

(YEAR 1961)

**

** 1961 - 1980 = DISCHARGE

DAY	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
1	105.47	51.35	27.99	6.73	32.33	45.10	23.10	21.09	12.14	43.40	21.14	60.30
2	101.10	48.35	25.59	2.88	32.33	45.10	23.10	21.09	12.14	43.40	21.14	58.03
3	196.04	42.40	24.07	2.88	32.33	45.10	23.10	21.09	12.14	43.40	21.14	54.71
4	86.40	42.52	23.50	2.88	32.33	45.10	23.10	21.09	12.14	43.40	21.14	61.94
5	92.40	40.25	23.50	2.88	32.33	45.10	23.10	21.09	12.14	43.40	21.14	61.43
6	110.14	39.25	23.50	2.88	32.33	45.10	23.10	21.09	12.14	43.40	21.14	61.43
7	110.21	39.25	23.50	2.88	32.33	45.10	23.10	21.09	12.14	43.40	21.14	61.43
8	110.21	39.25	23.50	2.88	32.33	45.10	23.10	21.09	12.14	43.40	21.14	61.43
9	110.21	39.25	23.50	2.88	32.33	45.10	23.10	21.09	12.14	43.40	21.14	61.43
10	110.21	39.25	23.50	2.88	32.33	45.10	23.10	21.09	12.14	43.40	21.14	61.43
11	110.21	39.25	23.50	2.88	32.33	45.10	23.10	21.09	12.14	43.40	21.14	61.43
12	110.21	39.25	23.50	2.88	32.33	45.10	23.10	21.09	12.14	43.40	21.14	61.43
13	110.21	39.25	23.50	2.88	32.33	45.10	23.10	21.09	12.14	43.40	21.14	61.43
14	110.21	39.25	23.50	2.88	32.33	45.10	23.10	21.09	12.14	43.40	21.14	61.43
15	110.21	39.25	23.50	2.88	32.33	45.10	23.10	21.09	12.14	43.40	21.14	61.43
16	110.21	39.25	23.50	2.88	32.33	45.10	23.10	21.09	12.14	43.40	21.14	61.43
17	110.21	39.25	23.50	2.88	32.33	45.10	23.10	21.09	12.14	43.40	21.14	61.43
18	110.21	39.25	23.50	2.88	32.33	45.10	23.10	21.09	12.14	43.40	21.14	61.43
19	110.21	39.25	23.50	2.88	32.33	45.10	23.10	21.09	12.14	43.40	21.14	61.43
20	110.21	39.25	23.50	2.88	32.33	45.10	23.10	21.09	12.14	43.40	21.14	61.43
21	110.21	39.25	23.50	2.88	32.33	45.10	23.10	21.09	12.14	43.40	21.14	61.43
22	110.21	39.25	23.50	2.88	32.33	45.10	23.10	21.09	12.14	43.40	21.14	61.43
23	110.21	39.25	23.50	2.88	32.33	45.10	23.10	21.09	12.14	43.40	21.14	61.43
24	110.21	39.25	23.50	2.88	32.33	45.10	23.10	21.09	12.14	43.40	21.14	61.43
25	110.21	39.25	23.50	2.88	32.33	45.10	23.10	21.09	12.14	43.40	21.14	61.43
26	110.21	39.25	23.50	2.88	32.33	45.10	23.10	21.09	12.14	43.40	21.14	61.43
27	110.21	39.25	23.50	2.88	32.33	45.10	23.10	21.09	12.14	43.40	21.14	61.43
28	110.21	39.25	23.50	2.88	32.33	45.10	23.10	21.09	12.14	43.40	21.14	61.43
29	110.21	39.25	23.50	2.88	32.33	45.10	23.10	21.09	12.14	43.40	21.14	61.43
30	110.21	39.25	23.50	2.88	32.33	45.10	23.10	21.09	12.14	43.40	21.14	61.43
31	110.21	39.25	23.50	2.88	32.33	45.10	23.10	21.09	12.14	43.40	21.14	61.43
TOTAL	3101-	1212-	755-	1474-	1403-	1240-	908-	630-	1227-	2485-	1603-	1961-
AVR.	100.04	43.29	24.35	49.13	47.19	41.53	21.55	20.33	40.81	80.18	55.43	63.25

YEAR MAX. 350DAY 950DAY 1850DAY 2750DAY 3550DAY TOTAL
 1961 360.98 85.57 61.00 45.26 20.09 13.37 10.80 48.99 17882.5

(YEAR 1962)

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** 4.6% - 1980 DISCHARGE

DAY	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
1	58.20	40.30	24.49	18.13	48.09	32.02	30.80	11.49	7.38	29.34	22.53	69.33
2	85.54	39.30	34.34	41.20	69.77	12.77	07.00	11.43	34.07	28.37	20.50	66.71
3	79.08	34.10	47.36	22.57	17.04	22.04	26.03	11.35	33.74	22.15	17.07	63.74
4	07.73	31.25	42.75	22.00	17.04	22.04	29.00	11.22	37.43	22.07	17.33	52.29
5	37.34	29.07	45.09	22.00	17.04	22.04	20.17	11.22	35.35	22.07	17.33	74.14
6	09.40	22.15	42.07	22.00	17.04	22.04	20.17	11.22	35.35	22.07	17.33	82.51
7	03.94	22.07	42.07	22.00	17.04	22.04	20.17	11.22	35.35	22.07	17.33	70.03
8	52.00	22.07	42.07	22.00	17.04	22.04	20.17	11.22	35.35	22.07	17.33	79.03
9	52.00	22.07	42.07	22.00	17.04	22.04	20.17	11.22	35.35	22.07	17.33	06.06
10	29.08	22.07	42.07	22.00	17.04	22.04	20.17	11.22	35.35	22.07	17.33	73.35
11	29.08	22.07	42.07	22.00	17.04	22.04	20.17	11.22	35.35	22.07	17.33	76.28
12	43.08	22.07	42.07	22.00	17.04	22.04	20.17	11.22	35.35	22.07	17.33	62.23
13	43.08	22.07	42.07	22.00	17.04	22.04	20.17	11.22	35.35	22.07	17.33	67.20
14	07.08	22.07	42.07	22.00	17.04	22.04	20.17	11.22	35.35	22.07	17.33	62.23
15	07.08	22.07	42.07	22.00	17.04	22.04	20.17	11.22	35.35	22.07	17.33	67.20
16	07.08	22.07	42.07	22.00	17.04	22.04	20.17	11.22	35.35	22.07	17.33	62.23
17	07.08	22.07	42.07	22.00	17.04	22.04	20.17	11.22	35.35	22.07	17.33	67.20
18	07.08	22.07	42.07	22.00	17.04	22.04	20.17	11.22	35.35	22.07	17.33	62.23
19	07.08	22.07	42.07	22.00	17.04	22.04	20.17	11.22	35.35	22.07	17.33	67.20
20	07.08	22.07	42.07	22.00	17.04	22.04	20.17	11.22	35.35	22.07	17.33	62.23
21	07.08	22.07	42.07	22.00	17.04	22.04	20.17	11.22	35.35	22.07	17.33	67.20
22	07.08	22.07	42.07	22.00	17.04	22.04	20.17	11.22	35.35	22.07	17.33	62.23
23	07.08	22.07	42.07	22.00	17.04	22.04	20.17	11.22	35.35	22.07	17.33	67.20
24	07.08	22.07	42.07	22.00	17.04	22.04	20.17	11.22	35.35	22.07	17.33	62.23
25	07.08	22.07	42.07	22.00	17.04	22.04	20.17	11.22	35.35	22.07	17.33	67.20
26	07.08	22.07	42.07	22.00	17.04	22.04	20.17	11.22	35.35	22.07	17.33	62.23
27	07.08	22.07	42.07	22.00	17.04	22.04	20.17	11.22	35.35	22.07	17.33	67.20
28	07.08	22.07	42.07	22.00	17.04	22.04	20.17	11.22	35.35	22.07	17.33	62.23
29	07.08	22.07	42.07	22.00	17.04	22.04	20.17	11.22	35.35	22.07	17.33	67.20
30	07.08	22.07	42.07	22.00	17.04	22.04	20.17	11.22	35.35	22.07	17.33	62.23
31	07.08	22.07	42.07	22.00	17.04	22.04	20.17	11.22	35.35	22.07	17.33	67.20
TOTAL	1958.	803.	1132.	734.	675.	575.	704.	1472.	1460.	773.	1334.	2012.
AVR.	63.15	30.81	36.51	24.01	21.78	19.17	22.72	47.68	48.05	24.92	44.48	15695.
YEAR	MAX.	35DAY.	95DAY	185DAY	275DAY	355DAY	MIN.	AVR.	TOTAL	ANNUAL	AVR.	TOTAL
1962	167.07	67.62	52.36	28.94	21.37	12.56	11.22	37.52	13094.9	773.	1334.	2012.
										24.92	44.48	15695.
										ANNUAL	AVR.	TOTAL
										37.52	13094.9	37.52

(YEAR 1963)

1901 - 1980 DISCHARGE

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DAY	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
1	47.40	19.03	19.45	11.01	9.47	13.71	15.21	35.80	10.10	42.02	25.72	63.82
2	48.25	19.87	19.27	11.00	9.43	14.35	14.70	32.43	10.74	39.44	23.41	82.63
3	42.34	17.77	19.09	11.00	9.23	10.35	14.70	27.27	12.10	39.74	51.41	74.72
4	45.23	17.77	19.09	11.00	9.23	10.35	14.70	27.27	12.10	39.74	51.41	83.72
5	45.23	17.77	19.09	11.00	9.23	10.35	14.70	27.27	12.10	39.74	51.41	83.72
6	45.23	17.77	19.09	11.00	9.23	10.35	14.70	27.27	12.10	39.74	51.41	83.72
7	46.09	17.77	19.09	11.00	9.23	10.35	14.70	27.27	12.10	39.74	51.41	83.72
8	42.06	17.77	19.09	11.00	9.23	10.35	14.70	27.27	12.10	39.74	51.41	83.72
9	39.20	17.77	19.09	11.00	9.23	10.35	14.70	27.27	12.10	39.74	51.41	83.72
10	39.20	17.77	19.09	11.00	9.23	10.35	14.70	27.27	12.10	39.74	51.41	83.72
11	39.20	17.77	19.09	11.00	9.23	10.35	14.70	27.27	12.10	39.74	51.41	83.72
12	39.20	17.77	19.09	11.00	9.23	10.35	14.70	27.27	12.10	39.74	51.41	83.72
13	39.20	17.77	19.09	11.00	9.23	10.35	14.70	27.27	12.10	39.74	51.41	83.72
14	39.20	17.77	19.09	11.00	9.23	10.35	14.70	27.27	12.10	39.74	51.41	83.72
15	39.20	17.77	19.09	11.00	9.23	10.35	14.70	27.27	12.10	39.74	51.41	83.72
16	39.20	17.77	19.09	11.00	9.23	10.35	14.70	27.27	12.10	39.74	51.41	83.72
17	39.20	17.77	19.09	11.00	9.23	10.35	14.70	27.27	12.10	39.74	51.41	83.72
18	39.20	17.77	19.09	11.00	9.23	10.35	14.70	27.27	12.10	39.74	51.41	83.72
19	39.20	17.77	19.09	11.00	9.23	10.35	14.70	27.27	12.10	39.74	51.41	83.72
20	39.20	17.77	19.09	11.00	9.23	10.35	14.70	27.27	12.10	39.74	51.41	83.72
21	39.20	17.77	19.09	11.00	9.23	10.35	14.70	27.27	12.10	39.74	51.41	83.72
22	39.20	17.77	19.09	11.00	9.23	10.35	14.70	27.27	12.10	39.74	51.41	83.72
23	39.20	17.77	19.09	11.00	9.23	10.35	14.70	27.27	12.10	39.74	51.41	83.72
24	39.20	17.77	19.09	11.00	9.23	10.35	14.70	27.27	12.10	39.74	51.41	83.72
25	39.20	17.77	19.09	11.00	9.23	10.35	14.70	27.27	12.10	39.74	51.41	83.72
26	39.20	17.77	19.09	11.00	9.23	10.35	14.70	27.27	12.10	39.74	51.41	83.72
27	39.20	17.77	19.09	11.00	9.23	10.35	14.70	27.27	12.10	39.74	51.41	83.72
28	39.20	17.77	19.09	11.00	9.23	10.35	14.70	27.27	12.10	39.74	51.41	83.72
29	39.20	17.77	19.09	11.00	9.23	10.35	14.70	27.27	12.10	39.74	51.41	83.72
30	39.20	17.77	19.09	11.00	9.23	10.35	14.70	27.27	12.10	39.74	51.41	83.72
31	39.20	17.77	19.09	11.00	9.23	10.35	14.70	27.27	12.10	39.74	51.41	83.72
TOTAL	1016.	465.	416.	328.	425.	396.	494.	842.	693.	1429.	1996.	2402.
AVR.	32.70	17.52	13.41	10.94	13.70	13.21	15.94	27.16	23.09	46.09	60.53	77.50

YFAR	MAX.	30DAY	55DAY	135DAY	270DAY	355DAY	MIN.	AVR.	TOTAL
1963	130.12	72.45	44.60	18.10	11.45	7.67	7.14	29.92	10921.5

(YEAR 1964)

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1961 - 1960 : DISCHARGE

DAY	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	UCT.	NOV.	DEC.
1	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345
2	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345
3	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345
4	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345
5	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345
6	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345
7	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345
8	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345
9	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345
10	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345
11	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345
12	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345
13	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345
14	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345
15	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345
16	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345
17	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345
18	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345
19	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345
20	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345
21	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345
22	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345
23	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345
24	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345
25	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345
26	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345
27	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345
28	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345
29	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345
30	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345
31	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345	12345
TOTAL	1845	1165	1086	1084	909	1001	1116	890	679	912	2033	1968
AVR.	59.51	40.27	35.04	36.14	29.32	33.36	36.00	22.29	22.64	29.42	67.78	1491
										ANNUAL		1491
										ANNUAL		63.48
										AVR.		39.59

YEAR MAX. 35DAY 95DAY 165DAY 275DAY 355DAY MIN. AVR. TOTAL

1964 200.39 69.34 49.21 34.45 25.09 13.43 11.41 39.59 14490.5

(YEAR 1965)

** 1961 - 1980 = DISCHARGE

DAY	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
1	67.78	15.48	00.00	52.00	30.84	7.30	6.00	27.35	63.44	22.14	63.44	90.05
2	54.28	14.00	00.00	09.44	39.44	3.00	4.00	25.37	57.37	22.35	57.37	81.30
3	40.81	14.00	00.00	09.44	39.44	3.00	4.00	25.37	57.37	22.35	57.37	81.30
4	57.50	15.00	00.00	50.34	17.80	2.00	3.00	22.00	50.00	22.00	50.00	85.50
5	44.50	15.00	00.00	50.34	17.80	2.00	3.00	22.00	50.00	22.00	50.00	85.50
6	44.50	15.00	00.00	50.34	17.80	2.00	3.00	22.00	50.00	22.00	50.00	85.50
7	44.50	15.00	00.00	50.34	17.80	2.00	3.00	22.00	50.00	22.00	50.00	85.50
8	44.50	15.00	00.00	50.34	17.80	2.00	3.00	22.00	50.00	22.00	50.00	85.50
9	44.50	15.00	00.00	50.34	17.80	2.00	3.00	22.00	50.00	22.00	50.00	85.50
10	44.50	15.00	00.00	50.34	17.80	2.00	3.00	22.00	50.00	22.00	50.00	85.50
11	44.50	15.00	00.00	50.34	17.80	2.00	3.00	22.00	50.00	22.00	50.00	85.50
12	44.50	15.00	00.00	50.34	17.80	2.00	3.00	22.00	50.00	22.00	50.00	85.50
13	44.50	15.00	00.00	50.34	17.80	2.00	3.00	22.00	50.00	22.00	50.00	85.50
14	44.50	15.00	00.00	50.34	17.80	2.00	3.00	22.00	50.00	22.00	50.00	85.50
15	44.50	15.00	00.00	50.34	17.80	2.00	3.00	22.00	50.00	22.00	50.00	85.50
16	44.50	15.00	00.00	50.34	17.80	2.00	3.00	22.00	50.00	22.00	50.00	85.50
17	44.50	15.00	00.00	50.34	17.80	2.00	3.00	22.00	50.00	22.00	50.00	85.50
18	44.50	15.00	00.00	50.34	17.80	2.00	3.00	22.00	50.00	22.00	50.00	85.50
19	44.50	15.00	00.00	50.34	17.80	2.00	3.00	22.00	50.00	22.00	50.00	85.50
20	44.50	15.00	00.00	50.34	17.80	2.00	3.00	22.00	50.00	22.00	50.00	85.50
21	44.50	15.00	00.00	50.34	17.80	2.00	3.00	22.00	50.00	22.00	50.00	85.50
22	44.50	15.00	00.00	50.34	17.80	2.00	3.00	22.00	50.00	22.00	50.00	85.50
23	44.50	15.00	00.00	50.34	17.80	2.00	3.00	22.00	50.00	22.00	50.00	85.50
24	44.50	15.00	00.00	50.34	17.80	2.00	3.00	22.00	50.00	22.00	50.00	85.50
25	44.50	15.00	00.00	50.34	17.80	2.00	3.00	22.00	50.00	22.00	50.00	85.50
26	44.50	15.00	00.00	50.34	17.80	2.00	3.00	22.00	50.00	22.00	50.00	85.50
27	44.50	15.00	00.00	50.34	17.80	2.00	3.00	22.00	50.00	22.00	50.00	85.50
28	44.50	15.00	00.00	50.34	17.80	2.00	3.00	22.00	50.00	22.00	50.00	85.50
29	44.50	15.00	00.00	50.34	17.80	2.00	3.00	22.00	50.00	22.00	50.00	85.50
30	44.50	15.00	00.00	50.34	17.80	2.00	3.00	22.00	50.00	22.00	50.00	85.50
TOTAL	445	487	303	554	2492	1150	532	840	1120	1843	1908	2447
AVR.	31.13	17.40	9.95	18.47	90.39	38.53	17.18	27.29	37.53	59.46	63.60	40.18

YEAR MAX. 350DAY 78.57 57.91 28.26 18.29 9.30 8.99 +0.18 TOTAL 14002.7

1901 - 1980 : DISCHARGE (YEAR 1960) **

DAY	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
1	57-205	95-205	80-205	74-205	65-205	55-205	45-205	35-205	25-205	15-205	5-205	0-205
2	57-205	95-205	80-205	74-205	65-205	55-205	45-205	35-205	25-205	15-205	5-205	0-205
3	57-205	95-205	80-205	74-205	65-205	55-205	45-205	35-205	25-205	15-205	5-205	0-205
4	57-205	95-205	80-205	74-205	65-205	55-205	45-205	35-205	25-205	15-205	5-205	0-205
5	57-205	95-205	80-205	74-205	65-205	55-205	45-205	35-205	25-205	15-205	5-205	0-205
6	57-205	95-205	80-205	74-205	65-205	55-205	45-205	35-205	25-205	15-205	5-205	0-205
7	57-205	95-205	80-205	74-205	65-205	55-205	45-205	35-205	25-205	15-205	5-205	0-205
8	57-205	95-205	80-205	74-205	65-205	55-205	45-205	35-205	25-205	15-205	5-205	0-205
9	57-205	95-205	80-205	74-205	65-205	55-205	45-205	35-205	25-205	15-205	5-205	0-205
10	57-205	95-205	80-205	74-205	65-205	55-205	45-205	35-205	25-205	15-205	5-205	0-205
11	57-205	95-205	80-205	74-205	65-205	55-205	45-205	35-205	25-205	15-205	5-205	0-205
12	57-205	95-205	80-205	74-205	65-205	55-205	45-205	35-205	25-205	15-205	5-205	0-205
13	57-205	95-205	80-205	74-205	65-205	55-205	45-205	35-205	25-205	15-205	5-205	0-205
14	57-205	95-205	80-205	74-205	65-205	55-205	45-205	35-205	25-205	15-205	5-205	0-205
15	57-205	95-205	80-205	74-205	65-205	55-205	45-205	35-205	25-205	15-205	5-205	0-205
16	57-205	95-205	80-205	74-205	65-205	55-205	45-205	35-205	25-205	15-205	5-205	0-205
17	57-205	95-205	80-205	74-205	65-205	55-205	45-205	35-205	25-205	15-205	5-205	0-205
18	57-205	95-205	80-205	74-205	65-205	55-205	45-205	35-205	25-205	15-205	5-205	0-205
19	57-205	95-205	80-205	74-205	65-205	55-205	45-205	35-205	25-205	15-205	5-205	0-205
20	57-205	95-205	80-205	74-205	65-205	55-205	45-205	35-205	25-205	15-205	5-205	0-205
21	57-205	95-205	80-205	74-205	65-205	55-205	45-205	35-205	25-205	15-205	5-205	0-205
22	57-205	95-205	80-205	74-205	65-205	55-205	45-205	35-205	25-205	15-205	5-205	0-205
23	57-205	95-205	80-205	74-205	65-205	55-205	45-205	35-205	25-205	15-205	5-205	0-205
24	57-205	95-205	80-205	74-205	65-205	55-205	45-205	35-205	25-205	15-205	5-205	0-205
25	57-205	95-205	80-205	74-205	65-205	55-205	45-205	35-205	25-205	15-205	5-205	0-205
26	57-205	95-205	80-205	74-205	65-205	55-205	45-205	35-205	25-205	15-205	5-205	0-205
27	57-205	95-205	80-205	74-205	65-205	55-205	45-205	35-205	25-205	15-205	5-205	0-205
28	57-205	95-205	80-205	74-205	65-205	55-205	45-205	35-205	25-205	15-205	5-205	0-205
29	57-205	95-205	80-205	74-205	65-205	55-205	45-205	35-205	25-205	15-205	5-205	0-205
30	57-205	95-205	80-205	74-205	65-205	55-205	45-205	35-205	25-205	15-205	5-205	0-205
31	57-205	95-205	80-205	74-205	65-205	55-205	45-205	35-205	25-205	15-205	5-205	0-205
TOTAL	2118-	1218-	1297-	1209-	960-	630-	1124-	1008-	1210-	1049-	1618-	1578-
AVR.	68-31	43-52	41-52	40-29	30-96	21-01	36-24	32-52	40-55	33-18	53-92	50-59

YEAR MAX. 35DAY 45DAY 1950DAY 270DAY 350DAY MIN. AVR. TOTAL
 1960 171.71 64.42 53.89 40.62 29.39 15.48 11.08 42.80 15623.7

(YEAR 1967)

