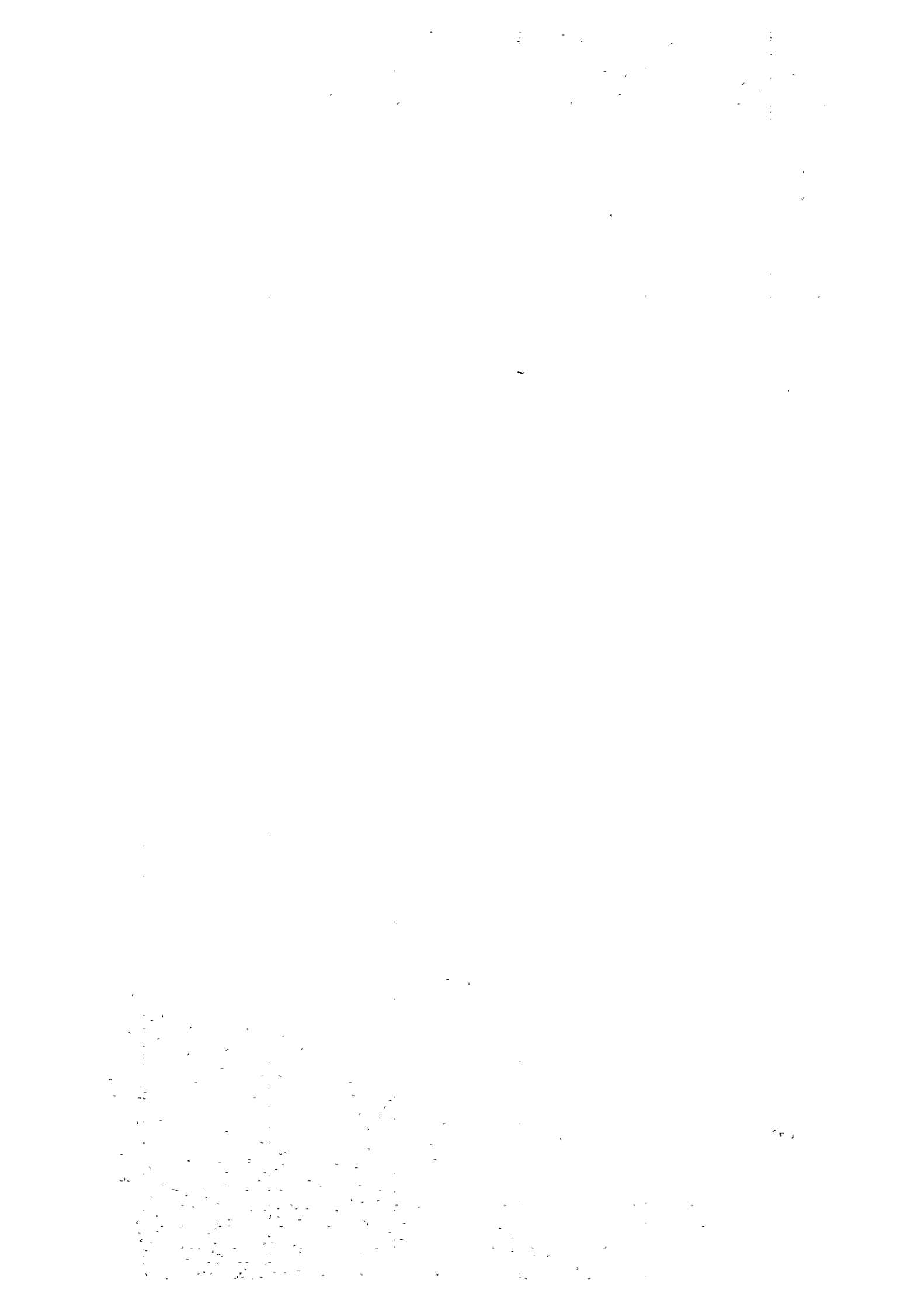


FEASIBILITY REPORT
ON
THE MAE KUANG IRRIGATED AGRICULTURE
DEVELOPMENT PROJECT
IN
THE KINGDOM OF THAILAND
(APPENDIX)

FEBRUARY 1982

JAPAN INTERNATIONAL COOPERATION AGENCY



JICA LIBRARY



1030925[0]

FEASIBILITY REPORT
ON
THE MAE KUANG IRRIGATED AGRICULTURE
DEVELOPMENT PROJECT
IN
THE KINGDOM OF THAILAND
(APPENDIX)

FEBRUARY 1982

JAPAN INTERNATIONAL COOPERATION AGENCY

AFT
CR (5)
82-17

No.13810

122

83.3

AFT

国際協力事業団	
船名 57.8.1 84.9.25	122
登録No. 19006	83.3
	AFT

CONTENTS

- Appendix A. Meteorology and Hydrology
- Appendix B. Soil
- Appendix C. Geology
- Appendix D. Irrigation and Drainage
- Appendix E. Reservoir Plan, Hydro-Power Generation and Flood Control
- Appendix F. Agriculture and Supporting Services
- Appendix G. Dam and Canal
- Appendix H. Construction Materials
- Appendix I. Cost Estimates
- Appendix J. Project Implementation
- Appendix K. Agro-Economy

1. The first part of the document discusses the importance of maintaining accurate records of all transactions and activities. It emphasizes that this is crucial for ensuring transparency and accountability in the organization's operations.

2. The second part of the document outlines the various methods and tools used to collect and analyze data. It highlights the need for consistent and reliable data collection processes to support informed decision-making.

3. The third part of the document focuses on the role of technology in modern data management. It discusses how advanced software solutions can streamline data collection, storage, and analysis, leading to more efficient and accurate results.

4. The fourth part of the document addresses the challenges associated with data management, such as data quality, security, and privacy. It provides strategies to mitigate these risks and ensure that data is used responsibly and ethically.

5. The fifth part of the document concludes by summarizing the key findings and recommendations. It stresses the importance of ongoing monitoring and evaluation to ensure that data management practices remain effective and up-to-date.

APPENDIX A. METEOROLOGY AND HYDROLOGY

APPENDIX A METEOROLOGY AND HYDROLOGY

Table A 1	Mean Monthly Sunshine Hours Duration at Chiang Mai
Table A 2	Mean Monthly Short-wave Solar Radiation of Chiang Mai
Table A 3	Correlation of Monthly Rainfalls
Table A 4-1	Monthly Rainfall Record at A. Muang, Chiang Mai (07013)
Table A 4-2	Monthly Rainfall Record at A. Sarapi, Chiang Mai(07022)
Table A 4-3	Monthly Rainfall Record at A. San Kamphaeng, Chiang Mai (07032)
Table A 4-4	Monthly Rainfall Record at A. San Sai, Chiang Mai (07042)
Table A 4-5	Monthly Rainfall Record at A. Doi Saket, Chiang Mai (07052)
Table A 4-6	Monthly Rainfall Record at A. Hang Dong, Chiang Mai (07072)
Table A 4-7	Monthly Rainfall Record at A. San Pa Tong, Chiang Mai (07082)
Table A 4-8	Monthly Rainfall Record at A. Phrao, Chiang Mai (07122)
Table A 4-9	Monthly Rainfall Record at Kaeng Kut (P.13), A. Mae Taeng, Chiang Mai (07331)
Table A 4-10	Monthly Rainfall Record at Mae Kuang (P.25), A. Doi Saket, Chiang Mai (07341)
Table A 4-11	Monthly Rainfall Record at Mae Ngat (P.28), A. Mae Taeng, Chiang Mai (07361)
Table A 4-12	Monthly Rainfall Record at RID Office, A. Muang, Chiang Mai (07391)
Table A 4-13	Monthly Rainfall Record at Tail Regulator of Mae Fack Project (07460)
Table A 4-14	Monthly Rainfall Record at Huai Mae Lai (P.36), A. San Kamphaeng, Chiang Mai (07581)
Table A 4-15	Monthly Rainfall Record at A. Muang, Lamphun (17012)
Table A 4-16	Monthly Rainfall Record at A. Mae Tha, Lamphun (17042)
Table A 5-1	Annual Maximum Daily Rainfall at A. Muang, Chiang Mai (07013)
Table A 5-2	Annual Maximum Daily Rainfall at A. Sarapi, Chiang Mai (07022)
Table A 5-3	Annual Maximum Daily Rainfall at A. San Kamphaeng, Chiang Mai (07032)
Table A 5-4	Annual Maximum Daily Rainfall at A. San Sai, Chiang Mai (07042)

Table A 5-5	Annual Maximum Daily Rainfall at A. Doi Saket, Chiang Mai (07052)
Table A 5-6	Annual Maximum Daily Rainfall at A. Hang Dong, Chiang Mai (07072)
Table A 5-7	Annual Maximum Daily Rainfall at A. San Pa. Tong, Chiang Mai (07082)
Table A 5-8	Annual Maximum Daily Rainfall at A. Prao, Chiang Mai (07122)
Table A 5-9	Annual Maximum Daily Rainfall at Mae Kuang (P.25), A. Doi Saket, Chiang Mai (07341)
Table A 5-10	Annual Maximum Daily Rainfall at RID Office, A. Muang, Chiang Mai (07391)
Table A 5-11	Annual Maximum Daily Rainfall at Tail Regulator of Mae Fack Project (07460)
Table A 5-12	Annual Maximum Daily Rainfall at Huai Mae Lai (P.36), A. San Kamphaeng, Chiang Mai (07581)
Table A 5-13	Annual Maximum Daily Rainfall at A. Muang, Lamphun (17012)
Table A 5-14	Annual Maximum Daily Rainfall at A. Mae Tha, Lamphun (17042)
Table A 6-1	Monthly Runoff Record at P-1 Gaging Station
Table A 6-2	Monthly Runoff Record at P-5 Gaging Station
Table A 6-3	Monthly Runoff Record at P-13 Gaging Station
Table A 6-4	Monthly Runoff Record at P-30 Gaging Station
Table A 6-5	Monthly Runoff Record at P-34 Gaging Station
Table A 6-6	Monthly Runoff Record at P-36 Gaging Station
Table A 6-7	Monthly Runoff to Mae Kuang Weir (P.25)
Table A 6-8	Monthly Runoff Record through Mae Kuang Weir (P.25)
Table A 6-9	Monthly Total Diverted Flow at Mae Kuang Weir (P.25)
Table A 6-10	Monthly Diverted Flow to Koh Matan Canal (P.25A)
Table A 6-11	Monthly Diverted Flow to Muang Wa Canal (P.25B)
Table A 6-12	Monthly Diverted Flow to Pha Taek Canal (P.25C)
Table A 6-13	Correlation of Monthly Runoff at P-13 and P-34
Table A 7-1	Annual Maximum Discharge at P-1 Gaging Station
Table A 7-2	Annual Maximum Discharge at P-5 Gaging Station
Table A 7-3	Annual Maximum Discharge at P-19.A Gaging Station
Table A 7-4	Annual Maximum Discharge at P-30 Gaging Station
Table A 7-5	Annual Maximum Discharge at P-34 Gaging Station

Table A 8-1	Flood Situation in the Mae Kuang Basin in 1969
Table A 8-2	Flood Situation in the Mae Kuang Basin in 1970
Table A 8-3	Flood Situation in the Mae Kuang Basin in 1971
Table A 8-4	Flood Situation in the Mae Kuang Basin in 1973
Table A 8-5	Flood Situation in the Mae Kuang Basin in 1975
Table A 9	Runoff Coefficients of Recorded Floods
Table A 10-1	Hourly Record of Flood (August 1970)
Table A 10-2	Hourly Record of Flood (August 1973)
Table A 10-3	Hourly Record of Flood (September 1974)
Table A 10-4	Hourly Record of Flood (August 1975)
Table A 10-5	Hourly Record of Flood (July 1978)
Table A 11	Probable Design Rainfalls for Flood Estimation
Table A 12	Flood Computation program by Unit Hydrograph
Table A 13	Data for Flood Computation Program
Table A 14	Design Flood Discharge
Table A 15	Estimated Monthly Suspended Sediment Yield at P-34 Gauging Station
Figure A 1	Detail Basin Boundary of Mae Kuang River
Figure A 2	Correlation Between Reservoir Inflow and Rainfall at Chiang Mai
Figure A 3	Profile of Mae Ping River
Figure A 4	Cross-section of Mae Ping River
Figure A 5	Profile of Mae Kuang River
Figure A 6	Cross-section of Mae Kuang River
Figure A 7-1	Cross-section and Rating Curve at P-1 Gauging Station
Figure A 7-2	Cross-section and Rating Curve at P-5 Gauging Station
Figure A 7-3	Cross-section and Rating Curve at P-30 Gauging Station
Figure A 7-4	Cross-section and Rating Curve at P-34 Gauging Station
Figure A 8	Verification of Applied Runoff Models
Figure A 9-1	Flood Hydrograph (August 1970)
Figure A 9-2	Flood Hydrograph (August 1973)
Figure A 9-3	Flood Hydrograph (September 1974)
Figure A 9-4	Flood hydrograph (August 1975)
Figure A 9-5	Flood Hydrograph (July 1978)

- Figure A 10 Applied Tank Model at Mae Kuang Dam Site
- Figure A 11 Applied Unit Hydrograph at Mae Kuang Dam Site
- Figure A 12 Suspended Sediment Rating Curve of Mae Kuang River at P-34 Gauging Station

Table A 1 Mean Monthly Sunshine Hours Duration at Chiang Mai (Unit: hours/day)

