representatives, 78th Congress, 2d Session, which states in part as follows:

> . . . "That in lieu of the construction of the proposed Jacksonville Reservoir an expenditure, to the extent justified by proportinate benefits for flood control, estimated at $5,800,000 for the equivalent of 320,000 acre-feet in Jacksonville Reservoir, be authorized toward the first cost of the proposed New Don Pedro Reservoir or other suitable reservoirs in Tuolumne Basin, provided that local interests construct, maintain, and operate the dams and reservoirs, allocate storage for flood control, and agree to operate such storage in accordance with rules and regulations prescribed by the Secretary of War . . . ."

b. The terms of the agreement between the Irrigation Districts, the City and County of San Francisco, and the Federal Government for joint construction and use of reservoir storage in the Tuolumne River Basin are set forth in Contract No. DA-04-167-eng-38, dated 29 August 1949, as amended by Supplemental Agreement No. 1 dated 12 June 1967; the flood control accomplishments of the project being achieved in three steps as follows:

Step 1. During the period of December 1949 to March 1956, the Modesto and Turlock Irrigation Districts operated up to 100,000 acre-feet of storage space in Don Pedro Reservoir for flood control in accordance with rules specified by the Corps of Engineers.

Step 2. During the period of March 1956 to October 1970, the City and County of San Francisco operated Cherry Valley and Hetch Hetchy Reservoirs, and the Irrigation Districts operated Don Pedro Reservoir for flood control in accordance with regulations mutually agreed upon by the Corps of Engineers and the operating agencies, and published in the Federal Register.

Step 3. Since October 1970, with completion of Don Pedro Lake (to a capacity of 2,030,000 acre-feet) by local interests, the Irrigation Districts have been operating a maximum of 340,000 acre-feet of flood control reservation in Don Pedro Lake as described herein. This manual, specifically prepared for Step 3 operation, will supersede the "Reservoir Regulation Manual for Flood Control, Tuolumne River Project, California, Don Pedro, Hetch Hetchy, and Cherry Valley Reservoirs, revised July 1959."

CHAPTER II - BASIN DESCRIPTION

3. DESCRIPTION OF THE AREA

a. Tuolumne River drains an area of about 1,958 square miles located in central California between the Stanislaus River Basin on the north and the Merced River Basin on the south. A map of the area is shown on chart 1. The Tuolumne River originates in the extensive snow fields of the upper Sierra Nevada, which rise to elevations in excess of 13,000 feet m.s.l. at the higher peaks including Mt. Lyell (13,090 ft.) and Mt. Dana. It flows westward through upland meadows and then through a deep canyon nearly 80 miles long cut in solid granite. The lower end of this canyon is Hetch Hetchy Valley, which is occupied by Hetch Hetchy Reservoir. Below Hetch Hetchy Reservoir the river passes through a relatively steep canyon and flows into Don Pedro Lake. Below Don Pedro Lake the river flows westward across the valley floor and joins the San Joaquin River, about 10 miles west of the city of Modesto.

b. The area above Don Pedro Dam consists of 1,533 square miles of steep and rugged mountainous terrain. Elevations range from about 500 feet at the dam to over 13,000 feet near the crest of the Sierra Nevada, with about 60 percent of the total area above 5,000 feet. Topography of Tuolumne River Basin is shown on chart 2. The drainage system includes the main stream and numerous tributaries, the most important of which are Clavey River, Cherry and Eleanor Creeks, and the North, Middle, and South Forks of Tuolumne River. The slope of the stream above the dam averages 125 feet per mile, ranging from about 50 feet per mile in the lower reaches to more than 800 feet per mile on some of the upper tributaries. Stream profiles are shown on chart 3. Tuolumne River at Don Pedro Dam has a mean annual natural runoff (measured at the gage near La Grange) of 1,850,000 acre-feet. This represents a basin average of 22.7 inches, which is 51 percent of the normal annual precipitation of 44.5 inches.

c. The drainage area between Don Pedro Dam and the mouth of Tuolumne River includes about 167 square miles of undeveloped, hilly pasture land and about 180 square miles of valley floor land. The latter includes one of the most highly developed diversified agricultural areas in the State of California, and food processing is the main industrial activity of the area. The area below Don Pedro Dam contributing to Tuolumne River flows consists of 295 square miles, entirely upstream from the city of Modesto. Local runoff from the 52 square miles located below Modesto is considered to be inconsequential for reservoir regulation purposes. The principal foothill stream contributing to Tuolumne River below Don Pedro Lake is Dry Creek, which has an area of 196 square miles, and enters Tuolumne River from the north at the city of Modesto. The valley floor area slopes from an elevation of about 200 feet at the foothill line to an elevation of about 40 feet at San Joaquin River. This area is traversed by an extensive network of canals, which distribute Tuolumne River water to the service areas of the Modesto Irrigation District on the north and the Turlock Irrigation District on the south of Tuolumne River. The area is serviced by the main lines of the Southern Pacific and Santa Fe Railroads, by U.S. Highway No. 99, and by numerous State and County highways.

d. The vegetative cover of the basin consists of scattered sub-alpine conifers in the upper elevations, light and heavy coniferous forest in the intermediate elevations, and a light cover of deciduous trees, chaparral, and grassland in the lower elevations. The following tabulation gives a distribution of the various types of vegetation with respect to elevation.

Description	Range of elevation (feet)	Percent of basin area
Grass lands (scattered timber)	500 - 2,000	7
Brushlands (chaparral, etc.)	1,500 - 3,500	14
Deciduous forest	1,000 - 4,000	12
Light coniferous	4,000 - 10,000	30
Heavy coniferous	6,000 - 8,500	20
Sub-alpine forest	9,000 - 10,000	11
Bare rock	11,000 - 13,000	6

4. CLIMATE

The climate of the Tuolumne River Basin is characterized by moderate winters and hot summers in the valley area, wet cold winters and hot dry summers in the higher watershed areas, and severe winters with cool summers at the higher elevations. The winter storms affecting the area are caused by cyclonic wave disturbances along the polar front which usually originate in the vicinity of the Aleutian Islands. Most of the precipitation associated with these storms over Tuolumne River Basin, is concentrated by orographic effect on the western slope of the Sierra Nevada, with marked differences in precipitation amounts within short distances. The normal annual precipitation varies from about 10 inches on the valley floor to 19 inches at Don Pedro Dam, about 70 inches in the upper reaches of the watershed, and the basin mean above Don Pedro Dam is about 44.5 inches. About 88 percent of the annual precipitation occurs during the period of November through April. Isohyets of normal annual precipitation, and the location of climatological stations within and adjacent to the basin are shown on chart 4. The monthly distribution of normal annual precipitation in inches for three stations located within the basin is shown below.

Average Monthly Precipitation

Month	Modesto (elev 91 ft)		Sonora RS (elev 1750 ft)		Hetch Hetchy (elev 3870 ft)	
	in	%	in	%	in	%
Jul	0.02	0.2	0.03	0.2	0.11	0.3
Aug	0.01	0.1	0.02	0.1	0.08	0.2
Sep	0.19	1.5	0.35	1.1	0.52	1.5
Oct	0.58	4.8	1.61	5.0	1.97	5.6
Nov	0.94	7.7	2.98	9.3	3.47	9.9
Dec	2.41	19.8	5.61	17.5	6.40	18.2
Jan	2.27	18.7	6.01	18.8	5.91	16.8
Feb	2.11	17.3	5.97	18.6	5.85	16.6
Mar	1.82	15.0	5.06	15.8	5.02	14.3
Apr	1.26	10.3	2.83	8.8	3.09	8.8
May	0.49	4.0	1.27	4.0	2.01	5.7
Jun	0.07	0.6	0.27	0.8	0.75	2.1
Annual	12.17	100.0	32.01	100.0	35.18	100.0

Precipitation usually occurs as rain at elevations below 4,000 feet and as snow at higher elevations, although snow has occurred in the valley and rain may occur at elevations above 10,000 feet. Snow cover below 5,000 feet is generally transient, and may accumulate and melt several times during a winter season. Normally the snow accumulates at higher elevations until about the 1st of April, when the melt rate exceeds snowfall. Basin 1 April snowpack data for a wet year (1969), a dry year (1961), and normal (1931-1970 average) at selected representative snow courses are given in the following tabulation.

1 April Snow Survey Data

Snow Course No.	Name	Elev. in feet	Depth in inches		Water equivalent Inches			% normal	
			1969	1961	1969	1961	Normal	1969	1961
159	Bond Pass	9,300	193.0	62.0	85.3	20.2	43.5	196	46
161	Tuolumne Mdws	8,600	125.6	44.3	50.5	12.4	22.6	223	55
167	Paradise	7,700	163.8	69.0	85.6	22.4	40.2	213	56
172	Bell Meadow	6,500	104.9	7.4	42.2	3.2	18.1	233	18

A complete list of snow courses representative of Tuolumne River Basin, and their respective locations, is given on chart 4.

Temperatures in the mountains decrease generally with increasing elevation. Observed temperature extremes at Modesto in the valley are 15°F. and 111°F., while those at Hetch Hetchy (elev. 3,870 ft.) are -1°F. and 104°F. The monthly distribution of mean temperature is illustrated by key stations as follows:

Month	Monthly Mean Temperatures (°F.) Modesto (elev. 91 ft.)	Sonora RS (elev. 1,750 ft.)	Hetch Hetchy (elev. 3,870 ft.)
Jan	45.0	43.9	37.3
Feb	49.3	47.0	40.0
Mar	53.9	50.6	44.3
Apr	59.6	56.6	50.7
May	65.5	62.9	56.5
Jun	71.2	69.9	63.1
Jul	76.3	77.8	71.6
Aug	74.0	76.2	70.7
Sep	70.8	71.6	66.2
Oct	62.6	62.0	56.7
Nov	52.3	52.0	46.6
Dec	46.0	46.0	40.1
Mean	60.5	59.7	53.7

5. RUNOFF CHARACTERISTICS

Runoff on Tuolumne River varies considerably over the watershed. In the lower portion of the watershed, runoff is mostly the result of rain and is subject to considerable fluctuation during the winter season. Low flows occur from late spring through the summer and fall season, when rainfall is very light. About 75 percent of the runoff occurs during December through March. In the middle portion of the watershed, runoff is produced by either rain or snow or a combination of the two. About 40 percent of the runoff occurs during December through March. Runoff from the upper portion of the watershed is produced mainly from snow, about 20 percent occurring during the months of December through March and about 75 percent during the months of April through July. Occasionally in the early winter a heavy storm of warm rain may remove the snow cover over the entire area and produce heavy runoff. Chart 5 gives computed natural runoff (1895-1970) on monthly and annual bases, for Tuolumne River near La Grange. Charts 6 and 7 give various pertinent natural runoff data for a number of representative locations within the Tuolumne River Basin.

6. FLOOD CHARACTERISTICS

a. Flood flows on both Tuolumne and lower San Joaquin Rivers are of two types, winter rain floods and spring snowmelt floods. Winter rain floods, which occur during the period of November through March, are caused by heavy rains and are sometimes augmented by the melting of snow at intermediate elevations. Winter floods have sharp, high peak flows and are usually of short duration and comparatively small volume. Winter storms, which account for about 80 percent of the annual precipitation of the Tuolumne region, originate over the Pacific Ocean and are associated with large volumes of moist air moving inland against the mountain barriers. Usually rainfall occurs over the Coast Ranges and below 5,000 feet elevation on the Sierra Nevada, with snowfall at higher elevations. Rainfall intensities are usually moderate, but rainfall generally continues for 3 or 4 days. Up to 50 percent of the normal annual precipitation may fall in a single storm period. Above 5,000 feet elevation on the Sierra Nevada, the snow usually accumulates into a deep snow pack which does not melt until the next summer. Occasionally, the incoming moist air is sufficiently warm to cause rainfall at the higher elevations, which may melt some of the accumulated snow pack and augment the rain flood runoff. Snowmelt floods, which occur from April through July, are the result of general melting of snow in the high mountains. Although these floods have comparatively low peaks, they have large volumes and are of long duration.

b. The largest rain flood of record on Tuolumne River was that of December 1955. The series of meteorological events which culminated in this great flood began with a moderately heavy, warm type storm on 5-9 December, which deposited several inches of rain along the Sierra Nevada, melted back the abnormally low snowline which had existed before the storm, and compacted the snow at high elevations. After a storm-free period of about 5 days, a stationary-cold front developed which extended from the vicinity of the Hawaiian Islands northeastward to the northern California coast, between a massive high pressure cell off Southern California and a strong low pressure cell in the Gulf of Alaska. That system directed a persistent, fast-moving stream of air inland across the west coast. By 15 December, the snowline was at about 4,500 feet elevation, and there was about 50 inches of snow at 10,000 feet elevation. During the first cold phase of the storm, from 16 to 20 December, about 3.5 inches of precipitation fell as rain below about 6,000 feet elevation and as snow above. The snowline retreated about 500 feet in elevation, but snow depths at 10,000 feet increased to over 100 inches. Ground conditions at low elevations became moderately wet. After the 21st, temperatures and wind velocities increased greatly, and the rainfall extended almost to the highest point in the basin. During the 3-day period from 21 to 24 December, about 16.5 inches of rain fell on the basin. The snowline retreated about 800 feet in elevation, and snow depths increased about 18 inches at all elevations. On the last day of the storm, temperatures again decreased, snow fell as low as 3,500 feet elevation, and previous snow depths were generally restored. The peak inflow of 22 December

into Don Pedro Reservoir (controlled by Hetch Hetchy, Cherry Valley, and Eleanor Reservoirs) was about 100,000 c.f.s. and the outflow at La Grange was 41,700 c.f.s. The natural inflow peak would have been about 160,000 c.f.s., and the 3-day inflow volume was 420,000 acre-feet.

c. The previously recorded maximum inflow was 86,000 c.f.s. on 19 November 1950, while corresponding outflow at La Grange was 28,900 c.f.s. Maximum outflow at La Grange was 61,000 c.f.s. on 8 December 1950, only slightly less than the inflow at that time. The storm series responsible for the 1950 flood runoff began with a cool storm of moderate intensity on 13-15 November, which left a shallow blanket of snow down to about 6,000 feet elevation over the Tuolumne Basin. The entire region was then invaded by a storm of near record-breaking magnitude which brought extremely warm air inland against the entire range of the Sierra Nevada and caused intense rainfall to extremely high elevations. By 18 November the mountain watershed was very wet and had been stripped of its protective pack of snow. During the 8-day storm period 14-21 November, rainfall totaled 14.62 inches at Hetch Hetchy with a maximum 24-hour rainfall of 7.95 inches. At Lake Eleanor the total for the period was 18.32 inches, and the maximum 24-hour rainfall was estimated at 9 inches. A second storm followed on 3-4 December during which period the stations recorded 6.05 inches and 7.06 inches, respectively. After a 2-day let-up the rains came again on 7-8 December, the stations recorded 3.09 inches and 4.33 inches, respectively. This latter rainfall brought additional runoff to an almost full reservoir with the result that peak inflow on 8 December was reduced only slightly to a peak outflow of 61,000 c.f.s. on that date.

d. The largest snowmelt flood of record on Tuolumne River was that of 1906, which had a peak discharge of about 20,000 c.f.s. and an April through July runoff volume of 2,680,000 acre-feet at La Grange. This record flood volume was almost equaled by the 1969 snowmelt flood which had a computed natural April through July runoff volume of about 2,400,000 acre-feet at La Grange. The 1969 flood had a higher peak (22,000 c.f.s.) and an earlier runoff distribution, thus providing a more critical test of project accomplishments.

e. Other important flood runoff has occurred from the Tuolumne River watershed. In the pre-record period 1850 to 1896, three major floods are known to have occurred. These were the rain floods of January 1862 and December 1867, and the snowmelt flood of 1890. The peak flow of the 1862 flood has been estimated at 130,000 c.f.s. near La Grange. The 26 December 1867 stage has been reported as slightly higher than the 1862 peak. The snowmelt runoff of 1890 has been estimated as about 2,500,000 acre-feet during May, June and July.

7. AREAS SUBJECT TO FLOODING

The present valley flood plain of Tuolumne River, subject to damaging flows from both rain floods and snowmelt floods, is estimated at about 16,000 acres of highly developed agricultural land extending from the town of Waterford to the confluence with San Joaquin River. A small part of the metropolitan area of Modesto (population 100,000) also lies within this flood plain. Although an extensive levee system gives a considerable degree of protection to the Modesto urban and suburban areas, large rain floods on Tuolumne River are a significant threat to these areas. Any flood flow in excess of 40,000 c.f.s. at Modesto could cause extensive damage to residential, industrial, and commercial development.

CHAPTER III - FLOOD POTENTIAL

8. RAIN-FLOOD POTENTIAL

a. Rain-flood potential is affected by antecedent ground conditions and by the extent and condition of the snowpack over the basin. An unusually wet watershed, or a shallow initial snowpack in the basin may significantly augment the amount of flood runoff. On the other hand, a deep persistent snowpack in the basin may be capable of retaining substantial amounts of rainfall on the basin for extended periods of time.

b. The more damaging flows on Tuolumne River are caused by intense rain floods of short duration similar to that of December 1955, described in paragraph 6b. The standard project rainflood series is developed and presented in the Hydrology Report. Inflow to Don Pedro Lake and runoff from the uncontrolled area downstream, are shown on chart 8. This flood series has a peak flow of 260,000 c.f.s., a 7-day volume of 947,000 acre-feet, and a 35-day volume of 1,530,000 acre-feet at Don Pedro Lake. Frequency curves of rain-flood volumes, for Don Pedro Lake inflows under natural conditions, and similar curves of rain-floods originating in the Dry Creek area below Don Pedro Dam are shown on charts 9 and 10, respectively.

9. SNOWMELT FLOOD POTENTIAL

Snowmelt runoff in the Tuolumne River Basin begins about 1 April each year and continues into July. The April-July runoff volume averages 1,253,000 acre-feet for the period 1896 through 1970 and ranged from 382,000 acre-feet in 1924 to 2,680,000 acre-feet in 1906. The standard project snowmelt flood inflow to Don Pedro Lake, presented in the Hydrology Report, is shown on chart 11. This flood has a maximum daily flow of 28,400 c.f.s. and an April-July runoff volume of 2,880,000 acre-feet. Frequency curves of snowmelt flood volumes for Don Pedro Lake inflows under natural conditions are shown on chart 12.

10. SEASONAL VARIATION OF RAIN-FLOOD POTENTIAL

Large rain floods in the Tuolumne River Basin occur most frequently in the months of November through March, and are not known to occur in the months of June through August. For a specified ground condition, the seasonal variation of rain-flood potential is dependent on the seasonal variation of storm potential, which has been related to latitude and 10-year storm precipitation. This seasonal variation of storm potential is defined by criteria contained in office report, "Reservoir Operation Criteria for Flood Control," dated October 1959.

CHAPTER IV - FLOOD CONTROL DESIGN REQUIREMENTS

11. RESERVOIR DESIGN RAIN FLOOD

a. Provision of 340,000 acre-feet of flood control space in Don Pedro Lake is in accordance with Contract No. DA-04-167-eng-38, entered into on 29 August 1949, as amended by Supplemental Agreement No. 1 dated 12 June 1967; between the United States of America, the City and County of San Francisco, and Turlock and Modesto Irrigation Districts as referred to in paragraph 2b. This flood control space requirement was derived on the basis of experienced rain floods in the Tuolumne River Basin. More recent experience during the large rain floods of November-December 1950 and December 1955 indicates that the flood control space of 340,000 acre-feet in Don Pedro Lake (with no space in upstream reservoirs) would not be adequate to control these large floods to nondamaging flows downstream. However, based on historical record of upstream reservoir operation, about 220,000 acre-feet of incidental empty space will exist (on the average) 80 percent of the time during the rain flood season.

b. Routing studies using hypothetical rain floods patterned after the standard project rain flood series, indicate that the 340,000 acre-feet of flood control space would control about 64 percent of the standard project rain flood to nondamaging outflows if 220,000 acre-feet of incidental empty space was assumed to exist in upstream reservoirs. Such a flood, (64% SPF) is used in this report as a reservoir design flood. It was constructed to conform with the following runoff volumes obtained from the rain flood volume frequency data given on chart 9.

Duration (days)	Reservoir Design rain flood (acre-feet)
1	234,000
5	487,000
10	612,000
20	796,000
30	938,000
35	984,000

A reservoir design rain flood series has been obtained by reducing the ordinates of the standard project rain flood series so that volume from the various durations equal those in the above tabulation. The hydrograph thus obtained is shown on chart 13.

12. RAIN-FLOOD SPACE REQUIREMENTS

a. Provision of 340,000 acre-feet of flood control space during the rain flood season would provide control of the reservoir design flood described in paragraph 11. In order to maximize the overall project accomplishments, it is desirable to allocate only as much space to flood control

as actually needed and to carefully define seasonal allocation requirements in order that space may be allocated for other project uses when there is no flood control requirement.

b. In order to determine the reservoir design rain flood potential at the beginning and end of the rain flood season, criteria relative to the seasonal variation of rainstorm potential referenced in paragraph 10 were used. Since the reservoir design flood was derived from percentages of the standard project flood and not developed as a result of a specific reservoir design storm, floods that would result from various percentages of the "reservoir design storm", on both wet and dry ground conditions, were obtained indirectly by approximate procedures described in the Flood Control Reservoir Operation Report.

c. The seasonal variation of maximum flood space requirement is based in part on the seasonal variation of ground wetness potential. Values of maximum required space, interpolated between space required for dry and wet ground conditions are indicated by the large circles on chart 14.

d. As stated in paragraph 11a, a minimum of about 220,000 acre-feet of incidental empty space in upstream reservoirs can be expected to exist 80 percent of the time in the rain flood season. A routing of the standard project flood series based on the assumed availability of 220,000 acre-feet of space in upstream reservoirs and 340,000 acre-feet of space in Don Pedro Lake is shown on chart 15. This routing is made using the emergency spillway operation criteria discussed in paragraph 5 of Appendix A and shown on chart A-9. Routings of four large rain floods through Don Pedro Lake are shown on chart 16.

13. RESERVOIR DESIGN SNOWMELT FLOOD

a. Routings of the maximum recorded snowmelt floods of 1906, 1907 and 1969 indicate that use of a maximum of 340,000 acre-feet of space at Don Pedro Lake is adequate to control these floods to channel capacity through the critical downstream Tuolumne River reach. About 260,000 acre-feet would be required to control the 1906 snowmelt flood, and about 308,000 acre-feet would be required to control the 1969 snowmelt flood if empty space does not exist in upstream reservoirs. It will be noted that in the 1906 and 1907 snowmelt flood routings, snowmelt runoff was preceded by rain floods requiring flood control space in March. It was further assumed that both 1906 and 1907 rain floods occurred under present-day conditions, and therefore, they were partially controlled by upstream reservoirs.

b. Routing of a hypothetical snowmelt flood obtained from snowmelt volume frequency data on chart 12, and patterned after the standard project snowmelt flood series indicates that use of 340,000 acre-feet of flood control space will control about 77 percent of the standard project snowmelt

flood to channel capacity below Don Pedro Lake, if such a flood is preceded by the March 1907 rain flood, the most severe of record obtained from the frequency curves on chart 12. A reservoir design snowmelt flood has been obtained by assigning ordinate values equal to 77% of the ordinates of the standard project snowmelt flood series with resulting volumes for the various durations as follows:

Duration (days)	Reservoir design snowmelt flood (acre-feet)
15	531,000
35	1,096,000
60	1,695,000
90	2,045,000
122	2,210,000

The routings of both the standard project snowmelt flood and the reservoir design snowmelt flood are shown on chart 17, and routings of the 1906, 1907 and 1969 snowmelt floods are shown on chart 18.

14. SNOWMELT FLOOD SPACE REQUIREMENTS

a. While space for snowmelt floods will be required only on a forecast basis, limits should be defined for the maximum anticipated snowmelt flood space requirement on any specified day of the year. The limiting space requirements have been based on the control of the reservoir design and recorded snowmelt floods. The maximum required space was determined by routing the reservoir design snowmelt flood using a full channel capacity release of 9,000 c.f.s. plus irrigation and aqueduct diversions.

b. The snowmelt space limits at the end of the snowmelt season were determined from back routings of the reservoir design, 1906 and 1969 snowmelt floods under the criteria referred to in paragraph 14a. The 1906 flood was the most critical on record insofar as late season snowmelt is concerned. Space requirements determined from those back routings are summarized on chart 14.

15. MULTIPLE USE OF RESERVOIR SPACE

The allocation of a portion of project costs to flood control at Don Pedro Lake is based on optimum use of reservoir space for all project purposes with space reserved for flood control use on a priority basis when needed, as defined in approved flood control regulations. Since the rainflood and the snowmelt flood potential vary seasonally, it is possible to obtain optimum usage of that portion of the reservoir space required for flood control during flood seasons by carefully defining seasonal limits and space

requirements for flood control, thus releasing the reservoir space for other uses outside the flood seasons. Furthermore, since snowmelt flood volumes can be forecast well in advance, additional space can be used for conservation purposes during the snowmelt season when forecasts indicate that a lesser amount of flood control space is required. Rain floods, however, cannot yet be adequately forecasted far enough in advance for operational purposes and rain flood space requirements cannot be decreased on the basis of a forecast.

16. FLOOD CONTROL DIAGRAM

a. The flood control diagram which provides a maximum flood control reservation of 340,000 acre-feet is shown on chart A-8.

b. Conditional use of space within the maximum snowmelt flood reservation is provided by the snowmelt parameters. These parameters were based on computed relationships between remaining runoff and required space, shown on chart 19, with a contingency allowance equal to twice the standard error of estimate, the derivation of which is explained below. With such allowance, the space provided should be adequate, on the average, an estimated 97 percent of the time.

c. The relationships of required space to remaining runoff at the beginning of each month (chart 19) were derived by back-routing snowmelt flows for each year when flood control space would have been needed. These back-routings were based on the assumption that operating contingencies will limit efficiency of operation to about 80%, and the resulting outflows are approximated by using an average assumed release of 7200 c.f.s. (80% of objective) plus the following irrigation, power and municipal demands.

Month	Irrigation and power (acre-feet)	Municipal (San Francisco) (acre-feet)
Feb	29,000	11,200
Mar	29,000	12,400
Apr	160,000	12,000
May	160,000	12,400
Jun	160,000	12,000
Jul	160,000	12,400

17. CREDIT FOR UPSTREAM STORAGE SPACE

a. After 1 May of each year, when the natural forecasted April-July snowmelt runoff of Tuolumne River at La Grange indicates a runoff volume of 1,450,000 acre-feet (or less) is anticipated, the required space, indicated by the snowmelt parameters (chart A-8), may be reduced when empty space is available in the upstream reservoirs. Such a reduction of flood control space requirements in Don Pedro Lake could be made only to the extent that such upstream space would be sure to be filled by the time that Don Pedro Lake fills.

b. Examination of runoff data in connection with empty space in upstream reservoirs usable for flood control indicates that credit for 80 percent of the space available for the storage of snowmelt floodwaters in reservoirs upstream of Don Pedro Lake can safely be allowed subject to conditions stated in paragraph 17a above. Because of variation of snowmelt flood potentials in the Tuolumne River Basin, and absence of close operational coordination between Don Pedro Lake and the upstream reservoirs, credit for available empty space in Cherry Valley and Hetch Hetchy Reservoirs will be subject to the following restrictions (see note 4 on chart A-8).

(1) Not more than 70 percent of the creditable portion of the requirement may be allowed for empty space in Hetch Hetchy Reservoir.

(2) Not more than 30 percent of the creditable portion of the requirement may be allowed for empty space in Cherry Valley Reservoir.

(3) No reduction of the rain flood reservation value will be permitted below 50,000 acre-feet.

Criteria established herein, for allowing credit for available empty space in Cherry Valley and Hetch Hetchy Reservoirs, are illustrated by the following examples: (After 1 June, these criteria could be further modified as per note 5 of Flood Control Diagram, chart A-8.)

Date	Forecast	Total required storage based on forecast	Total combined empty space in upstream reservoirs	Total credit for empty space in upstream reservoirs	Maximum credit for empty space in Hetch Hetchy Res	Maximum credit for empty space in Cherry Valley Res	Adjusted required empty space in Don Pedro Reservoir
			(ALL VALUES IN ACRE-FEET)				
1 May	1,800,000	610,000	250,000	200,000	140,000	60,000	340,000
5 May	1,600,000	505,000	200,000	160,000	112,000	48,000	340,000
10 May	1,400,000	405,000	160,000	128,000	89,600	38,400	277,000
15 May	1,200,000	310,000	130,000	104,000	72,800	31,200	206,000
30 May	1,000,000	300,000	100,000	80,000	56,000	24,000	220,000
15 Jun	600,000	120,000	30,000	24,000	16,800	72,000	96,000
1 Jul	300,000	35,000	20,000	16,000	11,200	4,800	35,000

18. MONTHLY SPACE REQUIREMENTS UNDER HISTORICAL CONDITIONS

Using the flood control diagram shown on chart A-8, the monthly storage space requirements based on forecasts from observed precipitation data (see paragraph 31) by use of chart 23 of Flood Control Reservoir Operation Report were determined for the period 1896 through 1958. For the period 1959 through 1970, the monthly storage space requirements are based on actual runoff forecasts made by the State of California. Computed values of the monthly space requirements are tabulated on chart 20.

CHAPTER V - PROJECT FEATURES

19. DESCRIPTION OF PROJECT

a. The Don Pedro Project, located on the Tuolumne River about 35 miles east of Modesto, includes the following major features: the dam and reservoir, gated and ungated spillway sections, outlet works, and power plant. The general layout of the project including the main units, power and diversion tunnels, access roads and other permanent features is shown on chart 1.

b. The Don Pedro Dam is located in Section 3, T3S, R14E, 1½ miles downstream from the old concrete-arch structure which since 1956, in cooperation with Cherry Valley and Hetch Hetchy Reservoirs, has provided a fair degree of flood protection to the downstream areas under step 2 of the flood control agreement. All gates have been removed from the old dam and interference with flow is now minor. The Don Pedro Dam is a combination rock and earthfill structure with maximum height of 585 feet above foundation and a length of 1,900 feet. The elevation of the top of the dam is 855 feet, providing a 5-foot freeboard above the spillway design flood pool at elevation 850 feet. Plan and section of the dam are shown on chart 21.

c. Don Pedro Lake gross pool capacity at 830.0 foot elevation is 2,030,000 acre-feet, of which 340,000 acre-feet are allocated during flood seasons for flood control storage. The minimum power pool of 309,000 acre-feet corresponds to elevation 600.0 feet. Maximum storage corresponding to the spillway design (probable maximum) flood is 2,301,000 acre-feet at elevation 850.0 feet. The water surface area at gross pool is 12,960 acres and the length of shoreline is approximately 159 miles. The maximum reservoir depth at gross pool elevation is about 550 feet. The area-capacity curves for Don Pedro Lake are shown on chart A-1, and an area-capacity table is given on chart A-2.

d. The spillway located on the abutment ridge west of the dam, as shown on chart 21, consists of two sections:

(1) A gated spillway with a 135-foot long concrete ogee section, crest at elevation 800 feet, controlled by three 45-foot long by 30-foot high radial type, hoist operated, steel gates, provides control for all normal operations of the reservoir.

(2) An ungated emergency spillway with a 995-foot long concrete ogee section, crest at elevation 830 feet, located adjacent and to the right of the controlled spillway, provides additional safety precaution for the passage of very large and infrequent flood flows.

(3) The total combined discharge capacity of the gated and emergency spillways is 472,500 c.f.s. at the maximum water surface elevation of 850 feet, with 5 feet of freeboard remaining. Plans and elevations of the spillways are shown on charts 22 and 23. Spillway discharge rating curves are given on chart A-5 (full gate opening), and on chart A-6 (partial gate opening).

e. A concrete-lined 3,500-foot long 30 feet diameter tunnel, located through the left abutment, initially constructed for diverting the river around the project during construction, is used as the outlet works for all normal reservoir release purposes. The inlet works are located near and to the left of the upstream portal of the diversion tunnel at elevation 343 feet and may be closed for inspection and maintenance by a 22-foot by 11-foot wheeled buckhead gate. Flow passes through a 12-foot diameter concrete-lined tunnel, enters the diversion tunnel through an elbow plug and continues on to a 60-foot long head reducing section before entering the outlet works. The outlet works is located in a concrete plug about 135 feet long, centered approximately on the axis of the dam. Three separate parallel outlets are provided, each controlled by two 4-foot by 5-foot high-pressure slide gates in tandem. The combined capacity of the three outlets at elevation 830 feet is 7,370 c.f.s. Plans and sections of the outlet works are shown on chart 24. Discharge rating curves for the outlet works are shown on chart A-3.

f. A 2,950-foot long power tunnel passes through the left abutment about 225 feet above present riverbed level. The intake and trashrack structure incorporates a remote controlled hydraulically operated bulkhead gate to allow unwatering of the tunnel for inspection and maintenance. From the intake the tunnel is 18'-6" in diameter and concrete-lined for about 1,615 feet including an 86-foot long transition section at the 321 foot high shaft for the 12-foot by 21-foot fixed wheel control gate. The next portion of the tunnel is 16'-6" in diameter and steel-lined for about 880 feet. The remaining 455 feet of the power conduit is 16'-0" steel-lined to the outlet portal at elevation 299 feet and is connected to the turbine branch lines by means of a steel reducing manifold encased in concrete. A hollow-jet flood control valve, located in the power house, is connected to the power conduit at the manifold and is used in conjunction with the outlet works for making reservoir releases. Plans and sections through the power tunnel works are shown on chart 25. Discharge rating curves for the flood control valve and turbines are shown on chart A-4. Chart A-7 shows stage-discharge curves for several pertinent stream gaging stations located downstream from Don Pedro Dam.

g. The power house is an outdoor type with three Francis type turbines, each rated at 70,000 HP at 450 feet net head, which drive three 47,900 KVA, 3-phase, 0.95 p.f., 60-cycle generators. The three main transformers are rated at 55,100 KVA, 13.8/69 KV, 3-phase, 60-cycle.

20. RECREATION FACILITIES

a. The Modesto and Turlock Irrigation Districts have agreed through a contract with the State of California under terms and conditions provided by the Davis-Grunsky Act to develop and maintain recreational facilities at Don Pedro Lake. The Districts have acquired multipurpose lands, needed for project operational purposes, to a distance of at least 100 feet back from the contour line defining elevation 830 feet. The total area of lands to be developed for recreation under the Davis-Grunsky grant, including multipurpose project lands to be used for recreation, is 558 acres, with 259 acres to be used exclusively for recreational purposes under the Davis-Grunsky program. In addition, lands below elevation 830 feet are seasonally available as the water level recedes. Several locations have been found suitable for recreational development. Of these locations, three, shown on chart 26, have been selected for development under the Davis-Grunsky program as follows:

(1) Fleming Meadows Recreation Area, on the south shore, will have 130 picnic units, 125 tent camping units, 87 recreation vehicle hookup units, a 7-lane boat launching ramp, a swimming lagoon, and two concession complexes.

(2) Right Abutment Recreation Area will provide 183 camping units and an observation area overlooking the dam and reservoir.

(3) Moccasin Point Recreation Area, at the upper end of the reservoir, will include 20 picnic units, 62 tent camping units, 13 recreation vehicle hookup units, and a 2-lane boat launching ramp.

Highway 49-120 and a new county road will provide good access to the three recreation areas plus a 500-acre location set aside for hunting.

b. Besides fishing, Don Pedro Lake is expected to be widely used for picnicking, boating, camping, swimming, and water skiing. The overall recreation plan calls for the development of permanent recreation facilities at all the selected sites listed above.

c. Don Pedro recreational facilities are expected to serve as many as 390,000 visitors during the first year of operation with progressive increase to 500,000 visitors by 1980. The reservoir area and the locations of the proposed recreational developments are shown on chart 26.

21. CONSTRUCTION HISTORY

a. Public access roads, and reservoir and site clearing began in August 1967. Excavation for the diversion tunnel began in September 1967, was completed in September 1968 and the tunnel was plugged in October 1970 after the outlet works were completed in July 1970. Excavation work for both the

controlled and emergency spillways started in September 1967 and the spillways were completed in November 1970. Foundation excavation for the main dam began in December 1967 and the embankment was completed in May 1970. Construction of the new power plant began in August 1968 and was completed in March 1971.

b. Dedication ceremonies were held on 29 May 1970 when the final load of fill officially completed the construction of the dam. All facilities required for the control of Tuolumne River flows were completed by October 1970 and the river outlets in the old dam were opened on 15 November 1970 to allow transfer of storage and control to the Don Pedro Dam and Lake. All remaining work was completed in May 1971 and the project was dedicated on June 11, 1971.

CHAPTER VI - GENERAL PROJECT OPERATION

22. RESPONSIBILITY FOR OPERATION

Don Pedro Lake is operated by Modesto and Turlock Irrigation Districts. Operation in the interest of flood control is in accordance with the rules and regulations prescribed by the Secretary of the Army pursuant to Section 7 of the Flood Control Act of 1944 (see Appendix A). The flood control diagram is shown on chart A-8, and the emergency spillway release diagram on chart A-9. Details concerning the responsibility for flood control operation are discussed in paragraph 7 of Appendix A.

23. UPSTREAM REGULATION

a. There are three reservoirs in the drainage basin above Don Pedro Lake. These are: Lake Eleanor (26,000 acre-feet), Hetch Hetchy (360,000 acre-feet), and Cherry Valley (Lake Lloyd 268,000 acre-feet). Although there is no longer any flood control space allocated in these reservoirs, their normal operation effectively controls small and moderate floods and has considerable influence in reducing large rain and snowmelt floods. Area and capacity curves for Hetch Hetchy and Cherry Valley (Lake Lloyd) reservoirs are shown on charts 27 an 28 respectively. A capacity curve for Lake Eleanor is shown on chart 29.

b. Although Tuolumne River runoff upstream from Don Pedro Lake is also under constant regulation by diversions leading to several power plants, the only diversion away from Tuolumne River Basin is the flow diverted into the Hetch Hetchy Aqueduct which leads to San Francisco. The capacity of this aqueduct is about 620 c.f.s. in the mountains and about 250 c.f.s. through the valley floor to San Francisco. The valley floor portion will be increased to the full 620 c.f.s. capacity when this greater supply is required.

24. DOWNSTREAM REGULATION

Water for irrigation is diverted at La Grange Dam, a masonry gravity diversion structure located about 2½ miles downstream from the Don Pedro Dam. Modesto Canal diverts into Dallas-Warner Reservoir (27,000 acre-feet) and thence into the Modesto Irrigation District canals. Turlock Canal diverts into Turlock Lake (49,000 acre-feet) and thence into the Turlock Irrigation District canals. The combined capacity of the Turlock and Modesto Canals is about 4,000 c.f.s. Since diversions for irrigations are upstream from the areas subject to flood damage, such diversions have considerable effect in reducing prolonged snowmelt floodflows. However, winter diversions are small and have practically no effect on large rain floods.

25. DOWNSTREAM CHANNEL CAPACITIES

a. Tuolumne River from Don Pedro Dam to San Joaquin River has a length of about 50 miles. The channel reach above the town of Waterford has a large capacity, and little damage results from floodflows. Below Waterford,

low intermittent levees along the stream give partial protection against flood overflow, but some agricultural damage occurs in low-lying unprotected areas when flows exceed 9,000 c.f.s., and significant damage begins when flows exceed 12,000 c.f.s. In the vininity of Modesto, flows in the order of 35,000 c.f.s. will endanger the Modesto sewage disposal plant and may damage homes in a few areas.

b. On the average, uncontrolled flows originating below Don Pedro Lake will exceed 9,000 c.f.s. once in 25 years and will exceed 12,000 c.f.s. once in 60 years (77% SPF). Local floods of this magnitude are of short duration and the accompanying damages are minor.

26. FLOOD DAMAGES

a. Flood damages along Tuolumne River below Don Pedro Lake are caused by both rain and snowmelt floods. Rain floods, characterized by high peaks, small volumes, and short durations are damaging to both urban and agricultural areas, while snowmelt floods, characterized by low peaks, large volumes, and long durations are damaging to low-lying agricultural areas only. Damages caused by recent floods along Tuolumne River, based on prices and conditions at the time of the flood, are as follows:

Floods		Damages ($)
November-December	1950	630,000
December	1955	550,000
March-April	1958	50,000
January	1969	1,440,000

In each flood, at least 50 percent of the total damages along Tuolumne River was to agricultural land and crops, and the remainder was to utilities, roads, bridges, canals, and to some commercial and residential establishments located in the suburban area of Modesto.

b. With 340,000 acre-feet of flood control space available in Don Pedro Lake there will be a higher degree of flood protection to the agricultural lands and to the suburban areas of Modesto than has existed before completion of the Don Pedro Dam. However, some damage may result from Tuolumne River rain floods and snowmelt floods under present conditions on the average once each 60 years as determined from charts 39 and 42, respectively. Charts 30 and 31 show the flow-damage curves for areas below Don Pedro Lake for rain floods and snowmelt floods, respectively.

27. CONSERVATION OPERATION

Operation for conservation will be as follows:

a. All inflows in excess of irrigation, municipal, and power demands will be stored to the extent that conservation space is available.

b. Releases will be in accordance with daily requirements as determined by the Modesto and Turlock Irrigation Districts.

c. Irrigation releases will be seasonally adjusted to greater or lesser amounts in accordance with forecasts of expected runoff and water in storage at the beginning of the irrigation season.

d. Releases to benefit downstream fishery will be in accordance with schedules worked out with the State Department of Fish and Game and the US Fish and Wildlife Service. Annually, these releases will vary from 123,210 acre-feet to 64,040 acre-feet depending on whether the amount of runoff in the prior water year into Don Pedro Lake exceeds or is less than 1,000,000 acre-feet.

28. POWER RELEASES

Power generation equipment at the Don Pedro Powerplant consists of three units, rated at 47,900 KVA at 0.95 p.f. This generated capacity is serving the electrical distribution system of the Modesto and Turlock Irrigation Districts. Releases of water for power generation is subordinated to releases required for irrigation and will be coordinated with the release requirements for flood control and fish life. Project releases will normally be restricted to a maximum discharge of 4,000 c.f.s. which is the contemplated combined capacity of the Districts' canal system.

29. RELATION TO OTHER PROJECTS

The flood control operation of Don Pedro Lake will be independent of the operation of all other Tuolumne River reservoirs except for credit allowed for incidental empty space in upstream reservoirs.

CHAPTER VII - OPERATIONAL CONTROLS

30. HYDROLOGIC FACILITIES

Hydrologic facilities available for operation of the project consist of the following:

a. Recording pool gages at Don Pedro Lake, Lake Eleanor, Hetch Hetchy, and Dallas-Warner reservoirs.

b. Non-recording pool gages (staff gages) at Lake Lloyd and Turlock Lake.

c. Eighteen recording stream gaging stations, of which twelve are above and six below Don Pedro Lake.

d. Twenty-eight precipitation stations in or adjacent to the basin. Of these stations, five are recording, fourteen are non-recording, and nine are seasonal storage gages.

e. Eight snow courses.

f. One aerial snow depth marker.

g. Fifteen snow courses with aerial snow depth markers.

The locations of the above facilities are shown on charts 2 and 4.

31. FORECASTS OF INFLOW

a. Of primary concern in the operation of Don Pedro Dam and Lake are forecasts of the volume of snowmelt inflow that occurs each year during the months of April through July. Under step 2 operation (1949-1970), forecasts of natural runoff for Tuolumne River at La Grange were made on the basis of precipitation data and by the use of forecasting criteria specifically designed and prepared for Tuolumne River Basin by US Army, Corps of Engineers (see chart 23 of Flood Control Reservoir Operation Report). While the selection of forecast procedure is a part of the operation responsibility of the operating agency, subject to approval of the Corps of Engineers, the generally accepted forecasts of snowmelt season runoff for Sierra Nevada streams are those prepared and published by the State of California, Department of Water Resources. These forecasts have been determined to be reliable and are used in operating all major San Joaquin River Basin reservoirs; therefore use of the official published State of California forecast for operation of Don Pedro Lake is recommended. The Department prepares and publishes forecasts of April through July runoff for the Tuolumne River, inflow to Don Pedro Lake, as of 1 February, 1 March, 1 April, and 1 May of each year. Forecasts are available in the reports titled Bulletin No. 120, "Water Conditions in California," which

are published on the 10th of each month of February, March, April, and May each year. Prior to 1953, snow survey data for 1 February and 1 March were collected and published by the State of California, but no forecasts of Tuolumne River inflow to Don Pedro were made on these dates. Beginning in February 1953, the State has been making and publishing preliminary forecasts of snowmelt runoff for 1 February and 1 March. Snow survey data for 1 April and 1 May have been collected and published by the State since 1932, and forecasts of snowmelt runoff have been made and published for these dates by the State since 1936 and in earlier years. Chart 32 shows the actual April through July runoff, the forecasts of runoff made by the State, and the errors in these forecasts.

b. The forecasting procedure currently in use by the State of California, Department of Water Resources for Tuolumne River inflow to Don Pedro, is illustrated, using 1967 data, on chart 33. Figure 1 is the diagram used to solve the forecast equation. The dashed line graphically illustrates the determination of the 1 April forecast of unimpaired April - July 1967 snowmelt runoff to Don Pedro Lake (1,500,000 acre-feet). Figures 2 and 3 are the forms used to compute indexes (1967 indexes shown) required in the forecast equation. Forecasts are based upon conditions as of the date of forecast, with median precipitation and snowpack increments assumed after the date of forecast.

c. The forecast range diagram shown on figure 3 (chart 33) is used to determine the probable range of forecast departure for any forecast date during the season. For example, for the forecast of 1,500,000 April - July runoff to Don Pedro Lake made on 1 April 1967, the Forecast Range Diagram indicates a 10 percent probability that the actual runoff will exceed 1,500,000 + 260,000, (with abnormal accretions) or 1,760,000 acre-feet, and a 90 percent probability that the runoff will exceed (or a 10 percent probability that the runoff will be less than) 1,500,000 - 140,000 (with subnormal accretions) or 1,360,000 acre-feet. The actual forecast and departure is summarized in tabular form in the lower left hand corner of figure 3, chart 33.

d. Forecasts made by the State may be modified for operating purposes as the snowmelt season progresses when such modification is indicated by information developed after the forecast was issued, and is approved by the District Engineer, Corps of Engineers. Modification of the published forecast for operating purposes may be based on new data developed by aerial reconnaissance flights, new storm conditions, or significantly different end-of season forecasts based on current rate of runoff and normal rate of runoff recession.

e. Because rain floods which normally occur during the November-March season are far more severe and more damaging than snowmelt floods over Tuolumne River Basin, it will also be necessary to make or procure frequent forecasts of rain flood inflow to Don Pedro Lake and of local inflow downstream from the reservoir.

f. Procedures for forecasting the approximate rain flood inflow hydrograph to Don Pedro Lake have been developed by the State Federal Forecasting Center as shown by the rain flood forecasting criteria on chart 34. Forecast prepared using these procedures, subject to modicication for known hydrologic deviations at the time, are considered acceptable for the flood control operation of Don Pedro Lake. Figure "b" of the criteria gives the rainfall-runoff relationship as computed by the State-Federal Forecasting Center for the area above Don Pedro Dam, and shows the total potential runoff resulting from total basin-mean-precipitation for any desired period. Figure "a" of the criteria shown on chart 34, adjusts the total potential runoff to immediate runoff caused by the rainfall during a specified period of precipitation. Thus adjustment is based mainly on the freezing level of the total contributing area above Don Pedro Dam (1,533 square miles). The approximate freezing level is usually reported during storm periods by the National Weather Service (NOAA). An average freezing level should be used whenever this level changes rapidly during a storm period.

g. The antecedent index (AI) used in the rain flood forecasts shown on chart 34 is an index of the loss potential of the basin, or an index of the relationship between rainfall and surface runoff for a selected storm period. The mumerical value of this AI indicates the number of inches of rain that would be required to produce one inch of surface runoff. Antecedent indexes and freezing levels may be obtained from the State-Federal River Forecast Center. The estimated basin-mean adjusted runoff given on chart 34, along with the prestorm AI and the base flow, could be applied to the unit hydrograph ordinates and the basin AI-loss-rain relationship to determine an inflow hydrograph to Don Pedro Lake. Also, when desired, an approximate runoff volume for any specified duration can be directly computed by application of chart 34. However, in computing inflows into Don Pedro Lake allowance would be made for various degrees of regulation by empty space in the upstream reservoirs.

h. No flood forecasting procedures are available for Dry Creek drainage areas, and none are needed for snowmelt forecasting purposes from this low-lying area. During the rainflood season, when necessary peak flows and runoff volumes could be obtained from the State-Federal River Forest Center or of unit hydrograph techniques and precipitation data.

32. COORDINATION WITH OTHER AGENCIES

In order to insure that the flood control operation of Don Pedro Lake will be as effective and reasonable as possible, in controlling floods along Tuolumne River as well as along San Joaquin River below the mouth of the Tuolumne River, it is essential that the operating districts keep advised at all times of possible flood hazards, weather conditions, inflow into the reservoir, and flows in the Tuolumne River below Don Pedro Dam and in San Joaquin River. This requires close liaison with other agencies, including the National Weather Service (NOAA), the State of California Department of Water Resources, the Bureau of Reclamation, and the Corps of Engineers.

CHAPTER VIII - PROJECT ACCOMPLISHMENTS

33. EXAMPLES OF OPERATION

Routings of four large historical rain floods through Don Pedro Lake are shown on chart 16. At the beginning of each routing, it was assumed that there was 340,000 acre-feet of empty space in Don Pedro Lake and that inflows into the reservoir were impaired by incidental regulation by upstream reservoirs. Routings of three large historical snowmelt floods (1906, 1907, and 1969) are shown on chart 18. It was assumed that at the beginning of each snowmelt flood routing, all upstream reservoirs were full and that there was 340,000 acre-feet of empty space in Don Pedro Lake. A hypothetical operation of Don Pedro Lake during the probable maximum flood (spillway design flood) is shown on chart 35. It was assumed that at the beginning of this routing all upstream reservoirs were full and there was 170,000 acre-feet of empty space in Don Pedro Lake. A maximum pool elevation of 850.0 feet (2,303,000 acre-feet) and a peak outflow of 470,000 c.f.s. were attained. Stage-duration curves are presented on chart 36, a stage frequency curve on chart 37, and a seasonal variation of reservoir storage frequency on chart 38. Peak rain-flood frequency curves under natural, preproject and project conditions for Tuolumne River below La Grange Dam are shown on chart 39. Similar frequency curves for Tuolumne River at Modesto, derived indirectly by use of the flow-relationship curve shown on chart 41, are shown on chart 40. Daily peak snowmelt-flood frequency curves for Tuolumne River below La Grange Dam, under natural, preproject and project conditions are shown on chart 42.