DAY	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
1	19-05	32-42	12-10	7-03	49-12	32-27	29-01	9-89	12-31	37-12	27-09	126-81
2	68-22	30-13	11-20	37-01	48-79	30-27	14-12	20-09	12-22	37-09	27-09	126-81
3	63-21	21-10	11-08	30-01	40-79	27-08	10-01	20-09	12-22	37-09	27-09	126-81
4	63-21	21-10	11-08	30-01	40-79	27-08	10-01	20-09	12-22	37-09	27-09	126-81
5	101-77	30-04	12-23	40-82	47-38	29-08	10-01	18-13	12-22	37-09	27-09	126-81
6	177-40	30-04	12-23	40-82	47-38	29-08	10-01	18-13	12-22	37-09	27-09	126-81
7	90-20	22-70	09-05	32-29	53-12	25-38	10-01	18-13	12-22	37-09	27-09	126-81
8	810-30	22-70	09-05	32-29	53-12	25-38	10-01	18-13	12-22	37-09	27-09	126-81
9	75-10	22-70	09-05	32-29	53-12	25-38	10-01	18-13	12-22	37-09	27-09	126-81
10	74-07	22-70	09-05	32-29	53-12	25-38	10-01	18-13	12-22	37-09	27-09	126-81
11	80-03	22-70	09-05	32-29	53-12	25-38	10-01	18-13	12-22	37-09	27-09	126-81
12	81-03	22-70	09-05	32-29	53-12	25-38	10-01	18-13	12-22	37-09	27-09	126-81
13	110-30	22-70	09-05	32-29	53-12	25-38	10-01	18-13	12-22	37-09	27-09	126-81
14	90-19	22-70	09-05	32-29	53-12	25-38	10-01	18-13	12-22	37-09	27-09	126-81
15	84-00	22-70	09-05	32-29	53-12	25-38	10-01	18-13	12-22	37-09	27-09	126-81
16	84-00	22-70	09-05	32-29	53-12	25-38	10-01	18-13	12-22	37-09	27-09	126-81
17	82-00	22-70	09-05	32-29	53-12	25-38	10-01	18-13	12-22	37-09	27-09	126-81
18	82-00	22-70	09-05	32-29	53-12	25-38	10-01	18-13	12-22	37-09	27-09	126-81
19	87-20	22-70	09-05	32-29	53-12	25-38	10-01	18-13	12-22	37-09	27-09	126-81
20	74-20	22-70	09-05	32-29	53-12	25-38	10-01	18-13	12-22	37-09	27-09	126-81
21	70-20	22-70	09-05	32-29	53-12	25-38	10-01	18-13	12-22	37-09	27-09	126-81
22	76-20	22-70	09-05	32-29	53-12	25-38	10-01	18-13	12-22	37-09	27-09	126-81
23	65-20	22-70	09-05	32-29	53-12	25-38	10-01	18-13	12-22	37-09	27-09	126-81
24	65-20	22-70	09-05	32-29	53-12	25-38	10-01	18-13	12-22	37-09	27-09	126-81
25	57-20	22-70	09-05	32-29	53-12	25-38	10-01	18-13	12-22	37-09	27-09	126-81
26	57-20	22-70	09-05	32-29	53-12	25-38	10-01	18-13	12-22	37-09	27-09	126-81
27	50-20	22-70	09-05	32-29	53-12	25-38	10-01	18-13	12-22	37-09	27-09	126-81
28	58-20	22-70	09-05	32-29	53-12	25-38	10-01	18-13	12-22	37-09	27-09	126-81
29	44-20	22-70	09-05	32-29	53-12	25-38	10-01	18-13	12-22	37-09	27-09	126-81
30	42-01	22-70	09-05	32-29	53-12	25-38	10-01	18-13	12-22	37-09	27-09	126-81
31	34-04	22-70	09-05	32-29	53-12	25-38	10-01	18-13	12-22	37-09	27-09	126-81
TOTAL	2180-	2391-	3072-	1038-	1719-	681-	693-	488-	945-	1592-	2930-	3438-
AVR.	70.31	85.38	99.10	54.59	55.47	22.72	22.36	15.73	31.45	51.35	99.32	110.91

YEAR MAX. 35DAY 95DAY 185DAY 275DAY 355DAY
 1967 420.73 114.69 79.24 48.16 26.17 12.64 12.02 59.77
 TOTAL 21816.4
 AVR. 59.77

(YEAR 1968)

**

** 1961 - 1980 : DISCHARGE

DAY	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
1	327.05	243.22	127.05	42.20	53.44	50.49	47.09	17.22	34.71	23.71	67.00	327.05
2	305.79	222.71	109.83	22.21	43.44	39.19	35.47	14.92	30.37	19.70	60.00	305.79
3	308.35	223.75	110.37	23.02	43.03	39.03	35.47	15.22	30.74	19.70	60.00	308.35
4	304.39	219.09	105.13	22.02	42.37	38.37	34.72	14.92	29.74	18.70	59.00	304.39
5	305.79	220.02	106.37	22.02	42.37	38.37	34.72	14.92	29.74	18.70	59.00	305.79
6	305.79	220.02	106.37	22.02	42.37	38.37	34.72	14.92	29.74	18.70	59.00	305.79
7	305.79	220.02	106.37	22.02	42.37	38.37	34.72	14.92	29.74	18.70	59.00	305.79
8	305.79	220.02	106.37	22.02	42.37	38.37	34.72	14.92	29.74	18.70	59.00	305.79
9	305.79	220.02	106.37	22.02	42.37	38.37	34.72	14.92	29.74	18.70	59.00	305.79
10	305.79	220.02	106.37	22.02	42.37	38.37	34.72	14.92	29.74	18.70	59.00	305.79
11	305.79	220.02	106.37	22.02	42.37	38.37	34.72	14.92	29.74	18.70	59.00	305.79
12	305.79	220.02	106.37	22.02	42.37	38.37	34.72	14.92	29.74	18.70	59.00	305.79
13	305.79	220.02	106.37	22.02	42.37	38.37	34.72	14.92	29.74	18.70	59.00	305.79
14	305.79	220.02	106.37	22.02	42.37	38.37	34.72	14.92	29.74	18.70	59.00	305.79
15	305.79	220.02	106.37	22.02	42.37	38.37	34.72	14.92	29.74	18.70	59.00	305.79
16	305.79	220.02	106.37	22.02	42.37	38.37	34.72	14.92	29.74	18.70	59.00	305.79
17	305.79	220.02	106.37	22.02	42.37	38.37	34.72	14.92	29.74	18.70	59.00	305.79
18	305.79	220.02	106.37	22.02	42.37	38.37	34.72	14.92	29.74	18.70	59.00	305.79
19	305.79	220.02	106.37	22.02	42.37	38.37	34.72	14.92	29.74	18.70	59.00	305.79
20	305.79	220.02	106.37	22.02	42.37	38.37	34.72	14.92	29.74	18.70	59.00	305.79
21	305.79	220.02	106.37	22.02	42.37	38.37	34.72	14.92	29.74	18.70	59.00	305.79
22	305.79	220.02	106.37	22.02	42.37	38.37	34.72	14.92	29.74	18.70	59.00	305.79
23	305.79	220.02	106.37	22.02	42.37	38.37	34.72	14.92	29.74	18.70	59.00	305.79
24	305.79	220.02	106.37	22.02	42.37	38.37	34.72	14.92	29.74	18.70	59.00	305.79
25	305.79	220.02	106.37	22.02	42.37	38.37	34.72	14.92	29.74	18.70	59.00	305.79
26	305.79	220.02	106.37	22.02	42.37	38.37	34.72	14.92	29.74	18.70	59.00	305.79
27	305.79	220.02	106.37	22.02	42.37	38.37	34.72	14.92	29.74	18.70	59.00	305.79
28	305.79	220.02	106.37	22.02	42.37	38.37	34.72	14.92	29.74	18.70	59.00	305.79
29	305.79	220.02	106.37	22.02	42.37	38.37	34.72	14.92	29.74	18.70	59.00	305.79
30	305.79	220.02	106.37	22.02	42.37	38.37	34.72	14.92	29.74	18.70	59.00	305.79
31	305.79	220.02	106.37	22.02	42.37	38.37	34.72	14.92	29.74	18.70	59.00	305.79
TOTAL	1340.	497.	696.	421.	1297.	691.	1140.	970.	723.	1160.	538.	994.
AVR.	43.22	17.05	22.47	27.35	41.89	23.04	36.98	31.28	24.10	37.41	17.94	10866.7

YEAR - MAX. 35DAY 185DAY 275DAY 355DAY MIN. AVR. TOTAL
 1968 231.43 30.68 37.20 26.29 17.94 12.40 29.69 10866-1

(YEAR 1969)

DAY	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
1	57	48	47	52	81	21	21	19	73	18	02	71
2	55	47	43	51	80	20	20	18	72	17	01	70
3	55	47	43	51	80	20	20	18	72	17	01	70
4	57	48	47	52	81	21	21	19	73	18	02	71
5	57	48	47	52	81	21	21	19	73	18	02	71
6	57	48	47	52	81	21	21	19	73	18	02	71
7	57	48	47	52	81	21	21	19	73	18	02	71
8	57	48	47	52	81	21	21	19	73	18	02	71
9	57	48	47	52	81	21	21	19	73	18	02	71
10	57	48	47	52	81	21	21	19	73	18	02	71
11	57	48	47	52	81	21	21	19	73	18	02	71
12	57	48	47	52	81	21	21	19	73	18	02	71
13	57	48	47	52	81	21	21	19	73	18	02	71
14	57	48	47	52	81	21	21	19	73	18	02	71
15	57	48	47	52	81	21	21	19	73	18	02	71
16	57	48	47	52	81	21	21	19	73	18	02	71
17	57	48	47	52	81	21	21	19	73	18	02	71
18	57	48	47	52	81	21	21	19	73	18	02	71
19	57	48	47	52	81	21	21	19	73	18	02	71
20	57	48	47	52	81	21	21	19	73	18	02	71
21	57	48	47	52	81	21	21	19	73	18	02	71
22	57	48	47	52	81	21	21	19	73	18	02	71
23	57	48	47	52	81	21	21	19	73	18	02	71
24	57	48	47	52	81	21	21	19	73	18	02	71
25	57	48	47	52	81	21	21	19	73	18	02	71
26	57	48	47	52	81	21	21	19	73	18	02	71
27	57	48	47	52	81	21	21	19	73	18	02	71
28	57	48	47	52	81	21	21	19	73	18	02	71
29	57	48	47	52	81	21	21	19	73	18	02	71
30	57	48	47	52	81	21	21	19	73	18	02	71
31	57	48	47	52	81	21	21	19	73	18	02	71
TOTAL	1407	400	444	573	971	1037	1306	1879	1021	1573	1899	2084
AVR.	45.38	14.28	14.32	19.09	31.34	34.57	42.14	60.62	34.03	50.75	63.31	67.24

YEAR	MAX.	35DAY	65DAY	195DAY	275DAY	355DAY	MIN.	AVR.	TOTAL
1969	146.32	73.54	56.77	36.78	17.57	9.56	8.88	39.99	14595.0

(YEAR 1970)

** 1961 - 1980 = DISCHARGE

**

DAY	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
1	45-112	24-222	1-110	2-116	5-123	0-100	5-122	2-100	1-102	1-122	1-105	4-112
2	45-112	24-222	1-110	2-116	5-123	0-100	5-122	2-100	1-102	1-122	1-105	4-112
3	45-112	24-222	1-110	2-116	5-123	0-100	5-122	2-100	1-102	1-122	1-105	4-112
4	45-112	24-222	1-110	2-116	5-123	0-100	5-122	2-100	1-102	1-122	1-105	4-112
5	45-112	24-222	1-110	2-116	5-123	0-100	5-122	2-100	1-102	1-122	1-105	4-112
6	45-112	24-222	1-110	2-116	5-123	0-100	5-122	2-100	1-102	1-122	1-105	4-112
7	45-112	24-222	1-110	2-116	5-123	0-100	5-122	2-100	1-102	1-122	1-105	4-112
8	45-112	24-222	1-110	2-116	5-123	0-100	5-122	2-100	1-102	1-122	1-105	4-112
9	45-112	24-222	1-110	2-116	5-123	0-100	5-122	2-100	1-102	1-122	1-105	4-112
10	45-112	24-222	1-110	2-116	5-123	0-100	5-122	2-100	1-102	1-122	1-105	4-112
11	45-112	24-222	1-110	2-116	5-123	0-100	5-122	2-100	1-102	1-122	1-105	4-112
12	45-112	24-222	1-110	2-116	5-123	0-100	5-122	2-100	1-102	1-122	1-105	4-112
13	45-112	24-222	1-110	2-116	5-123	0-100	5-122	2-100	1-102	1-122	1-105	4-112
14	45-112	24-222	1-110	2-116	5-123	0-100	5-122	2-100	1-102	1-122	1-105	4-112
15	45-112	24-222	1-110	2-116	5-123	0-100	5-122	2-100	1-102	1-122	1-105	4-112
16	45-112	24-222	1-110	2-116	5-123	0-100	5-122	2-100	1-102	1-122	1-105	4-112
17	45-112	24-222	1-110	2-116	5-123	0-100	5-122	2-100	1-102	1-122	1-105	4-112
18	45-112	24-222	1-110	2-116	5-123	0-100	5-122	2-100	1-102	1-122	1-105	4-112
19	45-112	24-222	1-110	2-116	5-123	0-100	5-122	2-100	1-102	1-122	1-105	4-112
20	45-112	24-222	1-110	2-116	5-123	0-100	5-122	2-100	1-102	1-122	1-105	4-112
21	45-112	24-222	1-110	2-116	5-123	0-100	5-122	2-100	1-102	1-122	1-105	4-112
22	45-112	24-222	1-110	2-116	5-123	0-100	5-122	2-100	1-102	1-122	1-105	4-112
23	45-112	24-222	1-110	2-116	5-123	0-100	5-122	2-100	1-102	1-122	1-105	4-112
24	45-112	24-222	1-110	2-116	5-123	0-100	5-122	2-100	1-102	1-122	1-105	4-112
25	45-112	24-222	1-110	2-116	5-123	0-100	5-122	2-100	1-102	1-122	1-105	4-112
26	45-112	24-222	1-110	2-116	5-123	0-100	5-122	2-100	1-102	1-122	1-105	4-112
27	45-112	24-222	1-110	2-116	5-123	0-100	5-122	2-100	1-102	1-122	1-105	4-112
28	45-112	24-222	1-110	2-116	5-123	0-100	5-122	2-100	1-102	1-122	1-105	4-112
29	45-112	24-222	1-110	2-116	5-123	0-100	5-122	2-100	1-102	1-122	1-105	4-112
30	45-112	24-222	1-110	2-116	5-123	0-100	5-122	2-100	1-102	1-122	1-105	4-112
31	45-112	24-222	1-110	2-116	5-123	0-100	5-122	2-100	1-102	1-122	1-105	4-112
TOTAL	1444	585	802	1357	900	858	675	672	1154	2362	2250	2702
AVR.	46-58	21-02	25-06	45-10	30-98	27-94	22-41	22-51	39-46	76-18	73-00	137-18

YEAR: MAX. 350DAY 95DAY 185DAY 270DAY 350DAY MIN. 10-27 43-40 158+1-5
 1970: 294-91 78-62 55-62 33-59 23-27 11-12 10-27 43-40 158+1-5

(YEAR 1971)

** 1961 - 1980 DISCHARGE **

DAY	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
1	490	503	547	590	710	700	750	720	720	200	420	810
2	581	529	450	460	450	470	490	490	530	210	400	760
3	522	460	420	430	430	440	450	450	490	210	390	800
4	522	460	420	430	430	440	450	450	490	210	390	800
5	522	460	420	430	430	440	450	450	490	210	390	800
6	522	460	420	430	430	440	450	450	490	210	390	800
7	522	460	420	430	430	440	450	450	490	210	390	800
8	522	460	420	430	430	440	450	450	490	210	390	800
9	522	460	420	430	430	440	450	450	490	210	390	800
10	522	460	420	430	430	440	450	450	490	210	390	800
11	522	460	420	430	430	440	450	450	490	210	390	800
12	522	460	420	430	430	440	450	450	490	210	390	800
13	522	460	420	430	430	440	450	450	490	210	390	800
14	522	460	420	430	430	440	450	450	490	210	390	800
15	522	460	420	430	430	440	450	450	490	210	390	800
16	522	460	420	430	430	440	450	450	490	210	390	800
17	522	460	420	430	430	440	450	450	490	210	390	800
18	522	460	420	430	430	440	450	450	490	210	390	800
19	522	460	420	430	430	440	450	450	490	210	390	800
20	522	460	420	430	430	440	450	450	490	210	390	800
21	522	460	420	430	430	440	450	450	490	210	390	800
22	522	460	420	430	430	440	450	450	490	210	390	800
23	522	460	420	430	430	440	450	450	490	210	390	800
24	522	460	420	430	430	440	450	450	490	210	390	800
25	522	460	420	430	430	440	450	450	490	210	390	800
26	522	460	420	430	430	440	450	450	490	210	390	800
27	522	460	420	430	430	440	450	450	490	210	390	800
28	522	460	420	430	430	440	450	450	490	210	390	800
29	522	460	420	430	430	440	450	450	490	210	390	800
30	522	460	420	430	430	440	450	450	490	210	390	800
31	522	460	420	430	430	440	450	450	490	210	390	800
TOTAL	5389	1191	1173	789	776	938	640	1673	1300	898	1103	5443
AVR.	173.84	42.55	37.84	26.29	25.05	31.26	20.64	53.97	43.32	28.95	36.76	173.84

YEAR MAX. 350DAY 142-71 55-34 35-39 23-11 13-49 12-32 58-39 TOTAL 21312.3

(YEAR 1972)

**

** 1461 - 1980 DISCHARGE

DAY	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
1	109-42	310-74	177-79	111-15	228-00	123-75	109-10	99-09	19-71	20-37	36-82	67-11
2	109-37	309-74	177-47	111-21	227-00	123-39	109-35	99-09	19-03	20-34	34-03	67-19
3	109-40	309-74	177-47	111-21	227-00	123-39	109-35	99-09	19-03	20-34	34-03	67-19
4	109-40	309-74	177-47	111-21	227-00	123-39	109-35	99-09	19-03	20-34	34-03	67-19
5	109-40	309-74	177-47	111-21	227-00	123-39	109-35	99-09	19-03	20-34	34-03	67-19
6	109-40	309-74	177-47	111-21	227-00	123-39	109-35	99-09	19-03	20-34	34-03	67-19
7	109-40	309-74	177-47	111-21	227-00	123-39	109-35	99-09	19-03	20-34	34-03	67-19
8	109-40	309-74	177-47	111-21	227-00	123-39	109-35	99-09	19-03	20-34	34-03	67-19
9	109-40	309-74	177-47	111-21	227-00	123-39	109-35	99-09	19-03	20-34	34-03	67-19
10	109-40	309-74	177-47	111-21	227-00	123-39	109-35	99-09	19-03	20-34	34-03	67-19
11	109-40	309-74	177-47	111-21	227-00	123-39	109-35	99-09	19-03	20-34	34-03	67-19
12	109-40	309-74	177-47	111-21	227-00	123-39	109-35	99-09	19-03	20-34	34-03	67-19
13	109-40	309-74	177-47	111-21	227-00	123-39	109-35	99-09	19-03	20-34	34-03	67-19
14	109-40	309-74	177-47	111-21	227-00	123-39	109-35	99-09	19-03	20-34	34-03	67-19
15	109-40	309-74	177-47	111-21	227-00	123-39	109-35	99-09	19-03	20-34	34-03	67-19
16	109-40	309-74	177-47	111-21	227-00	123-39	109-35	99-09	19-03	20-34	34-03	67-19
17	109-40	309-74	177-47	111-21	227-00	123-39	109-35	99-09	19-03	20-34	34-03	67-19
18	109-40	309-74	177-47	111-21	227-00	123-39	109-35	99-09	19-03	20-34	34-03	67-19
19	109-40	309-74	177-47	111-21	227-00	123-39	109-35	99-09	19-03	20-34	34-03	67-19
20	109-40	309-74	177-47	111-21	227-00	123-39	109-35	99-09	19-03	20-34	34-03	67-19
21	109-40	309-74	177-47	111-21	227-00	123-39	109-35	99-09	19-03	20-34	34-03	67-19
22	109-40	309-74	177-47	111-21	227-00	123-39	109-35	99-09	19-03	20-34	34-03	67-19
23	109-40	309-74	177-47	111-21	227-00	123-39	109-35	99-09	19-03	20-34	34-03	67-19
24	109-40	309-74	177-47	111-21	227-00	123-39	109-35	99-09	19-03	20-34	34-03	67-19
25	109-40	309-74	177-47	111-21	227-00	123-39	109-35	99-09	19-03	20-34	34-03	67-19
26	109-40	309-74	177-47	111-21	227-00	123-39	109-35	99-09	19-03	20-34	34-03	67-19
27	109-40	309-74	177-47	111-21	227-00	123-39	109-35	99-09	19-03	20-34	34-03	67-19
28	109-40	309-74	177-47	111-21	227-00	123-39	109-35	99-09	19-03	20-34	34-03	67-19
29	109-40	309-74	177-47	111-21	227-00	123-39	109-35	99-09	19-03	20-34	34-03	67-19
30	109-40	309-74	177-47	111-21	227-00	123-39	109-35	99-09	19-03	20-34	34-03	67-19
31	109-40	309-74	177-47	111-21	227-00	123-39	109-35	99-09	19-03	20-34	34-03	67-19
TOTAL	1868	744	400	835	806	430	279	33	1112	907	1205	6487
AVR.	60-27	25-66	13-18	28-50	25-92	14-35	8-99	10-68	37-07	31-10	42-15	209-25
YEAR	1972	1118-10	06-55	36-82	23-29	12-76	7-75	6-68	42-30	15500-1	TOTAL	
MIN.												
MAX.												