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Annual Mean
1953	7.2*	7.3*	5.1*	6.3*	5.6*	6.0*	5.8*	5.9*	6.1*	5.8*	6.3*	7.4*	6.2
1954	6.2*	9.8	9.0	8.5	6.7	5.9	5.6	3.8	6.0	8.5	7.3	7.7	7.1
1955	7.8	8.5	8.9	8.2	7.7	4.5	4.7	3.6	5.8	7.7	7.1	9.2	7.0
1956	9.4	9.3	9.6	7.5	6.7	6.4	4.9	4.5	5.7	7.1	8.1	8.8	7.3
1957	9.2	8.8	9.4	9.5	8.6	4.1	4.7	5.9	6.5	7.6	9.2	10.0	7.8
1958	8.9	9.7	8.9	9.6	8.6	5.8	4.1	5.8	5.5	7.0	8.5	8.7	7.6
1959	8.9	10.3	9.2	8.7	7.5	6.5	4.4	3.7	4.9	8.3	9.5	9.0	7.6
1960	8.0	9.5	9.4	9.3	7.4	6.5	5.6*	3.6	4.6	5.0	7.8	7.7	7.0
1961	9.1	4.2	9.0	8.8	6.8	4.0	3.8	3.2	4.2	6.7	8.6	8.9	6.5
1962	8.7	9.8	9.2	8.9	8.4	4.8	5.2	2.5	5.8	7.4	9.3*	9.3*	7.4
1963	6.2	8.6	8.9	9.1	9.4	4.2	2.7	4.6	6.3	6.5	9.4	8.5	7.0
1964	10.2	10.0	9.0	9.1	7.7	6.8	5.1	4.8	5.1	6.6	6.9	9.3	7.5
1965	10.0	9.9	9.6	9.8	8.5	4.1	5.2	5.8	6.5	7.5	9.4	7.5	7.8
1966	8.7	10.1	9.9	10.1	6.6	6.1	4.4	3.6	7.1	7.5	8.9	9.2	7.7
1967	8.2	9.6	9.4	9.0	7.7	7.4	5.7	5.5	4.6	8.0	8.7	8.2	7.7
1968	9.5	10.4	9.5	8.6	8.4	6.0	6.6	4.9	6.8	7.1	9.3	9.6	8.0
1969	8.8	10.4	9.7	9.3	7.8	6.3	4.4	5.1	7.1	8.0	7.3	8.9	7.7
1970	9.5	10.2	10.0	9.0	7.7	6.2	3.7	4.2	5.7	7.0	7.2	7.3	7.3
1971	9.4	10.0	8.7	9.9	7.9	4.9	3.8	3.6	6.9	7.2	8.9	8.9	7.5
1972	9.2	10.5	9.4	8.8	8.6	7.0	4.4	4.3	6.5	7.7	6.7	7.7	7.5
Average	8.7	9.3	9.1	8.9	7.7	5.7	4.7	4.4	5.9	7.2	8.2	8.6	7.4

* Missing Data

Missing data were obtained by linear correlation as follows:

- For months Jan. 1953 to Jan. 1954 based on Vientiane data using formula:

Chiang Mai = $2.327 + 0.771 \times$ (Vientiane) with a correlation coefficient of 0.67

- For the month Jul. 1960 based on Bangkok data using formula:

Chiang Mai = $0.000 + 1.013 \times$ (Bangkok) with a correlation coefficient of 0.85

- For months Nov. 1962 and Dec. 1962 based on Chiang Rai data using formula:

Chiang Mai = $0.166 + 1.077 \times$ (Chiang Rai) with a correlation coefficient of 0.91

Source: Meteorological Department of Thailand

Analized and Reported by: Summary of Monthly and Yearly Hydro-meteorological Dat in the Thai Part of the

Lower Mekong Basin Committee for Coordination of Investigations of the Lower

Mekong Basin October 1975

Table A 2 Mean Monthly Short-wave Solar Radiation at Chiang Mai

(Unit: cal/cm²/day)

Year	Month												Annual Mean
	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
1958	393	438	423	494	506	445	391	458	439	444	429	415	439
1959	405	493	480	474	505	476	393	363	394	475	481	429	447
1960	-	-	-	-	-	-	-	-	-	-	-	-	-
1961	-	-	-	-	-	-	-	-	-	-	-	-	-
1962	-	-	-	-	-	-	-	-	-	-	-	-	-
1963	-	-	-	-	-	-	-	-	-	-	-	-	-
1964	471	448	477	489	507	494	457	428	431	441	467	351	455
1965	461	492	490	546	547	428	455	-	-	-	511	-	491
1966	398	511	542	256	-	-	-	-	-	-	-	-	427
1967	425	482	-	528	538	399	-	-	-	-	-	-	474
1968	398	462	457	443	-	-	-	-	-	-	-	-	440
1969	-	-	-	-	-	-	-	-	-	-	-	-	-
1970	325	360	406	501	528	450	434	389	367	422	370	356	411
1971	429	461	431	523	511	419	367	378	441	434	439	367	433
1972	399	463	441	526	510	476	583	368	440	441	356	361	447
Average	410	501	461	478	519	448	440	397	419	443	436	380	444

- : Missing Record. Source: Meteorological Department of Thailand

Reported by: Summary of Monthly and Yearly Hydro-meteorological Data in the Thai Part of the Lower Mekong Basin
Committee for Coordination of Investigations of the Lower Mekong Basin October 1975

Table A 3 Correlation of Monthly Rainfalls

Station	Correlation Coefficients											
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	<u>11</u>	<u>12</u>
1. A. Muang, Chiang Mai (07013)	1.00	0.80	0.82	0.91	0.88	0.88	0.84	0.78	0.90	0.97	0.82	0.78
2. A. Sarapi (07022)	0.80	1.00	0.68	0.77	0.79	0.77	0.73	0.69	0.80	0.84	0.72	0.68
3. A. San Kamphaeng (07052)	0.82	0.68	1.00	0.81	0.85	0.78	0.76	0.76	0.86	0.84	0.74	0.72
4. A. San Sai (07042)	0.91	0.77	0.81	1.00	0.88	0.89	0.83	0.78	0.89	0.95	0.78	0.77
5. A. Doi Saket (07052)	0.88	0.79	0.85	0.88	1.00	0.84	0.77	0.79	0.95	0.94	0.78	0.76
6. A. Hang Dong (07072)	0.88	0.77	0.78	0.89	0.84	1.00	0.87	0.76	0.82	0.88	0.80	0.76
7. A. San Pa Tong (07082)	0.84	0.73	0.76	0.83	0.77	0.87	1.00	0.73	0.75	0.83	0.78	0.70
8. A. Phrao (07122)	0.78	0.69	0.76	0.78	0.79	0.76	0.73	1.00	0.88	0.85	0.65	0.67
9. Mae Kuang (P-25) (07341)	0.90	0.80	0.86	0.89	0.95	0.82	0.75	0.88	1.00	0.93	0.81	0.80
10. RID Office, Chiang Mai (07391)	0.97	0.84	0.84	0.95	0.94	0.88	0.83	0.85	0.93	1.00	0.88	0.82
11. A. Muang, Lamphun (17012)	0.82	0.72	0.74	0.78	0.78	0.80	0.78	0.65	0.81	0.88	1.00	0.77
12. A. Mae Tha (17042)	0.78	0.68	0.72	0.77	0.76	0.76	0.70	0.67	0.80	0.82	0.77	1.00

Note: This analysis is conducted with the monthly records from 1952 to 1976 of water year.

Table A 4-1 Monthly Rainfall Record at A. Muang, Chiang Mai (07013)

(Unit: mm)

Water Year	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Total
1906	0.0	83.2	52.5	124.8	92.5	234.1	61.2	12.9	0.0	42.0	0.0	11.3	714.0
1907	0.0	189.2	117.9	191.7	155.8	206.8	156.6	30.4	0.7	0.0	0.0	7.3	1,050.7
1908	35.9	267.9	122.8	190.8	387.5	236.6	132.9	116.6	0.0	0.0	38.3	0.0	1,529.8
1909	5.0	200.3	120.4	343.1	245.6	248.6	176.9	68.0	0.0	0.0	0.0	93.8	1,501.7
1910	120.7	191.5	158.5	157.5	208.5	306.9	52.7	70.3	0.0	0.0	0.0	2.7	1,369.8
1911	8.7	129.2	168.0	80.3	139.3	591.6	82.2	5.4	8.1	94.8	0.0	0.0	1,303.3
1912	31.1	141.3	143.3	95.8	226.3	365.5	124.3	107.1	0.0	0.0	0.0	11.1	1,345.5
1913	18.0	68.9	82.6	120.3	157.6	209.9	126.6	94.6	10.6	0.0	0.0	0.3	889.4
1914	31.1	190.1	140.0	310.6	162.2	65.4	52.9	106.8	0.0	10.3	0.0	0.0	1,069.4
1915	92.6	79.0	70.6	92.1	148.4	99.6	123.4	117.2	46.9	0.0	0.0	0.0	869.5
1916	41.3	109.6	173.0	83.3	119.7	204.7	171.2	19.7	11.5	23.0	0.0	20.8	979.1
1917	29.4	87.6	95.9	95.3	228.8	378.8	203.6	17.0	48.8	5.9	0.0	5.6	1,196.4
1918	26.7	417.3	52.0	159.3	297.4	317.2	93.4	55.7	7.8	0.0	3.6	0.3	1,388.5
1919	9.6	179.8	177.0	206.6	186.8	114.4	194.1	19.9	5.2	0.0	0.5	71.6	1,165.5
1920	28.1	82.0	130.9	119.0	279.9	268.5	104.5	75.9	13.5	0.0	1.5	49.1	1,152.2
1921	43.5	188.5	105.6	150.7	235.0	343.8	96.6	44.2	0.0	6.0	0.0	47.0	1,260.6
1922	45.6	215.7	120.3	126.1	246.3	233.3	143.6	60.6	39.3	0.0	0.0	23.1	1,256.6
1923	81.1	202.1	207.5	67.8	171.0	94.5	310.7	48.3	0.0	14.3	0.0	84.4	1,281.1
1924	31.4	9.7	96.0	164.2	358.8	173.0	276.6	69.0	0.6	0.0	0.0	9.4	1,218.0
1925	69.8	74.0	109.8	192.5	169.0	283.2	140.0	10.5	25.3	31.8	0.0	57.2	1,162.3
1926	1.6	17.4	177.7	60.6	171.6	200.6	344.5	43.8	31.0	0.0	0.0	7.0	1,075.2
1927	46.0	440.9	122.5	201.1	125.6	173.7	275.4	13.8	0.5	0.0	19.9	1.5	1,420.9
1928	34.4	133.9	202.8	257.0	140.8	111.0	114.4	39.9	0.0	0.0	12.2	25.0	1,071.4
1929	84.2	190.4	142.6	187.2	184.8	376.9	18.3	7.2	8.7	0.0	1.7	13.4	1,215.4
1930	14.1	170.5	214.2	125.6	193.7	362.7	44.1	46.5	7.5	7.3	0.0	1.3	1,167.4
1931	12.2	19.7	55.4	102.0	198.5	135.8	38.6	0.0	3.3	0.0	0.0	21.2	586.7
1932	35.6	105.6	84.0	323.1	140.1	259.3	127.8	12.7	15.9	0.0	0.0	0.0	1,104.1
1933	10.0	152.3	46.2	269.2	282.0	293.4	118.6	14.4	0.0	0.0	14.0	0.0	1,200.5
1934	62.9	54.8	156.7	261.4	266.1	293.0	52.6	23.1	9.0	1.5	0.0	8.5	1,189.6
1935	14.8	202.7	76.4	144.1	169.0	342.6	181.7	72.4	44.3	0.0	25.8	8.3	1,282.1
1936	3.4	146.3	188.0	209.0	176.4	98.5	45.5	0.0	0.0	0.0	46.8	0.0	913.9
1937	116.3	102.2	180.6	295.2	78.2	362.5	79.1	16.5	38.2	0.0	0.0	0.0	1,368.8
1938	51.0	110.8	130.7	193.4	271.7	173.0	89.2	31.0	0.0	0.0	7.0	0.0	1,057.8
1939	24.0	12.0	90.0	228.6	287.0	247.0	59.5	95.0	0.0	0.0	0.0	0.0	1,043.1
1940	-	-	-	168.0	234.0	195.0	62.0	113.8	0.0	0.0	0.0	0.0	-