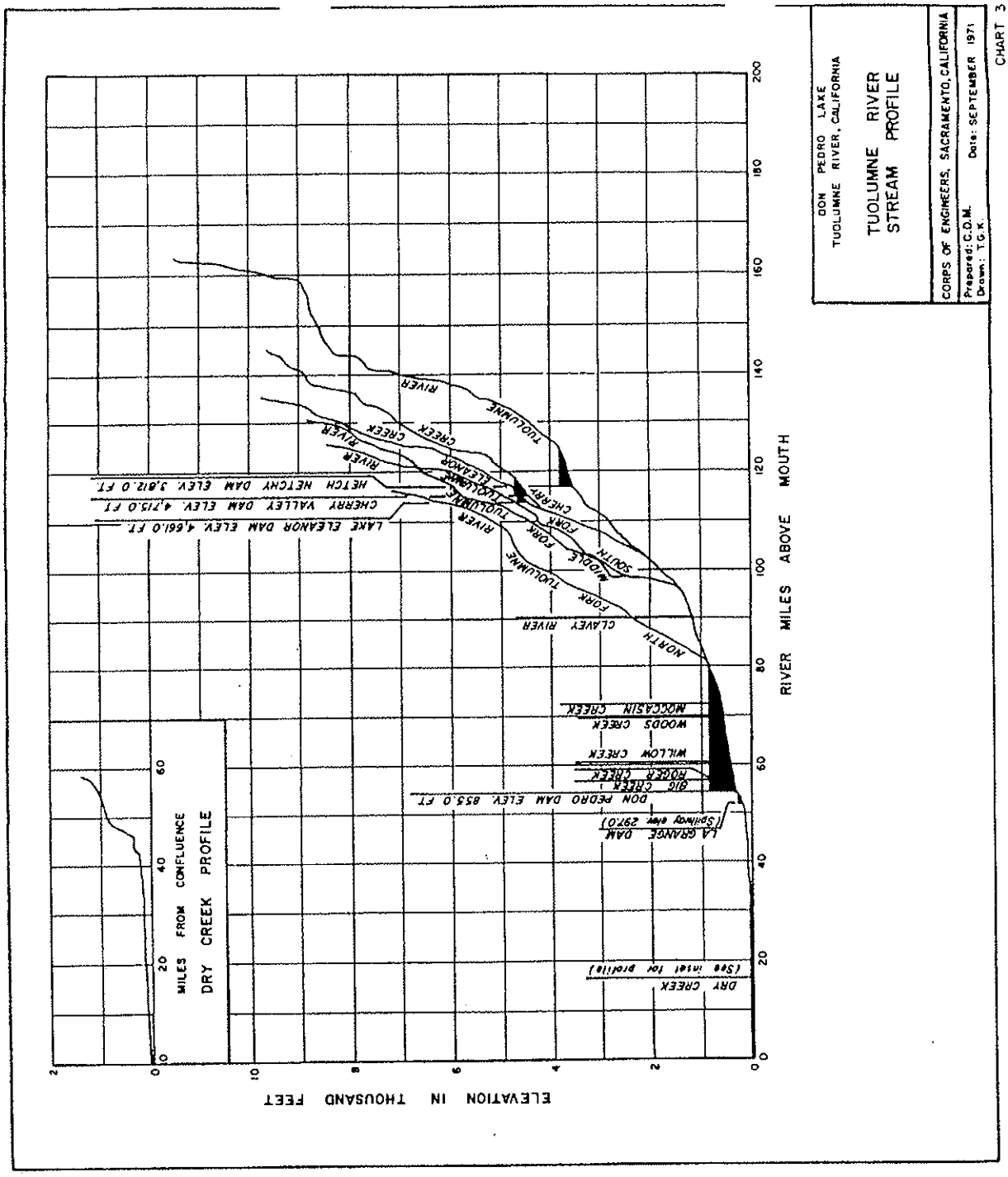
34. OPERATION RECORD

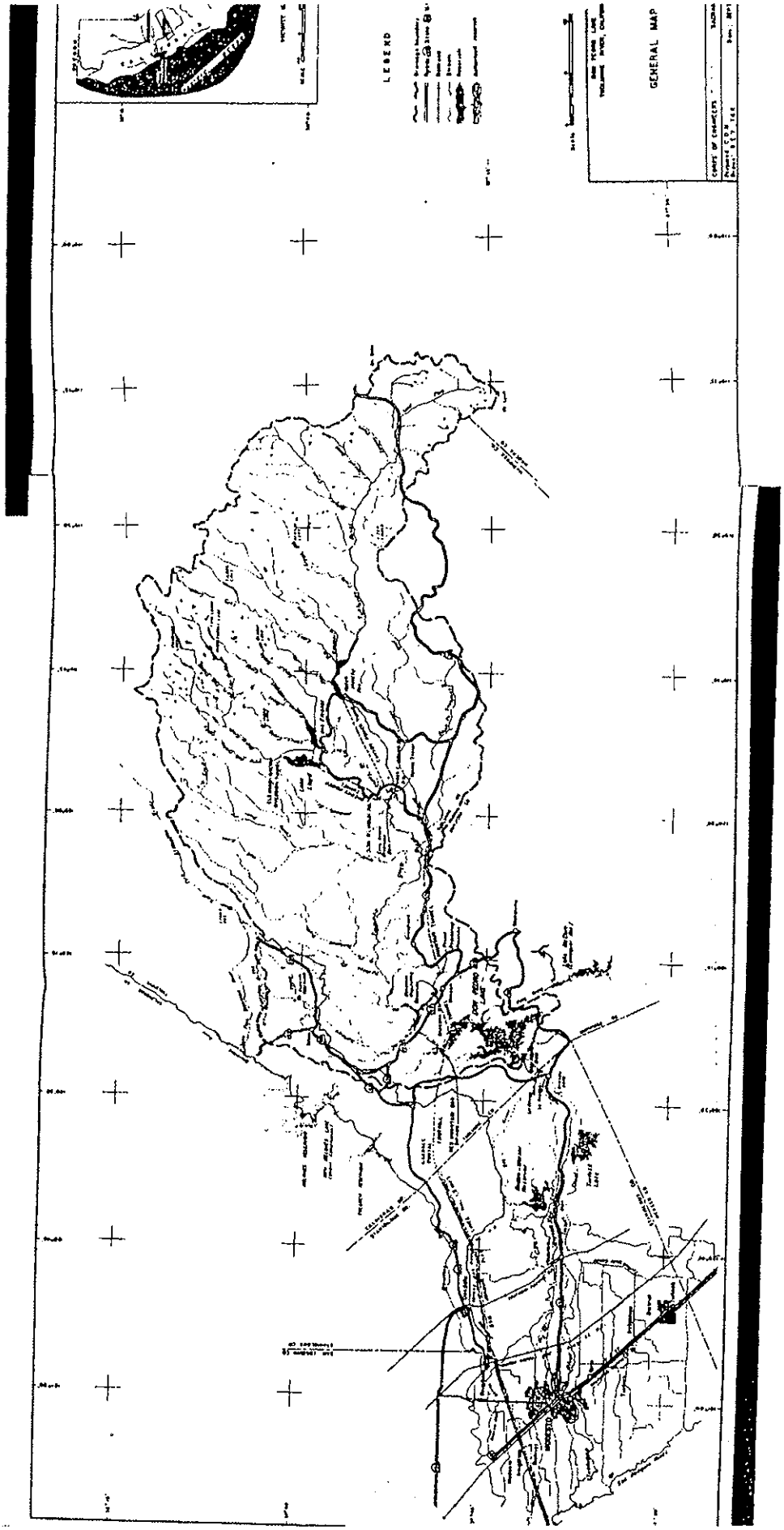
A record of storage at Don Pedro Lake and flows in Tuolumne River above La Grange Dam (corresponding to outflow from Don Pedro) is published in the Surface Water Records of the US Geological Supply. The historical record of operation for Don Pedro Lake, Hetch Hetchy, and Cherry Valley (Lake Lloyd) Reservoirs under step 2 flood control regulations (water years 1950-1970) is shown in graphical form on chart 43. The operation of Don Pedro Lake under step 3 flood control regulations began on 1 October 1970, and is shown on chart 44. A record of flood control requirements, and of storage and flow pertinent to the flood control operation is contained in the monthly reports submitted to the Chief of Engineers by the District Engineer, Corps of Engineers, Sacramento, California. A copy of this monthly report form is shown on chart 45.

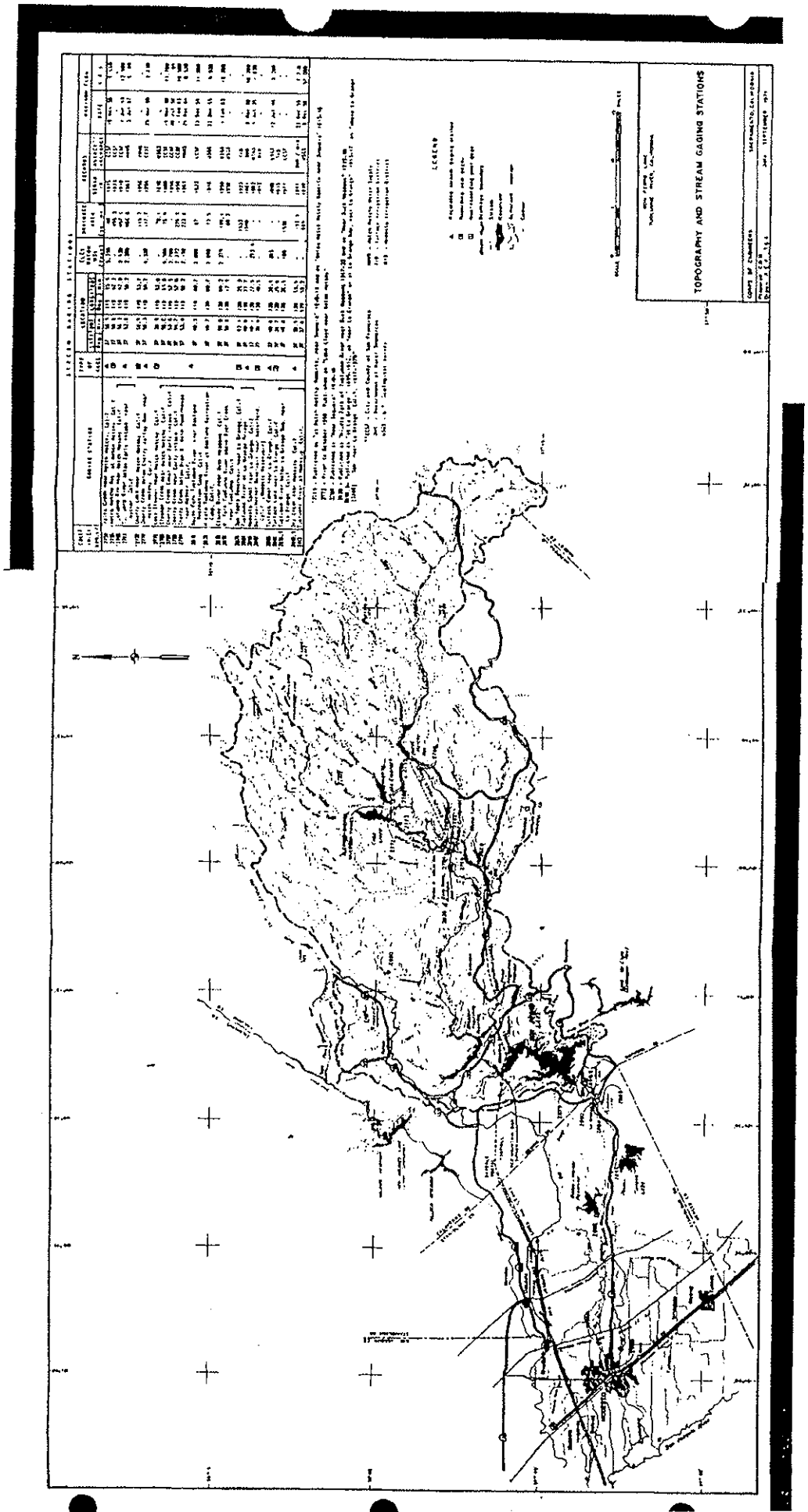
CHAPTER IX - STUDIES IN PROGRESS OR PLANNED

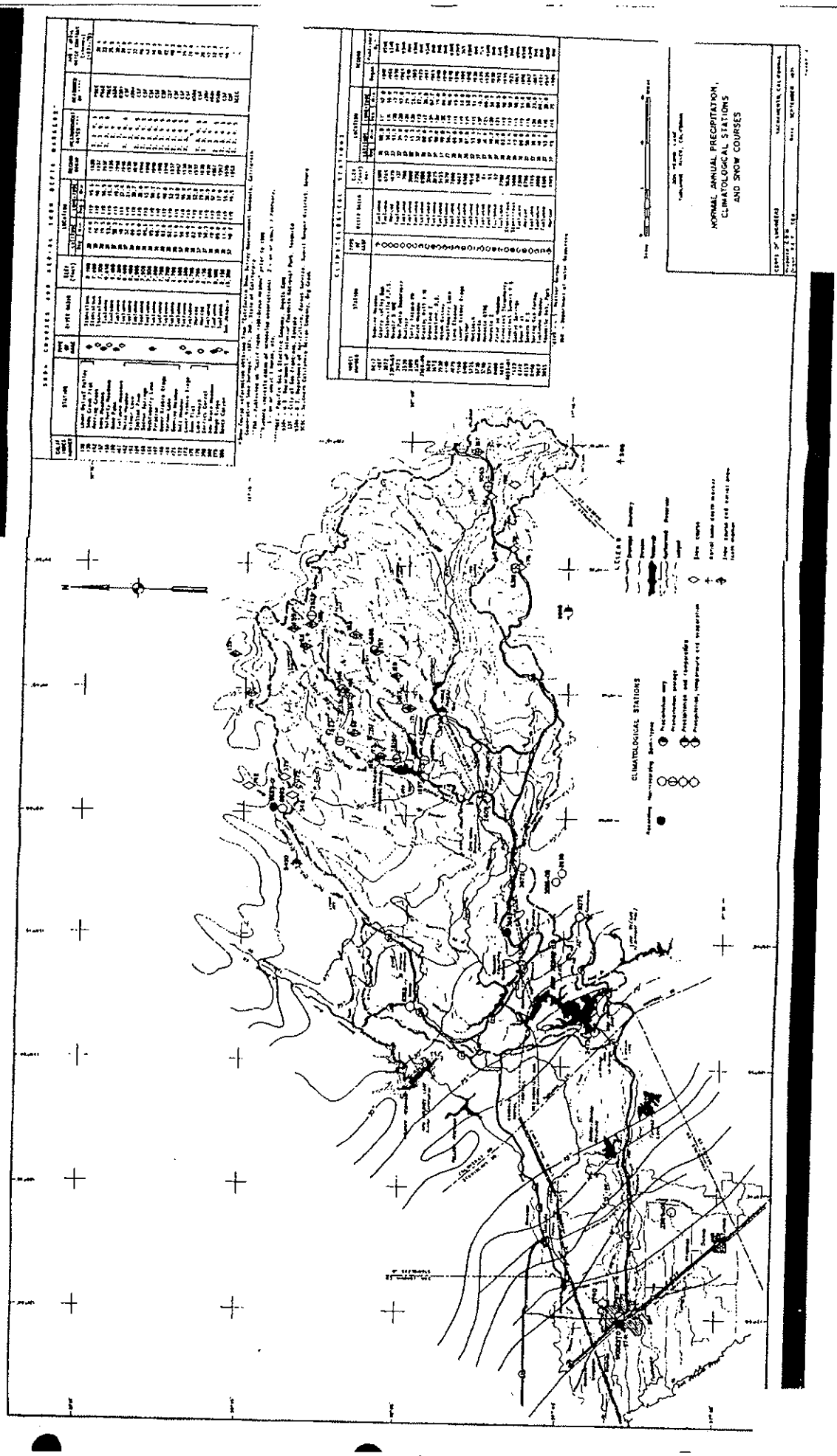
35. CURRENT STUDIES

No studies are currently in progress or planned for the immediate future in the Tuolumne River Basin. However, it is anticipated that the "Master Manual of Reservoir Regulation, San Joaquin River Basin, California" dated 5 September 1953 will be revised and up-dated in the near future. A practicable plan for coordinating flood control operation of all facilities in the San Joaquin River Basin, including storage structures on the tributary streams, bypass and diversion facilities, coordinated reporting and dissemination of hydrologic and operating data, and necessary interagency operating agreements is under study and will be discussed in the Master Manual.


DON PEDRO LAKE
TUOLUMNE RIVER, CALIFORNIA
TUOLUMNE RIVER
STREAM PROFILE
CORPS OF ENGINEERS, SACRAMENTO, CALIFORNIA
Prepared: C.D.M.
Drawn: T.G.K.
Date: SEPTEMBER 1971
CHART 3
RIVER MILES ABOVE MOUTH
ELEVATION IN THOUSAND FEET
DRY CREEK
(See inset for profile)
LA GRANGE DAM
(Spillway elev. 297.0)
DON PEDRO DAM ELEV. 853.0 FT.
BIG CREEK
ROCKY CREEK
WILLOW CREEK
WOODS CREEK
MOCCASIN CREEK
CLAVEY RIVER
NORTH FORK TUOLUMNE RIVER
SOUTH FORK TUOLUMNE RIVER
CHERRY CREEK
TUOLUMNE RIVER
LAKE ELEANOR DAM ELEV. 4,661.0 FT.
CHERRY VALLEY DAM ELEV. 4,713.0 FT.
HETCH HETCHY DAM ELEV. 3,812.0 FT.
MILES FROM CONFLUENCE
DRY CREEK PROFILE


LEGEND
GENERAL MAP


TOPOGRAPHY AND STREAM GAGING STATIONS


NORMAL ANNUAL PRECIPITATION,
CLIMATOLOGICAL STATIONS
AND SNOW COURSES

COMPUTED NATURAL FLOW, TUOLUMNE RIVER NEAR LA GRANGE
DON PEDRO LAKE
TUOLUMNE RIVER, CALIFORNIA

Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
						Runoff in thousands of acre-feet							
1895-96	6.5	7.3	17.4	174.0	67.9	187.6	209.6	340.2	652.1	212.5	31.5	26.9	1,913.5
1896-97	9.3	73.8	68.2	71.3	273.9	224.1	455.7	771.4	117.9	120.9	16.4	8.9	2,413.7
1897-98	14.9	45.1	64.6	30.7	49.0	71.9	221.9	362.8	118.3	19.4	11.7	6.5	916.8
1898-99	11.1	6.9	15.9	12.7	43.3	242.3	321.4	294.5	378.7	85.2	12.9	5.4	1,432.3
1899-1900	12.6	154.1	177.2	154.4	58.2	156.3	157.8	445.2	332.4	51.2	7.3	4.8	1,751.5
1900-01	76.7	159.0	85.5	222.9	435.7	245.3	256.9	532.0	590.2	251.9	52.0	11.9	2,922.0
1901-02	13.7	35.9	96.7	32.5	83.8	138.8	291.7	397.5	401.3	84.0	27.0	6.1	1,589.0
1902-03	7.9	41.0	50.8	123.3	93.8	195.4	342.0	479.0	432.9	83.4	16.5	7.0	1,879.0
1903-04	5.4	59.1	26.6	26.1	217.4	134.1	350.6	654.9	516.9	164.1	46.6	37.6	2,439.5
1904-05	196.6	45.3	28.5	45.2	103.7	200.6	226.7	344.7	337.3	81.3	14.9	6.4	1,630.6
1905-06	4.9	6.0	6.3	179.6	120.6	453.5	400.4	697.1	551.9	731.0	153.3	27.9	3,614.7
1906-07	12.4	16.1	92.2	148.3	237.9	696.6	579.0	641.7	661.3	498.0	132.8	30.6	3,746.9
1907-08	12.9	18.6	38.6	59.3	47.6	112.2	207.0	251.1	181.6	62.6	23.9	5.4	1,027.4
1908-09	13.0	12.8	21.5	405.5	275.4	179.1	340.1	519.5	645.3	211.9	31.8	10.9	2,667.9
1909-10	13.8	154.0	237.0	197.0	108.0	241.0	419.0	465.0	207.0	51.4	16.9	16.0	2,121.6
1910-11	16.0	20.4	39.8	373.0	220.0	449.0	438.0	616.0	821.0	451.0	64.0	15.6	3,424.4
1911-12	15.4	14.3	13.9	27.7	27.7	60.8	101.0	333.0	281.2	67.0	12.4	7.1	1,061.2
1912-13	6.1	26.5	12.5	22.0	28.4	53.3	173.0	192.0	242.0	71.9	32.0	20.3	1,060.5
1913-14	6.8	13.5	15.3	416.0	199.0	235.0	313.0	508.0	541.0	259.0	52.4	11.6	2,626.6
1914-15	13.5	16.1	15.4	56.1	200.0	180.0	303.0	472.0	578.0	208.0	21.6	8.9	2,074.0
1915-16	9.2	8.9	11.1	321.0	183.0	367.0	403.0	459.0	409.0	181.0	33.6	13.9	2,359.7
1916-17	71.3	35.9	66.4	53.9	224.0	141.0	281.0	437.0	678.0	199.0	26.6	8.9	2,223.0
1917-18	4.5	5.9	11.1	12.2	54.5	366.8	280.2	347.3	415.0	42.1	8.0	13.3	1,461.5
1918-19	52.2	34.2	32.7	20.4	78.0	117.9	268.6	563.0	143.9	25.0	7.1	4.0	1,347.2
1919-20	5.9	4.2	24.7	24.8	29.0	161.8	231.0	478.6	315.0	48.3	12.4	6.2	1,342.1
1920-21	41.1	53.3	69.5	196.2	155.9	231.8	254.4	442.2	458.3	95.2	13.5	6.6	2,018.0
1921-22	6.2	5.9	57.1	71.7	189.5	181.3	260.3	717.5	751.9	194.0	27.2	10.4	2,473.8
1922-23	10.6	31.6	123.9	113.6	79.5	113.1	265.7	521.3	349.1	157.8	27.3	22.3	1,785.8
1923-24	28.5	13.6	13.8	25.3	41.6	37.9	138.9	209.4	16.8	16.8	0	0	542.6
1924-25	14.7	47.9	97.0	44.5	227.1	165.6	350.3	538.4	752.4	111.9	22.6	5.9	1,932.1
1925-26	15.1	16.2	30.8	19.0	100.0	127.4	382.3	303.8	69.2	18.9	3.3	1.4	1,110.0
1926-27	5.2	74.1	60.0	63.2	223.1	159.7	351.5	454.1	476.2	146.3	24.6	13.1	2,051.1
1927-28	15.3	87.0	44.1	51.3	82.2	343.4	263.3	447.5	152.7	27.6	7.3	2.0	1,525.1
1928-29	0	5.8	18.1	19.1	38.2	101.6	148.1	378.1	224.7	40.7	4.6	1	979.0
1929-30	2.0	0	24.7	39.0	70.1	146.6	245.9	274.8	286.2	48.8	10.0	0	1,148.1
1930-31	8.9	20.4	10.3	26.1	44.5	66.3	154.0	209.3	49.0	10.2	9.0	1.8	609.8
1931-32	1.7	6.0	93.7	79.4	240.2	171.6	245.0	524.2	532.7	175.8	32.0	12.0	2,114.3
1932-33	5.7	3.2	10.9	26.9	31.5	82.6	170.9	250.8	426.1	75.1	16.1	4.5	1,104.3
1933-34	0	8.0	40.8	64.9	90.0	150.2	186.4	149.0	95.1	12.1	6.1	4.8	807.2
1934-35	11.2	47.6	52.0	105.9	107.3	136.9	465.5	530.7	521.5	109.5	20.7	4.1	2,103.0
1935-36	11.6	19.0	18.2	104.8	352.0	207.5	392.9	520.2	390.2	120.4	17.0	2.9	2,160.1
1936-37	4.3	8.6	27.3	31.4	273.9	209.5	295.6	633.9	399.4	91.4	16.9	4.8	1,997.0
1937-38	9.2	18.8	312.6	102.9	322.7	424.8	422.4	720.2	711.6	305.2	55.5	19.5	3,424.4
1938-39	43.3	46.4	37.3	42.6	59.9	144.1	261.9	216.0	74.3	17.3	7.5	10.3	987.9
1939-40	44.9	16.6	20.2	226.5	250.6	344.1	324.9	571.1	341.6	54.2	10.8	2.4	2,206.9
1940-41	11.3	15.6	129.1	115.4	219.0	260.1	279.6	662.7	534.4	224.1	30.5	8.2	2,489.4
1941-42	7.0	37.6	161.5	164.6	142.4	148.7	337.0	472.0	597.6	253.4	30.2	3.3	2,355.5
1942-43	5.1	86.4	92.6	246.3	163.8	371.9	385.2	494.5	352.5	140.9	24.8	5.2	2,369.4
1943-44	11.6	15.6	20.9	42.7	80.4	135.2	164.6	455.8	267.2	37.6	11.2	2.4	1,295.2
1944-45	9.1	89.0	81.3	55.6	304.8	164.4	284.3	455.1	462.3	163.1	16.8	0	2,085.8
1945-46	60.1	98.3	207.7	118.9	69.9	155.8	347.3	488.5	242.7	52.5	7.9	3.4	1,873.7
1946-47	16.1	64.0	76.7	41.9	80.2	146.1	192.2	352.5	110.7	20.9	0	2.9	1,004.2
1947-48	38.2	28.1	17.2	39.7	25.9	73.0	220.7	436.2	433.8	87.7	5.2	2.5	1,408.2
1948-49	5.2	8.2	17.8	19.9	39.1	121.2	318.2	436.4	240.4	29.5	4.5	3.7	1,246.1
1949-50	3.9	14.2	13.4	77.5	124.3	126.3	329.1	467.4	319.4	62.2	6.5	0	1,546.2
1950-51	24.4	521.0	509.0	159.2	138.9	168.7	253.3	372.9	256.7	60.1	9.6	2.0	2,476.9
1951-52	9.0	30.8	121.4	218.7	147.8	219.8	466.4	791.3	594.2	291.9	54.1	16.9	2,982.3
1952-53	8.7	11.9	53.1	145.1	63.5	106.6	269.6	259.5	414.4	166.7	12.7	4.2	1,516.0
1953-54	6.0	16.5	25.7	43.5	101.0	213.7	344.8	450.2	185.3	37.7	2.1	1.9	1,428.4
1954-55	5.0	16.3	49.2	67.0	61.5	81.5	144.4	366.9	295.4	38.3	0	1.3	1,126.8
1955-56	5.7	11.1	671.4	435.8	168.7	197.8	301.0	592.5	618.2	247.8	29.4	9.5	3,288.9
1956-57	19.7	24.0	22.8	36.5	125.3	153.7	175.9	378.4	410.4	64.3	5.9	3.6	1,420.5
1957-58	14.9	20.8	43.9	63.2	180.5	251.6	403.4	718.3	555.7	230.1	57.6	21.6	2,561.6
1958-59	15.2	6.2	8.8	69.8	108.1	120.5	216.7	233.5	137.0	12.2	0	41.8	969.8
1959-60	11.3	6.6	8.5	23.5	120.7	148.4	238.1	293.3	156.8	6.3	0	0	1,013.3
1960-61	1.3	11.6	30.8	14.6	46.1	69.5	160.4	214.8	115.6	9.2	3.3	1.6	678.8
1961-62	3.9	9.5	25.3	25.3	235.0	139.2	389.9	356.5	446.0	112.4	8.8	0	1,750.8
1962-63	13.5	9.2	24.6	66.6	336.0	113.2	247.9	534.0	464.4	171.4	26.8	14.2	2,021.8
1963-64	16.8	105.4	50.8	60.4	53.7	71.1	167.1	318.8	222.4	34.6	6.3	1.7	1,109.1
1964-65	6.6	54.2	495.3	310.6	142.5	141.6	120.7	437.1	474.0	227.3	95.8	19.9	2,715.6
1965-66	2.3	128.4	86.1	81.9	77.2	143.6	295.2	353.2	82.9	18.0	7.0	8.7	1,284.5
1966-67	8.3	59.4	218.5	114.5	118.4	308.2	290.2	647.3	733.2	490.0	72.2	17.9	3,098.1
1967-68	9.1	12.3	30.9	44.6	132.8	121.5	184.1	287.1	143.6	18.3	8.6	4.2	996.5
1968-69	13.2	78.1	80.8	558.5	266.7	269.3	443.6	389.7	721.4	313.9	55.3	1.9	3,651.7
1969-70	42.6	41.7	103.2	388.6	135.7	185.3	160.6	395.1	341.0	90.7	13.9	16.3	1,914.7
Mean	17.7	42.4	78.4	112.6	139.3	188.5	286.4	451.6	384.2	131.1	23.7	9.1	1,865.6

CHART 5

MEAN MONTHLY NATURAL FLOWS FOR PERIOD OF RECORD THROUGH 1969

TUOLUMNE RIVER BASIN

Station	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
						Acre-feet							
Tuolumne River near Hetch Hetchy	5,900	11,900	20,000	18,500	23,000	37,000	90,400	216,300	222,200	77,800	13,300	4,400	740,700
Cherry Creek below Cherry Valley Dam, near Hetch Hetchy	3,400	7,900	13,100	10,600	14,400	21,400	45,600	82,600	68,300	18,700	1,900	1,200	289,100
Eleanor Creek near Hetch Hetchy	1,200	4,400	7,700	7,500	9,100	14,800	26,900	39,800	25,600	6,500	800	500	144,800
Middle Tuolumne River at Oakland Recreation Camp	300	900	2,300	2,400	3,700	4,800	9,500	18,300	10,600	1,900	400	200	55,300
South Fork Tuolumne River near Oakland Recreation Camp	700	1,800	4,100	5,100	7,000	9,500	13,700	16,000	7,600	1,900	800	600	68,800
Tuolumne River at LA Grange	17,400	42,400	78,000	108,900	139,300	188,600	288,500	452,600	384,800	131,700	23,800	9,000	1,865,000
*Dry Creek near Modesto	3,300	2,100	6,100	10,100	8,200	6,800	7,100	5,100	4,500	3,400	3,400	3,700	63,800
*Tuolumne River at Tuolumne City	50,400	68,800	102,100	114,700	128,500	137,600	134,100	151,300	153,600	50,400	25,200	29,800	1,146,500
						Percent of Annual Runoff							
Tuolumne River near Hetch Hetchy	0.8	1.6	2.7	2.5	3.1	5.0	12.2	29.2	30.0	10.5	1.8	0.6	100.0
Cherry Creek below Cherry Valley Dam, near Hetch Hetchy	1.2	2.7	4.5	3.7	5.0	7.4	15.8	28.5	23.6	6.5	0.7	0.4	100.0
Eleanor Creek near Hetch Hetchy	0.8	3.1	5.3	5.2	6.3	10.2	18.6	27.5	17.7	4.5	0.5	0.3	100.0
Middle Tuolumne River at Oakland Recreation Camp	0.5	1.6	4.2	4.4	6.7	8.6	17.2	33.1	19.2	3.5	0.7	0.3	100.0
South Fork Tuolumne River near Oakland Recreation Camp	1.1	2.6	5.9	7.4	10.2	13.8	19.9	23.3	11.0	2.8	1.2	0.8	100.0
Tuolumne River at La Grange	0.9	2.3	4.2	5.8	7.5	10.1	15.5	24.3	20.6	7.0	1.3	0.5	100.0
*Dry Creek near Modesto	5.1	3.3	9.5	15.8	12.9	10.7	11.1	8.0	7.1	5.4	5.3	5.8	100.0
*Tuolumne River at Tuolumne City	4.4	6.0	8.9	10.0	11.2	12.0	11.7	13.2	13.4	4.4	2.2	2.6	100.0

* Flows affected by storage, diversion, and return flow.

PERTINENT RUNOFF DATA

TUOLUMNE RIVER BASIN

Station	Source of data	Drainage area (sq miles)	Yrs. of record to 1969	Yearly Average Natural Flow				Maximum flow (Through 1969)	
				April-July		Annual			
				inches	ac-ft	inches	ac-ft	cfs	cfsm
Tuolumne River near Hetch Hetchy	b	457	59	24.9	606,700	30.4	740,700	12,900	28d
Cherry Creek below Cherry Valley Dam, near Hetch Hetchy	b	118	59	36.3	215,200	48.8	289,100	18,100	153d
Eleanor Creek near Hetch Hetchy	b	78.4	59	23.6	98,800	34.6	144,600	11,700	149d
Middle Tuolumne River at Oakland Recreation Camp	b	73.5	44	10.3	40,300	14.1	55,300	4,920	67
South Fork Tuolumne River near Oakland Recreation Camp	b	87	46	8.5	39,200	14.8	68,800	11,900	137
Tuolumne River at La Grange	a	1,540	74	15.3	1,257,600	22.7	1,865,000	61,000	40d
Dry Creek near Modesto	c	192.3	26	2.6	20,100d	6.2	63,800d	7,710	40d
Tuolumne River at Tuolumne City	c	1,896	33	4.8	489,400d	11.3	1,146,500d	44,000	23e

a City of San Francisco (computed natural flows)
b U.S.G.S.
c State of California
d Flows affected by storage and/or diversions
e Mean daily flows

CHART 7

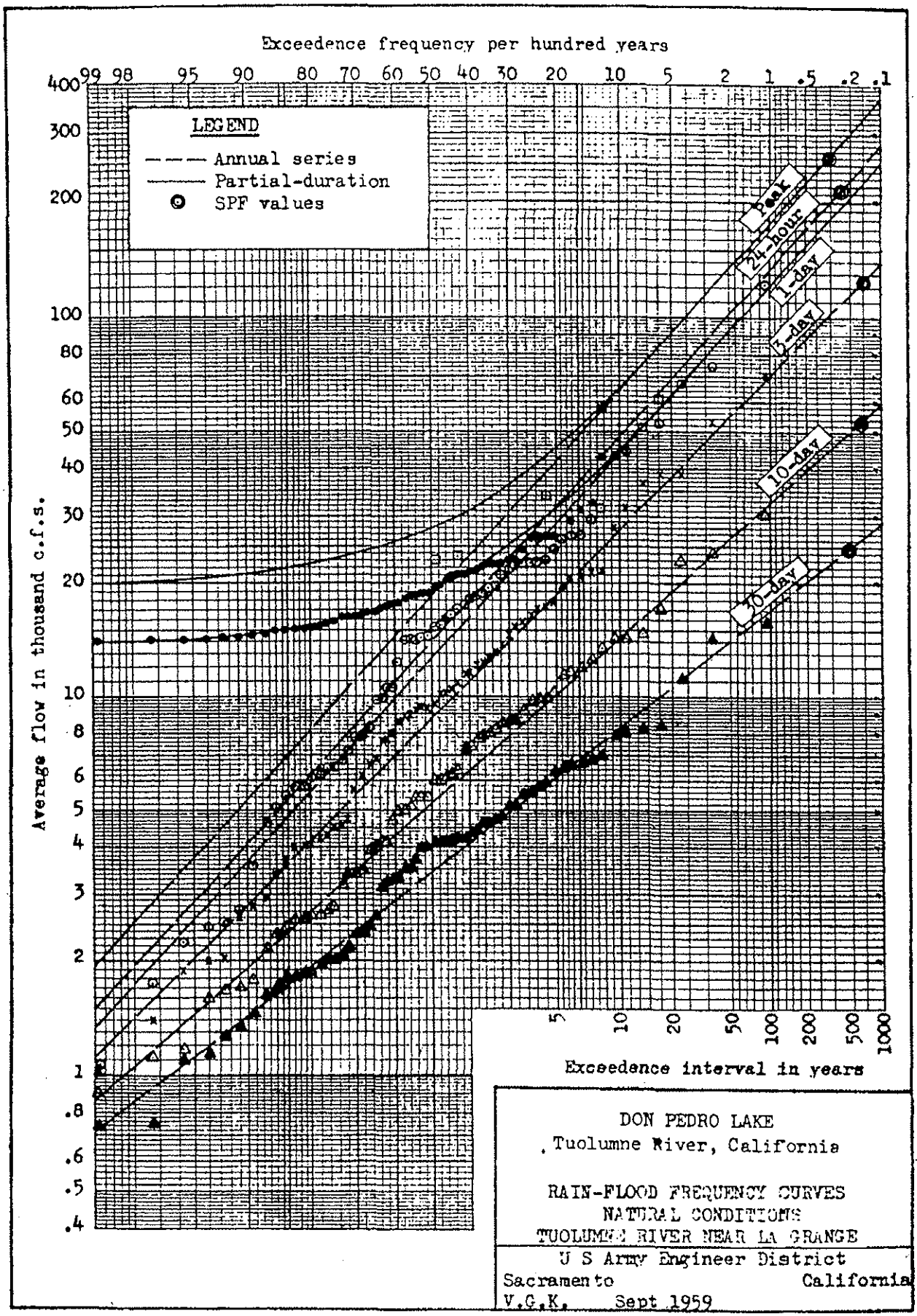
STANDARD PROJECT RAIN-FLOOD SERIES
TUOLUMNE RIVER BASIN

6-hour average flows in thousand c.f.s.

Period Ending	New Don Pedro Inflow	Down-stream Runoff	Period Ending	New Don Pedro Inflow	Down-stream Runoff	Period Ending	New Don Pedro Inflow	Down-stream Runoff	Period Ending	New Don Pedro Inflow	Down-stream Runoff
1-6	3.9	.1	10-18	1.2	.1	20-6	58.3	9.5	29-18	18.4	3.7
12	8.8	.4	24	1.0	.1	12	45.1	6.2	24	12.8	2.6
18	12.4	1.4	11-6	8.3	.2	18	36.9	4.1	30-6	9.1	1.7
24	16.8	2.1	12	16.7	1.1	24	30.6	2.8	12	6.2	1.1
2-6	22.7	3.1	18	26.6	2.4	21-6	26.2	2.0	18	4.8	.8
12	23.1	4.1	24	35.9	3.8	12	20.9	1.5	24	3.9	.5
18	17.1	3.5	12-6	48.5	5.6	18	17.4	1.1	31-6	3.2	.4
24	12.0	2.5	12	49.4	7.3	24	14.6	.8	12	2.8	.3
3-6	8.1	1.6	18	36.4	6.4	22-6	12.2	.7	18	2.3	.2
12	5.4	1.1	24	21.6	4.4	12	10.2	.5	24	2.2	.2
18	4.2	.7	13-6	17.3	2.9	18	8.5	.4	32-6	2.2	.1
24	3.7	.5	12	11.7	1.9	24	7.1	.3	12	2.2	.1
4-6	2.8	.4	18	9.0	1.3	23-6	6.0	.2	18	2.2	.1
12	2.5	.3	24	7.4	.9	12	13.5	.8	24	2.2	.1
18	2.0	.2	14-6	6.1	.7	18	19.1	1.9	33-6	2.9	.1
24	1.6	.2	12	5.2	.5	24	25.6	2.9	12	6.4	.4
5-6	1.4	.1	18	4.2	.4	24-6	34.2	4.3	18	9.0	1.2
12	1.1	.1	24	3.5	.3	12	34.9	5.7	24	11.1	1.8
18	1.0	.1	15-6	2.9	.2	18	25.6	5.0	34-6	14.9	2.7
24	.8	.1	12	2.4	.2	24	18.1	3.5	12	15.1	3.6
6-6	5.0	.1	18	2.0	.2	25-6	12.3	2.3	18	10.7	3.1
12	11.1	.7	24	1.7	.2	12	8.4	1.5	24	6.2	2.2
18	15.8	1.7	16-6	2.0	.1	18	6.5	1.0	35-6	5.5	1.4
24	21.3	2.6	12	9.2	.1	24	5.3	.7	12	4.0	.9
7-6	28.8	3.8	18	51.6	.1	26-6	4.4	.5	18	3.1	.6
12	29.3	5.0	24	100.2	.1	12	3.8	.4	24	2.5	.5
18	21.7	4.3	17-6	62.1	.3	18	3.0	.3	36-6	2.2	.3
24	15.1	3.0	12	34.3	1.9	24	2.5	.2	12	2.2	.3
8-6	10.2	2.0	18	26.3	2.6	27-6	2.2	.2	18	2.2	.2
12	6.9	1.3	24	41.8	1.8	12	2.2	.1	24	2.2	.1
18	5.4	.9	18-6	93.8	1.2	18	2.2	.1	37-6	2.2	.1
24	4.4	.6	12	132.9	1.1	24	2.2	.1	12	2.2	.1
9-6	3.6	.5	18	179.8	2.7	28-6	4.4	.2	18	2.2	.1
12	3.1	.4	24	242.7	5.2	12	9.9	.4	24	2.2	.1
18	2.5	.3	19-6	247.2	8.1	18	14.1	1.4			
24	2.1	.2	12	182.5	12.0	24	18.7	2.2	Total	3082.0	263.1
10-6	1.7	.2	18	127.7	15.6	29-6	24.6	3.3	Thousand		
12	1.4	.1	24	86.1	13.6	12	25.0	4.3	ac-ft	1531.0	130.3

NOTE:

Downstream runoff includes that tributary between Don Pedro Dam site and the mouth of Tuolumne River. Quantities shown are reduced quantities that can coincide with full standard project flood quantities above Don Pedro Reservoir. For days 16-22, timing shown hereon has been corrected and flows for downstream runoff are 1 day later than shown in Table IV of Hydrology Report.

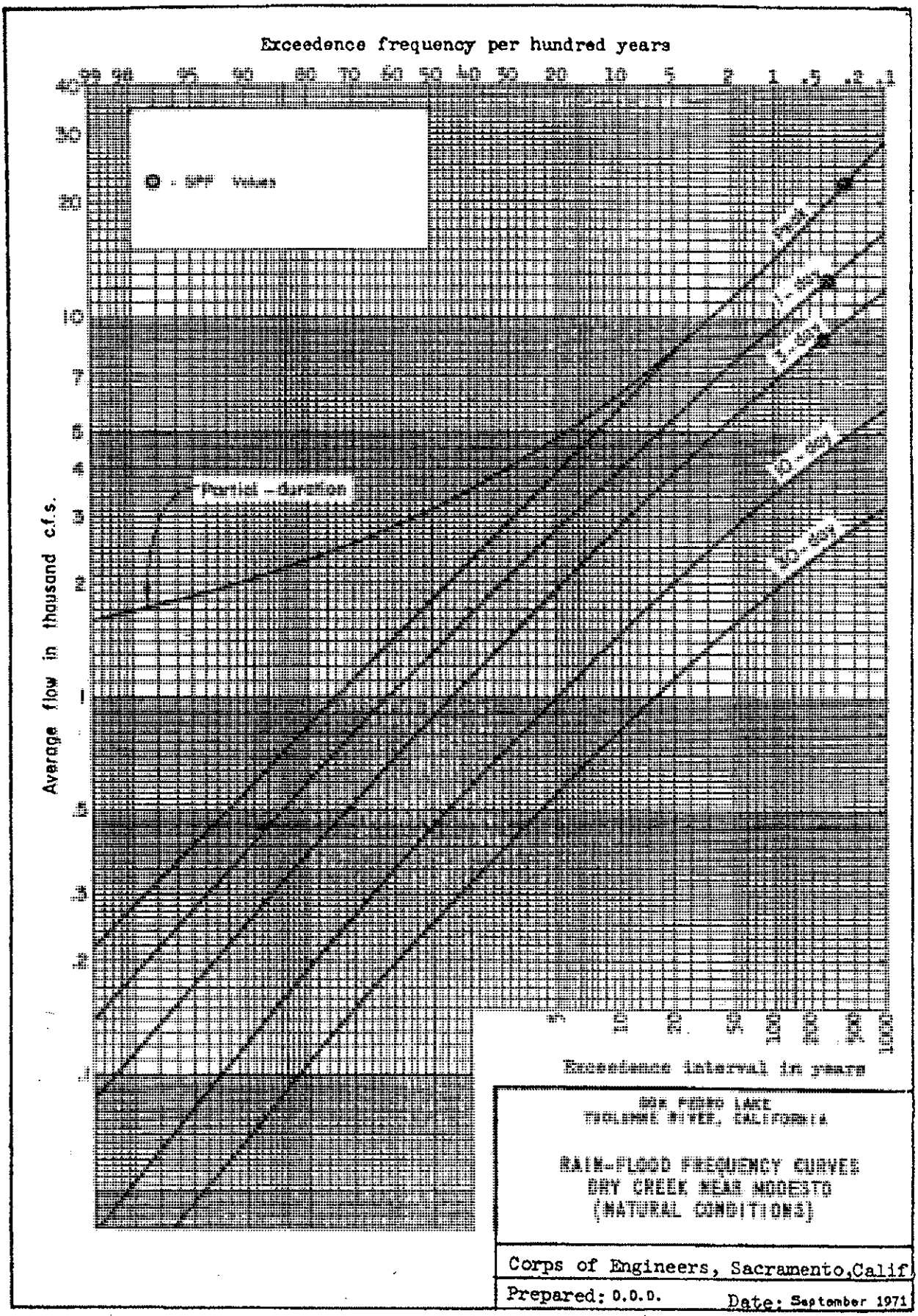


DON PEDRO LAKE
Tuolumne River, California

RAIN-FLOOD FREQUENCY CURVES
NATURAL CONDITIONS
TUOLUMNE RIVER NEAR LA GRANGE

U S Army Engineer District
Sacramento California
V.C.K. Sept 1959

CHART 9



DON PEDRO LAKE
TUOLUMNE RIVER, CALIFORNIA

RAIN-FLOOD FREQUENCY CURVES
DRY CREEK NEAR MODESTO
(NATURAL CONDITIONS)

Corps of Engineers, Sacramento, Calif

Prepared: D.D.D. Date: September 1971

CHART 10

STANDARD PROJECT SNOWMELT FLOOD

TUOLUMNE RIVER AT DON PEDRO DAM

24-hour average flows in thousand c.f.s.

April	Flow	May	Flow	June	Flow	July	Flow
1	2.4	1	8.8	1	22.2	1	15.3
2	3.6	2	11.3	2	24.3	2	13.2
3	4.6	3	12.3	3	23.9	3	13.0
4	3.3	4	13.3	4	24.1	4	13.9
5	2.9	5	15.5	5	24.2	5	14.1
6	3.3	6	13.2	6	25.9	6	13.3
7	3.7	7	10.4	7	28.4	7	11.4
8	3.4	8	8.6	8	25.1	8	10.1
9	3.3	9	8.5	9	21.3	9	8.4
10	3.4	10	9.6	10	20.8	10	8.3
11	3.5	11	11.1	11	21.2	11	7.5
12	3.6	12	12.8	12	21.4	12	7.0
13	3.5	13	17.9	13	20.9	13	7.1
14	3.5	14	18.4	14	19.2	14	6.5
15	4.2	15	16.5	15	17.3	15	6.3
16	4.8	16	17.0	16	15.9	16	5.8
17	4.0	17	19.5	17	16.0	17	5.6
18	4.5	18	22.4	18	17.2	18	5.0
19	4.9	19	23.3	19	18.3	19	4.3
20	3.7	20	23.0	20	16.9	20	3.9
21	4.1	21	20.6	21	17.5	21	3.6
22	4.6	22	19.2	22	17.8	22	3.5
23	5.9	23	18.3	23	18.8	23	3.3
24	5.7	24	16.0	24	20.4	24	3.1
25	5.5	25	11.9	25	20.3	25	2.8
26	5.1	26	11.6	26	19.9	26	2.6
27	4.9	27	13.1	27	21.2	27	2.5
28	5.5	28	17.0	28	21.6	28	2.4
29	7.0	29	18.6	29	21.6	29	2.3
30	7.9	30	21.4	30	19.4	30	2.2
		31	22.2			31	2.1
Total	130.3		483.3		623.0		210.4

Tuolumne River Project, California, March 1961 D.D.D.

CHART 11

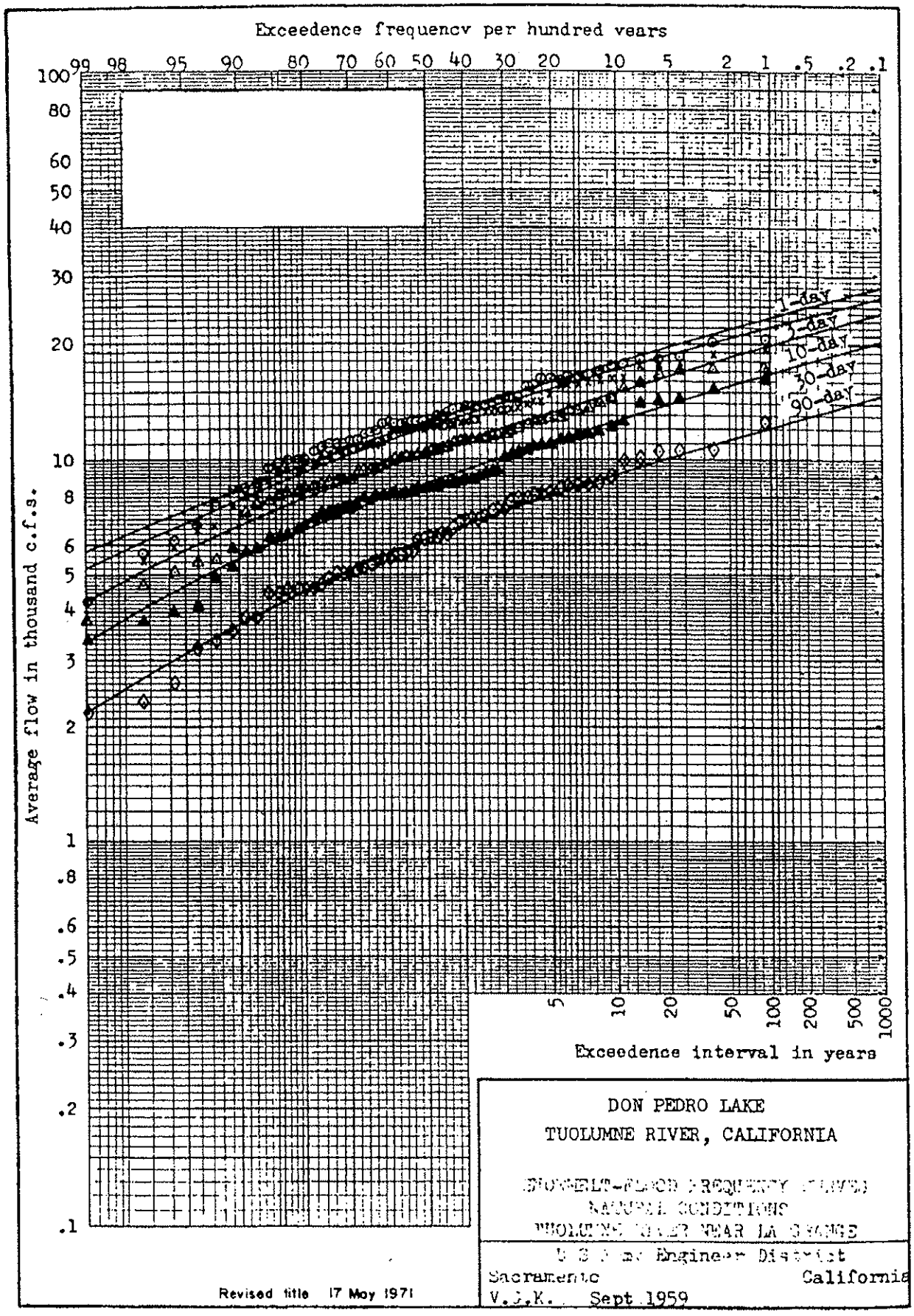
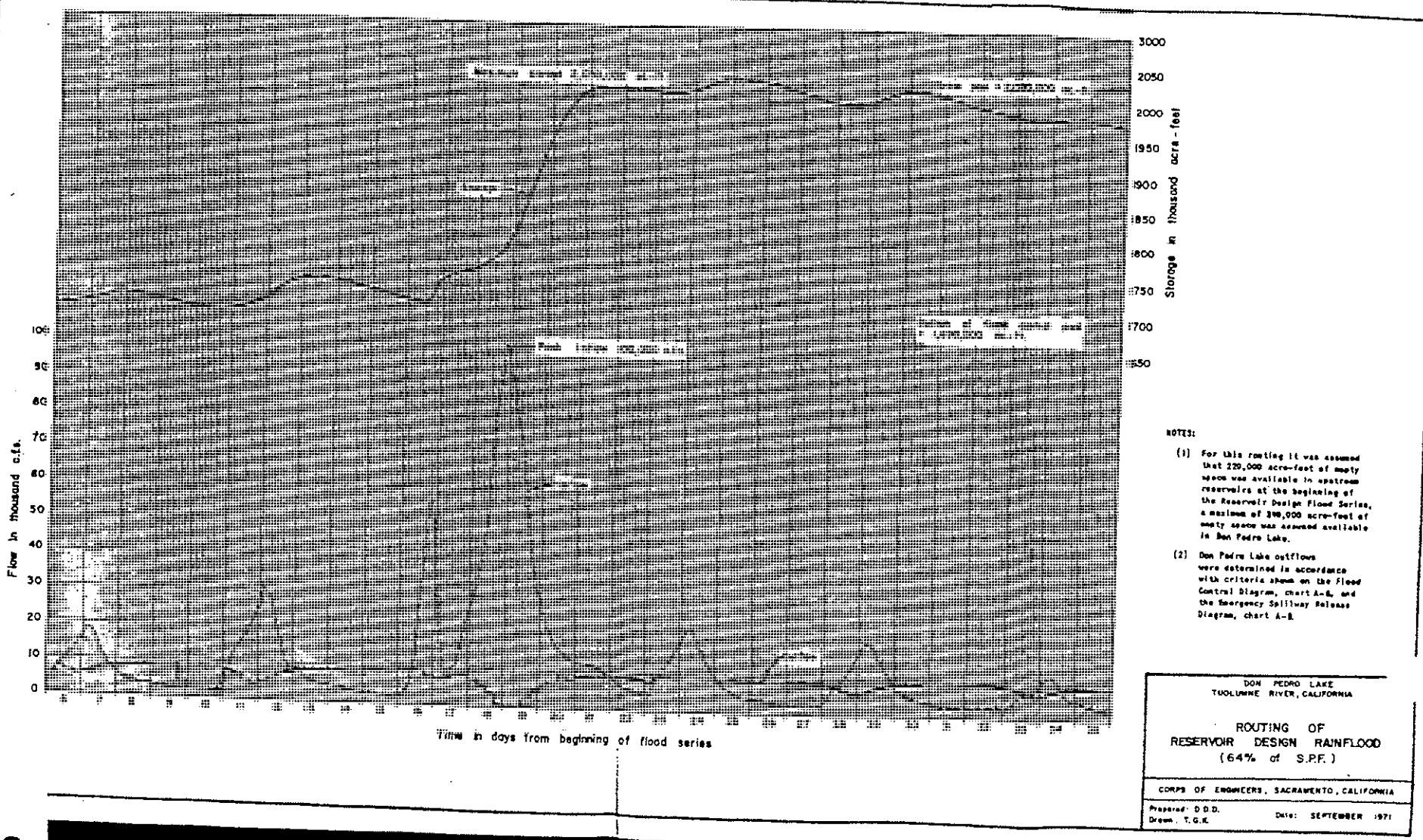


CHART 12



NOTES:

(1) For this routing it was assumed that 220,000 acre-feet of empty space was available in upstream reservoirs at the beginning of the Reservoir Design Flood Series, a maximum of 390,000 acre-feet of empty space was assumed available in Don Pedro Lake.

(2) Don Pedro Lake outflows were determined in accordance with criteria shown on the Flood Control Diagram, chart A-8, and the Emergency Spillway Release Diagram, chart A-8.