(YEAR 1973)

** 1961 - 1980 : DISCHARGE

DAY	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
1	196	337	219	84	27	30	45	21	12	25	82	166
2	196	337	219	84	27	30	45	21	12	25	82	166
3	196	337	219	84	27	30	45	21	12	25	82	166
4	196	337	219	84	27	30	45	21	12	25	82	166
5	196	337	219	84	27	30	45	21	12	25	82	166
6	196	337	219	84	27	30	45	21	12	25	82	166
7	196	337	219	84	27	30	45	21	12	25	82	166
8	196	337	219	84	27	30	45	21	12	25	82	166
9	196	337	219	84	27	30	45	21	12	25	82	166
10	196	337	219	84	27	30	45	21	12	25	82	166
11	196	337	219	84	27	30	45	21	12	25	82	166
12	196	337	219	84	27	30	45	21	12	25	82	166
13	196	337	219	84	27	30	45	21	12	25	82	166
14	196	337	219	84	27	30	45	21	12	25	82	166
15	196	337	219	84	27	30	45	21	12	25	82	166
16	196	337	219	84	27	30	45	21	12	25	82	166
17	196	337	219	84	27	30	45	21	12	25	82	166
18	196	337	219	84	27	30	45	21	12	25	82	166
19	196	337	219	84	27	30	45	21	12	25	82	166
20	196	337	219	84	27	30	45	21	12	25	82	166
21	196	337	219	84	27	30	45	21	12	25	82	166
22	196	337	219	84	27	30	45	21	12	25	82	166
23	196	337	219	84	27	30	45	21	12	25	82	166
24	196	337	219	84	27	30	45	21	12	25	82	166
25	196	337	219	84	27	30	45	21	12	25	82	166
26	196	337	219	84	27	30	45	21	12	25	82	166
27	196	337	219	84	27	30	45	21	12	25	82	166
28	196	337	219	84	27	30	45	21	12	25	82	166
29	196	337	219	84	27	30	45	21	12	25	82	166
30	196	337	219	84	27	30	45	21	12	25	82	166
31	196	337	219	84	27	30	45	21	12	25	82	166
TOTAL	2275	802	550	523	750	580	611	374	721	927	1588	6378
AVR.	73.40	28.60	17.73	17.77	24.16	19.32	13.27	12.06	24.02	29.22	52.94	202.73

YFAR	MAX.	350DAY	950DAY	1850DAY	2750DAY	3550DAY	MIN.	AVR.	TOTAL
1973	471.35	92.98	39.73	21.00	14.74	8.96	7.78	43.53	15889-2

(YEAR 1974)

**

#W 1961 - 1980 :DISCHARGE

DAY	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
1	00	00	00	00	00	00	00	00	00	00	00	00
2	00	00	00	00	00	00	00	00	00	00	00	00
3	00	00	00	00	00	00	00	00	00	00	00	00
4	00	00	00	00	00	00	00	00	00	00	00	00
5	00	00	00	00	00	00	00	00	00	00	00	00
6	00	00	00	00	00	00	00	00	00	00	00	00
7	00	00	00	00	00	00	00	00	00	00	00	00
8	00	00	00	00	00	00	00	00	00	00	00	00
9	00	00	00	00	00	00	00	00	00	00	00	00
10	00	00	00	00	00	00	00	00	00	00	00	00
11	00	00	00	00	00	00	00	00	00	00	00	00
12	00	00	00	00	00	00	00	00	00	00	00	00
13	00	00	00	00	00	00	00	00	00	00	00	00
14	00	00	00	00	00	00	00	00	00	00	00	00
15	00	00	00	00	00	00	00	00	00	00	00	00
16	00	00	00	00	00	00	00	00	00	00	00	00
17	00	00	00	00	00	00	00	00	00	00	00	00
18	00	00	00	00	00	00	00	00	00	00	00	00
19	00	00	00	00	00	00	00	00	00	00	00	00
20	00	00	00	00	00	00	00	00	00	00	00	00
21	00	00	00	00	00	00	00	00	00	00	00	00
22	00	00	00	00	00	00	00	00	00	00	00	00
23	00	00	00	00	00	00	00	00	00	00	00	00
24	00	00	00	00	00	00	00	00	00	00	00	00
25	00	00	00	00	00	00	00	00	00	00	00	00
26	00	00	00	00	00	00	00	00	00	00	00	00
27	00	00	00	00	00	00	00	00	00	00	00	00
28	00	00	00	00	00	00	00	00	00	00	00	00
29	00	00	00	00	00	00	00	00	00	00	00	00
30	00	00	00	00	00	00	00	00	00	00	00	00
31	00	00	00	00	00	00	00	00	00	00	00	00
TOTAL	1215.	970.	601.	1032.	1038.	823.	1172.	755.	1059.	1192.	2029.	1377.
AVG.	39.19	34.63	19.40	54.39	52.83	27.43	38.44	24.34	35.28	38.45	67.62	44.45

YEAR	MAX.	350DAY	950DAY	1850DAY	2750DAY	3550DAY	MIN.	AVR.	TOTAL
1974	203.22	67.22	46.30	32.19	24.30	15.60	12.03	39.67	1481.1

(YEAR 1975)

** 1961 - 1980 = DISCHARGE

DAY	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.							
1	88-1250	44-1118	9-1270	23-44	12-44	10-10	12-12	16-16	35-17	21-21	37-15	185-39							
2	103-1230	44-1118	9-1270	23-44	12-44	10-10	12-12	16-16	35-17	21-21	37-15	1143-104							
3	103-1230	44-1118	9-1270	23-44	12-44	10-10	12-12	16-16	35-17	21-21	37-15	11109-104							
4	112-1200	44-1118	9-1270	23-44	12-44	10-10	12-12	16-16	35-17	21-21	37-15	1131-104							
5	112-1200	44-1118	9-1270	23-44	12-44	10-10	12-12	16-16	35-17	21-21	37-15	1101-104							
6	112-1200	44-1118	9-1270	23-44	12-44	10-10	12-12	16-16	35-17	21-21	37-15	1101-104							
7	112-1200	44-1118	9-1270	23-44	12-44	10-10	12-12	16-16	35-17	21-21	37-15	1101-104							
8	112-1200	44-1118	9-1270	23-44	12-44	10-10	12-12	16-16	35-17	21-21	37-15	1101-104							
9	112-1200	44-1118	9-1270	23-44	12-44	10-10	12-12	16-16	35-17	21-21	37-15	1101-104							
10	112-1200	44-1118	9-1270	23-44	12-44	10-10	12-12	16-16	35-17	21-21	37-15	1101-104							
11	112-1200	44-1118	9-1270	23-44	12-44	10-10	12-12	16-16	35-17	21-21	37-15	1101-104							
12	112-1200	44-1118	9-1270	23-44	12-44	10-10	12-12	16-16	35-17	21-21	37-15	1101-104							
13	112-1200	44-1118	9-1270	23-44	12-44	10-10	12-12	16-16	35-17	21-21	37-15	1101-104							
14	112-1200	44-1118	9-1270	23-44	12-44	10-10	12-12	16-16	35-17	21-21	37-15	1101-104							
15	112-1200	44-1118	9-1270	23-44	12-44	10-10	12-12	16-16	35-17	21-21	37-15	1101-104							
16	112-1200	44-1118	9-1270	23-44	12-44	10-10	12-12	16-16	35-17	21-21	37-15	1101-104							
17	112-1200	44-1118	9-1270	23-44	12-44	10-10	12-12	16-16	35-17	21-21	37-15	1101-104							
18	112-1200	44-1118	9-1270	23-44	12-44	10-10	12-12	16-16	35-17	21-21	37-15	1101-104							
19	112-1200	44-1118	9-1270	23-44	12-44	10-10	12-12	16-16	35-17	21-21	37-15	1101-104							
20	112-1200	44-1118	9-1270	23-44	12-44	10-10	12-12	16-16	35-17	21-21	37-15	1101-104							
21	112-1200	44-1118	9-1270	23-44	12-44	10-10	12-12	16-16	35-17	21-21	37-15	1101-104							
22	112-1200	44-1118	9-1270	23-44	12-44	10-10	12-12	16-16	35-17	21-21	37-15	1101-104							
23	112-1200	44-1118	9-1270	23-44	12-44	10-10	12-12	16-16	35-17	21-21	37-15	1101-104							
24	112-1200	44-1118	9-1270	23-44	12-44	10-10	12-12	16-16	35-17	21-21	37-15	1101-104							
25	112-1200	44-1118	9-1270	23-44	12-44	10-10	12-12	16-16	35-17	21-21	37-15	1101-104							
26	112-1200	44-1118	9-1270	23-44	12-44	10-10	12-12	16-16	35-17	21-21	37-15	1101-104							
27	112-1200	44-1118	9-1270	23-44	12-44	10-10	12-12	16-16	35-17	21-21	37-15	1101-104							
28	112-1200	44-1118	9-1270	23-44	12-44	10-10	12-12	16-16	35-17	21-21	37-15	1101-104							
29	112-1200	44-1118	9-1270	23-44	12-44	10-10	12-12	16-16	35-17	21-21	37-15	1101-104							
30	112-1200	44-1118	9-1270	23-44	12-44	10-10	12-12	16-16	35-17	21-21	37-15	1101-104							
31	112-1200	44-1118	9-1270	23-44	12-44	10-10	12-12	16-16	35-17	21-21	37-15	1101-104							
TOTAL	3060-	1052-	1510-	948-	1536-	728-	618-	670-	930-	1247-	5510-	2999-							
AVR.	98.40	58.99	48.70	31.00	49.54	24.27	19.92	21.80	31.01	40.24	183.60	96.73							
YEAR	MAX.	35DAY	95DAY	185DAY	275DAY	355DAY	MIN.	AVR.	TOTAL	1975	1401.46	109.09	61.25	34.33	24.84	17.36	13.33	58.68	21418.4

(YEAR 1976)

DISCHARGE

1962

1976

DAY	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
1	42.0	58.0	11.0	6.0	7.0	15.0	12.0	10.0	22.0	20.0	32.0	11.0
2	43.0	59.0	12.0	7.0	8.0	16.0	13.0	11.0	23.0	21.0	33.0	12.0
3	44.0	60.0	13.0	8.0	9.0	17.0	14.0	12.0	24.0	22.0	34.0	13.0
4	45.0	61.0	14.0	9.0	10.0	18.0	15.0	13.0	25.0	23.0	35.0	14.0
5	46.0	62.0	15.0	10.0	11.0	19.0	16.0	14.0	26.0	24.0	36.0	15.0
6	47.0	63.0	16.0	11.0	12.0	20.0	17.0	15.0	27.0	25.0	37.0	16.0
7	48.0	64.0	17.0	12.0	13.0	21.0	18.0	16.0	28.0	26.0	38.0	17.0
8	49.0	65.0	18.0	13.0	14.0	22.0	19.0	17.0	29.0	27.0	39.0	18.0
9	50.0	66.0	19.0	14.0	15.0	23.0	20.0	18.0	30.0	28.0	40.0	19.0
10	51.0	67.0	20.0	15.0	16.0	24.0	21.0	19.0	31.0	29.0	41.0	20.0
11	52.0	68.0	21.0	16.0	17.0	25.0	22.0	20.0	32.0	30.0	42.0	21.0
12	53.0	69.0	22.0	17.0	18.0	26.0	23.0	21.0	33.0	31.0	43.0	22.0
13	54.0	70.0	23.0	18.0	19.0	27.0	24.0	22.0	34.0	32.0	44.0	23.0
14	55.0	71.0	24.0	19.0	20.0	28.0	25.0	23.0	35.0	33.0	45.0	24.0
15	56.0	72.0	25.0	20.0	21.0	29.0	26.0	24.0	36.0	34.0	46.0	25.0
16	57.0	73.0	26.0	21.0	22.0	30.0	27.0	25.0	37.0	35.0	47.0	26.0
17	58.0	74.0	27.0	22.0	23.0	31.0	28.0	26.0	38.0	36.0	48.0	27.0
18	59.0	75.0	28.0	23.0	24.0	32.0	29.0	27.0	39.0	37.0	49.0	28.0
19	60.0	76.0	29.0	24.0	25.0	33.0	30.0	28.0	40.0	38.0	50.0	29.0
20	61.0	77.0	30.0	25.0	26.0	34.0	31.0	29.0	41.0	39.0	51.0	30.0
21	62.0	78.0	31.0	26.0	27.0	35.0	32.0	30.0	42.0	40.0	52.0	31.0
22	63.0	79.0	32.0	27.0	28.0	36.0	33.0	31.0	43.0	41.0	53.0	32.0
23	64.0	80.0	33.0	28.0	29.0	37.0	34.0	32.0	44.0	42.0	54.0	33.0
24	65.0	81.0	34.0	29.0	30.0	38.0	35.0	33.0	45.0	43.0	55.0	34.0
25	66.0	82.0	35.0	30.0	31.0	39.0	36.0	34.0	46.0	44.0	56.0	35.0
26	67.0	83.0	36.0	31.0	32.0	40.0	37.0	35.0	47.0	45.0	57.0	36.0
27	68.0	84.0	37.0	32.0	33.0	41.0	38.0	36.0	48.0	46.0	58.0	37.0
28	69.0	85.0	38.0	33.0	34.0	42.0	39.0	37.0	49.0	47.0	59.0	38.0
29	70.0	86.0	39.0	34.0	35.0	43.0	40.0	38.0	50.0	48.0	60.0	39.0
30	71.0	87.0	40.0	35.0	36.0	44.0	41.0	39.0	51.0	49.0	61.0	40.0
31	72.0	88.0	41.0	36.0	37.0	45.0	42.0	40.0	52.0	50.0	62.0	41.0
TOTAL	875	420	350	391	553	530	503	741	837	1330	1299	2208
AVR.	28.23	14.70	11.57	13.03	17.85	17.05	16.22	23.90	27.90	43.10	43.29	71.24

YEAR MAX. 350DAY 1850AY 2750AY 355DAY
 1976 220-34 50-73 32-00 19-73 12-87 8-14 27-48 10057-1

(YEAR 1977)

**

1962 - 1980 DISCHARGE

DAY	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
1	111	23	23	7	29	7	7	7	2	2	2	9
2	111	23	23	7	29	7	7	7	2	2	2	9
3	111	23	23	7	29	7	7	7	2	2	2	9
4	111	23	23	7	29	7	7	7	2	2	2	9
5	111	23	23	7	29	7	7	7	2	2	2	9
6	111	23	23	7	29	7	7	7	2	2	2	9
7	111	23	23	7	29	7	7	7	2	2	2	9
8	111	23	23	7	29	7	7	7	2	2	2	9
9	111	23	23	7	29	7	7	7	2	2	2	9
10	111	23	23	7	29	7	7	7	2	2	2	9
11	111	23	23	7	29	7	7	7	2	2	2	9
12	111	23	23	7	29	7	7	7	2	2	2	9
13	111	23	23	7	29	7	7	7	2	2	2	9
14	111	23	23	7	29	7	7	7	2	2	2	9
15	111	23	23	7	29	7	7	7	2	2	2	9
16	111	23	23	7	29	7	7	7	2	2	2	9
17	111	23	23	7	29	7	7	7	2	2	2	9
18	111	23	23	7	29	7	7	7	2	2	2	9
19	111	23	23	7	29	7	7	7	2	2	2	9
20	111	23	23	7	29	7	7	7	2	2	2	9
21	111	23	23	7	29	7	7	7	2	2	2	9
22	111	23	23	7	29	7	7	7	2	2	2	9
23	111	23	23	7	29	7	7	7	2	2	2	9
24	111	23	23	7	29	7	7	7	2	2	2	9
25	111	23	23	7	29	7	7	7	2	2	2	9
26	111	23	23	7	29	7	7	7	2	2	2	9
27	111	23	23	7	29	7	7	7	2	2	2	9
28	111	23	23	7	29	7	7	7	2	2	2	9
29	111	23	23	7	29	7	7	7	2	2	2	9
30	111	23	23	7	29	7	7	7	2	2	2	9
31	111	23	23	7	29	7	7	7	2	2	2	9
TOTAL	1811	723	378	205	291	378	375	539	514	1485	805	670
AVR.	58.42	25.83	12.18	6.83	9.37	12.60	12.10	17.38	17.13	47.91	28.85	22.56
YEAR	1977	1977	1977	1977	1977	1977	1977	1977	1977	1977	1977	1977
MAX-	155.92	42.41	26.86	16.28	8.87	5.81	5.12	22.56	8233.7	TOTAL	ANNUAL	ANNUAL
MIN-	5.12	22.56	8233.7	8233.7	8233.7	8233.7	8233.7	8233.7	8233.7	8233.7	8233.7	8233.7

1661 - 1980 = DISCHARGE (YEAR 1978)

DAY	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
1	12.3	17.0	19.5	17.5	19.0	17.0	15.0	15.0	10.0	11.0	7.0	25.0
2	13.4	18.1	20.6	18.6	20.1	18.1	16.1	16.1	11.1	12.1	8.1	26.1
3	14.5	19.2	21.7	19.7	21.2	19.2	17.2	17.2	12.2	13.2	9.2	27.2
4	15.6	20.3	22.8	20.8	22.3	20.3	18.3	18.3	13.3	14.3	10.3	28.3
5	16.7	21.4	23.9	21.9	23.4	21.4	19.4	19.4	14.4	15.4	11.4	29.4
6	17.8	22.5	25.0	23.0	24.5	22.5	20.5	20.5	15.5	16.5	12.5	30.5
7	18.9	23.6	26.1	24.1	25.6	23.6	21.6	21.6	16.6	17.6	13.6	31.6
8	19.0	23.7	26.2	24.2	25.7	23.7	21.7	21.7	16.7	17.7	13.7	31.7
9	19.1	23.8	26.3	24.3	25.8	23.8	21.8	21.8	16.8	17.8	13.8	31.8
10	19.2	23.9	26.4	24.4	25.9	23.9	21.9	21.9	16.9	17.9	13.9	31.9
11	19.3	24.0	26.5	24.5	26.0	24.0	22.0	22.0	17.0	18.0	14.0	32.0
12	19.4	24.1	26.6	24.6	26.1	24.1	22.1	22.1	17.1	18.1	14.1	32.1
13	19.5	24.2	26.7	24.7	26.2	24.2	22.2	22.2	17.2	18.2	14.2	32.2
14	19.6	24.3	26.8	24.8	26.3	24.3	22.3	22.3	17.3	18.3	14.3	32.3
15	19.7	24.4	26.9	24.9	26.4	24.4	22.4	22.4	17.4	18.4	14.4	32.4
16	19.8	24.5	27.0	25.0	26.5	24.5	22.5	22.5	17.5	18.5	14.5	32.5
17	19.9	24.6	27.1	25.1	26.6	24.6	22.6	22.6	17.6	18.6	14.6	32.6
18	20.0	24.7	27.2	25.2	26.7	24.7	22.7	22.7	17.7	18.7	14.7	32.7
19	20.1	24.8	27.3	25.3	26.8	24.8	22.8	22.8	17.8	18.8	14.8	32.8
20	20.2	24.9	27.4	25.4	26.9	24.9	22.9	22.9	17.9	18.9	14.9	32.9
21	20.3	25.0	27.5	25.5	27.0	25.0	23.0	23.0	18.0	19.0	15.0	33.0
22	20.4	25.1	27.6	25.6	27.1	25.1	23.1	23.1	18.1	19.1	15.1	33.1
23	20.5	25.2	27.7	25.7	27.2	25.2	23.2	23.2	18.2	19.2	15.2	33.2
24	20.6	25.3	27.8	25.8	27.3	25.3	23.3	23.3	18.3	19.3	15.3	33.3
25	20.7	25.4	27.9	25.9	27.4	25.4	23.4	23.4	18.4	19.4	15.4	33.4
26	20.8	25.5	28.0	26.0	27.5	25.5	23.5	23.5	18.5	19.5	15.5	33.5
27	20.9	25.6	28.1	26.1	27.6	25.6	23.6	23.6	18.6	19.6	15.6	33.6
28	21.0	25.7	28.2	26.2	27.7	25.7	23.7	23.7	18.7	19.7	15.7	33.7
29	21.1	25.8	28.3	26.3	27.8	25.8	23.8	23.8	18.8	19.8	15.8	33.8
30	21.2	25.9	28.4	26.4	27.9	25.9	23.9	23.9	18.9	19.9	15.9	33.9
31	21.3	26.0	28.5	26.5	28.0	26.0	24.0	24.0	19.0	20.0	16.0	34.0
TOTAL	913	440	407	409	970	965	702	430	475	576	1639	2522
AVR.	29.46	15.72	13.12	13.63	31.29	28.83	22.66	15.48	16.51	18.29	56.32	81.35

YEAR MAX. 350DAY 95DAY 185DAY 275DAY 355DAY MIN. AVR. TOTAL
 1978 315.39 93.37 28.38 19.54 14.07 10.24 6.50 28.68 10469.2

(YEAR 1979)

DAY	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
1	33.00	17.00	12.00	07.50	07.00	07.00	07.00	07.00	07.00	07.00	07.00	07.00
2	33.00	17.00	12.00	07.50	07.00	07.00	07.00	07.00	07.00	07.00	07.00	07.00
3	33.00	17.00	12.00	07.50	07.00	07.00	07.00	07.00	07.00	07.00	07.00	07.00
4	33.00	17.00	12.00	07.50	07.00	07.00	07.00	07.00	07.00	07.00	07.00	07.00
5	33.00	17.00	12.00	07.50	07.00	07.00	07.00	07.00	07.00	07.00	07.00	07.00
6	33.00	17.00	12.00	07.50	07.00	07.00	07.00	07.00	07.00	07.00	07.00	07.00
7	33.00	17.00	12.00	07.50	07.00	07.00	07.00	07.00	07.00	07.00	07.00	07.00
8	33.00	17.00	12.00	07.50	07.00	07.00	07.00	07.00	07.00	07.00	07.00	07.00
9	33.00	17.00	12.00	07.50	07.00	07.00	07.00	07.00	07.00	07.00	07.00	07.00
10	33.00	17.00	12.00	07.50	07.00	07.00	07.00	07.00	07.00	07.00	07.00	07.00
11	33.00	17.00	12.00	07.50	07.00	07.00	07.00	07.00	07.00	07.00	07.00	07.00
12	33.00	17.00	12.00	07.50	07.00	07.00	07.00	07.00	07.00	07.00	07.00	07.00
13	33.00	17.00	12.00	07.50	07.00	07.00	07.00	07.00	07.00	07.00	07.00	07.00
14	33.00	17.00	12.00	07.50	07.00	07.00	07.00	07.00	07.00	07.00	07.00	07.00
15	33.00	17.00	12.00	07.50	07.00	07.00	07.00	07.00	07.00	07.00	07.00	07.00
16	33.00	17.00	12.00	07.50	07.00	07.00	07.00	07.00	07.00	07.00	07.00	07.00
17	33.00	17.00	12.00	07.50	07.00	07.00	07.00	07.00	07.00	07.00	07.00	07.00
18	33.00	17.00	12.00	07.50	07.00	07.00	07.00	07.00	07.00	07.00	07.00	07.00
19	33.00	17.00	12.00	07.50	07.00	07.00	07.00	07.00	07.00	07.00	07.00	07.00
20	33.00	17.00	12.00	07.50	07.00	07.00	07.00	07.00	07.00	07.00	07.00	07.00
21	33.00	17.00	12.00	07.50	07.00	07.00	07.00	07.00	07.00	07.00	07.00	07.00
22	33.00	17.00	12.00	07.50	07.00	07.00	07.00	07.00	07.00	07.00	07.00	07.00
23	33.00	17.00	12.00	07.50	07.00	07.00	07.00	07.00	07.00	07.00	07.00	07.00
24	33.00	17.00	12.00	07.50	07.00	07.00	07.00	07.00	07.00	07.00	07.00	07.00
25	33.00	17.00	12.00	07.50	07.00	07.00	07.00	07.00	07.00	07.00	07.00	07.00
26	33.00	17.00	12.00	07.50	07.00	07.00	07.00	07.00	07.00	07.00	07.00	07.00
27	33.00	17.00	12.00	07.50	07.00	07.00	07.00	07.00	07.00	07.00	07.00	07.00
28	33.00	17.00	12.00	07.50	07.00	07.00	07.00	07.00	07.00	07.00	07.00	07.00
29	33.00	17.00	12.00	07.50	07.00	07.00	07.00	07.00	07.00	07.00	07.00	07.00
30	33.00	17.00	12.00	07.50	07.00	07.00	07.00	07.00	07.00	07.00	07.00	07.00
31	33.00	17.00	12.00	07.50	07.00	07.00	07.00	07.00	07.00	07.00	07.00	07.00
TOTAL	1032.	495.	449.	727.	698.	441.	351.	525.	1509.	1293.	3932.	2151.
AVR.	33.51	17.67	14.49	24.22	22.50	14.70	17.76	16.95	50.29	41.88	131.06	69.58

YEAR	MAX.	350DAY	950DAY	1850DAY	2750DAY	3550DAY	MIN.	AVR.	TOTAL
1979	632.95	60.74	37.34	22.66	14.35	9.98	7.62	37.83	13806.9

(YEAR 1980)