- to be continued -

Water Year	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Total
1941	5.5	130.1	93.0	62.0	191.0	157.2	182.6	3.0	0.0	0.0	0.0	33.0	857.4
1942	104.0	197.0	272.3	124.4	477.5	191.1	56.2	72.0	0.0	0.0	0.0	0.0	1,494.5
1943	38.0	92.1	125.5	-	-	-	-	-	-	1.0	54.5	0.0	-
1944	0.5	106.0	119.0	134.5	209.0	273.0	127.3	127.0	4.5	17.4	0.0	39.5	1,157.7
1945	76.0	153.1	234.0	263.5	202.5	271.3	23.2	0.0	14.0	0.0	16.0	5.2	1,258.8
1946	69.0	153.8	71.2	92.3	150.1	170.3	209.2	41.1	0.0	26.9	5.3	8.5	997.7
1947	138.6	61.8	200.8	83.2	279.5	458.3	115.2	0.0	0.0	0.0	0.0	58.7	1,396.1
1948	55.2	194.1	72.9	88.3	210.9	341.7	239.3	0.0	0.0*	0.0	0.0	0.0	1,202.4
1949	91.6	96.7	91.5	108.1	216.2	334.8	165.9	91.4	0.0	0.0	0.0	0.0	1,196.2
1950	45.9	150.0**	112.0	110.2	291.8	374.9	103.3	156.5	12.3	0.0	0.0	20.2	1,377.1
1951	41.5	144.7	190.8	260.4	163.3	296.7	216.5	74.6	13.8	0.0	0.0	68.1	1,470.4
1952	0.0	175.9	200.0	107.0	229.7	225.5	123.4	39.8	0.0	20.0	74.2	0.0	1,195.5
1953	152.1	156.6	338.1	196.4	181.9	386.2	291.2	77.3	0.6	0.0	0.0	0.0	1,780.4
1954	33.4	273.8	32.5	54.0	300.2	388.4	153.9	16.5	4.9	0.0	8.5	51.2	1,217.3
1955	119.2	139.7	198.2	157.0	166.6	223.8	81.7	50.0	0.0	0.0	11.6	0.0	1,147.8
1956	39.2	311.2	136.3	223.3	206.0	341.0	50.0	4.6	0.5	0.0	0.6	0.0	1,312.7
1957	101.2	54.9	204.0	157.6	246.9	208.7	85.2	0.0	0.1	32.3	0.0	32.9	1,123.8
1958	20.4	149.5	144.1	164.4	214.7	211.8	159.3	0.5	0.0	15.4	0.0	16.9	1,097.0
1959	35.8	127.1	94.7	164.8	188.7	290.5	19.7	0.0	0.0	15.4	0.0	7.9	944.6
1960	6.1	256.1	142.2	233.9	219.1	281.9	126.3	25.0	84.9	1.8	33.3	22.5	1,433.1
1961	56.0	254.0	108.4	102.8	286.9	473.1	137.9	15.2	60.6	0.0	0.0	7.5	1,502.4
1962	28.0	8.6	57.2	211.9	136.4	265.0	248.7	8.9	0.0	0.0	1.6	0.0	966.3
1963	35.6	17.5	140.3	125.8	280.4	127.0	188.6	123.2	1.9	1.9	0.0	11.9	1,054.1
1964	62.8	153.5	88.7	225.8	124.1	292.2	134.1	19.5	1.5	0.0	0.0	0.0	1,082.2
1965	20.2	71.1	72.9	68.6	284.1	148.3	195.6	48.1	75.8	3.6	0.3	0.0	988.6
1966	7.5	140.8	56.4	202.2	236.7	131.4	77.7	5.8	0.5	6.2	0.0	2.1	867.3
1967	32.2	108.8	173.6	200.5	144.7	529.6	54.9	97.8	3.7	3.8	0.0	7.7	1,357.3
1968	122.4	123.2	245.6	150.8	301.5	184.1	110.4	9.1	0.0	5.5	0.0	0.0	1,252.6
1969	22.4	228.5	91.9	156.6	340.5	163.8	92.3	18.9	0.0	0.4	1.8	91.6	1,208.7
1970	69.9	352.0	244.9	179.4	348.7	194.7	37.8	7.1	35.1	0.0	0.0	17.2	1,486.8
1971	33.1	245.0	173.0	299.6	324.8	194.8	130.4	24.1	11.0	0.0	6.3	5.2	1,447.3
1972	156.1	65.0	91.2	70.0	264.3	193.2	46.4	164.7	17.4	0.0	0.0	86.5	1,154.8
1973	4.4	163.0	128.7	233.5	330.1	295.3	30.2	25.0	0.0	0.0	0.0	11.2	1,221.4
1974	51.6	88.4	106.6	159.9	203.2	278.6	171.3	90.8	5.0	74.9	4.5	3.5	1,238.3
1975	7.8	171.6	185.8	190.9	378.4	243.2	168.9	77.7	53.2	0.0	5.4	6.5	1,489.4
1976	20.8	173.7	88.9	97.3	209.7	198.1	223.8	3.1	8.1	63.2	2.2	35.0	1,123.9
1977	90.2	121.0	98.3	120.1	222.5	303.6	164.2	3.0	49.2	34.6	16.3	0.0	1,223.0
1978	13.9	198.2	61.9	445.7	279.4	211.5	70.0	2.1	6.3	0.0	0.7	1.7	1,291.4
1979	63.1	194.3	171.1	89.9	144.7	201.3	6.2	0.0	0.0	0.0	0.0	20.0	890.6
Mean	46.3	150.0	133.6	167.3	223.3	254.2	127.4	43.6	11.9	7.6	5.6	16.9	1,187.7

Note) - : Missing Record
 * : Estimated
 ** : Estimated as the mean value of May

Table A 4-2 Monthly Rainfall Record at A. Sarapi, Chiang Mai (07022)

(Unit: mm)

Water Year	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Total
1952	0.0	43.0	188.9	141.8	196.6	214.6	148.5	0.0	0.0	6.0	87.2	0.0	1,026.6
1953	98.0	36.5	250.0	177.6	157.8	269.5	69.5	80.3	0.0	0.0	0.0	101.3	1,240.5
1954	24.7	198.3	82.0	71.6	289.0	210.2	130.6	0.0	0.0	0.0	0.0	20.9	1,027.3
1955	54.2	117.4	198.8	129.3	399.2	169.9	79.5	41.0	0.0	0.0	0.0	0.0	1,189.3
1956	38.7	380.2	-	180.9	185.7	396.4	68.2	0.0	0.0	0.0	0.0	0.0	-
1957	0.0	53.1	201.1	136.6	231.7	-	-	0.0	0.0	0.0	0.0	0.0	-
1958	0.0	96.4	153.2	109.5	232.6	125.1	255.5	0.0	0.0	0.0	0.0	0.0	972.3
1959	8.5	101.7	70.8	49.4	125.4	219.2	54.3	0.0	0.0	0.0	0.0	0.0	629.3
1960	0.0	-	-	10.9	21.9	138.4	48.5	0.0	0.0	0.0	0.0	0.0	-
1961	0.0	-	65.5	10.2	30.0	98.7	-	0.0	0.0	0.0	0.0	0.0	-
1962	0.0	-	20.5	54.1	108.3	148.1	51.1	0.0	0.0	0.0	0.0	0.0	-
1963	0.0	-	-	26.2	78.0	63.8	61.4	62.8	0.0	0.0	0.0	0.0	-
1964	0.0	-	48.7	114.1	70.8	164.2	-	0.0	0.0	0.0	0.0	0.0	-
1965	0.0	-	20.5	20.6	126.5	154.3	179.8	133.9	5.6	0.0	0.0	0.0	-
1966	0.0	99.3	3.5	134.4	161.1	31.0	50.8	0.0	0.0	0.0	0.0	0.0	460.1
1967	3.5	5.5	43.8	25.7	36.7	184.3	3.3	16.5	0.0	0.0	0.0	0.0	319.3
1968	0.0	18.0	202.8	84.4	121.2	119.0	15.5	15.5	0.0	0.0	0.0	0.0	576.4
1969	0.0	138.9	32.0	79.6	240.0	193.1	70.3	12.8	0.0	0.0	0.0	2.5	769.2
1970	31.5	251.7	206.9	61.0	279.5	117.0	2.5	0.0	30.7	0.0	0.0	0.0	980.8
1971	18.5	288.5	68.8	221.5	230.1	53.6	10.2	0.0	0.0	0.0	0.0	0.0	891.2
1972	71.0	64.6	126.5	48.3	167.8	226.7	21.0	46.6	0.0	0.0	0.0	5.3	777.8
1973	0.0	100.6	75.4	138.2	109.9	203.8	0.0	0.0	0.0	0.0	0.0	8.5	636.4
1974	39.7	107.3	53.5	155.8	186.1	380.9	135.5	79.6	0.0	80.8	0.0	0.0	1,219.0
1975	0.0	57.5	182.5	167.2	355.5	335.7	136.8	18.8	18.8	0.0	0.0	6.1	1,278.9
1976	23.0	186.4	86.7	124.9	86.1	84.8	9.2	0.0	10.5	51.5	2.0	0.0	665.1
1977	-	-	28.0	107.3	227.8	276.3	121.9	0.0	30.7	27.4	20.1	0.0	-
1978	14.4	187.9	55.0	243.9	177.8	310.1	109.8	2.6	0.0	0.0	0.0	0.0	1,101.5
1979	80.5	208.4	141.4	98.8	185.7	507.7	126.8	0.0	0.0	0.0	0.0	13.7	1,163.0
Mean	18.8	130.5	104.3	104.5	172.1	192.5	77.6	18.2	3.4	5.9	3.9	5.7	837.4

Note - : Missing Record

Table A 4-3 Monthly Rainfall Record at A. San Kamphaeng, Chiang Mai (07032)

(Unit: mm)

Water Year	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Total
1952	0.0	94.5	191.2	192.0	172.7	176.0	70.2	4.3	0.0	57.8	28.4	0.0	967.1
1953	89.0	60.6	163.4	116.4	111.6	323.0	122.4	48.0	8.2	0.0	0.0	81.6	1,124.2
1954	15.9	133.7	108.3	29.4	323.5	149.4	137.7	0.0	0.0	0.0	0.0	30.9	928.8
1955	31.3	107.1	57.0	122.3	306.4	182.2	113.1	30.6	0.0	0.0	0.0	0.0	950.0
1956	82.4	86.0	64.1	150.4	190.9	176.0	97.3	4.2	0.0	0.0	0.0	2.4	853.7
1957	57.7	43.3	254.8	51.8	194.8	225.5	51.5	0.0	0.0	0.0	0.0	2.4	881.8
1958	145.1	44.9*	166.2	101.7	236.0	135.1	91.7	5.7	0.0	6.6	0.0	14.6	947.6
1959	30.1	104.4	25.2	184.7	182.2	276.0	79.5	0.0	0.0	14.2	0.0	0.0	896.3
1960	0.0	121.0	110.5	280.3	277.1	370.4	110.5	17.1	62.6	3.8	0.0	48.9	1,402.2
1961	63.0	241.0	186.7	72.4	428.8	302.5	134.5	2.5	53.7	0.0	0.0	0.0	1,485.1
1962	0.0	73.6	115.5	200.3	242.1	164.5*	112.2*	0.0	0.0	0.0	0.0	0.0	908.2
1963	8.2	14.9*	124.2	64.2	118.7	117.4	197.6	101.8	0.0	0.0	6.2	21.3	774.5
1964	87.1	133.3	65.2	220.8	122.9	333.4	128.4	51.8	1.4	0.0	8.4	0.0	1,152.7
1965	0.0	42.3	78.2	58.5	244.4	151.8	159.7	105.9	0.0	0.0	0.0	0.0	840.8
1966	2.1	126.4	34.2	178.4	272.0	374.6	186.8	43.1	0.0	0.0	0.0	0.0	1,217.6
1967	66.3	182.6	124.0	119.5	147.3	347.5	15.4	12.8	0.0	0.0	0.0	0.0	1,015.4
1968	100.1*	102.4*	79.8*	24.6*	116.6	107.5	62.8	2.9	0.0	0.0	0.0	0.0	596.7
1969	0.0	159.8	26.2	86.4	132.6	74.7	7.8	52.1	0.0	0.0	0.0	20.0	559.6
1970	65.6	106.8	140.8	61.1	290.3	206.6	47.4	3.4	15.6	0.0	0.0	0.0	937.6
1971	0.0	127.8	136.7	221.7	242.4	55.7	117.7	12.7	0.0	0.0	0.0	0.0	914.7
1972	57.7	69.1	99.8	58.4	71.0	246.4	55.6	48.7	0.0	0.0	0.0	7.7	714.4
1973	9.4	54.2	107.9	96.5	319.7*	200.1*	50.9*	31.2*	8.8*	8.8*	8.8*	22.6*	918.9
1974	48.9*	92.7*	92.7*	77.5*	133.6*	197.0*	103.5*	56.7*	13.7*	71.8*	10.1*	8.8*	907.0
1975	20.0*	87.5*	191.2*	182.4*	316.6*	159.1*	157.5*	55.9*	43.5*	8.8*	12.5*	13.2*	1,248.2
1976	15.8*	76.8*	115.0*	76.3*	193.5*	172.7*	110.1*	20.7*	5.7	7.1	6.0	41.2	840.9
1977	78.0	127.0	102.0	124.2	156.5	353.9	45.3	0.0	107.5	31.2	25.5	0.0	1,151.1
1978	16.5	262.2	80.7	279.0	254.2	321.6	39.8	13.5*	8.8*	7.8	28.1	0.0	1,312.2
1979	64.8	175.2	123.7*	53.2*	214.9	131.5	61.3*	8.8*	8.8*	0.0	0.0	52.9	873.1
Mean	41.2	108.9	113.0	124.4	214.8	215.4	95.3	26.2	12.1	7.1	4.8	12.4	975.6

Note)

- : Missing Record

* : Estimated with regression equation below;

Rs: Estimated Monthly Rainfall at San Kamphaeng (mm)

Rd: Monthly Rainfall at Doi Saket (mm)

Table A 4-4 Monthly Rainfall Record at A. San Sai, Chiang Mai (07042)

Water Year	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Total
1952	0.0	182.0	111.0	190.0	226.3	287.0	82.7	24.3	0.0	10.0	45.2	0.0	1,158.5
1953	98.6	136.9	239.4	211.2	308.9	287.8	71.6	117.7	1.8	0.0	12.3	62.1	1,548.3
1954	73.1	168.0	91.4	92.5	171.1	258.3	151.0	15.6	4.3	0.0	6.2	41.0	1,072.5
1955	180.7	107.3	272.8	172.5	269.3	191.4	85.0	11.9	0.0	0.0	20.7	0.0	1,311.6
1956	31.4	288.6	108.9	162.0	280.9	330.0	67.5	21.6	48.8	0.0	0.0	2.8	1,342.5
1957	16.7	54.2	259.0	135.7	238.1	253.4	60.1	0.0	34.3	0.0	0.0	27.4	1,078.9
1958	50.5	81.4	205.5	214.9	198.7	187.0	225.5	1.4	0.0	10.8	0.0	0.1	1,175.8
1959	87.0	140.5	169.4	150.0	174.7	216.5	52.1	3.1	1.8	28.7	0.0	0.0	1,023.8
1960	0.2	108.2	114.3	190.1	158.7	238.9	94.9	29.3	71.6	4.1	43.0	32.1	1,085.4
1961	32.5	268.2	157.5	93.8	347.3	539.1	181.3	10.8	75.6	0.0	0.0	3.6	1,509.7
1962	21.6	111.2	78.6	275.8	210.5	270.3	167.7	4.3	0.0	0.0	20.5	16.1	1,176.6
1963	45.5	9.4	166.4	149.8	335.0	172.9	90.4	37.7	2.6	0.0	0.0	8.8	1,186.6
1964	22.5	158.4	90.4	312.6	159.0	246.0	170.9	125.3	0.0	0.0	0.0	0.0	1,149.6
1965	42.2	170.4	61.8	100.5	212.6	153.1	206.8	16.7	1.9	3.7	19.1	7.9	1,018.1
1966	21.3	137.5	67.0	209.5	366.3	217.8	46.4	3.6	0.0	4.2	0.0	7.2	1,080.8
1967	43.5	85.8	155.5	262.9	168.3	459.9	52.9	78.5	0.0	2.4	0.7	17.9	1,328.3
1968	186.0	139.1	136.6	72.0	269.8	161.1	86.4	3.7	0.0	0.0	0.0	0.0	1,054.7
1969	36.1	265.6	82.9	161.0	320.9	130.5	100.5	13.4	5.3	10.6	0.0	76.2	1,203.0
1970	110.5	429.0	245.1	153.5	273.7	231.6	42.2	10.7	43.4	2.3	0.0	16.5	1,558.5
1971	46.9	245.7	258.9	270.2	432.9	176.5	56.4	18.4	17.7	0.0	0.3	2.8	1,526.7
1972	162.3	73.9	114.4	104.5	221.8	166.8	79.2	150.6	14.7	0.0	0.0	25.3	1,113.5
1973	5.8	177.5	153.2	133.7	298.1	413.3	16.5	23.0	0.0	0.0	0.0	0.0	1,221.1
1974	39.8	119.4	91.3	157.6	169.7	246.2	49.0	46.5	0.0	101.4	5.1	0.0	1,026.0
1975	0.4	70.4	94.6	192.5	275.9	215.6	125.1	22.8	5.1	0.0	0.0	3.0	1,005.4
1976	16.2	117.4	81.8	74.7	158.4	219.4	150.6	5.7	10.7	68.5	0.0	0.0	903.4
1977	-	-	-	-	-	-	-	-	-	-	-	-	-
1978	0.0	134.2	37.3	428.3	229.8	132.6	89.8	0.0	0.0	-	-	-	-
1979	-	-	-	-	-	-	-	-	-	-	-	-	-
Mean	52.8	153.0	140.2	179.6	249.1	238.6	100.1	30.7	14.8	9.9	7.1	14.0	1,189.9

