CALFED Bay-Delta Program Storage and Conveyance Refinement Process:

A Status Report on System Modeling Using DWRSIM

Hydrology and Operations Section
Modeling Support Branch
Office of State Water Project Planning
Department of Water Resources, Sacramento

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CALFED Storage and Conveyance Refinement Process: A Status Report on DWRSIM Model Studies

This brief report presents status of DWRSIM model studies activities since last quarterly report of September 24, 1997. Today's presentation will cover three aspects of DWRSIM studies.

a) Update on Completed DWRSIM Model Studies and Key Assumptions

1. Existing System Studies
2. New Facilities Studies
3. Special Evaluation Studies

b) DWRSIM Sensitivity Studies and Key Assumptions

c) Environmental Stakeholders Studies and Key Assumptions

A list of completed DWRSIM studies and Key Model Assumptions are presented in Table 1. Details of study assumptions, inputs and results are also available on the DWR's Hydrology and Operations Section home page at the URL;

http://wwwhydro.water.ca.gov/calfed.html

Study results in terms of project deliveries for all completed studies are presented in Table 2.

Water supply benefits of existing system, new faciities and special evaluations are compared in Table 3.

A number of DWRSIM sensitivity studies have been completed and a list of these studies with Key Study Assumptions, is given in Table 1. Study results showing variations in project deliveries are given in Table 4.

Five studies were requested by Environmental Stakeholders and key assumptions of these studies are given in Table 1. Two of these have been completed and results in terms of water supply benefits are given in Table 5.

Tables 6 through 25 represent water supply impacts for each study with appropriate base case under critical dry and long-term periods.

Key results from selected studies are also presented in several graphs and charts.

TABLE 1
CALFED DWRSIM STUDIES AND KEY ASSUMPTIONS

A. Existing System studies

1. D-1485 Base Study: Study 2020d09b-calfed-527

D-1485 Bay-Delta Standards
2020 level hydrology
SWP variable demand
Stanislaus Operation (USBR Interim Operation Plan)

2. Benchmark: Study 2020d09b-calfed-514

1995 WQCP Bay-Delta Standards
Selected Upstream AFRP in-stream flows

3. Benchmark Reoperation: Study 2020d09b-calfed-515a

Study 514 (Benchmark) plus
- maximum wheeling of CVP water through SWP facilities

4. Benchmark Reoperation: Study 2020d09b-calfed-515

Study 514 (Benchmark) plus
- maximum wheeling of CVP water through SWP facilities
- unmet CVP demands on SWP system

5. No Action: Study 2020d09b-calfed-516a

Study 514 (Benchmark) plus
AFRP Delta Actions

a. April-May export restrictions
   - 1:3 below normal, dry & critical years
   - 1:4 above normal years
   - 1:5 wet years
b. More X2 days at Chipps Island in May-June
c. Delta Cross Channel closed November through June.

6. No Action: Study 2020d09b-calfed-516

Study 514 (Benchmark) plus
AFRP in-stream flows below Goodwin Dam
AFRP Delta Actions

a. April-May export restrictions
- 1:3 below normal, dry & critical years
- 1:4 above normal years
- 1:5 wet years

b. More X2 days at Chipps Island in May-June

c. Delta Cross Channel closed November through June.

7. No Action with Reoperation: Study 2020d09b-calfed-517

Study 516 (No Action) plus
- maximum wheeling of CVP water through SWP facilities
- unmet CVP demand on SWP system

8. No Action with Reoperation and ERPP (ALT 1A): Study 2020d09b-calfed-518

Study 517 (No Action with Reoperation) plus
- ERPP flow targets

9. Calfed Affected Environment - Existing Conditions Study: 1995d06a-calfed-558

1995 WQCP Bay-Delta Standards
1995 Level of Development
SWP Demand varies from 2.6 to 3.5 MAF
CVP demand is 3.3 MAF
Upstream in-stream flows same as Study 516
Selected Delta Actions

a. Vernalis Adaptive Management Plan Flows (VAMP)

b. More X2 days at Chipps Island in May-June

c. Delta Cross Channel closed November through June.

B. New Facility Scenarios

Note: New Criteria
Isolated facility criteria
- included in E/I ratio and SJR April-May pulse ratio
- no constraint on IF diversions to total Delta export ratio (i.e., 100%)

Minimum through Delta exports
1000 cfs Oct-Mar and July-Sept
0 cfs Apr-June

9. New Facility -SDI (ALT 2A): Study 2020d09b-calfed-528

Study 518 (ALT 1A) plus
- South Delta Improvements (SDI)

10. New Facility - SDI & IF (ALT 3A): Study 2020d09b-calfed-529

Study 528 (ALT 2A) plus
- 5,000 cfs Isolated Facility (IF)
- Delta Cross Channel gates closed from September through June and open July through August.

11. New Facilities - SDI & SDSS (ALT 2D): Study 2020d09b-calfed-530

Study 528 (ALT 2A) plus
- 2.0 MAF South of Delta Surface Storage (SDSS)
- 3500 cfs Inlet and Outlet capacities.

12. New Facilities - SDI, NDGS, NDSS, NDES, SDGS & SDSS (ALT 1C): Study 2020d09b-calfed-531

Study 528 (ALT 2A) plus
- 0.25 MAF North of Delta Groundwater Storage (NDGS)
- 2.0 MAF North of Delta Surface Storage (NDSS)
- 1.0 MAF North of Delta Environmental Storage (NDES)
  - diversion and discharge capacities of 5,000 cfs
  - no new diversion in any given water year until a 60,000 cfs mean daily flow event occurred at Chico Landing
- 0.5 MAF South of Delta Groundwater Storage (SDGS)
- 1.0 MAF South of Delta Surface Storage (SDSS) with 3500 cfs inlet and outlet capacities.

13. New Facilities - SDI, NDGS, NDSS, NDES, SDGS, SDSS & SJBSS (ALT 2B): Study 2020d09b-calfed-532

Study 531 (ALT 1C) facilities plus
- 2.0 MAF South of Delta Surface Storage (SDSS)
- 0.24 MAF San Joaquin Basin Surface Storage (SJBSS)

14. New Facilities - SDI, Storage, IF and IDS (ALT 3B): Study 2020d09b-calfed-533

Study 532 (ALT 2B) plus
- 5,000 cfs Isolated Facility (IF)
- 0.2 MAF In Delta Storage (IDS)

15. New Facilities - SDI, Storage, IF and IDS (ALT 3E): Study 2020d09b-calfed-534

Study 532 (ALT 2B) plus
- 15,000 cfs Isolated Facility (IF)
- 0.2 MAF In Delta Storage (IDS)

16. New facilities - SDI & NDSS: Study 2020d09b-calfed-543

Study 528 (ALT 2A) Plus
- 2.0 MAF North of Delta Surface Storage (NDSS)
- 1.0 MAF North of Delta Environmental Storage (NDES)
  - diversion and discharge capacities of 5,000 cfs
  - no new diversion in any given water year until a 60,000 cfs mean daily flow event occurred at Chico Landing.

C. Special Evaluation Studies

1. Interagency Development Team (IDT) Criteria - 2020d09b-calfed-547

Study 529 with 10,000 cfs IF IDT Criteria (No new storage)
Existing 1995 WQCP Standards with following modifications.

a. IF included in E/I Ratio if Banks plus Tracy exports exceed 10,000 cfs.
b. IF not included in E/I Ratio if Banks plus Tracy exports less than 10,000 cfs
c. No minimum through Delta channels diversion for south of Delta exports
d. Maximum export rate of 15,000 cfs (Banks 10,300 cfs and Tracy 4,600 cfs)
e. No south Delta diversions allowed during March through June unless Delta outflow exceeds 50,000 cfs or San Joaquin River at Vernalis exceeds 15,000 cfs
f. Maximum south Delta Diversion of 5,000 cfs in May Restrict Banks pumping to 1,000 cfs to approximate CVP/SWP usage.

2. Fish & Wildlife Service Criteria (Delta Ag from IF): Study 2020d09b-calfed-551

Study 529 with 15,000 cfs IF no storage and 1995 WQCP Standards, modified as follows.

a. Delta Diversions
  - minimum 1,000 cfs through Delta channels diversion for south of Delta export
  - Level 2 Delta Ag delivered from IF
b. Export Restrictions
  - Diversions to IF not subject to E/I Ratio
  - Maximum export rate of 15,000 cfs (Banks 10,300 cfs and Tracy 4,600 cfs)
  - Maximum south Delta diversion of 5,000 cfs in May Restrict Banks pumping to 1,000 cfs to approximate CVP/SWP usage.
c. Rio Vista flow criteria 3,000 cfs in July and August.

3. CALFED Storage Evaluation Study (Delta Ag from IF) - 2020d09b-calfed-555

Study 551 with 15,000 cfs IF Plus:
a. Storages same as Study 534 (Alt 3E)
b. North Delta Surface Storage Sacramento River monthly diversion geomorphological flow trigger of 1,500 TAF.

4. CALFED Storage Evaluation Study - 2020d09b-calfed-567

Study 533(Alt 3B) with 10,000 cfs IF Plus:
a. Minimum 1,000 cfs through Delta channels diversion
b. IF not included in E/I Ratio
c. Rio Vista flow criteria 3,000 cfs in July and August
d. Maximum south Delta diversion of 5,000 cfs in May
e. Diversions to NDSS or NDES zero trigger for Sacramento River flow.

D. New Facility Sensitivity Studies

1. New Facility - IF: Study 2020d09b-calfed-529b

Study 529 (ALT 3A) with 5,000 cfs IF
- Delta Cross Channel gates closed from November through June and open July through October.

2. New Facility - IF: Study 2020d09b-calfed-529c

Study 529 (ALT 3A) with 5,000 cfs IF
- IF not included in Delta Inflow/Export Ratio
- Delta Cross Channel gates closed from September through June and open July through August.

3. New Facility - IF: Study 2020d09b-calfed-529d

Study 529 (ALT 3A) with 5,000 cfs IF
- Minimum through Delta exports
  3000 cfs Oct-Mar and July-Sept
  0 cfs Apr-June

4. New Facility - IF: Study 2020d09b-calfed-529e

Study 529 (ALT 3A) with 5,000 cfs IF
- IF not included in Delta Inflow/Export Ratio
- Minimum through Delta exports
  3000 cfs Oct-Mar and July-Sept and 0 cfs Apr-June

5. New Facilities - SDI & Storage: Study 2020d09b-calfed-532a

Study 532 (ALT 2B) modified for;
- NDSS and NDES diversion 0 Trigger

6. New facilities - NDSS, NDES: Study 2020d09b-calfed-543a

Study 543 modified for;
- NDSS and NDES diversion 0 Trigger

7. New Facilities - Storage, IF & IDS: Study 2020d09b-calfed-568

Study 534(ALT 3E) 15,000 cfs IF
- Minimum through Delta exports to be zero.

8. New Facilities - Storage, IF & IDS: Study 2020d09b-calfed-569

Study 534(Alt 3E) with 15,000 cfs IF
- IF not in E/I ratio
- NDSS and NDES diversion 0 Trigger

9. New Facilities - SDI: Study 2020d09b-calfed-576

Study 528 modification
- Env E/I ratio, 0.5 Nov-Jan and 0.25 Feb-June

10. New Facilities - SDI & Storage: Study 2020d09b-calfed-577

Study 532 modification
- NDSS 0 Trigger
- Env E/I ratio, 0.5 Nov-Jan and 0.25 Feb-June

11. New Facilities - SDI & IF: Study 2020d09b-calfed-578

Study 529 with 5,000 cfs IF
a. Minimum 1,000 cfs through Delta diversion
b. IF not included in E/I Ratio
c. Rio Vista flow criteria 3,000 cfs in July and August
d. Maximum south Delta diversion of 5,000 cfs in May

12. New Facilities - SDI, Storage, IF & IDS: Study 2020d09b-calfed-579

Study 533(Alt 3B) with 5,000 cfs IF
a. Minimum 1,000 cfs through Delta diversion
b. IF not included in E/I Ratio
c. Rio Vista flow criteria 3,000 cfs in July and August
d. Maximum south Delta diversion of 5,000 cfs in May
e. NDSS and NDES diversion 0 Trigger

13. New Facilities - SDI & IF: Study 2020d09b-calfed-580

Study 529 with 15,000 cfs IF
a. Minimum 1,000 cfs through Delta diversion
b. IF not included in E/I Ratio
c. Rio Vista flow criteria 3,000 cfs in July and August
d. Maximum south Delta diversion of 5,000 cfs in May

14. New Facilities - SDI, Storage, IF & IDS: Study 2020d09b-calfed-581

Study 534 with 15,000 cfs IF
a. Minimum 1,000 cfs through Delta diversion
b. IF not included in E/I Ratio
c. Rio Vista flow criteria 3,000 cfs in July and August
d. Maximum south Delta diversion of 5,000 cfs in May
e. NDSS and NDES diversion 0 Trigger

15. New Facilities - SDI, Storage, IF & IDS (Delta Ag from IF): Study 2020d09b-calfed-582

Study 534 with 15,000 cfs IF
a. Minimum 1,000 cfs through Delta diversion
b. IF not included in E/I Ratio
c. Rio Vista flow criteria 3,000 cfs in July and August
d. Maximum south Delta diversion of 5,000 cfs in May
e. NDSS and NDES diversion 0 Trigger
f. Delta Ag diversion from IF

16. New Facilities - SDI, Storage, IF & IDS (Delta Ag from IF): Study 2020d09b-calfed-583

Study 534 with 15,000 cfs IF
a. No minimum through Delta diversion
b. IF not included in E/I Ratio
c. Rio Vista flow criteria 3,000 cfs in July and August

d. Maximum south Delta diversion of 5,000 cfs in May
e. NDSS and NDES diversion 0 Trigger
f. Delta Ag diversion from IF

E. Environmental Stakeholder Sensitivity Studies

1. Study #1 - Substantially Relaxed Environmental Standards for Alt 3: Study 2020d09b-calfed-565

15,000 cfs IF with no new storage, maximize water supply

-3,000 cfs minimum delta outflow
- no E/I ratio
- no water quality standards in Delta

b. Instream requirements: Same as Study 514 plus Mod.D-1400 for American River and Stanislaus Interim Operation Plan
c. Operations: Delta Ag and CCC from IF.