DON PEDRO LAKE
TUOLUMNE RIVER, CALIFORNIA

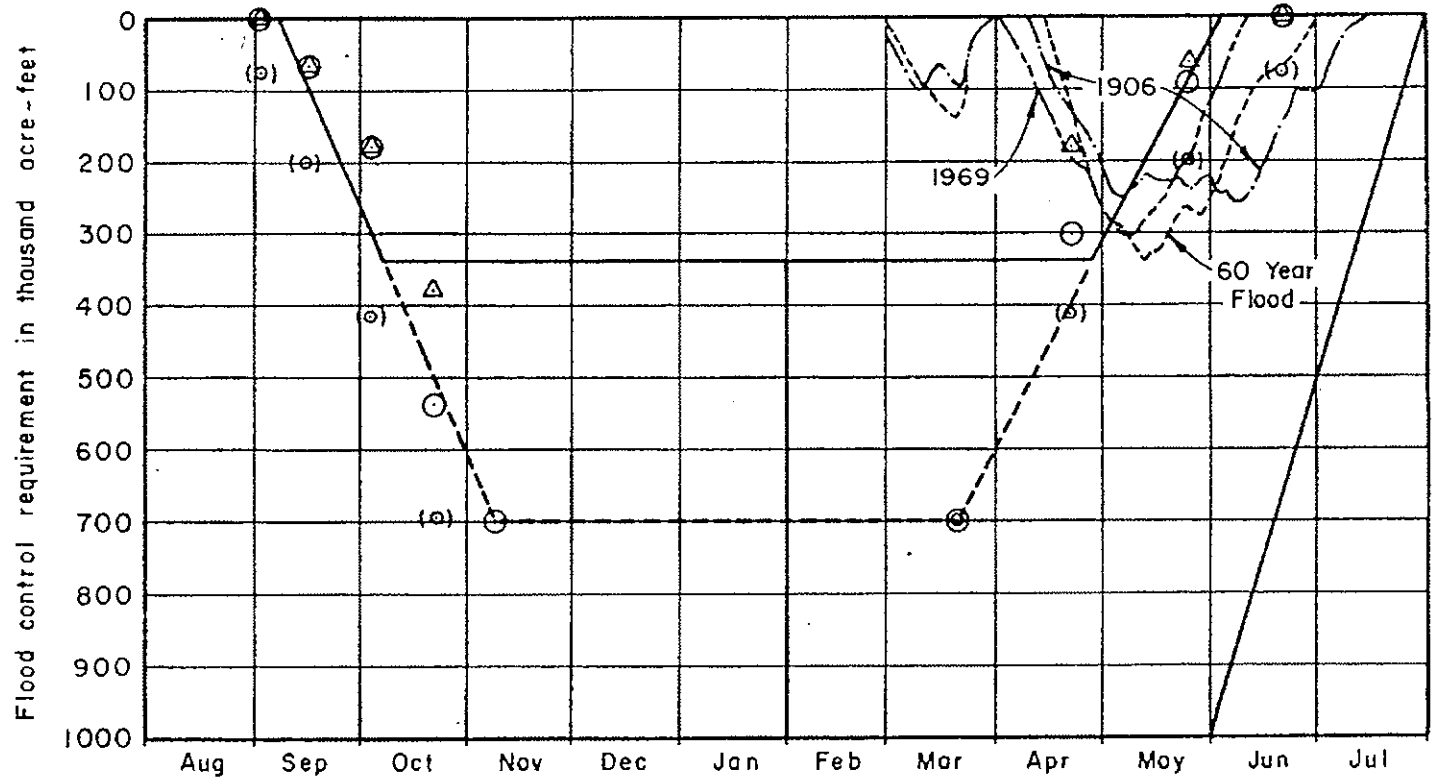
ROUTING OF
RESERVOIR DESIGN RAINFLOOD
(64% of S.P.F.)

CORPS OF ENGINEERS, SACRAMENTO, CALIFORNIA

Prepared: D.D.D.
Drawn: T.G.K.

Date: SEPTEMBER 1971

CHART



LEGEND

⊙ Requirement to control runoff from reservoir design storm (seasonally adjusted for flood potential) on wet ground to 7200 c.f.s. (80 percent of project flows) at Modesto. Values in parenthesis used for interpolation only.

△ Requirement to control runoff from reservoir design storm (seasonally adjusted for flood potential) on dry ground.

⊙ Requirement to control runoff from reservoir design storm, with seasonal adjustment of both storm potential and ground-wetness potential.

Minimum reservation required to control indicated snowmelt floods to 9,000 c.f.s. (100 percent of project flows).

—·—·— 1906; – – – – – 60 Year Flood; ———— 1969.

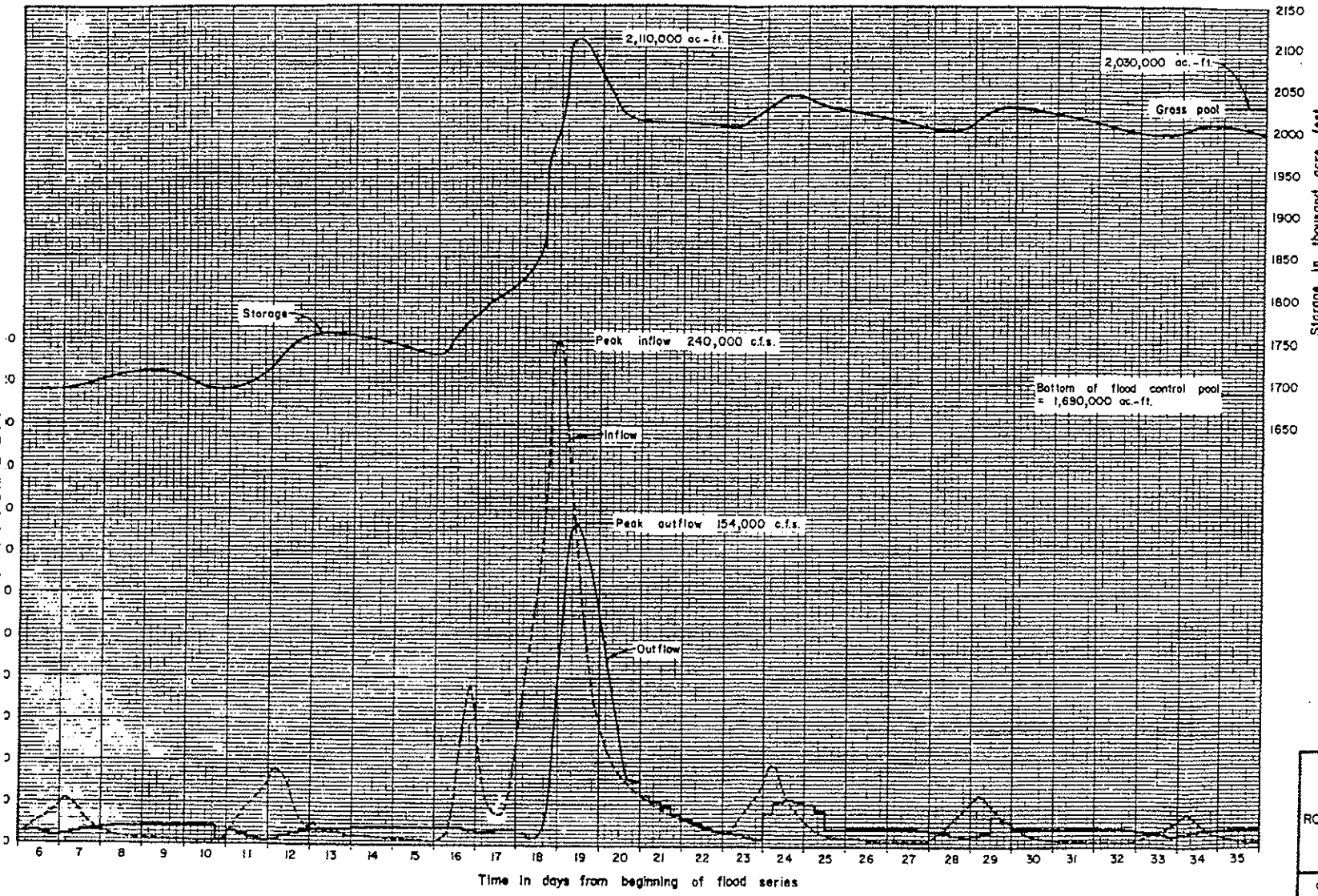
DON PEDRO LAKE
TUOLUMNE RIVER, CALIFORNIA

SEASONAL FLOOD CONTROL SPACE REQUIREMENT DON PEDRO LAKE

CORPS OF ENGINEERS, SACRAMENTO, CALIFORNIA

Prepared: R.F.C. Date: SEPTEMBER 1971
Drawn: T.G.K

CHART 14



NOTES:

(1) For this routing it was assumed that 220,000 acre-feet of empty space was available in upstream reservoirs at the beginning of the Standard Project Flood Series, and inflow hydrograph is, therefore, modified from that shown on chart 8. A maximum of 340,000 acre-feet of empty space was assumed available in Don Pedro Lake

(2) Don Pedro Lake outflows were determined in accordance with criteria shown on the Flood Control Diagram, chart A-8, and the Emergen Spillway Release Diagram, chart A-1

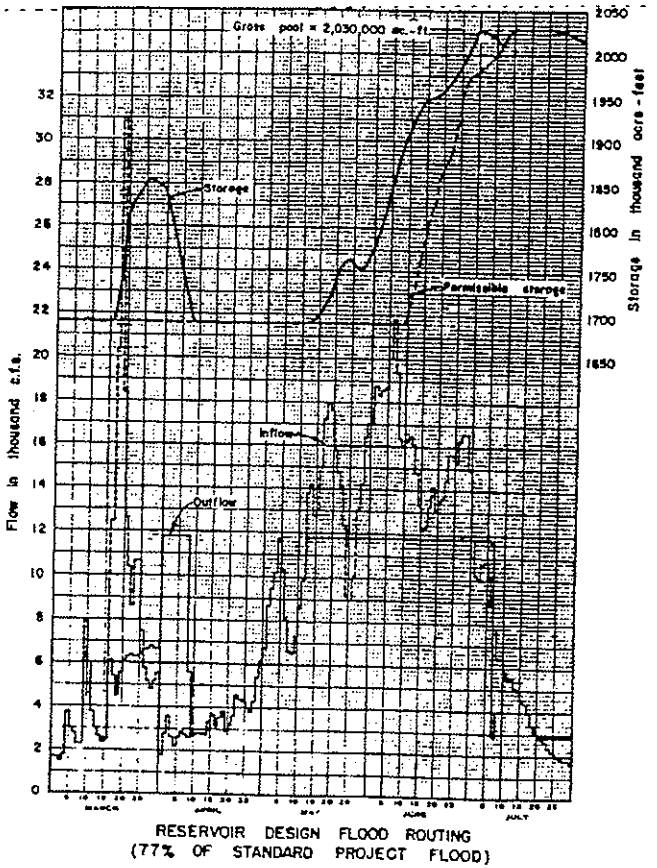
DON PEDRO LAKE
TUOLUMNE RIVER, CALIFORNIA

ROUTING OF STANDARD PROJECT FLOOD
(RAIN-FLOOD SERIES)

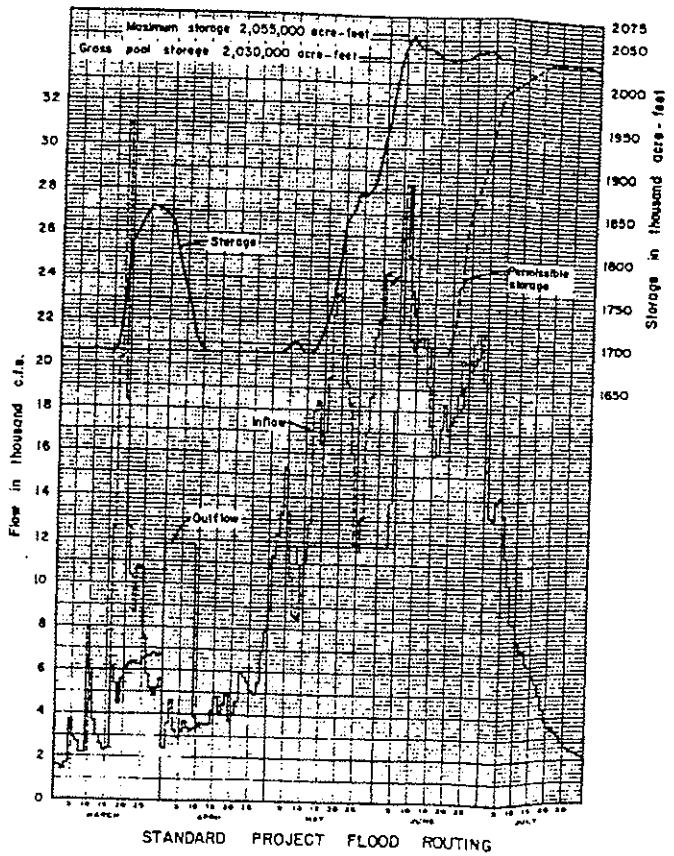
CORPS OF ENGINEERS, SACRAMENTO, CALIFO

Prepared: D.D.D.
Drawn T.G.K.

Date: SEPTEMBER



RESERVOIR DESIGN FLOOD ROUTING
(77% OF STANDARD PROJECT FLOOD)



STANDARD PROJECT FLOOD ROUTING

NOTES:

(1) All upstream reservoirs were assumed to be full at the beginning of each flood routing.

(2) In both routings, the forecast and actual run-off volumes were assumed to be identical.

(3) Permissable storage was determined by using the criteria shown on the Flood Control Diagram, chart A-8.

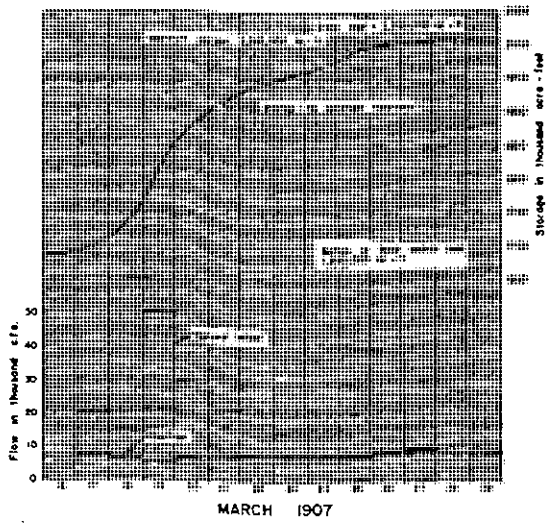
(4) The April thru July inflows shown are hypothetical flood flows. The March inflows are the highest March flows of record (March 1907) modified for present conditions of upstream reservoir storage.

DON PEDRO LAKE
TUOLUMNE RIVER, CALIFORNIA

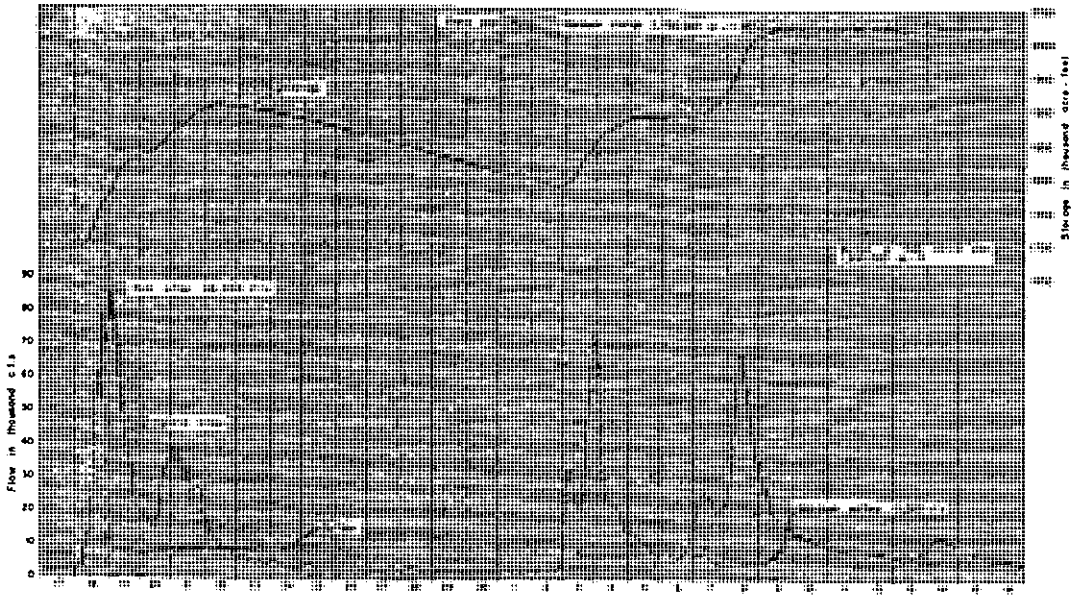
ROUTING OF
HYPOTHETICAL SNOWMELT FLOO

CORPS OF ENGINEERS, SACRAMENTO, CALIFORNIA

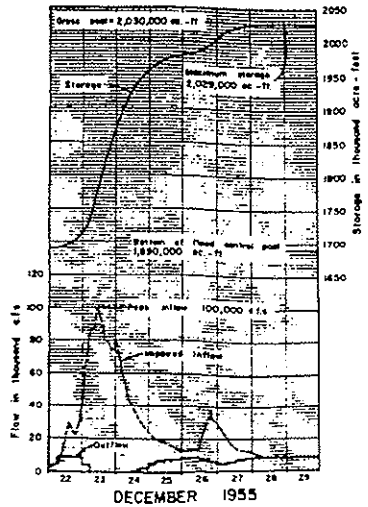
Prepared: O.D.D.
Drawn: T.G.K.
Date: SEPTEMBER 1971



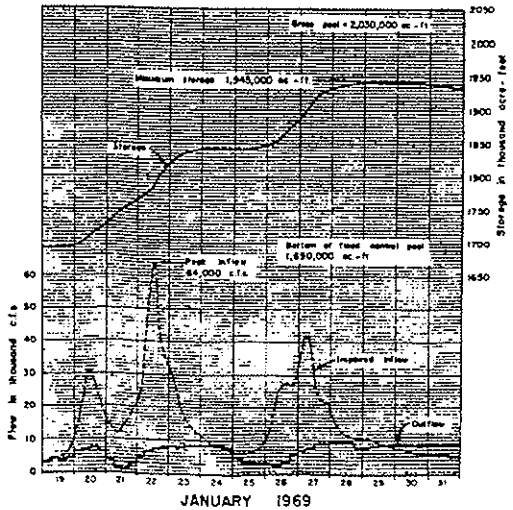
MARCH 1907



NOVEMBER – DECEMBER 1950



DECEMBER 1955



JANUARY 1969

NOTES:

(1) At the beginning of each flood routing, it was assumed that there was 348,000 acre-feet of empty space in Don Pedro Lake.

(2) Storage conditions in the upstream reservoirs are those that actually existed at the beginning of each respective flood period as follows:

(a) March 1907 flows – inflows to Don Pedro Lake are natural, since there were no upstream reservoirs.

(b) November–December 1950 flood – inflows to Don Pedro Lake were regulated by existing Hetch Hetchy Reservoir and Lake Eleanor.

(c) December 1955 flood – inflows to Don Pedro Lake were regulated by existing Hetch Hetchy and Lake Eleanor, and by a certain extent by existing Cherry Valley Reservoir which was under construction at the time.

(d) January 1969 flood – inflows to Don Pedro Lake were regulated by all present-day existing upstream reservoirs.

(3) All routings are based on criteria on chart A-6, with allowance to Hetch Hetchy Aqueduct evaporation.

DON PEDRO LAKE
TUOLUMNE RIVER, CALIFORNIA

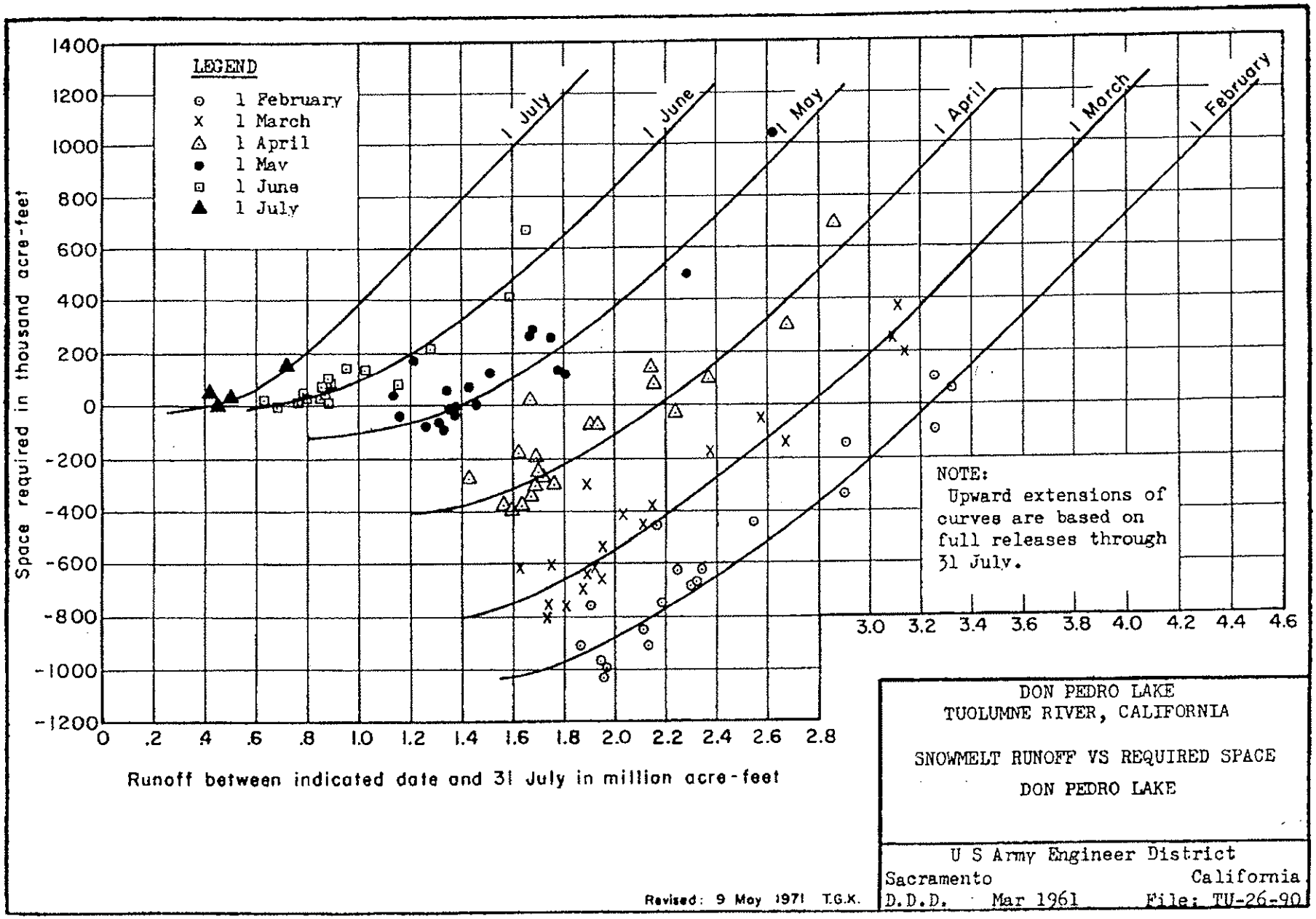
ROUTING OF
HISTORICAL RAIN FLOODS

CORPS OF ENGINEERS, SACRAMENTO, CALIFORNIA

Prepared D.O.D.
Drawn T.G.K.
Date SEPTEMBER 1971

CHART A-5

1906 FLOOD ROUTING
1907 FLOOD ROUTING
1969 FLOOD ROUTING
Storage in thousand acre - feet
Flow in thousand c.f.s.
ROUTING OF HISTORICAL SNOWMELT FLOODS
CHART 18



DON PEDRO LAKE
TUOLUMNE RIVER, CALIFORNIA

SNOWMELT RUNOFF VS REQUIRED SPACE
DON PEDRO LAKE

U S Army Engineer District
Sacramento California
D.D.D. Mar 1961 File: TU-26-90

Revised: 9 May 1971 T.G.K.

CHART 19

MONTHLY REQUIRED FLOOD CONTROL RESERVATION

DON PEDRO LAKE

(See footnote for adjustment)

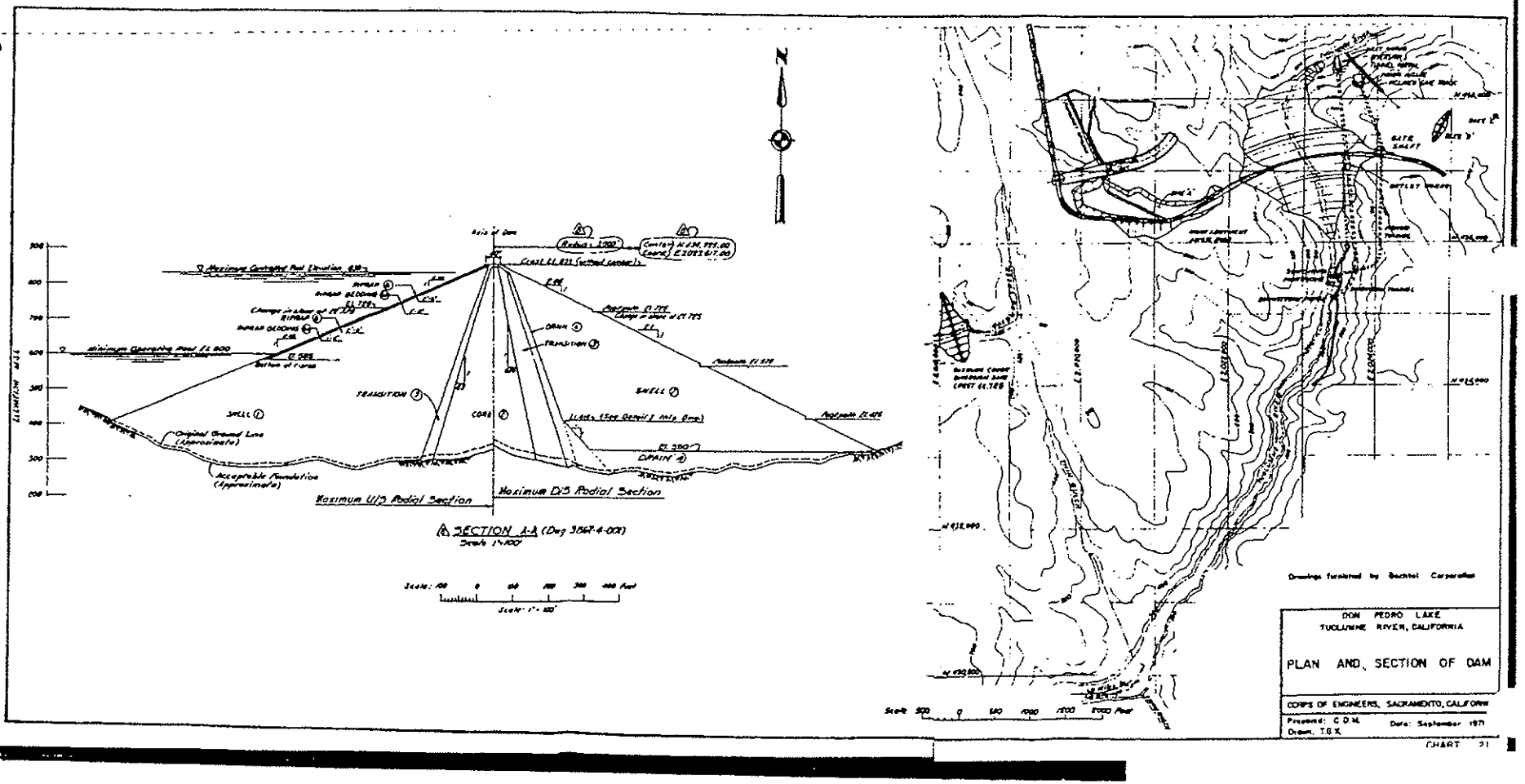
Year	Required space in thousand-acre feet at end of month											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1906	340	340	340	340	340	260	0	0	257	340	340	340
1907				340	340	100						
1908				317	28	0						
1909				317	135	0						
1910				317	28	0						
1911				340	240	0						
1912				317	28	0						
1913				317	28	0						
1914				317	175	5						
1915				317	280	15						
1916				317	28	0						
1917				317	130	0						
1918				317	30	0						
1919				317	28	0						
1920				317	28	0						
1921				317	60	0						
1922				317	28	0						
1923				317	28	0						
1924				317	28	0						
1925				340	250	95						
1926				317	28	0						
1927				317	160	0						
1928				317	70	15						
1929				317	28	0						
1930				317	40	0						
1931				317	28	0						
1932				317	50	0						
1933				317	40	0						
1934				317	28	0						
1935				317	135	0						
1936				317	70	0						
1937				317	40	0						
1938				340	300	5						
1939				317	28	0						
1940				317	40	0						
1941				340	200	0						
1942				317	265	3						
1943				317	60	0						
1944				317	40	0						
1945	340	340	340	317	55	0	0	0	257	340	340	340

MONTHLY REQUIRED FLOOD CONTROL RESERVATION

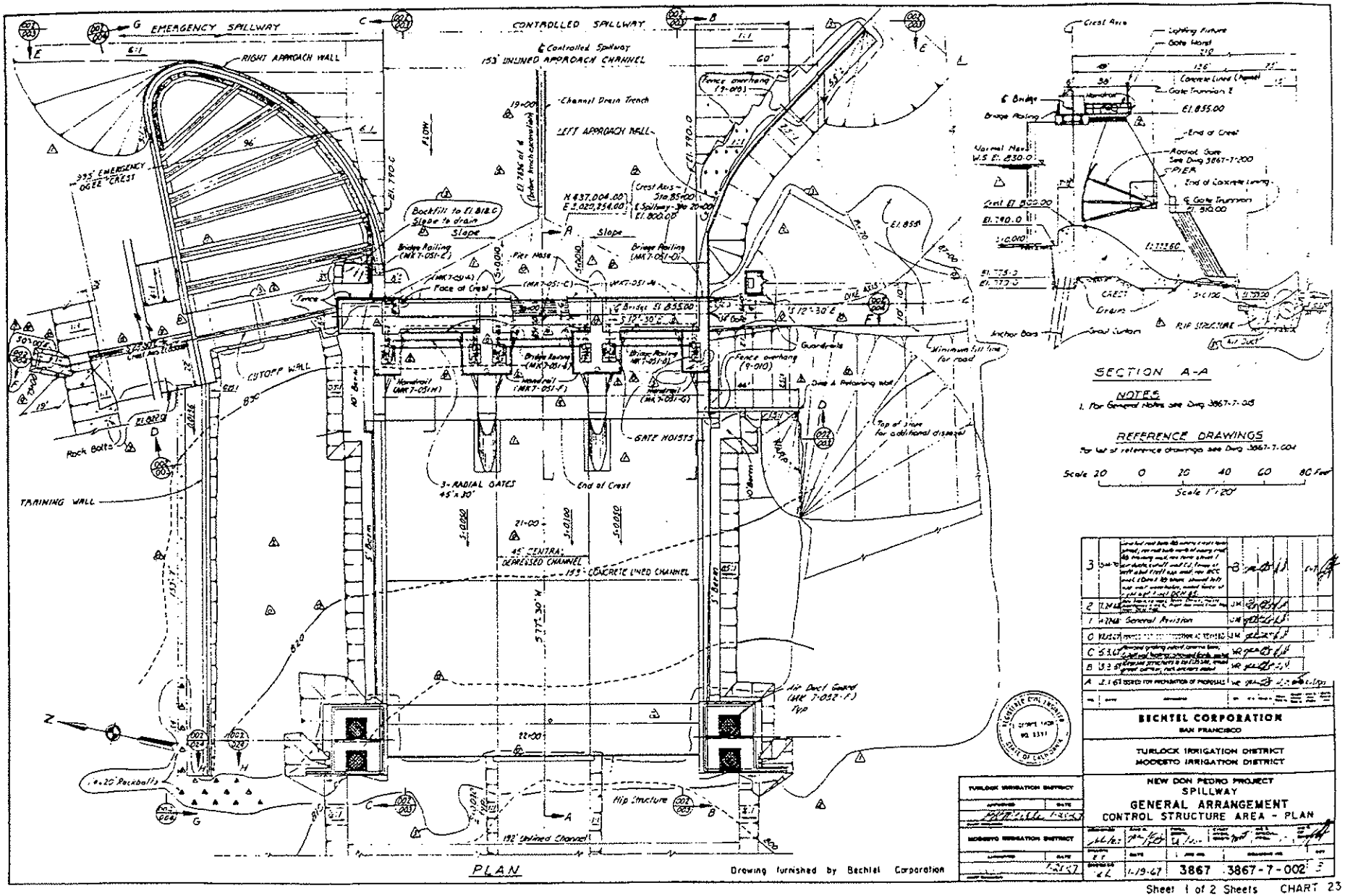
DON PEDRO LAKE

Year	Required space in thousand acre-feet at end of month											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1946	340	340	340	317	55	0	0	0	257	340	340	340
1947				317	28	0						
1948				317	80	0						
1949				317	28	0						
1950				317	28	0						
1951				317	75	0						
1952				340	135	0						
1953				317	40	0						
1954				317	28	0						
1955				317	28	0						
1956				317	115	0						
1957				317	55	0						
1958				340	120	0						
1959				317	28	0						
1960				317	28	0						
1961				317	28	0						
1962				317	28	0						
1963				317	50	0						
1964				317	28	0						
1965				317	130	0						
1966				317	28	0						
1967				340	150	0						
1968				317	28	0						
1969				340	100	0						
1970	340	340	340	317	28	0	0	0	257	340	340	340

Note: The required flood control space shown on the above table is based on the maximum available flood control reservation in Don Pedro Lake (340,000 acre-feet). During some wet years the space needed for flood control is actually greater than this maximum available space of 340,000 acre-feet. The flood control space requirements shown above are based on the flood control diagram shown on chart A-8 in conjunction with snowmelt forecasts obtained by use of historical precipitation data and forecast criteria shown on chart 23 of Flood Control Reservoir Operation Report for all years from 1906 through 1958. Forecasts made by the State of California were used for all years from 1959 through 1970.


Maximum U/S Radial Section
Maximum D/S Radial Section
SECTION A-A (Dwg 3567-4-003)
Drawings furnished by Bechtel Corporation
DON PEDRO LAKE
TUOLUMNE RIVER, CALIFORNIA
PLAN AND SECTION OF DAM
CORPS OF ENGINEERS, SACRAMENTO, CALIFORNIA
CHART 21

REFERENCE DRAWINGS
Drawing furnished by Bechtel Corporation
BECHTEL CORPORATION
San Francisco
TURLOCK IRRIGATION DISTRICT
MODESTO IRRIGATION DISTRICT
NEW DON PEDRO PROJECT
SPILLWAY
GENERAL ARRANGEMENT
3867-7-001
CONTROLLED SPILLWAY
EMERGENCY SPILLWAY
DISPOSAL AREA
PUBLIC ACCESS ROAD
PRIVATE ACCESS ROAD
Approach Canal
Control Weir
Training Wall
Rock Bolts
Drainage Trench
Spillway Channel Excavation
Low Point of Bridge
CHART



NOTES

1. For General Notes see Dwg 3867-7-005

REFERENCE DRAWINGS

For list of reference drawings see Dwg 3867-7-004

3	Deleted road from AB crossing crest to gallery, new road made north of existing road AB crossing road was never shown / Air ducts, conduit and C.I. frames etc. north of road revised, new road and RCC bench added / Dam & RB lines, diamond drill hole and cross-hairs, control lines at left end of C.L. of Dam added		
2	Trunnion El. changed from 810.00 to 810.00	J.M.	
1	2-7-68 General Revision	J.M.	
0	Issued for construction	J.M.	
C	5-3-67 Control and heating, concrete details added, grouting notes revised, gate hoist trunnion elevation changed from 810.00 to 810.00, minor grading, road and corner changes made	W.R.	
B	3-3-67 Control and heating, concrete details added, grouting notes revised, gate hoist trunnion elevation changed from 810.00 to 810.00, minor grading, road and corner changes made	W.R.	
A	2-1-67 ISSUED FOR PREPARATION OF PROPOSALS	W.R.	

BECHTEL CORPORATION
SAN FRANCISCO

TURLOCK IRRIGATION DISTRICT
MODESTO IRRIGATION DISTRICT

NEW DON PEDRO PROJECT
SPILLWAY
GENERAL ARRANGEMENT
CONTROL STRUCTURE AREA - PLAN

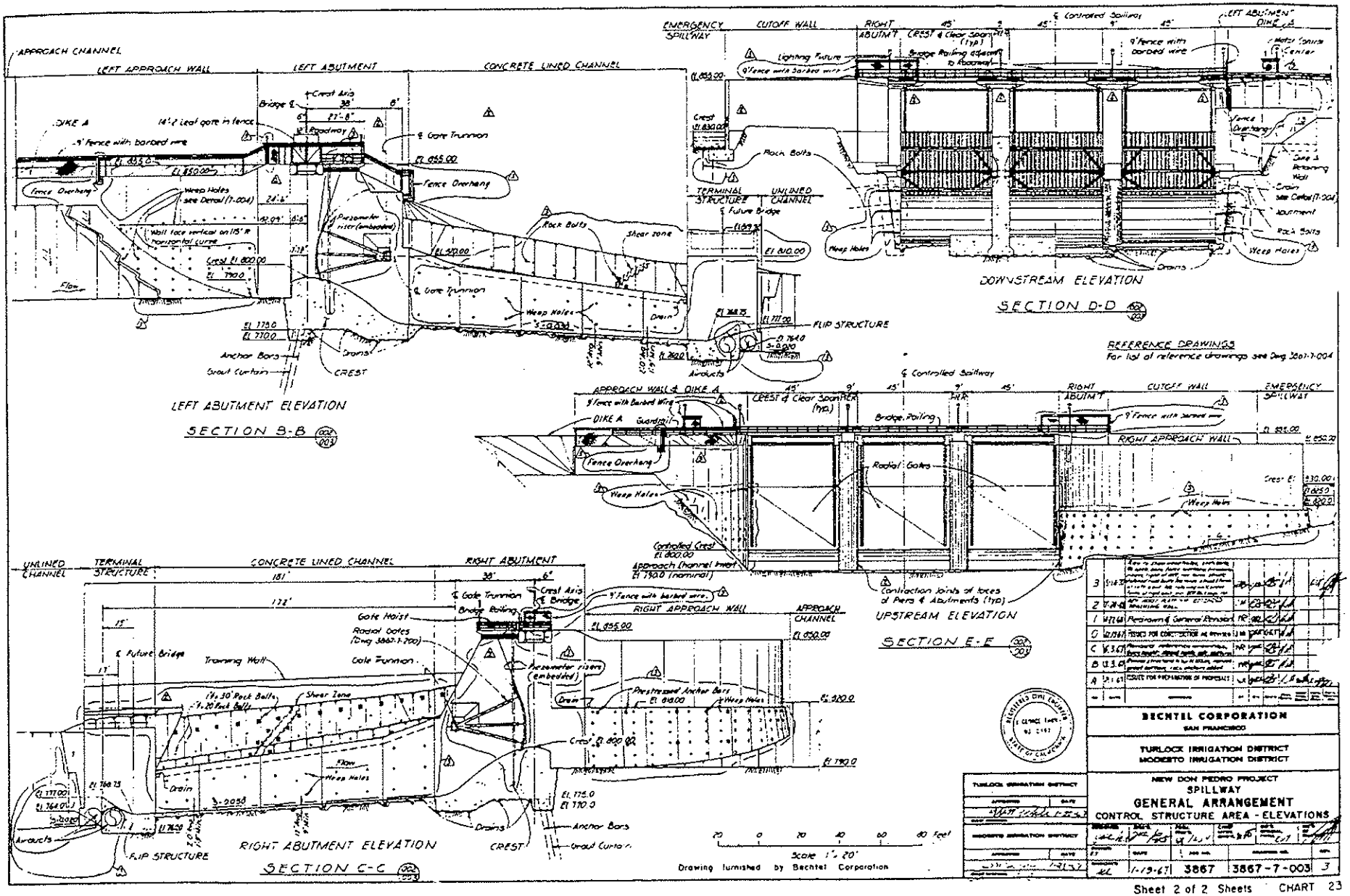
DESIGNED	DRAWN	TRACED	CHECKED	DATE
L.L./K.S.	J.M.	J.M.	W.R.	1-19-67

3867 3867-7-002 5

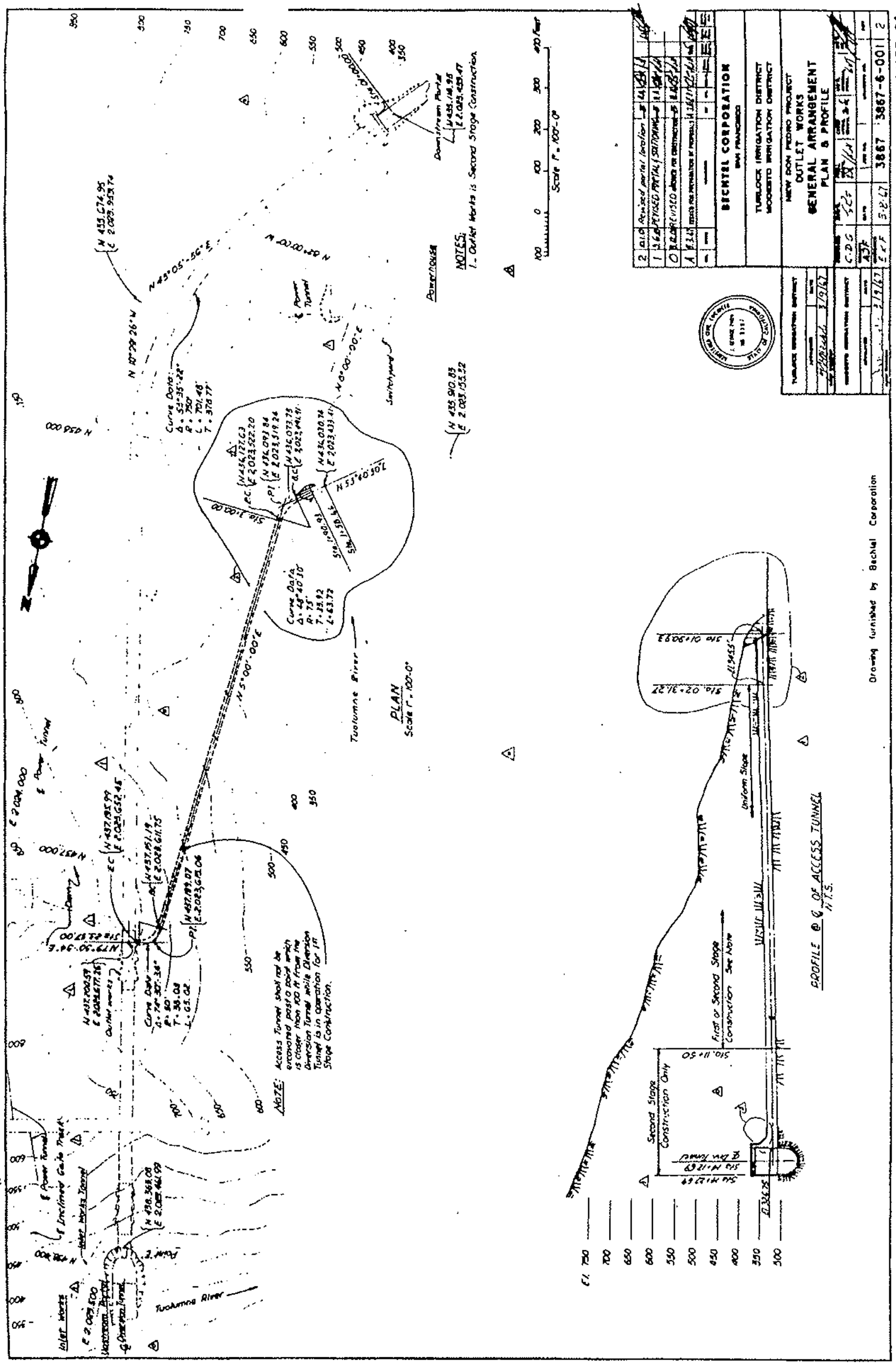
TURLOCK IRRIGATION DISTRICT — APPROVED — DATE 2-27-67
MODESTO IRRIGATION DISTRICT — APPROVED — DATE 2-27-67

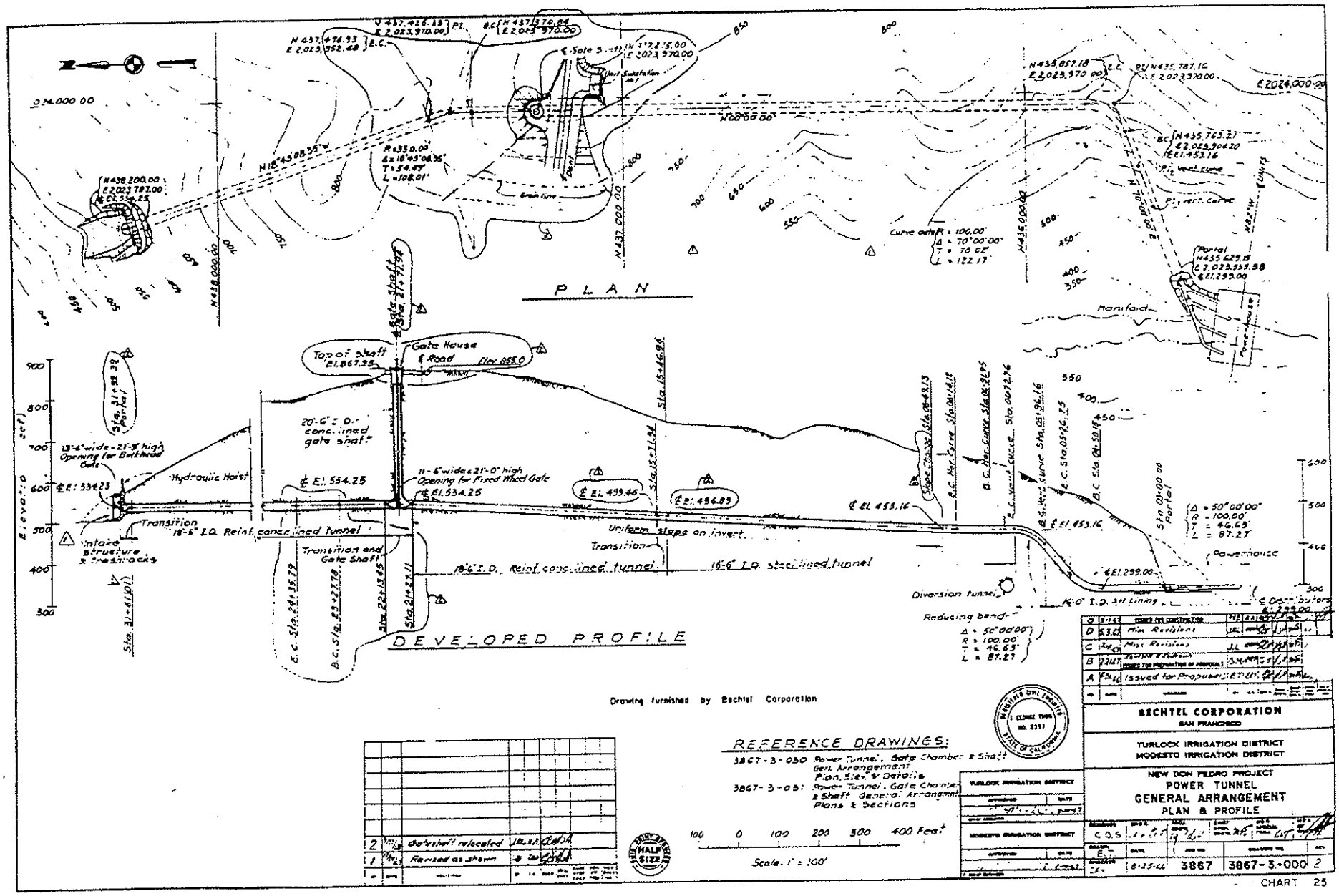
Drawing furnished by Bechtel Corporation

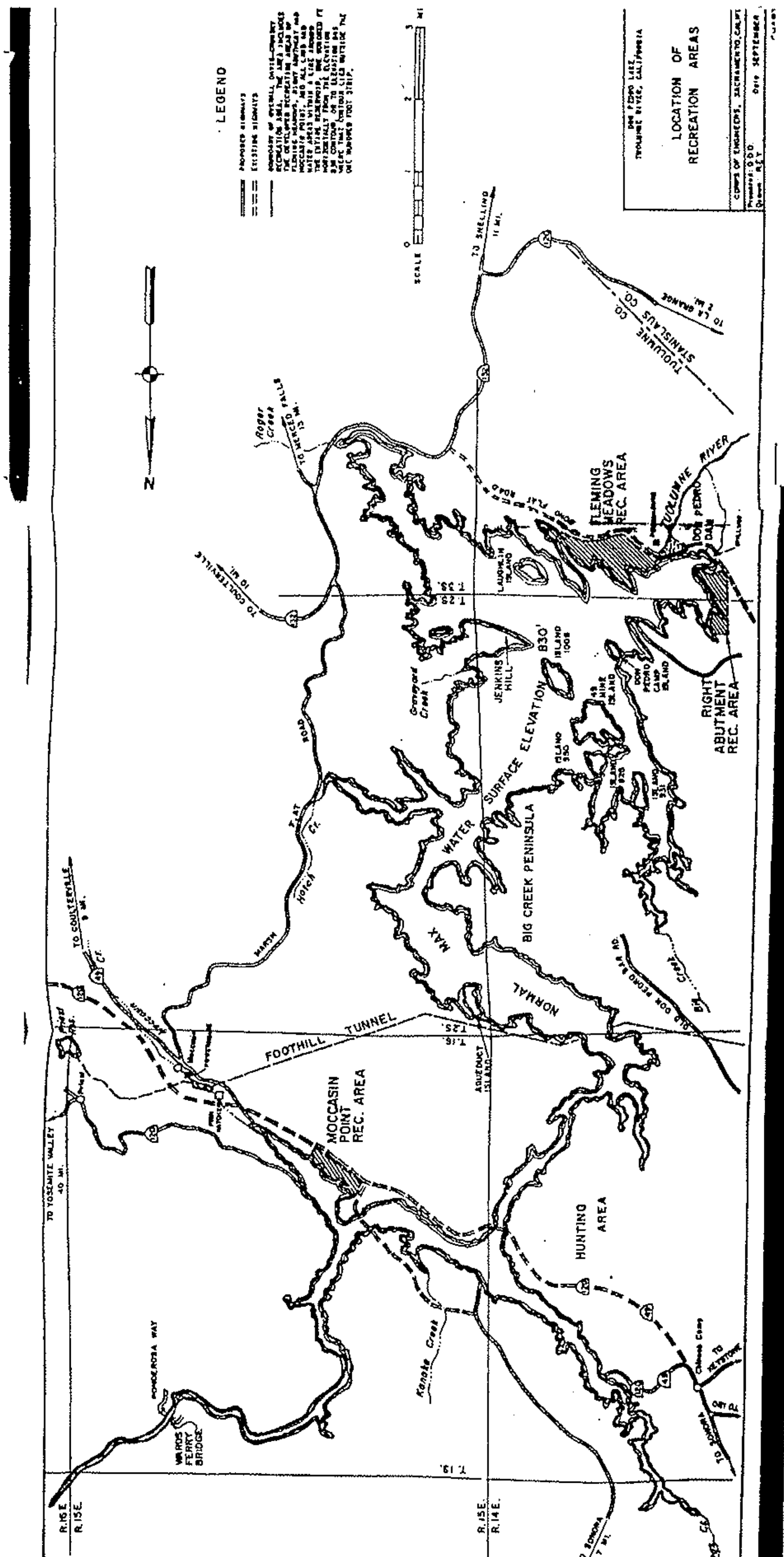
Sheet 1 of 2 Sheets CHART 23

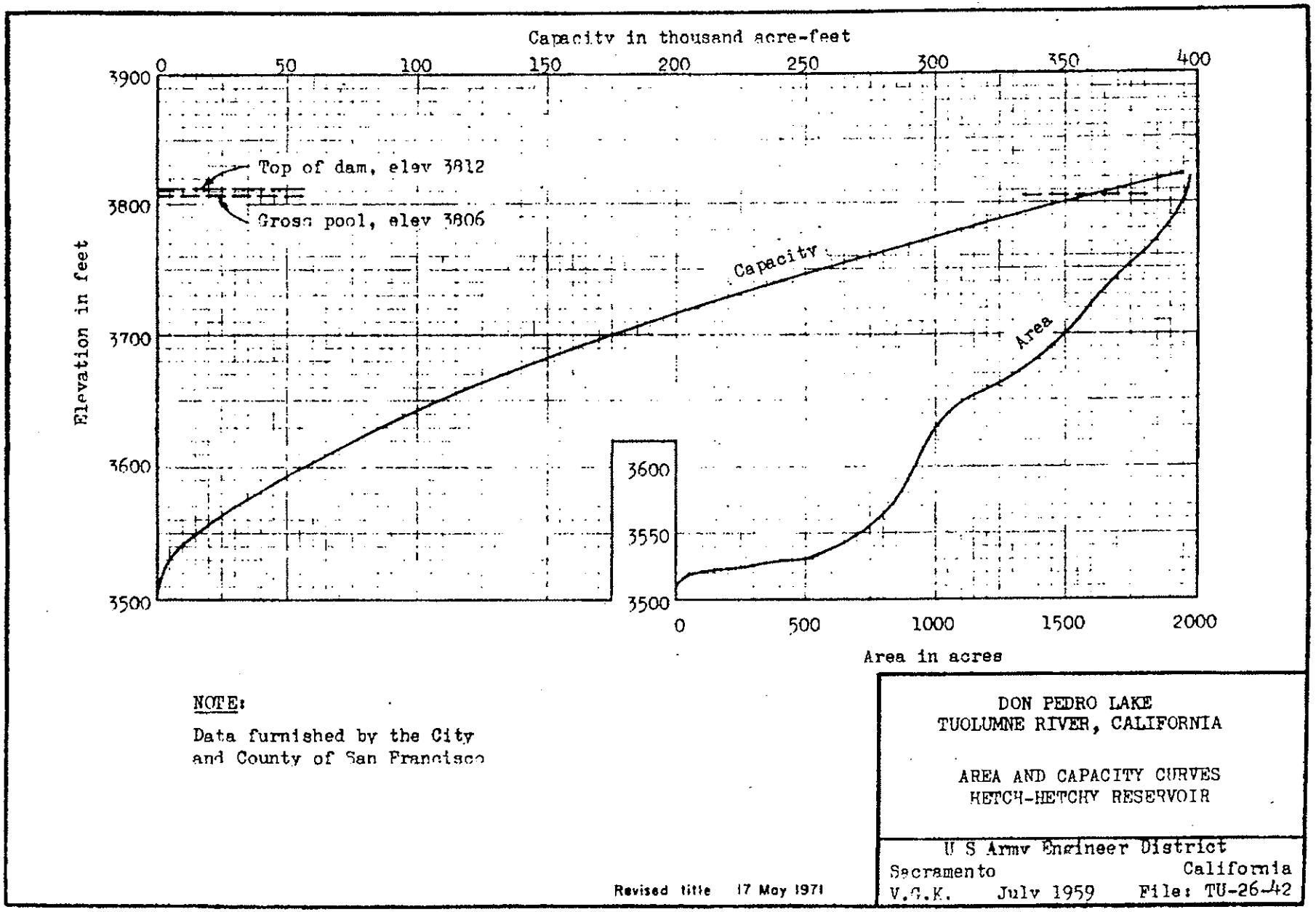


Sheet 2 of 2 Sheets CHART 23


BECHTEL CORPORATION
SAN FRANCISCO
TURLOCK IRRIGATION DISTRICT
MODESTO IRRIGATION DISTRICT
NEW DON PEDRO PROJECT
OUTLET WORKS
GENERAL ARRANGEMENT
PLAN & PROFILE
3867
3867-6-001
2
CHART 24
Revised portal location
REVISED PORTAL / STATIONING
REVISED
Drawing furnished by Bechtel Corporation
NOTES:
1. Outlet Works is Second Stage Construction.
NOTE:
Access Tunnel shall not be excavated past a point which is closer than 100 ft from the Diversion Tunnel while Diversion Tunnel is in operation for 1st Stage Construction.
PLAN
Scale 1" = 100'-0"
Scale 1" = 100'-0"
PROFILE @ ℄ OF ACCESS TUNNEL
N.T.S.
Powerhouse
Switchyard
Downstream Portal
Tuolumne River
Inlet Works
Inlet Works Tunnel
℄ Inclined Gate Track
℄ Power Tunnel
Outlet works
Curve Data
Δ = 53°35'22"
R = 750'
L = 701.48'
T = 378.77'
Curve Data
Δ = 48°40'30"
R = 75'
T = 33.92
L = 63.72
Curve Data
Δ = 74°30'38"
R = 50'
T = 38.04
L = 65.02
N 5°00'00" E
N 45°05'56" E
N 10°29'26" W
N 53°40'30" E
N 436,000
N 437,000
E 2,024,000
E 2,023,500
Sta. 1+00.00
Sta. 1+50.46
Sta. 1+90.93
Sta. 01+30.93
Sta. 02+31.27
Sta. 11+50
Sta. 14+12.69
Sta. 14+27.69
Uniform Slope
First or Second Stage Construction See Note
Second Stage Construction Only
℄ Div. Tunnel
El. 750
700
650
600
550
500
450
400
350
300