Note) - : Missing Record

Table A 4-5 Monthly Rainfall Record at A. Doi Saket, Chiang Mai (07052)

(Unit: mm)

Water Year	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Total
1952	7.2	48.6	193.0	250.3	429.4	316.5	88.9	43.9	0.0	11.2	72.1	0.0	1,461.1
1953	156.1	120.6	307.2	173.0	220.8	418.7	157.0	48.9	7.0	0.0	14.5	53.4	1,677.2
1954	91.2	384.8	67.1	65.5	351.2	299.5	185.3	13.2	5.3	0.6	7.4	17.1	1,468.2
1955	38.2	108.8	150.2	169.1	414.1	132.4	100.3	19.9	0.0	0.0	16.3	0.0	1,149.3
1956	26.9	321.7	100.7	245.1	276.3	321.3	87.9	0.0	14.3	0.0	0.0	1.0	1,395.2
1957	55.1	51.0	245.9	127.1	272.0	263.5	10.4	0.0	0.0	11.8	0.0	41.6	1,078.4
1958	33.5	51.3	124.1	142.0	156.4	275.4	290.8	3.1	0.0	11.5	0.0	7.0	1,095.1
1959	29.5	142.2	94.5	199.6	368.6	257.5	88.2	0.0	0.0	36.7	0.0	7.0	1,223.8
1960	5.0	64.7	95.5	234.6	208.3	411.2	113.9	48.9	61.4	5.0	13.5	25.0	1,287.0
1961	58.5	182.1	144.3	82.7	528.1	341.2	182.0	0.0	71.7	0.0	0.0	2.0	1,592.6
1962	8.0	100.3	137.3	270.4	254.9	221.5	147.1	0.0	0.0	0.0	20.0	46.6	1,206.1
1963	20.0	8.7	238.5	104.7	308.8	186.3	165.0	125.3	2.1	5.9	0.0	19.6	1,184.9
1964	23.0	233.7	117.1	254.2	219.0	244.4	221.8	33.0	0.0	0.0	9.0	16.4	1,371.6
1965	0.0	122.0	110.4	81.8	148.8	258.5	172.2	72.7	21.7	23.6	2.7	0.0	1,014.4
1966	20.6	236.2	45.2	151.1	316.1	137.4	66.4	12.1	0.0	3.2	0.0	19.8	1,008.1
1967	32.6	124.4	129.4	244.5	207.9	309.6	48.3	44.7	0.0	0.9	3.3	14.6	1,160.2
1968	129.9	133.2	101.0	22.5	175.7	139.8	52.2	3.9	0.0	6.3	0.0	0.0	764.5
1969	9.1	202.0	85.8	115.3	239.0	94.7	90.1	43.0	0.0	0.0	0.0	61.6	940.6
1970	68.3	234.3	169.8	181.6	436.4	257.8	102.4	10.8	91.5	0.9	0.0	24.1	1,577.9
1971	40.1	249.6	189.0	213.1	381.3	194.3	91.8	37.7	6.8	0.0	0.0	0.0	1,403.7
1972	92.7	88.5	133.1	109.1	303.3	203.0	52.7	121.4	10.5	0.0	0.0	39.0	1,153.3
1973	0.7	139.6	116.9	235.7	442.4	272.2	59.9	31.8	0.0	0.0	0.0	19.6	1,318.8
1974	57.0	119.4	119.4	97.8	177.6	267.8	134.7	68.1	6.9	89.6	1.8	0.0	1,140.1
1975	15.9	112.0	259.5	247.0	438.0	213.8	211.6	67.0	49.4	0.0	5.2	6.3	1,625.7
1976	10.0	96.8	151.1	96.0	262.8	233.2	144.1	16.9	8.0	56.1	5.8	19.0	1,099.8
1977	69.4	163.3	52.8	184.9	303.8	261.7	67.7	24.6	54.2	32.0	47.2	0.0	1,261.6
1978	12.0	171.9	101.5	312.9	175.9	219.8	114.0	6.7	0.0	0.0	0.0	2.8	1,117.5
1979	61.2	206.0	163.4	63.1	141.8	159.2	74.7	0.0*	0.0	0.0	0.0	14.6	884.0
Mean	41.8	150.6	140.8	167.0	290.7	246.9	118.6	32.1	14.7	10.5	7.8	16.4	1,237.9

Note)

- : Missing Record

* : Estimated with the data of November 1979 at Chiang Mai

Table A 4-6 Monthly Rainfall Record at A. Hang Dong, Chiang Mai (07072)

Water Year	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Total
1952	0.0	98.6	128.6	112.5	93.3	168.5	97.7	0.0	0.0	14.8	59.0	0.0	773.0
1953	93.7	110.6	175.9	201.6	241.2	214.8	132.5	176.0	0.0	0.0	0.0	4.0	1,350.3
1954	13.6	222.5	62.9	85.3	191.1	198.3	211.3	79.3	4.2	0.0	18.3	20.3	1,107.1
1955	80.5	222.3	288.4	86.8	267.5	144.4	95.0	13.8	0.0	0.0	14.3	0.0	1,213.0
1956	24.3	287.3	63.0	197.9	153.9	416.0	115.1	40.9	0.2	0.0	0.5	0.0	1,299.1
1957	9.4	82.9	228.8	204.0	198.7	173.8	70.3	0.0	0.0	0.2	0.5	0.0	968.6
1958	6.7	104.1	195.1	126.0	261.4	186.9	287.4	0.0	0.0	12.0	0.0	17.2	1,196.8
1959	32.6	176.5	169.7	191.9	155.6	281.6	31.9	9.8	3.9	40.7	0.0	0.0	1,094.2
1960	31.7	155.3	40.4	147.8	215.3	280.5	108.3	39.9	78.1	0.0	0.1	36.4	1,133.8
1961	61.1	304.4	121.3	83.6	320.0	303.1	159.3	2.0	67.4	3.4	0.0	42.0	1,467.6
1962	9.5	118.0	29.6	205.7	134.1	190.2	270.5	0.0	0.0	0.0	0.0	0.0	957.6
1963	54.9	24.9	167.5	91.2	355.8	183.7	185.5	52.3	9.8	0.0	0.0	4.1	1,129.7
1964	38.8	141.2	68.3	244.8	128.5	208.1	152.1	44.6	4.9	0.0	17.4	1.3	1,050.0
1965	43.2	29.9	93.7	82.5	186.1	346.6	238.3	6.4	60.2	2.9	2.4	0.0	1,092.2
1966	6.8	256.3	24.4	140.8	292.1	191.4	173.6	16.7	2.4	0.3	0.0	3.0	1,107.8
1967	21.6	112.5	126.4	239.7	225.8	458.8	94.3	108.0	0.0	11.8	0.0	27.7	1,426.6
1968	170.1	134.7	183.1	87.5	44.1	151.5	130.2	65.4	0.0	5.7	0.0	0.0	972.3
1969	21.6	163.5	51.8	129.1	264.5	190.6	116.0	21.4	6.8	4.6	0.0	61.0	1,030.9
1970	72.6	383.9	170.0	148.4	256.8	190.3	43.5	8.1	96.8	0.0	0.0	25.0	1,395.4
1971	92.6	274.6	71.9	207.4	244.6	176.1	148.3	17.8	8.9	0.0	0.0	0.1	1,242.3
1972	117.2	44.7	121.1	39.8	178.6	202.1	134.5	140.3	0.0	0.0	0.0	70.0	1,048.3
1973	0.2	89.1	139.4	148.6	339.4	322.4	9.7	2.1	0.0	0.0	0.0	4.8	1,055.7
1974	31.2	-	-	-	-	-	-	-	-	-	-	-	-
1975	13.7	93.5	189.9	238.7	165.6	312.1	203.1	27.2	59.2	0.0	0.0	26.0	1,329.0
1976	17.4	81.9	80.8	86.8	113.9	86.2	197.4	10.0	0.0	87.3	3.4	48.2	813.3
1977	88.4	96.6	46.3	146.0	246.3	231.4	226.2	0.0	33.7	30.2	52.0	0.0	1,197.1
1978	7.7	147.9	58.1	442.3	295.8	177.9	159.8	0.0	3.1	0.0	0.0	0.0	1,292.6
1979	87.5	158.9	214.4	159.6	149.0	334.0	127.5	0.0	0.0	0.0	0.0	17.0	1,247.9
Mean	44.6	152.5	122.7	158.4	211.8	234.1	145.2	32.6	16.3	8.0	6.2	15.1	1,147.5

(Unit: mm)

Note) - : Missing Record

Table A 4-7 Monthly Rainfall Record at A. San Pa Tong, Chiang Mai (07082)

(Unit: mm)

Water Year	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Total
1952	0.0	99.5	146.4	101.1	99.3	240.7	70.2	0.0	0.0	33.3	35.9	0.0	826.2
1953	82.3	109.5	163.2	262.4	43.6	129.3	193.5	102.0	0.0	0.0	0.0	0.0	1,085.8
1954	26.2	146.1	22.4	73.7	171.7	129.4	174.7	33.2	0.0	0.0	9.9	9.6	796.9
1955	112.5	98.5	203.3	85.7	179.0	157.0	74.0	20.2	0.0	0.0	12.5	0.0	942.7
1956	42.0	262.5	32.5	196.0	141.5	302.4	55.3	14.2	0.0	0.0	3.2	1.4	1,051.0
1957	10.0	48.6	204.9	189.7	124.9	151.5	104.2	0.0	0.0	37.2	3.2	55.7	929.9
1958	26.5	113.1	81.5	147.0	167.1	169.5	144.5	0.0	0.0	3.7	0.0	0.0	852.9
1959	41.8	139.5	122.1	264.4	79.7	272.4	34.9	22.4	0.0	28.9	0.0	0.0	1,006.1
1960	0.0	167.1	125.9	152.5	251.6	172.4	123.7	25.6	71.3	0.0	3.7	4.5	1,098.3
1961	55.7	306.8	58.5	149.9	317.8	263.7	93.9	0.0	52.7	0.0	0.0	40.4	1,339.4
1962	11.2	110.3	32.8	261.4	93.1	244.2	180.5	0.0	0.0	0.0	0.0	0.0	933.5
1963	66.2	27.3	86.9	89.5	285.5	183.9	248.3	54.1	8.2	0.0	0.0	0.7	1,050.6
1964	46.5	163.6	55.7	228.1	25.3	175.3	77.9	0.0	0.0	0.0	18.0	0.0	790.4
1965	0.0	37.0	83.6	47.8	162.4	184.1	-	0.0	0.0	0.0	0.0	0.0	-
1966	0.0	72.7	107.6	90.8	176.9	-	89.7	90.4	0.0	0.0	0.0	0.0	-
1967	0.0	102.2	49.6	108.4	99.9	299.5	42.5	70.6	0.0	0.0	0.0	0.0	772.7
1968	0.0	78.6	162.2	42.3	20.6	110.2	88.9	23.3	0.0	0.0	0.0	0.0	526.1
1969	37.2	112.4	65.8	114.5	222.0	288.6	45.1	17.4	9.3	0.0	0.0	0.0	912.3
1970	70.2	285.3	109.9	171.4	257.0	123.0	68.3	22.3	60.5	0.0	0.0	0.0	1,167.9
1971	74.1	274.2	20.9	197.4	225.1	116.2	111.3	13.5	21.4	0.0	0.0	0.0	1,054.1
1972	127.5	0.0	54.1	146.5	223.4	188.7	45.4	130.4	0.0	0.0	0.0	42.8	958.8
1973	0.0	163.5	123.4	129.9	170.5	514.0	27.0	19.7	0.0	0.0	0.0	0.0	1,148.0
1974	80.4	89.6	71.2	81.0	128.5	253.3	130.1	171.5	0.0	82.5	0.0	0.0	1,088.1
1975	0.0	15.0	0.0	275.9	552.9	254.6	193.9	19.2	60.7	0.0	0.0	7.6	1,179.8
1976	0.0	47.0	4.8	85.2	71.7	62.1	198.1	0.0	0.0	84.2	0.0	0.0	553.1
1977	83.6	25.4	32.7	151.0	148.6	500.9	232.8	0.0	27.1	19.7	13.8	0.0	1,035.6
1978	0.0	180.1	175.9	290.4	129.5	47.4	84.2	0.0	0.0	0.0	0.0	0.0	907.5
1979	37.9	170.3	146.9	48.6	37.8	287.7	-	-	-	-	-	-	-
Mean	36.8	123.1	90.9	149.4	157.4	208.2	112.8	31.5	11.6	10.7	3.8	6.0	942.2

Note) - : Missing Record

Table A 4-8 Monthly Rainfall Record at A. Phrao, Chiang Mai (07122)