2. Study #2 - Substantially Relaxed Environmental Standards for Alt 1: Study 2020d09b-calfed-566

Existing System with SDI
a. Delta Standards:
- 3,000 cfs minimum delta outflow
- no E/I ratio
- only Ag and MI water quality standards in Delta

b. Instream requirements: Same as Study 514 plus Mod.D-1400 for American River and Stanislaus Interim Operation Plan

3. Study #3 - CVP/SWP Demand Reduction Alt 1: Study 2020d09b-calfed-572

Study 532 modifications
a. CVP Demand: Reduce CVP south of Delta demand by 800 TAF in all years and no CVP surrogate and maximum wheeling
b. SWP Demand: Reduce SWP demand to 1995 level.

4. Study #4 - CVP/SWP Demand Reduction Alt 3: Study 2020d09b-calfed-574

Study 534 modifications
a. 10,000 cfs IF
b. CVP Demand: Reduce CVP south of Delta demand by 800 TAF in all years and no CVP surrogate and maximum wheeling
c. SWP Demand: Reduce SWP demand to 1995 level.

5. Study #5 - ERPP Instream Requirement: Study 2020d09b-calfed-575

Study 532 modifications
a. ERPP to be treated as instream flow requirement
b. Sacramento and San Joaquin storage for SWP/CVP supplies.

Table 2
PRELIMINARY DWRSIM STUDIES RESULTS
WATER SUPPLY DELIVERIES OF CALFED STORAGE & CONVEYANCE FACILITIES

Study Information		Storage/Conveyance	SWP Deliveries		CVP Deliveries		SWP & CVP Total Deliveries	
ID	Ver	Date Components	critical	73-yr	critical	73-yr	critical	73-yr
514	9.06	10/30/97 1995 WQCP + Selected Upstream AFRP instream flows	2117	3257	1917	2543	4034	5800
543	9.06	10/30/97 Study 518 + SDI + NDSS +NDES	2282	3481	1960	2516	4242	5997
543a	9.06	10/30/97 Study 543 + NDSS 0 trigger value	2590	3786	1906	2509	4496	6295
547	9.06 b	10/30/97 Study 529 + 10,000 cfs IF + No new storage	2091	3352	1580	2422	3671	5774
551	9.06 c	10/30/97 Study 529 + 15,000 cfs IF + No new storage + Delta Ag IF	1907	3207	1393	2369	3300	5576
555	9.06 c	10/30/97 Study 551 + Storages + 1,500 NDSS trigger value +Deltra Ag IF	2872	3891	1373	2323	4245	6214
558	VMP	10/30/97 1995 WQCP + VAMP + Selected Delta Actions	2103	2794	1762	2495	3865	5289
567	9.06	10/30/97 Study 533 + 10,000 cfs IF + min 1,000 cfs thru Delta	3247	4048	1660	2371	4907	6419
568	9.06 -1	10/30/97 Study 534 + 15,000 cfs IF + min 0 cfs thru Delta	2813	3842	1354	2269	4167	6111
569	9.06 -1	10/30/97 Study 534 + 15,000 cfs IF + NDSS & NDES 0 trigger value	3073	3968	1390	2283	4463	6251
576	9.06	10/30/97 Study 528 + E/I ratio modifications	1877	3253	1795	2436	3672	5689
577	9.06 -1	10/30/97 Study 532 + E/I ratio modifications + 0 NDSS trigger	2374	3741	1658	2381	4032	6122
578	9.06 -1	10/30/97 Study 529 + 5,000 cfs IF + min 1,000 cfs thru Delta	2139	3369	1597	2438	3736	5803
579	9.06 -1	10/30/97 Study 533 + 5,000 cfs IF + NDSS & NDES 0 trigger value	3213	4035	1823	2419	5036	6454
580	9.06 -1	10/30/97 Study 529 + 15,000 cfs IF + min 1,000 cfs thru Delta	2091	3309	1504	2385	3595	5694
581	9.06 -1	10/30/97 Study 534 + 15,000 cfs IF + NDSS & NDES 0 trigger value	3303	4056	1375	2283	4678	6339
582	9.06 c	10/30/97 Study 581 + Delta Ag from IF	3343	4067	1174	1683	4517	5750
583	9.06 e	10/30/97 Study 582 + min 0 cfs thru Delta	2974	3984	1159	1674	4133	5658
565	9.06 e	10/30/97 Study 514 + 15K IF + Delta Ag & CCC from IF + No Standards	2740	3638	1997	2638	4737	6276
566	9.06	10/30/97 Study 514 + SDI + No E/I ratio +MI & Ag Standards	2618	3562	2211	2736	4829	6298
572	9.06 -1	10/30/97 Study 532 + CVP & SWP Demand reduced	----------study in progress----------					
574	9.06 -1	10/30/97 Study 534 + 10k cfs thru Delta + CVP & SWP Demand reduced	----------study in progress----------					
575	9.06 -1	10/30/97 Study 532 + ERPP + Sac & SJ storage for SWP/CVP supplies	----------study in progress----------					

All units in TAF/yr
Interruptible deliveries are not included in SWP.

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Table 3
PRELIMINARY DWRSIM STUDIES RESULTS
WATER SUPPLY BENEFITS OF CALFED STORAGE & CONVEYANCE FACILITIES

Study Information ID	Ver	Date	Storage/Conveyance Components	SWP & CVP Deliveries critical	SWP & CVP Deliveries 73-yr	SWP [1] Interruptible critical	SWP [1] Interruptible 73-yr
EXISTING SYSTEM:							
558	VMP	12/22/97	1995 WQCP + VAMP + Selected Delta Actions [2]	-1092	-771	-3	9
NEW FACILITIES:							
543	9.06	10/30/97	Study 518 + SDI + NDSS + NDES	208	197	27	99
SPECIAL EVALUATIONS:							
547	9.06 b	12/04/97	Study 529 + 10,000 cfs IF + No new storage	-363	-25	92	100
551	9.06 c	12/15/97	Study 529 + 15,000 cfs IF + No new storage + Delta Ag IF	-733	-221	186	189
555	9.06 c	12/17/97	Study 551 + Storages + 1,500 NDSS trigger value + Delta Ag IF	212	414	-27	-36
567	9.06	12/26/97	Study 533 + 10,000 cfs IF + min 1,000 cfs thru Delta	875	621	-29	-25

[1] Benefits measured against Study 514 benchmark
All units in TAF/yr

[2] Benefits measured against Study 527

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Table 4
PRELIMINARY DWRSIM SENSITIVITY STUDIES RESULTS
WATER SUPPLY BENEFITS OF CALFED STORAGE & CONVEYANCE FACILITIES

ID	Component	Isolated Facility Capacity	E/I Ratio	Through Delta Export	Delta AG From	NDSS/ NDES Trigger	SWP & CVP Deliveries critical	SWP & CVP Deliveries 73-yr	SWP [1] Interruptible critical	SWP [1] Interruptible 73-yr
528	No action + SDI	--	--	--	--	--	46	86	57	112
576	528 + Env Ratio (.5 Nov-Jan, .25 Feb-Jun)	--	--	--	--	--	-362	-111	0	143
532a	All Storages	--	--	--	--	0	792	700	-32	-66
577	532a + Env Ratio (.5 Nov-Jan, .25 Feb-Jun)	--	--	--	--	0	-3	311	-33	-110
543	NDSS + NDES	0	--	--	--	1500	208	197	27	99
543a	NDSS + NDES	0	--	--	--	0	462	495	16	72
534	All Storages	15k	Yes	1000	--	1500	335	430	-31	-52
568	All Storages	15k	Yes	0	--	1500	133	306	-30	-53
569	All Storages	15k	No	0	--	0	429	451	-29	-49
578	No Storage + (3k RV +5k May)	5k	No	1000	--	--	-313	2	144	185
579	Storage + (3k RV +5k May)	5k	No	1000	--	0	1001	654	-29	-13
580	No Storage + (3k RV +5k May)	15k	No	1000	--	0	-439	-103	145	188
581	Storage + (3k RV +5k May)	15k	No	1000	--	0	644	539	-28	-21
582	Storage + (3k RV +5k May)	15k	No	1000	IF	0	471	-44	-27	-16
583	Storage + (3k RV +5k May)	15k	No	0	IF	0	101	-136	-26	-32
580	No Storage + (3k RV +5k May)	15k	No	1000	--	0	-439	-103	145	188
551	No Storage + (3k RV +5k May	15k	No	1000	IF	0	-733	-221	186	189

[1] Benefits measured against Study 514 benchmark
All units in TAF/yr

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Table 5
PRELIMINARY DWRSIM ENVIRONMENTAL STAKEHOLDERS SENSITIVITY STUDIES RESULTS
WATER SUPPLY BENEFITS OF CALFED STORAGE & CONVEYANCE FACILITIES

Study Information			Storage/Conveyance	SWP & CVP Deliveries		SWP [1] Interruptible	
ID	Ver	Date	Components	critical	73-yr	critical	73-yr
565	9.06 e	01/19/98	Study 514 + 15k IF + Delta Ag & CCC from IF + No Standards	705	476	335	289
566	9.06	01/16/98	Study 514 + SDI + No E/I ratio + MI & Ag Standards	794	498	171	241
572	9.06 -1	01/07/98	Study 532 + CVP & SWP Demand reduced	---------- study in progress ----------			
574	9.06 -1	01/07/98	Study 534 + 10,000 cfs thru Delta + CVP & SWP Demand reduced	---------- study in progress ----------			
575	9.06 -1	01/16/98	Study 532 + ERPP + Sac & SJ storage for SWP/CVP supplies	---------- study in progress ----------			

[1] Benefits measured against Study 514 benchmark
All units in TAF/yr

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TABLE 6

SUMMARY OF WATER SUPPLY IMPACTS

All values in Thousand Acre-Feet/Year

I. HISTORIC DRY PERIOD AVERAGES (May 1928 - Oct 1934)	2020D09B-CALFED-527			1995D06A-CALFED-558		
	TOTAL	CVP	SWP	TOTAL	CVP	SWP
A. (i) Total Delta Exports	5237	2878	2359	4155 [-1082]	2058 [-819]	2096 [-262]
(ii) Net Storage Used	1284	943	340	1275 [9]	950 [-7]	324 [16]
(a) Existing North-of-Delta		943	340		950 [-7]	324 [16]
(b) New North-of-Delta			0			0 [0]
WATER SUPPLY IMPACT (i+ii)				-1073		
(iii) Add water from CP81 & CP20	0			28 [-28]		
(iv) Other Storage Used	200	88	111	151 [48]	40 [48]	111 [0]
(b) New In-Delta			0			0 [0]
(a) Existing South-of-Delta		88	111		40 [48]	111 [0]
(b) New South-of-Delta			0			0 [0]
B. Total Delta Outflow	4128			4986 [858]		
II. 73-YEAR (1922-1994) AVERAGES (Oct 1921 - Sep 1994)						
A. Total Delta Exports	6639	3050	3589	5801 [-838]	2741 [-308]	3059 [-529]
WATER SUPPLY IMPACT				-838		
B. Add water	0			45 [-45]		
C. EOM SEPT SACTO BASIN STORAGE	7287	5283	2004	7341 [53]	4947 [-335]	2393 [389]
(i) Existing Sacto Basin		5283	2004		4947 [-335]	2393 [389]
(ii) New Sacto Basin			0			0 [0]
D. EOM SEPT NEW MELONES STORAGE	1428			1245 [-182]		
E. Total Delta Outflow	13964			14688 [724]		