DON PEDRO LAKE, TUOLUMNE RIVER, CALIFORNIA
LOCATION OF RECREATION AREAS
CORPS OF ENGINEERS, SACRAMENTO, CALIF.
LEGEND
PROPOSED HIGHWAYS
EXISTING HIGHWAYS
SCALE
N
TO SHELLING 11 MI.
TO LA GRANGE 2 MI.
TUOLUMNE CO.
STANISLAUS CO.
TO MERCED FALLS 13 MI.
Roger Creek
TO COULTERVILLE 10 MI.
FLEMING MEADOWS REC. AREA
TUOLUMNE RIVER
DON PEDRO DAM
LAUGHLIN ISLAND
T.3S.
T.2S.
JENKINS HILL
830'
ISLAND 1008
Graveyard Creek
49 MINE ISLAND
DON PEDRO CAMP ISLAND
RIGHT ABUTMENT REC. AREA
ISLAND 950
ISLAND 825
ISLAND 831
MAX WATER SURFACE ELEVATION
BIG CREEK PENINSULA
NORMAL
ROAD
FLAT
Hatch Cr.
MARSH
TO COULTERVILLE 9 MI.
OLD DON PEDRO BAR RD.
Big Creek
FOOTHILL TUNNEL
T.2S.
T.1S.
AQUEDUCT ISLAND
MOCCASIN POINT REC. AREA
TO YOSEMITE VALLEY 40 MI.
HUNTING AREA
Kanaka Creek
PONDEROSA WAY
WARDS FERRY BRIDGE
T.1S.
R.16E.
R.15E.
R.15E.
R.14E.
TO SONORA 7 MI.
TO SONORA
TO KEYSTONE
Chinese Camp



NOTE:

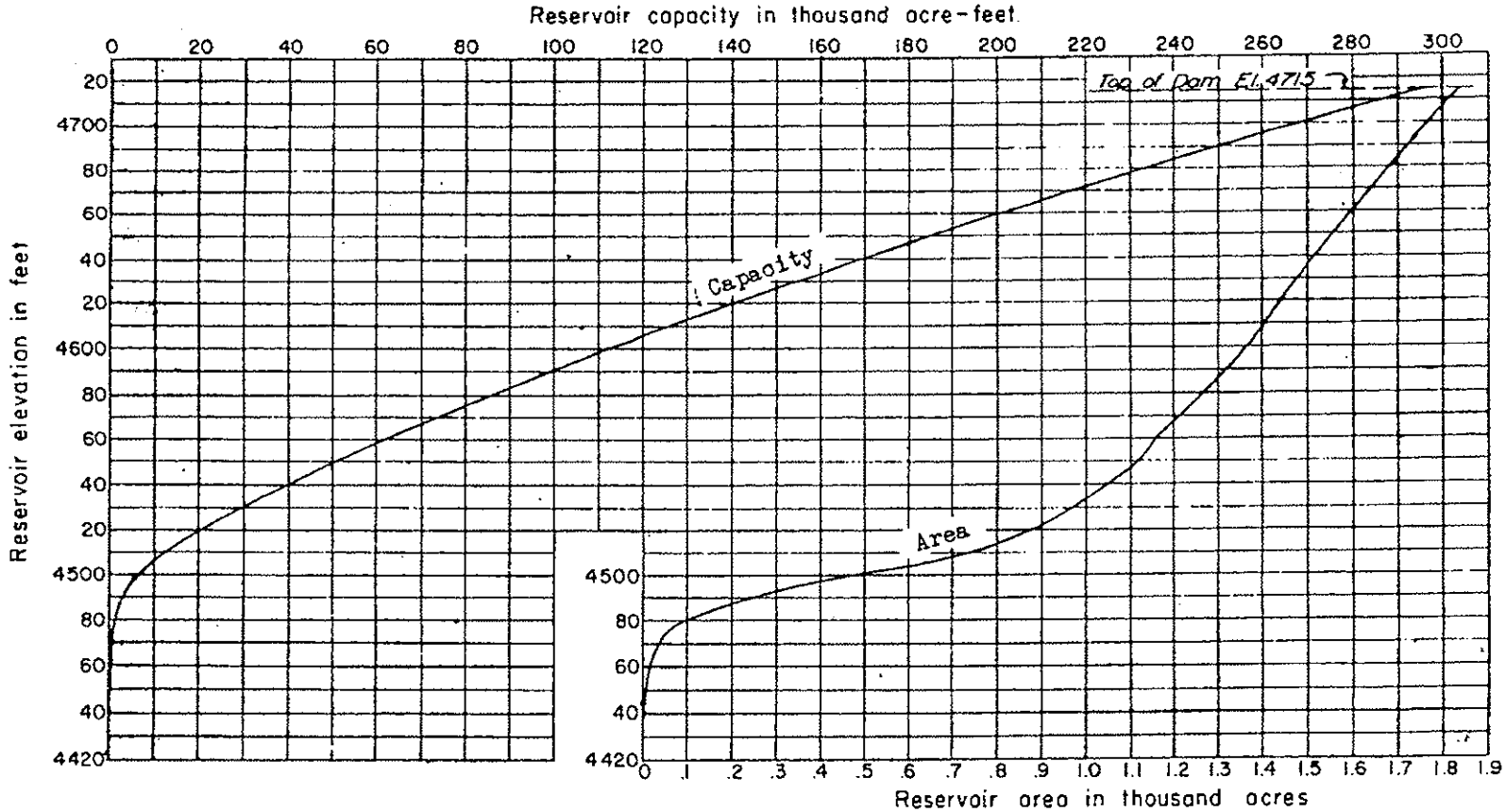
Data furnished by the City and County of San Francisco

DON PEDRO LAKE
TUOLUMNE RIVER, CALIFORNIA

AREA AND CAPACITY CURVES
HETCH-HETCHY RESERVOIR

U S Army Engineer District
Sacramento California
V.C.K. July 1959 File: TU-26-42

Revised title 17 May 1971



NOTE:

Data furnished by the City and County of San Francisco

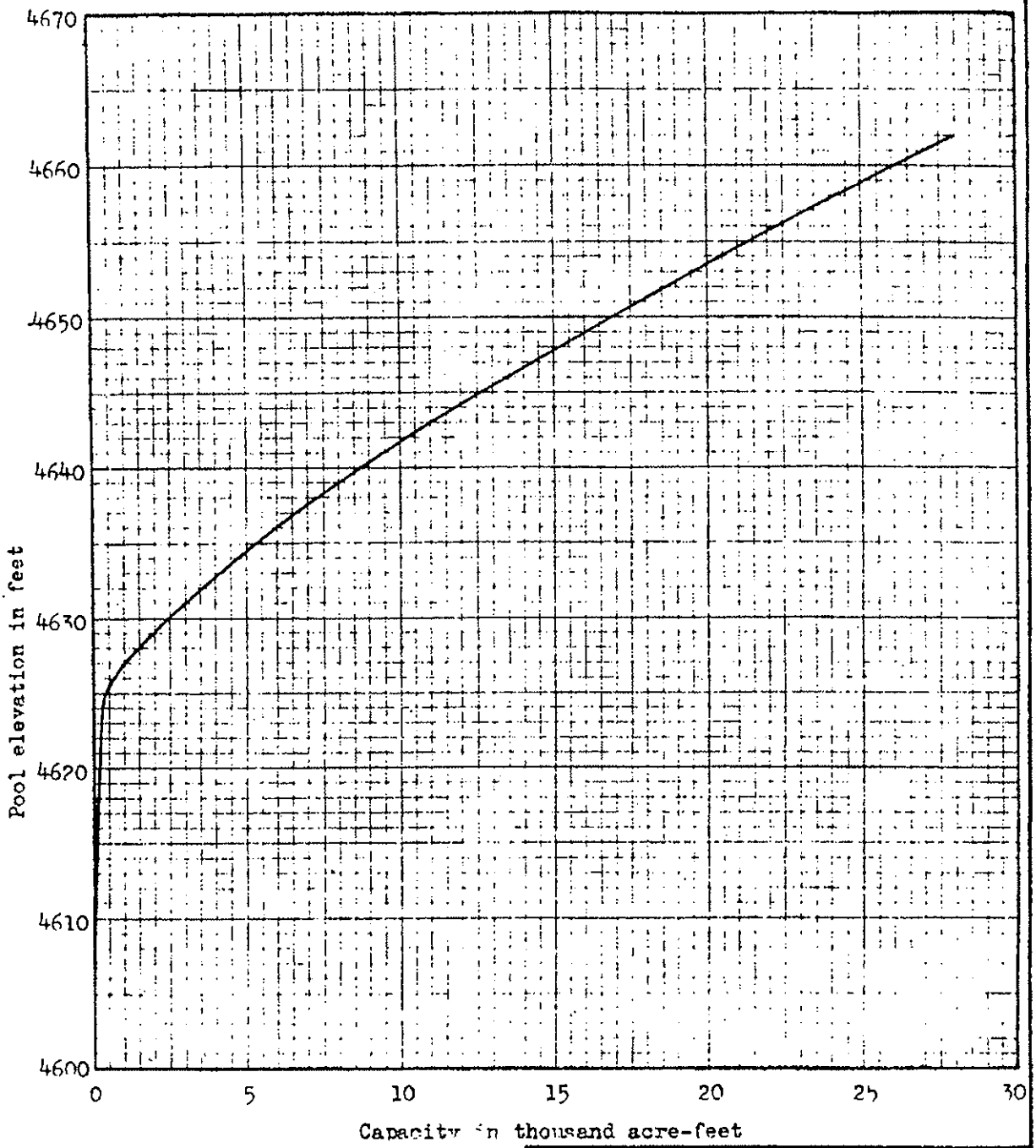
Revised title 17 May 1971

DON PEDRO LAKE
TUOLUMNE RIVER, CALIFORNIA

AREA AND CAPACITY CURVES
CHERRY VALLEY RESERVOIR
(LAKE LLOYD)

U S Army Engineer District
Sacramento California
L.R.B. August 1954 File: MU-26-52

CHART 28



Note:

Data furnished by City and county of San Francisco.

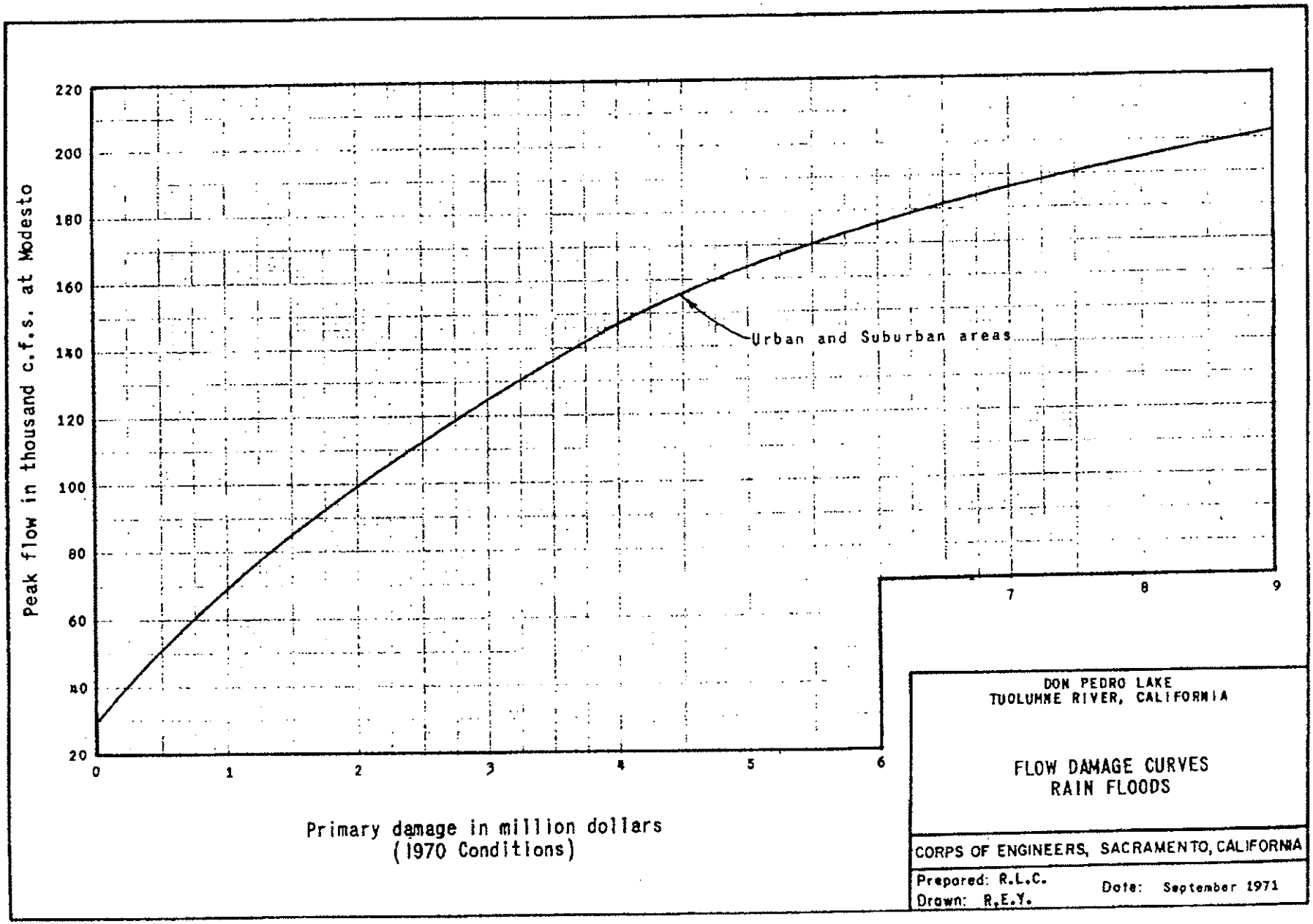
DON PEDRO LAKE
TUOLUMNE RIVER, CALIFORNIA

CAPACITY CURVE
LAKE ELEANOR

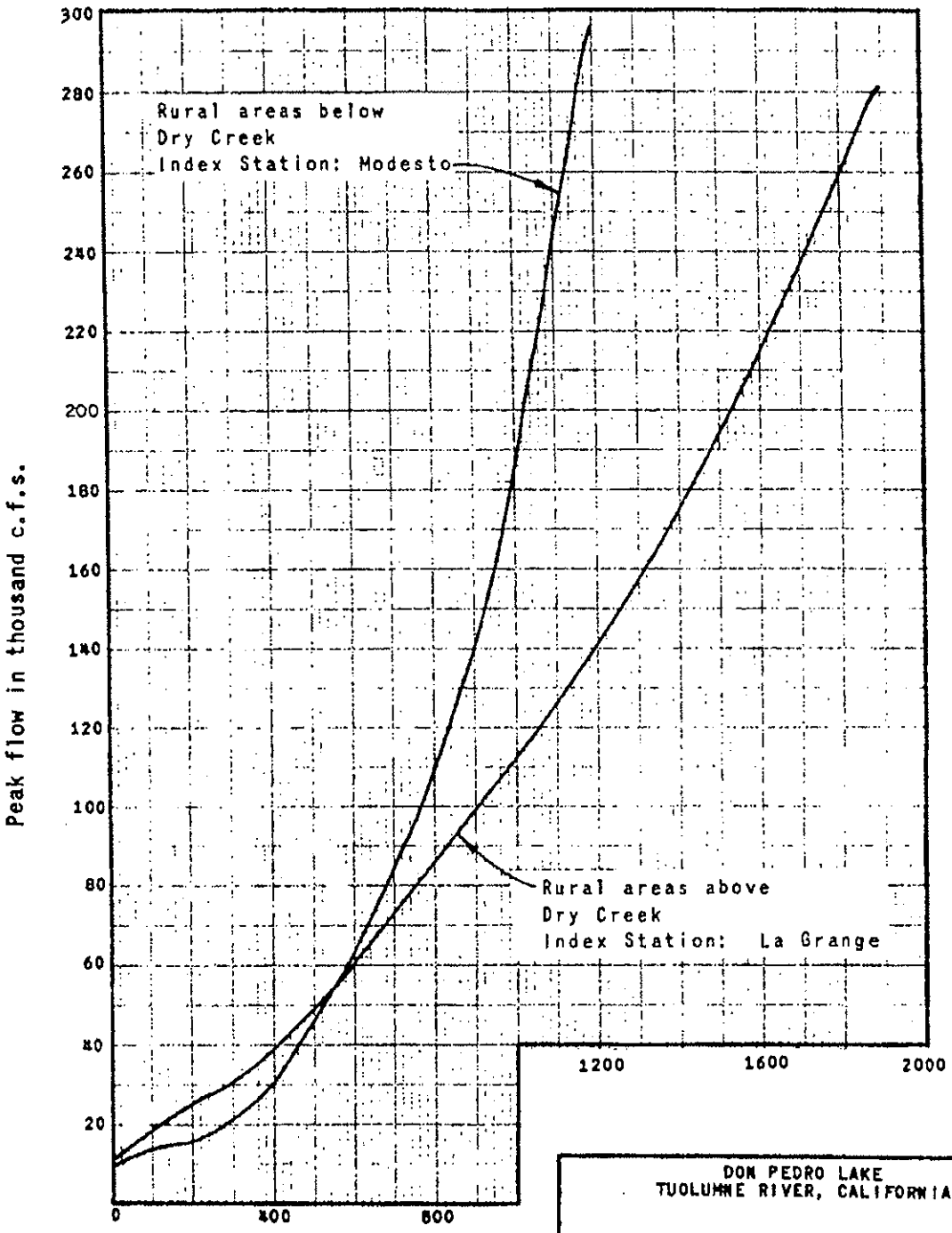
U S Army Engineer District
Sacramento California
A.C.C. 9 June 54 File: TU-26-47

Revised title 17 May 1971

CHART 29



Sheet 1 of 2 CHART 30



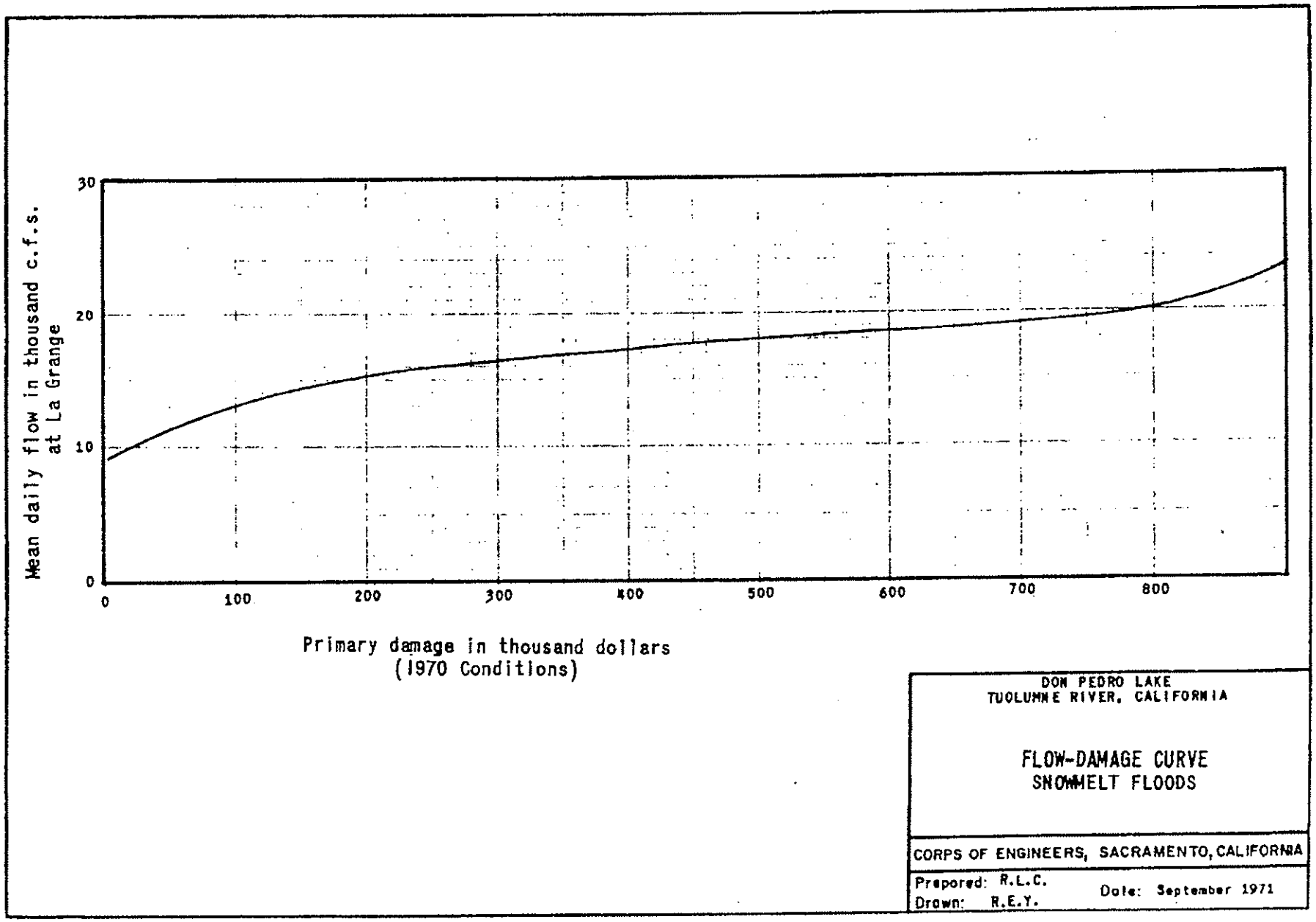
DON PEDRO LAKE
TUOLUMNE RIVER, CALIFORNIA

FLOW DAMAGE CURVES
RAIN FLOODS

CORPS OF ENGINEERS, SACRAMENTO, CALIFORNIA

Prepared: R.L.C.
Drawn: R.E.Y.
Date: September 1971

Sheet 2 of 2 CHART 30



DON PEDRO LAKE
TUOLUMNE RIVER, CALIFORNIA

FLOW-DAMAGE CURVE
SNOWMELT FLOODS

CORPS OF ENGINEERS, SACRAMENTO, CALIFORNIA

Prepared: R.L.C.
Drawn: R.E.Y.
Date: September 1971

CHART 31

FORECAST VERIFICATION DATA
NATURAL APRIL-JULY FLOWS
TULUMNE RIVER AT LA GRANGE

(Values in thousand acre-feet)

Year	Unimpaired runoff April-July	1 February		1 March		1 April		1 May	
		Fore-cast	Error	Fore-cast	Error	Fore-cast	Error	Fore-cast	Error
1936	1431					1412	-18		
1937	1418					1636	218	1636	218
1938	2164					1800	- 364	1800	-364
1939	584					600	16	540	- 44
1940	1301					1150	-151	1150	-151
1941	1706					1800	94	1900	194
1942	1671					1400	-271	1550	-121
1943	1372					1350	- 22	1350	- 22
1944	979					1070	91	1070	91
1945	1370					1450	80	1350	- 20
1946	1156					1350	194	1225	69
1947	680					770	90	730	50
1948	1183					650	-533	950	-223
1949	1026					1250	224	1100	74
1950	1180					1150	- 30	1210	30
1951	947					750	-197	750	-197
1952	2145					2400	255	2400	255
1953	1118					900	-218	900	-218
1954	1028	950	- 78	950	- 78	1150	122	1050	22
1955	846	1200	354	1020	174	750	- 96	850	4
1956	1668	2300	632	2000	332	1650	- 18	1780	112
1957	1027	900	-127	820	-207	820	-207	800	-227
1958	1902	1080	-822	1230	-672	1900	- 2	1800	-102
1959	615	850	235	960	345	670	55	600	- 15
1960	721	660	- 61	800	79	750	29	720	- 1
1961	528	700	172	500	- 28	520	- 8	480	-48
1962	1317	750	-567	1260	- 57	1440	123	1340	23
1963	1418	700	-718	640	-778	850	-568	1140	-278
1964	762	920	158	640	-122	600	-162	550	-212
1965	1483	1560	77	1370	-113	1260	-223	1440	- 43
1966	767	1160	393	1020	253	760	- 7	680	- 87
1967	2161	1320	-841	1100	-1061	1425	-736	2060	-101
1968	648	880	232	830	182	740	92	640	- 8
1969	2405	2000	-405	2500	95	2450	45	2500	95
1970	920	1300	380	1170	250	1080	160	1030	110
Average			368		284		163		109
Extreme			-841		-1061		-736		-364

Note: All forecasts prepared and published by State of California.

CHART 32

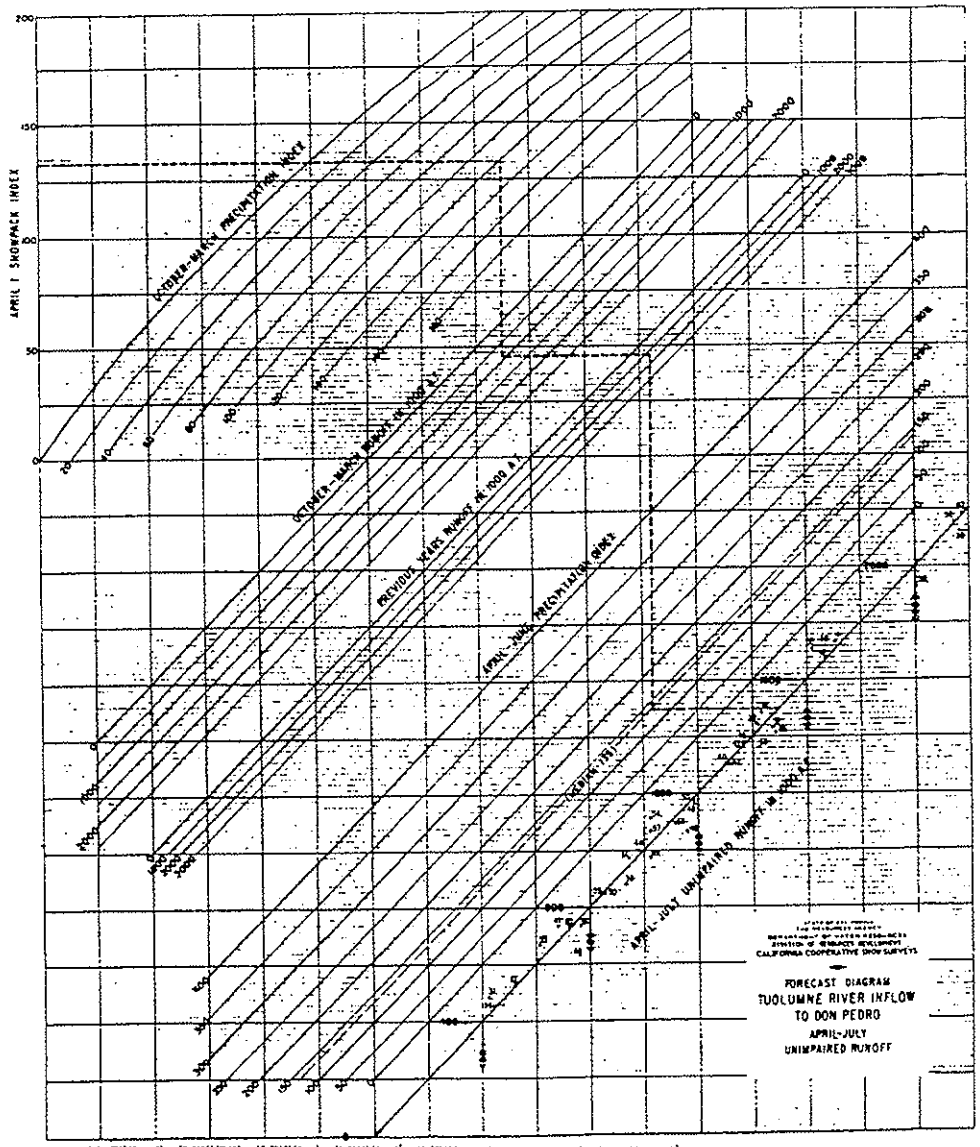


Fig. 1

NOTE:
Data shown for 1967 snowmelt forecast

DON PEDRO LAKE
Tuolumne River, California

SNOWMELT FORECAST CRITERIA

CORPS OF ENGINEERS, SACRAMENTO, CALIFORNIA

Prepared O.O.O.
Drawn: R.E.Y.

Date: September 1971

Sheet 1 of 2 Sheets CHART 33

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES
DIVISION OF RESOURCES DEVELOPMENT
CALIFORNIA COOPERATIVE SNOW SURVEYS

FORECAST COMPUTATION FORM
TUOLUMNE RIVER, INFLOW TO DON PEDRO
APRIL - JULY UNIMPAIRED RUNOFF

OCTOBER - MARCH PRECIPITATION

Precipitation Station (1)		(2)	Oct (3)	0.3 × Col 3 (4)	Nov (5)	0.6 × Col 5 (6)	Dec (7)	0.7 × Col 7 (8)	Jan (9)	0.8 × Col 9 (10)	(11)	Station Index (12)	Feb (13)	0.9 × Col 13 (14)	(15)	March (16)	Station Index (17)
DUDLEYS	2539	25.62	0	—	7.88	—	7.88	—	4.97	—	—	—	1.14	—	—	—	—
			—	0	—	4.61	—	5.52	—	7.10	17.31	68	—	4		9.78	38
HETCH HETCHY	3939	22.03	0	—	6.60	—	8.47	—	7.88	—	—	—	.58	—	—	—	—
			—	0	—	3.96	—	5.93	—	6.30	16.19	74	—	3		9.82	45
PINECREST	6893	26.51	0	—	10.19	—	8.84	—	10.78	—	—	—	.87	—	—	—	—
			—	0	—	6.11	—	5.98	—	8.60	20.69	78	—	3		15.7	59
SONORA	8353	21.36	0	—	6.87	—	7.57	—	7.18	—	—	—	.78	—	—	—	—
			—	0	—	4.12	—	6.30	—	5.72	16.14	71	—	4		6.36	30
YOSEMITE	9855	23.61	0	—	7.12	—	10.87	—	8.08	—	—	—	.83	—	—	—	—
			—	0	—	4.27	—	7.61	—	6.46	18.34	78	—	4		10.86	45

Total 369 — Basin index October - January 74
Total 19 — February 4
Total 217 — March 43

SNOW PACK INDEX

(1)	Snow Course Name	No.	(2)	(3)	February 1 (4)–(9)	March 1 (10)–(15)	April 1 (16)	(17)	(18)	(19)	(20)	(21)
2 4	DANA MEADOWS	137	1.2	28.3			329	36.3	.84	1.00	37.3	127
2 4 4A	TIOGA PASS	160	1.0	25.9			329	32.9	.84	0.8	33.7	131
2 4	ELLERY LAKE	284	1.2	30.1			329	37.2	.84	1.00	38.2	127
2345	VIRGINIA LAKES	180	0.79	17.0			322	29.6	2.09	1.5	31.1	183
234	CENTER MOUNT.	161	1.34	35.4			324	49.4	2.09	3.1	52.5	148
2 4	RAFFERTY MDWS.	158	1.2	30.2			329	47.0	.84	1.0	48.0	159
234	BOND PASS	169	1.88	42.4			408	64.6	3.09	-5.6	59.0	139
2345	SNOW FLAT	176	1.6	41.2			330	50.6	.84	1.3	51.9	124
234	HORSE MEADOW	162	1.9	45.2			409	65.5	3.09	-5.9	59.6	132
2345	L. RELIEF VALLEY	138	1.44	38.5			408	58.3	3.19	-4.5	50.8	132
2345	BIN FLAT	179	1.3	33.8			330	29.4	.84	1.1	30.5	90
2345	BEEHIVE MEADOW	176	1.14	26.4			411	33.1	4.01	-4.4	28.7	109

* HETCH HETCHY
\+ PINECREST

February 1 Snow Pack Index: 32
March 1 Snow Pack Index: 14
Total: 1603
April 1 Snow Pack Index: 133

NOTE:
Data shown ... snowmelt fore...

APRIL - JUNE PRECIPITATION

Precipitation Station (18)	(19)	April (20)	(21)	May (22)	(23)	(24)	June (25)	(26)	(27)
DUDLEYS	3.54								
HETCH HETCHY	3.17								
PINECREST	3.98								
SONORA	2.80								
YOSEMITE	3.25								

Total — Basin Index April; Total — May; Total — June

Fig. 2

PRECIPITATION INDEXES

Indexes	February 1	March 1	April 1	May 1	June 1	July 1
October - January			74			
February	20		4			
March	20	20	43			
October - March			121			
April				46		
May				6	6	
June						
April - June	135	135	135			

OCTOBER - MARCH RUNOFF

Period	February 1	March 1	April 1
October - January Runoff			433
February Runoff	128		116
March Runoff	152	152	306
October - March Runoff			855

FORECAST SUMMARY

Date of Forecast	April 1 Snow Pack Index	October - March Precipitation Index	[illegible]	[illegible]	April - June Precipitation Index	[illegible]	Median Forecast	Reasonable Range: Exceed	[illegible]
February 1									
March 1									
April 1	133	121	785	135			1500	1380	1760
May 1									
June 1									

FORECAST RANGE DIAGRAM

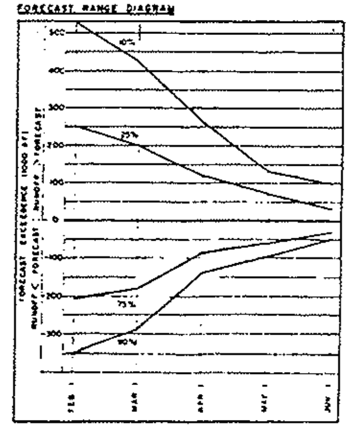


Fig 3

DON
TUOLUMNE

SNOWMELT FO

CORPS OF ENGINEERS,
Prepared: D.D.D.
Drawn: T.G.K.

RAIN FLOOD FORECASTING CRITERIA

SAN PEDRO LAKE
TORRANCE AREA, CALIFORNIA

CORPS OF ENGINEERS — SACRAMENTO, CALIFORNIA

Prepared: D.W.R.

Drawn: R.E.T. & D.E.L.

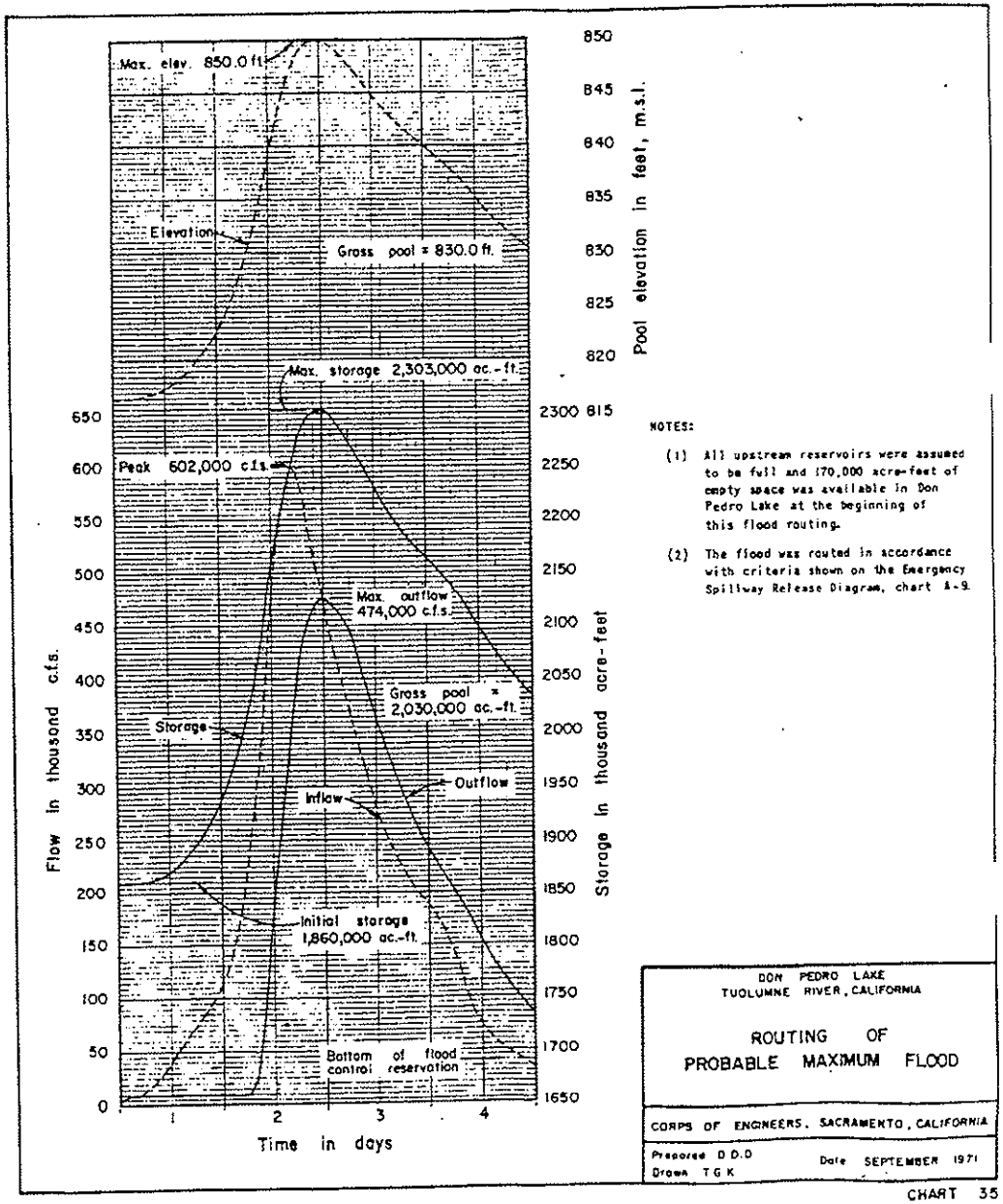
Date: September 1971

CHART 54

(Figure 8)

Adjusted runoff (inches)

Index for area above San Pedro Lake



NOTES:

(1) All upstream reservoirs were assumed to be full and 170,000 acre-feet of empty space was available in Don Pedro Lake at the beginning of this flood routing.

(2) The flood was routed in accordance with criteria shown on the Emergency Spillway Release Diagram, chart A-9.

DON PEDRO LAKE
TUOLUMNE RIVER, CALIFORNIA

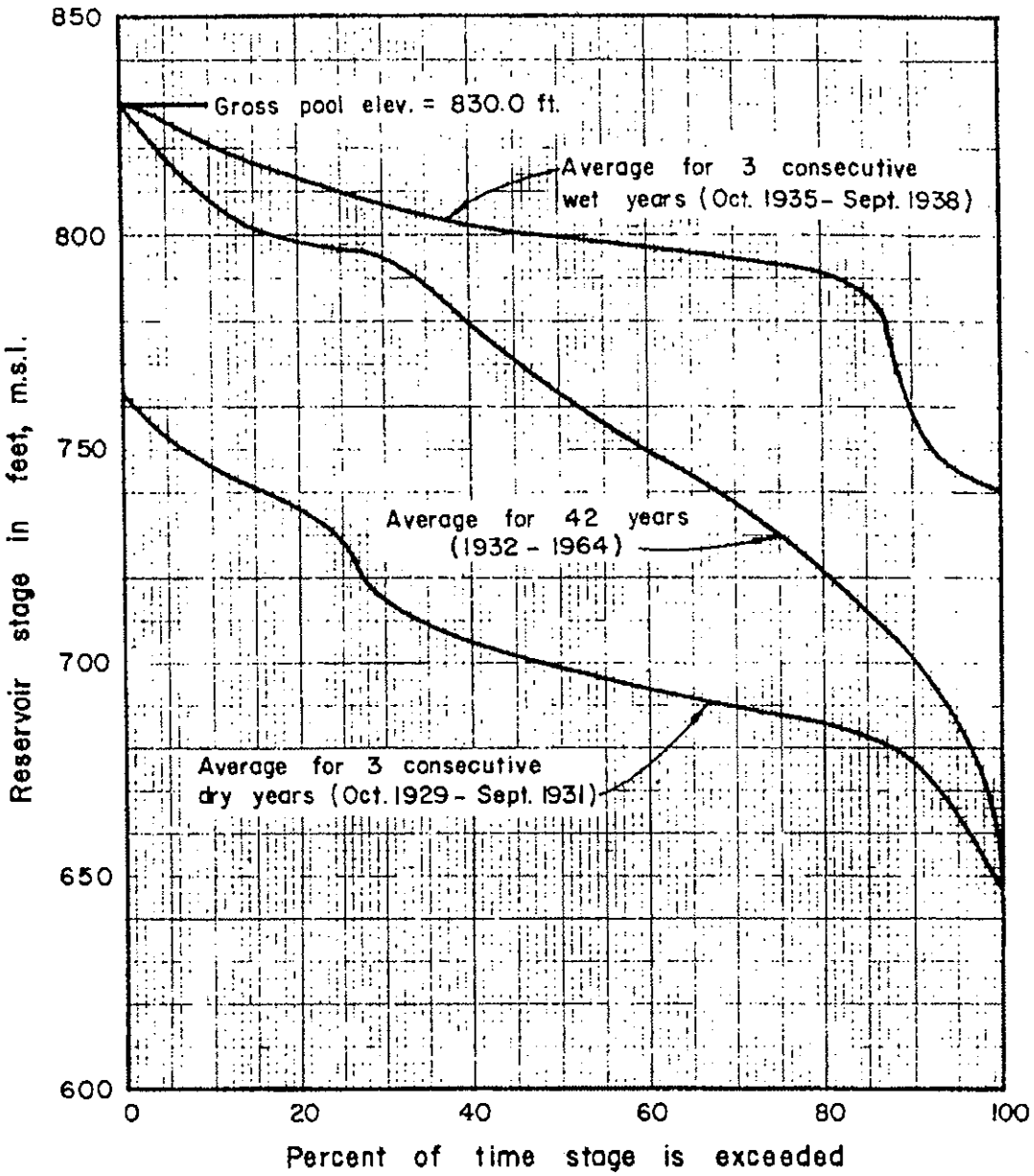
ROUTING OF
PROBABLE MAXIMUM FLOOD

CORPS OF ENGINEERS, SACRAMENTO, CALIFORNIA

Prepared D.D.D
Drawn T.G.K

Date SEPTEMBER 1971

CHART 35



NOTE:

Curves based on hypothetical monthly routings, furnished by Modesto and Turlock Irrigation Districts.

DON PEDRO LAKE
TUOLUMNE RIVER, CALIFORNIA

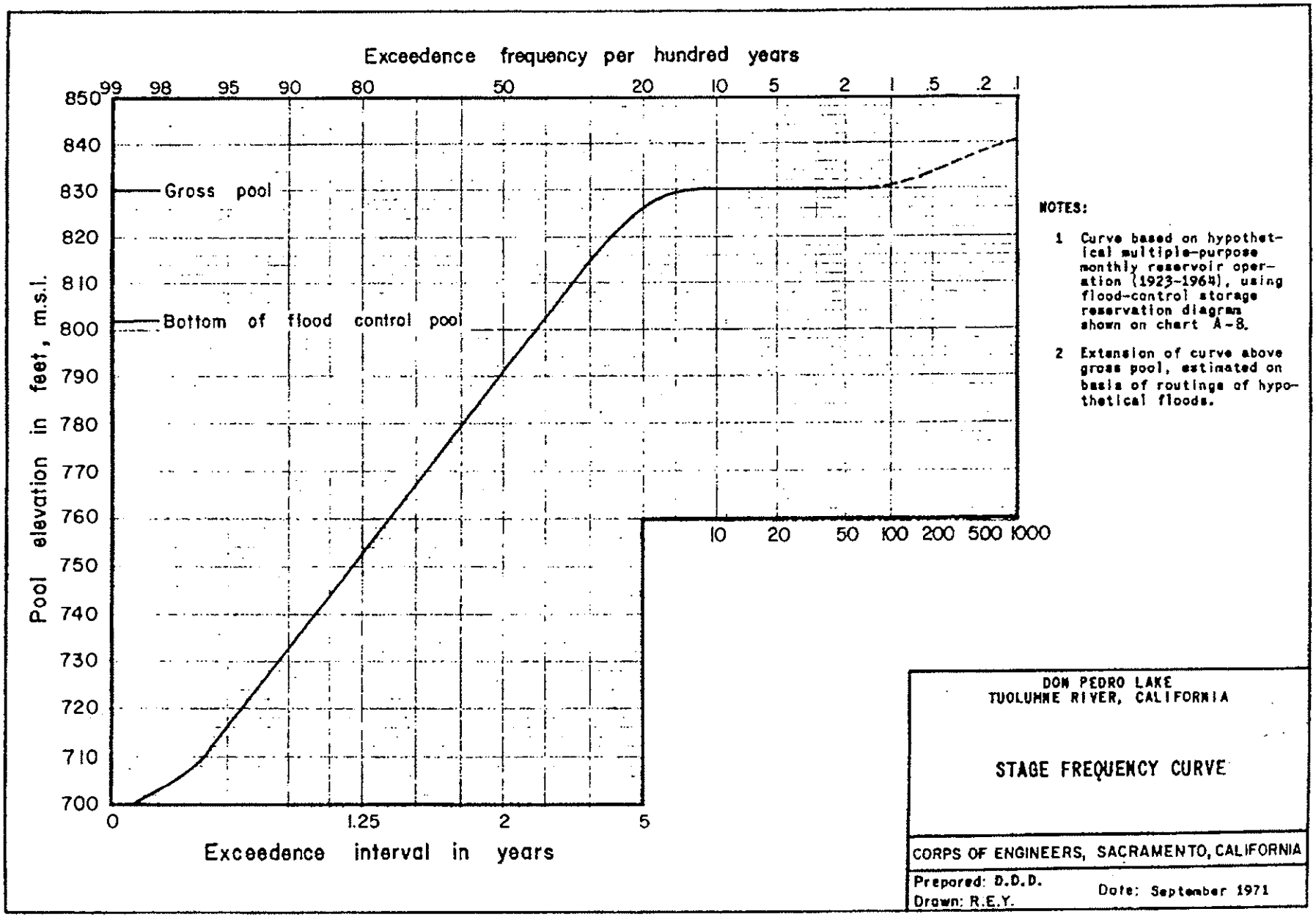
STAGE - DURATION CURVES

CORPS OF ENGINEERS, SACRAMENTO, CALIFORNIA

Prepared: D.D.D.
Drawn: T.G.K.

Date: September 1971

CHART 36



NOTES:

1 Curve based on hypothetical multiple-purpose monthly reservoir operation (1923-1964), using flood-control storage reservation diagram shown on chart A-8.

2 Extension of curve above gross pool, estimated on basis of routings of hypothetical floods.

DON PEDRO LAKE
TUOLUMNE RIVER, CALIFORNIA

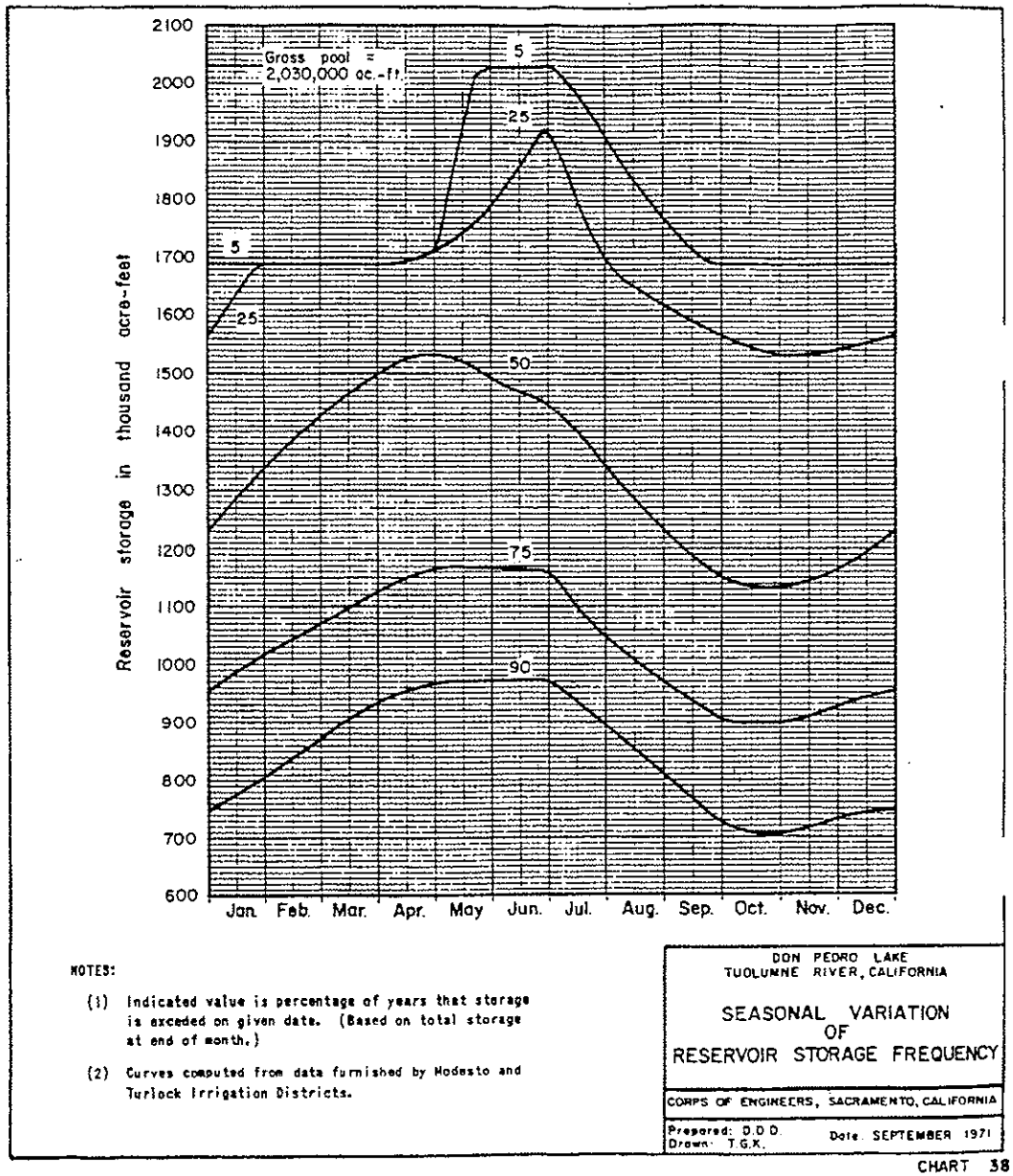
STAGE FREQUENCY CURVE

CORPS OF ENGINEERS, SACRAMENTO, CALIFORNIA

Prepared: D.D.D.
Drawn: R.E.Y.

Date: September 1971

CHART 37



NOTES:

(1) Indicated value is percentage of years that storage is exceeded on given date. (Based on total storage at end of month.)

(2) Curves computed from data furnished by Modesto and Turlock Irrigation Districts.