Water Year	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Total
1952	10.6	122.0	172.4	220.1	257.0	241.2	99.9	10.0	20.2	30.4	21.1	0.0	1,204.9
1953	60.4	112.7	75.2	161.1	186.9	301.3	113.1	69.2	0.0	0.0	13.2	15.5	1,108.6
1954	11.3	25.4	113.6	24.0	285.5	130.5	145.0	8.5	11.5	0.0	25.0	31.6	811.9
1955	120.0	125.0	150.0	159.5	507.0	224.0	119.0	35.0	0.0	0.0	39.0	0.0	1,478.5
1956	60.0	465.5	242.0	816.0	465.0	213.0	62.0	33.0	7.0	0.0	0.0	0.0	2,363.5
1957	15.0	230.5	234.0	125.5	223.5	320.0	113.0	6.0	0.0	93.0	0.0	31.0	1,391.5
1958	30.0	115.5	179.0	183.5	183.5	234.5	94.0	3.0	0.0	16.0	0.0	31.0	1,070.0
1959	57.0	190.0	70.0	227.0	248.5	328.5	4.5	11.0	16.0	60.0	9.0	9.0	1,230.5
1960	14.0	160.0	93.5	230.0	573.5	249.0	114.4	38.4	71.8	0.0	0.0	5.0	1,549.6
1961	150.0	544.0	200.0	89.8	265.4	283.8	128.2	15.7	43.5	0.2	4.5	31.7	1,756.8
1962	40.2	141.9	75.3	148.6	238.2	92.8	184.3	3.3	0.4	0.0	0.3	3.8	929.1
1963	18.9	98.4	153.9	139.6	309.3	121.9	236.8	74.5	4.1	0.4	0.3	4.6	1,162.7
1964	46.8	232.0	66.1	290.5	147.9	260.7	124.0	26.1	26.3	0.0	9.1	0.0	1,229.5
1965	52.8	144.2	296.2	175.7	236.9	172.3	247.0	0.0	63.9	14.6	0.2	0.0	1,403.8
1966	0.3	195.3	78.3	109.9	350.9	119.2	142.4	25.8	7.8	0.0	2.2	84.8	1,116.9
1967	61.7	169.9	159.5	149.8	119.0	387.8	29.3	57.3	0.0	6.4	3.6	9.2	1,153.5
1968	0.0	181.3	221.5	148.6	180.1	180.4	67.9	3.6	0.0	2.6	0.0	0.0	986.0
1969	33.6	191.1	162.4	140.5	261.1	41.7	72.3	-	18.2	1.0	0.0	18.5	-
1970	130.8	301.1	169.7	140.7	327.4	244.3	39.9	14.3	73.9	2.9	0.0	27.0	1,472.0
1971	30.2	549.4	137.7	236.8	312.9	85.0	120.1	29.3	16.6	0.0	0.0	0.0	1,318.0
1972	93.9	143.1	137.8	118.1	283.2	168.5	97.1	217.1	35.7	0.0	0.0	61.6	1,356.1
1973	0.0	197.5	192.4	189.9	566.1	205.5	30.6	19.8	0.0	0.0	0.0	13.0	1,414.8
1974	49.4	192.4	122.5	80.2	285.3	206.3	83.5	36.8	11.3	111.1	0.0	0.0	1,178.8
1975	0.0	223.5	161.1	247.6	392.1	197.8	117.9	14.1	49.2	0.0	1.6	1.0	1,405.9
1976	19.6	140.0	204.7	111.0	151.2	181.0	47.0	1.3	0.0	11.1	0.0	30.6	897.5
1977	111.4	121.3	23.5	117.6	160.1	214.1	84.9	2.1	48.5	82.2	30.3	0.0	996.0
1978	4.1	116.0	176.7	297.6	173.6	37.8	15.0	0.0	0.0	0.0	0.0	0.0	820.8
1979	19.4	175.9	125.4	31.0	158.6	56.4	89.8	0.0	0.0	0.0	0.0	0.0	656.5
Mean	44.4	193.1	149.8	182.5	280.4	196.4	100.8	28.0	18.8	15.4	5.7	14.6	1,229.9

Note) - : Missing Record

Table A 4-9 Monthly Rainfall Record at Kaeng Kut (P.13) A. Mae Taeng, Chiang Mai (07331)

(Unit: mm)

Water Year	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Total
1952	-	-	201.8	216.1	350.3	533.8	104.3	11.9	1.7	55.4	12.2	0.0	-
1953	77.1	185.3	308.2	571.3	401.6	328.5	159.8	107.8	0.0	0.0	0.0	32.9	1,972.5
1954	17.0	385.9	248.3	189.5	372.1	177.6	107.3	43.5	7.3	0.0	11.7	29.8	1,590.0
1955	92.4	246.4	368.4	267.2	354.4	258.2	41.7	14.7	0.0	0.0	16.0	0.0	1,659.4
1956	87.7	269.2	161.2	515.3	429.8	233.6	128.4	15.9	48.1	1.9	0.0	0.0	1,691.1
1957	-	-	-	-	-	-	-	-	-	-	-	-	-
1958	25.6	239.3	349.0	346.0	336.9	212.7	218.8	13.0	0.0	11.6	0.0	8.2	1,761.1
1959	25.3	266.2	315.6	325.3	234.1	347.1	87.4	19.9	9.1	74.2	0.0	5.6	1,709.8
1960	1.5	129.9	99.5	272.1	363.7	243.1	106.0	111.5	73.4	28.1	3.3	23.0	1,455.1
1961	152.3	155.7	221.0	139.3	494.9	363.6	131.6	55.0	36.6	0.0	5.9	12.4	1,768.3
1962	42.7	156.6	170.1	199.5	391.3	188.5	260.4	3.4	0.0	0.0	0.0	31.5	1,444.0
1963	28.2	24.4	311.1	311.2	399.8	238.4	354.0	73.5	0.0	0.0	0.0	17.5	1,758.1
1964	64.4	484.6	211.9	423.8	242.7	324.9	132.3	26.0	21.5	1.1	10.0	0.0	1,943.2
1965	37.7	201.3	231.8	190.4	405.6	276.5	310.8	39.0	61.0	4.8	0.0	0.7	1,759.6
1966	14.1	168.1	201.6	306.3	376.1	244.8	136.6	25.4	9.9	6.8	0.0	36.5	1,526.2
1967	62.8	275.6	192.8	254.1	234.5	470.5	87.6	55.8	0.0	13.9	0.0	2.9	1,650.5
1968	232.8	205.9	228.0	181.1	542.1	219.3	92.6	43.7	0.0	0.0	0.0	0.0	1,545.5
1969	39.1	479.3	244.2	291.6	462.0	134.3	164.8	32.7	0.0	28.1	0.0	25.6	1,901.7
1970	33.9	302.8	236.1	331.3	305.2	326.4	34.1	11.4	87.3	0.0	0.0	10.7	1,679.2
1971	42.1	286.3	412.7	361.1	555.9	290.2	197.5	14.8	20.1	6.1	0.0	0.0	2,186.8
1972	88.3	109.9	246.5	247.7	351.4	147.3	97.0	178.9	45.6	0.0	0.0	73.0	1,585.6
1973	1.9	337.7	339.9	359.8	732.7	224.9	51.2	12.2	0.0	0.0	0.0	8.5	2,068.8
1974	59.6	238.2	158.0	239.0	305.3	261.0	221.1	36.9	0.0	107.2	0.0	0.0	1,626.3
1975	0.0	275.4	341.6	252.9	429.5	315.7	178.8	24.4	82.5	0.0	0.9	1.2	1,902.9
1976	9.7	186.2	202.4	247.7	372.5	255.3	227.1	9.9	15.1	68.8	0.0	11.8	1,586.5
1977	49.4	193.1	158.6	274.8	271.5	243.3	196.2	19.0	48.9	48.2	25.8	0.0	1,528.8
1978	77.4	135.5	223.3	427.1	410.0	366.7	85.8	17.1	2.1	0.0	0.0	2.4	1,717.4
1979	26.8	176.6	367.6	134.9	319.7	174.5	139.3	2.0	0.0	0.0	0.0	0.0	1,341.4
Mean	53.5	235.2	250.0	276.9	378.7	272.3	150.1	57.7	21.1	16.9	3.1	12.4	1,707.6

Note) - : Missing Record

Table A 4-10 Monthly Rainfall Record at Mae Kuang (P.25) A. Doi Saket, Chiang Mai (07341)

(Unit: mm)

Water Year	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Total
1964	-	-	-	-	-	-	152.7	52.5	2.6	0.4	13.0	13.4	-
1965	0.0	147.8	150.5	79.0	256.4	224.4	256.0	71.4	48.8	0.1	8.3	0.0	1,242.7
1966	32.0	136.7	72.4	157.7	401.3	166.9	131.5	6.1	2.2	0.3	0.0	3.2	1,110.3
1967	82.7	126.1	194.8	217.9	157.5	328.3	53.2	33.9	0.0	1.7	0.0	1.1	1,197.0
1968	176.8	216.0	111.9	80.7	233.6	179.1	32.3	29.6	0.0	3.3	0.0	0.0	1,063.3
1969	0.0	229.3	73.7	144.0	249.9	96.0	65.3	5.2	0.0	0.0	0.0	43.0	906.4
1970	57.2	177.1	147.7	210.1	383.1	206.4	63.4	0.0	38.7	0.0	0.0	0.0	1,263.7
1971	41.1	239.4	261.2	290.4	419.9	181.7	120.6	9.8	13.7	0.0	0.1	12.6	1,590.5
1972	-	-	158.5	123.2	245.6	292.1	58.6	97.0	22.8	0.0	0.0	40.4	-
1973	2.2	191.2	161.2	255.0	415.0	254.5	75.7	1.9	0.0	0.0	0.0	19.2	1,375.9
1974	67.4	91.1	131.0	137.8	201.1	277.8	120.8	63.0	0.0	88.6	0.0	0.0	1,178.6
1975	23.8	191.9	252.4	261.2	442.3	349.4	180.4	35.4	34.5	0.0	11.4	5.8	1,768.5
1976	16.7	98.9	73.0	136.7	507.0	225.2	108.0	31.0	16.7	59.2	1.6	29.8	1,101.8
1977	83.5	128.3	55.4	170.5	320.7	316.9	218.1	5.4	46.4	34.5	45.4	0.0	1,425.7
1978	21.6	164.8	115.9	359.4	208.1	304.8	203.2	12.6	3.1	0.0	0.0	0.0	1,393.5
1979	27.4	172.5	159.4	80.6	110.6	170.9	88.5	0.0	0.0	0.0	0.0	9.1	819.0
Mean	43.7	165.1	140.0	180.3	290.1	238.1	120.5	28.4	14.3	11.7	5.0	11.1	1,248.3

Note) - : Missing Record

Table A 4-11 Monthly Rainfall Record at Mae Ngat (P.28), A. Mae Taeng, Chiang Mai (07361)

(Unit: mm)

Water Year	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Total
1968	156.0	93.0	178.6	137.5	262.2	156.1	70.2	7.2	0.0	0.0	0.0	0.0	1,040.8
1969	0.0	67.1	134.7	242.6	465.7	125.0	121.3	5.4	0.0	0.0	0.0	54.6	1,214.4
1970	23.0	293.9	217.9	210.0	278.6	329.4	24.6	2.5	37.9	0.0	0.0	0.0	1,417.8
1971	22.4	291.9	277.1	317.2	437.6	185.4	135.4	0.0	0.0	0.0	0.0	0.0	1,665.0
1972	40.8	32.1	132.5	116.9	201.5	193.5	71.2	203.2	15.0	0.0	0.0	85.7	1,092.4
1973	0.0	112.0	141.5	318.8	548.4	264.6	5.4	12.0	0.0	0.0	0.0	12.0	1,414.7
1974	16.5	194.5	160.7	183.7	247.6	280.2	42.1	67.3	0.0	101.7	0.0	0.0	1,294.3
1975	0.0	175.9	220.8	240.2	391.0	355.7	143.1	27.4	70.3	0.0	12.3	2.9	1,619.6
1976	4.6	162.6	56.1	181.6	237.5	254.7	156.1	17.2	10.2	88.3	0.0	12.6	1,181.5
1977	111.8	163.2	139.9	149.2	161.1	274.5	185.6	8.7	41.4	46.4	0.0	0.0	1,281.6
1978	49.3	179.2	131.9	314.7	162.2	275.4	118.1	-	0.0	0.1	0.0	5.5	1,254.4
1979	52.3	125.6	322.2	93.7	231.6	71.9	157.3	0.0	-	0.0	0.0	-	1,034.6
Mean	36.4	157.6	176.2	208.9	302.1	228.5	102.5	29.3	14.6	19.7	1.0	14.3	1,290.9

Note) - : Missing Record

Table A 4-12 Monthly Rainfall Record at R.I.D. Office, A Muang, Chiang Mai (07391)

(Unit: mm)

Water Year	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Total
1971	58.0	200.0	158.8	260.1	357.3	146.2	83.5	13.7	8.0	0.0	4.2	3.8	1,293.6
1972	120.6	56.3	98.7	93.8	214.4	159.4	53.9	144.5	14.3	0.0	0.0	63.1	1,019.0
1973	1.4	169.7	136.7	150.7	295.2	338.0	27.9	23.8	0.0	0.0	0.0	25.5	1,168.9
1974	54.5	81.4	67.2	124.3	191.1	325.7	145.8	80.6	0.0	74.4	9.3	3.4	1,157.7
1975	0.0	121.3	188.4	213.1	319.8	188.3	153.0	51.3	37.9	0.0	0.4	3.1	1,276.6
1976	10.2	159.1	95.6	76.3	189.5	214.0	176.6	21.0	12.2	63.3	1.3	19.9	1,039.0
1977	69.8	86.9	59.0	89.1	218.2	250.8	131.3	0.0	72.5	36.7	33.7	0.0	1,048.0
1978	38.9	205.4	65.2	363.3	289.9	204.8	108.1	30.4	0.0	0.0	0.0	5.3	1,311.3
1979	61.2	124.5	169.6	84.7	160.1	217.3	144.4	0.0	-	-	-	-	-
Mean	46.1	133.8	115.4	161.7	248.4	227.2	113.8	40.6	18.1	21.8	6.1	15.5	1,148.5

Note) - : Missing Record

Table A 4-13 Monthly Rainfall Record at Tail Regulator of Mae Faek Project (07460)

(Unit: mm)