TABLE 7

SUMMARY OF WATER SUPPLY IMPACTS

All values in Thousand Acre-Feet/Year

I. HISTORIC DRY PERIOD AVERAGES (May 1928 - Oct 1934)	2020D09B-CALFED-514			2020D09B-CALFED-543		
	TOTAL	CVP	SWP	TOTAL	CVP	SWP
A. (i) Total Delta Exports	4356	2196	2159	4590 [234]	2232 [35]	2358 [198]
(ii) Net Storage Used	1175	842	332	1314 [-139]	879 [-37]	434 [-102]
(a) Existing North-of-Delta		842	332		879 [-37]	334 [-2]
(b) New North-of-Delta			0			100 [-100]
WATER SUPPLY IMPACT (i+ii)				95		
(iii) Add water from CP81 & CP20	80			89 [-9]		
(iv) Other Storage Used	156	58	98	157 [0]	64 [-6]	92 [6]
(b) New In-Delta			0			0 [0]
(a) Existing South-of-Delta		58	98		64 [-6]	92 [6]
(b) New South-of-Delta			0			0 [0]
B. Total Delta Outflow	4933			4982 [49]		
II. 73-YEAR (1922-1994) AVERAGES (Oct 1921 - Sep 1994)						
A. Total Delta Exports	6357	2804	3553	6655 [297]	2779 [-25]	3875 [322]
WATER SUPPLY IMPACT				297		
B. Add water	16			24 [-8]		
C. EOM SEPT SACTO BASIN STORAGE	6857	4926	1930	7686 [829]	4803 [-123]	2883 [952]
(i) Existing Sacto Basin		4926	1930		4803 [-123]	2225 [295]
(ii) New Sacto Basin			0			657 [-657]
D. EOM SEPT NEW MELONES STORAGE	1337			1066 [-271]		
E. Total Delta Outflow	14264			14089 [-175]		

TABLE 8

SUMMARY OF WATER SUPPLY IMPACTS

All values in Thousand Acre-Feet/Year

I. HISTORIC DRY PERIOD AVERAGES (May 1928 - Oct 1934)	2020D09B-CALFED-514			2020D09B-CALFED-547		
	TOTAL	CVP	SWP	TOTAL	CVP	SWP
A. (i) Total Delta Exports	4356	2196	2159	4058 [-297]	1841 [-351]	2217 [57]
(ii) Net Storage Used	1175	842	332	1203 [-28]	870 [-27]	333 [0]
(a) Existing North-of-Delta		842	332		870 [-27]	333 [0]
(b) New North-of-Delta			0			0 [0]
WATER SUPPLY IMPACT (i+ii)				-325		
(iii) Add water from CP81 & CP20	80			90 [-10]		
(iv) Other Storage Used	156	58	98	184 [-27]	76 [-18]	108 [-9]
(b) New In-Delta			0			0 [0]
(a) Existing South-of-Delta		58	98		76 [-18]	108 [-9]
(b) New South-of-Delta			0			0 [0]
B. Total Delta Outflow	4933			5391 [457]		
II. 73-YEAR (1922-1994) AVERAGES (Oct 1921 - Sep 1994)						
A. Total Delta Exports	6357	2804	3553	6443 [85]	2692 [-112]	3751 [197]
WATER SUPPLY IMPACT				85		
B. Add water	16			23 [-7]		
C. EOM SEPT SACTO BASIN STORAGE	6857	4926	1930	6508 [-348]	4763 [-162]	1744 [-186]
(i) Existing Sacto Basin		4926	1930		4763 [-162]	1744 [-186]
(ii) New Sacto Basin			0			0 [0]
D. EOM SEPT NEW MELONES STORAGE	1337			1066 [-270]		
E. Total Delta Outflow	14264			14376 [111]		

TABLE 9

SUMMARY OF WATER SUPPLY IMPACTS

All values in Thousand Acre-Feet/Year

I. HISTORIC DRY PERIOD AVERAGES (May 1928 - Oct 1934)	2020D09B-CALFED-514			2020D09B-CALFED-551		
	TOTAL	CVP	SWP	TOTAL	CVP	SWP
A. (i) Total Delta Exports	4356	2196	2159	3864 [-491]	1703 [-493]	2161 [1]
(ii) Net Storage Used	1175	842	332	1364 [-189]	997 [-154]	367 [-34]
(a) Existing North-of-Delta		842	332		997 [-154]	367 [-34]
(b) New North-of-Delta			0			0 [0]
WATER SUPPLY IMPACT (i+ii)				-680		
(iii) Add water from CP81 & CP20	80			92 [-11]		
(iv) Other Storage Used	156	58	98	101 [55]	28 [29]	73 [25]
(b) New In-Delta			0			0 [0]
(a) Existing South-of-Delta		58	98		28 [29]	73 [25]
(b) New South-of-Delta			0			0 [0]
B. Total Delta Outflow	4933			5739 [805]		
II. 73-YEAR (1922-1994) AVERAGES (Oct 1921 - Sep 1994)						
A. Total Delta Exports	6357	2804	3553	6339 [-18]	2640 [-164]	3699 [145]
WATER SUPPLY IMPACT				-18		
B. Add water	16			23 [-7]		
C. EOM SEPT SACTO BASIN STORAGE	6857	4926	1930	6085 [-771]	4497 [-428]	1588 [-342]
(i) Existing Sacto Basin		4926	1930		4497 [-428]	1588 [-342]
(ii) New Sacto Basin			0			0 [0]
D. EOM SEPT NEW MELONES STORAGE	1337			1067 [-270]		
E. Total Delta Outflow	14264			14509 [245]		

TABLE 10

SUMMARY OF WATER SUPPLY IMPACTS
All values in Thousand Acre-Feet/Year

I. HISTORIC DRY PERIOD AVERAGES (May 1928 - Oct 1934)	2020D09B-CALFED-514			2020D09B-CALFED-555		
	TOTAL	CVP	SWP	TOTAL	CVP	SWP
A. (i) Total Delta Exports	4356	2196	2159	4245 [-111]	1661 [-535]	2584 [424]
(ii) Net Storage Used	1175	842	332	1463 [-288]	1030 [-187]	433 [-100]
(a) Existing North-of-Delta		842	332		1030 [-187]	365 [-33]
(b) New North-of-Delta			0			67 [-67]
WATER SUPPLY IMPACT (i+ii)				-399		
(iii) Add water from CP81 & CP20	80			93 [-12]		
(iv) Other Storage Used	156	58	98	485 [-328]	50 [7]	434 [-336]
(b) New In-Delta			0			30 [-30]
(a) Existing South-of-Delta		58	98		50 [7]	99 [-1]
(b) New South-of-Delta			0			304 [-304]
B. Total Delta Outflow	4933			5475 [541]		
II. 73-YEAR (1922-1994) AVERAGES (Oct 1921 - Sep 1994)						
A. Total Delta Exports	6357	2804	3553	6800 [442]	2596 [-207]	4203 [650]
WATER SUPPLY IMPACT				442		
B. Add water	16			22 [-6]		
C. EOM SEPT SACTO BASIN STORAGE	6857	4926	1930	7285 [428]	4422 [-503]	2863 [932]
(i) Existing Sacto Basin		4926	1930		4422 [-503]	2058 [128]
(ii) New Sacto Basin			0			804 [-804]
D. EOM SEPT NEW MELONES STORAGE	1337			1068 [-269]		
E. Total Delta Outflow	14264			13964 [-300]		

TABLE 11

SUMMARY OF WATER SUPPLY IMPACTS

All values in Thousand Acre-Feet/Year

I. HISTORIC DRY PERIOD AVERAGES (May 1928 - Oct 1934)	2020D09B-CALFED-514			2020D09B-CALFED-567		
	TOTAL	CVP	SWP	TOTAL	CVP	SWP
A. (i) Total Delta Exports	4356	2196	2159	4858 [501]	1937 [-259]	2920 [761]
(ii) Net Storage Used	1175	842	332	1563 [-388]	926 [-84]	637 [-304]
(a) Existing North-of-Delta		842	332		926 [-84]	333 [-1]
(b) New North-of-Delta			0			303 [-303]
WATER SUPPLY IMPACT (i+ii)				113		
(iii) Add water from CP81 & CP20	80			90 [-9]		
(iv) Other Storage Used	156	58	98	531 [-374]	61 [-3]	469 [-371]
(b) New In-Delta			0			30 [-30]
(a) Existing South-of-Delta		58	98		61 [-3]	107 [-9]
(b) New South-of-Delta			0			331 [-331]
B. Total Delta Outflow	4933			4960 [26]		
II. 73-YEAR (1922-1994) AVERAGES (Oct 1921 - Sep 1994)						
A. Total Delta Exports	6357	2804	3553	7020 [663]	2642 [-161]	4378 [824]
WATER SUPPLY IMPACT				663		
B. Add water	16			22 [-6]		
C. EOM SEPT SACTO BASIN STORAGE	6857	4926	1930	8176 [1319]	4620 [-306]	3556 [1626]
(i) Existing Sacto Basin		4926	1930		4620 [-306]	2395 [464]
(ii) New Sacto Basin			0			1161 [-1161]
D. EOM SEPT NEW MELONES STORAGE	1337			1068 [-268]		
E. Total Delta Outflow	14264			13678 [-586]		

TABLE 12

SUMMARY OF WATER SUPPLY IMPACTS

All values in Thousand Acre-Feet/Year

I. HISTORIC DRY PERIOD AVERAGES (May 1928 - Oct 1934)	2020D09B-CALFED-543			2020D09B-CALFED-543A					
	TOTAL	CVP	SWP	TOTAL		CVP		SWP	
A. (i) Total Delta Exports	4590	2232	2358	4843	[252]	2181	[-50]	2661	[303]
(ii) Net Storage Used	1314	879	434	1489	[-175]	892	[-12]	597	[-162]
(a) Existing North-of-Delta		879	334			892	[-12]	331	[3]
(b) New North-of-Delta			100					266	[-165]
WATER SUPPLY IMPACT (i+ii)					77				
(iii) Add water from CP81 & CP20	89			90	[0]				
(iv) Other Storage Used	157	64	92	146	[10]	61	[3]	85	[7]
(b) New In-Delta			0					0	[0]
(a) Existing South-of-Delta		64	92			61	[3]	85	[7]
(b) New South-of-Delta			0					0	[0]
B. Total Delta Outflow	4982			4895	[-87]				
II. 73-YEAR (1922-1994) AVERAGES (Oct 1921 - Sep 1994)									
A. Total Delta Exports	6655	2779	3875	6919	[263]	2770	[-8]	4148	[272]
WATER SUPPLY IMPACT					263				
B. Add water	24			24	[0]				
C. EOM SEPT SACTO BASIN STORAGE	7686	4803	2883	8078	[319]	4726	[-76]	3351	[468]
(i) Existing Sacto Basin		4803	2225			4726	[-76]	2466	[240]
(ii) New Sacto Basin			657					885	[-227]
D. EOM SEPT NEW MELONES STORAGE	1066			1067	[1]				
E. Total Delta Outflow	14089			13795	[-294]				

TABLE 13

SUMMARY OF WATER SUPPLY IMPACTS

All values in Thousand Acre-Feet/Year

I. HISTORIC DRY PERIOD AVERAGES (May 1928 - Oct 1934)	2020D09B-CALFED-514			2020D09B-CALFED-568		
	TOTAL	CVP	SWP	TOTAL	CVP	SWP
A. (i) Total Delta Exports	4356	2196	2159	4161 [-194]	1648 [-548]	2513 [353]
(ii) Net Storage Used	1175	842	332	1312 [-137]	894 [-51]	418 [-86]
(a) Existing North-of-Delta		842	332		894 [-51]	333 [0]
(b) New North-of-Delta			0			85 [-85]
WATER SUPPLY IMPACT (i+ii)				-331		
(iii) Add water from CP81 & CP20	80			94 [-13]		
(iv) Other Storage Used	156	58	98	462 [-305]	44 [13]	418 [-319]
(b) New In-Delta			0			4 [-4]
(a) Existing South-of-Delta		58	98		44 [13]	103 [-4]
(b) New South-of-Delta			0			310 [-310]
B. Total Delta Outflow	4933			5385 [452]		
II. 73-YEAR (1922-1994) AVERAGES (Oct 1921 - Sep 1994)						
A. Total Delta Exports	6357	2804	3553	6659 [301]	2538 [-265]	4120 [567]
WATER SUPPLY IMPACT				301		
B. Add water	16			24 [-8]		
C. EOM SEPT SACTO BASIN STORAGE	6857	4926	1930	7591 [734]	4665 [-260]	2925 [995]
(i) Existing Sacto Basin		4926	1930		4665 [-260]	2122 [192]
(ii) New Sacto Basin			0			802 [-802]
D. EOM SEPT NEW MELONES STORAGE	1337			1065 [-272]		
E. Total Delta Outflow	14264			14080 [-184]		