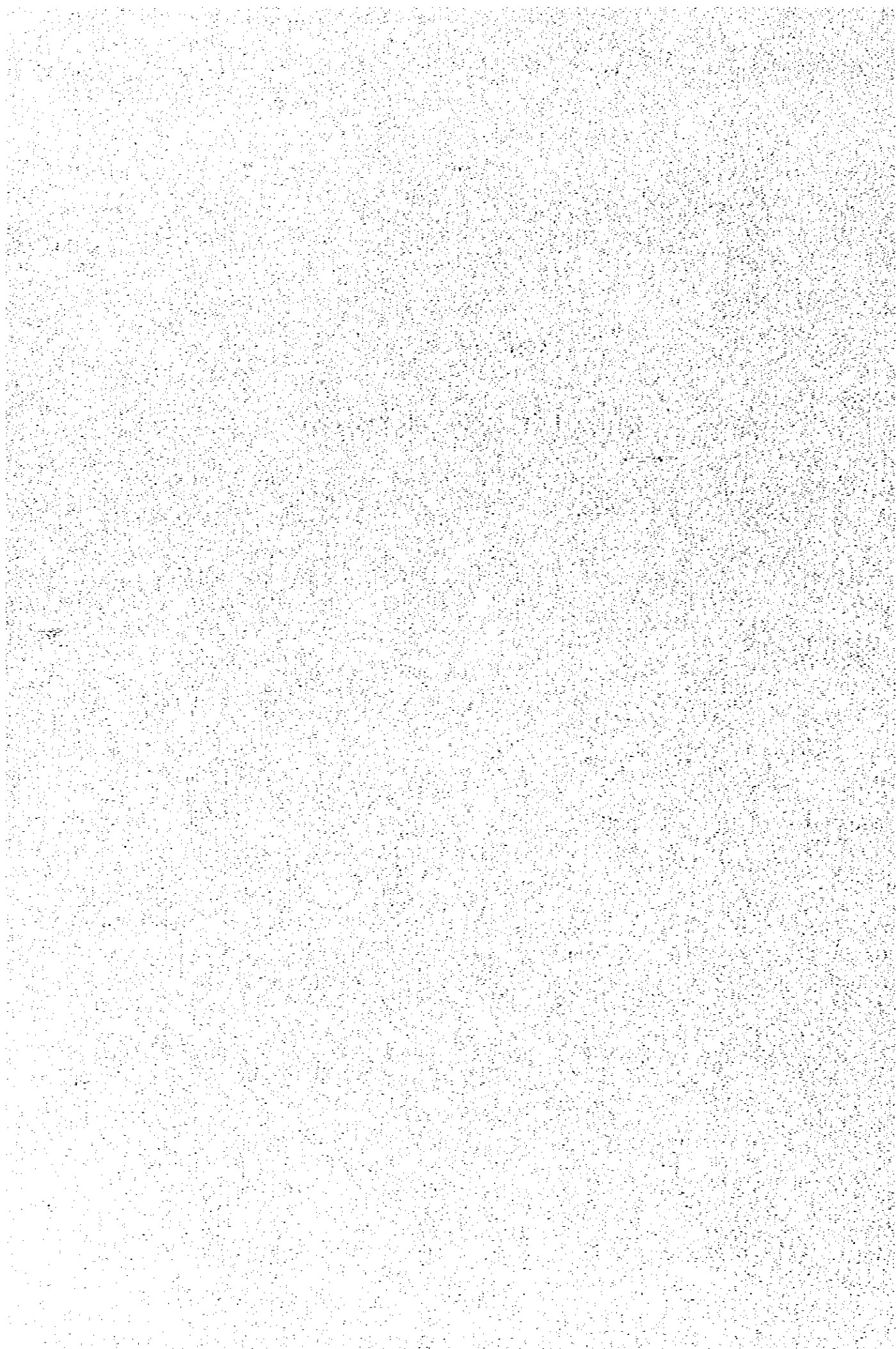
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1981 - 1980 : DISCHARGE

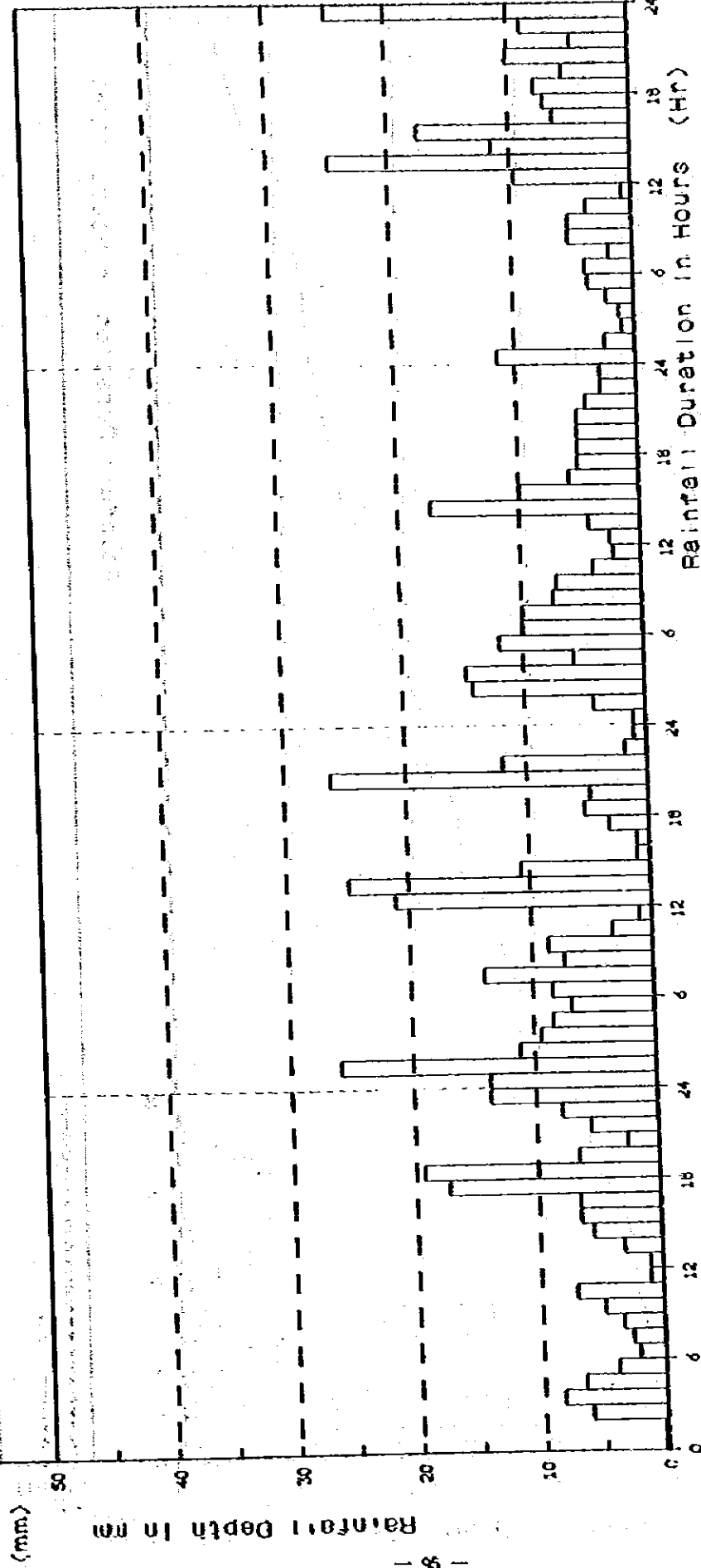
DAY	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
1	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
2	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
3	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
4	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
5	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
6	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
7	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
8	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
9	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
10	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
11	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
12	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
13	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
14	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
15	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
16	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
17	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
18	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
19	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
20	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
21	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
22	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
23	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
24	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
25	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
26	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
27	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
28	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
29	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
30	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
31	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
TOTAL	610.	552.	647.	647.	742.	602.	437.	740.	1040.	1751.	1368.	1918.
AVR.	19.68	19.00	20.87	21.50	23.92	20.00	17.11	23.88	34.38	50.49	45.60	61.88
MAX.	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00
MIN.	9.47	9.47	9.47	9.47	9.47	9.47	9.47	9.47	9.47	9.47	9.47	9.47
355DAY	275DAY	165DAY	95DAY	37.04	22.05	10.05	12.43	30.22	11054.5			

Appendix E

Rainfall Patterns at Stations



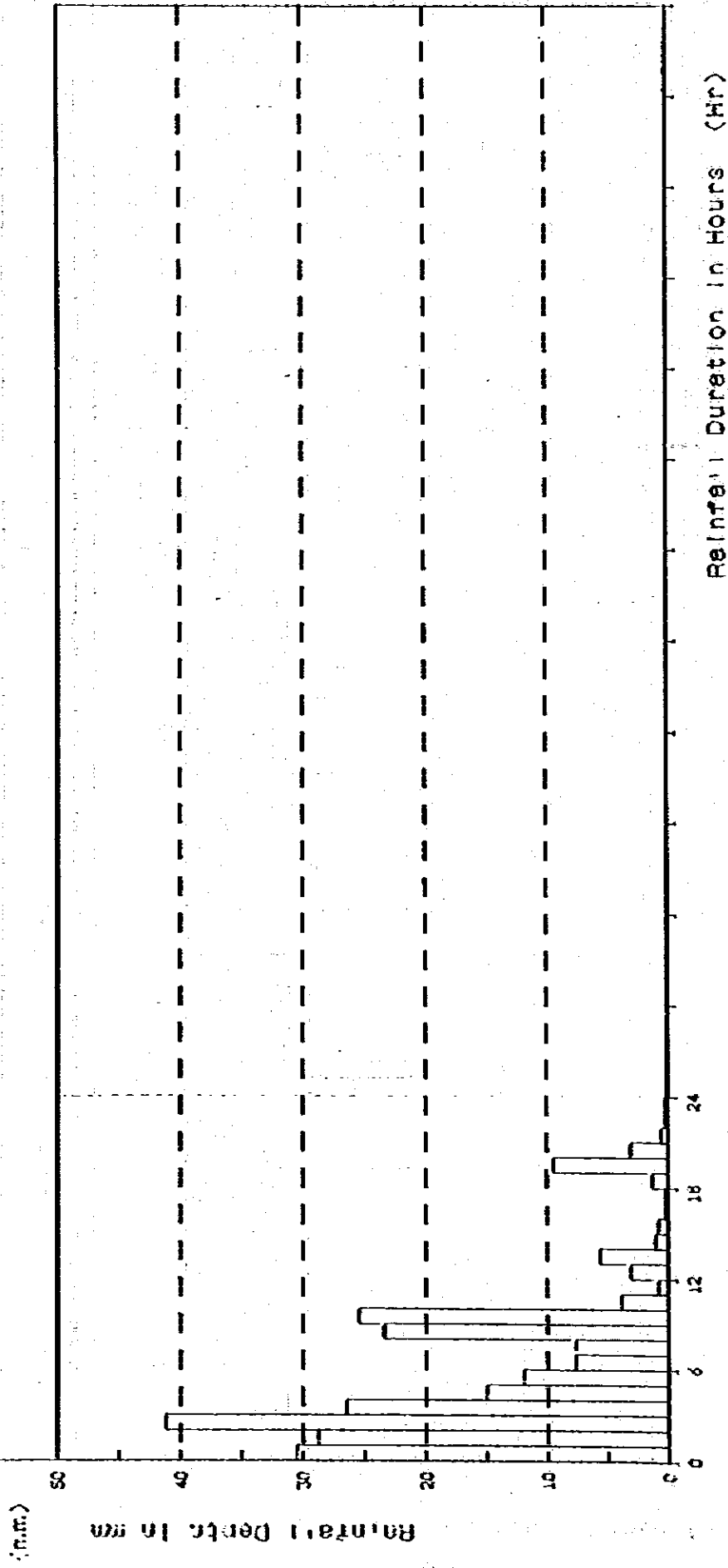
1971 . 1 . 1 ~ 1971 . 1 . 5 (Σ = 967.2 mm) (NO 1)



Time (Hr)	Rain (mm)
0	0
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0

Benta

1971 . 1 . 1 ~ 1971 . 1 . 5 (Σ= 967.2 mm) (NO 2)



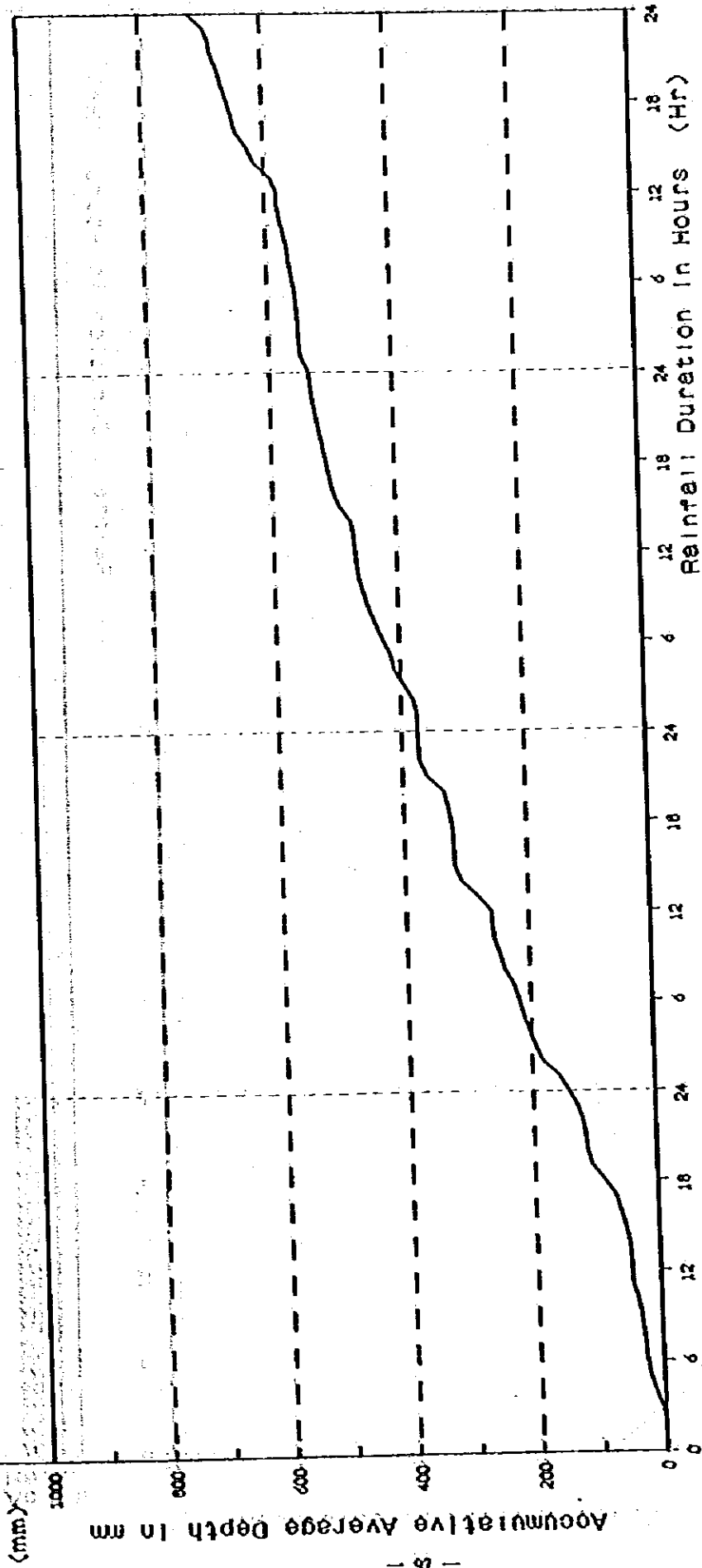
Rain. (mm) 80 40 20 0

Reinfal Duretion in Hours (Hr) 6 12 18 24

Legend:
 Rainfall Depth in mm: [Bar symbol]
 Rainfall Duration in Hours: [Line symbol]

Benta

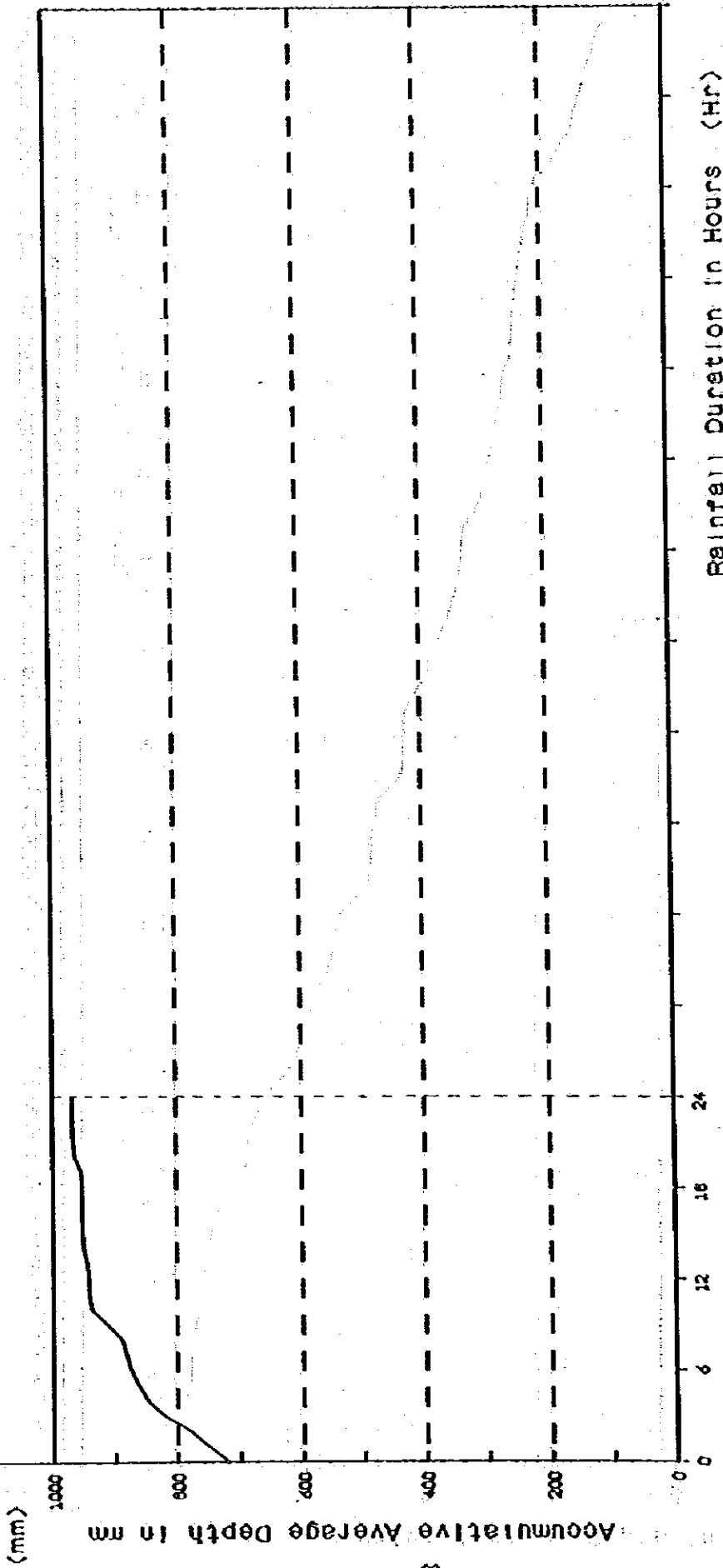
1971 . 1 . 1 ~ 1971 . 1 . 5 (Σ = 967.2 mm.) (NO 1)



Accum. Rain.	Rainfall Duration in Hours (Hr)
0.1	0
0.4	0.5
0.5	1.0
1.0	1.5
1.5	2.0
2.0	2.5
2.5	3.0
3.0	3.5
3.5	4.0
4.0	4.5
4.5	5.0
5.0	5.5
5.5	6.0
6.0	6.5
6.5	7.0
7.0	7.5
7.5	8.0
8.0	8.5
8.5	9.0
9.0	9.5
9.5	10.0
10.0	10.5
10.5	11.0
11.0	11.5
11.5	12.0
12.0	12.5
12.5	13.0
13.0	13.5
13.5	14.0
14.0	14.5
14.5	15.0
15.0	15.5
15.5	16.0
16.0	16.5
16.5	17.0
17.0	17.5
17.5	18.0
18.0	18.5
18.5	19.0
19.0	19.5
19.5	20.0
20.0	20.5
20.5	21.0
21.0	21.5
21.5	22.0
22.0	22.5
22.5	23.0
23.0	23.5
23.5	24.0
24.0	24.5
24.5	25.0
25.0	25.5
25.5	26.0
26.0	26.5
26.5	27.0
27.0	27.5
27.5	28.0
28.0	28.5
28.5	29.0
29.0	29.5
29.5	30.0
30.0	30.5
30.5	31.0
31.0	31.5
31.5	32.0
32.0	32.5
32.5	33.0
33.0	33.5
33.5	34.0
34.0	34.5
34.5	35.0
35.0	35.5
35.5	36.0
36.0	36.5
36.5	37.0
37.0	37.5
37.5	38.0
38.0	38.5
38.5	39.0
39.0	39.5
39.5	40.0
40.0	40.5
40.5	41.0
41.0	41.5
41.5	42.0
42.0	42.5
42.5	43.0
43.0	43.5
43.5	44.0
44.0	44.5
44.5	45.0
45.0	45.5
45.5	46.0
46.0	46.5
46.5	47.0
47.0	47.5
47.5	48.0
48.0	48.5
48.5	49.0
49.0	49.5
49.5	50.0
50.0	50.5
50.5	51.0
51.0	51.5
51.5	52.0
52.0	52.5
52.5	53.0
53.0	53.5
53.5	54.0
54.0	54.5
54.5	55.0
55.0	55.5
55.5	56.0
56.0	56.5
56.5	57.0
57.0	57.5
57.5	58.0
58.0	58.5
58.5	59.0
59.0	59.5
59.5	60.0
60.0	60.5
60.5	61.0
61.0	61.5
61.5	62.0
62.0	62.5
62.5	63.0
63.0	63.5
63.5	64.0
64.0	64.5
64.5	65.0
65.0	65.5
65.5	66.0
66.0	66.5
66.5	67.0
67.0	67.5
67.5	68.0
68.0	68.5
68.5	69.0
69.0	69.5
69.5	70.0
70.0	70.5
70.5	71.0
71.0	71.5
71.5	72.0
72.0	72.5
72.5	73.0
73.0	73.5
73.5	74.0
74.0	74.5
74.5	75.0
75.0	75.5
75.5	76.0
76.0	76.5
76.5	77.0
77.0	77.5
77.5	78.0
78.0	78.5
78.5	79.0
79.0	79.5
79.5	80.0
80.0	80.5
80.5	81.0
81.0	81.5
81.5	82.0
82.0	82.5
82.5	83.0
83.0	83.5
83.5	84.0
84.0	84.5
84.5	85.0
85.0	85.5
85.5	86.0
86.0	86.5
86.5	87.0
87.0	87.5
87.5	88.0
88.0	88.5
88.5	89.0
89.0	89.5
89.5	90.0
90.0	90.5
90.5	91.0
91.0	91.5
91.5	92.0
92.0	92.5
92.5	93.0
93.0	93.5
93.5	94.0
94.0	94.5
94.5	95.0
95.0	95.5
95.5	96.0
96.0	96.5
96.5	97.0
97.0	97.5
97.5	98.0
98.0	98.5
98.5	99.0
99.0	99.5
99.5	100.0

Benta

1971 . 1 . 1 ~ 1971 . 1 . 5 (Σ= 967.2 mm) (NO 2)