Water Year	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Total
1960	0.0	66.4	70.0	245.2	324.9	312.3	129.2	28.1	116.4	4.0	8.7	43.0	1,348.2
1961	20.3	248.9	176.0	129.8	599.9	498.3	192.7	6.5	119.7	0.0	0.0	9.0	2,001.1
1962	30.1	88.5	138.2	369.3	321.1	260.7	267.2	8.1	1.0	0.0	1.8	0.0	1,486.0
1963	41.9	18.1	206.5	230.0	329.4	220.7	245.7	0.0	3.0	0.0	0.0	0.0	1,295.3
1964	29.0	240.1	94.2	326.9	-	-	-	0.0	0.0	0.0	0.0	0.0	-
1965	1.2	96.3	76.4	93.1	15.4	17.7	117.8	0.0	0.0	0.0	0.0	0.0	417.9
1966	-	-	-	-	255.6	213.2	3.2	0.0	0.0	16.1	0.0	0.0	488.1
1967	20.9	158.0	113.5	205.2	190.1	506.7	41.8	54.4	0.0	0.0	0.0	0.0	1,090.6
1968	91.2	109.2	159.3	87.4	222.0	120.6	27.7	12.3	0.0	0.0	0.0	0.0	829.7
1969	10.4	218.9	79.8	451.7	335.6	100.5	101.5	9.4	0.0	0.0	0.0	60.5	1,368.3
1970	98.1	353.6	156.7	148.5	342.4	240.4	25.5	25.2	67.9	0.0	0.0	20.9	1,479.2
1971	52.8	222.1	208.0	228.8	364.7	141.2	105.3	10.9	11.9	0.0	0.0	0.0	1,345.7
1972	108.8	24.8	114.7	113.4	171.1	265.0	44.6	117.9	0.0	0.0	0.0	54.3	1,014.6
1973	0.0	90.4	105.4	163.5	321.7	349.7	47.1	7.3	0.0	0.0	0.0	7.4	1,092.5
1974	61.4	81.3	97.4	136.4	215.6	280.2	64.2	107.5	0.0	112.5	0.0	0.0	1,154.5
1975	3.4	43.9	167.8	253.5	262.2	249.2	128.0	24.7	74.1	0.0	4.2	0.0	1,211.0
1976	7.2	65.7	58.4	92.9	194.3	277.0	116.7	17.2	7.8	57.0	5.2	8.7	906.1
1977	85.8	85.4	66.6	130.8	264.6	353.3	187.9	15.7	53.8	35.3	34.5	0.0	1,291.7
1978	19.0	111.3	65.6	288.0	193.4	139.8	106.7	0.0	2.8	0.0	0.0	0.0	926.6
1979	38.7	146.1	113.9	60.8	125.4	150.1	-	0.0	0.0	0.0	0.0	19.3	-
Mean	37.8	129.9	119.4	197.6	265.7	235.6	108.5	23.0	22.9	11.2	2.6	11.2	1,165.4

Note) - : Missing Record

Table A 4-14 Monthly Rainfall Record at Huai Mae Lai (P.36), A San Kamphaeng,
Chiang Mai (07581)

(Unit: mm)

Water Year	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Total
1977	-	-	52.3	266.8	455.4	287.9	342.3	15.9	33.4	48.8	13.9	0.8	-
1978	33.4	285.1	146.2	262.8	283.5	316.0	190.1	-	0.0	0.0	0.0	1.9	-
1979	67.0	240.7	195.8	284.6	192.6	107.7	117.7	0.0	-	0.0	0.0	-	-
Mean	50.2	262.9	131.4	271.4	310.5	237.2	216.7	8.0	16.7	16.3	4.6	1.4	1,527.3

Note) - : Missing Record

Table A 4-15 Monthly Rainfall Record at A. Muang, Lamphun (17012)

(Unit: mm)

Water Year	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Total
1952	0.0	96.0	385.7	156.7	252.1	145.1	113.6	23.6	0.0	0.0	0.0	0.0	1,172.8
1953	0.0	6.2	277.9	250.1	290.2	388.1	213.9	158.8	0.0	0.4	0.0	0.0	1,585.6
1954	33.7*	220.3*	91.7	96.5	230.2	155.8	204.0	0.0	0.0	0.0	14.5	0.0	1,046.7
1955	0.0	84.7	245.8	19.5	59.3	265.4	0.0	0.0	0.0	0.0	0.0	0.0	674.7
1956	0.0	11.0	51.7	221.9	137.0	584.3	158.5	1.1	0.0	0.0	0.0	0.0	1,165.5
1957	86.3*	50.4*	166.1*	130.1*	199.4*	169.7*	73.9*	7.8*	7.9*	32.8*	7.8*	33.3*	965.5
1958	23.6*	123.8*	119.6*	135.5*	174.4*	172.1*	131.4*	8.2*	7.8*	19.7*	7.8*	20.9*	944.8
1959	35.6*	106.4*	81.3*	135.7*	154.2*	233.2*	23.1*	7.8*	7.8*	19.7*	7.8*	13.9*	826.5
1960	12.5*	206.5*	118.1*	189.3*	177.8*	226.5*	105.8*	27.2*	73.7*	9.2*	33.6*	25.2*	1,205.4
1961	51.2*	204.9*	91.9*	87.6*	230.4*	374.9*	114.8*	19.6*	54.8*	0.0	0.0	68.8	1,298.9
1962	16.2	124.1	94.4	147.4	304.7	332.4	193.2	0.0	0.0	0.0	0.0	0.0	1,212.4
1963	35.9	48.1	140.0	102.5	99.3	193.1	171.6	51.6	9.5	0.0	0.0	0.0	851.6
1964	88.9	240.0	97.6	208.5	93.6	175.3	164.4	9.2	0.0	0.0	12.6	4.8	1,094.9
1965	0.0	42.5	104.9	26.0	200.6	153.9	124.0	0.0	0.0	0.0	28.1	0.0	680.0
1966	0.0	115.8	38.6	96.6	298.3	101.3	174.9	0.0	0.0	0.0	0.0	0.0	825.5
1967	14.3	154.0	93.3	23.5	102.0	509.4	28.8	71.5	0.0	0.0	0.0	0.0	996.8
1968	159.2	79.4	129.1	54.3	31.5	90.1	100.1	51.5	0.0	11.9	0.0	0.0	707.1
1969	60.3	148.2	114.3	144.6	196.4	178.0	53.5	23.5	16.8	0.0	0.0	0.0	935.6
1970	161.8	284.2	118.1	69.4	304.0	165.9	76.4	12.1	49.4	0.0	0.0	14.9	1,256.2
1971	47.1	228.2	89.4	107.4	291.4	149.9	81.5	25.1	11.9	0.0	0.0	9.3	1,041.2
1972	173.2	40.2	146.1	48.9	151.6	153.6	89.1	128.3	21.3*	0.0	0.0	98.9	1,051.2
1973	0.0	179.0	92.8	164.3	202.8	369.6	23.3	12.8	0.0	0.0	0.0	16.0	1,060.6
1974	117.6	131.2	91.7	90.2	117.2	209.3	157.0	81.1	0.0	95.1	0.0	2.5	1,092.9
1975	6.0	112.8	222.2	183.7	375.6	130.2	151.8	38.0	19.5	0.0	15.6	26.0	1,281.4
1976	42.2	95.4	55.2	194.0	200.5	51.1	228.7	2.7	1.0	91.9	0.0	7.7	970.4
1977	99.6	149.6	33.5	100.5	242.9	199.2	239.8	1.7	35.1	20.8	44.8	0.0	1,167.5
1978	7.6	204.2	114.6	307.8	197.2	270.1	101.6	0.0	0.0	0.0	0.0	0.0	1,203.1
1979	22.7	155.5	97.5	271.2	50.0	81.8	67.4	0.0	0.0	0.0	0.0	13.8	759.9
Mean	46.3	130.1	125.1	134.4	191.6	222.5	120.2	27.3	11.3	10.8	6.2	12.7	1,038.5

Note)

- : Missing Record

* : Estimated with regression equation below;

R_L = 7.8 + 0.776 Rc

R_L: Estimated Monthly Rainfall at Lamphun (mm)

Rc: Monthly Rainfall at Chiang Mai (mm)

Table A 4-16 Monthly Rainfall Record at A. Mae Tha, Lamphun (17042)

Water Year	(Unit: mm)												Total
	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	
1952	19.5	150.2	217.5	95.4	173.1	286.4	158.4	70.2	0.0	10.0	0.0	0.0	1,180.7
1953	151.0	140.3*	283.4*	171.7*	160.3*	296.0	72.6	0.0	0.0	0.0	0.0	54.0	1,329.3
1954	54.0	384.1	72.0	80.4	225.9	155.4	237.7	0.0	4.4	0.0	14.3	54.0	1,282.2
1955	128.0	99.1	238.6	48.0	261.8	215.0	127.2	12.6	0.0	0.0	24.0	0.0	1,154.3
1956	60.0	263.2	112.3	298.5	171.5	353.1	146.4	9.6	0.0	0.0	8.0	0.0	1,402.6
1957	137.9	84.0	128.2	180.5	223.7	243.1	0.0	0.0	0.0	0.0	0.0	0.0	997.4
1958	0.0	169.5	401.5	362.0	460.2	709.9	75.6	0.0	0.0	0.4	0.0	0.4	2,179.5
1959	0.8	4.4	6.3	7.1	107.6	111.7	73.2	14.0	0.0	0.0	0.0	0.0	325.1
1960	0.0	53.0	0.0	269.8	161.3	200.2	121.0	37.1	36.1	0.0	4.2	57.5	940.2
1961	38.1	218.9	146.4	110.3	288.6	329.6	88.9	0.0	62.4	0.0	0.0	4.5	1,287.7
1962	48.1	108.0	104.9	115.3	311.7	229.4	256.6	0.0	0.3	0.0	20.1	5.9	1,200.3
1963	78.5	67.1	250.3	97.3	318.2	221.2	173.1	116.4	6.1	0.0	36.7	0.0	1,364.9
1964	40.9	269.4	204.7	146.8	116.8	352.7	94.7	8.4	0.0	0.0	11.9	4.1	1,250.4
1965	4.2	107.9	137.0	128.4	249.0	129.0	149.6	70.5	0.0	23.2	0.0	33.5	1,032.3
1966	0.0	329.9	71.5	53.4	291.1	204.5	107.1	0.0	0.0	0.0	0.0	0.0	1,057.5
1967	88.5	269.9	129.2	211.9	135.8	240.5	32.0	38.3	0.0	7.9	0.0	0.0	1,154.0
1968	196.2	147.5	203.1	100.7	185.0	126.7	54.2	1.3	0.0	8.5	0.0	0.0	1,023.2
1969	87.5	253.8	197.8	65.5	282.7	207.6	89.9	0.0	50.8	0.0	0.0	60.5	1,296.1
1970	78.8	328.7	200.8	123.5	243.2	152.0	141.1	8.8	13.5	0.0	0.0	45.4	1,335.8
1971	25.3	112.1	136.5	272.5	223.4	170.6	114.8	0.0	9.1	0.0	0.0	12.7	1,076.8
1972	202.4	28.2	223.2	103.4	225.7	177.8	68.8	187.1	15.5	0.0	16.9*	85.1*	1,334.1
1973	18.1	49.8	57.7	104.7	211.3	196.0	90.3	38.9	0.0	0.0	0.0	90.1	856.9
1974	132.1	101.9	41.0	101.3	70.9	270.1	104.5	77.6	0.0	190.2	0.0	16.2	1,105.8
1975	21.1	134.8	165.0	168.4	273.2	192.5	327.8	47.6	10.0	0.0	0.0	0.0	1,340.4
1976	46.9	82.2	34.3	111.5	184.9	72.0	225.2	21.0	15.3	70.0	0.0	6.2	869.5
1977	39.3	181.2	48.1	196.4	228.5	525.6	87.6	0.0	23.6	24.6	67.8	0.0	1,222.7
1978	12.5	135.5	77.0	233.0	149.0	282.9	176.1	0.0	0.0	0.0	12.0	0.0	1,078.0
1979	77.0	225.1	196.0	119.5	89.7	118.2	41.3	0.0	0.0	0.0	0.0	8.0	874.8
Mean	63.8	160.7	145.9	145.6	215.1	233.9	122.7	27.1	8.8	12.0	7.7	19.2	1,162.5

Note) - : Missing Record
 * : Estimated with regression equation below;
 Rm = 16.9 + 0.788 Rc Rm: Estimated Monthly Rainfall at Mae Tha (mm)
 Rc: Monthly Rainfall at Chiang Mai (mm)

Table A 5-1 Annual Maximum Daily Rainfall at A. Huang, Chiang Mai (07013)

(Unit: mm)

Water Year	1 day		2 day		3 day		5 day		Remarks
	Record	Date	Record	Date	Record	Date	Record	Date	
1952	72.7	16, May	106.0	2, Jun.	112.2	2, Jun.	141.2	2, Jun.	
1953	5 110.5	31, Oct.	3 165.7	6, Jun.	5 175.9	15, Sep.	2 206.7	12, Sep.	
1954	75.7	8, Oct.	94.4	19, Sep.	95.6	19, Sep.	156.7	16, Sep.	
1955	54.6	14, May	64.7	23, Apr.	105.7	14, May	110.2	23, Apr.	
1956	55.9	2, Sep.	88.5	1, Sep.	98.1	6, Sep.	102.2	11, May	
1957	85.4	20, Aug.	88.3	19, Aug.	98.9	18, Aug.	110.2	28, Aug.	
1958	60.2	24, Oct.	76.9	20, Sep.	97.0	20, Sep.	138.3	20, Sep.	
1959	47.9	20, Aug.	70.2	11, Sep.	75.2	20, Aug.	91.0	19, Aug.	
1960	68.0	1, Dec.	96.4	21, May	99.9	20, May	165.8	18, May	
1961	94.4	10, Sep.	122.8	17, Sep.	5 181.1	8, Sep.	5 199.6	6, Sep.	
1962	55.6	6, Oct.	91.0	14, Oct.	109.2	14, Oct.	130.3	5, Oct.	
1963	51.5	9, Jun.	84.7	25, Oct.	111.2	25, Oct.	123.3	25, Oct.	
1964	3 118.4	7, Sep.	5 139.9	6, Sep.	147.8	5, Sep.	153.2	4, Sep.	
1965	55.7	16, Dec.	75.8	16, Dec.	75.8	16, Dec.	96.9	24, Oct.	
1966	55.7	30, Jul.	48.2	11, Aug.	64.7	28, Jul.	90.3	11, Jul.	
1967	2 131.6	23, Sep.	4 160.5	23, Sep.	1 229.5	23, Sep.	1 296.3	23, Sep.	
1968	1 166.5	14, Aug.	1 180.0	14, Aug.	2 184.4	15, Aug.	4 194.4	11, Aug.	
1969	69.8	23, Mar.	103.8	13, Aug.	124.4	12, Aug.	152.9	13, Aug.	
1970	4 113.3	20, May	121.1	20, May	128.9	20, May	151.2	16, May	
1971	71.4	2, Sep.	116.0	13, Jul.	117.7	12, Jul.	139.3	13, Jul.	
1972	59.5	7, Nov.	91.3	10, Apr.	123.4	24, Sep.	128.4	22, Sep.	
1973	75.4	5, Jul.	78.7	19, Sep.	100.0	19, Sep.	137.1	16, Sep.	
1974	70.8	31, Oct.	79.8	30, Oct.	98.8	29, Oct.	120.1	25, Jul.	
1975	77.1	31, May	110.0	31, May	133.8	20, Aug.	168.3	20, Aug.	
1976	74.9	26, Oct.	85.9	26, Oct.	85.9	26, Oct.	99.7	20, May	
1977	69.7	30, Aug.	80.5	30, Aug.	89.3	29, Aug.	111.8	5, Sep.	
1978	105.6	8, Jul.	2 175.1	1, Jul.	1 178.9	1, Jul.	5 192.9	1, Jul.	
1979	66.2	7, Sep.	79.5	6, Sep.	92.8	12, Jun.	93.0	11, Jun.	