TABLE 14

SUMMARY OF WATER SUPPLY IMPACTS
All values in Thousand Acre-Feet/Year

I. HISTORIC DRY PERIOD AVERAGES (May 1928 - Oct 1934)	2020D09B-CALFED-514			2020D09B-CALFED-569		
	TOTAL	CVP	SWP	TOTAL	CVP	SWP
A. (i) Total Delta Exports	4356	2196	2159	4457 [101]	1693 [-502]	2763 [603]
(ii) Net Storage Used	1175	842	332	1522 [-347]	905 [-62]	617 [-285]
(a) Existing North-of-Delta		842	332		905 [-62]	332 [0]
(b) New North-of-Delta			0			285 [-285]
WATER SUPPLY IMPACT (i+ii)				-246		
(iii) Add water from CP81 & CP20	80			94 [-13]		
(iv) Other Storage Used	156	58	98	467 [-310]	34 [23]	432 [-334]
(b) New In-Delta			0			11 [-11]
(a) Existing South-of-Delta		58	98		34 [23]	111 [-12]
(b) New South-of-Delta			0			310 [-310]
B. Total Delta Outflow	4933			5294 [361]		
II. 73-YEAR (1922-1994) AVERAGES (Oct 1921 - Sep 1994)						
A. Total Delta Exports	6357	2804	3553	6804 [446]	2550 [-254]	4254 [701]
WATER SUPPLY IMPACT				446		
B. Add water	16			24 [-8]		
C. EOM SEPT SACTO BASIN STORAGE	6857	4926	1930	8049 [1192]	4577 [-348]	3471 [1541]
(i) Existing Sacto Basin		4926	1930		4577 [-348]	2384 [454]
(ii) New Sacto Basin			0			1087 [-1087]
D. EOM SEPT NEW MELONES STORAGE	1337			1065 [-272]		
E. Total Delta Outflow	14264			13897 [-367]		

TABLE 15

SUMMARY OF WATER SUPPLY IMPACTS

All values in Thousand Acre-Feet/Year

I. HISTORIC DRY PERIOD AVERAGES (May 1928 - Oct 1934)	2020D09B-CALFED-528			2020D09B-CALFED-576		
	TOTAL	CVP	SWP	TOTAL	CVP	SWP
A. (i) Total Delta Exports	4460	2221	2238	3952 [-508]	2060 [-160]	1891 [-347]
(ii) Net Storage Used	1216	884	332	1190 [26]	859 [25]	331 [1]
(a) Existing North-of-Delta		884	332		859 [25]	331 [1]
(b) New North-of-Delta			0			0 [0]
WATER SUPPLY IMPACT (i+ii)				-482		
(iii) Add water from CP81 & CP20	90			97 [-7]		
(iv) Other Storage Used	156	59	97	165 [-8]	71 [-12]	93 [3]
(b) New In-Delta			0			0 [0]
(a) Existing South-of-Delta		59	97		71 [-12]	93 [3]
(b) New South-of-Delta			0			0 [0]
B. Total Delta Outflow	5017			5498 [480]		
II. 73-YEAR (1922-1994) AVERAGES (Oct 1921 - Sep 1994)						
A. Total Delta Exports	6559	2801	3758	6225 [-333]	2692 [-108]	3533 [-224]
WATER SUPPLY IMPACT				-333		
B. Add water	24			26 [-1]		
C. EOM SEPT SACTO BASIN STORAGE	6683	4921	1761	6683 [0]	4957 [35]	1726 [-34]
(i) Existing Sacto Basin		4921	1761		4957 [35]	1726 [-34]
(ii) New Sacto Basin			0			0 [0]
D. EOM SEPT NEW MELONES STORAGE	1065			1062 [-3]		
E. Total Delta Outflow	14256			14588 [332]		

TABLE 16

SUMMARY OF WATER SUPPLY IMPACTS

All values in Thousand Acre-Feet/Year

I. HISTORIC DRY PERIOD AVERAGES (May 1928 - Oct 1934)	2020D09B-CALFED-532			2020D09B-CALFED-577		
	TOTAL	CVP	SWP	TOTAL	CVP	SWP
A. (i) Total Delta Exports	4629	2099	2530	4194 [-434]	1951 [-147]	2243 [-287]
(ii) Net Storage Used	1328	880	447	1379 [-51]	864 [15]	515 [-67]
(a) Existing North-of-Delta		880	324		864 [15]	326 [-1]
(b) New North-of-Delta			122			188 [-65]
WATER SUPPLY IMPACT (i+ii)				-485		
(iii) Add water from CP81 & CP20	91			99 [-7]		
(iv) Other Storage Used	434	63	371	282 [152]	43 [20]	238 [132]
(b) New In-Delta			0			0 [0]
(a) Existing South-of-Delta		63	87		43 [20]	45 [42]
(b) New South-of-Delta			283			193 [90]
B. Total Delta Outflow	4953			5466 [512]		
II. 73-YEAR (1922-1994) AVERAGES (Oct 1921 - Sep 1994)						
A. Total Delta Exports	6913	2786	4127	6561 [-352]	2634 [-151]	3926 [-201]
WATER SUPPLY IMPACT				-352		
B. Add water	24			26 [-1]		
C. EOM SEPT SACTO BASIN STORAGE	7790	4826	2964	8115 [324]	4803 [-22]	3312 [347]
(i) Existing Sacto Basin		4826	2128		4803 [-22]	2356 [228]
(ii) New Sacto Basin			836			955 [-119]
D. EOM SEPT NEW MELONES STORAGE	1065			1058 [-7]		
E. Total Delta Outflow	13818			14151 [333]		

TABLE 17

SUMMARY OF WATER SUPPLY IMPACTS

All values in Thousand Acre-Feet/Year

I. HISTORIC DRY PERIOD AVERAGES (May 1928 - Oct 1934)	2020D09B-CALFED-529			2020D09B-CALFED-578					
	TOTAL	CVP	SWP	TOTAL		CVP		SWP	
A. (i) Total Delta Exports	4288	2089	2199	4183	[-105]	1867	[-222]	2316	[116]
(ii) Net Storage Used	1202	868	333	1182	[19]	850	[18]	331	[1]
(a) Existing North-of-Delta		868	333			850	[18]	331	[1]
(b) New North-of-Delta			0					0	[0]
WATER SUPPLY IMPACT (i+ii)					-85				
(iii) Add water from CP81 & CP20	90			90	[0]				
(iv) Other Storage Used	187	91	96	175	[12]	68	[23]	107	[-11]
(b) New In-Delta			0					0	[0]
(a) Existing South-of-Delta		91	96			68	[23]	107	[-11]
(b) New South-of-Delta			0					0	[0]
B. Total Delta Outflow	5166			5245	[79]				
II. 73-YEAR (1922-1994) AVERAGES (Oct 1921 - Sep 1994)									
A. Total Delta Exports	6530	2760	3770	6561	[30]	2708	[-51]	3852	[82]
WATER SUPPLY IMPACT					30				
B. Add water	24			24	[0]				
C. EOM SEPT SACTO BASIN STORAGE	6654	4918	1736	6546	[-108]	4876	[-41]	1670	[-66]
(i) Existing Sacto Basin		4918	1736			4876	[-41]	1670	[-66]
(ii) New Sacto Basin			0					0	[0]
D. EOM SEPT NEW MELONES STORAGE	1065			1067	[1]				
E. Total Delta Outflow	14283			14258	[-25]				

TABLE 18

SUMMARY OF WATER SUPPLY IMPACTS

All values in Thousand Acre-Feet/Year

I. HISTORIC DRY PERIOD AVERAGES (May 1928 - Oct 1934)	2020D09B-CALFED-533			2020D09B-CALFED-579		
	TOTAL	CVP	SWP	TOTAL	CVP	SWP
A. (i) Total Delta Exports	4539	2017	2522	4971 [432]	2091 [73]	2880 [358]
(ii) Net Storage Used	1348	894	454	1554 [-206]	929 [-35]	625 [-171]
(a) Existing North-of-Delta		894	326		929 [-35]	322 [4]
(b) New North-of-Delta			127			302 [-175]
WATER SUPPLY IMPACT (i+ii)				226		
(iii) Add water from CP81 & CP20	91			88 [2]		
(iv) Other Storage Used	454	88	365	544 [-89]	68 [19]	475 [-109]
(b) New In-Delta			11			30 [-18]
(a) Existing South-of-Delta		88	86		68 [19]	110 [-24]
(b) New South-of-Delta			267			334 [-66]
B. Total Delta Outflow	5067			4843 [-223]		
II. 73-YEAR (1922-1994) AVERAGES (Oct 1921 - Sep 1994)						
A. Total Delta Exports	6845	2663	4182	7063 [217]	2689 [26]	4373 [190]
WATER SUPPLY IMPACT				217		
B. Add water	24			22 [2]		
C. EOM SEPT SACTO BASIN STORAGE	7868	4830	3038	8384 [515]	4738 [-91]	3645 [607]
(i) Existing Sacto Basin		4830	2176		4738 [-91]	2455 [279]
(ii) New Sacto Basin			861			1189 [-327]
D. EOM SEPT NEW MELONES STORAGE	1065			1069 [3]		
E. Total Delta Outflow	13869			13632 [-237]		

TABLE 19

SUMMARY OF WATER SUPPLY IMPACTS

All values in Thousand Acre-Feet/Year

I. HISTORIC DRY PERIOD AVERAGES (May 1928 - Oct 1934)	2020D09B-CALFED-514			2020D09B-CALFED-580		
	TOTAL	CVP	SWP	TOTAL	CVP	SWP
A. (i) Total Delta Exports	4356	2196	2159	4043 [-312]	1773 [-423]	2270 [110]
(ii) Net Storage Used	1175	842	332	1184 [-9]	851 [-8]	332 [0]
(a) Existing North-of-Delta		842	332		851 [-8]	332 [0]
(b) New North-of-Delta			0			0 [0]
WATER SUPPLY IMPACT (i+ii)				-321		
(iii) Add water from CP81 & CP20	80			91 [-10]		
(iv) Other Storage Used	156	58	98	176 [-20]	69 [-11]	107 [-8]
(b) New In-Delta			0			0 [0]
(a) Existing South-of-Delta		58	98		69 [-11]	107 [-8]
(b) New South-of-Delta			0			0 [0]
B. Total Delta Outflow	4933			5384 [450]		
II. 73-YEAR (1922-1994) AVERAGES (Oct 1921 - Sep 1994)						
A. Total Delta Exports	6357	2804	3553	6453 [95]	2654 [-150]	3798 [245]
WATER SUPPLY IMPACT				95		
B. Add water	16			24 [-7]		
C. EOM SEPT SACTO BASIN STORAGE	6857	4926	1930	6357 [-499]	4733 [-193]	1624 [-306]
(i) Existing Sacto Basin		4926	1930		4733 [-193]	1624 [-306]
(ii) New Sacto Basin			0			0 [0]
D. EOM SEPT NEW MELONES STORAGE	1337			1067 [-270]		
E. Total Delta Outflow	14264			14385 [120]		

TABLE 20

SUMMARY OF WATER SUPPLY IMPACTS

All values in Thousand Acre-Feet/Year

I. HISTORIC DRY PERIOD AVERAGES (May 1928 - Oct 1934)	2020D09B-CALFED-580			2020D09B-CALFED-581		
	TOTAL	CVP	SWP	TOTAL	CVP	SWP
A. (i) Total Delta Exports	4043	1773	2270	4668 [625]	1693 [-80]	2975 [705]
(ii) Net Storage Used	1184	851	332	1521 [-338]	925 [-74]	596 [-264]
(a) Existing North-of-Delta		851	332		925 [-74]	317 [14]
(b) New North-of-Delta			0			278 [-278]
WATER SUPPLY IMPACT (i+ii)				287		
(iii) Add water from CP81 & CP20	91			92 [-1]		
(iv) Other Storage Used	176	69	107	489 [-313]	19 [50]	469 [-362]
(b) New In-Delta			0			28 [-28]
(a) Existing South-of-Delta		69	107		19 [50]	108 [-1]
(b) New South-of-Delta			0			331 [-331]
B. Total Delta Outflow	5384			5096 [-288]		
II. 73-YEAR (1922-1994) AVERAGES (Oct 1921 - Sep 1994)						
A. Total Delta Exports	6453	2654	3798	6948 [495]	2557 [-97]	4391 [593]
WATER SUPPLY IMPACT				495		
B. Add water	24			23 [1]		
C. EOM SEPT SACTO BASIN STORAGE	6357	4733	1624	8173 [1816]	4649 [-84]	3524 [1900]
(i) Existing Sacto Basin		4733	1624		4649 [-84]	2379 [755]
(ii) New Sacto Basin			0			1144 [-1144]
D. EOM SEPT NEW MELONES STORAGE	1067			1068 [1]		
E. Total Delta Outflow	14385			13759 [-626]		