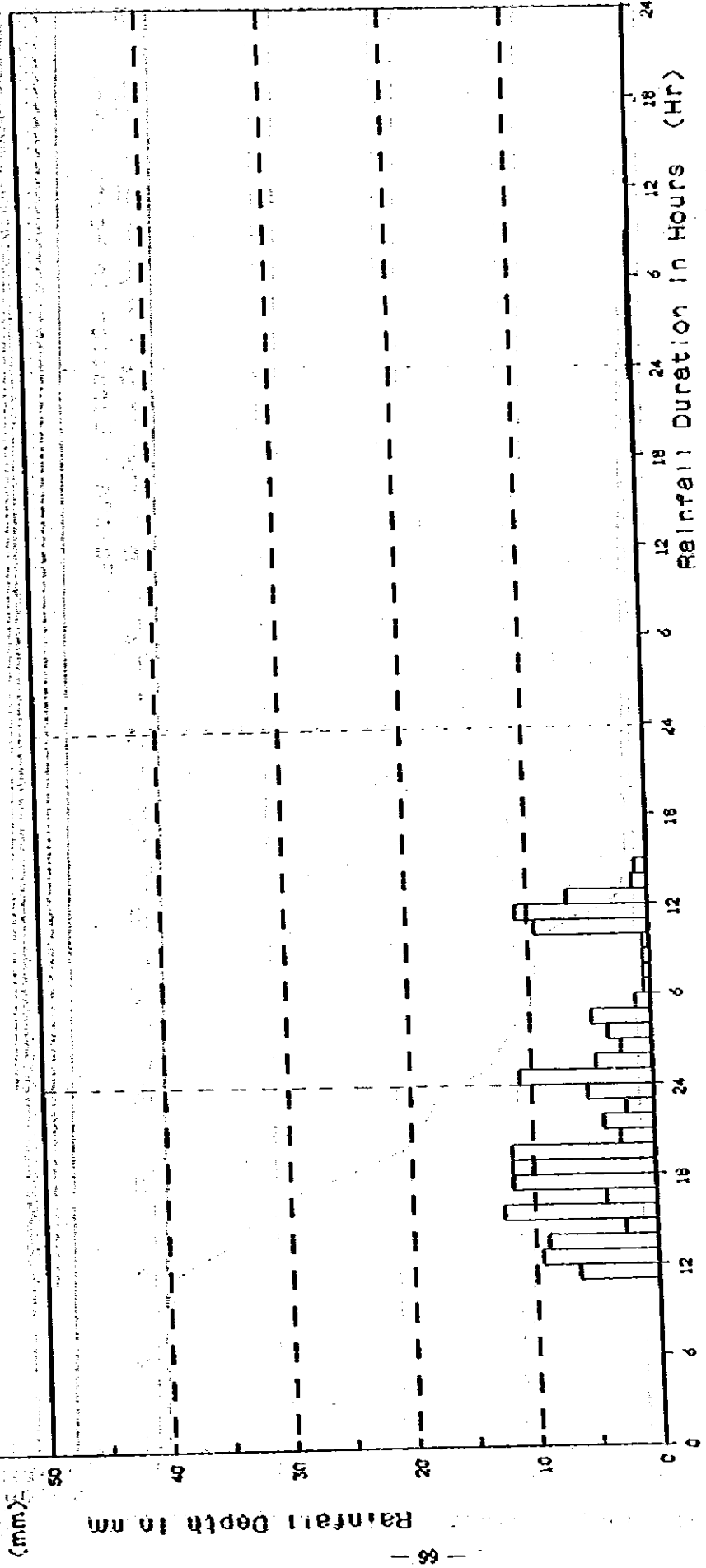


Accum. Rain.:

778
814
844
879
911
940
967
991
1011
1028
1042
1053
1061
1066
1069
1070
1070
1069
1066
1061
1053
1042
1028
1011
991
967
940
911
879
844
814
778

Benta

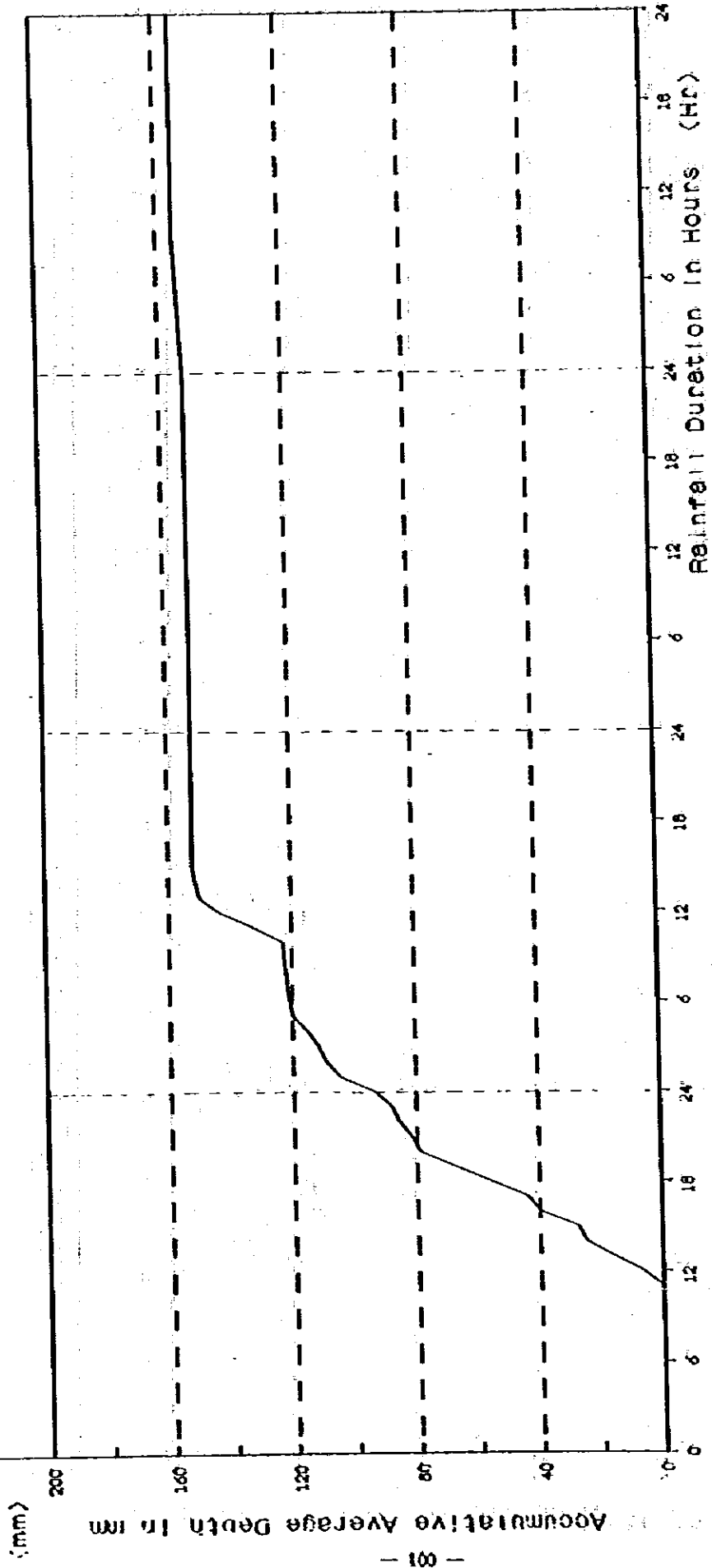
1972 ~ 12.16 ~ 1972 : 12.19 (Σ= 154.7 mm)



Rain. mmmmmmmm
oooooodeee

Kg. Merting

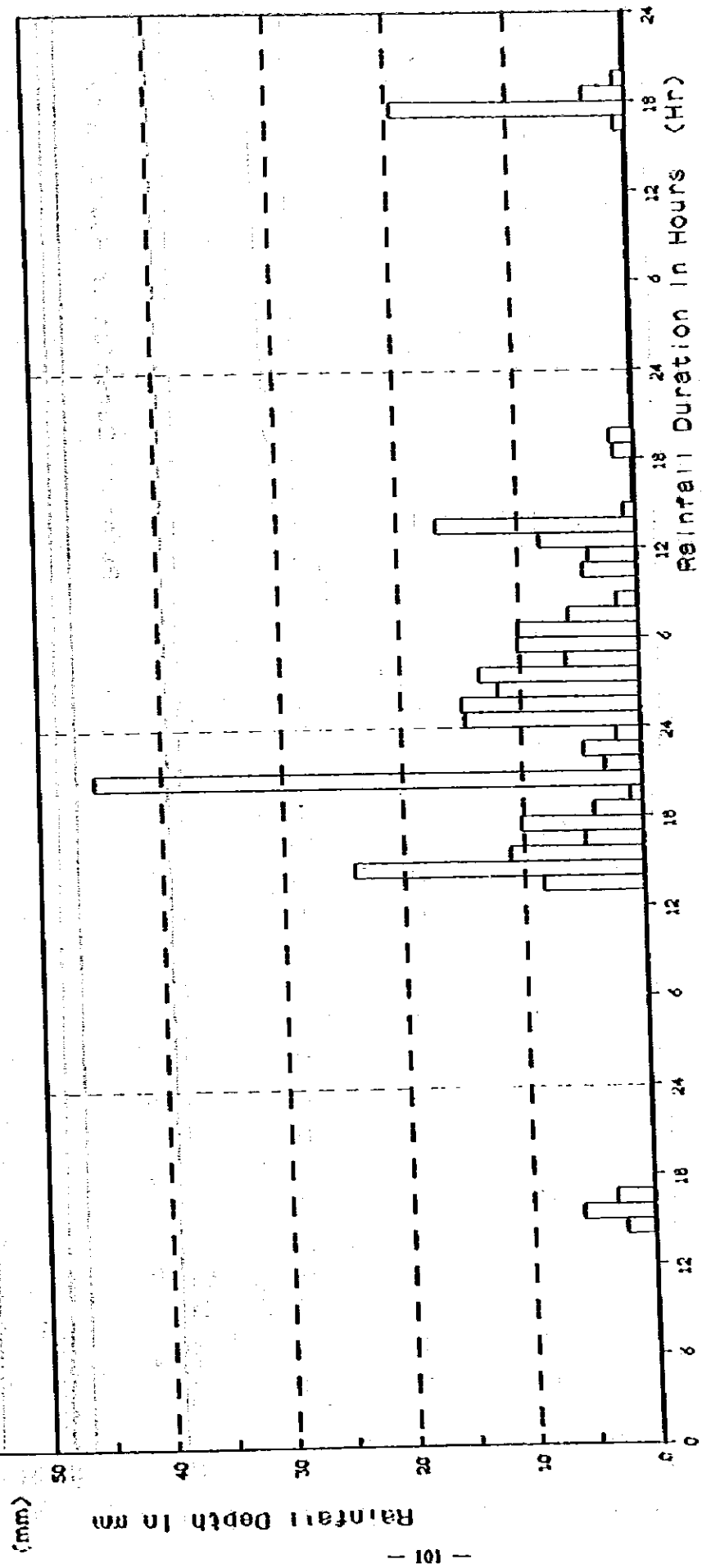
1972 . 12 . 16 ~ 1972 . 12 . 19 (Σ= 154.7 mm)



Accum. Rsn. (mm)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Kg. Merting

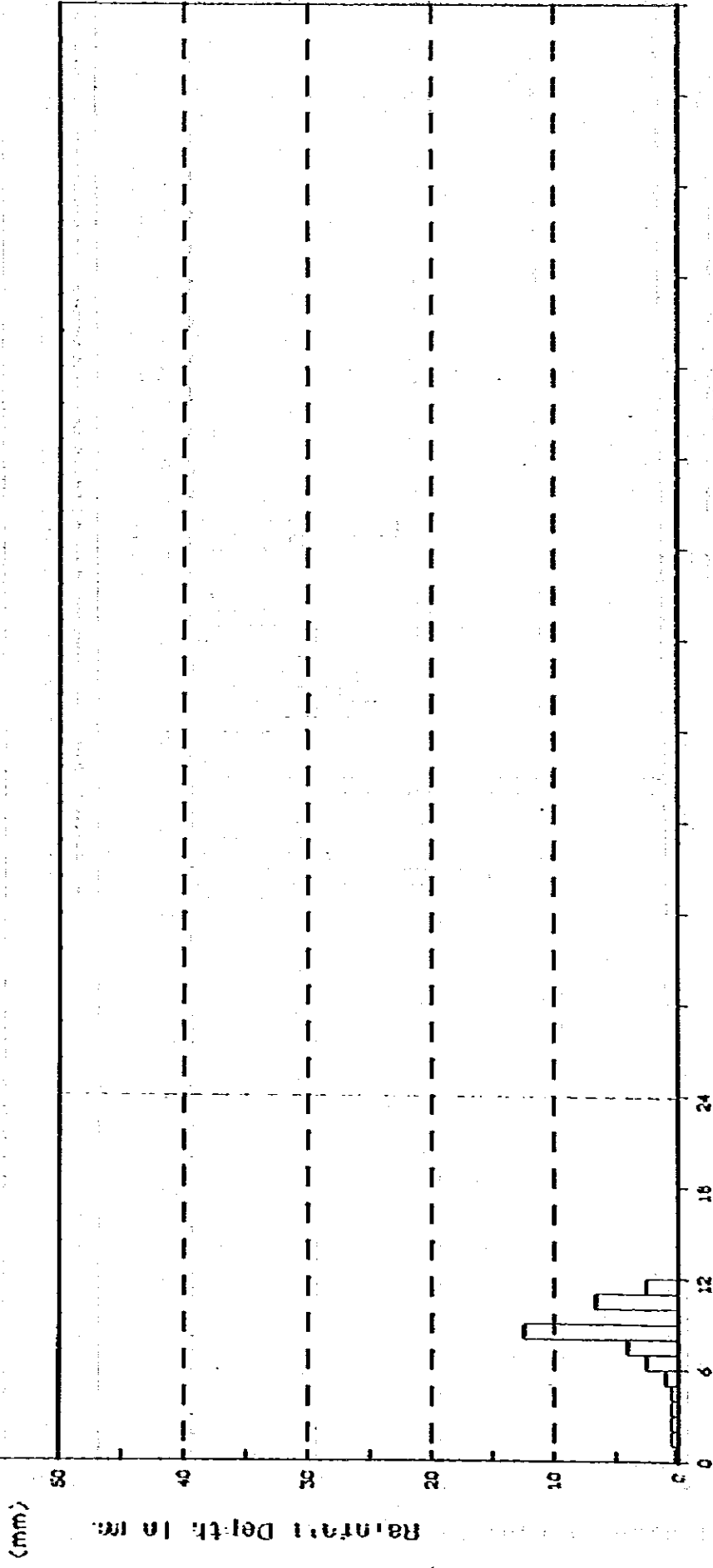
1973 . 12 . 6 ~ 1973 . 12 . 10 (Σ= 321.3 mm) (NO 1)



Rain. mm
 Num

Kg. Merting

1973 . 12 . 6 ~ 1973 . 12 . 10 (Σ= 321.3 mm) (NO 2)

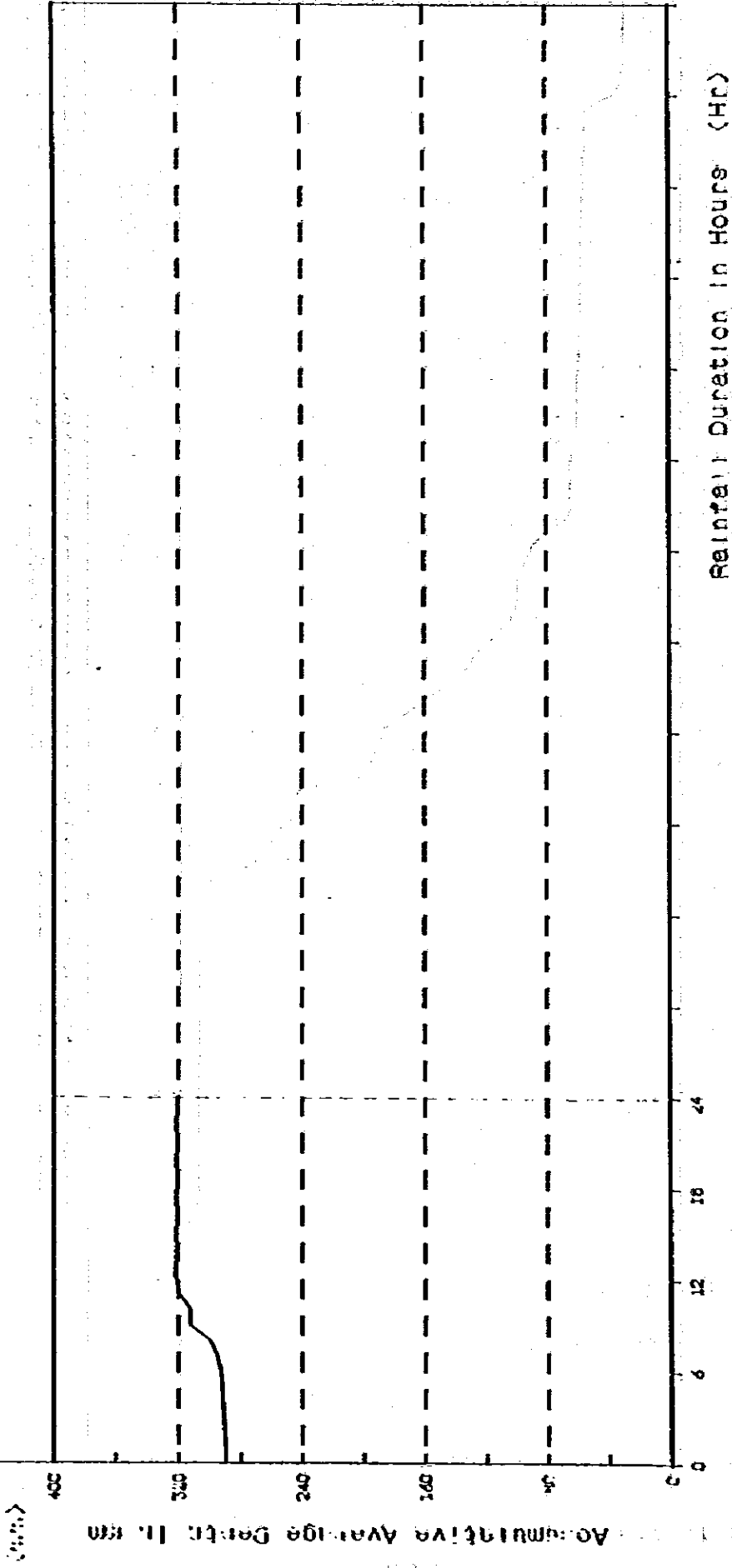


Rainfall Duration In Hours (Hr)

Rain
 50
 40
 30
 20
 10
 0

Kg. Merting

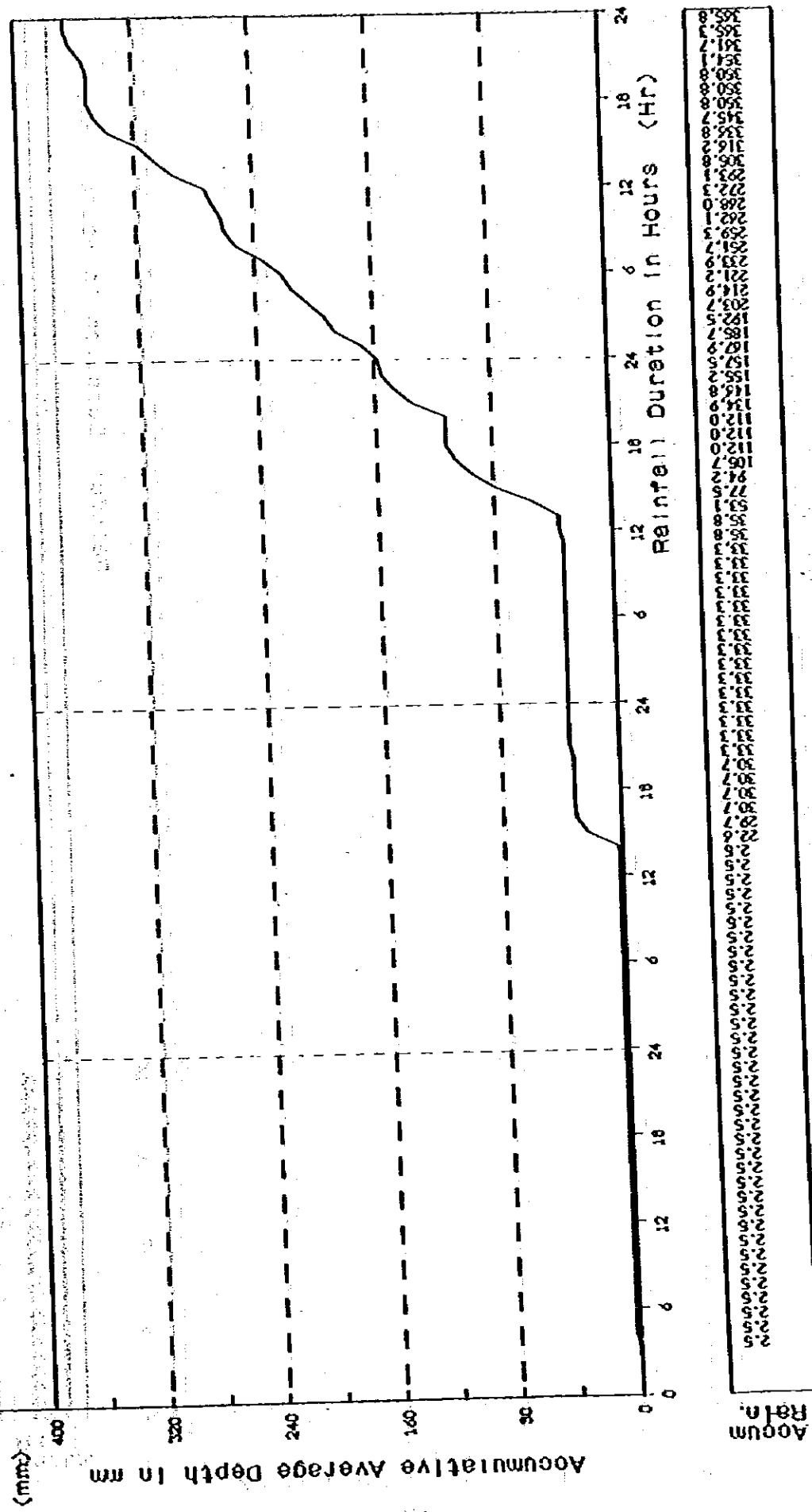
1973 . 12 . 6 ~ 1973 . 12 . 10 (Σ= 321.3 mm) (NO 2)



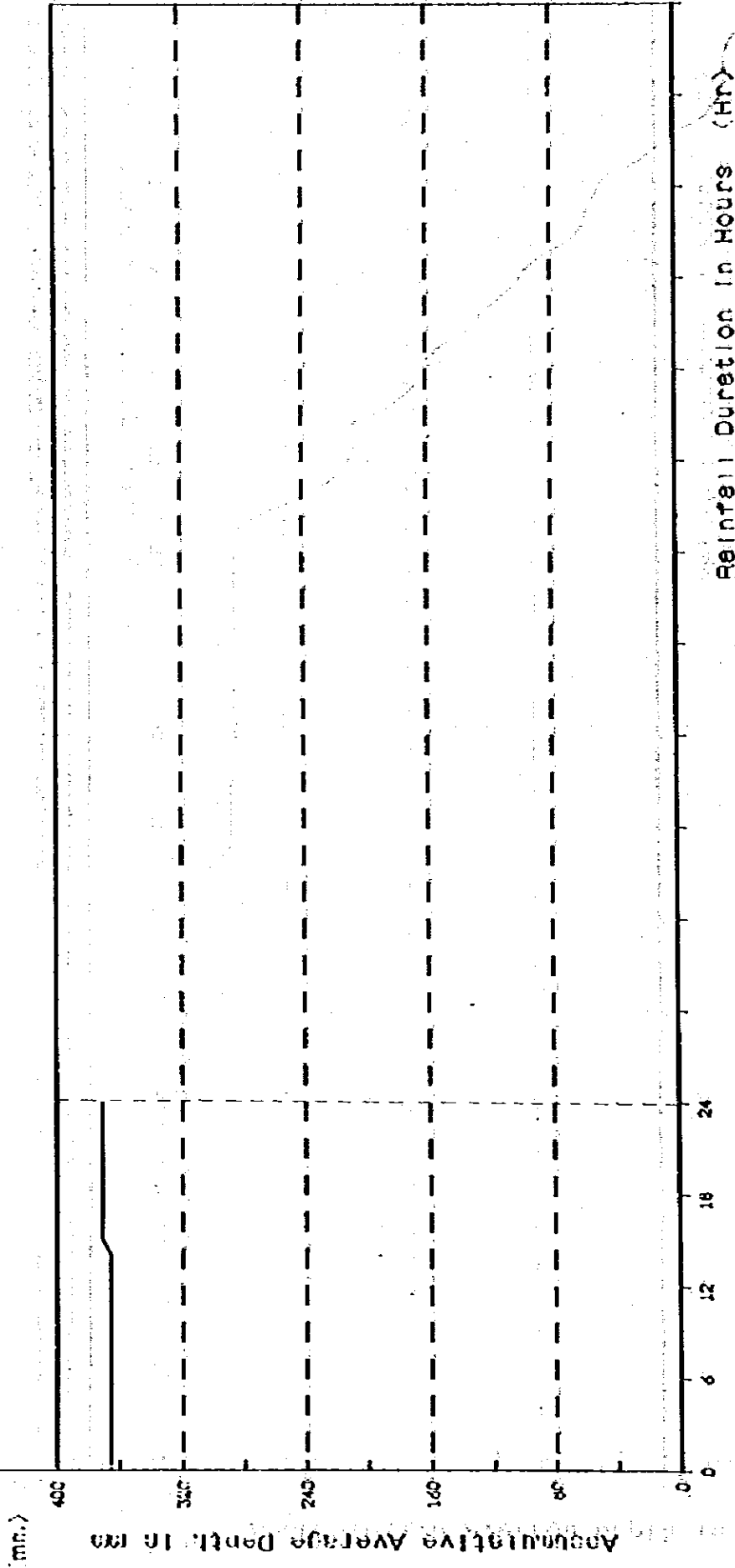
Accum. Reinf.