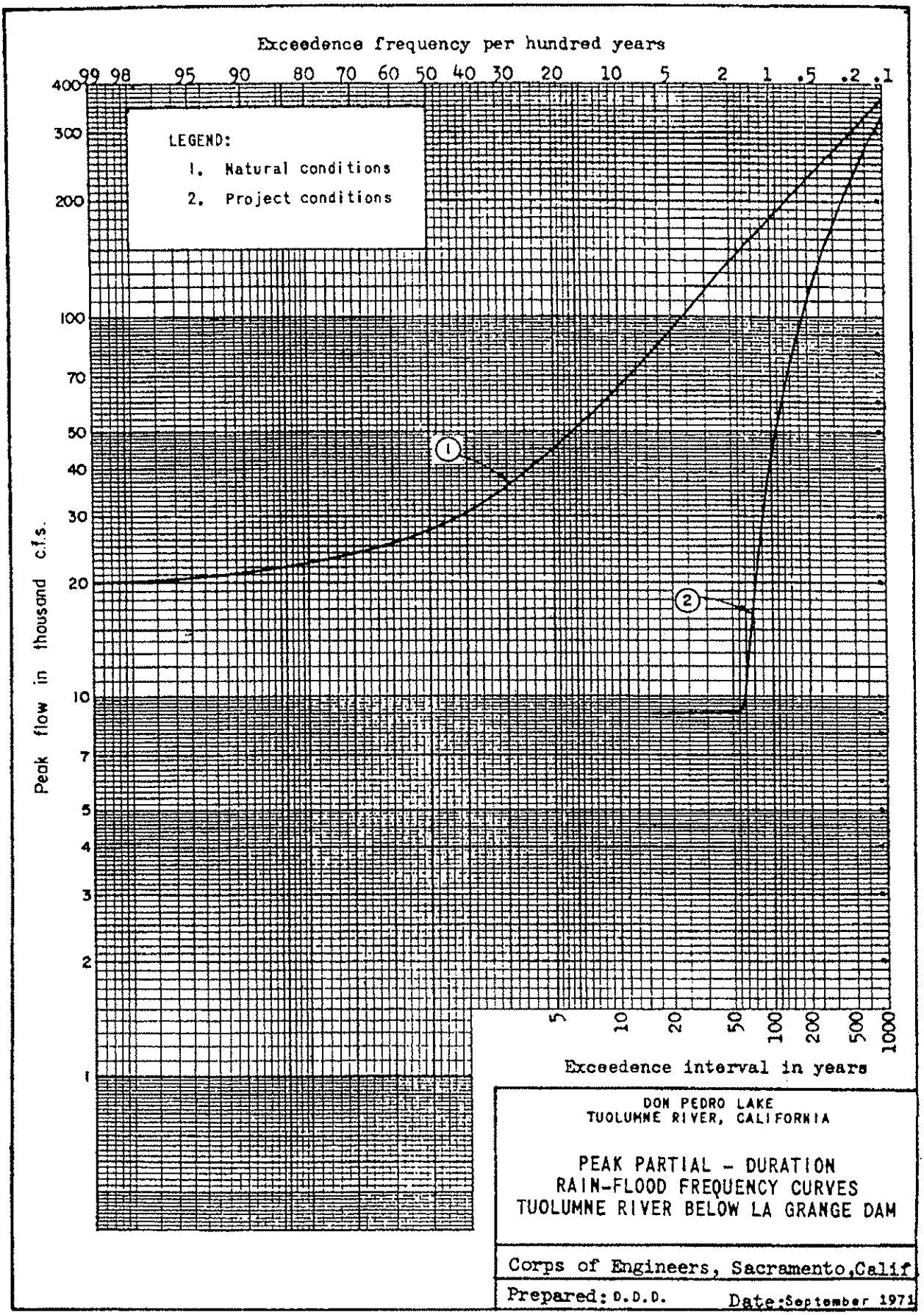
DON PEDRO LAKE
TUOLUMNE RIVER, CALIFORNIA

SEASONAL VARIATION OF RESERVOIR STORAGE FREQUENCY

CORPS OF ENGINEERS, SACRAMENTO, CALIFORNIA

Prepared: D.D.D. Date: SEPTEMBER 1971
Drawn: T.G.K.

CHART 38



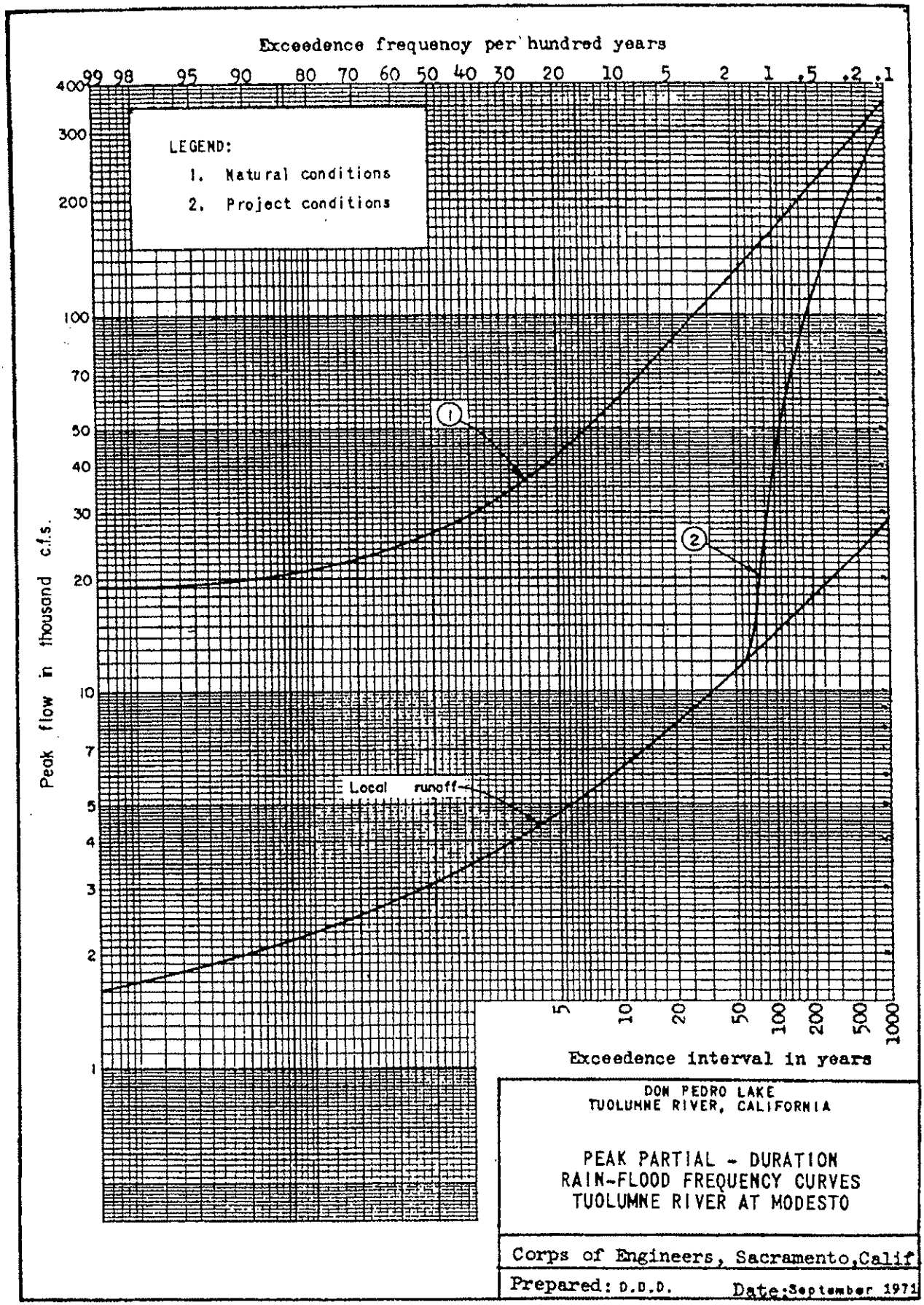
DON PEDRO LAKE
TUOLUMNE RIVER, CALIFORNIA

PEAK PARTIAL - DURATION
RAIN-FLOOD FREQUENCY CURVES
TUOLUMNE RIVER BELOW LA GRANGE DAM

Corps of Engineers, Sacramento, Calif

Prepared: D.D.D. Date: September 1971

CHART 39



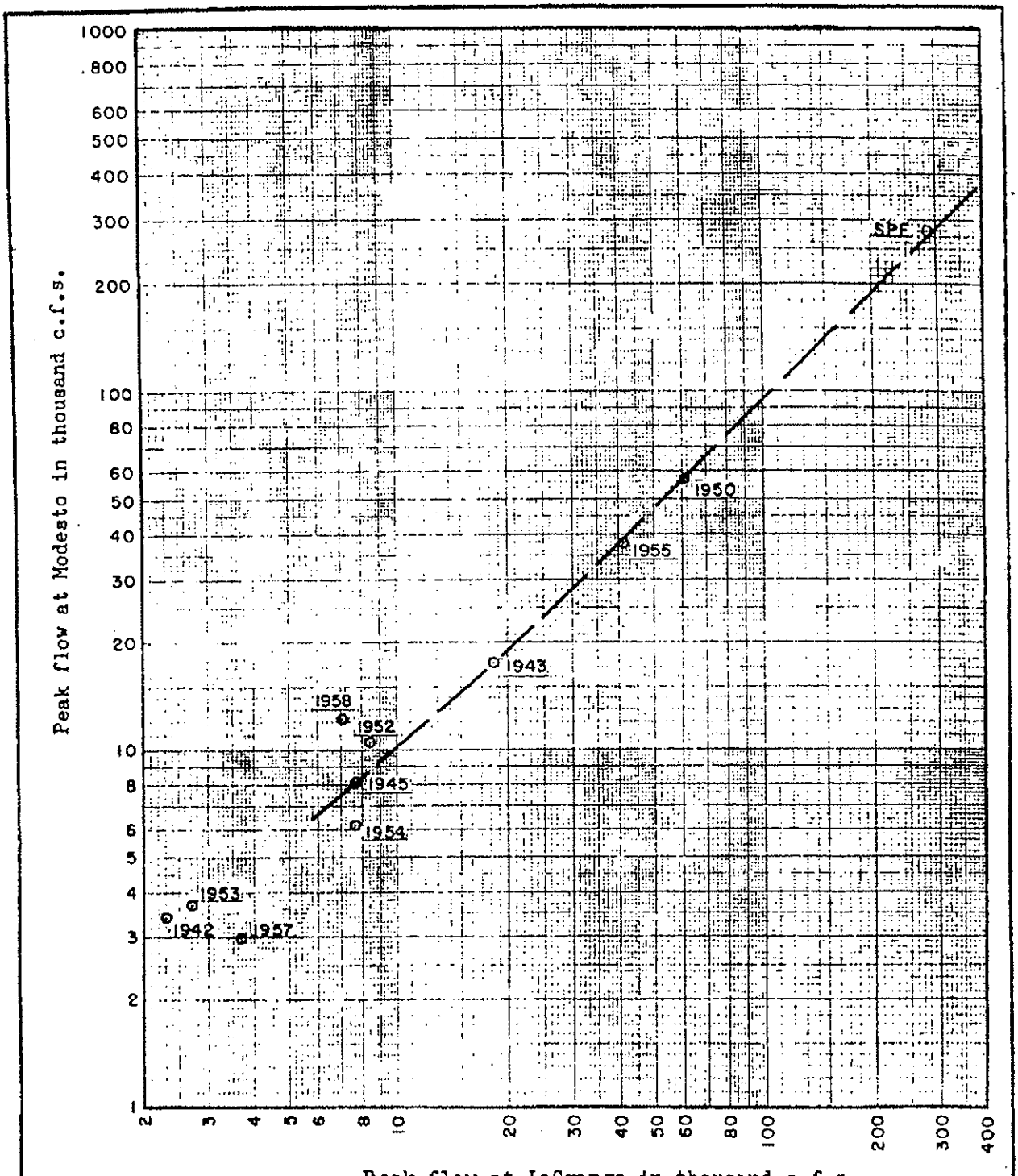
DON PEDRO LAKE
TUOLUMNE RIVER, CALIFORNIA

PEAK PARTIAL - DURATION
RAIN-FLOOD FREQUENCY CURVES
TUOLUMNE RIVER AT MODESTO

Corps of Engineers, Sacramento, Calif

Prepared: D.D.D. Date: September 1971

CHART 40



Note:
Values are observed rain-flood flows

Revised title 17 May 1971

DON PEDRO LAKE
TUOLUMNE RIVER, CALIFORNIA

RELATION OF RAINFLOODS
AT MODESTO AND LAGRANGE

U S Army Engineer District
Sacramento California
V.C.K. Mar 1961 File: TU-26-107

CHAP 4

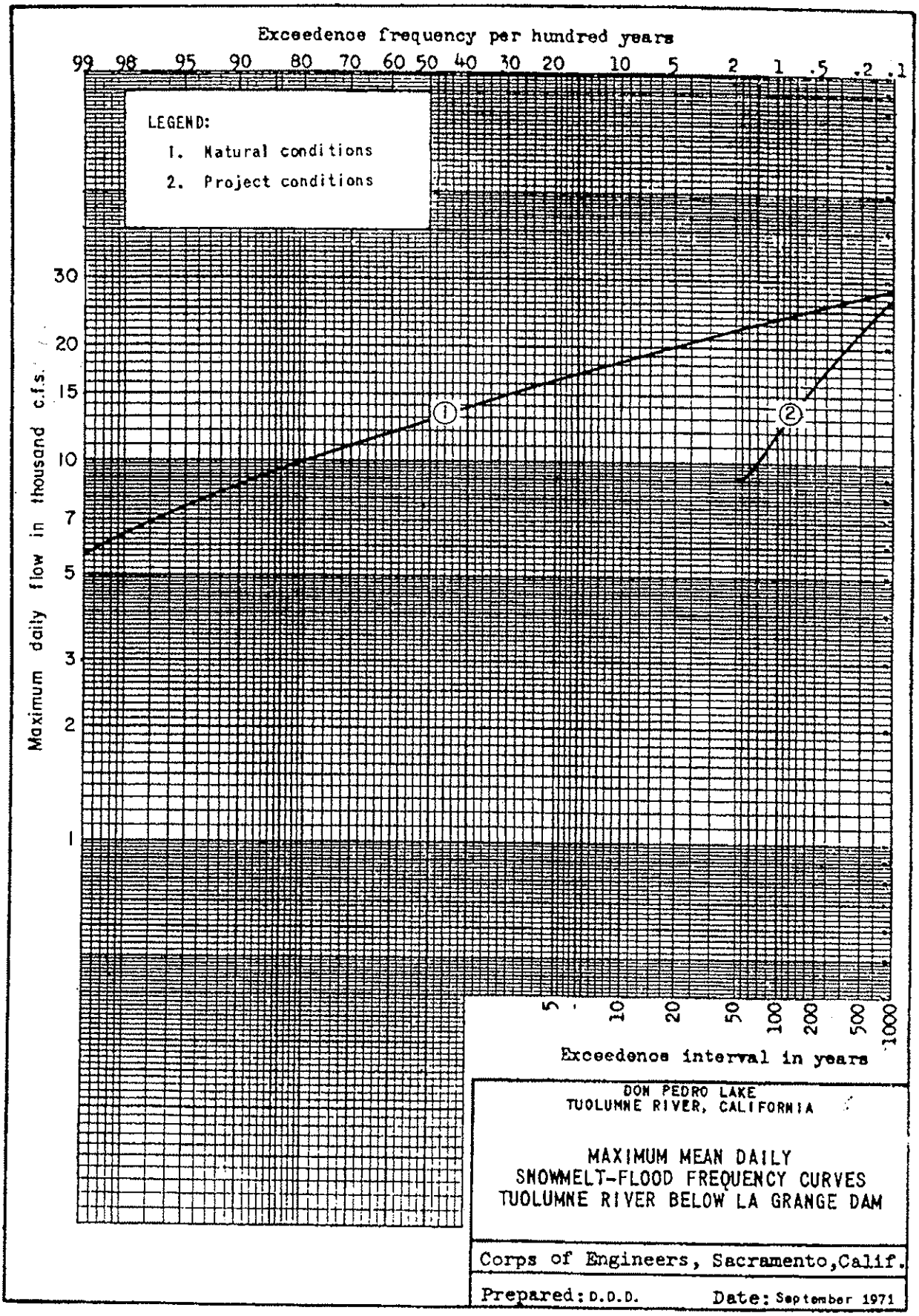
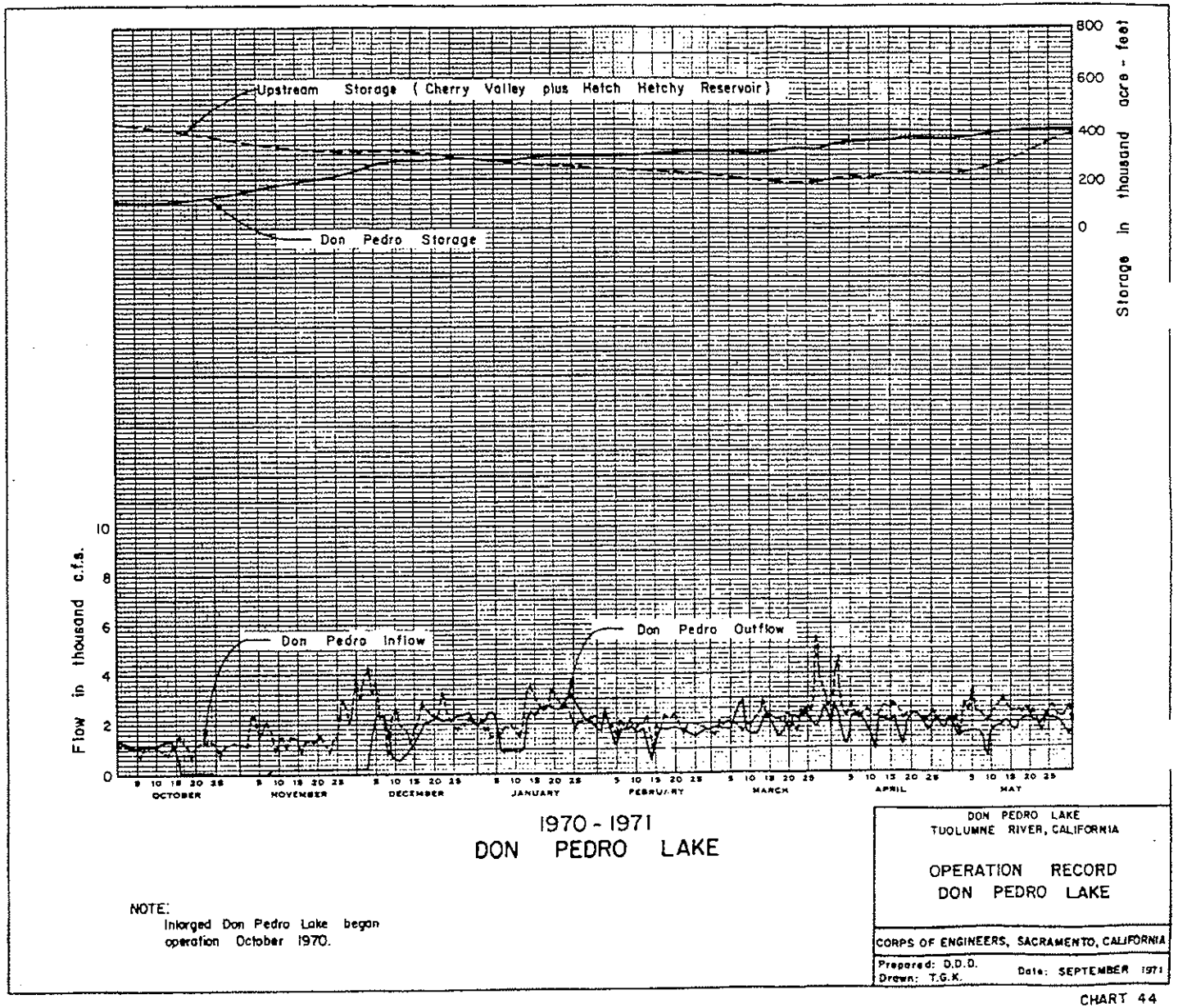


CHART 42

RESERVOIR OPERATION RECORD
(1949 - 1970)

RESERVOIR OPERATION RECORD
(1949-1970)

RESERVOIR OPERATION RECORD
(1949-1970)



1970 - 1971
DON PEDRO LAKE

NOTE:
Inlarged Don Pedro Lake began operation October 1970.

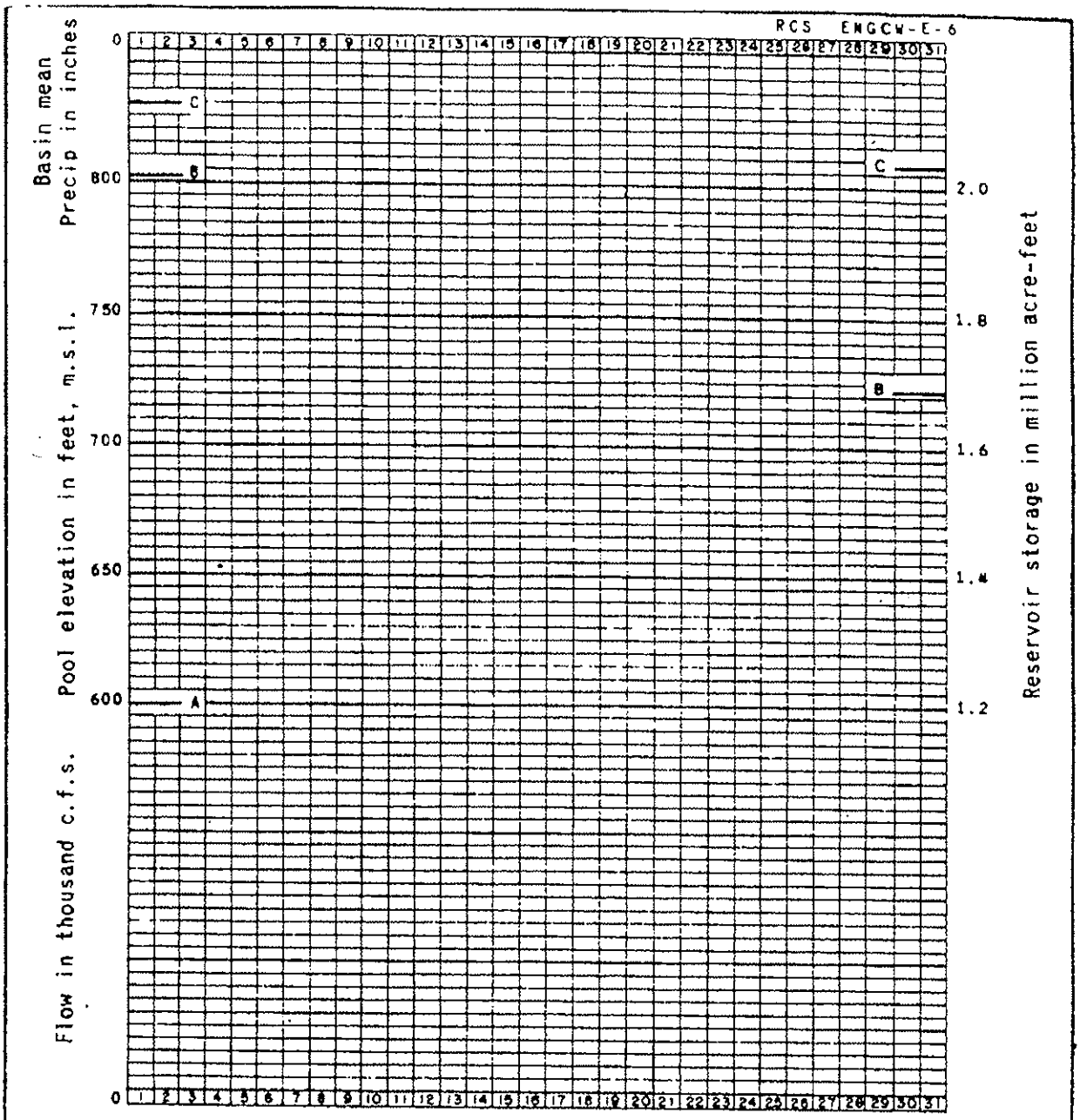
DON PEDRO LAKE
TUOLUMNE RIVER, CALIFORNIA

OPERATION RECORD
DON PEDRO LAKE

CORPS OF ENGINEERS, SACRAMENTO, CALIFORNIA

Prepared: D.D.D.
Drawn: T.G.K.
Date: SEPTEMBER 1971

CHART 44



A. Min. power pool elev: 600.0 ft.
storage: 309,000 ac-ft

B. Bottom flood-control reservation:
elev: 802.0 ft.
storage: 1,690,000 ac-ft

C. Gross pool elev: 830.0 ft.
storage: 2,030,000 ac-ft

Release capacities @ pool elev. 830.0 ft.
Outlet works - - - - - - 7,370 c.f.s.

Powerhouse:
Flood control valve - - 3,140 c.f.s.
Turbines - - - - - - - - 4,500 c.f.s.

MONTHLY RESERVOIR OPERATION

DON PEDRO LAKE

(OPERATED JOINTLY BY TURLOCK AND MODESTO IRRIGATION DISTRICTS)

TUOLUMNE RIVER, CALIFORNIA

DRAINAGE AREA: 1,533 SQ. MILES

SOUTH PACIFIC DIVISION
SACRAMENTO DISTRICT
SACRAMENTO, CALIFORNIA

SPK FORM 359
1 JUL. 66

CHART 45

REPORT ON RESERVOIR REGULATION FOR FLOOD CONTROL

DON PEDRO DAM AND LAKE TUOLUMNE RIVER, CALIFORNIA

APPENDIX A
STANDING INSTRUCTIONS TO DAMTENDERS INCLUDING EMERGENCY SPILLWAY OPERATIONS AND FLOOD CONTROL REGULATIONS

AUGUST 1972

Department of the Army
Sacramento District, Corps of Engineers
Sacramento, California

REPORT ON RESERVOIR REGULATION
FOR FLOOD CONTROL

DON PEDRO DAM AND LAKE
TUOLUMNE RIVER, CALIFORNIA

APPENDIX A
STANDING INSTRUCTIONS TO DAMTENDERS
INCLUDING EMERGENCY SPILLWAY OPERATIONS
AND FLOOD CONTROL REGULATIONS

TABLE OF CONTENTS

LIST OF CHARTS

Chart No.	
A-1	Area and Capacity Curves
A-2	Area and Capacity Tables (15 sheets)
A-3	Discharge Rating Curves (River Outlet Works)
A-4	Discharge Rating Curves (Flood Control Valve and Turbines)
A-5	Spillway Rating Curves (Gates fully open)
A-6	Spillway Rating Curves (Gates partially open)
A-7	Stage Discharge Rating Curves
A-8	Flood Control Diagram
A-9	Emergency Spillway Release Diagram

REPORT ON RESERVIOR REGULATION
FOR FLOOD CONTROL

DON PEDRO DAM AND LAKE
TUOLUMNE RIVER, CALIFORNIA

APPENDIX A
STANDING INSTRUCTIONS TO DAMTENDERS
INCLUDING EMERGENCY SPILLWAY OPERATIONS
AND FLOOD CONTROL REGULATIONS

PART I - STANDING OPERATING INSTRUCTIONS

1. GENERAL

a. This appendix to the "Report on Reservoir Regulation for Flood Control, Tuolumne River Basin, California" is prepared in accordance with instructions contained in EM 1110-2-3600, paragraph 4-07, (Standing Instructions to Damtenders) and pertains to duties and responsibilities of the damtender in connection with the functional operation of Don Pedro Dam and Lake, and the reporting of required hydrologic data.

b. Operational instructions to the damtender are briefly outlined with specific emphasis on his duties and responsibilities during extreme flood emergencies when communication facilities between him and his operating office (Modesto and Turlock Irrigation Districts) may have been disrupted. It is designed to be used independently as an emergency flood control regulation guide, or in conjunction with the "Report on Reservoir Regulation for Flood Control, Don Pedro Dam and Lake, Tuolumne River, California".

2. FLOOD CONTROL OPERATION REQUIREMENTS

a. Don Pedro Dam and Lake will be operated for flood control in accordance with flood control regulations prescribed by the Secretary of the Army, a copy of which is contained in this appendix. Accompanying the regulations are the flood control diagram, chart A-8, and the emergency spillway release diagram, chart A-9, which together define the requirements for flood control operation of Don Pedro Lake. The flood control objectives for Don Pedro Lake are to restrict flows in Tuolumne River downstream of Don Pedro Dam to non-damaging rates, insofar as possible and to minimize damage along Lower San Joaquin River.

b. A maximum of 340,000 acre-feet of space is dedicated to flood control during the winter rain flood season as shown on the flood control diagram. During the snowmelt season, flood control space requirements are defined by the parameter lines on the flood control diagram in terms of space required versus predicted snowmelt runoff. Capacity curves are shown on chart A-1 and area and capacity tables are listed on chart A-2.

runoff downstream to recede, maximum releases should be regulated as closely as possible by gradually closing the river outlet gates and thereafter restricting outflows according to the induced-surcharge curve of the emergency spillway release diagram. Accordingly, it is essential that such releases be made immediately in order that it will not subsequently become necessary to make larger releases. For this reason the reservoir operators at the dam should be thoroughly familiar with the emergency spillway release diagram and should be authorized to initiate use of the diagram, if required, when communication with Modesto and Turlock Irrigation Districts office is disrupted.

6. STANDING INSTRUCTIONS DURING FLOOD EMERGENCY

Whenever communications between the Turlock and Modesto Irrigation Districts office and the damtender are broken during a flood period, the damtender shall continue to operate in accordance with the latest instructions until communications are restored or until emergency spillway operation, in accordance with paragraph 5 above, becomes necessary.

7. OPERATIONAL REQUIREMENTS

a. Don Pedro Lake is operated by Turlock and Modesto Irrigation Districts and these districts are jointly responsible for:

(1) Accomplishing the physical operation of the reservoir and associated facilities in accordance with the official regulations.

(2) Advising the District Engineer, Sacramento District, Corps of Engineers, of any need for emergency change in operation.

(3) Reporting to the District Engineer, Sacramento District, Corps of Engineers, any unusual condition in the reservoir or along downstream channels that might temporarily interfere with the planned flood control operation of the reservoir.

(4) Keeping downstream interests advised of impending changes in flood control releases which may affect them.

(5) Reporting by telephone to the Reservoir Regulation Section, Sacramento District, Corps of Engineers, the data outlined in paragraph 8-a below, and other data that may be requested from time to time.

(6) Keeping informed of the rules and regulations contained in this report and bringing to the attention of the District Engineer, Sacramento District, Corps of Engineers, any features contained herein that may require clarification or revision.

(1) Daily inflow, outflow, elevation, and storage at Don Pedro Lake.

(2) Daily storage at upstream reservoirs (Hetch Hetchy, Lake Lloyd, and Lake Eleanor).

(3) Daily diversion at La Grange Dam (Modesto and Turlock Canals).

(4) Daily flow in Tuolumne River below La Grange Dam.

(5) Daily precipitation amounts at Don Pedro, Hetch Hetchy, Sonora and Yosemite.

9. MODIFICATION OF REGULATIONS

a. The official regulations are subject to temporary modification by the District Engineer, Corps of Engineers, during flood emergencies. Permanent changes in the regulations may be made by reissuing them in the same manner as originally prescribed.

b. The Turlock and Modesto Irrigation Districts may temporarily suspend application of the flood control regulations for Don Pedro Lake in the event this is deemed necessary for emergency reasons to protect the safety of the dam, or to avoid other severe hazards. Revision of the flood control diagram for Don Pedro Dam and Lake may be made when necessary with the mutual consent of the Corps of Engineers and the Turlock and Modesto Irrigation Districts.

DON PEDRO DAM AND LAKE
TUOLUMNE RIVER, CALIFORNIA

REPORT ON RESERVOIR REGULATION
FOR FLOOD CONTROL

AUGUST 1972

APPENDIX A
FLOOD CONTROL REGULATIONS

Department of the Army
Sacramento District, Corps of Engineers
Sacramento, California

CODE OF FEDERAL REGULATIONS

TITLE 33 - NAVIGATION AND NAVIGABLE WATERS

Chapter II - Corps of Engineers
Department of the Army

PART 208 - FLOOD CONTROL REGULATIONS

DON PEDRO DAM AND LAKE
TUOLUMNE RIVER, CALIFORNIA

Pursuant to the provisions of Section 7 of the Act of Congress approved December 22, 1944 (58 Stat. 890; 33 U.S.C. 709), and of contract no. DA-04-167-Eng-38 dated August 29, 1949, as amended by Supplemental Agreement No. 1 dated 12 June 1967, between the United States of America and the City and County of San Francisco, California, the Modesto Irrigation District, Modesto, California and the Turlock Irrigation District, Turlock, California, the following Part #208 _____ regulations are hereby prescribed to govern the operation of Don Pedro Dam and Lake on Tuolumne River, California, in the interest of flood control:

PART 208. - DON PEDRO DAM AND LAKE, CALIFORNIA.

The Modesto Irrigation District, Modesto, California and Turlock Irrigation District, Turlock, California, hereinafter referred to as the Districts, shall operate or otherwise effect the operation of Don Pedro Dam and Lake in the interest of flood control in accordance with instructions furnished by the Department of the Army, represented by the District Engineer in charge of the locality, hereinafter referred to as the District Engineer, as follows:

a. Storage space in Don Pedro Lake of 340,000 acre-feet below

elevation 830.00 feet, shall be kept available for flood control purposes on a seasonal basis in accordance with the Flood Control Diagram currently in force. The Flood Control Diagram in force as of the promulgation of this section is that dated _____, File No. TU-1-19-9.

b. Except when greater releases are required as prescribed in paragraph (c) of this section, releases from Don Pedro Lake shall be restricted insofar as possible to quantities which will not cause flows in the Tuolumne River below Dry Creek to exceed the controlling flow rates specified on the Flood Control Diagram currently in force. Any water temporarily stored in the flood control space indicated by the Flood Control Diagram shall be released as rapidly as can be safely accomplished without causing downstream flows to exceed the rates of flow shown thereon.

c. In the event the water level at Don Pedro Lake exceeds the top of flood control pool, elevation 830, and is rising, subsequent operation shall be in accordance with the Emergency Spillway Release Diagram currently in force. When the lake level again recedes to elevation 830, subsequent operation shall be in accordance with the Flood Control Diagram. The Emergency Spillway Release Diagram in force as of the promulgation of this section is that dated _____, File No. TU-1-13-11.

d. Except as necessary in order to comply with the provisions of the Emergency Spillway Release Diagram under paragraph (c) above, the regulations of this section shall not be construed to require dangerously

rapid changes in magnitudes of release or that releases be made in a manner that will be inconsistent with requirements for protecting the dam and reservoir from major damages.

e. The Districts shall procure such current basic hydrologic data and make such current determinations of required flood control space and releases at the lake as are required to accomplish the flood control objectives prescribed in this section.

f. The Districts shall keep the District Engineer currently advised of lake storage and such other operating data as the District Engineer may request.

g. The flood control regulations of this section are subject to temporary modification by the District Engineer if found necessary in time of emergency. Requests for and action on such modifications may be made by any available means of communication, and the action taken by the District Engineer shall be confirmed in writing under date of same day to the office of the Districts.

h. The Districts may temporarily suspend application of the flood control regulations of this section in the event it is deemed necessary for emergency reasons to protect the safety of the dam, or to avoid other serious hazards. Such action shall be immediately reported by any available means of communication, and confirmed in writing under date of same day to the District Engineer.

i. Revision of the Flood Control or Emergency Spillway Release Diagrams requires approval of the Chief of Engineers, or his duly authorized representative, and the Modesto and Turlock Irrigation

Districts. Each such revision shall be effective upon the date specified in the approval, and from that date until replaced shall be the diagram in force for the purpose of this section. The Flood Control and Emergency Spillway Release Diagrams are on file in the Office, Chief of Engineers, Department of the Army, Washington, D. C., and the offices of the Modesto Irrigation District, Modesto, California and Turlock Irrigation District, Turlock, California. Copies of the diagrams currently in force shall be kept on file in and may be obtained from the offices of the District Engineer, Corps of Engineers, Sacramento, California, and the Modesto Irrigation District, Modesto, California and Turlock Irrigation District, Turlock, California.

Area in thousand acres

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14

Top of dam elev. 855.0 ft.

Gross pool elev. 830.0 ft.

Capacity

Area

Elevation in feet, m.s.l.

900 850 800 750 700 650 600 550 500 450 400 350 300 250 200

0 200 400 600 800 1000 1200 1400 1600 1800 2000 2200 2400 2600 2800

Capacity in thousand acre-feet

NOTE:

Curves based on data furnished by Bechtel Corp.

DON PEDRO LAKE
TUOLUMNE RIVER, CALIFORNIA

AREA AND CAPACITY CURVES

CORPS OF ENGINEERS, SACRAMENTO, CALIFORNIA

Prepared: C.D.M.
Drawn: R.E.Y. & S.K.N.

Date: August 1970

CHART A-1

DON PEDRO LAKE, TUOLUMNE RIVER, CALIFORNIA - AREA AND CAPACITY TABLE AUG 1970

ELEV FEET	CAP AREA 0	CAP AREA 1	CAP AREA 2	CAP AREA 3	CAP AREA 4	CAP AREA 5	CAP AREA 6	CAP AREA 7	CAP AREA 8	CAP AREA 9
290.0	0 0	0 0	0 0	1 1	1 1	3 2	5 3	8 3	12 4	17 6
300.0	35 7	42 7	50 8	57 8	65 8	74 8	82 9	91 9	100 9	110 10
310.0	120 10	130 10	140 10	150 11	161 11	172 11	183 11	194 11	206 12	218 12
320.0	229 12	242 13	255 13	268 14	283 15	297 15	313 16	330 17	347 17	364 18
330.0	383 19	402 20	423 21	444 22	466 22	489 23	512 24	537 25	563 26	589 27
340.0	617 28	645 28	673 29	702 29	732 30	762 30	792 30	822 31	853 31	885 32
350.0	916 32	949 33	982 34	1016 35	1051 35	1087 36	1124 37	1162 38	1200 39	1240 40
360.0	1280 41	1322 42	1365 44	1409 45	1455 46	1502 48	1551 49	1600 51	1652 52	1705 54
370.0	1759 55	1815 57	1872 59	1932 60	1993 62	2056 64	2121 66	2188 68	2257 70	2328 72
380.0	2401 74	2477 76	2554 79	2634 81	2717 84	2802 87	2890 89	2981 92	3074 94	3170 97
390.0	3268 100	3370 104	3476 108	3587 112	3701 117	3820 121	3943 125	4071 130	4203 135	4340 139

DON PEDRO LAKE, TUOLUMNE RIVER, CALIFORNIA - AREA AND CAPACITY TABLE AUG 1970

ELEV FEET	CAP AREA 0	CAP AREA 1	CAP AREA 2	CAP AREA 3	CAP AREA 4	CAP AREA 5	CAP AREA 6	CAP AREA 7	CAP AREA 8	CAP AREA 9
400.0	4481	4629	4783	4944	5113	5289	5472	5663	5862	6069
	144	151	158	165	172	180	187	195	203	211
410.0	6283	6507	6738	6978	7226	7483	7749	8025	8309	8603
	219	227	236	244	253	262	271	280	289	298
420.0	8906	9218	9538	9865	10201	10545	10898	11259	11628	12006
	308	316	324	332	340	348	357	365	374	382
430.0	12393	12787	13190	13601	14020	14447	14882	15325	15777	16237
	391	399	407	415	423	431	439	448	456	464
440.0	16706	17184	17670	18166	18671	19185	19709	20242	20785	21337
	473	482	491	500	510	519	528	538	548	557
450.0	21899	22471	23054	23647	24251	24865	25490	26126	26774	27432
	567	577	588	598	609	620	631	642	653	664
460.0	28101	28782	29473	30175	30888	31613	32348	33095	33853	34623
	675	686	697	708	719	730	741	752	764	775
470.0	35404	36198	37008	37832	38672	39527	40397	41284	42186	43103
	787	802	817	832	847	863	878	894	910	926
480.0	44037	44987	45952	46932	47928	48940	49967	51010	52070	53145
	942	957	973	986	1004	1019	1035	1051	1067	1084
490.0	54237	55344	56466	57603	58754	59921	61102	62298	63510	64737
	1100	1115	1129	1144	1159	1174	1189	1204	1219	1235
500.0	66110	67371	68654	69960	71288	72639	74014	75411	76832	78276
	1250	1272	1294	1317	1340	1363	1386	1409	1432	1456
510.0	79744	81232	82735	84254	85789	87340	88907	90490	92090	93705
	1480	1496	1511	1527	1543	1559	1575	1591	1607	1624
520.0	95337	96992	98679	100396	102145	103925	105738	107582	109460	111370
	1640	1671	1702	1733	1765	1796	1829	1861	1894	1927
530.0	113313	115290	117299	119341	121417	123527	125671	127848	130061	132308
	1960	1993	2026	2059	2093	2127	2161	2195	2230	2265
540.0	134591	136902	139236	141592	143971	146374	148799	151247	153718	156213
	2300	2323	2342	2368	2391	2414	2437	2460	2483	2507
550.0	158731	161269	163823	166393	168978	171579	174197	176830	179480	182146
	2530	2546	2562	2577	2593	2609	2625	2641	2658	2674
560.0	184827	187529	190253	192999	195769	198561	201376	204215	207076	209961
	2690	2713	2735	2758	2781	2804	2827	2850	2873	2897
570.0	212870	215797	218741	221701	224676	227668	230675	233699	236738	239794
	2920	2936	2952	2968	2983	2999	3015	3032	3048	3064
580.0	242866	245957	249069	252204	255360	258538	261738	264960	268204	271471
	3080	3102	3123	3145	3167	3189	3211	3233	3255	3278
590.0	274760	278070	281403	284757	288134	291532	294952	298394	301858	305345
	3300	3322	3343	3365	3387	3409	3431	3453	3475	3498

DON PEDRO LAKE, TUOLUMNE RIVER, CALIFORNIA - AREA AND CAPACITY TABLE AUG 1970

ELEV FEET	CAP AREA .0	CAP AREA .1	CAP AREA .2	CAP AREA .3	CAP AREA .4	CAP AREA .5	CAP AREA .6	CAP AREA .7	CAP AREA .8	CAP AREA .9
600.0	308960	309312	309665	310017	310370	310723	311076	311430	311784	312138
	3520	3522	3525	3527	3529	3531	3534	3536	3538	3540
601.0	312492	312846	313201	313556	313911	314266	314621	314977	315333	315689
	3543	3545	3547	3549	3552	3554	3556	3559	3561	3563
602.0	316046	316402	316759	317116	317474	317831	318189	318547	318905	319264
	3565	3568	3570	3572	3575	3577	3579	3581	3584	3586
603.0	319623	319982	320341	320700	321060	321420	321780	322140	322500	322861
	3588	3591	3593	3595	3597	3600	3602	3604	3607	3609
604.0	323222	323583	323945	324307	324669	325031	325393	325756	326118	326482
	3611	3613	3615	3618	3620	3623	3625	3627	3629	3632
605.0	326845	327208	327572	327936	328300	328665	329029	329394	329759	330125
	3634	3636	3639	3641	3643	3646	3648	3650	3653	3655
606.0	330490	330856	331222	331589	331955	332322	332689	333056	333424	333791
	3657	3659	3662	3664	3666	3669	3671	3673	3676	3678
607.0	334159	334527	334896	335264	335633	336002	336371	336741	337111	337481
	3680	3683	3685	3687	3690	3692	3694	3696	3699	3701
608.0	337851	338221	338592	338963	339334	339706	340077	340449	340821	341193
	3703	3706	3708	3710	3713	3715	3717	3720	3722	3724
609.0	341566	341939	342312	342685	343059	343432	343806	344180	344555	344929
	3727	3729	3731	3734	3736	3738	3741	3743	3745	3748
610.0	345310	345679	346055	346430	346806	347182	347559	347935	348312	348689
	3750	3752	3755	3757	3760	3762	3765	3767	3770	3772
611.0	349067	349444	349822	350200	350578	350957	351336	351715	352094	352474
	3775	3777	3780	3782	3785	3787	3789	3792	3794	3797
612.0	352854	353234	353614	353995	354375	354756	355138	355519	355901	356283
	3799	3802	3804	3807	3809	3812	3814	3817	3819	3822
613.0	356665	357048	357431	357814	358197	358581	358964	359348	359733	360117
	3824	3827	3829	3832	3834	3837	3839	3842	3844	3847
614.0	360502	360887	361272	361658	362044	362430	362816	363202	363589	363976
	3849	3852	3854	3857	3859	3862	3864	3866	3869	3871
615.0	364363	364751	365139	365527	365915	366304	366692	367081	367471	367860
	3874	3876	3879	3881	3884	3887	3889	3892	3894	3897
616.0	368250	368640	369030	369421	369812	370203	370594	370985	371377	371769
	3899	3902	3904	3907	3909	3912	3914	3917	3919	3922
617.0	372162	372554	372947	373340	373733	374127	374521	374915	375309	375703
	3924	3927	3929	3932	3934	3937	3939	3942	3944	3947
618.0	376098	376493	376889	377284	377680	378076	378472	378869	379266	379663
	3949	3952	3954	3957	3959	3962	3965	3967	3970	3972
619.0	380060	380458	380856	381254	381652	382051	382450	382849	383248	383648
	3975	3977	3980	3982	3985	3987	3990	3992	3995	3997

DON PEDRO LAKE, TUOLUMNE RIVER, CALIFORNIA - AREA AND CAPACITY TABLE AUG 1970

ELEV FEET	CAP AREA .0	CAP AREA .1	CAP AREA .2	CAP AREA .3	CAP AREA .4	CAP AREA .5	CAP AREA .6	CAP AREA .7	CAP AREA .8	CAP AREA .9
620.0	384060	384461	384861	385262	385663	386064	386466	386868	387270	387672
	4000	4003	4006	4009	4011	4014	4017	4020	4023	4026
621.0	388075	388478	388881	389285	389689	390093	390497	390902	391307	391712
	4029	4031	4034	4037	4040	4043	4046	4049	4051	4054
622.0	392118	392524	392930	393336	393743	394150	394557	394965	395373	395781
	4057	4060	4063	4066	4069	4072	4074	4077	4080	4083
623.0	396189	396598	397007	397416	397826	398236	398646	399056	399467	399878
	4086	4089	4092	4095	4097	4100	4103	4106	4109	4112
624.0	400290	400701	401113	401525	401938	402351	402764	403177	403591	404005
	4115	4118	4121	4123	4126	4129	4132	4135	4138	4141
625.0	404419	404833	405248	405663	406079	406494	406910	407327	407743	408160
	4144	4147	4150	4152	4155	4158	4161	4164	4167	4170
626.0	408577	408995	409412	409830	410249	410667	411086	411505	411925	412344
	4173	4176	4179	4182	4184	4187	4190	4193	4196	4199
627.0	412764	413185	413605	414026	414448	414869	415291	415713	416135	416558
	4202	4205	4208	4211	4214	4217	4219	4222	4225	4228
628.0	416981	417404	417828	418252	418676	419100	419525	419950	420375	420801
	4231	4234	4237	4240	4243	4246	4249	4252	4255	4258
629.0	421227	421653	422080	422506	422933	423361	423789	424216	424645	425073
	4261	4263	4266	4269	4272	4275	4278	4281	4284	4287
630.0	425510	425931	426361	426790	427221	427651	428081	428512	428944	429375
	4290	4293	4296	4299	4302	4305	4308	4311	4314	4317
631.0	429807	430239	430671	431104	431537	431970	432404	432838	433272	433707
	4320	4323	4325	4328	4331	4334	4337	4340	4343	4346
632.0	434141	434576	435012	435447	435883	436320	436756	437193	437630	438068
	4349	4352	4355	4358	4361	4364	4367	4370	4373	4376
633.0	438505	438943	439382	439820	440259	440699	441138	441578	442018	442458
	4379	4382	4385	4388	4391	4394	4397	4400	4403	4406
634.0	442899	443340	443782	444223	444665	445107	445550	445993	446436	446879
	4409	4412	4415	4418	4421	4424	4427	4430	4433	4436
635.0	447323	447767	448211	448656	449101	449546	449992	450437	450884	451330
	4439	4442	4445	4448	4451	4454	4457	4460	4463	4466
636.0	451777	452224	452671	453119	453567	454015	454463	454912	455361	455811
	4469	4472	4475	4478	4481	4484	4487	4490	4493	4496
637.0	456261	456711	457161	457612	458063	458514	458965	459417	459869	460322
	4499	4502	4505	4508	4511	4514	4517	4520	4523	4526
638.0	460775	461228	461681	462135	462589	463043	463498	463952	464408	464863
	4529	4532	4535	4538	4541	4544	4547	4550	4553	4557
639.0	465319	465775	466231	466688	467145	467603	468060	468518	468976	469435
	4560	4563	4566	4569	4572	4575	4578	4581	4584	4587

DON PEDRO LAKE, TUOLUMNE RIVER, CALIFORNIA - AREA AND CAPACITY TABLE AUG 1970

ELEV FEET	CAP AREA .0	CAP AREA .1	CAP AREA .2	CAP AREA .3	CAP AREA .4	CAP AREA .5	CAP AREA .6	CAP AREA .7	CAP AREA .8	CAP AREA .9
640.0	469910	470370	470829	471289	471749	472210	472671	473132	473593	474055
	4590	4593	4596	4600	4603	4606	4609	4613	4616	4619
641.0	474517	474979	475442	475905	476369	476832	477296	477761	478225	478690
	4622	4626	4629	4632	4636	4639	4642	4645	4649	4652
642.0	479156	479621	480087	480554	481020	481487	481955	482422	482890	483359
	4655	4658	4662	4665	4668	4671	4675	4678	4681	4685
643.0	483827	484296	484765	485235	485705	486175	486646	487117	487588	488059
	4688	4691	4694	4698	4701	4704	4707	4711	4714	4717
644.0	488531	489004	489476	489949	490422	490896	491370	491844	492318	492793
	4721	4724	4727	4731	4734	4737	4740	4744	4747	4750
645.0	493268	493744	494220	494696	495173	495649	496127	496604	497082	497560
	4754	4757	4760	4763	4767	4770	4773	4777	4780	4783
646.0	498039	498517	498997	499476	499956	500436	500917	501397	501878	502360
	4787	4790	4793	4797	4800	4803	4807	4810	4813	4816
647.0	502842	503324	503806	504289	504772	505256	505740	506224	506708	507193
	4820	4823	4826	4830	4833	4836	4840	4843	4846	4850
648.0	507678	508164	508649	509136	509622	510109	510596	511084	511571	512060
	4853	4856	4860	4863	4866	4870	4873	4876	4880	4883
649.0	512548	513037	513526	514015	514505	514995	515486	515977	516468	516959
	4886	4890	4893	4897	4900	4903	4907	4910	4913	4917
650.0	517450	517943	518436	518929	519422	519915	520409	520902	521397	521891
	4920	4923	4926	4929	4932	4935	4938	4941	4944	4947
651.0	522386	522881	523377	523872	524368	524865	525361	525858	526355	526853
	4950	4953	4956	4958	4961	4964	4967	4970	4973	4976
652.0	527350	527849	528347	528846	529345	529844	530343	530843	531343	531844
	4979	4982	4985	4988	4991	4994	4997	5000	5003	5006
653.0	532345	532846	533347	533849	534351	534853	535355	535858	536361	536865
	5009	5012	5015	5018	5021	5024	5027	5030	5033	5036
654.0	537369	537873	538377	538882	539387	539892	540397	540903	541409	541916
	5039	5042	5045	5048	5051	5054	5057	5060	5063	5066
655.0	542423	542930	543437	543945	544452	544961	545469	545978	546487	546997
	5069	5072	5075	5078	5081	5084	5087	5090	5093	5096
656.0	547506	548016	548527	549037	549548	550060	550571	551083	551595	552108
	5099	5102	5105	5108	5111	5114	5117	5120	5123	5126
657.0	552620	553133	553647	554160	554674	555189	555703	556218	556733	557249
	5129	5132	5135	5138	5141	5144	5147	5150	5153	5156
658.0	557765	558281	558797	559314	559831	560348	560866	561384	561902	562420
	5159	5162	5165	5168	5171	5174	5177	5180	5184	5187
659.0	562939	563458	563978	564497	565017	565538	566058	566579	567100	567622
	5190	5193	5196	5199	5202	5205	5208	5211	5214	5217

DON PEDRO LAKE, TUOLUMNE RIVER, CALIFORNIA - AREA AND CAPACITY TABLE AUG. 1970

ELEV FEET	CAP AREA .0	CAP AREA .1	CAP AREA .2	CAP AREA .3	CAP AREA .4	CAP AREA .5	CAP AREA .6	CAP AREA .7	CAP AREA .8	CAP AREA .9
660.0	568150	568673	569195	569718	570241	570764	571288	571812	572337	572861
	5220	5223	5226	5229	5233	5236	5239	5242	5245	5248
661.0	573386	573912	574437	574963	575489	576016	576543	577070	577598	578126
	5252	5255	5258	5261	5264	5267	5271	5274	5277	5280
662.0	578654	579182	579711	580240	580770	581299	581829	582360	582890	583422
	5283	5286	5290	5293	5296	5299	5302	5305	5309	5312
663.0	583953	584485	585016	585549	586081	586614	587148	587681	588215	588749
	5315	5318	5321	5325	5328	5331	5334	5337	5340	5344
664.0	589284	589819	590354	590889	591425	591961	592498	593034	593571	594109
	5347	5350	5353	5356	5360	5363	5366	5369	5372	5376
665.0	594647	595185	595723	596262	596801	597340	597880	598420	598960	599501
	5379	5382	5385	5388	5392	5395	5398	5401	5404	5408
666.0	600041	600583	601124	601666	602208	602751	603294	603837	604380	604924
	5411	5414	5417	5420	5424	5427	5430	5433	5437	5440
667.0	605468	606013	606558	607103	607648	608194	608740	609286	609833	610380
	5443	5446	5449	5453	5456	5459	5462	5466	5469	5472
668.0	610927	611475	612023	612571	613120	613669	614218	614768	615318	615868
	5475	5478	5482	5485	5488	5491	5495	5498	5501	5504
669.0	616419	616970	617521	618073	618624	619177	619729	620282	620835	621389
	5508	5511	5514	5517	5521	5524	5527	5530	5534	5537
670.0	621950	622497	623051	623606	624161	624716	625272	625828	626384	626941
	5540	5543	5546	5549	5552	5555	5558	5561	5564	5567
671.0	627497	628055	628612	629170	629728	630286	630845	631403	631963	632522
	5570	5573	5576	5579	5582	5584	5587	5590	5593	5596
672.0	633082	633642	634202	634763	635324	635885	636447	637009	637571	638133
	5599	5602	5605	5608	5611	5614	5617	5620	5623	5626
673.0	638696	639259	639823	640386	640950	641515	642079	642644	643209	643775
	5629	5632	5635	5638	5641	5644	5647	5650	5653	5656
674.0	644340	644906	645473	646039	646606	647174	647741	648309	648877	649446
	5659	5662	5665	5668	5671	5674	5677	5680	5683	5686
675.0	650014	650583	651153	651722	652292	652863	653433	654004	654575	655147
	5689	5692	5695	5698	5701	5704	5707	5710	5713	5716
676.0	655718	656290	656863	657435	658008	658582	659155	659729	660303	660878
	5719	5722	5725	5728	5731	5734	5737	5740	5743	5746
677.0	661452	662028	662603	663179	663755	664331	664907	665484	666061	666639
	5749	5752	5755	5758	5761	5764	5767	5770	5773	5776
678.0	667217	667795	668373	668952	669531	670110	670690	671270	671850	672430
	5779	5782	5785	5788	5791	5794	5798	5801	5804	5807
679.0	673011	673592	674174	674755	675338	675920	676502	677085	677669	678252
	5810	5813	5816	5819	5822	5825	5828	5831	5834	5837