TABLE 21

SUMMARY OF WATER SUPPLY IMPACTS

All values in Thousand Acre-Feet/Year

I. HISTORIC DRY PERIOD AVERAGES (May 1928 - Oct 1934)	2020D09B-CALFED-514			2020D09B-CALFED-582		
	TOTAL	CVP	SWP	TOTAL	CVP	SWP
A. (i) Total Delta Exports	4356	2196	2159	4512 [156]	1501 [-695]	3011 [851]
(ii) Net Storage Used	1175	842	332	1603 [-428]	978 [-135]	625 [-293]
(a) Existing North-of-Delta		842	332		978 [-135]	323 [9]
(b) New North-of-Delta			0			302 [-302]
WATER SUPPLY IMPACT (i+ii)				-272		
(iii) Add water from CP81 & CP20	80			93 [-13]		
(iv) Other Storage Used	156	58	98	487 [-331]	11 [46]	476 [-377]
(b) New In-Delta			0			30 [-30]
(a) Existing South-of-Delta		58	98		11 [46]	110 [-12]
(b) New South-of-Delta			0			335 [-335]
B. Total Delta Outflow	4933			5326 [393]		
II. 73-YEAR (1922-1994) AVERAGES (Oct 1921 - Sep 1994)						
A. Total Delta Exports	6357	2804	3553	6378 [21]	1974 [-830]	4404 [851]
WATER SUPPLY IMPACT				21		
B. Add water	16			24 [-7]		
C. EOM SEPT SACTO BASIN STORAGE	6857	4926	1930	8189 [1332]	4546 [-379]	3642 [1712]
(i) Existing Sacto Basin		4926	1930		4546 [-379]	2474 [543]
(ii) New Sacto Basin			0			1168 [-1168]
D. EOM SEPT NEW MELONES STORAGE	1337			1062 [-275]		
E. Total Delta Outflow	14264			14308 [43]		

TABLE 22

SUMMARY OF WATER SUPPLY IMPACTS

All values in Thousand Acre-Feet/Year

I. HISTORIC DRY PERIOD AVERAGES (May 1928 - Oct 1934)	2020D09B-CALFED-534			2020D09B-CALFED-583					
	TOTAL	CVP	SWP	TOTAL		CVP		SWP	
A. (i) Total Delta Exports	4362	1933	2428	4185	[-176]	1495	[-438]	2690	[260]
(ii) Net Storage Used	1259	884	375	1669	[-410]	967	[-82]	702	[-327]
(a) Existing North-of-Delta		884	323			967	[-82]	434	[-110]
(b) New North-of-Delta			51					267	[-216]
WATER SUPPLY IMPACT (i+ii)					-586				
(iii) Add water from CP81 & CP20	92			94	[-2]				
(iv) Other Storage Used	475	87	388	433	[42]	1	[85]	431	[-42]
(b) New In-Delta			19					30	[-11]
(a) Existing South-of-Delta		87	87			1	[85]	98	[-11]
(b) New South-of-Delta			281					301	[-20]
B. Total Delta Outflow	5161			5717	[556]				
II. 73-YEAR (1922-1994) AVERAGES (Oct 1921 - Sep 1994)									
A. Total Delta Exports	6783	2663	4119	6271	[-511]	1966	[-696]	4304	[185]
WATER SUPPLY IMPACT					-511				
B. Add water	24			24	[0]				
C. EOM SEPT SACTO BASIN STORAGE	7661	4705	2955	7801	[140]	4475	[-229]	3326	[370]
(i) Existing Sacto Basin		4705	2129			4475	[-229]	2264	[135]
(ii) New Sacto Basin			826					1061	[-235]
D. EOM SEPT NEW MELONES STORAGE	1065			1062	[-2]				
E. Total Delta Outflow	13962			14433	[471]				

TABLE 23

SUMMARY OF WATER SUPPLY IMPACTS
All values in Thousand Acre-Feet/Year

I. HISTORIC DRY PERIOD AVERAGES (May 1928 - Oct 1934)	2020D09B-CALFED-582			2020D09B-CALFED-583		
	TOTAL	CVP	SWP	TOTAL	CVP	SWP
A. (i) Total Delta Exports	4512	1501	3011	4185 [-327]	1495 [-6]	2690 [-320]
(ii) Net Storage Used	1603	978	625	1669 [-65]	967 [11]	702 [-76]
(a) Existing North-of-Delta		978	323		967 [11]	434 [-111]
(b) New North-of-Delta			302			267 [34]
WATER SUPPLY IMPACT (i+ii)				-392		
(iii) Add water from CP81 & CP20	93			94 [0]		
(iv) Other Storage Used	487	11	476	433 [54]	1 [9]	431 [45]
(b) New In-Delta			30			30 [0]
(a) Existing South-of-Delta		11	110		1 [9]	98 [12]
(b) New South-of-Delta			335			301 [33]
B. Total Delta Outflow	5326			5717 [391]		
II. 73-YEAR (1922-1994) AVERAGES (Oct 1921 - Sep 1994)						
A. Total Delta Exports	6378	1974	4404	6271 [-107]	1966 [-8]	4304 [-99]
WATER SUPPLY IMPACT				-107		
B. Add water	24			24 [0]		
C. EOM SEPT SACTO BASIN STORAGE	8189	4546	3642	7801 [-387]	4475 [-71]	3326 [-316]
(i) Existing Sacto Basin		4546	2474		4475 [-71]	2264 [-209]
(ii) New Sacto Basin			1168			1061 [107]
D. EOM SEPT NEW MELONES STORAGE	1062			1062 [0]		
E. Total Delta Outflow	14308			14433 [124]		

TABLE 24

SUMMARY OF WATER SUPPLY IMPACTS

All values in Thousand Acre-Feet/Year

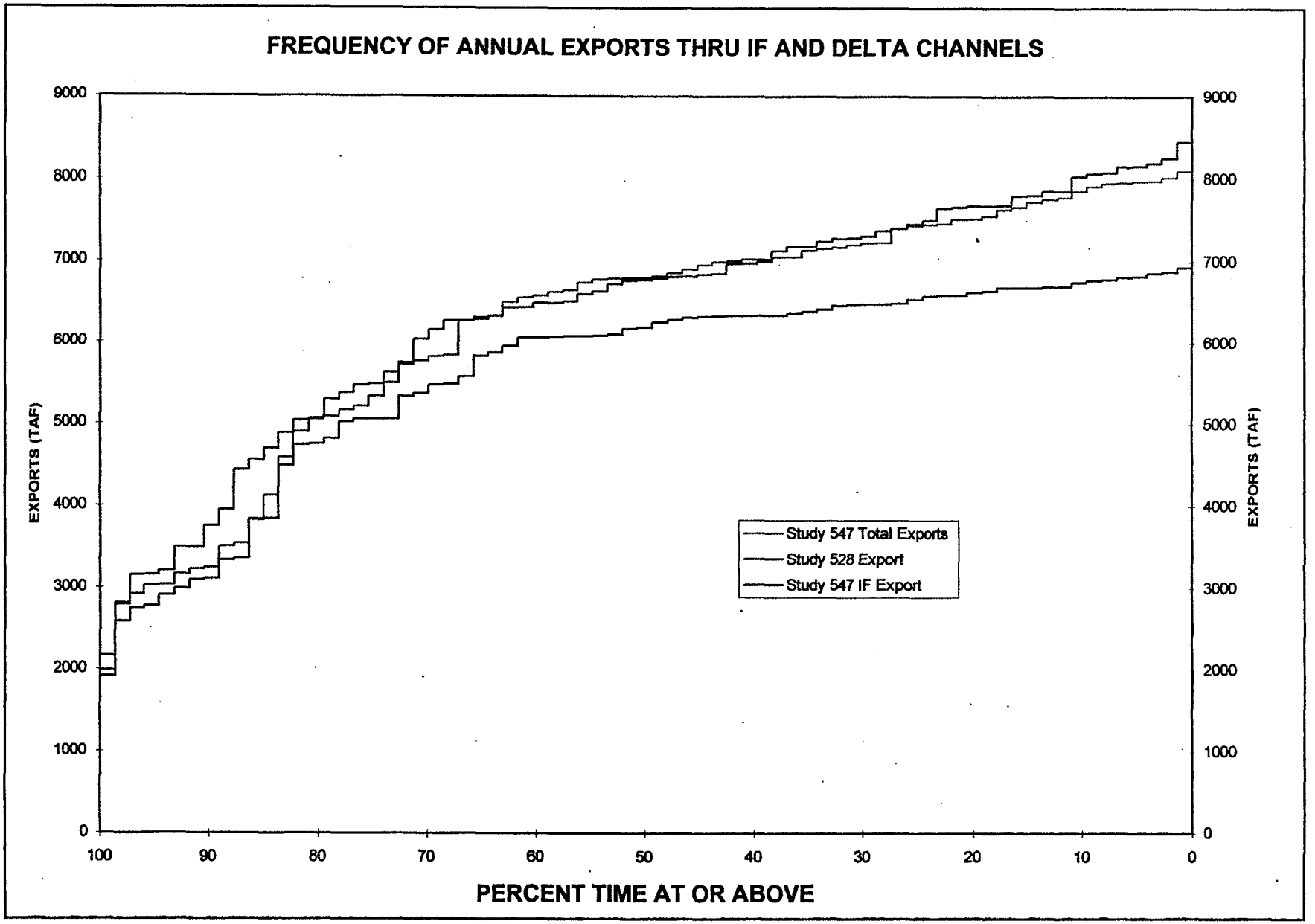
I. HISTORIC DRY PERIOD AVERAGES (May 1928 - Oct 1934)	2020D09B-CALFED-514			2020D09B-CALFED-565		
	TOTAL	CVP	SWP	TOTAL	CVP	SWP
A. (i) Total Delta Exports	4356	2196	2159	5450 [1094]	2308 [111]	3142 [982]
(ii) Net Storage Used	1175	842	332	1066 [108]	730 [112]	336 [-3]
(a) Existing North-of-Delta		842	332		730 [112]	336 [-3]
(b) New North-of-Delta			0			0 [0]
WATER SUPPLY IMPACT (i+ii)				1202		
(iii) Add water from CP81 & CP20	80			160 [-79]		
(iv) Other Storage Used	156	58	98	100 [56]	26 [31]	73 [25]
(b) New In-Delta			0			0 [0]
(a) Existing South-of-Delta		58	98		26 [31]	73 [25]
(b) New South-of-Delta			0			0 [0]
B. Total Delta Outflow	4933			3789 [-1144]		
II. 73-YEAR (1922-1994) AVERAGES (Oct 1921 - Sep 1994)						
A. Total Delta Exports	6357	2804	3553	7137 [779]	2908 [103]	4229 [676]
WATER SUPPLY IMPACT				779		
B. Add water	16			32 [-16]		
C. EOM SEPT SACTO BASIN STORAGE	6857	4926	1930	7380 [523]	5262 [336]	2118 [187]
(i) Existing Sacto Basin		4926	1930		5262 [336]	2118 [187]
(ii) New Sacto Basin			0			0 [0]
D. EOM SEPT NEW MELONES STORAGE	1337			1268 [-69]		
E. Total Delta Outflow	14264			13501 [-763]		