K9. Merting

1973. 12. 5 ~ 1973. 12. 9 ($\Sigma = 370.8$ mm) (NO 1)



1973 . 12 . 5 ~ 1973 . 12 . 9 (Σ= 370.8 mm) (NO 2)

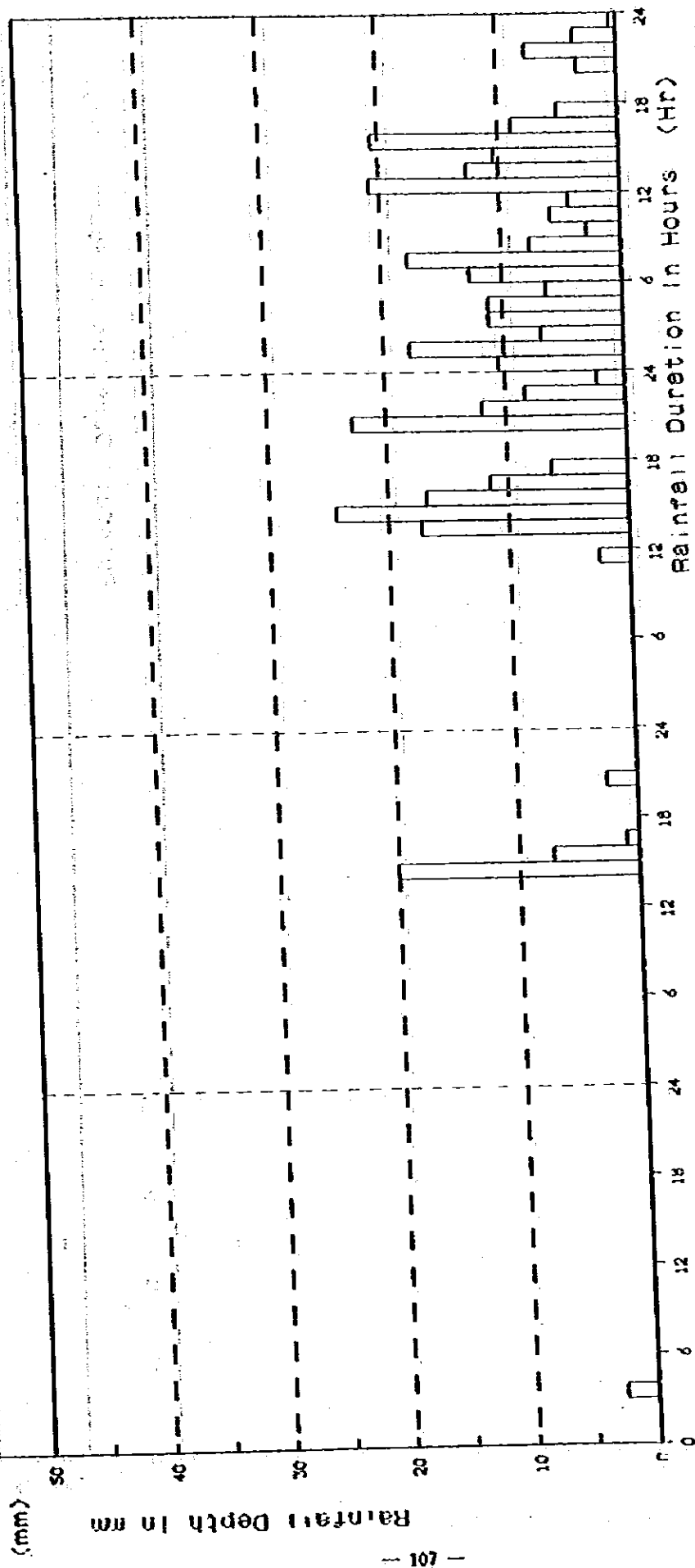


Accum. Rain.

1973 . 12 . 5 ~ 1973 . 12 . 9 (Σ= 370.8 mm) (NO 2)

SO. Yap

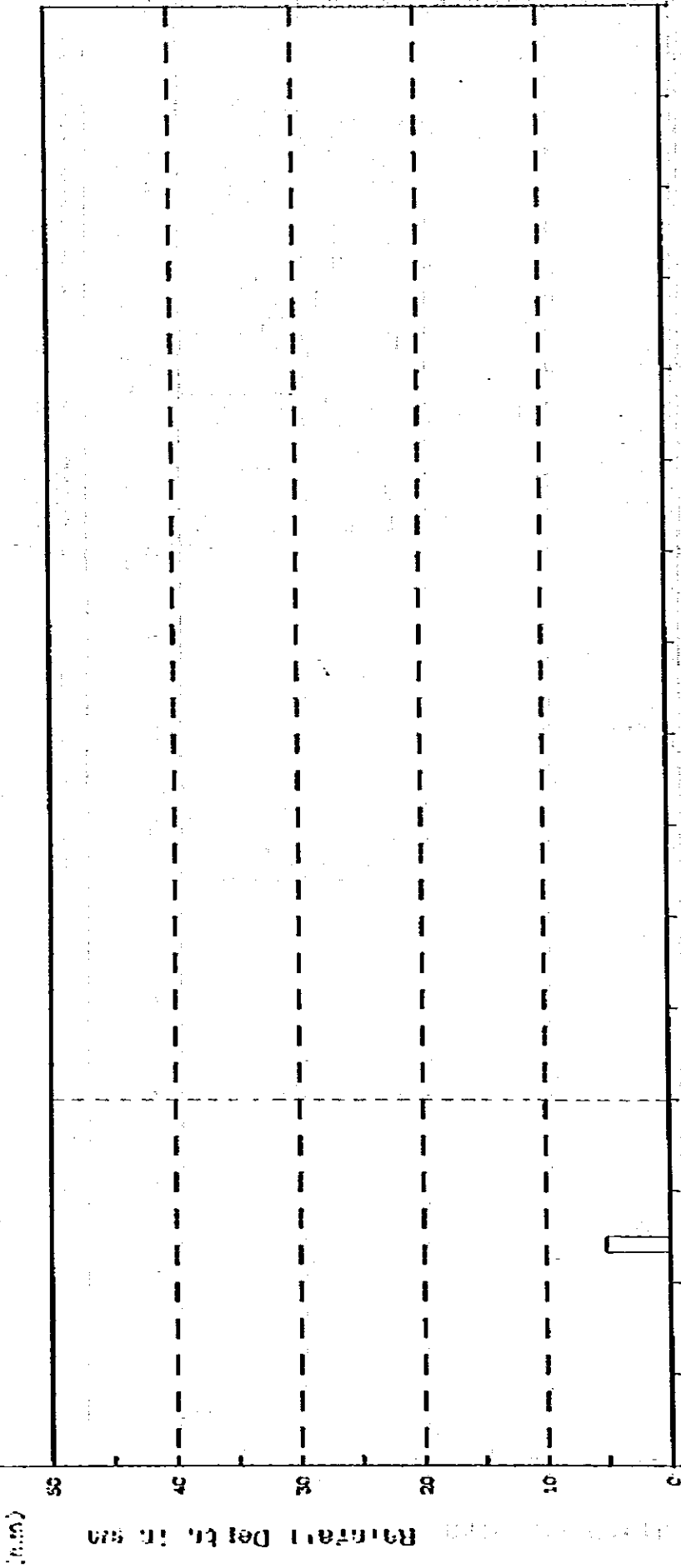
1973 . 12 . 5 ~ 1973 . 12 . 9 (Σ= 370.8 mm) (NO 1)



Hour	Rainfall (mm)
0	2.5
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	17.3
13	24.4
14	11.4
15	25.0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0

Sg. Yap

1973 . 12 . 5 ~ 1973 . 12 . 9 (Σ= 370.8 mm) (NO 2)

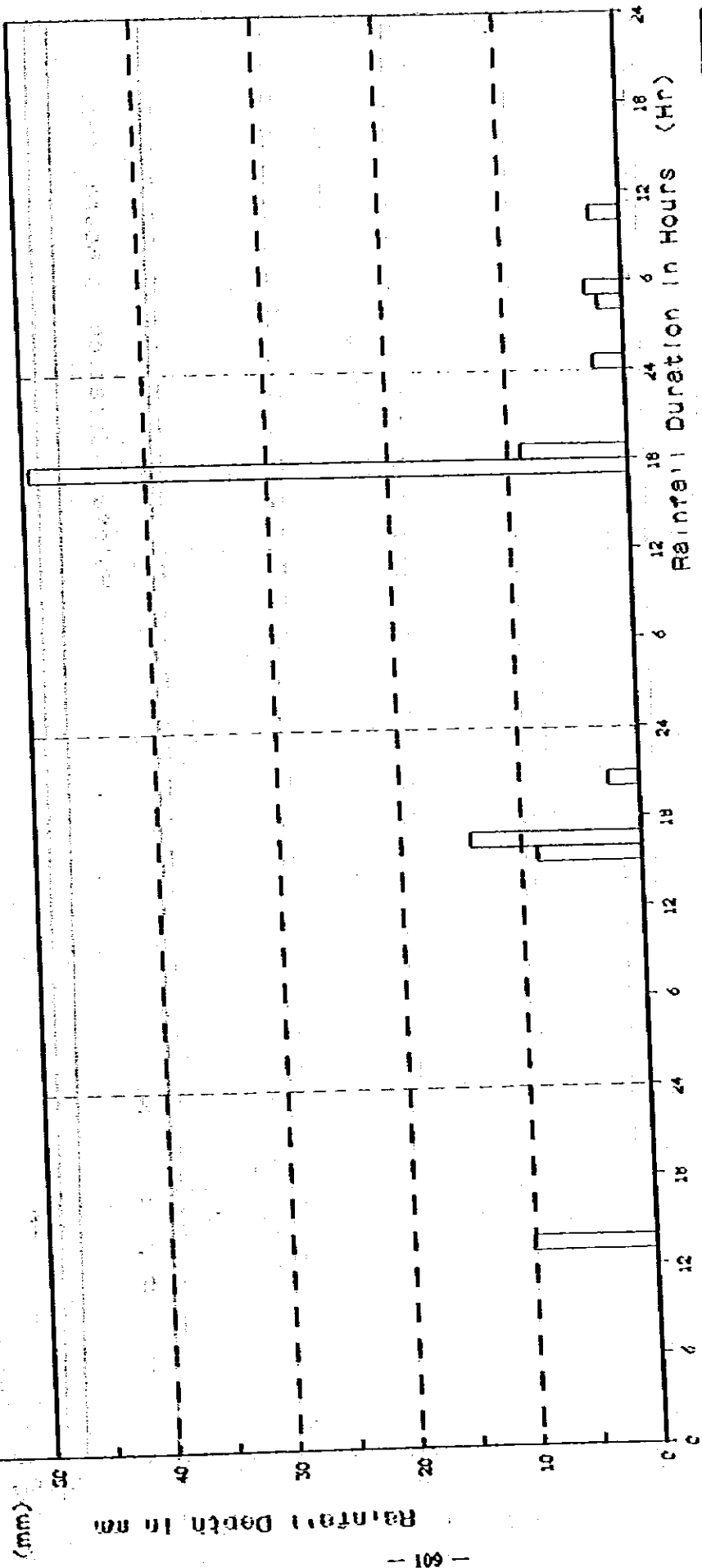


Rainfall Duration in Hours (Hr)

Rainfall

Sg. Yap

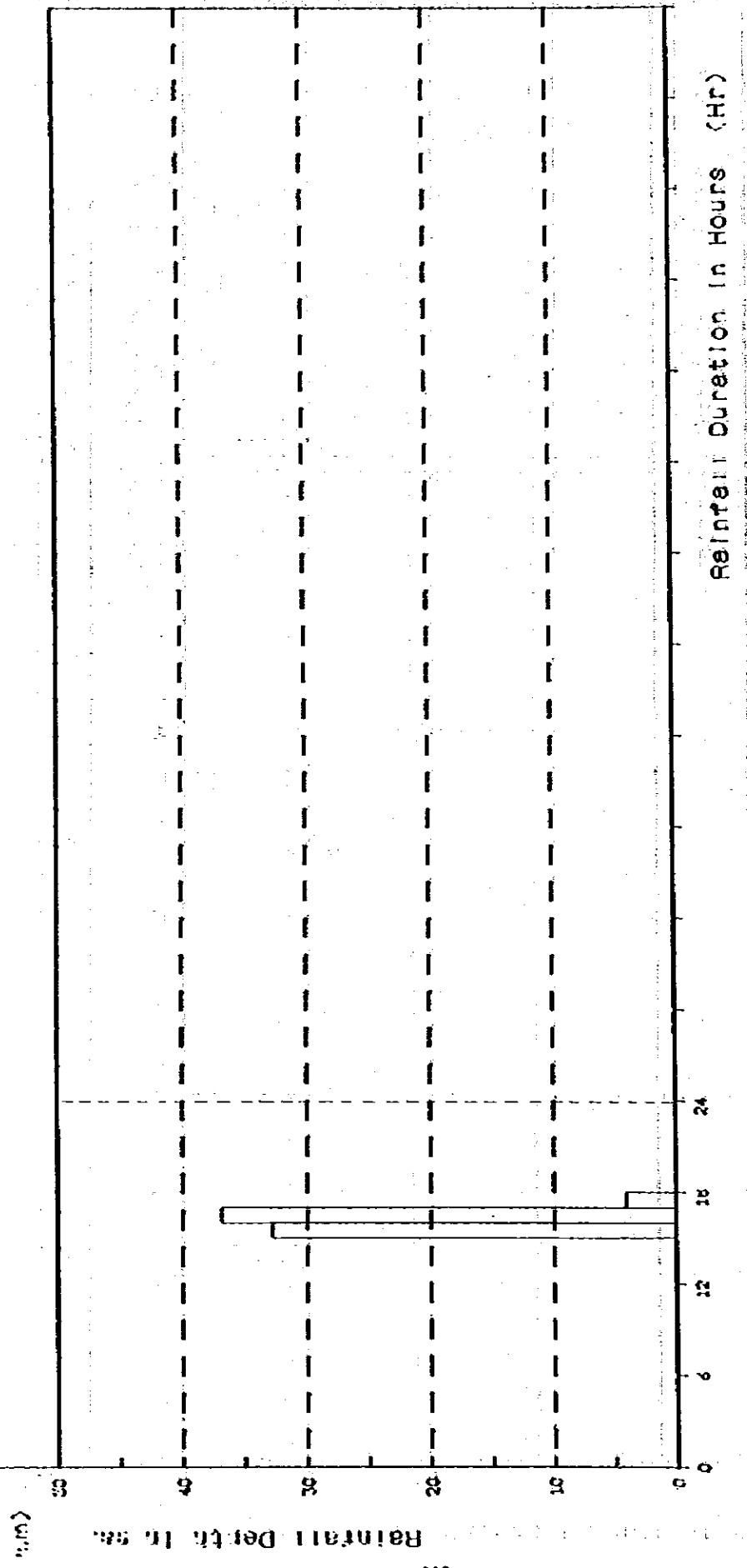
1975. 11. 19 ~ 1975. 11. 23 (Σ= 177.8 mm) (NO 1)



Time (Hr)	Rainfall Depth (mm)
0	0
6	0
12	10.2
18	8.6
21	35.0
24	2.5

Sg. Yap

1975 . 11 . 19 ~ 1975 . 11 . 23 (Σ= 177.4 mm) (NO 2)



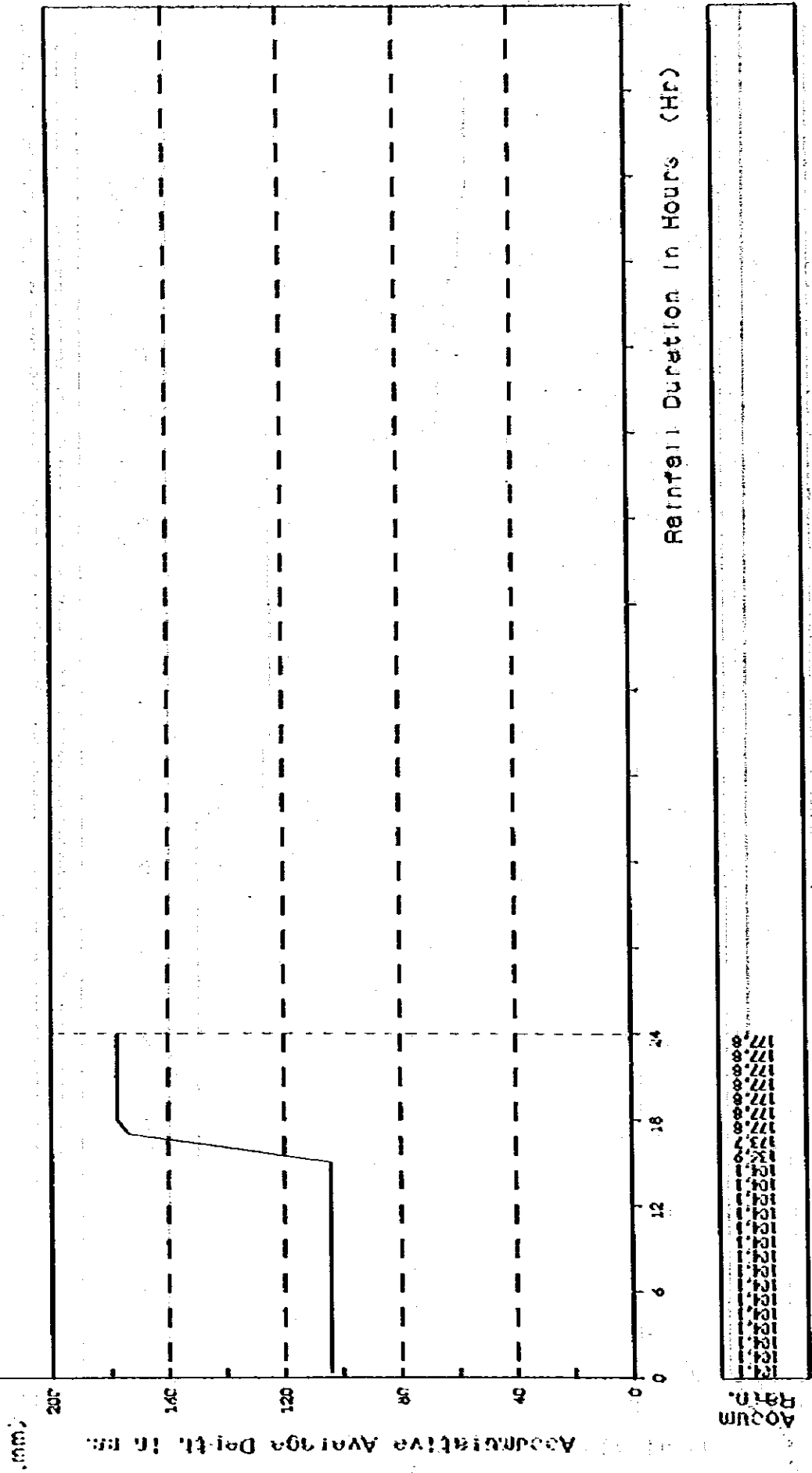
Rainfall Duration In Hours (Hr)

0007
283

1975 . 11 . 19 ~ 1975 . 11 . 23 (Σ= 177.4 mm) (NO 2)

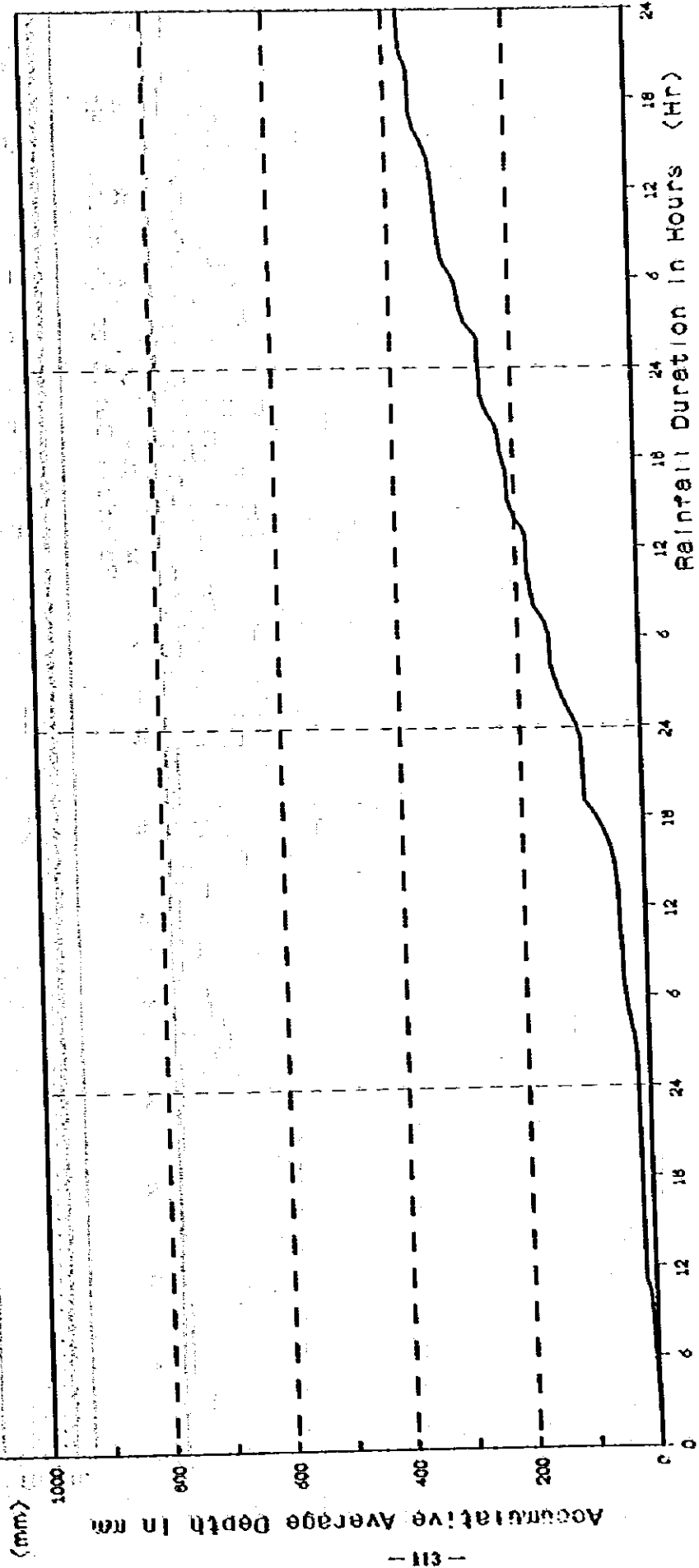
SG: Yap

1975 . 11 . 19 ~ 1975 . 11 . 23 (Σ= 177.4 mm) (NO 2)