DON PEDRO LAKE, TUOLUMNE RIVER, CALIFORNIA - AREA AND CAPACITY TABLE AUG 1970

ELEV FEET	CAP AREA .0	CAP AREA .1	CAP AREA .2	CAP AREA .3	CAP AREA .4	CAP AREA .5	CAP AREA .6	CAP AREA .7	CAP AREA .8	CAP AREA .9
680.0	678950	679535	680120	680705	681290	681875	682461	683047	683634	684221
	5840	5843	5847	5850	5853	5857	5860	5863	5867	5870
681.0	684808	685395	685983	686571	687160	687749	688338	688928	689517	690108
	5874	5877	5880	5884	5887	5890	5894	5897	5900	5904
682.0	690698	691289	691880	692472	693064	693656	694249	694842	695435	696028
	5907	5911	5914	5917	5921	5924	5927	5931	5934	5938
683.0	696622	697217	697811	698406	699001	699597	700193	700789	701386	701983
	5941	5944	5948	5951	5955	5958	5961	5965	5968	5971
684.0	702580	703178	703776	704374	704973	705572	706171	706771	707371	707971
	5975	5978	5982	5985	5988	5992	5995	5999	6002	6005
685.0	708572	709173	709774	710376	710978	711581	712183	712787	713390	713994
	6009	6012	6016	6019	6022	6026	6029	6033	6036	6039
686.0	714598	715202	715807	716412	717018	717624	718230	718836	719443	720050
	6043	6046	6050	6053	6056	6060	6063	6067	6070	6074
687.0	720658	721266	721874	722482	723091	723701	724310	724920	725530	726141
	6077	6080	6084	6087	6091	6094	6098	6101	6104	6108
688.0	726752	727363	727975	728587	729199	729812	730425	731038	731652	732266
	6111	6115	6118	6122	6125	6128	6132	6135	6139	6142
689.0	732880	733495	734110	734725	735341	735957	736574	737191	737808	738425
	6146	6149	6152	6156	6159	6163	6166	6170	6173	6177
690.0	738950	739661	740280	740899	741518	742137	742757	743378	743998	744619
	6180	6183	6187	6190	6194	6197	6201	6204	6208	6211
691.0	745240	745862	746484	747106	747729	748352	748975	749599	750223	750847
	6215	6218	6221	6225	6228	6232	6235	6239	6242	6246
692.0	751472	752097	752723	753349	753975	754601	755228	755855	756483	757111
	6249	6253	6256	6260	6263	6267	6270	6274	6277	6281
693.0	757739	758367	758996	759626	760255	760885	761515	762146	762777	763409
	6284	6287	6291	6294	6298	6301	6305	6308	6312	6315
694.0	764040	764672	765305	765937	766571	767204	767838	768472	769106	769741
	6319	6322	6326	6329	6333	6336	6340	6343	6347	6350
695.0	770377	771012	771648	772284	772921	773558	774195	774833	775471	776109
	6354	6357	6361	6364	6368	6371	6375	6378	6382	6385
696.0	776748	777387	778026	778666	779306	779947	780587	781229	781870	782512
	6389	6392	6396	6399	6403	6406	6410	6413	6417	6420
697.0	783154	783797	784440	785083	785727	786371	787015	787660	788305	788950
	6424	6428	6431	6435	6438	6442	6445	6449	6452	6456
698.0	789596	790242	790888	791535	792182	792830	793478	794126	794775	795423
	6459	6463	6466	6470	6473	6477	6480	6484	6487	6491
699.0	796073	796722	797372	798023	798673	799324	799976	800628	801280	801932
	6495	6498	6502	6505	6509	6512	6516	6519	6523	6526

DON PEDRO LAKE, TUOLUMNE RIVER, CALIFORNIA - AREA AND CAPACITY TABLE AUG 1970

ELEV FEET	CAP AREA .0	CAP AREA .1	CAP AREA .2	CAP AREA .3	CAP AREA .4	CAP AREA .5	CAP AREA .6	CAP AREA .7	CAP AREA .8	CAP AREA .9
700.0	802500	803154	803807	804461	805116	805770	806425	807081	807736	808392
	6530	6534	6537	6541	6545	6548	6552	6556	6559	6563
701.0	809049	809706	810363	811021	811679	812337	812995	813655	814314	814974
	6567	6570	6574	6578	6581	6585	6589	6592	6596	6600
702.0	815634	816294	816955	817616	818278	818940	819602	820265	820928	821592
	6603	6607	6611	6614	6618	6622	6625	6629	6633	6636
703.0	822255	822920	823584	824249	824914	825580	826246	826912	827579	828246
	6640	6644	6647	6651	6655	6658	6662	6666	6669	6673
704.0	828914	829582	830250	830918	831587	832257	832926	833597	834267	834938
	6677	6680	6684	6688	6692	6695	6699	6703	6706	6710
705.0	835609	836281	836952	837625	838297	838970	839644	840318	840992	841666
	6714	6717	6721	6725	6729	6732	6736	6740	6743	6747
706.0	842341	843016	843692	844368	845044	845721	846398	847076	847754	848432
	6751	6754	6758	6762	6766	6769	6773	6777	6780	6784
707.0	849111	849790	850469	851149	851829	852509	853190	853871	854553	855235
	6788	6792	6795	6799	6803	6807	6810	6814	6818	6821
708.0	855917	856600	857283	857966	858650	859334	860019	860704	861389	862075
	6825	6829	6833	6836	6840	6844	6848	6851	6855	6859
709.0	862761	863447	864134	864821	865509	866197	866885	867574	868263	868952
	6863	6866	6870	6874	6878	6881	6885	6889	6893	6896
710.0	869700	870332	871023	871714	872405	873097	873789	874482	875175	875868
	6900	6904	6908	6912	6916	6920	6924	6928	6932	6936
711.0	876562	877256	877951	878646	879341	880037	880733	881429	882126	882824
	6939	6943	6947	6951	6955	6959	6963	6967	6971	6975
712.0	883521	884219	884918	885617	886316	887016	887716	888416	889117	889819
	6979	6983	6987	6991	6995	6999	7003	7007	7011	7015
713.0	890520	891222	891925	892628	893331	894035	894739	895443	896148	896853
	7019	7023	7027	7031	7035	7039	7043	7047	7051	7055
714.0	897559	898265	898971	899678	900386	901093	901801	902510	903219	903928
	7059	7063	7067	7071	7075	7079	7083	7087	7091	7095
715.0	904638	905348	906058	906769	907480	908192	908904	909616	910329	911042
	7099	7103	7107	7111	7115	7119	7123	7127	7131	7135
716.0	911756	912470	913185	913900	914615	915330	916047	916763	917480	918197
	7139	7143	7147	7151	7155	7159	7163	7167	7171	7175
717.0	918915	919633	920351	921070	921790	922509	923229	923950	924671	925392
	7179	7183	7187	7191	7195	7199	7203	7207	7211	7215
718.0	926114	926836	927558	928281	929005	929728	930453	931177	931902	932627
	7219	7223	7227	7231	7235	7239	7243	7247	7251	7255
719.0	933353	934079	934806	935533	936260	936988	937716	938445	939174	939903
	7259	7264	7268	7272	7276	7280	7284	7288	7292	7296

DON PEDRO LAKE, TUOLUMNE RIVER, CALIFORNIA - AREA AND CAPACITY TABLE AUG 1970

ELEV FEET	CAP AREA .0	CAP AREA .1	CAP AREA .2	CAP AREA .3	CAP AREA .4	CAP AREA .5	CAP AREA .6	CAP AREA .7	CAP AREA .8	CAP AREA .9
720.0	940700	941431	942162	942893	943624	944356	945088	945821	946554	947287
	7300	7304	7308	7312	7316	7320	7324	7328	7332	7336
721.0	948021	948756	949490	950225	950961	951697	952433	953170	953907	954644
	7341	7345	7349	7353	7357	7361	7365	7369	7373	7377
722.0	955382	956120	956859	957598	958338	959078	959818	960559	961300	962042
	7381	7385	7389	7393	7397	7401	7406	7410	7414	7418
723.0	962784	963526	964269	965012	965756	966500	967244	967989	968734	969480
	7422	7426	7430	7434	7438	7442	7446	7450	7454	7459
724.0	970226	970972	971719	972466	973214	973962	974711	975460	976209	976959
	7463	7467	7471	7475	7479	7483	7487	7491	7495	7500
725.0	977709	978459	979210	979962	980714	981466	982218	982971	983725	984479
	7504	7508	7512	7516	7520	7524	7528	7532	7536	7541
726.0	985233	985988	986743	987498	988254	989010	989767	990524	991282	992040
	7545	7549	7553	7557	7561	7565	7569	7573	7578	7582
727.0	992798	993557	994316	995076	995836	996596	997357	998118	998880	999642
	7586	7590	7594	7598	7602	7606	7611	7615	7619	7623
728.0	1000405	1001168	1001931	1002695	1003459	1004223	1004988	1005754	1006520	1007286
	7627	7631	7635	7640	7644	7648	7652	7656	7660	7664
729.0	1008052	1008820	1009587	1010355	1011123	1011892	1012661	1013431	1014201	1014971
	7668	7673	7677	7681	7685	7689	7693	7698	7702	7706
730.0	1015700	1016513	1017285	1018057	1018829	1019602	1020375	1021149	1021923	1022698
	7710	7714	7718	7722	7727	7731	7735	7739	7743	7747
731.0	1023472	1024248	1025024	1025800	1026576	1027353	1028131	1028909	1029687	1030466
	7751	7756	7760	7764	7768	7772	7776	7781	7785	7789
732.0	1031245	1032024	1032804	1033585	1034365	1035147	1035928	1036710	1037493	1038275
	7793	7797	7801	7806	7810	7814	7818	7822	7826	7831
733.0	1039059	1039842	1040627	1041411	1042196	1042981	1043767	1044553	1045340	1046127
	7835	7839	7843	7847	7852	7856	7860	7864	7868	7872
734.0	1046914	1047702	1048491	1049279	1050068	1050858	1051648	1052438	1053229	1054020
	7877	7881	7885	7889	7893	7898	7902	7906	7910	7914
735.0	1054812	1055604	1056397	1057190	1057983	1058777	1059571	1060365	1061160	1061956
	7919	7923	7927	7931	7935	7940	7944	7948	7952	7956
736.0	1062752	1063548	1064345	1065142	1065939	1066737	1067536	1068334	1069134	1069933
	7961	7965	7969	7973	7978	7982	7986	7990	7994	7999
737.0	1070733	1071534	1072335	1073136	1073938	1074740	1075543	1076346	1077149	1077953
	8003	8007	8011	8016	8020	8024	8028	8032	8037	8041
738.0	1078757	1079562	1080367	1081173	1081979	1082785	1083592	1084399	1085207	1086015
	8045	8049	8054	8058	8062	8066	8071	8075	8079	8083
739.0	1086824	1087633	1088442	1089252	1090062	1090873	1091684	1092495	1093307	1094120
	8087	8092	8096	8100	8104	8109	8113	8117	8121	8126

DON PEDRO LAKE, TUOLUMNE RIVER, CALIFORNIA - AREA AND CAPACITY TABLE AUG 1970

ELEV FEET	CAP AREA .0	CAP AREA .1	CAP AREA .2	CAP AREA .3	CAP AREA .4	CAP AREA .5	CAP AREA .6	CAP AREA .7	CAP AREA .8	CAP AREA .9
740.0	1094900	1095715	1096528	1097342	1098157	1098972	1099787	1100603	1101419	1102236
	8130	8134	8139	8143	8147	8152	8156	8160	8165	8169
741.0	1103053	1103871	1104689	1105507	1106326	1107145	1107965	1108785	1109606	1110427
	8173	8178	8182	8187	8191	8195	8200	8204	8208	8213
742.0	1111248	1112070	1112893	1113716	1114539	1115362	1116187	1117011	1117836	1118662
	8217	8221	8226	8230	8235	8239	8243	8248	8252	8256
743.0	1119487	1120314	1121140	1121968	1122795	1123623	1124452	1125281	1126110	1126940
	8261	8265	8270	8274	8278	8283	8287	8291	8296	8300
744.0	1127770	1128601	1129432	1130263	1131095	1131928	1132761	1133594	1134428	1135262
	8305	8309	8313	8318	8322	8327	8331	8335	8340	8344
745.0	1136097	1136932	1137767	1138603	1139440	1140276	1141114	1141951	1142790	1143628
	8349	8353	8357	8362	8366	8371	8375	8379	8384	8388
746.0	1144467	1145307	1146147	1146987	1147828	1148669	1149511	1150353	1151195	1152038
	8393	8397	8401	8406	8410	8415	8419	8424	8428	8432
747.0	1152882	1153726	1154570	1155415	1156260	1157106	1157952	1158799	1159646	1160493
	8437	8441	8446	8450	8454	8459	8463	8468	8472	8477
748.0	1161341	1162189	1163038	1163887	1164737	1165587	1166438	1167288	1168140	1168992
	8481	8486	8490	8494	8499	8503	8508	8512	8517	8521
749.0	1169844	1170697	1171550	1172404	1173258	1174112	1174967	1175823	1176679	1177535
	8525	8530	8534	8539	8543	8548	8552	8557	8561	8566
750.0	1178300	1179249	1180107	1180965	1181823	1182683	1183542	1184402	1185262	1186123
	8570	8575	8579	8584	8588	8593	8597	8602	8606	8611
751.0	1186985	1187846	1188709	1189571	1190434	1191298	1192162	1193027	1193892	1194757
	8615	8620	8625	8629	8634	8638	8643	8647	8652	8656
752.0	1195623	1196489	1197356	1198223	1199091	1199959	1200828	1201697	1202566	1203436
	8661	8666	8670	8675	8679	8684	8688	8693	8698	8702
753.0	1204307	1205178	1206049	1206921	1207793	1208666	1209539	1210413	1211287	1212161
	8707	8711	8716	8720	8725	8730	8734	8739	8743	8748
754.0	1213036	1213912	1214788	1215664	1216541	1217418	1218296	1219174	1220053	1220932
	8753	8757	8762	8766	8771	8776	8780	8785	8789	8794
755.0	1221812	1222692	1223572	1224453	1225335	1226217	1227099	1227982	1228865	1229749
	8798	8803	8808	8812	8817	8822	8826	8831	8835	8840
756.0	1230633	1231518	1232403	1233289	1234175	1235061	1235948	1236836	1237724	1238612
	8845	8849	8854	8858	8863	8868	8872	8877	8881	8886
757.0	1239501	1240390	1241280	1242170	1243061	1243952	1244844	1245736	1246628	1247521
	8891	8895	8900	8905	8909	8914	8919	8923	8928	8932
758.0	1248415	1249309	1250203	1251098	1251993	1252889	1253785	1254682	1255579	1256477
	8937	8942	8946	8951	8956	8960	8965	8970	8974	8979
759.0	1257375	1258274	1259173	1260072	1260972	1261873	1262774	1263675	1264577	1265479
	8983	8988	8993	8997	9002	9007	9011	9016	9021	9025

DON PEDRO LAKE, TUOLUMNE RIVER, CALIFORNIA - AREA AND CAPACITY TABLE AUG 1970

ELEV FEET	CAP AREA .0	CAP AREA .1	CAP AREA .2	CAP AREA .3	CAP AREA .4	CAP AREA .5	CAP AREA .6	CAP AREA .7	CAP AREA .8	CAP AREA .9
760.0	1266400	1267304	1268208	1269112	1270017	1270922	1271828	1272734	1273641	1274548
	9030	9035	9040	9045	9050	9055	9060	9065	9070	9074
761.0	1275456	1276364	1277273	1278182	1279091	1280002	1280912	1281823	1282735	1283647
	9079	9084	9089	9094	9099	9104	9109	9114	9119	9124
762.0	1284560	1285473	1286387	1287301	1288215	1289131	1290046	1290962	1291879	1292796
	9129	9134	9139	9144	9149	9154	9159	9164	9169	9174
763.0	1293714	1294632	1295550	1296469	1297389	1298309	1299230	1300151	1301072	1301995
	9179	9184	9189	9194	9198	9203	9208	9213	9218	9223
764.0	1302917	1303840	1304764	1305688	1306612	1307538	1308463	1309389	1310316	1311243
	9228	9233	9238	9243	9248	9253	9258	9263	9268	9273
765.0	1312170	1313099	1314027	1314956	1315886	1316816	1317746	1318678	1319609	1320541
	9278	9283	9288	9293	9298	9303	9308	9313	9318	9323
766.0	1321474	1322407	1323340	1324275	1325209	1326144	1327080	1328016	1328953	1329890
	9328	9333	9338	9343	9348	9353	9358	9364	9369	9374
767.0	1330827	1331765	1332704	1333643	1334583	1335523	1336463	1337405	1338346	1339288
	9379	9384	9389	9394	9399	9404	9409	9414	9419	9424
768.0	1340231	1341174	1342118	1343062	1344007	1344952	1345897	1346844	1347790	1348737
	9429	9434	9439	9444	9449	9454	9459	9464	9469	9474
769.0	1349685	1350633	1351582	1352531	1353481	1354431	1355382	1356333	1357285	1358237
	9479	9484	9490	9495	9500	9505	9510	9515	9520	9525
770.0	1359200	1360143	1361097	1362051	1363006	1363961	1364917	1365873	1366830	1367788
	9530	9535	9540	9545	9551	9556	9561	9566	9571	9576
771.0	1368746	1369704	1370663	1371622	1372582	1373543	1374504	1375465	1376427	1377390
	9581	9587	9592	9597	9602	9607	9612	9617	9623	9628
772.0	1378353	1379316	1380280	1381245	1382210	1383176	1384142	1385108	1386075	1387043
	9633	9638	9643	9648	9654	9659	9664	9669	9674	9679
773.0	1388011	1388980	1389949	1390919	1391889	1392860	1393831	1394803	1395776	1396748
	9685	9690	9695	9700	9705	9710	9716	9721	9726	9731
774.0	1397722	1398696	1399670	1400645	1401620	1402596	1403573	1404550	1405527	1406506
	9736	9742	9747	9752	9757	9762	9767	9773	9778	9783
775.0	1407484	1408463	1409443	1410423	1411404	1412385	1413366	1414349	1415331	1416315
	9788	9793	9799	9804	9809	9814	9819	9825	9830	9835
776.0	1417298	1418283	1419267	1420253	1421239	1422225	1423212	1424199	1425187	1426176
	9840	9846	9851	9856	9861	9866	9872	9877	9882	9887
777.0	1427165	1428154	1429144	1430135	1431126	1432118	1433110	1434102	1435096	1436089
	9893	9898	9903	9908	9913	9919	9924	9929	9934	9940
778.0	1437084	1438078	1439074	1440069	1441066	1442063	1443060	1444058	1445056	1446055
	9945	9950	9955	9961	9966	9971	9976	9982	9987	9992
779.0	1447055	1448055	1449055	1450056	1451058	1452060	1453063	1454066	1455069	1456074
	9997	10003	10008	10013	10018	10024	10029	10034	10039	10045

DON PEDRO LAKE, TUOLUMNE RIVER, CALIFORNIA - AREA AND CAPACITY TABLE AUG 1970

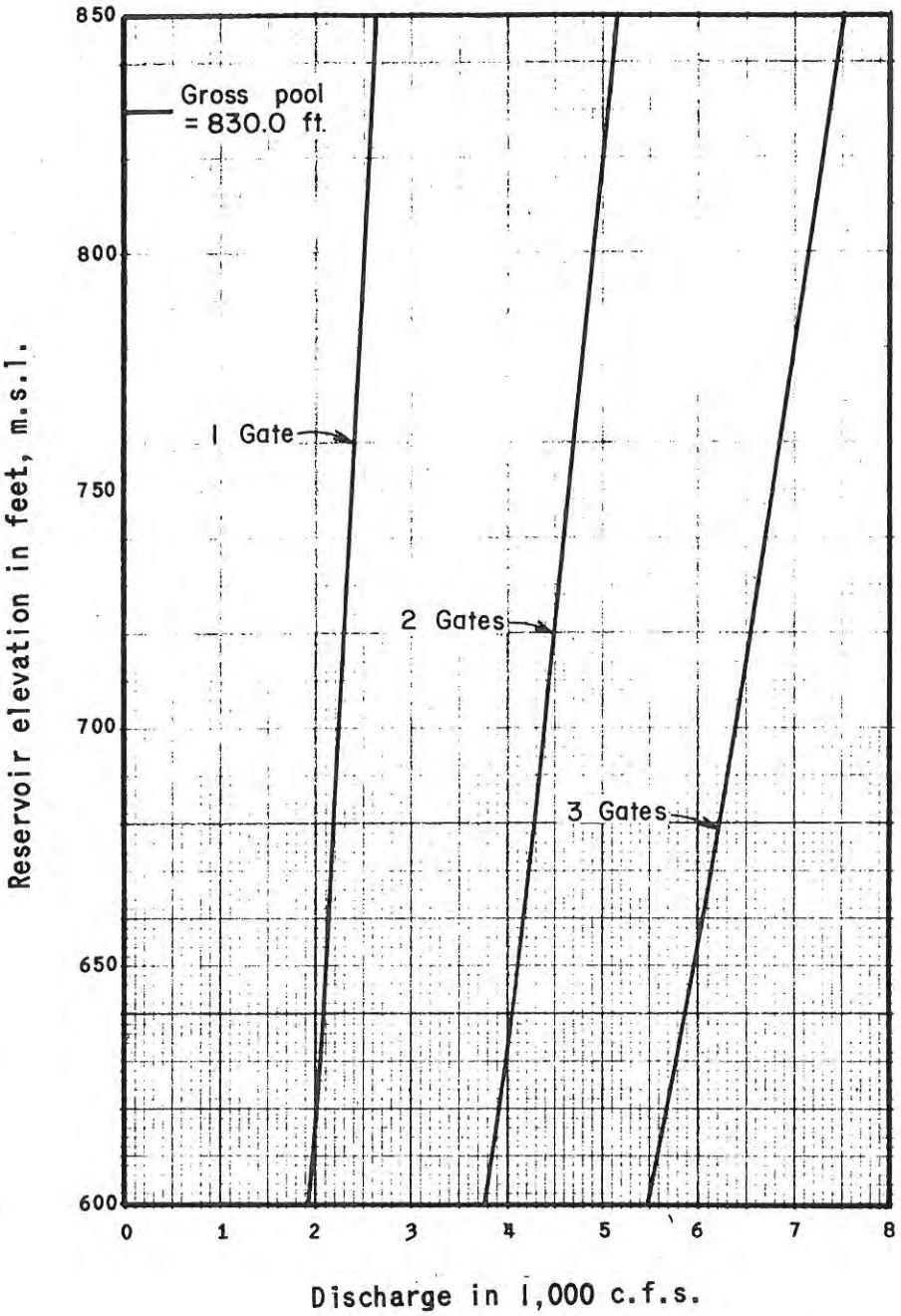
ELEV FEET	CAP AREA .0	CAP AREA .1	CAP AREA .2	CAP AREA .3	CAP AREA .4	CAP AREA .5	CAP AREA .6	CAP AREA .7	CAP AREA .8	CAP AREA .9
780.0	1457100	1458106	1459111	1460118	1461125	1462132	1463140	1464148	1465157	1466167
	10050	10055	10061	10066	10071	10077	10082	10087	10093	10098
781.0	1467177	1468188	1469199	1470210	1471223	1472235	1473249	1474263	1475277	1476292
	10103	10109	10114	10119	10125	10130	10135	10141	10146	10152
782.0	1477307	1478323	1479340	1480357	1481374	1482392	1483411	1484430	1485450	1486470
	10157	10162	10168	10173	10178	10184	10189	10194	10200	10205
783.0	1487491	1488512	1489534	1490556	1491579	1492603	1493627	1494651	1495676	1496702
	10211	10216	10221	10227	10232	10237	10243	10248	10254	10259
784.0	1497728	1498755	1499782	1500810	1501838	1502867	1503897	1504926	1505957	1506988
	10264	10270	10275	10280	10286	10291	10297	10302	10307	10313
785.0	1508020	1509052	1510084	1511117	1512151	1513185	1514220	1515256	1516291	1517328
	10318	10324	10329	10334	10340	10345	10351	10356	10361	10367
786.0	1518365	1519402	1520440	1521479	1522518	1523558	1524598	1525639	1526680	1527722
	10372	10378	10383	10389	10394	10399	10405	10410	10416	10421
787.0	1528764	1529807	1530851	1531895	1532939	1533984	1535030	1536076	1537123	1538170
	10427	10432	10437	10443	10448	10454	10459	10465	10470	10475
788.0	1539218	1540266	1541315	1542365	1543415	1544465	1545516	1546568	1547620	1548673
	10481	10486	10492	10497	10503	10508	10514	10519	10524	10530
789.0	1549726	1550780	1551834	1552889	1553944	1555000	1556057	1557114	1558172	1559230
	10535	10541	10546	10552	10557	10563	10568	10574	10579	10585
790.0	1560300	1561348	1562408	1563468	1564529	1565591	1566653	1567715	1568778	1569842
	10590	10596	10601	10607	10612	10618	10623	10629	10634	10640
791.0	1570906	1571971	1573036	1574102	1575169	1576236	1577303	1578372	1579440	1580510
	10645	10651	10656	10662	10668	10673	10679	10684	10690	10695
792.0	1581579	1582650	1583721	1584792	1585864	1586937	1588010	1589084	1590158	1591233
	10701	10706	10712	10718	10723	10729	10734	10740	10745	10751
793.0	1592308	1593384	1594460	1595537	1596615	1597693	1598772	1599851	1600931	1602011
	10756	10762	10768	10773	10779	10784	10790	10796	10801	10807
794.0	1603092	1604174	1605256	1606339	1607422	1608506	1609590	1610675	1611760	1612846
	10812	10818	10823	10829	10835	10840	10846	10851	10857	10863
795.0	1613933	1615020	1616107	1617196	1618284	1619374	1620464	1621554	1622645	1623737
	10868	10874	10879	10885	10891	10896	10902	10907	10913	10919
796.0	1624829	1625922	1627015	1628109	1629203	1630298	1631394	1632490	1633586	1634683
	10924	10930	10936	10941	10947	10952	10958	10964	10969	10975
797.0	1635781	1636880	1637978	1639078	1640178	1641278	1642380	1643481	1644584	1645686
	10980	10986	10992	10997	11003	11009	11014	11020	11026	11031
798.0	1646790	1647894	1648998	1650103	1651209	1652315	1653422	1654529	1655637	1656746
	11037	11042	11048	11054	11059	11065	11071	11076	11082	11088
799.0	1657855	1658965	1660075	1661185	1662297	1663409	1664521	1665634	1666748	1667862
	11093	11099	11105	11110	11116	11122	11127	11133	11139	11144

DON PEDRO LAKE, TUOLUMNE RIVER, CALIFORNIA - AREA AND CAPACITY TABLE AUG 1970

ELEV FEET	CAP AREA .0	CAP AREA .1	CAP AREA .2	CAP AREA .3	CAP AREA .4	CAP AREA .5	CAP AREA .6	CAP AREA .7	CAP AREA .8	CAP AREA .9
800.0	1669000	1670118	1671234	1672350	1673467	1674585	1675703	1676822	1677941	1679061
	11150	11156	11161	11167	11173	11178	11184	11189	11195	11201
801.0	1680181	1681302	1682423	1683545	1684668	1685791	1686915	1688039	1689164	1690290
	11206	11212	11218	11223	11229	11235	11240	11246	11252	11257
802.0	1691416	1692542	1693669	1694797	1695925	1697054	1698184	1699313	1700444	1701575
	11263	11269	11274	11280	11286	11291	11297	11303	11308	11314
803.0	1702707	1703839	1704972	1706105	1707239	1708374	1709509	1710644	1711781	1712917
	11320	11325	11331	11337	11342	11348	11354	11359	11365	11371
804.0	1714055	1715193	1716331	1717470	1718610	1719750	1720891	1722032	1723174	1724316
	11376	11382	11388	11393	11399	11405	11410	11416	11422	11428
805.0	1725459	1726603	1727747	1728892	1730037	1731183	1732330	1733477	1734624	1735772
	11433	11439	11445	11450	11456	11462	11467	11473	11479	11485
806.0	1736921	1738071	1739220	1740371	1741522	1742674	1743826	1744978	1746132	1747286
	11490	11496	11502	11507	11513	11519	11525	11530	11536	11542
807.0	1748440	1749595	1750751	1751907	1753064	1754221	1755379	1756537	1757696	1758856
	11548	11553	11559	11565	11570	11576	11582	11588	11593	11599
808.0	1760016	1761177	1762338	1763500	1764663	1765826	1766990	1768154	1769319	1770484
	11605	11611	11616	11622	11628	11634	11639	11645	11651	11657
809.0	1771650	1772816	1773984	1775151	1776319	1777488	1778658	1779828	1780998	1782169
	11662	11668	11674	11680	11685	11691	11697	11703	11708	11714
810.0	1783300	1784513	1785686	1786860	1788034	1789209	1790384	1791560	1792736	1793913
	11720	11726	11732	11738	11744	11750	11756	11762	11768	11774
811.0	1795091	1796270	1797448	1798628	1799808	1800989	1802170	1803352	1804535	1805718
	11780	11786	11792	11798	11804	11811	11817	11823	11829	11835
812.0	1806902	1808086	1809271	1810457	1811643	1812830	1814017	1815205	1816394	1817583
	11841	11847	11853	11859	11865	11871	11877	11883	11889	11895
813.0	1818773	1819963	1821154	1822346	1823538	1824731	1825925	1827119	1828313	1829509
	11901	11907	11914	11920	11926	11932	11938	11944	11950	11956
814.0	1830705	1831901	1833098	1834296	1835494	1836693	1837893	1839093	1840294	1841495
	11962	11968	11974	11980	11986	11993	11999	12005	12011	12017
815.0	1842697	1843900	1845103	1846307	1847511	1848716	1849922	1851128	1852335	1853543
	12023	12029	12035	12041	12047	12054	12060	12066	12072	12078
816.0	1854751	1855959	1857169	1858379	1859589	1860800	1862012	1863225	1864438	1865651
	12084	12090	12096	12102	12109	12115	12121	12127	12133	12139
817.0	1866865	1868080	1869296	1870512	1871729	1872946	1874164	1875382	1876601	1877821
	12145	12152	12158	12164	12170	12176	12182	12188	12194	12201
818.0	1879042	1880262	1881484	1882706	1883929	1885153	1886377	1887601	1888827	1890053
	12207	12213	12219	12225	12231	12238	12244	12250	12256	12262
819.0	1891279	1892506	1893734	1894962	1896191	1897421	1898651	1899882	1901113	1902345
	12268	12274	12281	12287	12293	12299	12305	12311	12318	12324

DON PEDRO LAKE, TUOLUMNE RIVER, CALIFORNIA - AREA AND CAPACITY TABLE AUG 1970

ELEV FEET	CAP AREA .0	CAP AREA .1	CAP AREA .2	CAP AREA .3	CAP AREA .4	CAP AREA .5	CAP AREA .6	CAP AREA .7	CAP AREA .8	CAP AREA .9
820.0	1903600	1904834	1906068	1907302	1908538	1909773	1911010	1912247	1913484	1914723
	12330	12336	12342	12349	12355	12361	12367	12374	12380	12386
821.0	1915962	1917201	1918441	1919682	1920924	1922166	1923408	1924652	1925895	1927140
	12392	12399	12405	12411	12417	12424	12430	12436	12442	12448
822.0	1928385	1929631	1930877	1932124	1933372	1934620	1935869	1937119	1938369	1939620
	12455	12461	12467	12474	12480	12486	12492	12499	12505	12511
823.0	1940871	1942123	1943376	1944629	1945883	1947138	1948393	1949649	1950905	1952162
	12517	12524	12530	12536	12542	12549	12555	12561	12568	12574
824.0	1953420	1954678	1955937	1957197	1958457	1959718	1960979	1962241	1963504	1964768
	12580	12586	12593	12599	12605	12612	12618	12624	12630	12637
825.0	1966032	1967296	1968561	1969827	1971094	1972361	1973629	1974897	1976166	1977436
	12643	12649	12656	12662	12668	12675	12681	12687	12693	12700
826.0	1978706	1979977	1981249	1982521	1983794	1985067	1986341	1987616	1988891	1990167
	12706	12712	12719	12725	12731	12738	12744	12750	12757	12763
827.0	1991444	1992721	1993999	1995277	1996557	1997836	1999117	2000398	2001680	2002962
	12769	12776	12782	12788	12795	12801	12807	12814	12820	12826
828.0	2004245	2005528	2006813	2008098	2009383	2010669	2011956	2013243	2014531	2015820
	12833	12839	12845	12852	12858	12864	12871	12877	12884	12890
829.0	2017109	2018399	2019690	2020981	2022273	2023565	2024859	2026152	2027447	2028742
	12896	12903	12909	12915	12922	12928	12934	12941	12947	12954
830.0	2030000	2031334	2032631	2033928	2035226	2036525	2037825	2039125	2040425	2041727
	12960	12966	12972	12979	12985	12991	12997	13004	13010	13016
831.0	2043029	2044331	2045634	2046938	2048243	2049548	2050853	2052160	2053466	2054774
	13022	13029	13035	13041	13047	13054	13060	13066	13072	13079
832.0	2056082	2057391	2058700	2060010	2061321	2062632	2063944	2065257	2066570	2067884
	13085	13091	13097	13104	13110	13116	13122	13129	13135	13141
833.0	2069198	2070513	2071829	2073145	2074462	2075780	2077098	2078417	2079736	2081056
	13147	13154	13160	13166	13173	13179	13185	13191	13198	13204
834.0	2082377	2083698	2085020	2086343	2087666	2088990	2090315	2091640	2092965	2094292
	13210	13216	13223	13229	13235	13242	13248	13254	13261	13267
835.0	2095619	2096946	2098275	2099604	2100933	2102263	2103594	2104925	2106257	2107590
	13273	13279	13286	13292	13298	13305	13311	13317	13324	13330
836.0	2108923	2110257	2111592	2112927	2114263	2115599	2116937	2118274	2119613	2120952
	13336	13343	13349	13355	13361	13368	13374	13380	13387	13393
837.0	2122291	2123631	2124972	2126314	2127656	2128999	2130342	2131686	2133031	2134376
	13399	13406	13412	13418	13425	13431	13437	13444	13450	13456
838.0	2135722	2137069	2138416	2139764	2141113	2142462	2143811	2145162	2146513	2147865
	13463	13469	13475	13482	13488	13495	13501	13507	13514	13520
839.0	2149217	2150570	2151923	2153278	2154632	2155988	2157344	2158701	2160058	2161416
	13526	13533	13539	13545	13552	13558	13565	13571	13577	13584



NOTES:

Outlet controls: 3 parallel outlets, each with two 4'x5' slide gates in tandem.

Curves based on data furnished by Modesto and Turlock Irrigation Districts.

Revised title 26 May 1971

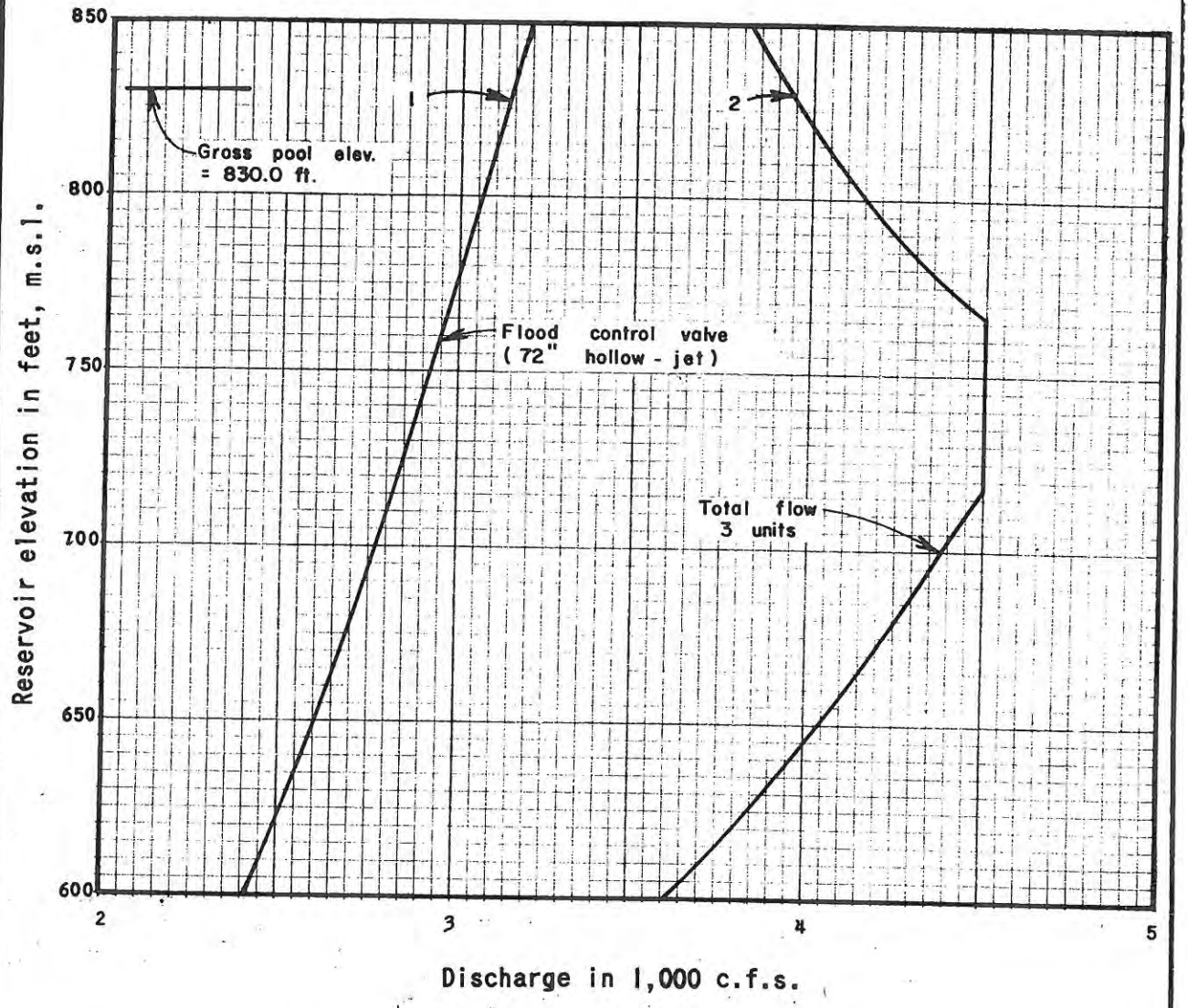
DON PEDRO LAKE
TUOLUMNE RIVER, CALIFORNIA

DISCHARGE RATING CURVES
(Through river outlet works)

CORPS OF ENGINEERS, SACRAMENTO, CALIFORNIA

Prepared: D.D.D.
Drawn: R.E.Y.&S.K.N.
Date: August 1970

CHART A-3



NOTE:

Curves furnished by Modesto and Turlock Irrigation Districts.

LEGEND

1. Discharge through flood control valve, with no releases through the turbines.
2. Total discharge through all 3 units, with no discharge through flood control valve.

Revised title 26 May 1971

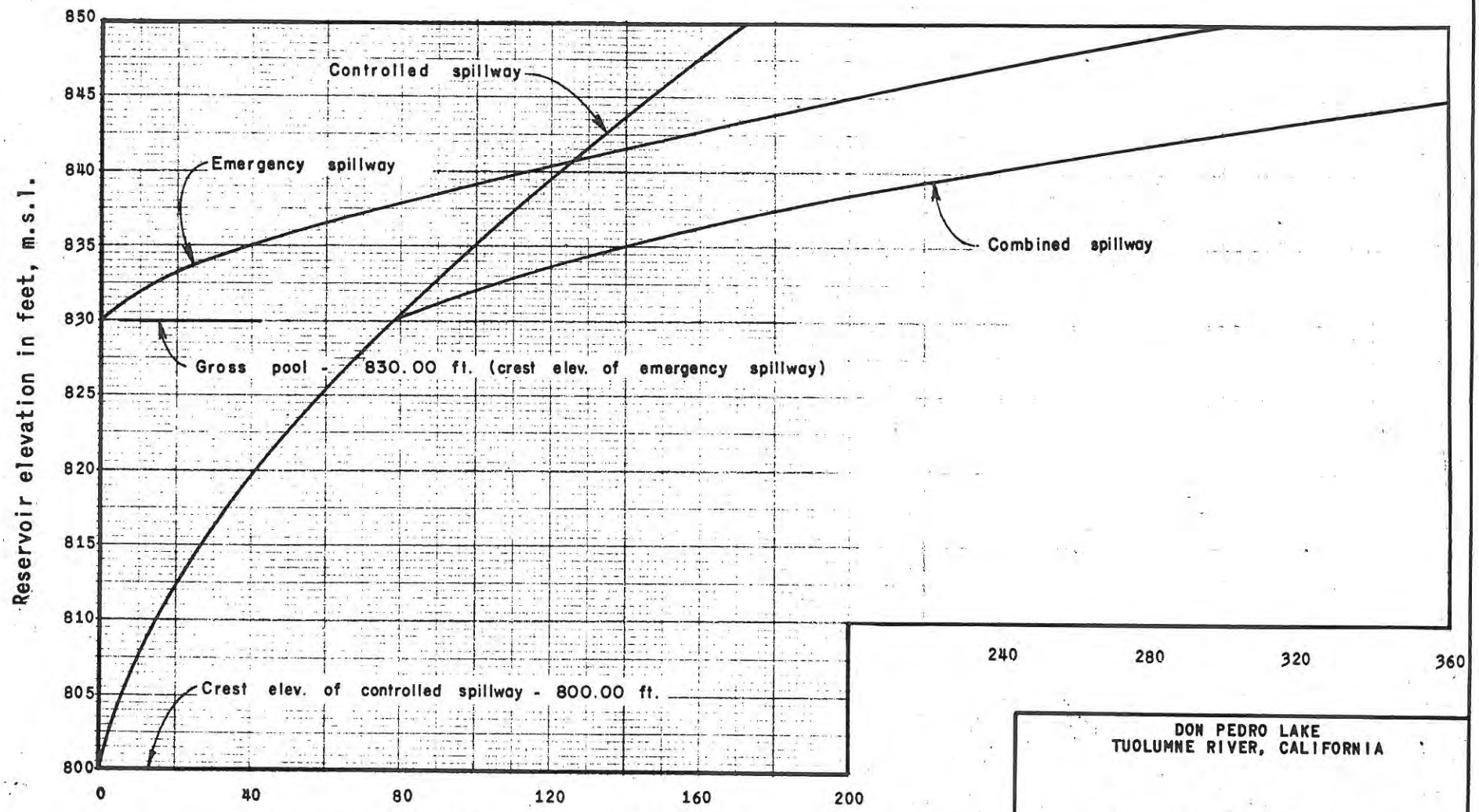
DON PEDRO LAKE
TUOLUMNE RIVER, CALIFORNIA

DISCHARGE RATING CURVES
(FLOOD CONTROL VALVE AND TURBINES)

CORPS OF ENGINEERS, SACRAMENTO, CALIFORNIA

Prepared: D.D.D.
Drawn: R.E.Y. & S.K.N. Date: August 1970

CHART A-4



NOTES:

1. Controlled spillway - 135.0 ft. (3-45 ft. x 30 ft. radial gates)
2. Curves based on data furnished by Modesto and Turlock Irrigation Districts.

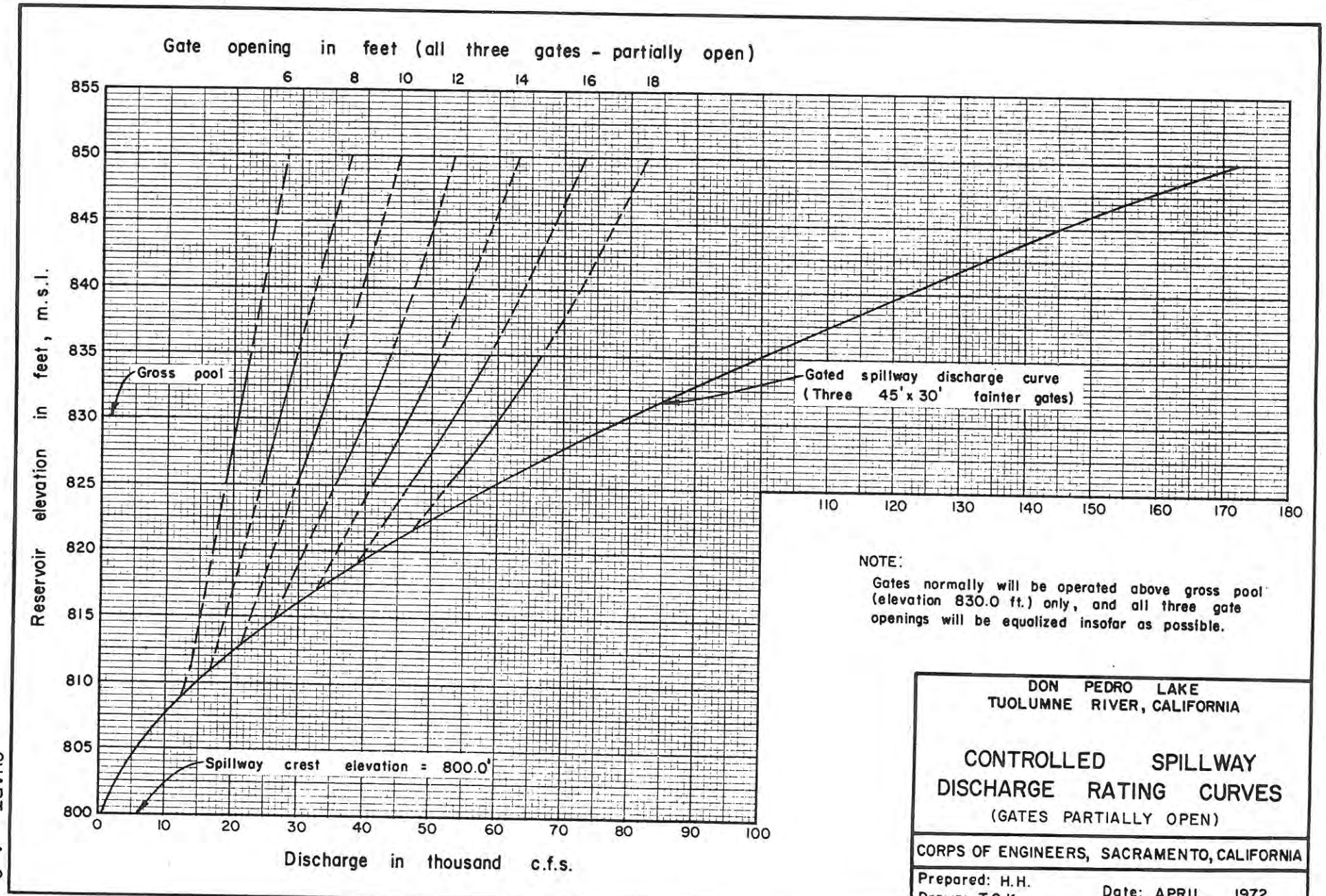
DON PEDRO LAKE
TUOLUMNE RIVER, CALIFORNIA

SPILLWAY RATING CURVES
(GATES FULLY OPEN)

CORPS OF ENGINEERS, SACRAMENTO, CALIFORNIA

Prepared: D.D.D.
Drawn: R.E.Y. & S.K.N. Date: August 1970

CHART A-5



NOTE:

Gates normally will be operated above gross pool (elevation 830.0 ft.) only, and all three gate openings will be equalized insofar as possible.

DON PEDRO LAKE
TUOLUMNE RIVER, CALIFORNIA

CONTROLLED SPILLWAY DISCHARGE RATING CURVES

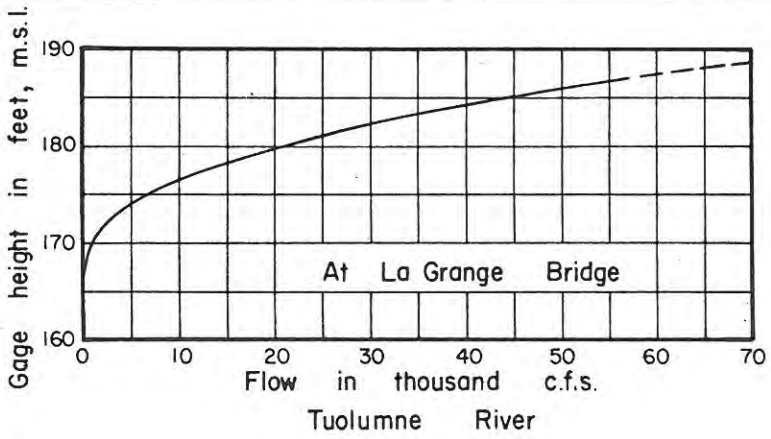
(GATES PARTIALLY OPEN)

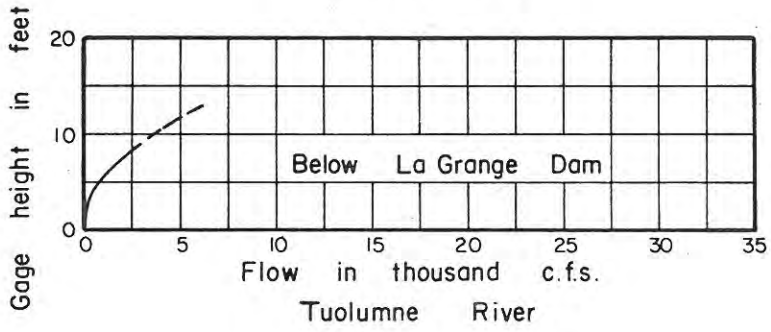
CORPS OF ENGINEERS, SACRAMENTO, CALIFORNIA

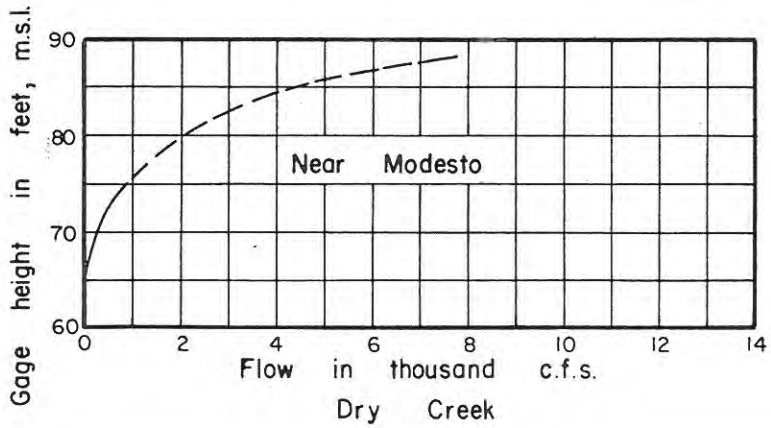
Prepared: H.H.
Drawn: T.G.K.