TABLE 25

SUMMARY OF WATER SUPPLY IMPACTS

All values in Thousand Acre-Feet/Year

I. HISTORIC DRY PERIOD AVERAGES (May 1928 - Oct 1934)	2020D09B-CALFED-514			2020D09B-CALFED-566		
	TOTAL	CVP	SWP	TOTAL	CVP	SWP
A. (i) Total Delta Exports	4356	2196	2159	5313 [957]	2489 [293]	2823 [664]
(ii) Net Storage Used	1175	842	332	1110 [64]	808 [34]	301 [30]
(a) Existing North-of-Delta		842	332		808 [34]	301 [30]
(b) New North-of-Delta			0			0 [0]
WATER SUPPLY IMPACT (i+ii)				1021		
(iii) Add water from CP81 & CP20	80			157 [-76]		
(iv) Other Storage Used	156	58	98	164 [-8]	58 [0]	106 [-8]
(b) New In-Delta			0			0 [0]
(a) Existing South-of-Delta		58	98		58 [0]	106 [-8]
(b) New South-of-Delta			0			0 [0]
B. Total Delta Outflow	4933			3973 [-960]		
II. 73-YEAR (1922-1994) AVERAGES (Oct 1921 - Sep 1994)						
A. Total Delta Exports	6357	2804	3553	7107 [749]	3003 [198]	4104 [550]
WATER SUPPLY IMPACT				749		
B. Add water	16			32 [-16]		
C. EOM SEPT SACTO BASIN STORAGE	6857	4926	1930	7163 [305]	5000 [73]	2162 [232]
(i) Existing Sacto Basin		4926	1930		5000 [73]	2162 [232]
(ii) New Sacto Basin			0			0 [0]
D. EOM SEPT NEW MELONES STORAGE	1337			1269 [-68]		
E. Total Delta Outflow	14264			13528 [-735]		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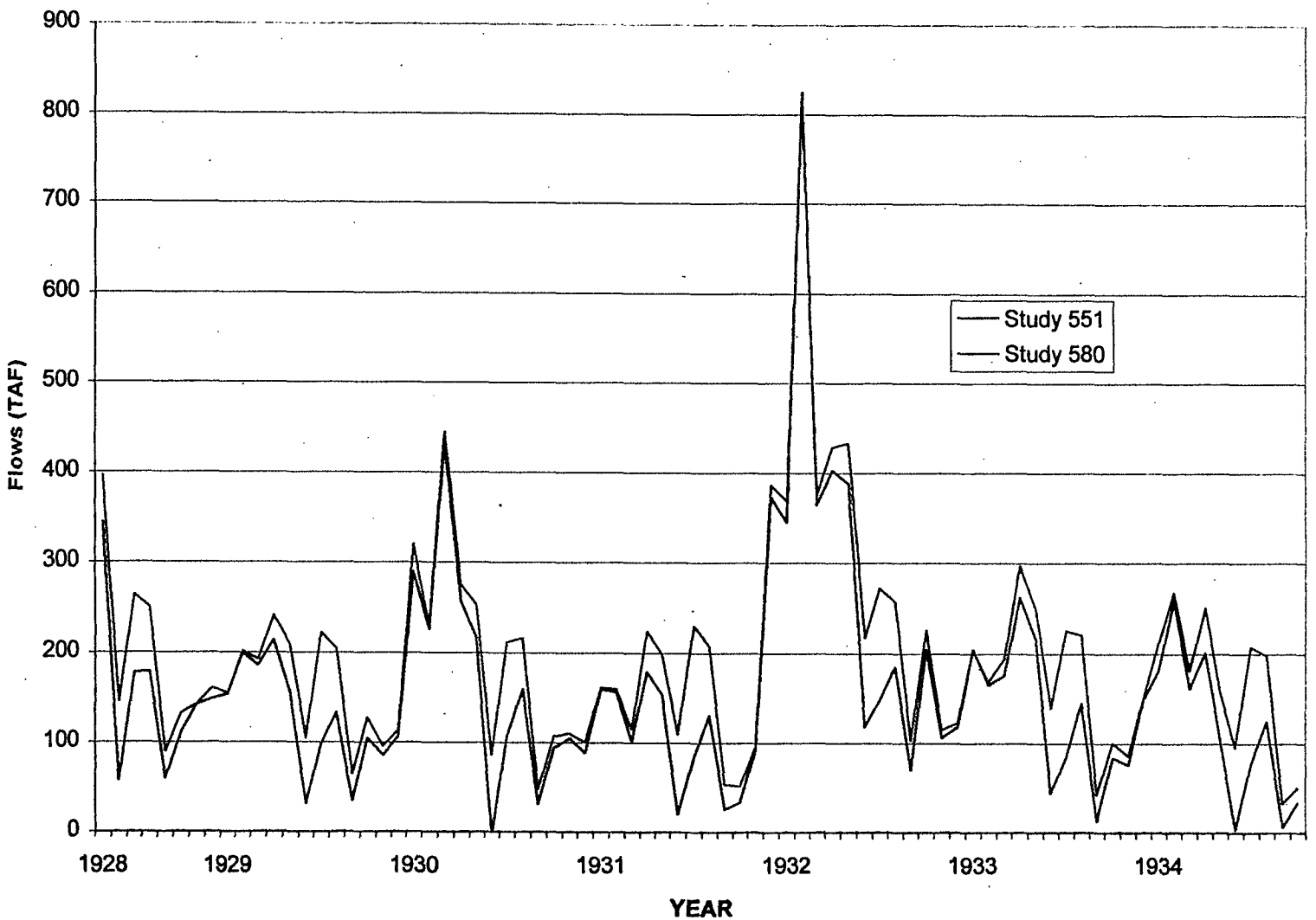
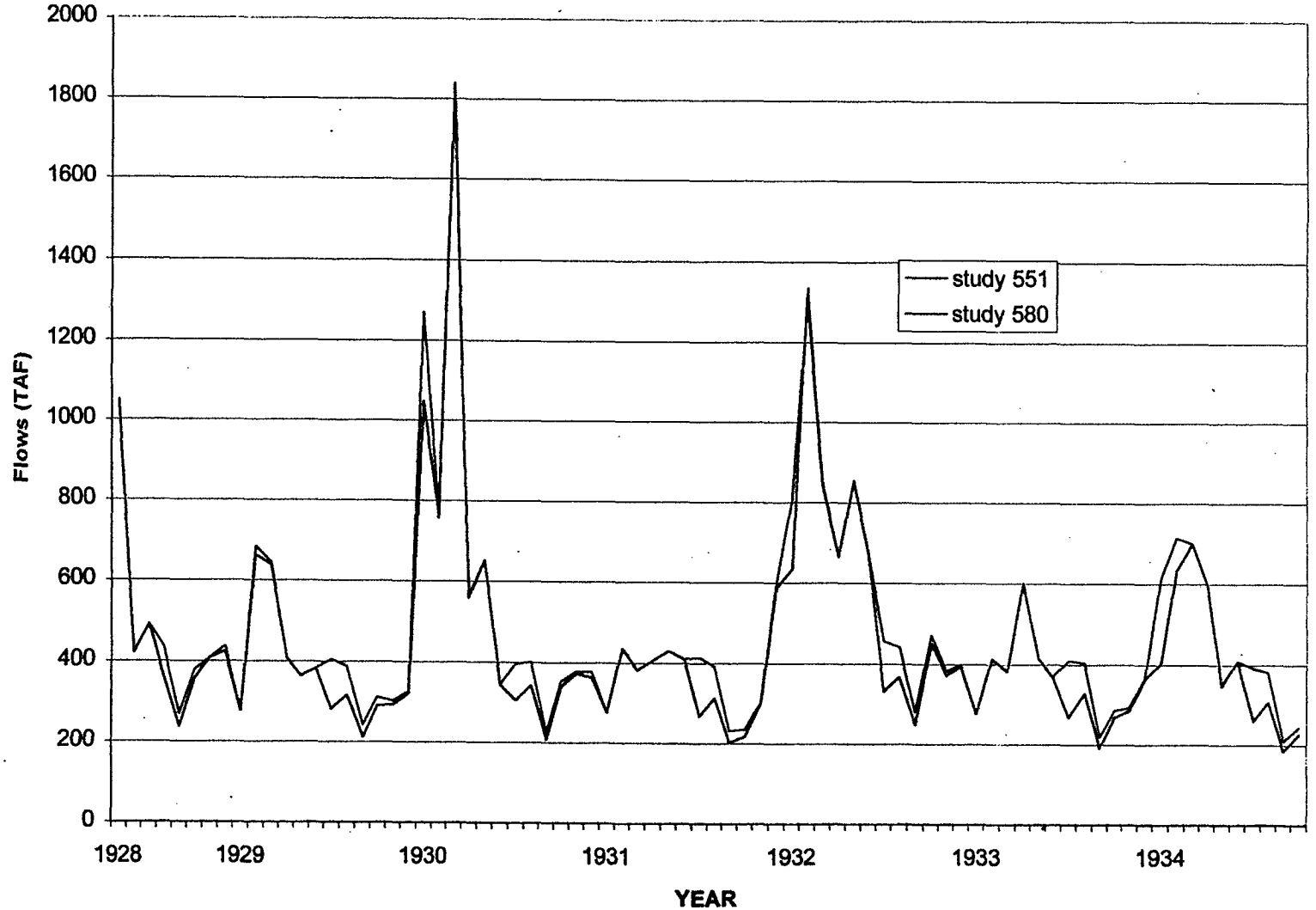
EXPORTS (TAF)
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
100
90
80
70
60
50
40
30
20
10
0
PERCENT TIME AT OR ABOVE
Study 547 Total Exports
Study 528 Export
Study 547 IF Export

D-010017

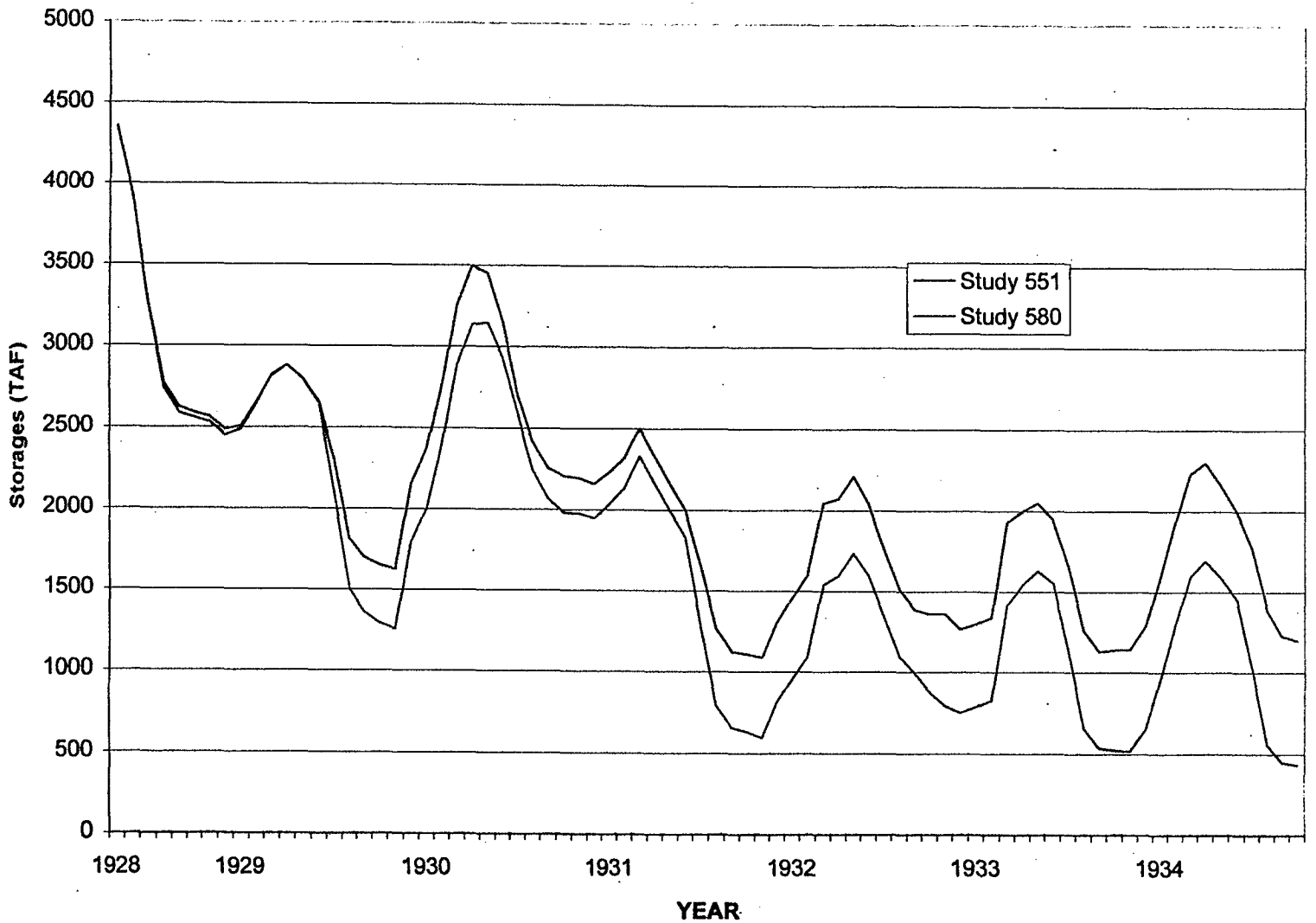
Comparison of Lower San Joaquin River Flows at Control Point 528