Sg. Yap

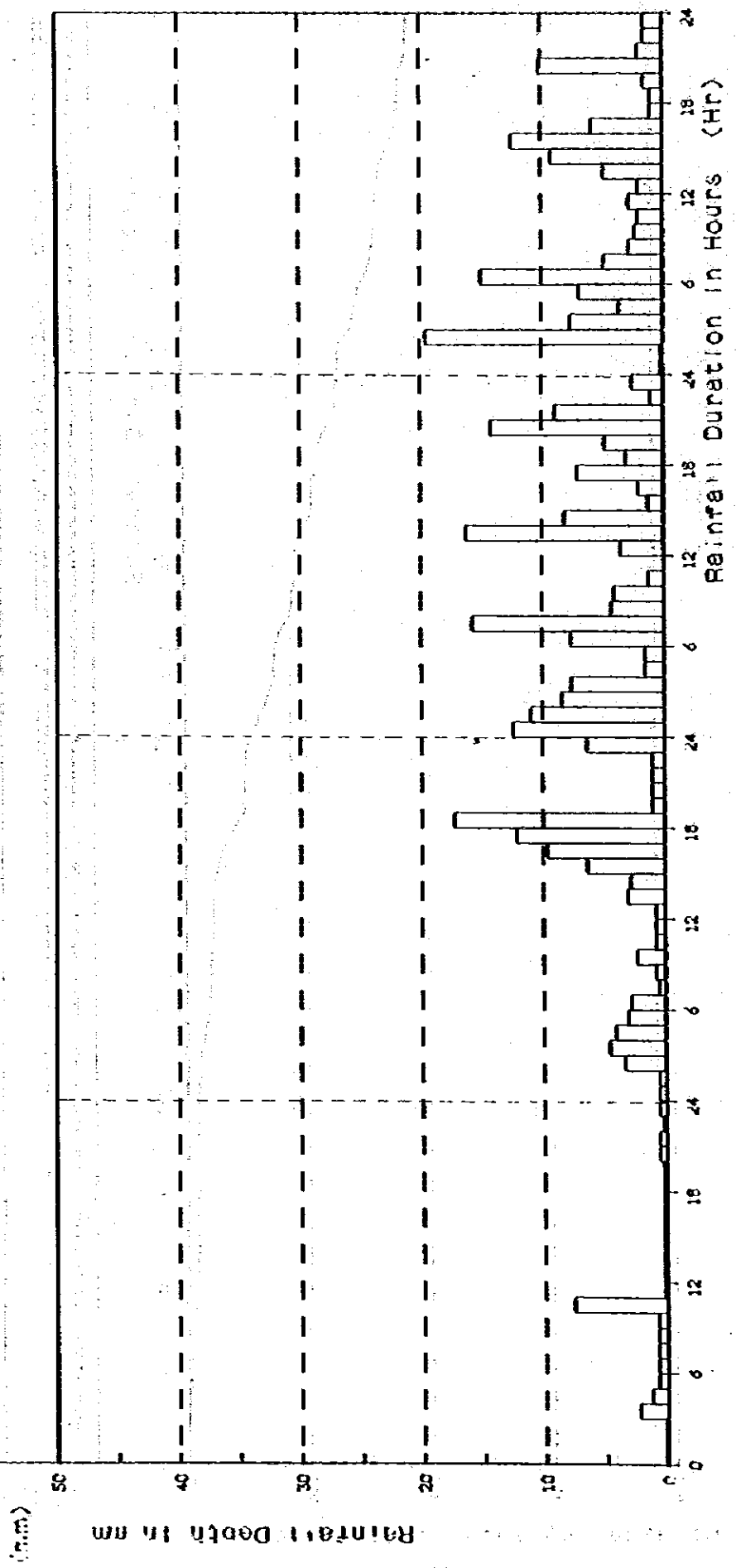
1970 . 12 . 31 ~ 1971 . 1 . 5 (Σ= 603.0 mm) (NO. 1)



Accum. Rain.	Rainfall Duration in Hours (Hr)
0.3	0.3
0.5	0.5
0.8	0.8
1.0	1.0
1.3	1.3
1.5	1.5
1.9	1.9
2.0	2.0
2.3	2.3
2.8	2.8
3.3	3.3
3.8	3.8
4.2	4.2
4.9	4.9
5.5	5.5
6.6	6.6
7.4	7.4
8.1	8.1
10.0	10.0
12.0	12.0
13.8	13.8
15.5	15.5
17.0	17.0
17.8	17.8
18.0	18.0
18.5	18.5
19.0	19.0
19.3	19.3
19.8	19.8
20.3	20.3
21.1	21.1
21.7	21.7
22.8	22.8
23.8	23.8
24.8	24.8
25.8	25.8
26.7	26.7
27.6	27.6
28.2	28.2
28.6	28.6
29.2	29.2
29.7	29.7
30.2	30.2
30.7	30.7
31.2	31.2
31.5	31.5
31.7	31.7
31.9	31.9
32.1	32.1
32.2	32.2
32.3	32.3
32.4	32.4
32.5	32.5
32.6	32.6
32.7	32.7
32.8	32.8
32.9	32.9
33.0	33.0
33.1	33.1
33.2	33.2
33.3	33.3
33.4	33.4
33.5	33.5
33.6	33.6
33.7	33.7
33.8	33.8
33.9	33.9
34.0	34.0
34.1	34.1
34.2	34.2
34.3	34.3
34.4	34.4
34.5	34.5
34.6	34.6
34.7	34.7
34.8	34.8
34.9	34.9
35.0	35.0
35.1	35.1
35.2	35.2
35.3	35.3
35.4	35.4
35.5	35.5
35.6	35.6
35.7	35.7
35.8	35.8
35.9	35.9
36.0	36.0
36.1	36.1
36.2	36.2
36.3	36.3
36.4	36.4
36.5	36.5
36.6	36.6
36.7	36.7
36.8	36.8
36.9	36.9
37.0	37.0
37.1	37.1
37.2	37.2
37.3	37.3
37.4	37.4

Raub

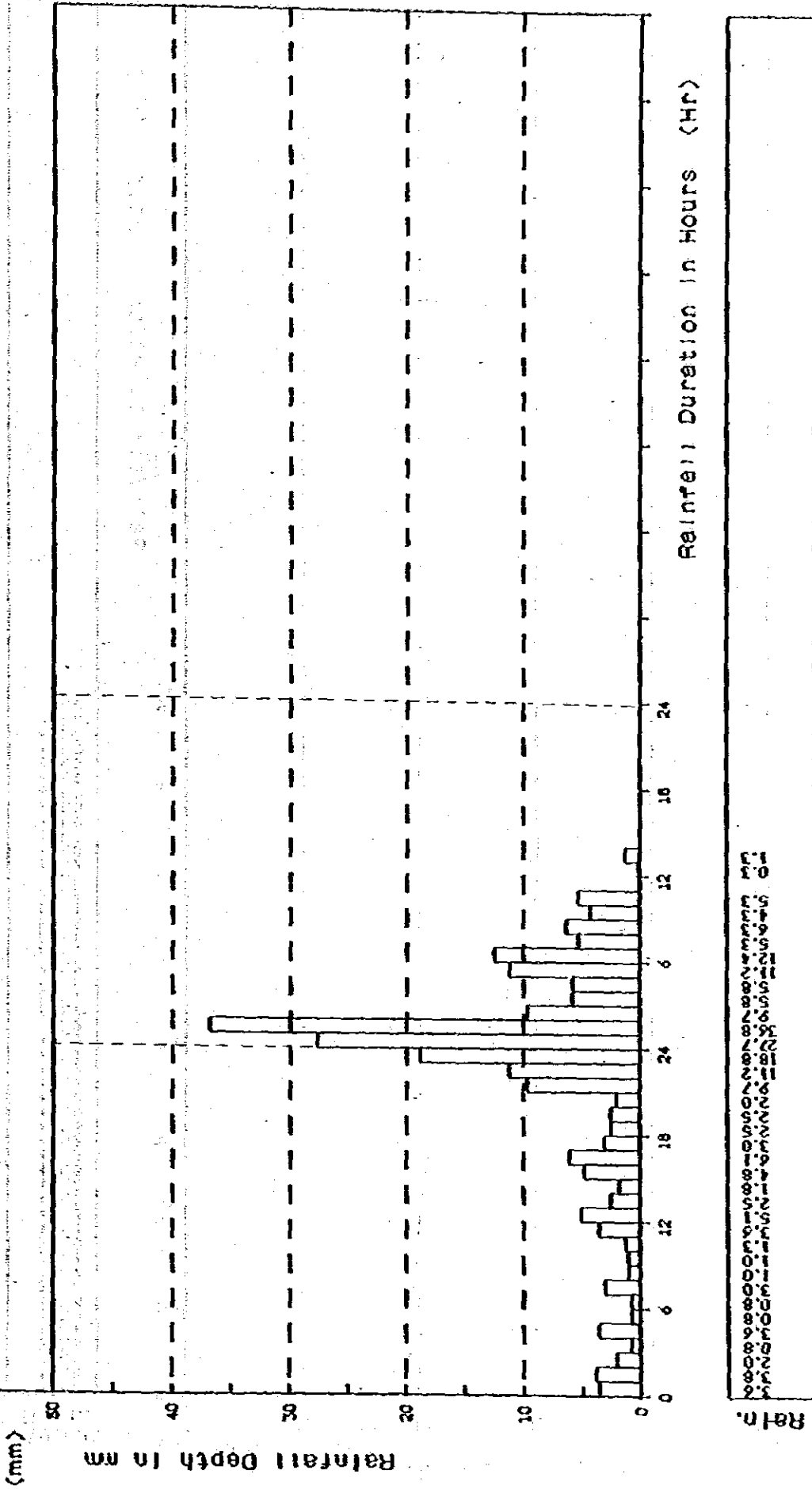
1970 . 12 . 31 ~ 1971 . 1 . 5 (Σ= 603.0 mm) (NO 1)



Rainfall Depth in mm (solid line)
 Rainfall Duration in Hours (Hr) (dashed line)
 Rainfall Intensity in mm/Hr (dotted line)

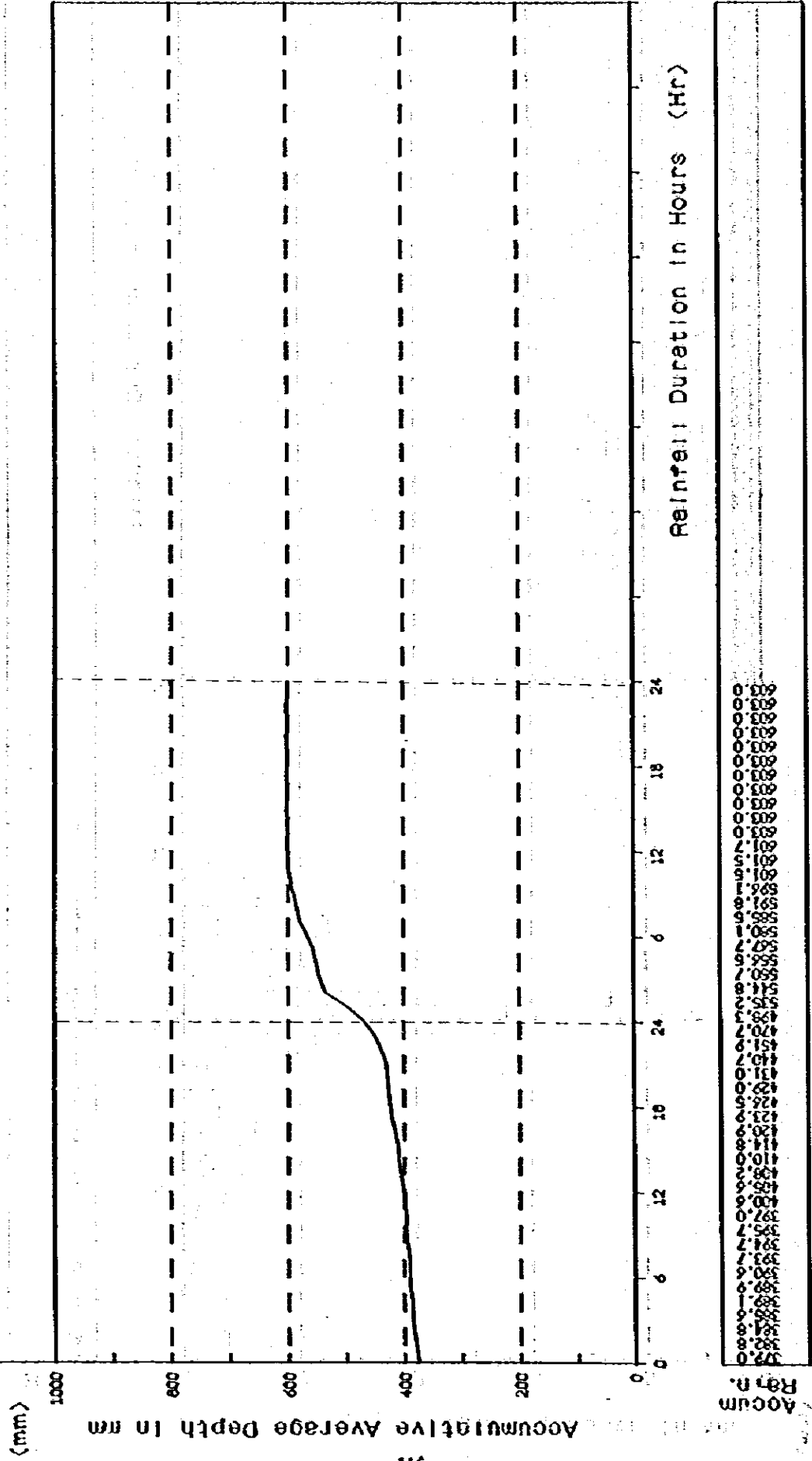
Raub

1970 . 12 . 31 ~ 1971 . 1 . 5 (Σ= 603.0 mm) (NO 2)



Raub

1970 . 12 . 31 ~ 1971 . 1 . 5 (Σ= 603.0 mm) (NO 2)



1970 . 12 . 31 ~ 1971 . 1 . 5 (Σ= 603.0 mm) (NO 2)

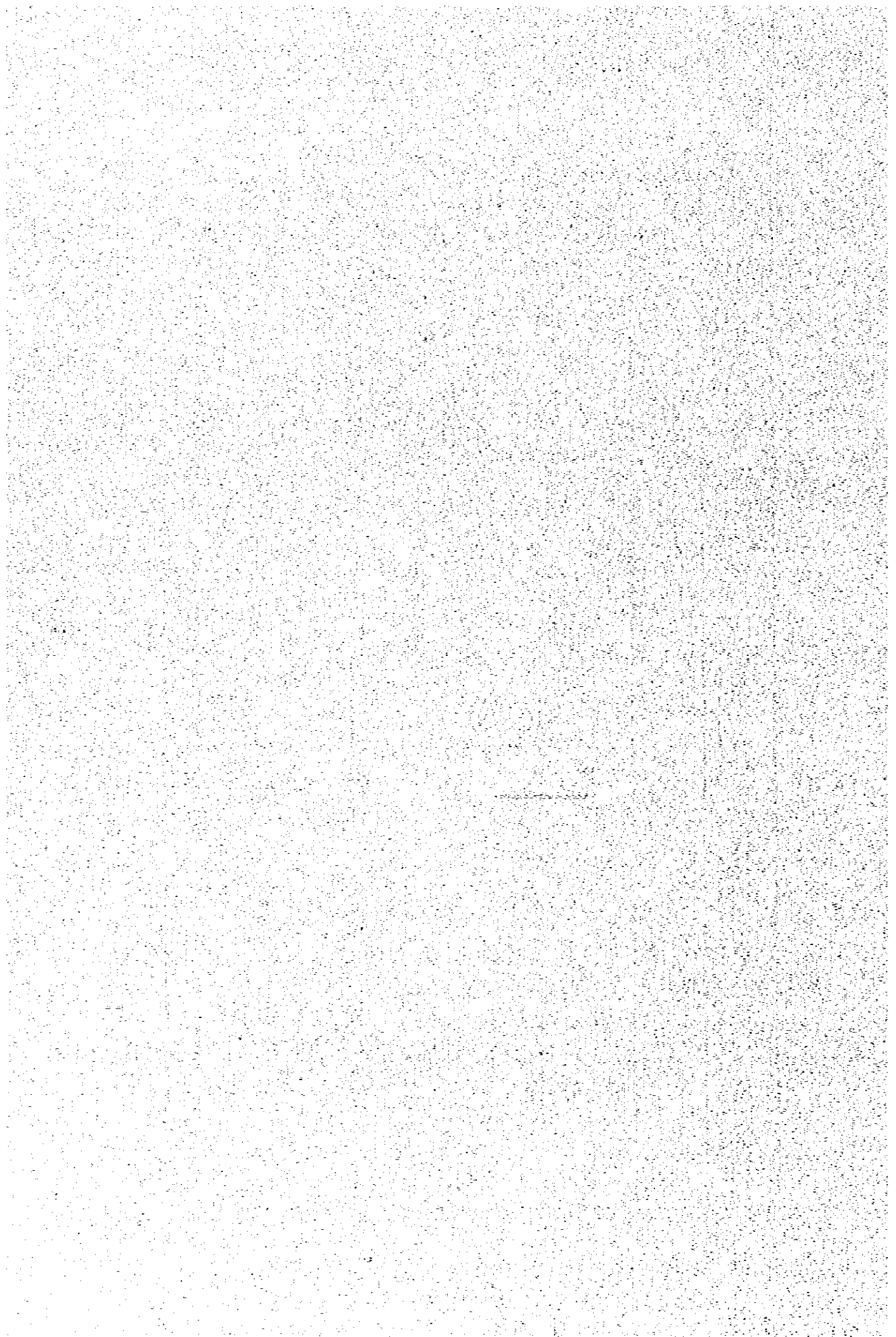
Raub

Accum. Rat. n.

97.0
98.8
99.6
101.4
103.2
105.0
106.8
108.6
110.4
112.2
114.0
115.8
117.6
119.4
121.2
123.0
124.8
126.6
128.4
130.2
132.0
133.8
135.6
137.4
139.2
141.0
142.8
144.6
146.4
148.2
150.0
151.8
153.6
155.4
157.2
159.0
160.8
162.6
164.4
166.2
168.0
169.8
171.6
173.4
175.2
177.0
178.8
180.6
182.4
184.2
186.0
187.8
189.6
191.4
193.2
195.0
196.8
198.6
200.4
202.2
204.0
205.8
207.6
209.4
211.2
213.0
214.8
216.6
218.4
220.2
222.0
223.8
225.6
227.4
229.2
231.0
232.8
234.6
236.4
238.2
240.0
241.8
243.6
245.4
247.2
249.0
250.8
252.6
254.4
256.2
258.0
259.8
261.6
263.4
265.2
267.0
268.8
270.6
272.4
274.2
276.0
277.8
279.6
281.4
283.2
285.0
286.8
288.6
290.4
292.2
294.0
295.8
297.6
299.4
301.2
303.0
304.8
306.6
308.4
310.2
312.0
313.8
315.6
317.4
319.2
321.0
322.8
324.6
326.4
328.2
330.0
331.8
333.6
335.4
337.2
339.0
340.8
342.6
344.4
346.2
348.0
349.8
351.6
353.4
355.2
357.0
358.8
360.6
362.4
364.2
366.0
367.8
369.6
371.4
373.2
375.0
376.8
378.6
380.4
382.2
384.0
385.8
387.6
389.4
391.2
393.0
394.8
396.6
398.4
400.2
402.0
403.8
405.6
407.4
409.2
411.0
412.8
414.6
416.4
418.2
420.0
421.8
423.6
425.4
427.2
429.0
430.8
432.6
434.4
436.2
438.0
439.8
441.6
443.4
445.2
447.0
448.8
450.6
452.4
454.2
456.0
457.8
459.6
461.4
463.2
465.0
466.8
468.6
470.4
472.2
474.0
475.8
477.6
479.4
481.2
483.0
484.8
486.6
488.4
490.2
492.0
493.8
495.6
497.4
499.2
501.0
502.8
504.6
506.4
508.2
510.0
511.8
513.6
515.4
517.2
519.0
520.8
522.6
524.4
526.2
528.0
529.8
531.6
533.4
535.2
537.0
538.8
540.6
542.4
544.2
546.0
547.8
549.6
551.4
553.2
555.0
556.8
558.6
560.4
562.2
564.0
565.8
567.6
569.4
571.2
573.0
574.8
576.6
578.4
580.2
582.0
583.8
585.6
587.4
589.2
591.0
592.8
594.6
596.4
598.2
600.0
601.8
603.0

Appendix F

**Estimation of Plotting-position, Iwai Method
and Curve Fitting.**



Estimation of return period by Hazen plotting

Plotting of data and return period

When a probability paper is chosen for use, the plotting of data on the paper requires the knowledge of plotting positions. Numerous methods have been proposed for the determination of the plotting position, for example, Hazen method, Weibull (or Thomas) method, Gringorton method and Chegodayev method.

Many kinds of probability graph papers are used in order to plot the data, such as normal curve paper, log normal curve paper, extreme curve paper.

If observed data are plotted by these method in log normal paper, the probability can be estimated from the plotting. When variable N hydrological data are obtained such as annual maximum rainfall or flood, they are arranged in order of magnitude.

The maximum data is named as x_1 , the second is x_2 , and the i -th is x_i in general.

If there are same value data among them, each order must be given to each data, as the total number sums up N . Taking x_1, x_2, \dots, x_N on the axis of abscissa, the rectangles which area is $1/N$ respectively can be drawn with the centers of x_1, x_2, \dots, x_N on the axis of abscissa, as shown fig.-1. If the area of all rectangles is summed up, it becomes as unit area 1.0.

A probability density curve is obtained by smoothing each rectangle. The probability on specimen beyond x_1 is $W_1=1/(2N)$, it is $W_2=3/(2N)$ beyond x_2 , and it is $W_i=(2i-1)/(2N)$ beyond x_i , in general.

The probability W_i of being equaled or exceeded in i -th data is given as the total area of right side rectangles from x_i , as shown in fig.-1 Therefore Hazen plot is obtained.

$$W_i = \frac{i-1}{N} + \frac{1}{2N} = \frac{2i-1}{2N}$$

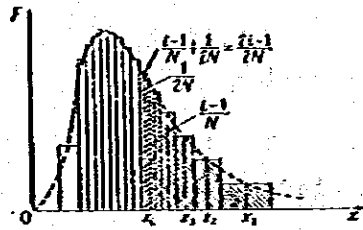


fig.-1

Where,

W_i : probability of being equalled or exceeded in i -th data

i : the rank of the event in order of magnitude (The largest event has $i=1$)

N . The number of recorded years.

In stead of probability W_i , return period T_i , is frequently used to define the design rainfall or the design flood.