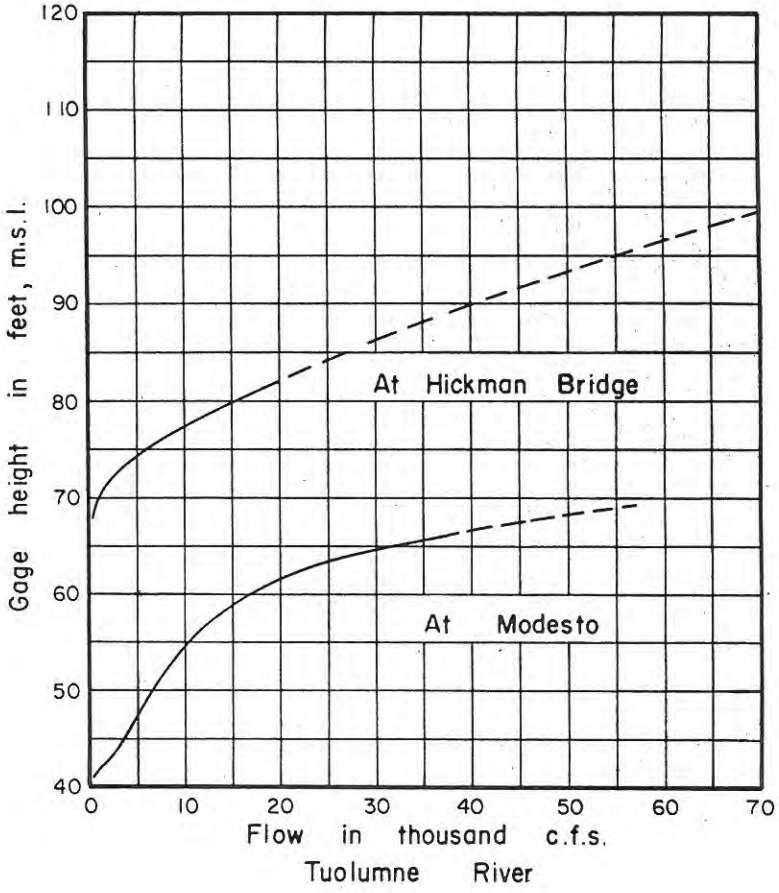
Date: APRIL 1972

CHART A-6









DON PEDRO LAKE
TUOLUMNE RIVER, CALIFORNIA

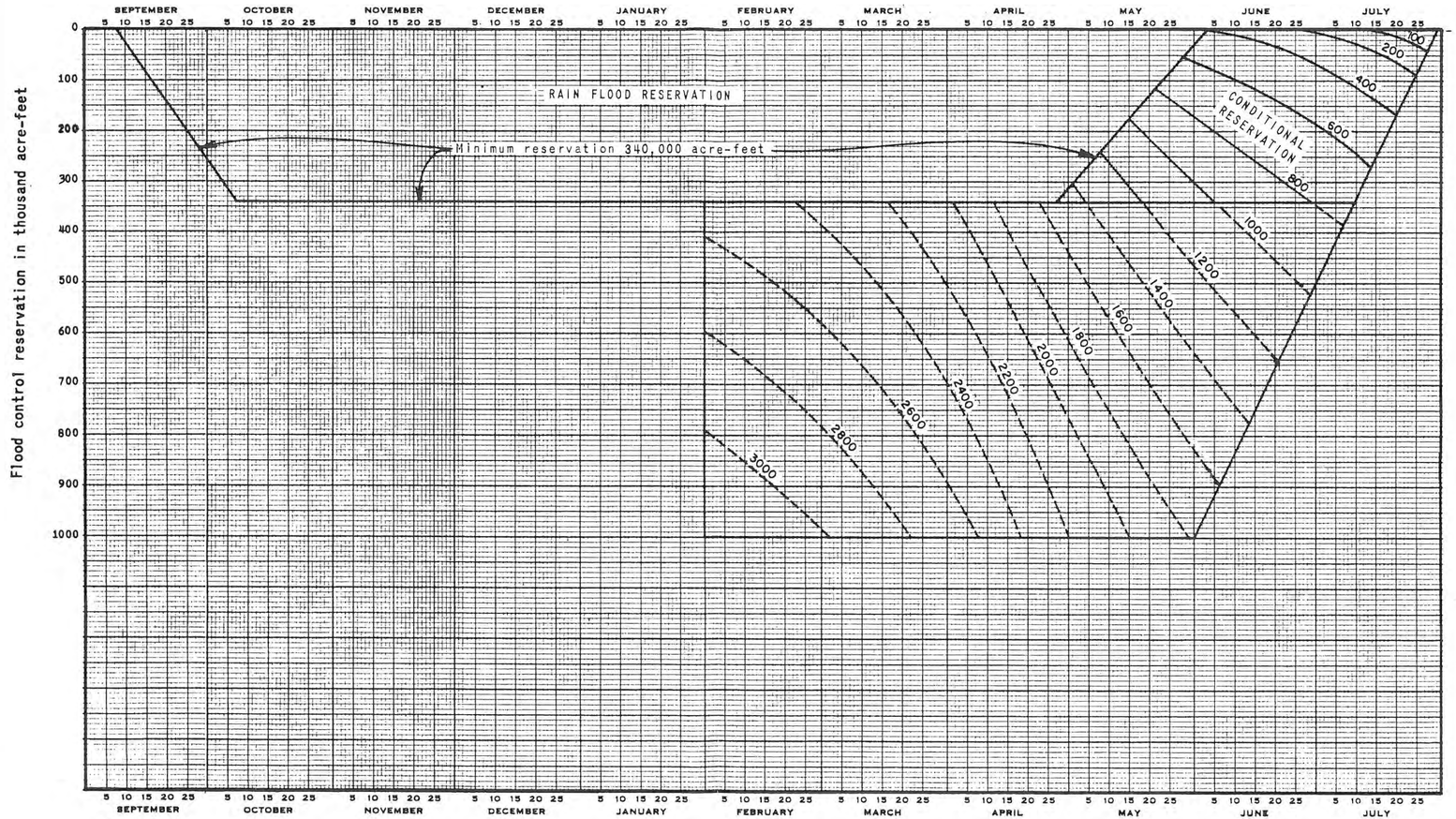
STAGE - DISCHARGE CURVES

CORPS OF ENGINEERS, SACRAMENTO, CALIFORNIA

Prepared: B.D.M.
Drawn: T.G.K.

Date: DECEMBER 1971

CHART A



NOTES

1. Don Pedro Lake shall be operated for flood control in accordance with this flood control diagram and the accompanying emergency spillway release diagram. Reservoir releases shall be made in accordance with the diagram requiring greater release.

2. Flood control reservation increases uniformly at a rate of 11,700 acre-feet per day from zero requirement on 8 September to the maximum reservation of 340,000 acre-feet by 7 October. The reservation is maintained at 340,000 acre-feet through 27 April after which, unless additional reservation is indicated by the snowmelt parameters, it will decrease uniformly at a rate of 9,200 acre-feet per day to zero requirement by 3 June.

3. Snowmelt parameter value is the forecasted natural runoff in thousand acre-feet of Tuolumne River inflow to Don Pedro Lake between the given date and 31 July. Dash line parameter extensions below maximum reservation line are used for computation purposes to define gross reservation requirement (before reduction for empty space in upstream reservoirs.)

4. The flood control reservation in Don Pedro Lake determined from snowmelt parameters may be decreased by 80 percent of the available empty space in each of Hetch Hetchy and Cherry Valley Reservoirs, respectively, but no reduction will be permitted below 50,000 acre-feet or the rain flood reservation value, and not more than 70% of the creditable portion of the requirement may be allowed for empty space in Hetch Hetchy Reservoir nor more than 30% for empty space in Cherry Valley Reservoir.

5. When space available for flood control is less than that indicated by the diagram (after allowing credit for empty space in upstream reservoirs), water shall be released as rapidly as possible without causing flows in Tuolumne River below Dry Creek to exceed 9,000 c.f.s.

6. Releases shall not be increased more than 2,000 c.f.s. or decreased more than 1,000 c.f.s. in any 2-hour period.

DON PEDRO LAKE
TUOLUMNE RIVER, CALIFORNIA

FLOOD CONTROL DIAGRAM

Prepared Pursuant to Flood Control Regulations for Don Pedro Dam and Lake

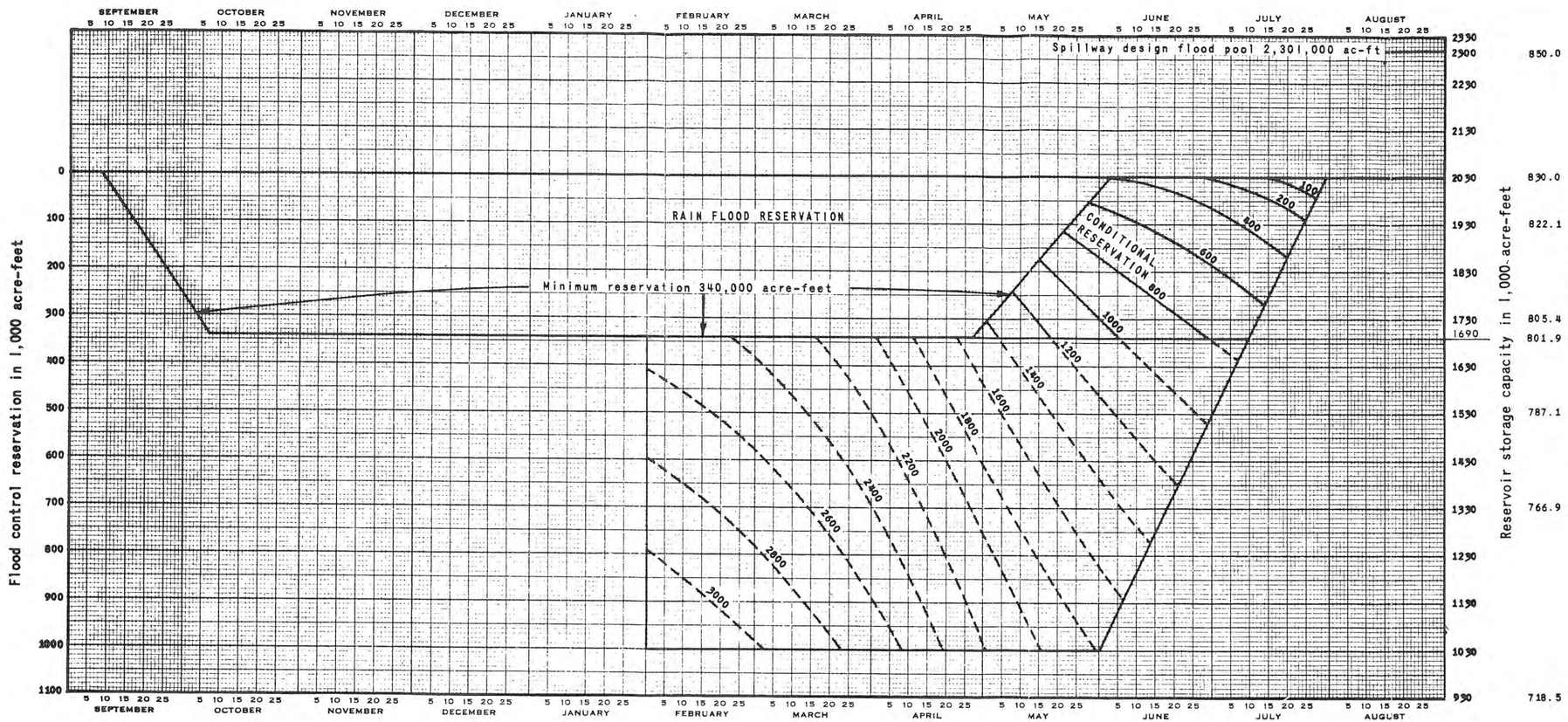
APPROVED: _____
Major General, USA, Director of Civil Works

APPROVED: _____
Chief Engineer, Modesto Irrigation District

APPROVED: _____
Chief Engineer, Turlock Irrigation District

Effective Date: _____ File No: TU-1-19-9

CHART A-8



NOTES

1. Don Pedro Lake shall be operated for flood control in accordance with this Flood Control Diagram and the accompanying Emergency Spillway Release Diagram. Reservoir releases shall be made in accordance with the diagram requiring greater release.
2. Flood control reservation increases uniformly at a rate of 11,700 acre-feet per day from zero requirement on 8 September to the maximum reservation of 340,000 acre-feet by 7 October. The reservation is maintained at 340,000 acre-feet through 27 April after which, unless additional reservation is indicated by the snowmelt parameters, it will decrease uniformly at a rate of 9,200 acre-feet per day to zero requirement by 3 June.
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5. When space available for flood control is less than that indicated by the diagram (after allowing credit for empty space in upstream reservoirs), water shall be released as rapidly as possible without causing flows in Tuolumne River below Dry Creek to exceed 9,000 c.f.s.
6. Releases shall not be increased more than 2,000 c.f.s. or decreased more than 1,000 c.f.s. in any 2-hour period except as required by the Emergency Spillway Release Diagram.

DON PEDRO LAKE
TUOLUMNE RIVER, CALIFORNIA

FLOOD CONTROL DIAGRAM

Prepared Pursuant to Flood Control Regulations for Don Pedro Dam and Lake in accordance with the Code of Federal Regulations Title 33 Part 208.11

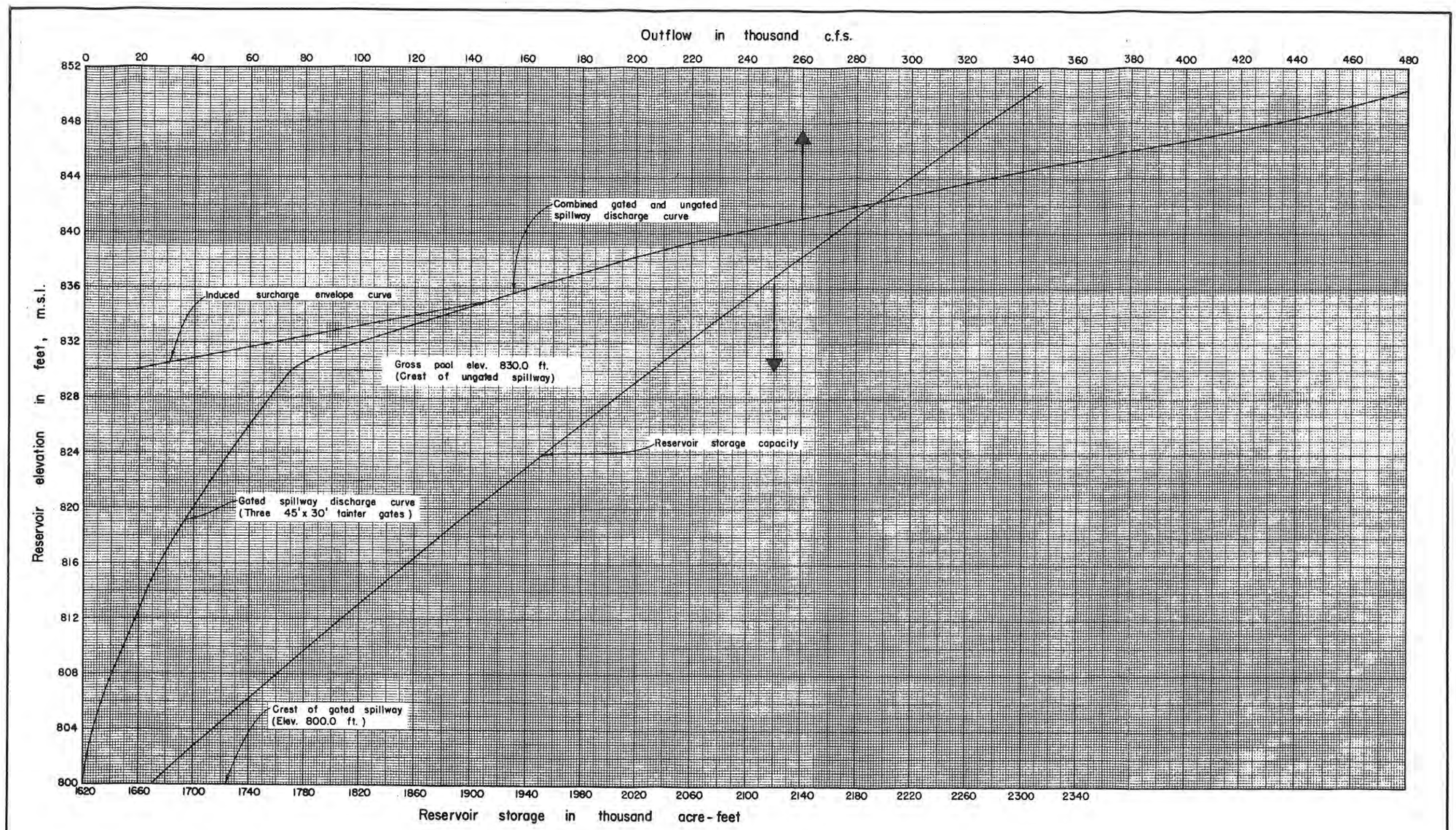
APPROVED: _____
Colonel, USA, Division Engineer, South Pacific Division

APPROVED: M. M. Bennett
Chief, Administrative Officer, Modesto Irrigation District

APPROVED: _____
Manager, Turlock Irrigation District

Effective Date: 27 JUL 1978 File No. TU-1-19-9

CHART A-8



OPERATING INSTRUCTIONS

1. Follow regular flood control regulation schedule until gross pool elevation 830.0 feet has been reached.

2. Above elevation 830.0 feet, minimum permissible releases are those indicated by the induced surcharge envelope curve. Gate openings (all three gates) shall be adjusted at least once each hour in order for the reservoir elevation to conform with the induced surcharge envelope curve as closely as possible.

3. When the reservoir water surface is dropping, maintain current gate openings until the water surface has reached elevation 830.0 feet (gross pool). Once the pool has dropped below elevation 830.0 feet releases should be reduced each hour by 0.3 of the difference between inflow and outflow until releases are reduced to rates required by the flood control diagram.

DON PEDRO LAKE
TUOLUMNE RIVER, CALIFORNIA

EMERGENCY SPILLWAY RELEASE DIAGRAM

Prepared Pursuant to Flood Control Regulations for Don Pedro Dam and Lake

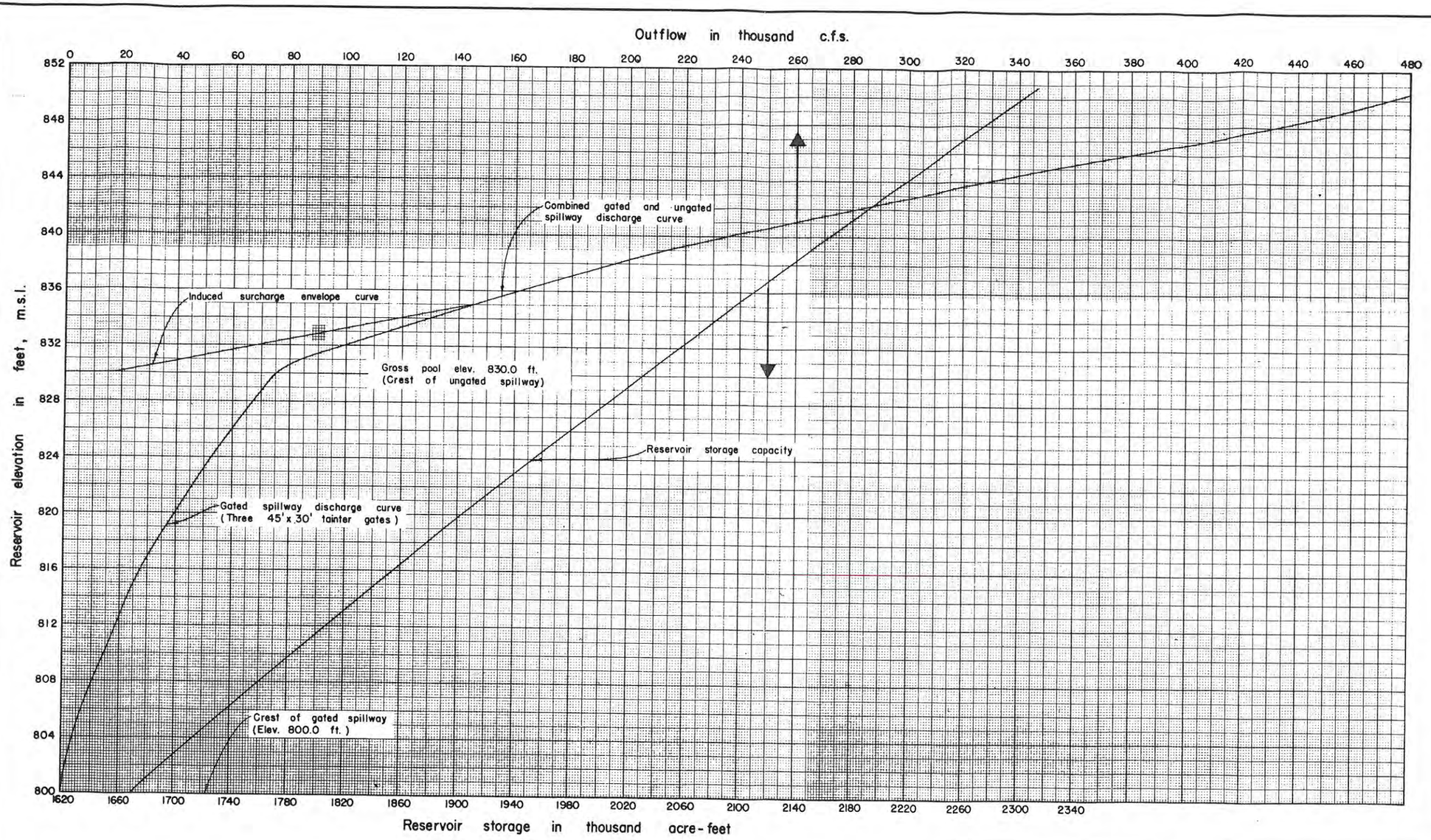
APPROVED: _____
MAJOR GENERAL, USA, DIRECTOR OF CIVIL WORKS

APPROVED: _____
CHIEF ENGINEER, MODESTO IRRIGATION DISTRICT

APPROVED: _____
CHIEF ENGINEER, TURLOCK IRRIGATION DISTRICT

Effective Date: _____ File No: TU-1-13-11

CHART A-9



OPERATING INSTRUCTIONS

1. Follow regular flood control regulation schedule until gross pool elevation 830.0 feet has been reached.

2. Above elevation 830.0 feet, minimum permissible releases are those indicated by the induced surcharge envelope curve. Gate openings (all three gates) shall be adjusted at least once each hour in order for the reservoir elevation to conform with the induced surcharge envelope curve as closely as possible.

3. When the reservoir water surface is dropping, maintain current gate openings until the water surface has reached elevation 830.0 feet (gross pool). Once the pool has dropped below elevation 830.0 feet releases should be reduced each hour by 0.3 of the difference between inflow and outflow until releases are reduced to rates required by the flood control diagram.

DON PEDRO LAKE
TUOLUMNE RIVER, CALIFORNIA

EMERGENCY SPILLWAY RELEASE DIAGRAM

Prepared Pursuant to Flood Control Regulations for Don Pedro Dam and Lake in accordance with the Code of Federal Regulations Title 33 Part 208.11

APPROVED: _____
Colonel, USA, Division Engineer, South Pacific Division

APPROVED: _____
Chief, Administrative Officer, Modesto Irrigation District

APPROVED: _____
Manager, Turlock Irrigation District

Effective Date 27 JUL 1978 File No. TU-1-13-11

CHART A-2

FIELD WORKING AGREEMENT
BETWEEN
THE MODESTO AND TURLOCK IRRIGATION DISTRICTS
AND
DEPARTMENT OF THE ARMY, CORPS OF ENGINEERS
FOR
FLOOD CONTROL OPERATION
OF
DON PEDRO DAM AND LAKE
ON
TUOLOMNE RIVER, CALIFORNIA

THIS agreement, made and entered into this 11th day of July, 1978, between the Modesto Irrigation District, and the Turlock Irrigation District hereinafter referred to as Irrigation Districts, and the Department of the Army, Corps of Engineers, hereinafter referred to as the Corps of Engineers.

WITNESSETH THAT:

WHEREAS, under the terms of contract number DA-04-167-eng-38 entered into 29 August 1949, and amended by Supplemental Agreement No. 1 dated 12 June 1967, by the United States of America, the Irrigation Districts and the City and County of San Francisco, the Irrigation Districts agreed to provide 340,000 acre-feet of flood space in Don Pedro Lake, and

WHEREAS, the Irrigation Districts, as owners and operators are responsible for the normal operation and structural safety of Don Pedro Dam and Lake, and

WHEREAS, the Department of the Army, acting through the Corps of Engineers, represented by its appropriate District and Division Engineers, is responsible for the flood control operation plan of said dam and lake in accordance with Section 7 of the 1944 Flood Control Act (33 U.S.C. 709) and as promulgated in Code of Federal Regulations, Title 33, Part 208.11, 15 May 1976, and

WHEREAS, there is a need for a working agreement to insure a clear understanding of the flood control regulations and information exchange required.

NOW, THEREFORE, it is mutually understood and agreed by and between the parties hereto that the Don Pedro Dam and Lake will be operated in accordance with the following criteria:

(a) Conservation operations shall be in accordance with the Irrigation Districts criteria.

(b) Storage space in the Don Pedro Dam and Lake Shall be made available on a seasonal basis and operated for flood control in accordance with the Flood Control Diagram currently in force.

(c) Emergency operations shall be in accordance with the procedure set forth on the Emergency Spillway Realease Diagram or procedures currently in force.

(d) The Irrigation Districts are responsible for the safety of the dam and appurtenant facilities and for regulation of the Don Pedro Dam and Lake during surcharge storage utilization. Emphasis upon the safety of the dam is especially important in the event surcharge storage is utilized, which results when the total storage space reserved for flood control is exceeded. Any assistance provided by the Corps of Engineers concerning surcharge regulation is to be utilized at the discretion of the Irrigation Districts, and does not relieve the Irrigation Districts of the responsibility for safety of the Don Pedro Dam and Lake.

(e) Revisions of the Flood Control or Emergency Spillway Release Diagrams and procedures may be developed as necessary by parties of this agreement. Each such revision shall be effective on the date specified.

(f) Except as necessary in order to comply with Emergency Operation procedures, the flood control regulations shall not be construed to require dangerously rapid changes in magnitude of releases. Releases will be made in a manner consistent with requirements for protecting the dam, lake and appurtenances from major damages.

(g) Any water impounded in the flood control space defined by the Flood Control Diagram shall be evacuated as rapidly as can be safely accomplished without causing downstream flows to exceed the controlling rates; i.e., releases from the reservoir shall be restricted insofar as practicable to quantities which, in conjunction with uncontrolled runoff downstream of the dam, will not cause water levels to exceed the controlling stages currently in force. Although conflicts may arise with other purposes, such as hydropower, the plan or regulation may require releases to be completely curtailed in the interest of flood control or safety of the project.

(h) The Irrigation Districts shall procure such current basic hydrologic data and make such current determinations of required flood control space and releases at the reservoir as are required to accomplish the flood control objectives.

(i) The Irrigation Districts shall keep the District Engineer advised of such currently available hydrometeorlogical reservoir operating data as the District Engineer may request. The minimum data required is reservoir storage, inflow, releases and streamflow at control points designated by the Flood Control Diagram on a daily basis.

(j) The flood control regulations are subject to temporary modification by the Corps of Engineers if found necessary in time of emergency. Requests for and action on such modifications may be made by the fastest

means of communication available. The action taken shall be confirmed in writing the same day to the offices of the Irrigation Districts and shall include justification for the action.

(k) The Irrigation Districts may temporarily deviate from the flood control regulations in the event an immediate short-term departure is deemed necessary for emergency reasons to protect the safety of the dam, or to avoid other serious hazards. Such actions shall be immediately reported by the fastest means of communication available. Actions shall be confirmed in writing the same day to the Corps of Engineers and shall include justification for the action. Continuation of the deviation will require the express approval of the Division Engineer.

IN WITNESS WHEREOF, the parties hereto have caused this memorandum of agreement to be executed as the day and date first above written.

CORPS OF ENGINEERS

By: William E. Vandenberg
Division Engineer
South Pacific Division

MODESTO IRRIGATION DISTRICT

By: M. M. Bennett
Chief, Administrative Officer

TURLOCK IRRIGATION DISTRICT

By: Ernest Cadle
General Manager

DON PEDRO PROJECT
FERC NO. 2299

DRAFT LICENSE APPLICATION

EXHIBIT H - PLANS AND ABILITY OF APPLICANT TO OPERATE THE PROJECT

APPENDIX H-4
DON PEDRO RECREATION AGENCY REGULATIONS AND ORDINANCES

DON PEDRO RECREATION AGENCY

REGULATIONS AND ORDINANCES

Section I
AUTHORITY AND ENFORCEMENT

1.1 AUTHORITY:

The Agency will use all applicable laws to carry out its duties including the following specific sections.

1.1.1 §12970 California Water Code

"Water Agency", as used in this part means any public corporation, district, political subdivision, or any other agency or authority now or hereafter organized under the laws of this state which develops, stores, distributes or supplies water.

1.1.2 §12973 California Water Code

The governing body of a water agency may adopt regulations binding upon all persons covering the use of such recreational facilities. Any violation of such regulations is a misdemeanor.

1.1.3 § 830.31 California Penal Code

The following persons are peace officers whose authority extends to any place in the state for the purpose of performing their primary duty or when making an arrest pursuant to Section 836 as to any public offense with respect to which there is immediate danger to person or property, or of the escape of the perpetrator of that offense, or pursuant to Section 8597 or 8598 of the Government Code. These peace officers may carry firearms only if authorized, and under the terms and conditions specified, by their employing agency…

(b) *A person designated by a local agency as a park ranger and regularly employed and paid in that capacity if the primary duty of the officer is the protection of park and other property of the agency and the preservation of the peace therein…*

1.1.4 §53069.4 (a) (1) California Government Code

The legislative body of a local agency, as the term "local agency" is Defined in Section 54951, may by ordinance make any violation of any ordinance enacted by the local agency subject to an administrative fine or penalty.

1.1.5 §54951 California Government Code

As used in this chapter, "local agency" means a county, city, whether general law or chartered, city and county, town, school district, municipal corporation, district, political subdivision, or any board, commission or agency thereof, or other local public agency.

1.1.6 §54952. California Government Code

As used in this chapter, "legislative body" means:

(a) *The governing body of a local agency or any other local body created by state or federal statute.*

1.2 ENFORCEMENT:

Violations of applicable laws may result in any or multiples of the following:

1.2.1 Issuance of Warnings

1.2.2 Administrative Citations

1.2.3 Criminal Citations/Notices to Appear

1.2.4 Revocations of use permits

1.2.5 Evictions from the Recreation Area

1.2.6 Personal property towing/impoundment

1.2.7 Restitution for damages to and clean-up of the Recreation Area and its facilities

1.2.8 Other actions deemed appropriate by the Director to carry out the enforcement of these Regulations and Ordinances

Section II:
GENERAL

2.1 INTERFERING WITH AGENCY EMPLOYEES

2.1.1 No person shall interfere with, harass, intimidate or threaten any Agency employee during the course of the employee's duties as charged by the Agency.

2.2 PERMITS

2.2.1 No person shall utilize the Recreation Area for any purpose without a valid permit from the Agency, except that permits are not required for authorized activities in dispersed areas accessed by non motorized means.

2.2.2 No person shall utilize the Recreation Area without paying all applicable fees for required permits.

2.2.3 No person shall utilize the Recreation Area without displaying required permits in the designated location.

2.2.4 No person shall refuse to show their permit to Agency personnel upon request.

2.2.5 No person shall transfer their permit to another person without prior Agency approval.

2.3 DOMESTIC ANIMALS

2.3.1 No person shall bring or possess a domestic animal in the developed facilities of the Recreation Area, unless the animal is specifically a seeing eye, signal or service animal as defined by the Americans with Disabilities Act, under the immediate control of the disabled person.

2.3.2 No person shall allow domestic animals to run loose in areas of the Recreation Area where their presence is permitted.

2.3.3 No person shall place their domestic animal on a leash more than six (6) feet in length in the Recreation Area where their presence is permitted.

2.3.4 No person shall be allowed to bring a dog into the Recreation Area where their presence is permitted without proof of current rabies vaccination or current license.

2.3.5 No person shall deposit or leave any domestic animal unattended for any length of time within the Recreation Area.

2.3.6 No person shall fail to clean up, seal in a bag, and properly dispose of waste deposited by their domestic animal where the animal's presence is permitted.

2.4 FIRES

2.4.1 No person shall build or light a charcoal or other type of fueled fire directly on the ground or outside of an appropriate device designed for this purpose (such as the furnished campsite fire ring).

2.4.2 No person shall use a portable camp stove, barbecue, candle or lantern without clearing away all vegetation and combustible materials around the unit to a minimum of ten (10) foot plus the height of any device used to elevate the stove, candle, lantern etc. (or greater when conditions warrant).

2.4.3 No person shall fail to observe any fire safety order issued by any authorized Agency representative.

2.4.4 No person shall possess firewood in the dispersed area of the Recreation Area.

2.4.5 No person shall build a fire using wood for fuel in the dispersed area of the Recreation Area.

2.4.6 No person shall add to a fire any fuel that exceeds in size the length, width or height of the container being used.

2.4.7 No person shall leave any fire unattended at any time without complete extinguishment.

2.4.8 No person shall leave or dispose of charcoal briquettes, ashes or other burned materials outside of the furnished campsite fire ring or a designated ash disposal receptacle.

2.5 FIREWORKS

2.5.1 No person shall possess, discharge, set off, or cause to be discharged, in or into any portion of the Recreation Area any firecrackers, torpedoes, rockets, fireworks, explosives, or similar type substances.

2.6 WEAPONS

2.6.1 No person shall discharge in or across the developed facilities of the Recreation Area any weapon, except for Sworn Peace Officers or persons authorized by the Agency in the performance of official duties.

2.6.2 No person shall possess any weapon within the developed facilities of the Recreation Area that is not deactivated, except for Sworn Peace Officers or persons authorized by the Agency in the performance of official duties.

2.6.3 No person shall use any weapon, except for hunting or fishing purposes in accordance with applicable laws, within the Recreation Area.

2.6.4 No person shall possess any weapon in the dispersed facilities that is not deactivated, except for persons hunting in accordance with applicable law, Sworn Peace Officers or persons authorized by the Agency in the performance of official duties.

2.6.5 No person may brandish, display or use any object that may be deemed to have the potential of serving as a weapon in any manner that may be deemed threatening or that may raise a level of public concern that such an item may be used as a weapon.

2.7 MINOR CHILDREN

2.7.1 No person under the age of eighteen (18) shall camp in the Recreation Area without being accompanied by a parent or legal guardian.

2.7.2 No person under the age of eighteen (18) shall be outside of their campsite between the hours of 11:00 p.m. and 5:00 a.m. unless they are accompanied by a parent or legal guardian.

2.8 CONDUCT

PEACE AND QUIET

2.8.1 No person shall fail to observe the quiet time hours of 10 p.m. to 7 a.m.

2.8.2 No person shall, at any time, use electronic equipment, including but not limited to powered speakers or other machinery within the 5 MPH zone at any launch ramp, in the launch ramp preparation area, in or near any parking or developed camping and day use areas or vessel mooring areas of the Recreation Area at a volume which emits sound beyond the immediate individual camp, picnic site, vehicle, vessel or vessel mooring location. This prohibition does not apply to authorized emergency vessels or when equipment is being operated to request assistance or warn of a hazardous situation.

2.8.3 No person shall operate an engine driven electrical generator which emits sound beyond the immediate limit of the campsite or vessel mooring location between the hours of 10 p.m. and 7 a.m.

DISORDERLY CONDUCT

2.8.4 No person(s) shall engage in fighting in the Recreation Area.

2.8.5 No person shall communicate in such a manner that is threatening, verbally offensive, or derisive.

2.8.6 No person shall make statements or actions toward another person that incites or produces imminent lawless action and is likely to incite or produce such action.

2.8.7 No person shall urinate or defecate in public.

2.8.8 No person over the age of five (5) shall appear, swim, bathe, sunbathe, walk or otherwise be in the Recreation Area in such a manner that the genital/pubic hair area of the body and the breast of any female person at or below the areola is exposed to public view.

2.9 SANITATION

2.9.1 No person shall litter or leave refuse of any type within the Recreation Area except in a receptacle or area designated for that purpose.

2.9.2 No person shall place or burn litter or refuse in fire rings or barbecues.

2.9.3 No person shall import any refuse from outside the Recreation Area and deposit such refuse within the Recreation Area.

2.9.4 No person shall place debris, construction materials and refuse including chemicals and containers resulting from the construction, remodeling or maintenance of houseboats, vessels, vehicles and concessionaire facilities in Agency waste receptacles or within the Recreation Area.

2.9.5 No person shall remove recyclable materials from Agency waste receptacles or designated Agency recycling containers.

2.9.6 No person shall rummage through or remove any items that are placed in or around any refuse or recycling receptacles.

2.9.7 No person shall deposit waste, water, sewage or effluent from vehicles, vessels, wastewater holding tanks, sinks, portable toilets, or any other source into or onto anything other than an appropriate disposal site as designated by the Agency.

2.9.8 No person shall deposit human waste in any location other than a restroom facility toilet, portable toilet or appropriate disposal site as designated by the Agency.

2.9.9 No person shall fail to cooperate in maintaining restrooms in a neat and sanitary condition.

2.9.10 No person shall use restrooms set apart for the opposite gender.

2.10 TRESPASSING

2.10.1 No person, vessel or vehicle shall enter any area after posted closure hours or that has been posted by the Agency as closed.

2.10.2 No person shall open, drive around a closed gate or through a fence or remove, unlock, destroy or tamper with any door on any building or lock on any gate that has been placed by the Agency.

2.10.3 No person shall violate any Agency order posting conditions and limitations for the use of any facility or area, or operation, use, size, type, permissible equipment, beaching, landing, launching, mooring, docking, or berthing of a vessel, boat, vehicle, or any other object.

2.10.4 No person shall establish, build, install, leave, tie-up or secure any kind of developed improvement including but not limited to docks, permanent vessel mooring devices, trails, roadways, buildings, etc. within the Recreation Area land or waters.

2.10.5 No person shall access Recreation Area land or water from adjacent property by use of a motorized vehicle.

2.10.6 No person shall leave a vehicle, trailer or vessel that is inoperable or has expired registration in the Recreation Area.

2.11 VANDALISM

2.11.1 No person shall willfully deface, mar, paint, damage, destroy, dismantle, remove, modify, or relocate any developed improvement or natural resource within the Recreation Area.

2.12 SOLICITING/OUTSIDE VENDORS

2.12.1 No person shall engage in soliciting, selling, or peddling any goods or services within the Recreation Area.

.

2.12.2 No person shall distribute, throw or deposit any handbills, circulars, pamphlets or advertisements, or affix to any tree, fence or structure any such handbill or advertisement.

Section III: VEHICLES

3.1 MOTOR VEHICLE OPERATION

3.1.1 No person shall drive any vehicle off of designated roadways and parking pads or into any dispersed area of the Recreation Area.

3.1.2 No Person shall operate, nor shall an owner permit the operation of, a motor vehicle in a manner likely to cause malicious or unnecessary damage to the land, wildlife, wildlife habitat or vegetative resources.

3.1.3 No person shall operate within the Recreation Area any motorized vehicle or other mobility device in violation of applicable laws.

3.1.4 No person shall fail to observe posted regulatory traffic signs roadway markings or any other temporary sign installed by the Agency.

3.1.5 No person shall operate their vehicle in an unsafe manner.

3.1.6 No person shall ride in or upon any trailer in tow, in any truck bed or upon any tailgate, hood, or other external portion of any vehicle not designed to legally carry passengers except when a trailer carrying or designed to carry a vessel is engaged in the immediate launching or retrieval of a vessel.

3.1.7 No person shall operate any vehicle without the appropriate driver license or learner permit.

3.1.8 No person shall operate any vehicle under the influence of alcohol or other substance which impairs ability to drive.

3.1.9 No person shall operate any vehicle with an open container of alcohol in the vehicle.

3.2 PARKING

VEHICLES

3.2.1 No person shall park any vehicle in any area posted “No Parking” or in any location other than a designated parking area.

3.2.2 No person shall park any vehicle in a signed handicapped parking place without displaying the proper handicapped placard/license on their vehicle.

3.2.3 No person shall park any vehicle in a manner to block or obstruct the exit of another vehicle already legally parked.

3.2.4 No person shall park any vehicle in a time restricted parking zone for longer than the posted time allowance.

TRAILERS

3.2.5 No person shall leave any unattached/unattended boat trailer in any place other than a designated trailer parking area or campsite.

3.2.6 No person shall leave any unattached/unattended boat trailer in any designated trailer parking area without a boat trailer parking permit.

3.3 OPERATOR PROPELLED DEVICES

3.3.1 No person shall ride any operator propelled device within the Recreation Area without proper personal safety equipment as required by applicable law.

3.3.2 No person shall ride any operator propelled device in an unsafe or discourteous manner or in a way to potentially cause property damage.

3.3.3 No person on any operator propelled device shall fail to observe posted use limitation signs, regulatory traffic signs, roadway markings or any other temporary sign posted by the Agency.

Section IV
RECREATION AREA USE

4.1 CAMPING AND PICNICKING

4.1.1 No person shall camp within the Recreation Area except in designated camping areas.

4.1.2 No person shall camp in the dispersed area of the Recreation Area where dispersed area camping is prohibited.

4.1.3 No person shall register for any campsite and then allow the overnight campsite occupancy limit of 8 persons per campsite to be exceeded.

4.1.4 No person shall occupy a campsite and/or vehicle parking pad other than the one to which they have been registered.

4.1.5 No person shall arrive to occupy a campsite for the coming night prior to the 4 p.m. check-in time (unless approved in advance by the Agency) without acquiring the previous night's camping permit.

4.1.6 No person shall occupy a campsite past the check out time of 2 p.m. (unless approved in advance by the Agency) if they have not acquired a permit to camp in that site for the coming night.

4.1.7 No person shall occupy a campsite for more than 14 consecutive nights between May 1 and September 30 of any given year, or more than 90 consecutive nights between October 1 and April 30 of any given year.

4.1.8 No person shall occupy a campsite for a maximum length of time and then for a consecutive stay without observing the defined break in occupancy.

4.1.9 No person shall move any Agency provided campsite or picnic site furnishing from one camp or picnic site to another.

4.1.10 No person shall picnic in a developed camping area.

4.1.11 No person shall leave any campsite furnishings or other personal property unattended for more than 12 hours in any dispersed area.

4.1.12 No person shall use the electrical outlets (other than those located in an individual's assigned hook-up or group site) in any restroom or other Agency facility for the purpose of plugging in an extension cord, electric appliance used for food or beverage preparation, and/or other electric device not needed for personal grooming.

4.1.13 No person shall leave a hose connected to any water faucet in any camping area or restroom, other than in an individual's assigned hook-up campsite.

4.1.14 No person shall set up portable swimming/wading pools within the Recreation Area.

4.2 GROUP USE

4.2.1 No person shall exceed a maximum number of 200 persons per group campsite or 100 persons per group picnic site.

4.3 DAY USE

4.3.1 No person shall exceed the day use hours of 5 a.m. to 10 p.m. without acquiring the appropriate additional day's use permit.

4.3.2 No person shall leave any day use furnishings in any dispersed area or other day use facility (such as swimming lagoon, lakeshore or picnic area) overnight (outside of the day use hours).

4.4 NIGHT FISHING

4.4.1 No person shall exceed the night fishing use hours of 5 p.m. to 10 a.m. without acquiring the appropriate additional day's use permit.

4.5 AQUATIC AND BOATING

VESSEL REQUIREMENTS AND RESTRICTIONS

4.5.1 All vessels that require registration numbers pursuant to applicable laws are required to have a current use permit from the Agency.

4.5.2 No person shall bring into the Recreation Area any vessel that is 10 feet or greater in width (during transport on land) other than an Agency permitted houseboat.

4.5.3 No person shall leave their vessel (except houseboats) unattended for more than 12 consecutive hours beached, moored, stored, or parked within the Recreation Area outside of an Agency authorized, assigned campsite, mooring or storage facility.

4.5.4 No person shall moor their vessel to or hang on with a vessel to any regulatory buoy, lake regulatory sign, hazard buoy, hazard marker, mooring buoy, supporting structures or beacon placed by the Agency or its authorized agents within the Recreation Area.

4.5.5 No person shall leave a vessel moored to an Agency or Marina courtesy dock, special use dock or floating restroom facility in excess of a posted maximum time limit.

4.5.6 No person shall moor any houseboat, private or rented, to an Agency courtesy dock, floating restroom facility, or to any buoy clearly marked "No Houseboats".

4.5.7 No person shall leave, moor, beach, or tie up any houseboat or sleeping capacity vessel on the shoreline of the developed Recreation Area facilities overnight during the time period of April 1 through September 30 of any year.

4.5.8 No person shall leave, moor, beach, or tie up any houseboat or sleeping capacity vessel in a manner during the day that creates congestion in a heavy use area (such as the launch ramp).

4.5.9 No person shall leave, moor, beach, tie up or secure any vessel in a manner which obstructs the navigation or access to any navigable water by any vessel.

4.5.10 No person shall leave, moor, tie up or secure any vessel to, otherwise use, or obstruct access to any Agency special use dock in conflict with a posted authorized reservation time period.

VESSEL OPERATION

4.5.11 No person shall operate or use any vessel, aquatic vehicle, or manipulate water-skis, aquaplane, or similar device in a reckless or negligent manner so as to endanger the life, limb or property of any person.

4.5.12 655.2 Harbors and Navigation Code

(a) *Every owner, operator, or person in command of any vessel propelled by machinery is guilty of a misdemeanor who uses it, or permits it to be used, at a speed in excess of five miles per hour in any portion of the following areas not otherwise regulated by local rules and regulations:*

(1) *Within 100 feet of any person who is engaged in the act of bathing. A person engaged in the sport of water skiing shall not be considered as engaged in the act of bathing for the purposes of this section.*

(2) *Within 200 feet of any of the following:*

(A) *A beach frequented by bathers.*

(B) *A swimming float, diving platform, or lifeline.*

(C) *A way or landing float to which boats are made fast or which is being used for the embarkation or discharge of passengers.*

(b) *This section does not apply to vessels engaged in direct law enforcement activities which are displaying the lights prescribed by Section 652.5. Those vessels are also exempt from any locally imposed speed regulation adopted pursuant to Section 660.*

4.5.13 No person shall tow any aquaplane behind or alongside a vessel in an area posted "No Ski" by means of authorized regulatory buoys or signs.

4.5.14 HOUSEBOAT RULES

No person who is permitted to place their houseboat on Don Pedro Lake shall fail to follow the rules set forth in the DPRA Houseboat Rules (see appendix A).

4.6 TRAILS

4.6.1 No person shall fail to observe posted trail use regulations or restrictions.

4.6.2 No person shall operate any motorized vehicle on trails except for power driven mobility devices operated by persons with mobility disabilities in accordance with applicable laws.

4.6.3 No person shall block any trail or set up campsite and/or day use furnishings on any trail.

4.6.4 No person shall use trails for the purpose of accessing or trespassing upon adjacent private property.

4.6.5 No person shall create their own trail or cut their own switchbacks or shortcuts.

4.6.6 No bicyclist shall fail to yield to pedestrian, mobility disabled or other non-motorized trail users.

4.6.7 No bicyclist, pedestrian, mobility disabled or other non-motorized trail user shall fail to yield to any equestrian where equestrian trail use is permitted.

4.6.8 No bicyclist shall fail to announce their presence by voice or other audible signal to other trail users prior to passing them.

Section V
NATURAL RESOURCES

5.1 MINING AND PANNING

5.1.1 No person shall engage in the act of mining within the Recreation Area.

5.1.2 No person shall engage in panning in any developed facility of the Recreation Area.

5.1.3 No person shall leave any panning site in the dispersed area of the Recreation Area prior to restoring the area in which the panning took place to its original, natural condition.

5.2 METAL DETECTING

5.2.1 No person shall enter the developed facility of the Recreation Area for the purpose of metal detecting.

5.2.2 No person shall keep personal property found during the act of metal detecting in the dispersed areas of the Recreation Area without first having abided by the Agency Lost and Found policy.

5.2.3 No person shall leave any metal detecting site in the dispersed area of the Recreation Area prior to restoring the area in which the metal detecting took place to its original, natural condition.

5.3 WILDLIFE, PLANTS, SOILS, MINERALS, AND WATER

5.3.1 No person shall maliciously, intentionally or negligently molest, hunt, disturb, injure, trap, net, poison, harm, kill, feed, touch, tease or spotlight any wild animal except for persons hunting or fishing in accordance with applicable law.

5.3.2 No person shall introduce any non-native wild species or domestic animal into the Recreation Area.

5.3.3 No person shall willfully or negligently pick, dig up, cut, mutilate, destroy, injure, disturb, move, molest, burn or carry away any tree, plant or any portion thereof except that which is needed to clear away vegetation or combustible material in compliance with these rules, FIRES section 2.4.2.

5.3.4 No person shall disturb the soils (except as otherwise permitted in these regulations and ordinances), archaeological, historical or geological resources within the Recreation Area.

5.3.5 No person shall engage in any work or repairs or other activity that would introduce into the waters or soil of the Recreation Area any substance which is or becomes defined as a hazardous waste, hazardous substance, pollutant, or contaminant under any federal, state, or local statute, regulation, rule, or ordinance or amendment thereto, or that would result in the violation of the Porter-Cologne Water Quality Act (Cal. Water Code Sec. 13100 et seq.) or the Clean Water Act (33USC 1251-1376).

Section VI
DEFINITIONS

The following definitions will be used for the purpose of these regulations and ordinances, whether or not they are initially capitalized.

AGENCY:
The Don Pedro Recreation Agency (also referenced DPRA), which is the organization charged with the responsibility for the operation and maintenance of the Recreation Area. The Agency has the jurisdiction to enforce Applicable Laws within the Recreation Area. Agency includes all authorized Agency representatives acting within the scope of their authority.

ANNUAL BOAT PERMIT:
A permit that allows day use, storage or moorage of a boat that does not have sleeping capacity in the Recreation Area and is valid for a calendar year. Required for boats that are stored or moored in the Recreation Area for greater than 15 consecutive days.

ANNUAL LAKESHORE CAMPING PERMIT:
A permit that allows lakeshore camping use of the Recreation Area and is valid for a calendar year.

ANNUAL PW PERMIT:
A permit that allows day use, storage or moorage of a personal watercraft in the Recreation Area and is valid for a calendar year. Required for personal watercraft that are stored or moored in the Recreation Area greater than15 consecutive days.

ANNUAL SC PERMIT:
A permit that allows day use, storage or moorage of a boat with sleeping capacity in the Recreation Area and is valid for a calendar year. Required for boats with sleeping capacity that are stored or moored in the Recreation Area greater than 15 consecutive days.

ANNUAL SECOND VEHICLE PERMIT:
A permit that allows vehicle day use of the Recreation Area and is valid for a calendar year, sold at a reduced rate when the vehicle's registered owner has already purchased an Annual Vehicle Permit or Annual Senior Citizen Vehicle Permit for another vehicle registered in his/her name.

ANNUAL SENIOR CITIZEN VEHICLE PERMIT:
A permit that allows vehicle day use of the Recreation Area and is valid for a calendar year, sold at a reduced rate for a vehicle whose registered owner is age 62 or over.

ANNUAL VEHICLE PERMIT:
A permit that allows vehicle day use of the Recreation Area and is valid for a calendar year.

APPLICABLE FEES:
All Agency approved Recreation Area permit and use fees.

APPLICABLE LAWS:
All Laws, Codes, Ordinances, Rules, Regulations (including these Regulations and Ordinances) and Standards currently in effect that pertain to or are relevant to the use of and/or the activities that take place within the Don Pedro Recreation Area.

AQUAPLANE:
All forms of water skiing, wakeboarding, barefoot skiing, skiing on skim boards, knee boards or other contrivances, parasailing, ski kiting, or any activity where a person is towed behind or alongside a boat with the exception of a vessel in tow.

BOAT:
Any vessel that is less than 10' in width and requires numbering and registration per State Law.

BREAK IN OCCUPANCY:
48 hour vacancy time period required before a camper may occupy a given campsite again after occupying that campsite for the maximum number of nights.

BOAT TRAILER PARKING PERMIT:
Permit provided at developed facility for the purpose of leaving an unattended vessel trailer in any designated parking area while camping, houseboating, or otherwise using the Recreation Area. Permit does not cover parking of unattended trailers if owner is not utilizing the Recreation Area facilities at the time the trailer is being left in the designated parking area.

CAMPING:
Overnight use of Recreation Area land other than for the sole activity of fishing. May include but is not limited to erecting a tent or shelter, arranging bedding, or using a parked or standing vehicle for staying overnight.

CAMPSITE:
Area established with Agency provided or user provided furnishings and utilized for the purpose of camping.

DAY USE:
Use of Recreation Area for parking and daytime activities.

DAY USE FURNISHINGS:
All portable structures that are brought in to facilitate day use activities.

DEACTIVATED WEAPON:
A weapon that is rendered temporarily inoperable by being cased, packed away, or stored in such a manner that will prevent ready use.

DESIGNATED PARKING AREA:
Paved or other area established for the purpose of parking vehicles and trailers. May be indicated by signage, proper striping, or obvious applicability for parking (such as for paved campsite parking pads).

DEVELOPED CAMPSITE:
Designated area (by number) that includes some or all of the following: Tent pad, site furnishing pad, and vehicle parking pad.

DEVELOPED FACILITY:
Designated area(s) within the Recreation Area that has been developed with permanent structures for Recreation use and is accessible only by Agency provided roadways.

DEVELOPED IMPROVEMENT:
Any structure or other object constructed or installed within the Recreation Area. Includes but is not limited to regulatory and hazard buoys, buildings, site furnishings, building furnishings, courtesy docks, floating restrooms, roadways, signs and utility connections.

DISPERSED AREA:
Areas within the Recreation Area that are available for recreation use but have no Agency provided roadways.

DOMESTICATED ANIMALS:
Any animal that is referred to as a pet or that has been “tended” by humans, such as, but not limited to cats, dogs, potbellied pigs, rabbits, horses, and cows.

FIREWORKS:
Includes all fireworks described as “Safe and Sane” and all illegal fireworks as described by applicable law.

GROUND FIRE:
Any fire that is built and ignited directly on the ground outside of an Agency provided fire ring.

HOUSEBOAT:
Private or concessionaire owned vessels that are 10' or greater in width, have sleeping capacity, are limited by a specific number of houseboat permits and are subject to specific Agency Houseboat Rules.

LAKESHORE CAMPING:
Camping in designated dispersed areas.

LEGAL GUARDIAN:
Parent or legal guardian (as defined by law) of a minor or adult over the age of 25 with a note from the minor's parents authorizing that adult to act in their stead.