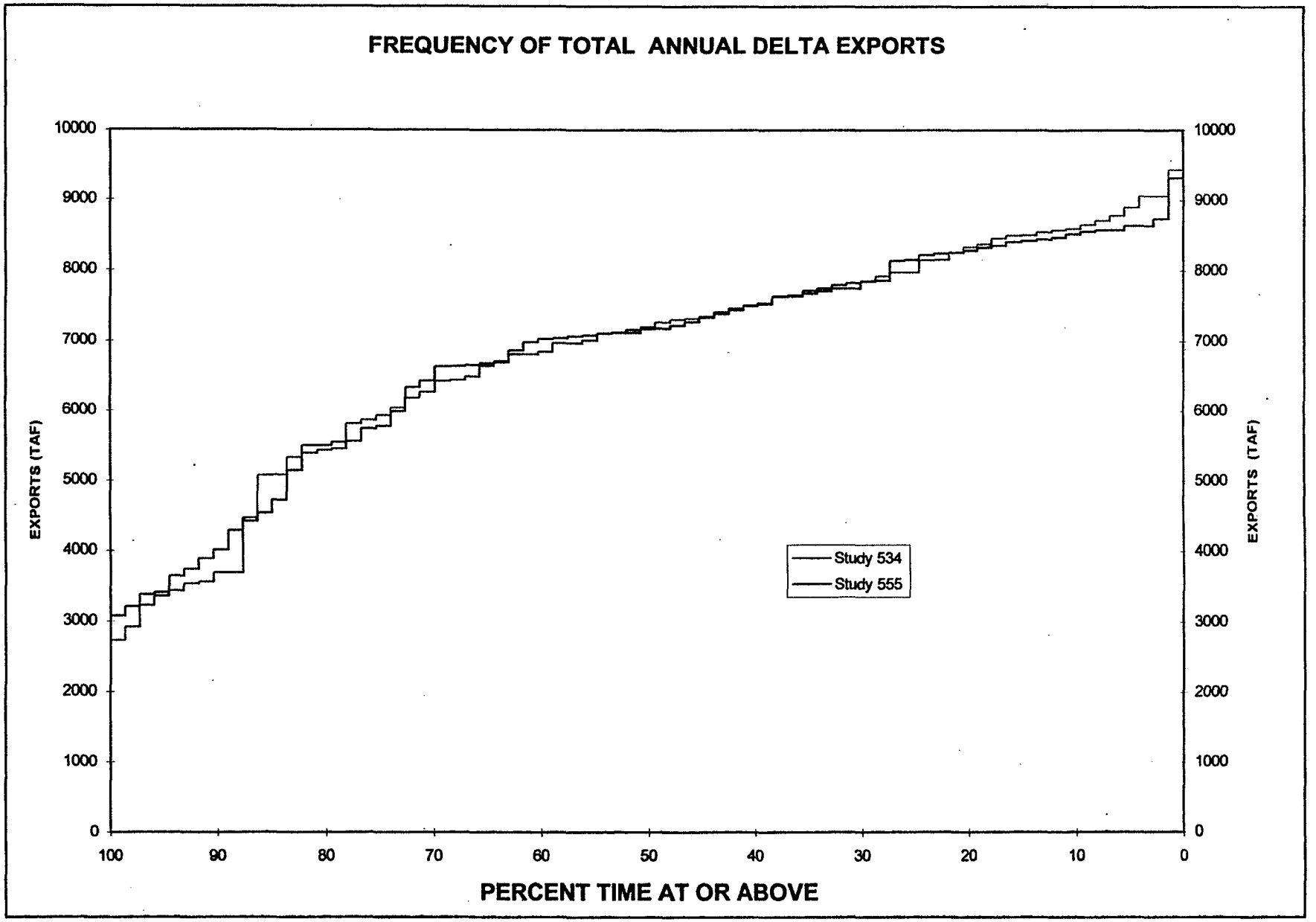


Comparison of Total Delta Outflows

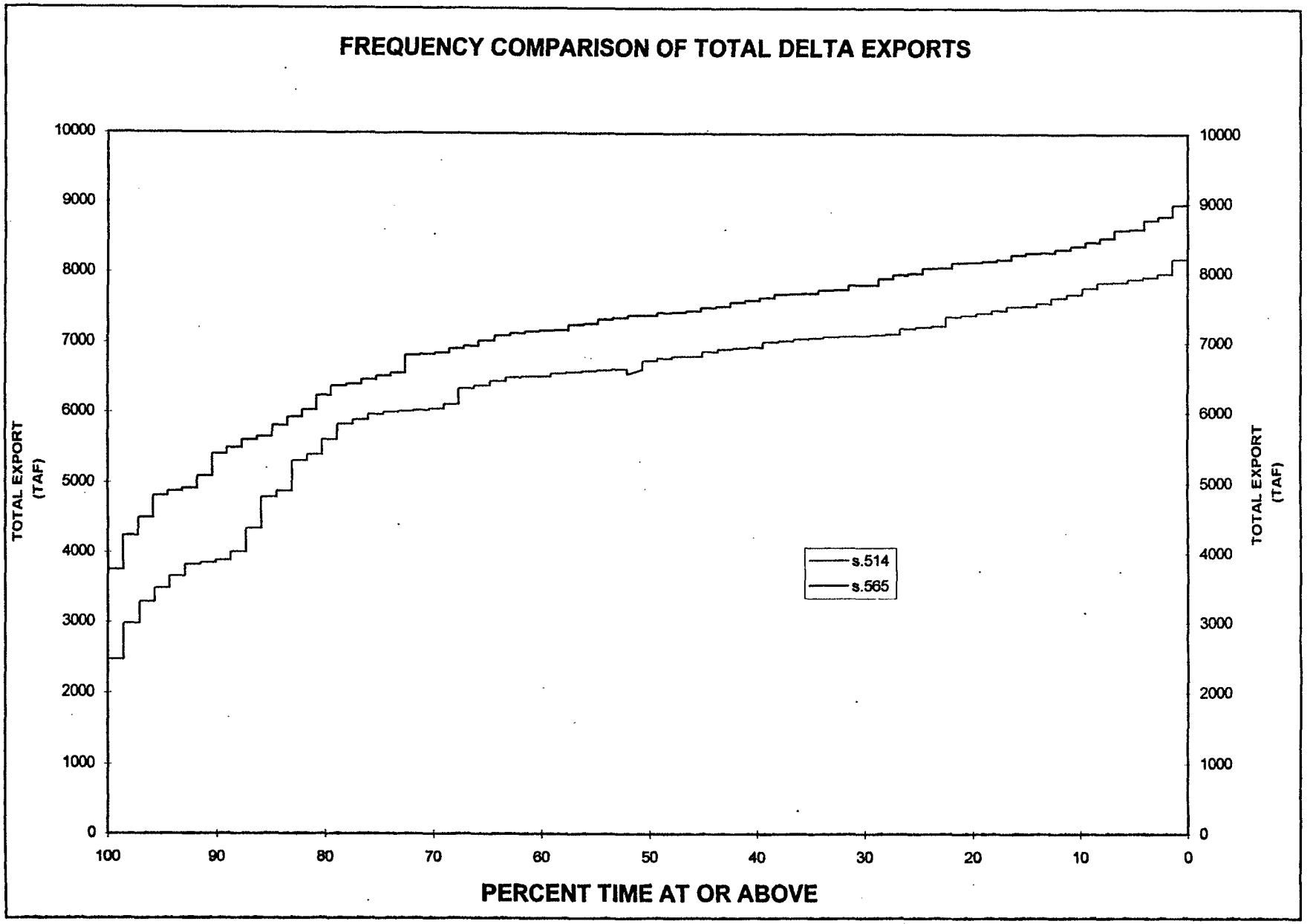


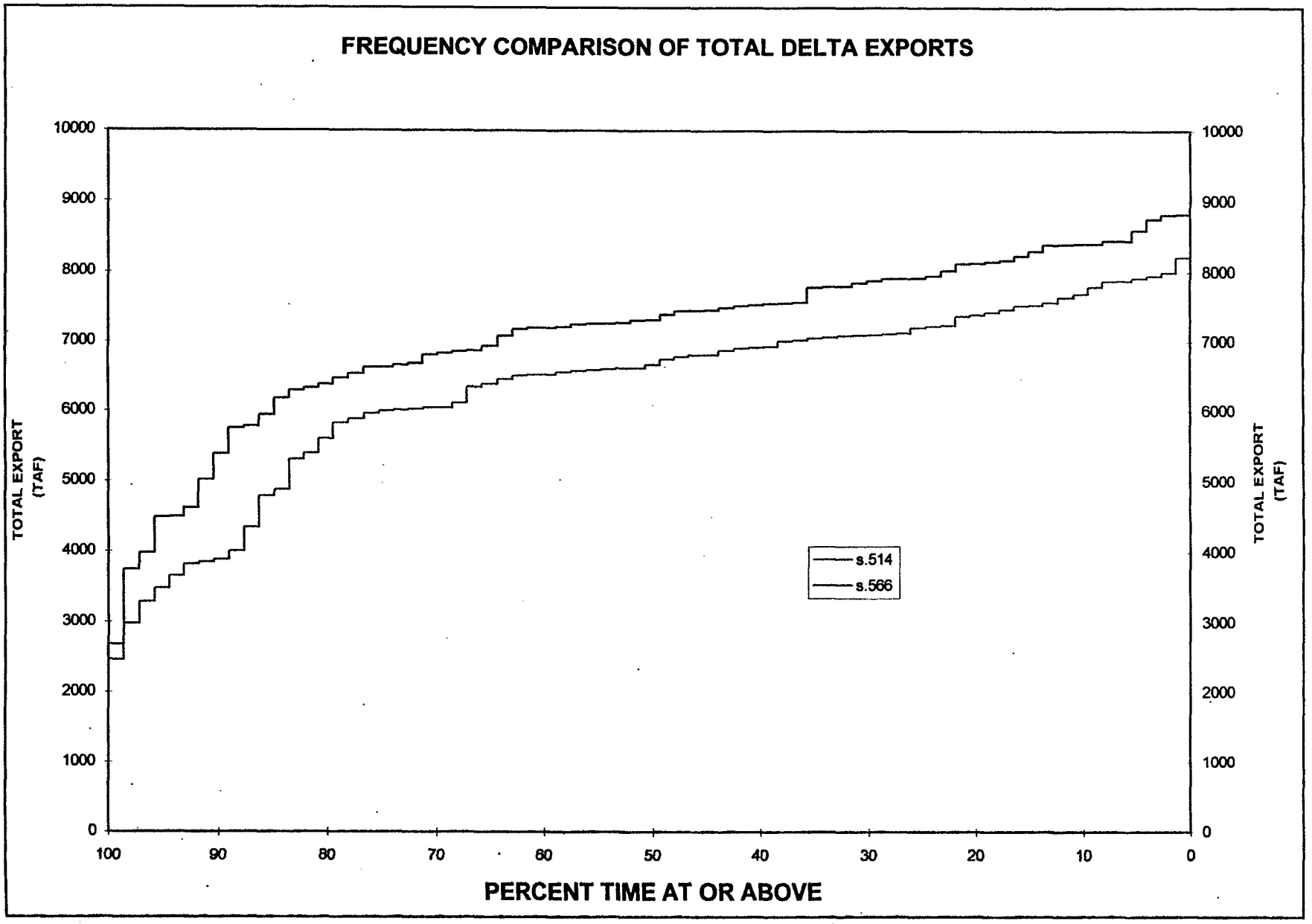
Comparison of End of Month of Shasta Storages




FREQUENCY OF TOTAL ANNUAL DELTA EXPORTS
EXPORTS (TAF)
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
100
90
80
70
60
50
40
30
20
10
0
PERCENT TIME AT OR ABOVE
Study 534
Study 555

D-010021


FREQUENCY COMPARISON OF TOTAL DELTA EXPORTS
TOTAL EXPORT (TAF)
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
100
90
80
70
60
50
40
30
20
10
0
PERCENT TIME AT OR ABOVE
s.514
s.565


FREQUENCY COMPARISON OF TOTAL DELTA EXPORTS
TOTAL EXPORT (TAF)
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
100
90
80
70
60
50
40
30
20
10
0
PERCENT TIME AT OR ABOVE
s.514
s.566

DWR PLANNING SIMULATION MODEL NETWORK REPRESENTATION

NORTH OF DELTA

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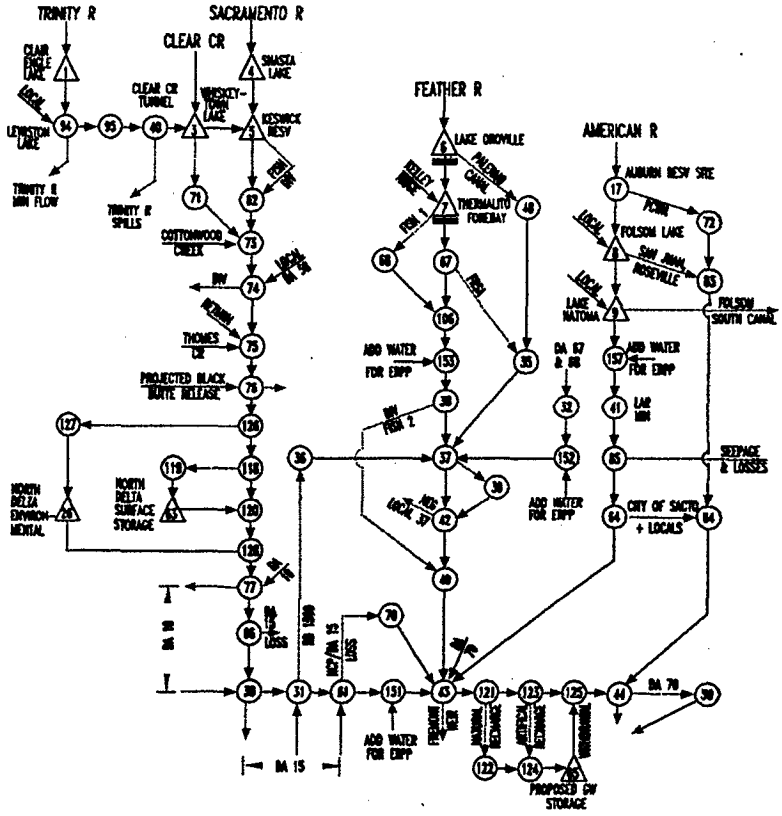