Probability Analysis

1/2 years	72	96	112	136
1/5	98	127	146	174
1/10	116	148	168	199
1/20	134	168	190	222
1/25	140	174	197	229
1/30	145	179	203	235
1/50	159	194	219	252
1/100	179	214	241	274
Max.	166.5	180.0	229.5	296.3

Table A 5-2 Annual Maximum Daily Rainfall at A. Sarapi, Chiang Mai (07022)

Water Year	1 day		2 day		3 day		5 day		Remarks
	Record	Date	Record	Date	Record	Date	Record	Date	
1952	71.8		5 119.0		123.0		5 161.8		
1953	3 99.3		115.3		5 130.6		134.7		
1954	75.0		87.1		107.9		121.5		
1955	79.0		82.7		105.8		118.8		
1956									
1957									
1958	5 84.3		84.3		117.9		128.8		
1959	59.5		84.8		84.8		125.4		
1960									
1961									
1962									
1963									
1964									
1965									
1966	35.5		47.2		47.2		64.0		
1967	30.5		52.6		65.1		90.6		
1968	67.2		87.2		90.8		101.2		
1969	45.3		83.8		83.8		126.3		
1970	75.5		86.5		118.8		141.3		
1971	69.0		97.3		97.3		144.2		
1972	75.5		3 138.8		3 149.3		4 174.8		
1973	67.2		95.8		113.0		2 183.8		
1974	2 110.8		2 151.9		2 151.9		3 178.3		
1975	70.0		4 130.0		4 145.5		5 157.5		
1976	52.3		62.3		96.6		113.4		
1977									
1978	4 85.6		98.1		103.3		128.8		
1979	1 246.7		1 249.3		1 250.3		1 252.9		
1980									

Probability Analysis

1/2 years	76	97	115	136
1/5	109	133	175	172
1/10	128	155	207	192
1/20	146	175	234	210
1/25	151	182	242	216
1/30	155	187	248	220
1/50	166	201	264	232
1/100	181	220	284	247

Max. 246.7 249.3 249.3 249.3 249.3

Table A 5-3 Annual Maximum Daily Rainfall at A. San Kamphaeng, Chiang Mai (07032)

Water Year	1 day		2 day		3 day		5 day		Remarks		
	Record	Date	Record	Date	Record	Date	Record	Date			
1952	89.4	29, Aug.	89.4	29, Aug.	5	119.2	2, Jun.	4	163.7	1, Jun.	
1953	70.8	22, Jul.	81.1	14, Sep.		108.4	13, Sep.		130.7	13, Sep.	
1954	3	116.3	5	116.3	8, Oct.	116.3	8, Oct.		125.5	16, Sep.	
1955		63.1		69.6	22, Aug.	103.4	21, Aug.		124.3	19, Aug.	
1956		82.6		92.9	12, Aug.	92.9	12, Aug.		97.3	1, Sep.	
1957		62.4		110.6	21, Jun.	114.7	21, Jun.		120.5	17, Sep.	
1958											
1959		66.5		81.9	11, Sep.	93.3	2, Jul.		105.9	19, Aug.	
1960		80.6		97.2	14, Sep.	97.2	14, Sep.		127.3	15, Jul.	
1961		74.5	2	146.4	21, Aug.	3	152.2	21, Aug.	5	156.4	19, Aug.
1962											
1963											
1964	1	128.2	1	162.8	21, Jul.	1	168.5	5, Sep.	2	186.0	5, Sep.
1965		79.3		95.7	2, Nov.		105.9	2, Nov.		131.1	31, Oct.
1966	2	122.4	4	122.4	16, Sep.	2	152.8	16, Sep.	1	243.1	12, Sep.
1967	4	109.8	3	142.3	13, Sep.	4	151.1	12, Sep.	3	183.2	13, Sep.
1968											
1969		47.1		54.5	13, Aug.		69.0	12, Aug.		76.2	13, Aug.
1970		66.1		96.5	18, Aug.		117.1	17, Aug.		136.5	17, Aug.
1971		31.2		51.3	15, Jul.		66.4	16, Jul.		94.7	15, Jul.
1972		70.6		101.0	20, Sep.		107.1	19, Sep.		156.3	20, Sep.
1973											
1974											
1975											
1976											
1977	5	94.2		101.0	14, Sep.		111.0	13, Sep.		112.1	19, Sep.
1978											
1979											
1980											
Probability Analysis											
1/2 years		80		95			113			132	
1/5		102		128			140			167	
1/10		115		146			154			189	
1/20		126		161			166			210	
1/25		129		165			169			216	
1/30		131		168			172			222	
1/50		138		178			179			236	
1/100		147		189			188			255	
Max.		128.2		162.8			168.5			243.1	

(Unit: mm)

Table A 5-4 Annual Maximum Daily Rainfall at A. Sun Sui, Chiang Mai (07042)

Water Year	1 day		2 day		3 day		5 day		Remarks
	Record	Date	Record	Date	Record	Date	Record	Date	
1952	65.3		82.5		98.5		121.9		
1953	99.7		117.6		5 162.0		176.5		
1954	94.8		94.8		94.8		144.1		
1955	90.5		110.0		123.2		169.1		
1956	89.3		107.8		112.2		130.7		
1957	85.3		120.7		161.0		176.1		
1958	63.9		71.2		85.5		113.7		
1959	54.4		58.5		87.0		97.9		
1960	65.7		75.4		77.9		90.1		
1961	76.3		123.4		134.0		138.7		
1962	92.1		94.1		95.8		113.0		
1963	72.8		86.7		130.9		160.5		
1964	3 124.7		3 150.6		3 174.0		180.9		
1965	51.1		74.6		107.7		123.4		
1966	4 116.4		5 131.2		133.1		159.0		
1967	60.1		99.8		142.0		208.6		
1968	95.7		110.6		119.8		130.6		
1969	65.6		100.7		133.4		195.5	4	
1970	1 170.8		1 206.4		1 255.2		1 265.1	1	
1971	2 131.1		4 135.5		4 167.0		5 194.5	5	
1972	85.8		108.5		124.1		130.6		
1973	89.2		109.8		155.3		226.5	2	
1974	46.9		60.1		79.0		108.2		
1975	71.4		80.7		99.0		104.5		
1976	64.0		72.2		100.9		119.7		
1977									
1978	5 114.5		2 192.1		2 194.4		3 208.5		
1979									
1980									

Probability Analysis

1/2 years	82	100	123	140
1/5	106	132	158	193
1/10	122	154	180	221
1/20	138	175	201	245
1/25	143	182	207	252
1/30	146	187	213	257
1/50	157	203	227	272

Table A 5-5 Annual Maximum Daily Rainfall at A. Doi Saket, Chiang Mai (07052)

Water Year	1 day		2 day		3 day		5 day		Remarks			
	Record	Date	Record	Date	Record	Date	Record	Date				
1952	4	113.5	19, Sep.	124.3	18, Sep.	129.9	18, Sep.	150.8	1, Jun.			
1953		85.6	25, Sep.	94.6	24, Sep.	124.6	18, Jun.	181.3	21, Sep.			
1954	1	129.4	8, Oct.	5	129.4	8, Oct.	129.8	25, May	167.3	30, Apr.		
1955		97.3	23, Aug.	4	145.5	22, Aug.	5	148.9	22, Aug.	4	199.5	22, Aug.
1956		86.2	13, Aug.		111.6	6, Sep.		142.6	6, Sep.		156.5	9, May
1957		76.0	1, Sep.		112.0	31, Aug.		140.4	30, Aug.		145.6	28, Aug.
1958		54.0	4, Jul.		80.5	20, Sep.		91.5	20, Sep.		134.1	20, Sep.
1959		105.0	22, Aug.		120.5	19, Aug.	1	207.5	20, Aug.	1	235.5	19, Aug.
1960		100.8	27, Sep.		107.2	27, Sep.		115.8	27, Sep.		126.9	1, Jul.
1961	3	114.0	21, Aug.	1	187.5	21, Aug.	2	194.5	21, Aug.	3	203.9	20, Aug.
1962		95.0	4, Jul.		104.0	3, Jul.		104.0	3, Jul.		120.4	4, Jul.
1963		96.0	2, Jun.		101.9	2, Jun.		127.1	22, Aug.		172.2	21, Aug.
1964		89.5	8, Aug.		125.5	21, Jul.		138.5	21, Jul.		138.5	21, Jul.
1965		98.6	9, Sep.		128.6	9, Sep.		145.8	9, Sep.		149.3	9, Sep.
1966		65.9	11, Aug.		84.1	16, May		89.0	16, May		106.8	27, Aug.
1967		59.0	15, Jul.		85.0	15, Jul.		94.6	27, Aug.		134.2	25, Aug.
1968		44.8	13, Apr.		56.5	13, Apr.		65.3	12, Apr.		65.3	12, Apr.
1969		53.7	13, Aug.		80.9	13, Aug.		101.4	12, Aug.		120.1	17, Aug.
1970	5	112.4	11, Sep.		126.4	11, Sep.		128.6	11, Sep.		147.4	19, Aug.
1971		66.5	5, May		89.8	13, Jul.		117.4	25, Aug.		167.3	25, Aug.
1972		88.4	24, Sep.		116.6	24, Sep.		119.7	24, Sep.		144.8	21, Sep.
1973	2	124.2	23, Aug.	3	148.3	22, Aug.	4	150.9	22, Aug.	2	204.7	23, Aug.
1974		75.4	11, Sep.		76.3	11, Sep.		114.9	11, Sep.		117.2	9, Sep.
1975		78.3	8, Oct.		111.0	24, Aug.		140.0	25, Jul.	5	195.0	24, Aug.
1976		103.8	25, Aug.		115.2	2, Jun.		116.2	1, Jun.		131.7	22, Aug.
1977		85.8	13, Sep.		109.2	13, Sep.		118.4	13, Sep.		118.4	13, Sep.
1978		108.4	2, Jul.	2	152.9	1, Jul.	5	156.2	1, Jul.		156.2	1, Jul.
1979												
1980												

Probability Analysis

1/2 years	89	109	125	150
1/5	108	134	152	182
1/10	119	150	169	199
1/20	128	163	184	214
1/25	130	167	189	219
1/30	132	171	192	222
1/50	138	180	203	232
1/100	145	192	216	244
Max.	129.4	187.5	207.5	235.5

Table A 5-6 Annual Maximum Daily Rainfall at A. Hlang Dong, Chiang Mai (07072)

Water Year	1 day		2 day		3 day		5 day		Remarks
	Record	Date	Record	Date	Record	Date	Record	Date	
1952	40.6		52.5		65.6		85.7		
1953	3 113.8		113.8		113.8		113.8		
1954	79.3		95.2		95.2		131.4		
1955	74.1		115.9		147.8		177.0		
1956	70.6		110.0		133.8		176.1		
1957	94.5		113.0		115.9		136.9		
1958	65.0		80.0		95.0		126.0		
1959	71.0		89.4		108.5		119.0		
1960	68.2		85.6		85.8		109.1		
1961	75.8		102.4		150.6		166.6		
1962	93.6		110.3		115.5		134.4		
1963	54.0		106.4		139.1		164.5		
1964	83.5		88.3		131.5		137.2		
1965	4 112.3		4 129.8		1 202.5		5 220.0		
1966	78.0		114.5		134.3		134.9		
1967	84.6		126.9		5 174.8		4 208.7		
1968	75.6		104.0		127.2		141.6		
1969	89.1		89.1		106.3		144.0		
1970	1 162.4		1 179.5		2 199.3		2 221.2		
1971	106.5		5 129.0		141.0		157.3		
1972	81.9		110.3		114.3		124.8		
1973	62.4		94.4		103.0		174.2		
1974									
1975	86.9		106.9		106.9		131.4		
1976	76.0		76.0		87.3		87.3		
1977	67.3		79.8		100.4		116.0		
1978	5 107.0		2 163.0		4 172.0		5 184.0		
1979	105.0		124.7		124.7		147.2		
1980	2 114.6		5 160.6		5 171.0		1 284.8		

Probability Analysis

1/2 years	84	105	125	147
1/5	104	151	154	184
1/10	116	147	172	208
1/20	126	161	189	229
1/25	129	166	194	235
1/30	132	169	199	241
1/50	139	179	210	255
1/100	148	193	225	271

Table A 5-7 Annual Maximum Daily Rainfall at A. San Pa Tong, Chiang Mai (07062)