MINING:
The process of disturbing the soil for the purpose of removing soil, ore, rock or minerals from the Recreation Area other than through the activity of panning.

NIGHT FISHING:
Use of the Recreation Area solely for the activity of fishing at night.

OCCUPANCY:
Authorized utilization of a given facility, location or area.

OPERATOR PROPELLED DEVICE:
Any device that is propelled by the person operating it, such as bicycles, skateboards, roller skates, and in-line skates.

OUTSIDE VENDOR:
Any person or entity that is or will be performing any type of work/duties for hire within the Recreation Area that does not fall within established Concessionaire Contract or other contract with the Agency.

PANNING:
Activity for the purpose of finding gold, accomplished by use of a pan no more than 18" in diameter and no motorized means of excavation.

PERMIT:
Authorization from the Agency to utilize the Recreation Area for a specific activity or purpose.

PERSON:
Any human being of any age.

PERSONAL WATERCRAFT (also PWC, PW):
A boat that is 13' in length or less, propelled by machinery, that is designed to be operated by a person sitting, standing, or kneeling on the vessel, rather than in the conventional manner of sitting or standing inside of the vessel.

PERSONAL SAFETY EQUIPMENT:
Any equipment worn or to be worn by persons engaged in operator propelled device activities - bicycling, skateboarding, roller skating, in line skating, etc. - that may or may not be required by applicable law.

RECREATION AREA:
All lands and water available for recreation use that fall within the Federally Licensed New Don Pedro Project Boundary - FERC License #2299.

REFUSE:
Any material, organic or inorganic, that is deposited or left within the Recreation Area.

RULES:
Term used to reference regulations, ordinances, and other applicable laws.

SLEEPING CAPACITY (also SC):
Equipped with built-in plumbing.

SPECIAL USE PERMIT:
Permit authorizing a use of the Recreation Area that may temporarily alter its normal operation, require special authorization for activities that would otherwise be prohibited, or exceed the realm of family camping or individual water oriented use.

TOWING/IMPOUNDMENT:
Lawful seizure of specific personal property associated with a failure to comply with applicable laws.

TRAILERS:
Any non-motorized mode of transportation on land to tow behind a vehicle for purpose of transporting living quarters, gear, supplies, vehicles or vessels.

UNATTENDED:
Any personal property that has not been watched, maintained, checked on or operated by the owner or authorized operator within a specific time period established by the Agency.

VEHICLE:
Any mode of motorized transportation for use on land.

VESSEL:
Any mode of motorized or non-motorized transportation for use on water with the exception of floating aircraft.

WEAPON:
Any object having potential to injure or kill, threaten injury or death to any living creature or to damage any public or private property. Includes but is not limited to firearms, archery equipment, gas or spring activated devices, slingshots, knives, laser pointers, traps, nets, vehicles, and vessels.

APPENDIX A
§ 4.5.14 - HOUSEBOAT RULES

Last revised: February 7, 2007

1. GENERAL RULES[*1]

1.01. The Primary Purpose for Houseboating on Don Pedro Lake shall be for Recreation.
- a. Any use of Houseboats found to be contrary to this purpose will not be permitted.
- b. Houseboats shall not be used as a residence.
- c. The Houseboat Permit Holder shall not rent, lease or assign Houseboat to others.

1.02. No Houseboat shall be in the Recreation Area without a valid Houseboat Permit from the Agency.
- a. Only the Registered owner(s) of a Houseboat may apply for an Agency Houseboat Permit or for the renewal of an Agency Houseboat Permit.
  1. Individuals with ownership rights to Houseboats with Non-Person Specific Registration will be considered the Registered Owners of that Houseboat.
  2. Official documentation listing all individuals with ownership rights to Houseboats with Non-Person Specific Registration shall be provided to the Agency before a Houseboat Permit will be issued or renewed.
- b. A Houseboat Permit may not be transferred without the sale or transfer of ownership of the permitted vessel.

1.03. Houseboat Permit Holders and Persons using or having charge, care or control of the Houseboat must comply with Applicable Laws.
- a. The Agency is authorized to inspect each Houseboat at all times for compliance with Applicable Laws.
- b. Houseboat Permit Holders may be held responsible for the actions of those Persons authorized to use or operate their Houseboat.

1.04 Houseboat Permit Holders must sign an Agency approved mooring agreement with the Assigned Concessionaire.
- a. All applicable requirements listed under section 2 of these Rules shall be met before a Houseboat mooring agreement is signed with a concessionaire.
- b. Permitted Houseboats left Unattended on Don Pedro Lake for a period of 24 hours or more must be in an assigned slip or moored to an assigned mooring buoy operated / maintained by an Agency approved concessionaire.
- c. A Houseboat Permit Holder(s) may not change their Assigned Concessionaire without prior Agency approval.

1.05 Houseboat Permit Holders must maintain in good standing Applicable Fees due the Agency and the Assigned Concessionaire.

1.06. *INSURANCE REQUIREMENT*

Houseboat Permit Holders shall procure and at all times maintain general liability insurance, which will provide coverage for limits of not less than $300,000.
- a. Such insurance shall be obtained from an insurer and in a form satisfactory to the Agency.
- b. The Don Pedro Recreation Agency, the Turlock Irrigation District, the Modesto Irrigation District, and their governing boards shall be named as additional insureds under the Houseboat Permit Holder's insurance policy.
- c. A certificate of insurance evidencing coverage shall be provided to the Agency when the Houseboat Permit is issued or when it is renewed.
- d. Coverage shall not be canceled nor materially altered without at least thirty (30) Days written notice to the Agency.

2. HOUSEBOAT PERMITTING PROCEDURES

2.01. *HOUSEBOAT PERMIT RESTRICTIONS*
- a. Except as otherwise allowed by this section 2.01, a Houseboat Permit Holder and his or her spouse may own an interest in no more than one Houseboat on Don Pedro Lake.

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*[*1] Appendix A, which is incorporated into these Rules, defines capitalized terms (other than section and subsection titles) used in these Rules.*

APPENDIX A

§ 4.5.14 - HOUSEBOAT RULES

Last revised: February 7, 2007

1. A current Houseboat Permit Holder and his or her spouse may acquire an interest in a second Houseboat for the purpose of modifying Houseboat size and or quality only, provided that only one Houseboat may be operated on Don Pedro Lake at any time.
2. A second Houseboat may be moored on Don Pedro Lake while it is for sale, but shall be operated only with permission of the Agency.

b. Prior Agency approval is required before the purchase of a second Houseboat with a permit for Don Pedro Lake.
   1. Interests in second Houseboat Permits may be owned for a maximum of two Years from the purchase date when the purpose is for remodeling, repair or New Construction of a Houseboat.
   2. Interests in second Houseboat Permits may be owned for a maximum of one Year only when no remodeling, repair or New Construction of a Houseboat is to take place.

c. No Person or Persons who have ever had a Houseboat Permit revoked or have ever been subject to non-renewal of their Houseboat Permit shall be eligible to apply for a Houseboat Permit again.

2.02. *HOUSEBOAT PERMIT WAITING LIST*.

a. The Agency at its discretion may open or close the Waiting List to new applicants.
b. Applicants for Houseboat Permits must submit a written request to the Agency to have their names added to the Waiting List.
c. No current Houseboat Permit Holder will be placed on or shall remain on the Waiting List.
d. Priority on the Waiting List will be ranked in order of the date and time each written request is received by the Agency with the oldest receipt date having the highest priority.
e. When a Houseboat Permit is available, the highest applicant on the Waiting List will be offered the Houseboat Permit subject to these Rules:
   1. Applicants will be sent a "Notice of Houseboat Permit Availability" by certified mail to the address listed on the request.
   2. Applicants must accept or decline the offer for a Houseboat Permit in writing received by the Agency within 30 Days after the date of "Notice of Houseboat Permit Availability." If an acceptance is not received within the 30 Day time period, the offer will be deemed declined and the applicant will be removed from the waiting list.
   3. The required "First Year Permit Fee" must be paid to the Agency within five Days of the date of the applicant's acceptance of the permit. Failure to pay the required First Year Permit Fee to the Agency within this five-Day period, for whatever reason, will result in the denial of the Houseboat Permit and removal of the Applicant(s) from the Waiting List.
   4. Failure of the Applicant(s), for whatever reason, to receive a Notice of Houseboat Permit Availability shall not entitle the Applicant(s) to any relief from the Agency's denial of the Houseboat Permit or from removal from the Waiting List.
f. Applicant(s) on the Waiting List cannot sell, trade, give, assign, or otherwise transfer their position on the Waiting List to another Person or entity.
g. The Houseboat Registration at the time the Houseboat Permit is issued must include all Applicants names as shown on the Waiting List.

2.03. *NEW APPLICATIONS*

Applicant(s) will be issued a new Houseboat Permit upon meeting all of the following requirements:

a. Applicants must obtain an authorized mooring space from the applicable Marina Concessionaire and shall pay in advance to the Marina Concessionaire monthly mooring fees for three (3) months.
b. Applicants must pay the required "First Year Permit Fee" to the Agency.
c. Applicants must complete an Application for Houseboat Permit, which meets the approval of the Agency.
d. Applicants must submit a current copy of their Houseboat Registration to the Agency.
e. Applicants must submit a certificate of insurance evidencing coverage as described in section 1.06 of these Rules and regulations to the Agency.

f. Applicants must place their Houseboat on Don Pedro Lake within two Years of issuance of the Houseboat Permit.

2.04. *RENEWAL APPLICATIONS*

An existing Houseboat Permit will be renewed upon meeting all of the following requirements:

a. Applicable Fees must be in good standing.

b. It is the renewal applicant(s) responsibility to pay the Annual Renewal Fee(s), and complete an Application for Houseboat Permit form signed by all registered owner(s), which meets the approval of the Agency, before February 1st of the renewal Year. Failure to receive a renewal reminder or application form does not absolve the renewal applicant from this responsibility.

c. A current copy of the renewal applicant(s) Houseboat Registration must be on file with the Agency before February 1st of the renewal Year.

d. A certificate of insurance evidencing coverage as described in section 1.06 of these Rules must be on file with the Agency before February 1st of the renewal Year.

e. Houseboat Permit Holders that fail to meet all of the requirements of section 2.04.a. through d. before February 1st will be required to pay the Non-discount Annual Renewal Fee.

2.05. *CHANGE OF OWNERSHIP*

When a Change of Ownership occurs, the following must be done:

a. The current Houseboat Permit Holder(s) must notify the Agency within fourteen (14) Days of the date of the Change of Ownership and provide the following information:
   1. The type of Change of Ownership that occurred [sale, transfer, change or addition or deletion of name(s)].
   2. The names, addresses and telephone numbers of the new owners or the Persons added or deleted.
   3. A "Permit Release Form" that has been signed by all current Houseboat Permit Holders who are releasing their interest in the Houseboat.
   4. The current Houseboat Permit Holder(s) shall provide the new owner(s) with current copies of these Rules and the D.P.R.A. Rules and Regulations and notify the new owner(s) that they must file a completed Application for Houseboat Permit and pay the required Change of Ownership Fee to the Agency within fourteen (14) Days of the date of the Change of Ownership.

b. The new owner(s) must file with the Agency a completed Application for Houseboat Permit form and must pay to the Agency, the required Change of Ownership Fee, all within fourteen (14) Days of the date of the Change of Ownership.

c. The new owner(s) must provide to the Agency a copy of the current Houseboat Registration within fourteen (14) Days of the date of Change of Ownership.

d. When registration is by United States Coast Guard Documentation the following will be required:
   1. If proof of USCG documentation cannot be secured within fourteen Days, the new owner(s) shall submit a copy of their USCG National Vessel Documentation Center application to the Agency within fourteen Days.
   2. The new owner(s) shall submit a copy of their official USCG Certificate of Documentation to the Agency no later than three months from the date of the Change of Ownership.

e. The new owner(s) must provide to the Agency a certificate of insurance evidencing coverage as described in section 1.06 of these Rules within fourteen (14) Days of the date of Change of Ownership.

2.06. *CHANGE OF ASSIGNED CONCESSIONAIRE*

Houseboat Permit Holders wishing to change the authorized mooring location of their Houseboat from one marina concession area to another must make a written request to the Agency identifying the permit Holder's new preferred location. The Agency will maintain a Relocation List of all Houseboat Permit Holder(s) desiring to relocate their Houseboats.

a. Relocation applicants will be ranked on the Relocation List in order of the date that their respective written requests were received by the Agency with the oldest requests having the highest priority.
b. Relocation requests received on the same Day will be ranked in order of the length of time each relocation applicant has held his Houseboat Permit with the most senior Houseboat Permit Holder having the highest priority of the relocation requests received on the same Day.
c. When a mooring space is available at the marina concession area of choice, the Agency will notify by mail the requesting Houseboat Permit Holder having the highest priority on such list.
d. The Houseboat Permit Holder will then notify the respective marinas, sign a mooring agreement with the new Assigned Concessionaire and pay the Agency the required Change of Assigned Concessionaire Fee.
e. Location change will not take place until written notification from the Agency is given to the Houseboat Permit Holder stating the designated relocation date.

3. HOUSEBOAT REPAIR, REPLACEMENT, CONSTRUCTION AND MAINTENANCE

3.01. *HOUSEBOAT REMOVAL AND LAUNCH*

Houseboat Permit Holder(s) must obtain prior authorization from the Agency to use launch ramps for Houseboat removal and Houseboat launch.

a. Houseboat Permit Holders shall notify the Agency a minimum of seven Days in advance of the date when a Houseboat is to be removed from Don Pedro Lake for repairs or replacement, except in emergencies.
b. Houseboat Permit Holders shall notify the Agency and arrange for a pre-launch inspection of their Houseboat a minimum of fourteen Days in advance of the planned launch date.
c. All Houseboats must pass the Agency inspection prior to launch.
d. Vendors hired to remove or launch Houseboats shall be subject to Applicable Laws, vendor permit and insurance requirements.
e. Permitted Houseboats removed from Don Pedro Lake shall re-launch within five Years from the date of their removal.
f. Permitted Houseboats already removed from Don Pedro Lake shall have a maximum of five Years from the effective date of these Rules to re-launch.

3.02. *REPAIR FACILITIES*

The Agency has established facilities within the Recreation Area for repair of Houseboats moored on Don Pedro Lake.

a. Only Houseboats with valid Houseboat Permits are authorized to use the Blue Oaks Houseboat Repair Yard
b. The Agency Board of Control shall adopt Regulations for operation of the Repair Yard with which all Houseboat Permit Holders must comply.

3.03. *REPAIR OR REPLACEMENT REQUIREMENT*

The Houseboat Permit Holder shall repair or replace the Houseboat in the event the Houseboat is damaged, destroyed, the motor inoperable, or the Houseboat is removed from the Recreation Area.

a. All such repairs or replacement shall commence within ninety (90) Days after the Houseboat has been damaged, destroyed, rendered inoperable, or removed from the Recreation Area.
b. Houseboat Permit Holders will notify the Agency of any intent to construct or acquire a replacement Houseboat.
c. During repairs and/or replacement all Houseboat Permit owners must maintain in good standing all applicable Agency and Concessionaire fees, including but not limited to, Assigned Concessionaire mooring/buoy fees.
d. Liability insurance as prescribed by section 1.06 of these Rules shall be maintained on all Houseboats that remain within the Recreation Area during repairs and / or replacement.
e. With prior approval of the Agency, replacement Houseboats for current Houseboat Permit Holders may be constructed in the Blue Oaks Houseboat Repair Yard prior to removal of the currently owned and permitted Houseboat from the lake.
f. Houseboats being replaced shall be removed from the Recreation Area and the permit transferred to the replacement Houseboat prior to launch.

APPENDIX A
§ 4.5.14 - HOUSEBOAT RULES

Last revised: February 7, 2007

3.04. *HAZARDOUS MATERIALS*

a. At no time shall any work or repairs be made on any Houseboat while on the lake that involves the following:
   1. Any work or repair that involves structural alteration or modification without prior Agency approval.
   2. Any work or repair or any by-product of such work or repair that could result in the introduction of any materials into the waters of Don Pedro Lake.

b. At no time shall any work or repairs be made on, or other activity take place on any Houseboat that would introduce into the waters or soil of the Recreation Area any substance which is or becomes defined as a hazardous waste, hazardous substance, pollutant, or contaminant under any federal, state, or local statute, regulation, rule, or ordinance or amendment thereto, or that would result in the violation of the Porter-Cologne Water Quality Act (Cal. Water Code Sec. 13100 et seq.) or the Clean Water Act (33USC 1251-1376).

c. Houseboat Permit Holders, their agents, employees, or contractors are required, at their sole cost and expense, to promptly take all actions to remediate the release of any substance prohibited by this section into the Recreation Area and to immediately notify the Agency of any violation of this section. If Houseboat Permit Holders, their agents, employees, or contractors fail to perform the duties required by this section, Agency reserves the right to perform the remediation at Houseboat Permit Holder's cost.

d. All Houseboat Permit Holders shall be responsible for the proper disposal of hazardous wastes, hazardous substances, pollutants, or contaminants resulting from the operation, repair or maintenance of their Houseboat.

e. *Battery Disposal:* The Houseboat Permit Holder is responsible for proper disposal and or recycling of their Houseboat's batteries.
   1. A battery drop off area will be provided at each campground for proper disposal and recycling of batteries.
   2. Campground personnel can be contacted for the location of this battery drop-off area.

3.05. *USE OF OFF-SITE VENDORS WITHIN THE RECREATION AREA*

a. Agency approved Marina concessionaires hold exclusive rights to provide certain approved services within their assigned concession lease agreement areas.

b. The hiring of any vendors, contractors or entities other than approved marina concessionaires by Houseboat Permit Holder(s) to perform any work or service within the Recreation Area shall be subject to all applicable Agency regulations, vendor permit and insurance requirements.

c. Outside vendors shall not be restricted from performing services for any Houseboat Permit Holder when the marina concessionaires are incapable or cannot perform the desired work or service required in a timely manner.

3.06. *MAINTENANCE AND CONSTRUCTION STANDARDS*

a. All Houseboats shall be maintained in a good and proper state of repair and shall be aesthetically neat in appearance.

b. All Houseboat propulsion systems shall be maintained in a safe and operable condition at all times.

c. All Houseboats shall be kept maintained, painted, stained, coated or other wise protected so as to present a neat and well-kept appearance and to furnish protection against weathering and corrosion.
   1. Colors shall blend with the surroundings.

d. All Houseboats shall be constructed and maintained in conformance with Applicable Laws.
   1. The Houseboat Permit Holder is responsible for ensuring that all construction standards are met.

e. All decking and roofs shall be protected from weathering or constructed with a suitable weather proofed material. Carpeting and other deck and roof coverings shall remain firmly attached and kept free of tears, mildew and other forms of deterioration.

f. A general description of all proposed New Construction must be submitted to the Agency for its approval prior to the start of such work. Routine repair and maintenance of the cabin, roof, deck(s), fascia, pontoons,

holding tank, connected plumbing and railing alone will not be considered New Construction and will not require submission of such a description.

g. All newly constructed Houseboats and newly constructed replacement railings shall meet or exceed the following railing requirements:
   1. Upper deck - full railing, 36-inch height, 6-inch spaces.
   2. Bottom deck - optional, none, full, or partial is acceptable, recommend 36-inch height, 6-inch spaces.

h. With the exception of those Agency Houseboat construction standards established for New Construction Only those Houseboats on Don Pedro Lake as of the effective date of these Rules which are not in compliance with these construction standards must be corrected and in full compliance prior to first re-entry to the lake after a takeout.

3.07 *REQUIRED EQUIPMENT*

a. Houseboats shall carry or be equipped with all equipment required by Applicable Laws.
b. Houseboats shall be equipped with permanently and properly installed operable navigation and anchor lights.
c. Houseboats shall display all required numbers, letters, names and stickers in accordance with Applicable Laws.
d. All Mechanical Compartments used for propulsion of the Houseboat that extend below the water line shall be equipped with an operable bilge pump and an Agency approved bilge absorbent material or filtration system that prevents pollutants from entering the lake when the bilge pump is operated.

3.08. *FLOTATION DEVICES*

a. Flotation Devices including Monohull design flotation shall be fitted with transverse and/or longitudinal Watertight bulkheads that provide Compartmentation sufficient to keep the fully loaded vessel afloat with positive stability, with any one main compartment flooded.
b. When pontoons are used for flotation, no single compartment in a pontoon shall comprise more than 20% of the total available flotation volume.
c. Flotation Devices shall be constructed of metal, wood that has been covered with fiberglass or other materials as approved by the Agency. Barrels and other containers will not be acceptable as Flotation Devices.
d. The exterior surfaces of all Flotation Devices shall be Watertight (Weathertight hatch covers are permitted when applicable) and thoroughly protected from rust, corrosion, solvents, and weather.
e. Flotation Devices shall be structurally sound and securely fastened to the main Houseboat structure.
   1. The Agency reserves the right to require Houseboat Permit Holders (at their expense) to perform reasonable tests in order to determine the structural condition of questionable Flotation Devices.
   2. Those Flotation Devices found to be structurally unsound as a result of such tests shall be promptly replaced or repaired when applicable at permit holder's expense.
f. All Hatch Covers leading to Storage or Mechanical Compartments in a Houseboat's Flotation Devices shall be at least Weathertight, preferably Watertight and Mechanically Fastened down.
   1. Hatch Covers on Mechanical Compartments that are hinged on one side and deemed sufficiently secured by other means (such as heavy weight) may, at the Agency's discretion, be exempted from this Mechanically Fastened requirement.
g. *New Construction only*:

   The following requirements shall apply to Flotation Devices (including replacement Flotation Devices) constructed after the effective date of these regulations:
   1. Flotation Device Storage Compartments may be ventilated but the outlet of the vent must be a minimum of 15" above the deck and will be capped with a 180-degree elbow.
   2. Vents for Mechanical Compartments in Flotation Devices shall comply with the Standards and Recommended Practices for Small Craft and any other applicable State or Federal standards.
   3. All new hollow Flotation Device compartments that do not contain Storage or Mechanical Compartments shall be fitted with Watertight pressure test fittings.

APPENDIX A

§ 4.5.14 - HOUSEBOAT RULES

Last revised: February 7, 2007

4. All new hollow Flotation Device compartments that do not contain Storage or Mechanical Compartments shall be pressure tested prior to their launch and shall be capable of holding positive pressure.
5. *Metal Flotation Devices:*
   All new Flotation Devices constructed of metal shall meet or exceed the following requirements:
   - ♦ Minimum of ten gauge (1/8 inch) thickness for all mild steel construction.
   - ♦ Minimum of ten gauge (1/8 inch) thickness for all aluminum construction.
   - ♦ Minimum of twelve gauge (3/32 inch) thickness 304 grade stainless steel, or other twelve gauge 300 series stainless steel with characteristics equal to or greater than the characteristics of 304 grade.
   - ♦ All mild steel and aluminum Flotation Devices shall be fitted with appropriate anti-electrolysis "anode" plates or other Agency approved systems that protect against electrolysis.
6. A plan detailing Flotation Device dimensions, displacement, and boatload capacity shall be submitted to the Agency prior to completion of any new Houseboat construction or Flotation Device reconstruction.

h. The minimum lower (main) deck height (excluding swim decks) of all Houseboats when fully loaded shall not be less than 12 inches above the water line.

3.09. *SANITARY FACILITIES*.

Each Houseboat's Wastewater system shall be maintained in strict compliance with Applicable Laws.

a. All Wastewater shall be delivered into on-board holding tanks.
b. All Wastewater holding tanks shall be emptied only by pumping into an Agency approved Wastewater system.
c. No Wastewater of any type shall at any time be in any way discharged into the lake.
d. All Houseboats shall be provided with a toilet facility and Wastewater holding tank.
e. The Wastewater holding tank and connected plumbing shall be constructed and maintained in such a manner that the tank can be emptied only by pump-out equipment.
f. No drain plugs shall be installed below the bottom of the toilet level.
g. Any Houseboat having a sink, shower, washbasin or other facility must provide plumbing so that all Wastewater from these facilities is piped to the holding tank(s).
h. Holding tanks may be constructed of stainless steel, mild steel, aluminum, reinforced fiberglass or Wastewater grade reinforced plastic.
   1. All new holding tanks are subject to the New Construction requirements so set forth in section 3.09.k.
   2. Holding tanks shall be painted, coated or otherwise fully protected from rust, corrosion and weathering.
   3. Holding tanks shall be Watertight and free of any leaks.
   4. The Agency reserves the right to require replacement of holding tanks believed to be in a state of deterioration.
i. Holding tanks shall have a combined minimum total capacity of 100 gallons.
j. *Holding Tank Attachments and Fittings:*
   1. Openings to pump-outs, vents, clean-outs, etc., must be a minimum of 15" above the lower deck.
   2. Pump-outs for more than one holding tank shall be located together.
   3. All fittings to holding tanks shall be glued, welded or otherwise permanently sealed and attached.
   4. Where attachments and fittings are clamped, a permanent clamp shall be used whenever possible.
   5. Prior Agency authorization is required to use screw clamps on any Wastewater plumbing.

k. *New Construction Only:* In addition to the requirements in 3.09.a. through j., the following requirements shall apply to all new holding tanks constructed or replaced after the effective date of these regulations:

1. All new holding tanks shall have a combined minimum total capacity of 200 gallons.

2. All new holding tanks shall not exceed a combined maximum total capacity of 600 gallons.

3. The interior surfaces of all new holding tanks (including replacement tanks) unless constructed of chemically resistant stainless steel, fiberglass or Wastewater grade reinforced plastic shall be sandblasted and lined / coated with a suitable impervious material such as Coal Tar Epoxy or equivalent prior to installation.

4. Any new or replacement holding tank installed so that it is in contact with lake water shall meet or exceed the following New Construction requirements:

♦ Minimum of twelve gauge (3/32 inch) thickness 304 grade stainless steel or other twelve gauge 300 series stainless steel with characteristics equal to or greater than the characteristics of 304 grade will be permitted for single wall holding tanks.

♦ Holding tanks constructed of other materials shall be a separate tank constructed of chemically resistant materials that is located within an approved outer flotation wall. Such tanks shall be equipped with a Watertight fitting that would permit inspection for leakage between this outer flotation wall and the inner tank.

5. Center mount holding tanks that are constructed and installed in a manner so that they will ride above the Waterline when the Houseboat is fully loaded may be of single wall mild steel or other approved material construction.

3.10. *SIZE LIMITATIONS.*

a. The following size limitations shall be in effect for all Houseboats unless an exception or exemption is listed:

1. *Minimum Size*:

♦ 10 feet width, 20 feet length.

2. *Absolute Maximum Size*:

♦ 22 feet width, 56 feet length (all inclusive).

♦ Out-drives, motor gear, swim decks and all other parts of the Houseboat shall remain within these dimensions whenever the Houseboat is left Unattended and is moored at its assigned mooring location.

♦ With prior Agency approval, bumpers or similar devices attached to the perimeter of the Houseboat for protection purposes only may exceed these dimensions.

♦ With prior Agency approval, Houseboats owned by an Agency approved concessionaire for the purpose of rental to the public may vary from the size limitations in this section.

3. *Maximum Height*:

♦ The Agency recommends one story with open upper deck.

♦ No enclosed structures shall be permitted to extend beyond 15 feet above the Waterline.

♦ The upper deck may be covered by use of open frame and awning provided that the awning is firmly attached, maintained in good condition, is constructed of flame resistant materials and allows for the passage of wind.

♦ Those Houseboats with existing permanent structures (excluding add-on walk-in storage buildings) that exceed these height limits that were constructed prior to August 13, 1999 shall be exempted from this rule.

b. Houseboats, which exceed the size limitations under section 3.10.a., may not be reconstructed to exceed those size limitations.

3.11. *HOUSEBOAT TO MOORING BUOY HOOKUP*.

a. A Primary Mooring (connecting) device between the Houseboat and mooring buoy is required.

1. This Primary Mooring Device when attached between the Houseboat and its mooring buoy shall be of sufficient size and strength to hold the Houseboat no further than thirty-six (36) inches away from its mooring buoy.

2. The Primary Mooring Device shall conform to all standards established by the Assigned Concessionaire.

♦ The Assigned Concessionaire shall provide these standards in writing to all Houseboat Permit Holders assigned to that marina.

b. In addition to the Primary Mooring device, a Secondary Safety Mooring Device between the Houseboat and the mooring buoy is also required.
   1. The Secondary Safety Mooring Device shall be of chain, cable or wire rope of sufficient size and strength to hold the Houseboat to the mooring buoy in the event of the failure or disconnection of the Primary Mooring Device.
   2. The Secondary Safety Mooring Device shall conform to all standards established by the Assigned Concessionaire.
      ♦ The Assigned Concessionaire shall provide these standards in writing to all Houseboat Permit Holders assigned to that marina.

c. All Houseboats shall be equipped with the Primary Mooring Device and the Secondary Safety Mooring Device however; those Houseboats, which are moored in slips at a Marina, need not use these devices while moored there.

d. The Moccasin Marina Concessionaire shall provide written specifications for "rear tie-up" to Houseboat Permit Holders assigned to mooring buoys at Moccasin whose Houseboats cannot free swing and must be tied end to end.
   1. A minimum of 5/8" poly- propylene or equivalent rope shall be used for all rear tie-ups.

3.12. *PRECEDENCE OF STATE AND FEDERAL REQUIREMENTS OVER AGENCY CONSTRUCTION STANDARDS*

a. While every effort is made to ensure that Agency construction standards are consistent with Applicable Laws, there can be no guarantee that compliance with the Agency construction standards will assure compliance with applicable Federal and State requirements.
   1. The Federal and State requirements, to the extent they are inconsistent with the Agency construction standards, will supersede the Agency standards.
   2. Agency requirements may exceed State and Federal requirements.

b. Houseboat Permit Holders should consult the manual of Standards and Recommended Practices for Small Craft published by the American Boat and yacht Council as well as the U.S. Coast Guard and the Tuolumne County Sheriff's Boat Patrol for Federal and State Standards.

4. ENFORCEMENT OF HOUSEBOAT RULES

4.01. *ADMINISTRATION*.

a. The Agency may make inspections and take actions to enforce the provisions of these Rules.

b. The Agency may inspect any Houseboat at any time for the purpose of insuring compliance with Applicable Laws.
   1. *Right of Entry:* No Houseboat Permit Holder or any other Person using or having charge, care or control of any Houseboat shall fail or neglect, after an authorized Agency representative has identified himself or herself, to promptly permit entry therein by the Agency representative for the purpose of such an inspection.
   2. All Houseboat Permit Holders shall make all Persons using their Houseboat aware of the Agency's right of entry, as specified in this section 4.01.

4.02. *COMPLIANCE*.

a. After any order of the Agency or decision of the Houseboat Appeals Board made pursuant to these Rules, no Person to whom any such order or decision is directed shall fail, neglect, or refuse to obey any such order.

b. If, after any order or decision made pursuant to these Rules, the Person or Persons to whom such order or decision is directed shall fail, neglect or refuse to obey such order or decision, the Agency may institute any appropriate action under Applicable Laws.

c. The Agency may issue Warnings, assess Non-Compliance Fines, seek restitution if applicable, issue Notice and Orders, Red Tags and any combination thereof and may also revoke or not renew a Houseboat Permit for violations of Applicable Laws.

d. All Non-Compliance Fines, restitution sought, Notice and Orders and Red Tags will be directed to the designated Houseboat Permit Holder contact Person(s) listed on the completed Application for Houseboat Permit.

APPENDIX A

§ 4.5.14 - HOUSEBOAT RULES

Last revised: February 7, 2007

4.03. *WARNINGS.*

The Agency may issue verbal or written Warnings to Houseboat Permit Holders and the Person or Persons using or having charge, care or control of the Houseboat for violations of Applicable Laws. Documented warnings may be used as evidence to support further punitive action against Houseboat Permit Holders.

4.04. *NON-COMPLIANCE FINES AND RESTITUTION.*

The Agency may assess Non-Compliance Fines against Houseboat Permit Holders and seek restitution if applicable for violations of these Rules. A Non-Compliance Fine and restitution procedure shall be established.

a. Houseboat Permit Holders will be notified of Non-Compliance Fines and / or applicable restitution in accordance with the Notice and Order procedures set forth in section 4.05.

b. Failure to pay Non-Compliance Fine(s) and / or applicable restitution pursuant to the conditions set forth in the Notice and Order may result in the assessment of additional Non-Compliance Fines, Red Tag and / or Revocation of the Houseboat Permit.

4.05. *NOTICE AND ORDERS*.

Whenever the Agency has determined that any Houseboat or Houseboat Permit Holder is in violation of any Applicable Laws, a Notice and Order will be issued to the record Houseboat Permit Holder(s) of the Houseboat under the following circumstances:

a. Non-Compliance Fines are to be assessed and / or restitution sought (if applicable) against the Houseboat Permit Holder(s).

b. The Houseboat is to be Red Tagged.

c. The Houseboat Permit is to be revoked or not renewed.

d. The Notice and Order shall contain:

   1. The Houseboat Registration identification number and Agency Houseboat Permit number.
   2. A statement that the Agency has found the Houseboat to be in violation of Applicable Laws and a brief and concise description of the conditions found to render the Houseboat in violation of these Applicable Laws.
   3. A statement of the action required to be taken by the Houseboat Permit Holder.

e. If the Notice and Order is for a Houseboat Permit Revocation or Houseboat Permit Non-Renewal it shall additionally contain:

   1. A statement advising that the Houseboat Permit Holder and any Person having any record title or legal interest in the Houseboat may appeal to the Houseboat Appeals Board, provided the appeal is made in writing as provided in Section 5 of these Rules, and filed with the Director within twenty-one (21) calendar Days of service of such Notice and Order.
   2. A statement advising the Houseboat Permit Holder that failure to appeal will constitute a waiver of all right to a hearing and determination of the matter.

f. *Service of Notice and Orders:*

   1. Each Notice and Order shall be served upon the record Houseboat Permit Holder either personally or by certified mail sent to the address indicated for such Houseboat Permit Holder in the Houseboat Permit records of the Agency.
   2. The failure of the Houseboat Permit Holder to receive such notice actually mailed shall not affect the validity of any proceedings taken under this section.
   3. No other Persons are required to be served with the Notice and Order.
   4. Service by certified mail in the manner provided herein shall be effective on the date of mailing.

4.06 *RED TAGS, PERMIT REVOCATION AND PERMIT NON-RENEWAL*

The Agency may issue Red Tags pursuant to these Rules which:

a. Immediately revoke or prohibit renewal of a Houseboat Permit or

b. Immediately prohibit the operation and use of a Houseboat.

c. A Red Tag immediately revoking a Houseboat Permit, prohibiting renewal of a Houseboat Permit or immediately prohibiting the operation and use of the Houseboat in question may be issued with a Notice and Order under any one of the following circumstances:

   1. The Houseboat Permit Holder has failed to comply with any lawful Agency order or requirement made pursuant to these Rules.

2. The Houseboat is in such condition as to make it immediately dangerous to the life, limb, property or safety of the public or to any Person operating or using the Houseboat.
3. The Houseboat is in such condition as to indicate that its permit holder or Person or Persons using or having charge, care or control of the Houseboat have intentionally, willfully, or negligently failed to maintain the Houseboat Wastewater system in strict compliance with Applicable Laws.
4. The Houseboat Permit Holder or Person or Persons using or having charge, care or control of the Houseboat have intentionally, willfully, or negligently failed to comply with Applicable Laws.
5. Whenever any ordered repair made pursuant to these Rules is not commenced within thirty (30) calendar Days of the order or is not pursued with sufficient diligence to enable the ordered repair to be completed within a reasonable period of time.
6. If pursuant to section 2.03 of these Rules, the applicant's Houseboat is not placed on Don Pedro Lake within two Years of the issuance of the permit.
   (a) The First Year Permit Fee shall also be forfeited unless a written extension of time is granted by the Agency.
   (b) If the Houseboat is not placed on Don Pedro Lake at the expiration of any such extension of time, then the permit shall be automatically revoked.
7. If pursuant to section 2.04 of these Rules, the Non-discount Annual Renewal Fee and or a Completed Application for Houseboat Permit are not received within thirty (30) Days of the mailing date of the Agency's delinquency notice to the renewal applicant.
8. If the Houseboat is damaged, destroyed, inoperable or removed from the Recreation Area and the Houseboat Permit owner has not commenced repairs or replacement within ninety (90) Days after the Houseboat was damaged, destroyed, inoperable, or removed.

d. When possible a Red Tag stating the purpose for the Red Tag shall be posted on the affected Houseboat.
e. When a Houseboat Permit is revoked all paid Permit Fees shall be forfeited to the Agency and all paid moorage fees shall be forfeited to the assigned Marina Concessionaire.
f. Upon revocation or the non-renewal of a Houseboat Permit, the Houseboat owner(s) shall remove the Houseboat at their own expense from the Recreation Area within thirty (30) Days of the revocation or non-renewal. If the Houseboat is not removed, the Agency may dispose of the Houseboat pursuant to the Boaters Lien Law, Harbors and Navigation Code Section 500 et seq.

5. APPEAL OF NOTICE AND ORDERS

5.01 *HOUSEBOAT APPEALS BOARD*.

A Houseboat Appeals Board (sometimes referred to as the "Appeals Board") has been established by resolution of the Board of Directors of the Turlock Irrigation District and the Board of Directors of the Modesto Irrigation District.

a. The Appeals Board shall consist of two members:
   1. One member who shall be the Chairperson of the Appeals Board shall be appointed by the Board of Directors of the Turlock Irrigation District.
   2. The other member shall be appointed by the Board of Directors of the Modesto Irrigation District.
   3. Each District may designate one or more alternates to act as its representative on the Appeals Board in the absence of the regular member.
b. The presence of both members of the Appeals Board shall constitute a quorum for the transaction of business.
   1. Less than a quorum may adjourn meetings of the Appeals Board from time to time.
   2. Any action or determination of the Appeals Board requires a unanimous vote of both members.
c. The Appeals Board shall review the history, evidence, actions and decisions of the Agency regarding Houseboat Permit Holder appeals and determine if the Agency has acted in accordance with Applicable Laws.
d. The Appeals Board is not empowered to set forth or establish its own conditions or requirements in regards to Houseboat Permit Holder appeals.

APPENDIX A

§ 4.5.14 - HOUSEBOAT RULES

Last revised: February 7, 2007

5.02 *RIGHT TO APPEAL*.

Any Houseboat Permit Holder and any Person having any record title or legal interest in the Houseboat may appeal Notice and Orders issued for the purpose of Houseboat Permit Revocation or Houseboat Permit Non-Renewal by filing at the office of the Director a written appeal in the form specified in Section 5.03.

a. *Staying of Permit Revocation and Non-Renewal Orders Pending Appeal:*
   1. Enforcement of any Houseboat Permit Revocation or Houseboat Permit Non-Renewal order issued under these Rules shall be stayed during the pendency of an appeal there from which is properly and timely filed.
   2. Except that unless specifically authorized in writing by the Agency, a Houseboat issued a Red Tag may not be operated or used (other than to be removed from Don Pedro Lake) pending the appeal.

5.03 *FORM OF APPEAL*.

All appeals must be in writing and contain the following:

a. A heading in the words: "Before the Houseboat Appeals Board of the Recreation Area".
b. A caption reading: "Appeal of _____," giving the names of all appellants participating in the appeal.
c. A brief statement setting forth the legal interest of each of the appellants in the Houseboat involved in the appeal.
d. A brief statement in ordinary and concise language of the specific order protested, together with all material facts claimed to support the contentions of the appellant.
e. A brief statement in ordinary and concise language of the relief sought, and the reasons why it is claimed the Agency did not act in accordance with Applicable Laws.
f. The signatures of all parties names as appellants, and their official mailing address.
g. The verification (by declaration under penalty of perjury) of at least one appellant as to the truth of the matters stated in the appeal.

5.04. *TIME FOR FILING APPEAL*.

The appeal shall be filed within twenty-one (21) calendar Days from the date of the service of such order.

5.05 *PROCESSING OF APPEAL*.

Upon receipt of any appeal filed pursuant to this section:

a. The Director shall present it at the next regular or special meeting of the Appeals Board.
b. As soon as practicable after receiving the written appeal, the Appeals Board shall fix a date, time, and place for the hearing of the appeal by the Board.
c. Written notice of the date, time, and place of the hearing shall be given at least ten (10) calendar Days prior to the date of the hearing to each appellant by the Secretary of the Board either by causing a copy of such notice to be delivered to the appellant personally or by mailing a copy thereof, postage prepaid, addressed to the appellant at his address shown on the appeal.

5.06 *EFFECT OF FAILURE TO APPEAL.*

a. Failure of any Person to file an appeal in accordance with the provisions of this Section 5 shall constitute a waiver of his right to a hearing and adjudication of the Notice and Order, or any portion thereof.
b. The order becomes final upon expiration of the appeal period specified in Section 5.04 above.

5.07 *SCOPE OF HEARING ON APPEAL*.

Only those matters or issues specifically raised by the appellant shall be considered in the hearing of the appeal.

5.08. *CONDUCT OF HEARING*.

a. Hearings need not be conducted according to the technical Rules relating to evidence and witnesses.
b. Oral evidence shall be taken only on oath or affirmation.
c. Any relevant evidence shall be admitted if it is the type of evidence on which responsible Persons are accustomed to rely in the conduct of serious affairs regardless of the existence of any common law or statutory rule which might make improper the admission of such evidence over objection in civil actions in courts of competent jurisdiction in this state.
d. Irrelevant and unduly repetitious evidence shall be excluded.

APPENDIX A

§ 4.5.14 - HOUSEBOAT RULES

Last revised: February 7, 2007

e. Each party shall have these rights, among others:
   1. To call and examine witnesses on any matter relevant to the issues of the hearing;
   2. To introduce documentary and physical evidence;
   3. To cross-examine opposing witnesses on any matter relevant to the issues of the hearing;
   4. To impeach any witness regardless of which party first called him to testify;
   5. To rebut the evidence against him; and
   6. To represent himself or to be represented by anyone of his choice who is lawfully permitted to do so.

5.09. *BASIS FOR APPEALS BOARD DECISIONS*

a. If the Appeals Board finds that the Agency has acted appropriately and in accordance with Applicable Laws, the Appeals Board shall uphold the Houseboat Permit Revocation or Houseboat Permit Non-Renewal.

b. If the Appeals Board finds that the Agency has not acted appropriately and in accordance with Applicable Laws, the Appeals Board shall include the specific reason(s) for this finding in their statement of decision. Only then may the Appeals Board rescind the Houseboat Permit Revocation or Houseboat Permit Non-Renewal.

5.10. *FORM OF DECISION AND FINALITY OF THE DECISION*.

a. The decision of the Appeals Board shall be in writing and shall contain findings of fact, a determination of the issues presented and the effective date of the decision.

b. A copy of the decision shall be delivered to the appellant personally or mailed to him, postage prepaid, addressed to the address shown on the appeal.

c. The decision of the Appeals Board becomes final on the effective date of the decision.

APPENDIX A
§ 4.5.14 - HOUSEBOAT RULES
Appendix A - Glossary of Terms Used

Last revised: February 7, 2007

Agency	The Don Pedro Recreation Agency, which is the organization charged with the responsibility for the operation and maintenance of the Don Pedro Recreation Area. The Agency has the jurisdiction to enforce Applicable Laws within the Recreation Area. Citations/Notices to Appear may be issued by authorized personnel, and / or personal property towed / impounded in accordance with State law for violations of these regulations, ordinances, and laws. The term "Agency" as used in these Rules shall include all authorized Agency representatives acting within the scope of their authority.
American Boat and Yacht Council (ABYC)	A non-profit, public service, membership organization incorporated in 1954 with worldwide membership that is dedicated to boating safety. The ABYC is a recognized authority in the area of technical practices and engineering standards for small vessels. They are the publishers of the manual of "Standards and Recommended Practices for Small Craft".
Annual Renewal Fee	An approved yearly fee required of all Houseboat Permit Holders due and payable to the Agency prior to February 1st of every calendar Year.
Applicable Fees	First Year Permit Fees, Annual Renewal Fees, Change of Ownership Fees, Change of Assigned Concessionaire Fees, Mooring Fees, use fees including annual permit fees for all vehicles and vessels stored or moored within the Recreation Area, Monthly Blue Oaks Houseboat Repair Yard fees, and other fees that the Agency may adopt from time to time. Not included as Applicable Fees, are charges for personal services, sundries, beverages, fuels and oils, repairs and other miscellaneous supplies.
Applicable Laws	All Laws, Codes, Ordinances, Rules (including these Rules), Regulations and Standards currently in effect that pertain to or are relevant to Houseboat Permit Holders, their guests and all Houseboats that are operated, moored, stored, occupied, maintained or constructed within the Don Pedro Recreation Area. (examples: U.S. Coast Guard Requirements, California Boating Law, Tuolumne County Ordinances and Codes, ABYC Standards and Recommended Practices for Small Craft, the D. P. R. A. Rules and Regulations).
Application for Houseboat Permit	A form requiring proof of current Houseboat Registration and proof of insurance as described in section 1.06 that shall be signed by all Registered Owners of a Houseboat before any renewal, Change of Ownership or issuance of a Houseboat Permit can take place.
Assigned Concessionaire	The Agency authorized marina concessionaire that maintains and operates the mooring facilities for all private permitted Houseboats assigned to their concession area.
Blue Oaks Houseboat Repair Yard	Facilities subject to Applicable Laws established within the Don Pedro Recreation Area for the maintenance, repair or replacement of permitted Don Pedro Lake Houseboats.
Change of Assigned Concessionaire	A change in the authorized concessionaire mooring location of a permitted Houseboat from one marina concession area to another subject to the terms of Section 2.06 of these Rules.
Change of Assigned Concessionaire Fee	An approved fee due and payable to the Agency before any "Change of Assigned Concessionaire" can take place.
Change of Ownership	Any sale, transfer or release of a permitted Houseboat, any deletion, change or addition of any name(s) on a Houseboat Registration or any deletion, change or addition of any Person with rights to ownership of a Houseboat except in the case of death of a spouse when that deceased spouse's name is removed from the permit and permit application.

Appendix A - Glossary of Terms Used

Last revised: February 7, 2007

Change of Ownership Fee	An approved fee due and payable to the Agency that is required when any Change of Ownership takes place.
Coal Tar Epoxy	A two-part coating comprised of a combination of coal-tar and epoxy resin designed to provide protection and waterproofing to steel and other materials.
Compartmentation	Divided into completely separate sections.
Day	Shall mean a calendar day, including Saturdays, Sundays, and holidays.
Director	The Don Pedro Recreation Agency Director.
Don Pedro Lake	All water available for Houseboat operation and use that falls within the Federally licensed New Don Pedro Project Boundary – FERC License #2299.
D.P.R.A. Rules and Regulations	The general Agency rules and regulations that are binding upon all Persons utilizing the Don Pedro Recreation Area.
First Year Permit Fee (New Permit Fee)	An approved fee due and payable to the Agency within 5 Days after the date of applicant(s) acceptance of an available Houseboat Permit.
Flotation Device	Watertight pontoons, floats, the hull or any other device used to keep a Houseboat afloat or aid in its flotation. Motor compartments, holding tanks, fuel tanks, water tanks or any other part of a Houseboat that displace lake water and effect flotation will be considered a Flotation Device and must comply with all applicable Flotation Device requirements.
Houseboat	Private or concessionaire owned vessels that are 10' or greater in width, 20' or greater in length, have sleeping capacity (built in plumbing), limited by a specific number of Houseboat Permits and subject to Applicable Laws.
Houseboat Appeals Board	A Review Board (sometimes referred to as the "Appeals Board") that can be convened in accordance with these rules for the purpose of hearing the appeals of Houseboat Permit Holders (and any person having any record title or legal interest in the Houseboat). (9.01)
Houseboat Permit	Authorization from the Agency to place and utilize a Houseboat within the Recreation Area. Validity of permit is subject to Applicable Laws.
Houseboat Permit Holder(s)	The registered owner(s) of an Agency permitted Houseboat subject to Applicable Laws.
Houseboat Permit Non-Renewal	The non-renewal or non-reissue of a Houseboat Permit pursuant to Applicable Laws.
Houseboat Permit Renewal	The annual renewal or reissue of a Houseboat Permit pursuant to Applicable Laws.
Houseboat Permit Revocation	The withdrawal or cancellation of authorization from the Agency to place and utilize a Houseboat within the Recreation Area pursuant to Applicable Laws.
Houseboat Registration	Official documentation of a Houseboat provided by the California State Department of Motor Vehicles or the United States Coast Guard.
Mechanical Compartment	Any compartment on a Houseboat containing permanently installed mechanically operated, fuel powered, electrical or battery powered devices, appliances and / or batteries.

Mechanically Fastened	Firmly secured by means of an automatic or manual, external or internal fastening device. (examples: latches, locks, screws, hydraulic openers and closers, etc.)
Monohull	A type of vessel flotation where the line of intersection of the water surface and the vessel at any one of its operating drafts forms a single closed curve.
National Vessel Documentation Center	The Department of the USCG that is responsible for documenting vessels and providing USCG Certificates of Documentation.
New Construction	The replacement of the entire Houseboat or replacement, reconstruction, structural alteration or modification of:the cabin and it's supporting members, (2) the roof, (3) the deck(s), fascia and their supporting members, the pontoons or other Flotation Devices, (5) the holding tank and connected plumbing and, (6) the railingaround the upper and lower decks. Routine repair and maintenance of the cabin, roof, deck(s), fascia, pontoons, holding tank(s), connected plumbing and railing alone will not be considered New Construction.
Non-Compliance Fines	Approved penalty fees that may be assessed against Houseboat Permit Holders for violations of the Rules.
Non-discount Annual Renewal Fee	An approved fee, due and payable to the Agency, required of Houseboat Permit Holders that fail to pay the Annual Renewal Fee or submit a Completed Application for Houseboat Permit before February 1st.
Non-Person Specific Registration	Official documentation of a Houseboat provided by the California State Department of Motor Vehicles or the United States Coast Guard that does not specify individual names of Persons such as but not limited to: beneficiary type registration (i.e. family trust, living trust), business owned registration or partnership registration.
Notice and Order	A written notification to Houseboat Permit Holders, in accordance with section 4.05 of these Rules, that informs them of required Non-Compliance Fines, Red Tag issue, Houseboat Permit Revocation or Houseboat Permit Non-Renewal.
Notice of Houseboat Permit Availability	A written notice sent by certified mail to applicants on the waiting list informing them of the availability of a houseboat permit
Permit Release Form	An Agency approved form signed by the Houseboat Permit Holder(s) that relinquishes a Houseboat Permit back to the Agency. Required for any change of ownership.
Person	Any human being of any age
Primary Mooring Device	A primary connecting device that holds the Houseboat to its mooring buoy pursuant to the requirements of Section 3.11 of these Rules.
Recreation Area	All lands and water available for recreation use that fall within the Federally licensed New Don Pedro Project Boundary – FERC License #2299.
Red Tag	A written notice issued by the Agency pursuant to sections 4.05 and 4.06 of these Rules that immediately revokes a Houseboat Permit, prohibits renewal of a Houseboat Permit, or prohibits the operation and use of a Houseboat.
Registered Owners (of a Houseboat)	All registered owner(s) of a Houseboat as listed by either the official records of the California State Department of Motor Vehicles or a valid United States Coast Guard Certificate of Documentation. All individuals with ownership rights to Houseboats registered in Non-Person Specific form will be considered the Registered Owners of that Houseboat.

Relocation List	A listing maintained by the Agency of Houseboat Permit Holder(s) desiring to relocate the authorized concessionaire mooring location of their Houseboat from one marina concession area to another.
Rules	These Don Pedro Houseboat Rules that are binding upon all privately owned Agency permitted houseboats and when applicable, Agency permitted concessionaire owned houseboats.
Secondary Safety Mooring Device	A secondary connecting device, pursuant to the requirements of Section 3.11 of these Rules, that is of sufficient size and strength to hold the Houseboat to the mooring buoy in the event of the failure or disconnection of the Primary Mooring Device.
Standards and Recommended Practices for Small Craft	A manual published by the American Boat and Yacht Council that provides generally applicable technical practices and engineering standards for small vessels. These standards and practices are voluntary for the general public. Those standards within this manual that are applicable to Houseboats will be required by the Agency. The Agency keeps a current (continuously updated) copy of this manual at its headquarters. This manual is available for Houseboat Permit Holder reference.
Storage Compartments	Any compartment on a Houseboat containing only temporarily stored items and no permanently installed mechanically operated, fuel powered, electrical or battery powered devices, appliances and / or batteries.
Unattended	Any Personal property that has not been watched, maintained, checked on or operated by the owner or authorized operator within a specific time period established by the Agency.
Uniform Building Code	Sections of the Building Code applicable to Houseboat construction as defined by the Tuolumne County Building Department.
USCG Certificate of Documentation	A certificate proving that a vessel has been documented by the United States Coast Guard.
USCG Documentation	A national form of vessel registration administered by the United States Coast Guard available only to vessels of at least 5 net tons that are owned by U.S. citizens. California State law does not require Dept. of Motor Vehicles Registration of vessels that are documented by the U.S. Coast Guard.
Waiting List	A waiting list maintained by the Agency as a basis for awarding any Houseboat Permits that the Agency may make available to applicants.
Warning	A written or verbal notification issued to Houseboat Permit Holders and or the Person or Persons using or Having charge, care or control of the Houseboat for violations of Applicable Laws.
Wastewater	All sewage and non-sewage liquid discharges from a vessel including but not limited to black water (human body wastes, wastes from toilets) and gray water (liquid discharges from sinks, showers, baths etc.). Non-polluting vessel wash down water or non-polluting water discharges necessary for the propulsion or stability of a vessel will not be included in this definition.
Waterline	The line to which the surface of the water comes up to on the Flotation Device(s) of a Houseboat.
Watertight	Constructed to effectively resist the passage of water.
Weathertight	Constructed to provide effective protection against seepage when exposed to rain or spray.
Year	365 calendar Days