Return period and probability are reciprocals.

$$T_i = 1/W_i$$

The probability of non-exceedance is one minus the probability of exceedance.

$$F_i = 1 - W_i$$

There are other various formulas for plotting positions shown as follows.

Weibull (or Thomas) $W_i = i/(N+1)$

California $W_i = i/N$

Gringorten $W_i = (i-0.44)/(N+0.12)$

Chengodayev $W_i = (i-0.3)/(N+0.4)$

Iwai method

This method is derived from lognormal distribution by applying the experimental distribution.

$$F(x) = \frac{1}{\sqrt{\pi}} \int_{-\infty}^{\xi} e^{-\xi^2} d\xi$$

$$\xi = a \log_{10} \frac{x+b}{x_0+b}, \quad (-b < x < \infty)$$

• Fundamental equation;

$$\log_{10}(x+b) = \log_{10}(x_0+b) + \frac{1}{a}\xi$$

where, a, b, x_0 : constants

• Estimation of the constants;

$$b = \frac{1}{m} \sum_{i=1}^m b_s, \quad (m = \frac{N}{10})$$

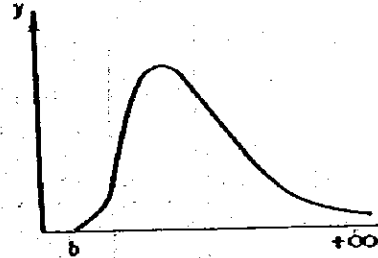
$$b_s = \frac{x_l x_s - x_q^2}{2x_l - (x_l + x_s)}, \quad (l + s = N + 1)$$

$$\log_{10} x_q = \frac{1}{N} \sum_{i=1}^N \log_{10} x_i$$

$$\log_{10}(x_0 + b) = \frac{1}{N} \sum_{i=1}^N \log_{10}(x_i + b) = \bar{Y}$$

$$\frac{1}{a} = \sqrt{\frac{2}{N-1} \sum_{i=1}^N \left(\log_{10} \frac{x_i + b}{x_0 + b} \right)^2} = \sqrt{\frac{2N}{N-1}} \cdot S_x$$

$$S_x = \sqrt{\frac{1}{N} \sum_{i=1}^N \left\{ \log_{10}(x_i + b) \right\}^2 - \left\{ \log_{10}(x_0 + b) \right\}^2} = \sqrt{\frac{1}{Y^2} - \left(\frac{1}{Y} \right)^2}$$



Relation between N and ξ

$$\frac{100}{W(\%)} = N \rightarrow \xi$$

N (年)	ξ	N (年)	ξ	N (年)	ξ	N (年)	ξ	N (年)	ξ
2	0.0060	37	1.3623	72	1.5560	107	1.6629	260	1.8847
3	0.3045	38	1.3702	73	1.5597	108	1.6654	270	1.8936
4	0.4769	39	1.3782	74	1.5635	109	1.6678	280	1.9029
5	0.5951	40	1.3860	75	1.5672	110	1.6701	290	1.9105
6	0.6858	41	1.3932	76	1.5709	111	1.6725	300	1.9184
7	0.7547	42	1.4008	77	1.5745	112	1.6749	310	1.9260
8	0.8134	43	1.4079	78	1.5780	113	1.6772	320	1.9335
9	0.8634	44	1.4145	79	1.5815	114	1.6795	330	1.9407
10	0.9062	45	1.4213	80	1.5843	115	1.6818	340	1.9476
11	0.9442	46	1.4276	81	1.5883	116	1.6841	350	1.9542
12	0.9780	47	1.4342	82	1.5917	117	1.6863	360	1.9606
13	1.0084	48	1.4404	83	1.5950	118	1.6885	370	1.9672
14	1.0361	49	1.4454	84	1.5982	119	1.6907	380	1.9733
15	1.0614	50	1.4520	85	1.6014	120	1.6929	390	1.9792
16	1.0849	51	1.4578	86	1.6045	125	1.7034	400	1.9850
17	1.1065	52	1.4634	87	1.6077	130	1.7135	410	1.9906
18	1.1263	53	1.4693	88	1.6108	135	1.7232	420	1.9961
19	1.1455	54	1.4746	89	1.6138	140	1.7324	430	2.0014
20	1.1630	55	1.4793	90	1.6168	145	1.7414	440	2.0067
21	1.1793	56	1.4843	91	1.6193	150	1.7499	450	2.0118
22	1.1955	57	1.4901	92	1.6228	155	1.7582	460	2.0166
23	1.2102	58	1.4952	93	1.6257	160	1.7662	470	2.0213
24	1.2245	59	1.4999	94	1.6285	165	1.7739	480	2.0260
25	1.2380	60	1.5047	95	1.6314	170	1.7814	490	2.0305
26	1.2509	61	1.5094	96	1.6342	175	1.7885	500	2.0350
27	1.2633	62	1.5141	97	1.6369	180	1.7955	510	2.0395
28	1.2749	63	1.5180	98	1.6396	185	1.8023	520	2.0437
29	1.2861	64	1.5231	99	1.6423	190	1.8089	530	2.0481
30	1.2967	65	1.5274	100	1.6450	195	1.8153	540	2.0524
31	1.3069	66	1.5317	101	1.6476	200	1.8215	550	2.0565
32	1.3170	67	1.5359	102	1.6502	210	1.8272	560	2.0605
33	1.3270	68	1.5400	103	1.6528	220	1.8328	570	2.0645
34	1.3359	69	1.5441	104	1.6554	230	1.8384	580	2.0683
35	1.3453	70	1.5481	105	1.6579	240	1.8438	590	2.0720
36	1.3537	71	1.5521	106	1.6604	250	1.8491	600	2.0756

Curve Fitting

After the hydrologic data are plotted on a probability paper, a curve may be fitted to the plotted points. The curve is a straight line if linearization of the distribution is attempted. The straight line can be essentially represented by Eq. (1). Curve fitting may be done either mathematically or graphically. In general, a mathematical curve fitting can be achieved by three methods: the method of moments, the method of least squares, and the method of likelihood. Of course, the mathematical fitting does not necessarily require data plotting on a probability paper. By graphical fitting, a straight line is simply drawn to fit the plotted data by eye-fit, and this method is the simplest but involves human error.

$$x = \bar{x} + \sigma k \dots\dots (1)$$

- x : variaty
- \bar{x} : the mean
- σ : standard deviation
- k : frequency factor

Method of Moments

By this method, the statistical parameters or moments are computed from the data and then substituted in the probability function of the given distribution. This method gives a theoretically exact fitting but the accuracy can be substantially affected by any errors involved in the data at the tails of the distribution where the moment arms are long and the errors are thus magnified. The method originally proposed by Gumbel to fit Type I extremal distribution is a method of moments. Liebelin modified this method by order statistics and developed a procedure which maintains the original time order of the extreme-value series, divides the values into subgroups, and then weighs each observation according to its ordered rank in the subgroup which in turn is a function of the sample size. Hershfield made a comparison of the two procedures and concluded that the Gumbel

procedure gives a better estimate beyond the range of data for the really independent data tests, but overestimates the longer recurrence-intervals in the dependent data tests.

Method of Least Squares

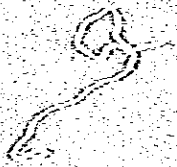
By this method, a regression line is computed to fit the plotted data. The curve so obtained may not represent the exact theoretical distribution but it gives a better overall fit than the method of moments. For extremal distributions, Gumbel introduced a modified least-squares method by minimizing both vertical and horizontal deviations and taking the geometric mean of the parameters obtained from the two minimizations. Based on the general equation for hydrologic frequency analysis, Eq. (1), proposed by Chow, a least-squares procedure for fitting a normal, lognormal, or extremal distribution was developed by Brakensiek.

Method of Maximum Likelihood

By this method, the value of a parameter is determined to make the probability of obtaining the observed outcome as high as possible. Mathematically, $\partial \log p(x)/\partial u = 0$, where $p(x)$ is probability density and u is a statistical parameter. This method provides the best estimate of the parameters but it is usually very complicated for practical application. Kimball has suggested this method for fitting extremal distributions, and a practical procedure was later developed by Panchang and Aggarwal.

Appendix G

Tank Model



TANK MODEL METHOD

Explanation

The tank model is intended for calculation of a run-off with the catchment area of a river substituted by a combination of a number of storage type model vessels (or called tanks in the following). It was proposed by Dr. Masami Sugawara. For example, let's consider a model of four tanks arranged in series as illustrated in Fig. 2.1. The outlets on the right hand side of the respective tanks represent run-offs and that at the bottom represents an infiltration.

A precipitation at a given time $R(t)$ is added to the uppermost tank V_1 . The water reserved in the tank V_1 runs off through the outlets on the right hand side or infiltrates through the outlet at the bottom into the tank V_2 in the second stage. The storage water in the tank V_2 supplied from the tank V_1 then runs-off through the outlets on the right hand side or infiltrates through the outlet at the bottom into the tank V_3 in the third stage. The process is repeated to the last tank.

The model may be readily understood when it is considered in reference to the mechanism of run-off in a basin shown schematically in Fig. 2.2.

Rain wets the soil layer on the surface of the ground. When the surface layer contains water more or less, the rain water flows over the ground surface. In the model of Fig. 2.1, the outlet provided slightly above the bottom on the right hand side of the tank V_1 corresponds to such run-off.

When the rainfall continues so that the surface layer contains water sufficiently, the surface run-off increases. This corresponds to the upper outlet on the right hand side of the tank V_1 .

The water contained in the surface layer continues to infiltrate into the lower side, and this is represented by the outlet provided at the bottom of the tank V_1 .



Fig. 1 Tank model in serial four stages



Fig. 2 Schematic representation of the mechanism of run-off in a catchment area

The water infiltrating from the surface layer stays in a first aquifer. When such water accumulates in excess of a certain limit, it begins to run-off from the aquifer. Water seeping out of a mountain-side is an example. This corresponds to the run-off from the tank V_2 .

The water infiltrating further from the first aquifer to the lower side stays in a second aquifer and presents a similar behavior to that in the first aquifer. Water seeping out of a mountain foot is a typical example. This is represented by the run-off from the tank V_3 .

Water infiltrating further below is stabilized as underground water and runs off gently at the time of a low or droughty water level of river. This is represented by the run-off from the tank V_4 .

The total of the run-offs from the outlets on the right hand side of the respective tanks is given as a value of calculation for the run-off of the catchment area.

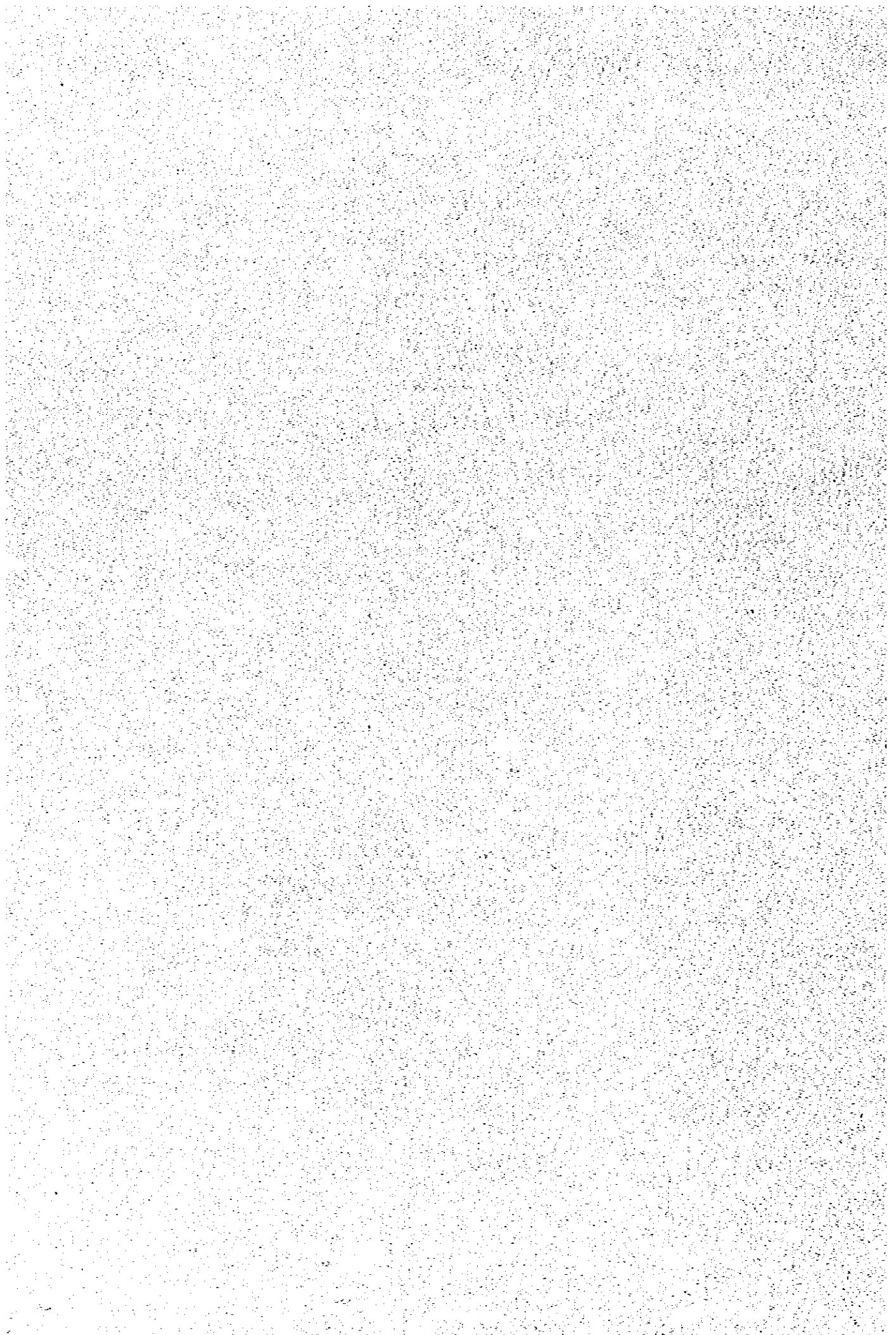
Thus, seeing the tanks in the model against the run-off components, the tank V_1 in the uppermost stage corresponds approximately to the

surface run-off, the tank V_2 in the second stage to the intermediate run-off, and the tanks V_3 and V_4 in the third stage and after to the base flow discharge.

In the tank model, three to four tanks are arranged in series generally, as illustrated in the foregoing. However, various arrangements of tanks can be considered according to the characteristics of the basin.

Appendix H

Storage Function Method



STORAGE FUNCTION METHOD

I. Outline of storage function method

The storage function method is a run-off calculation to obtain flood discharge from the rainfall which has fallen into the river basin or the inflow discharge to a river channel. This method was proposed by Dr. T. Kimura and it has been widely applied in Japan for flood routing.

As the flood run-off is non-linear feature it has an advantage to express a storage characteristic between rainfall and run-off like tank model method. And it can show the actual feature of flood run-off flow which changes slowly as unsteady flow, if its coefficients are determined properly by water level records.

1. Basic equation

If flood run-off is assumed by Manning's formula, the storage amount (S_1) of a river basin or a river channel is expressed as an exponential function of run-off discharge (Q_1).

$$S_1 = K \cdot Q_1^P$$

where, K, P : Constants for a basin or a channel

This equation of motion is combined with the following continuous equation for a river basin or a river channel.

(1) for river basin

$$\frac{1}{3.6} f \cdot R_{ave} \cdot A - Q_1 = \frac{d}{dt} S_1$$

where, f : Inflow coefficient

R_{ave} : Average rainfall in the basin (mm/hr)

A : Catchment area at the calculated point (km²)

T_1 : Lag time (hr)

$$Q_1(t) = Q(t+T_1) \quad (\text{m}^3/\text{sec})$$

Run-off discharge subtracting a certain base flow from the river basin after lag time considered

S_1 : Apparent storage amount in the basin

(2) for river channel

$$\sum_{j=1}^n f_j I_j - Q_1 = \frac{d}{dt} S_1$$

where, I_j : Inflow discharge into the channel from the basin, tributaries and/or upper boundary of the channel (m^3)

f_j : Inflow coefficient

T_1 : Lag time (hr)

$Q_1(t) = Q(t+T_1)$ (m^3/sec)

Discharge at lower boundary of channel after lag time

S_1 : Apparent storage in channel

2. Division and layout of river basins and river channels

A river basin is divided into smaller basins when its catchment area is extremely large or when the discharge from such smaller basin as tributary, upstream of water level gauging station or upstream of dam is needed.

The application range of storage function is $10 \sim 1,000 km^2$ in basin area, however, a basin is usually divided into smaller basin than $500 km^2$. For the storage function in river channel, $10 \sim 100 km$ is preferable in the length of river channel.

Appendix I

Monthly rainfall data used in analysis

Daily rainfall data at Kg. Merting

Recorded hydrograph in 1972 Flood



STATION NC- 3629098

	1	2	3	4	5	6	7	8	9	10	11	12
1970	231.60	19.30	142.50	262.70	274.80	66.00	110.70	179.30	279.90	294.60	283.50	617.20
1971	664.20	162.60	169.60	184.90	236.70	66.30	161.80	209.00	223.30	297.70	148.80	701.00
1972	39.70	162.50	152.60	177.60	115.00	125.60	158.10	178.50	295.70	261.40	165.60	535.20
1973	113.70	285.20	154.90	256.00	144.40	153.50	283.80	198.60	274.10	177.30	195.10	136.90
1974	229.50	278.20	174.50	234.50	159.50	174.50	208.70	154.00	209.10	261.10	589.50	121.00
1975	12.00	1.00	174.50	169.50	180.50	170.00	115.00	123.00	154.50	208.50	169.50	4.00
1976	99.00	131.00	30.50	131.50	252.50	157.50	142.50	194.00	266.50	276.50	295.50	224.00
1977	148.50	186.00	49.50	184.50	261.50	99.00	82.50	162.50	237.00	159.00	438.00	0.00
1978	111.00	179.50	190.50	184.50	268.50	94.00	129.50	129.60	237.50	304.00	179.00	60.00
1979	178.00	179.50	200.00	180.50	268.50	251.00	129.50	169.60	268.50	371.50	438.00	257.00
1980	178.00	179.50	200.00	180.50	268.50	251.00	129.50	169.60	268.50	371.50	438.00	257.00

STATION NC- 3726089

	1	2	3	4	5	6	7	8	9	10	11	12
1970	0.00	0.00	0.90	0.80	4.60	0.70	0.90	0.00	0.40	0.80	0.00	0.00
1971	68.70	35.70	103.70	257.80	18.60	0.70	218.00	271.50	233.40	287.80	294.60	659.20
1972	62.00	153.10	162.30	229.10	117.10	66.30	39.30	199.50	303.80	301.80	186.10	462.20
1973	10.50	191.20	162.30	229.10	117.10	66.30	39.30	199.50	303.80	301.80	186.10	462.20
1974	15.50	120.40	162.30	229.10	117.10	66.30	39.30	199.50	303.80	301.80	186.10	462.20
1975	57.50	120.40	162.30	229.10	117.10	66.30	39.30	199.50	303.80	301.80	186.10	462.20
1976	142.50	102.50	188.00	224.00	112.50	66.30	39.30	199.50	303.80	301.80	186.10	462.20
1977	192.50	123.50	188.00	224.00	112.50	66.30	39.30	199.50	303.80	301.80	186.10	462.20
1978	95.50	78.50	137.00	127.00	75.00	66.30	39.30	199.50	303.80	301.80	186.10	462.20
1979	95.50	78.50	137.00	127.00	75.00	66.30	39.30	199.50	303.80	301.80	186.10	462.20
1980	95.50	78.50	137.00	127.00	75.00	66.30	39.30	199.50	303.80	301.80	186.10	462.20

DAYA KAMGSAR
STATION NO. 3924072

	1	2	3	4	5	6	7	8	9	10	11	12
1970	0.00	0.30	0.90	0.10	0.20	0.80	96.00	13.60	238.30	373.60	244.30	518.90
1971	0.00	114.40	137.10	56.30	234.20	92.80	127.90	318.00	322.90	203.20	224.00	674.90
1972	121.70	184.20	213.60	164.10	194.30	162.20	123.70	268.50	325.90	224.00	145.00	340.10
1973	121.70	149.20	213.60	357.10	119.40	195.80	183.10	279.70	171.20	288.80	196.20	338.60
1974	122.50	180.10	248.00	256.00	224.50	184.50	141.50	141.50	168.10	198.10	343.50	176.00
1975	160.00	201.50	262.50	144.50	268.00	141.50	195.00	179.40	237.00	173.00	390.50	132.50
1976	25.00	15.50	62.50	20.50	88.50	180.00	48.00	247.00	136.50	235.00	185.50	292.00
1977	191.50	169.00	148.50	83.50	117.50	175.50	39.50	65.00	136.50	234.50	253.50	167.50
1978	191.50	49.00	185.00	137.00	108.00	167.50	170.00	71.00	195.50	455.50	339.50	269.00
1980	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

SEK KEB. TEMBELING
STATION NO. 4023117

	1	2	3	4	5	6	7	8	9	10	11	12
1970	119.90	35.80	148.80	158.40	71.60	267.90	47.50	90.40	334.00	180.80	170.40	619.30
1971	122.10	18.50	48.80	1.00	58.10	96.50	180.80	139.40	155.70	0.00	203.90	0.00
1972	40.80	140.40	48.80	105.90	29.50	20.80	1.30	170.10	51.80	73.60	145.50	0.00
1973	0.80	0.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1974	3.90	52.80	108.20	237.50	168.70	172.20	214.30	97.50	150.60	261.40	323.60	170.10
1975	30.90	145.00	190.40	397.10	157.20	170.60	180.00	73.00	144.00	263.00	438.50	132.50
1976	30.50	115.00	62.50	188.00	146.00	187.50	180.00	210.00	248.00	334.00	99.50	256.00
1977	66.50	115.00	96.00	196.00	116.50	194.00	131.50	40.00	143.00	141.50	202.00	77.00
1978	72.50	22.50	37.00	303.00	181.00	95.50	171.50	89.50	130.50	141.50	257.50	230.00
1980	53.50	20.50	139.50	184.00	211.00	76.50	165.50	182.50	124.50	234.00	383.00	256.00

KG. CHEBONG
STATION NO. 4123116

Year	1	2	3	4	5	6	7	8	9	10	11	12
1970	0	0	0	0	0	0	0	0	0	0	0	0
1971	321	05	166	86	253	183	307	81	271	199	123	31
1972	56	40	66	20	10	83	27	87	69	86	112	99
1973	44	30	70	70	108	98	53	46	36	116	186	281
1974	184	70	0	156	208	308	90	110	283	221	235	288
1975	366	70	0	170	328	98	90	110	220	225	350	175
1976	41	50	119	152	171	105	50	112	143	173	581	269
1977	82	50	2	143	201	200	50	60	75	170	167	172
1978	22	00	43	94	145	300	50	33	84	101	289	173
1979	0	00	120	145	177	30	50	174	174	220	297	183
1980	0	00	102	145	139	30	50	129	174	209	297	183

ULU TEKAI "B"
STATION NO. 4127001

Year	1	2	3	4	5	6	7	8	9	10	11	12
1970	0	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0	0	0
1975	195	00	30	246	250	184	56	0	0	29	306	123
1976	0	00	156	153	105	0	0	0	0	0	0	0
1977	0	00	166	110	96	64	0	0	0	0	0	0
1978	0	00	10	68	90	61	30	196	176	138	156	257
1979	0	00	0	68	142	61	0	0	0	0	0	0
1980	0	00	0	68	142	61	0	0	0	0	0	0