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DWR PLANNING SIMULATION MODEL NETWORK REPRESENTATION

DELTA

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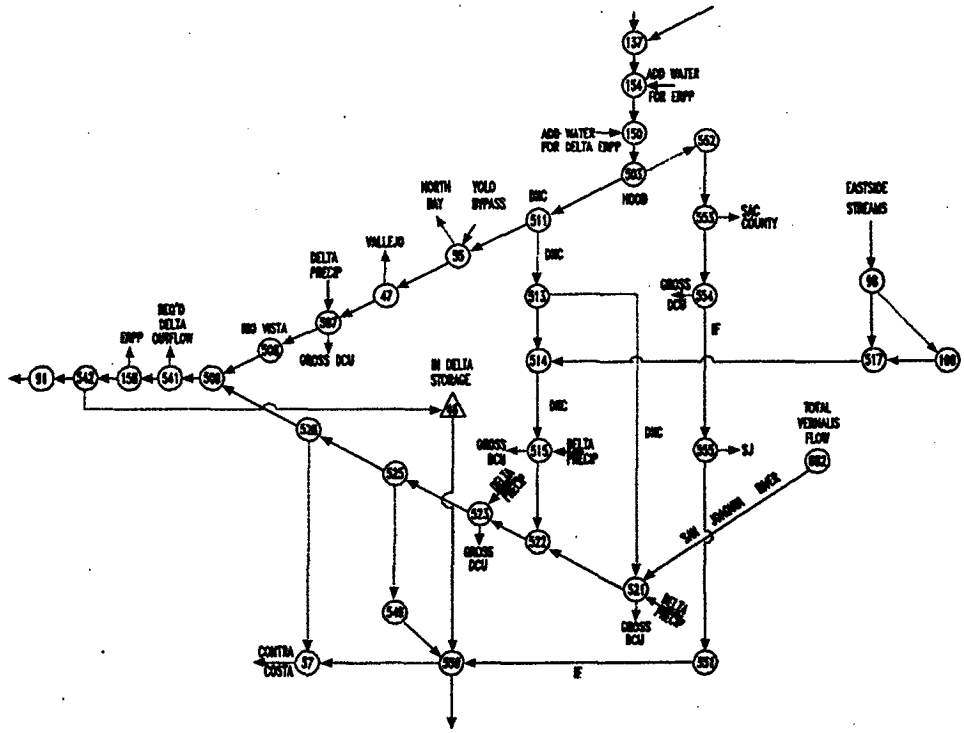

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SAN JOAQUIN BASIN

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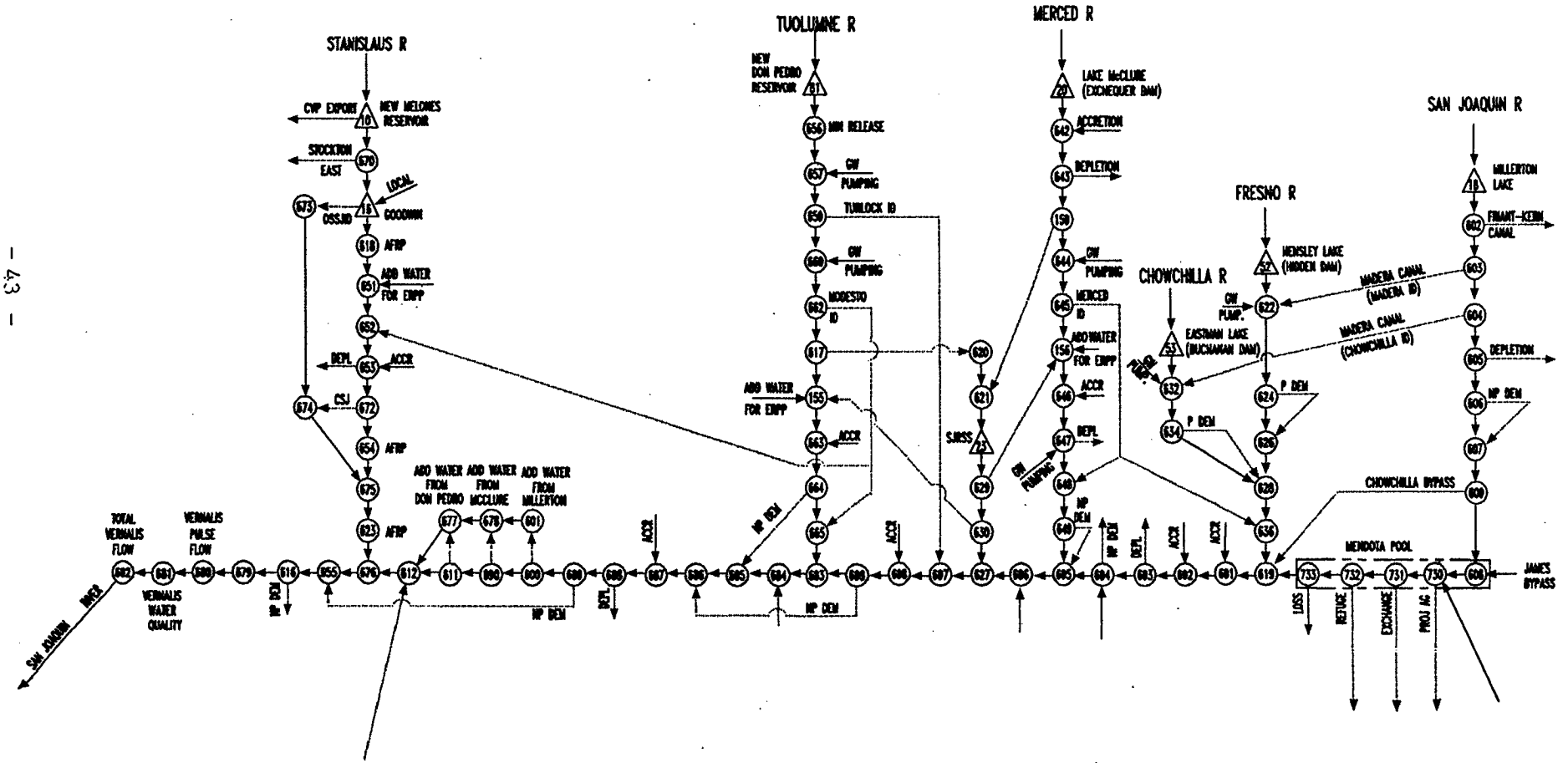

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DWR PLANNING SIMULATION MODEL NETWORK REPRESENTATION
AQUEDUCT AND DMC

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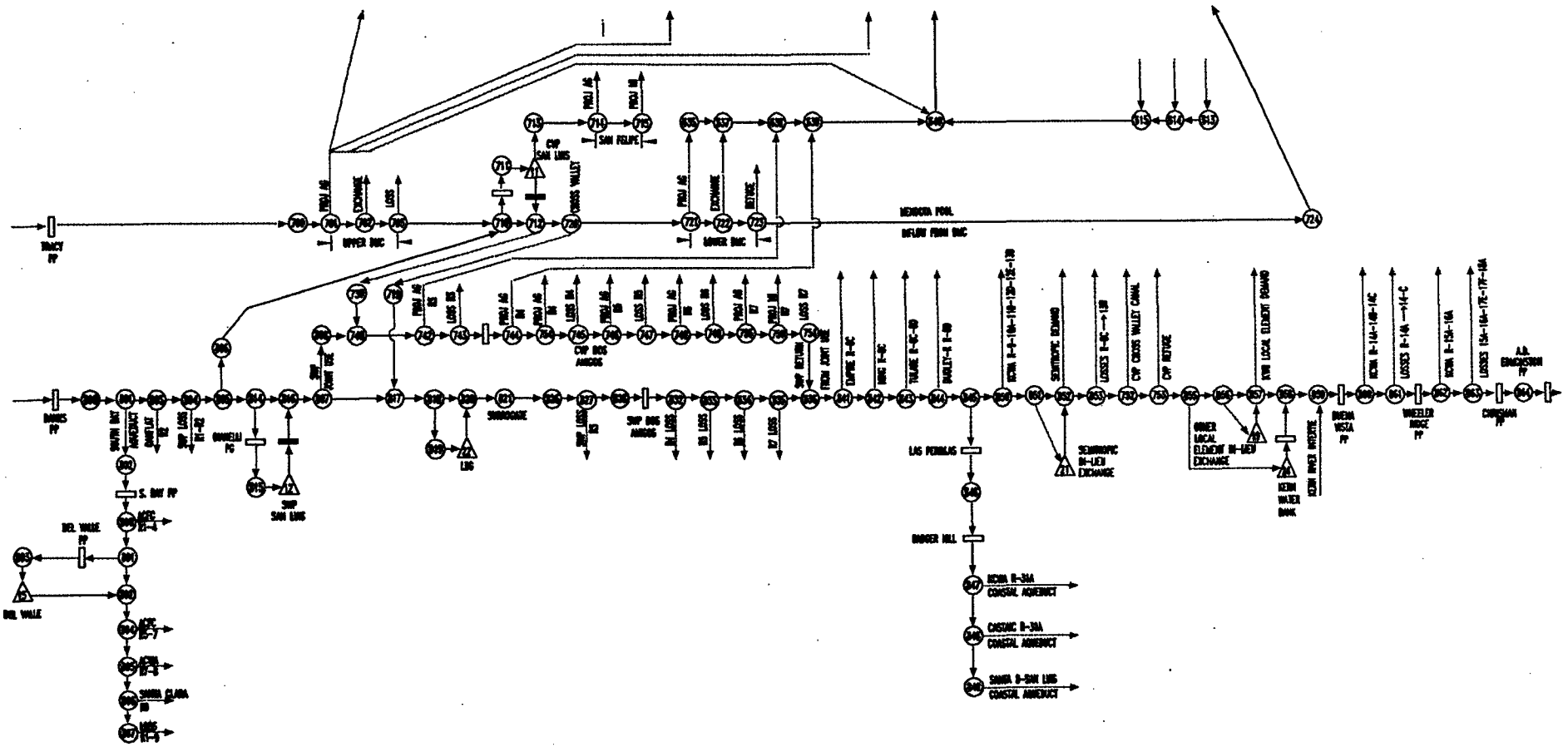

D-010027

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DWR PLANNING SIMULATION MODEL NETWORK REPRESENTATION
AQUEDUCT EAST AND WEST BRANCH

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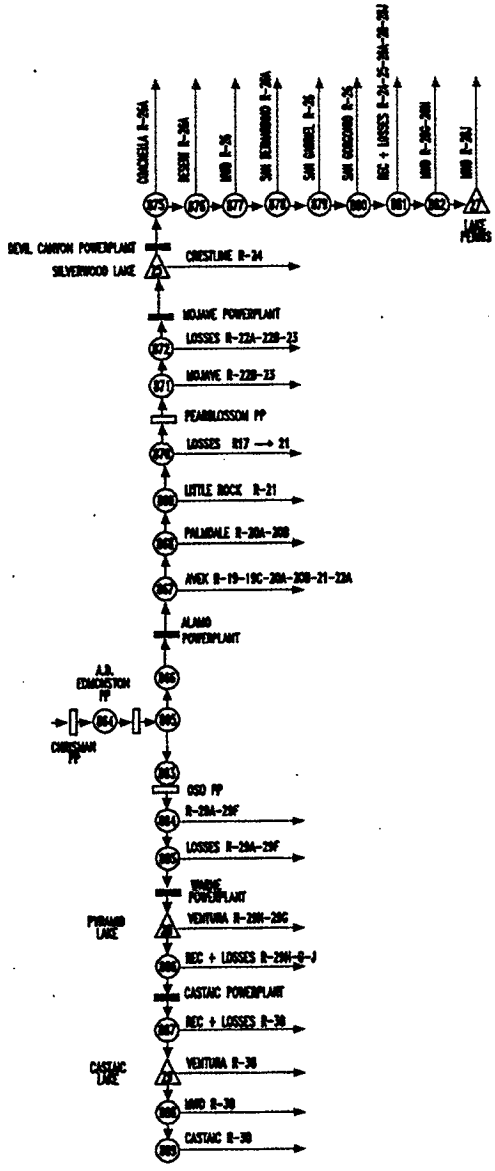

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