Water Year	1 day		2 day		3 day		5 day		Remarks
	Record	Date	Record	Date	Record	Date	Record	Date	
1952	50.5		62.7		62.7		92.6		
1953	80.8		118.3		118.3		120.9		
1954	59.5		91.6		91.6		105.8		
1955	52.1		84.2		86.5		100.1		
1956	64.1		77.8		106.0		116.3		
1957	56.7		89.8		100.7		142.9		
1958	86.0		89.6		96.7		104.0		
1959	56.8		69.7		91.6		123.6		
1960	98.1		111.9		123.2		149.5		
1961	2 126.1		1 172.4		2 186.6		2 193.1		
1962	60.3		79.0		118.4		122.5		
1963	51.3		82.7		100.3		121.2		
1964	93.1		93.1		5 126.8		5 153.0		
1965									
1966									
1967	3 116.3		3 132.5		3 132.5		4 155.5		
1968	70.5		79.5		79.5		80.5		
1969	58.6		78.4		119.8		149.1		
1970	91.5		101.3		109.0		152.6		
1971	69.3		102.0		106.0		152.6		
1972	5 107.5		107.5		107.5		112.8		
1973	4 109.0		2 156.3		1 217.9		1 290.9		
1974	55.0		84.0		85.6		93.8		
1975	76.3		94.5		100.3		140.8		
1976	89.6		109.3		109.3		109.3		
1977	1 126.3		5 126.3		126.3		147.7		
1978	65.5		4 129.0		4 129.0		3 183.6		
1979									
1980									
Probability Analysis									
1/2 Years		74		96		110		130	
1/5		96		120		136		165	
1/10		112		136		152		187	
1/20		127		152		166		208	
1/25		132		157		171		215	
1/30		136		161		174		220	
1/50		147		173		184		235	
1/100		163		189		197		255	
Max.		126.3		172.4		217.9		290.9	

(Unit: mm)

Table A 5-8 Annual Maximum Daily Rainfall at A. Phrao, Chiang Mai (07122)

Water Year	1 day		2 day		3 day		5 day		Remarks
	Record	Date	Record	Date	Record	Date	Record	Date	
1952	56.2		72.2		92.9		107.7		
1953	62.0		65.6		88.9		108.0		
1954	94.3		96.8		96.8		105.0		
1955	69.5		89.5		105.5		131.0		
1956	99.0		170.0		225.0		350.0		
1957	60.0		100.0		120.0		145.0		
1958	77.0		85.0		150.0		131.5		
1959	56.0		76.5		87.0		112.5		
1960	97.5		181.0		254.5		328.5		
1961	100.0		175.0		225.0		275.0		
1962	75.2		76.5		103.6		109.1		
1963	56.9		96.1		151.0		170.3		
1964	97.6		108.9		116.5		117.1		
1965	77.6		109.4		117.7		196.2		
1966	67.4		78.5		84.8		94.2		
1967	67.8		102.5		102.8		130.0		
1968	69.8		81.6		81.7		89.5		
1969									
1970	56.7		100.4		116.7		146.7		
1971	91.3		112.8		155.0		163.7		
1972	65.5		78.0		88.2		143.2		
1973	84.5		118.7		143.7		202.8		
1974	116.2		120.0		123.9		125.9		
1975	79.2		99.5		109.7		155.1		
1976	64.6		80.7		101.1		120.0		
1977	82.2		82.2		90.9		91.9		
1978	56.2		96.6		106.6		118.5		
1979	40.6		71.0		77.5		88.0		
1980									

Probability Analysis

1/2 Years	73	93	109	131
1/5	89	119	145	183
1/10	99	138	172	225
1/20	109	159	205	271
1/25	111	166	214	288
1/30	114	172	223	301
1/50	120	188	250	341
1/100	128	212	290	400

(Unit: mm)

Table A 5-9 Annual Maximum Daily Rainfall at Ilac Kuang (P-25), A. Doi Saket, Chiang Mai (07541)

Water Year	1 day		2 day		5 day		5 day		Remarks			
	Record	Date	Record	Date	Record	Date	Record	Date				
1952	72.6	26, Oct.	4	125.1	26, Oct.	4	150.5	26, Oct.				
1953	65.5	27, Aug.		69.1	27, Aug.		110.1	9, Aug.	159.1	21, Oct.		
1954	61.5	2, Jul.		79.7	5, Jun.		99.7	5, Jun.	155.0	27, Aug.		
1955	51.8	31, May		81.7	30, May		111.4	29, May	124.2	5, Jun.		
1956	52.9	7, May		79.5	6, May		110.0	18, Aug.	128.6	29, May		
1957	57.5	30, Jul.		85.8	30, Jul.		105.6	21, Aug.	147.1	17, Aug.		
1958	79.6	8, Sep.		88.7	28, Jun.		118.1	28, Jun.	159.8	20, Aug.		
1959	*86.5	25, Sep.		*159.4	24, Sep.		172.4	24, Sep.	177.0	24, Aug.		
1960	1	160.0	25, Aug.	2	165.7	22, Aug.	2	167.1	21, Aug.	*200.4	21, Sep.	
1961	5	94.5	11, Sep.	5	114.8	21, Sep.	5	160.2	25, Jul.	1	214.6	25, Aug.
1962	4	95.8	11, Sep.	3	125.9	30, Aug.	5	127.5	29, Aug.	4	150.6	7, Sep.
1963		65.8	31, Aug.	1	189.2	1, Jul.	1	189.2	1, Jul.	2	204.9	28, Jun.
1964	2	78.5	20, Aug.		76.5	2, Sep.		86.2	11, Jun.		96.1	12, Jun.
1965	2	142.4	2, Jul.		104.7	25, Jul.		111.7	24, Jul.		130.4	21, Jul.
1966	3	97.5	25, Jul.		189.2			189.2			189.2	
1967												
1968												
1969												
1970												
1971												
1972												
1973												
1974												
1975												
1976												
1977												
1978												
1979												
1980												
Probability Analysis												
1/2 Years		75		96		118		148				
1/5		101		125		145		176				
1/10		122		148		160		195				
1/20		144		175		176		208				
1/25		151		181		182		215				
1/50		157		188		186		217				
1/50		175		208		199		227				
1/100		201		238		216		241				
Max.		160.0		189.2		189.2		214.6				

Data missing in May

Table A 5-10 Annual Maximum Daily Rainfall at R.F.D. Office, A. Muang, Chiang Mai (07391)

Water Year	(Unit: mm)			
	1 day Record Date	2 day Record Date	5 day Record Date	5 day Record Date
1952	5 66.4	5 109.5	5 115.3	5 110.4
1953	1 65.3	1 88.5	4 92.4	2 121.6
1954	5 70.5	5 85.8	4 102.2	2 163.6
1955	5 56.4	61.5	95.6	119.9
1956	61.9	71.5	101.5	107.8
1957	51.1	61.8	95.1	131.0
1958	68.0	82.3	91.6	91.8
1959	2 85.0	1 152.0	1 154.8	1 166.4
1960	1 115.5	2 121.1	2 121.7	1 134.9
1961				
1962				
1963				
1964				
1965				
1966				
1967				
1968				
1969				
1970				
1971				
1972				
1973				
1974				
1975				
1976				
1977				
1978				
1979				
1980				

Probability Analysis

1/2 years	67	86	101	129
1/5	82	111	117	151
1/10	95	135	131	165
1/20	105	156	147	175
1/25	108	163	155	176
1/30				
1/50				
1/100				

Table A 5-11 Annual Maximum Daily Rainfall at Tail Regulator of Mae Fack Project (07460)

Water Year	(Unit: mm)					Remarks
	1 day Record Date	2 day Record Date	3 day Record Date	5 day Record Date		
1952	89.3 15, Sep.	98.4 1, Dec.	114.2 24, Aug.	131.1 11, Sep.		
1953	195.3 22, Aug.	219.2 22, Aug.	226.5 21, Aug.	228.8 21, Aug.		
1954	137.4 5, Jul.	138.2 5, Jul.	138.2 5, Jul.	165.2 5, Jul.		
1955	79.0 23, Aug.	136.6 23, Aug.	200.3 23, Aug.	213.8 22, Aug.		
1956	174.0 22, Jul.	175.4 22, Jul.	188.6 22, Jul.	189.9 21, Jul.		Aug.-Oct.: missing
1957	47.2 24, Jul.	73.1 27, Oct.	73.7 27, Oct.	111.8 24, Oct.		
1958	52.8 11, Aug.	87.6 10, Aug.	92.4 17, Sep.	116.6 10, Aug.		Apr.-Jul.: missing
1959	54.5 3, Jul.	91.4 14, Sep.	92.4 14, Sep.	125.5 14, Sep.		
1960	48.0 15, Aug.	57.4 15, May	63.2 4, Jul.	95.5 4, Jun.		
1961	108.7 15, Jul.	116.3 13, Jul.	156.8 13, Jul.	202.1 18, Aug.		
1962	139.4 15, May	177.7 15, May	207.7 15, May	215.9 15, May		
1963	79.6 28, Aug.	114.5 28, Aug.	171.4 26, Aug.	208.4 25, Aug.		
1964	122.4 25, Sep.	166.1 25, Sep.	196.9 25, Sep.	196.9 25, Sep.		
1965	88.5 24, Aug.	128.2 23, Aug.	131.8 25, Aug.	170.4 24, Aug.		
1966	56.3 11, Jan.	60.3 10, Jan.	98.2 12, Sep.	115.7 12, Sep.		
1967	101.2 26, Jul.	134.8 26, Jul.	165.4 26, Jul.	165.9 25, Jul.		
1968	69.2 23, Sep.	91.6 23, Sep.	103.7 18, Sep.	171.6 20, Sep.		
1969	77.0 14, Sep.	115.7 14, Sep.	140.0 30, Aug.	140.0 30, Aug.		
1970	84.0 3, Jul.	154.7 2, Jul.	158.3 2, Jul.	169.6 2, Jul.		
1971	62.6 10, May	63.5 13, Jun.	67.9 13, Jun.	121.4 3, Sep.		
1972						
1973						
1974						
1975						
1976						
1977						
1978						
1979						
1980						
Probability Analysis						
1/2 Years	83	115	135	161		
1/5	121	155	181	197		
1/10	149	179	207	217		
1/20	179	201	231	235		
1/25	189	207	238	240		
1/30	197	213	244	244		
1/50	221	227	259	255		
1/100	255	246	280	269		
Max.	195.3	219.2	226.5	228.8		

Table A 5-12 Annual Maximum Daily Rainfall at Huai Mae Lal (P.36), A. San Kamphaeng, Chiang Mai (07581)

(Unit: mm)

Water Year	1 day		2 day		3 day		5 day		Remarks
	Record	Date	Record	Date	Record	Date	Record	Date	
1952									
1953									
1954									
1955									
1956									
1957									
1958									
1959									
1960									
1961									
1962									
1963									
1964									
1965									
1966									
1967									
1968									
1969									
1970									
1971									
1972									
1973									
1974									
1975									
1976									
1977	88.5	12. Sep.	137.9	29. Aug.	157.3	28. Aug.	170.6	28. Aug.	no data in May
1978	80.4	2. Jul.	112.9	1. Jul.	116.4	1. Jul.	130.3	28. Jun.	
1979	64.2	25. Jul.	91.4	18. May	115.8	18. May	132.4	18. May	
1980									

Probability Analysis

- 1/2 Years
- 1/5
- 1/10
- 1/20
- 1/25
- 1/30
- 1/50
- 1/100

Table A 5-13 Annual Maximum Daily Rainfall at A. Muang, Lamphun (17012)

Water Year	1 day			2 day			5 day			Remarks				
	Record	Date		Record	Date		Record	Date						
	(Unit: mm)													
1952	70.7	6, Aug.		130.3	1, Jun.		4	178.2	4, Jun.		2	252.0	1, Jun.	
1953	162.8	12, Sep.		177.5	12, Sep.		2	209.6	12, Sep.		5	210.5	11, Sep.	
1954														
1955	87.2	7, Jun.		106.3	6, Jun.			109.3	5, Jun.			119.4	5, Jun.	
1956	4	116.8	1, Sep.	123.9	1, Sep.		5	168.6	16, Sep.			190.6	15, Sep.	
1957														
1958														
1959														
1960														
1961														
1962	106.5	31, Aug.		106.5	31, Aug.			106.5	31, Aug.			134.4	27, Aug.	
1963	52.7	27, Jul.		81.5	26, Oct.			109.0	25, Oct.			116.3	25, Oct.	
1964	70.3	21, Jul.		76.5	21, Jul.			76.5	21, Jul.			95.7	25, May	
1965	45.6	23, Sep.		63.0	18, Aug.			63.0	18, Aug.			81.5	18, Aug.	
1966	72.6	13, Aug.		99.0	27, Oct.			110.4	26, Oct.			118.9	9, Aug.	
1967	3	133.8	26, Sep.	3	159.0	13, Sep.	3	192.8	21, Sep.			316.2	22, Sep.	
1968	76.4	28, Apr.		112.6	27, Apr.			112.6	27, Apr.			150.2	24, Apr.	
1969	60.3	29, Apr.		65.9	21, Aug.			79.3	20, Aug.			89.8	15, Aug.	
1970	81.4	23, Apr.		133.9	23, Apr.			133.9	23, Apr.			137.5	22, Apr.	
1971	70.3	25, Aug.		80.3	24, Aug.			86.3	25, Aug.			162.0	21, Aug.	
1972	78.1	11, Apr.		128.5	10, Apr.			128.5	10, Apr.			128.5	10, Apr.	
1973	94.2	19, Sep.		128.7	16, Sep.			136.7	17, Sep.			243.3	16, Sep.	
1974	70.2	25, Sep.		79.6	31, Oct.			102.6	19, May			115.8	19, May	
1975	5	108.5	28, Aug.	2	161.0	28, Aug.		213.5	27, Aug.			213.5	27, Aug.	
1976	103.7	26, Oct.		116.2	29, Jul.			127.6	29, Jul.			129.4	26, Oct.	
1977	1	144.2	9, May	4	144.2	9, May		144.2	9, May			163.0	9, May	
1978	2	140.8	10, May	5	140.8	10, May		140.8	10, May			154.0	10, May	
1979								91.8	28, Jul.			99.8	20, May	
1980														

Probability Analysis

1/2 Years	87	112	122	144
1/5	111	140	161	197
1/10	126	157	185	233
1/20	140	171	208	270
1/25	144	176	215	282
1/30	148	179	221	291
1/50	157	189	237	319
1/100	169	201	259	357
Max.	144.2	177.5	213.5	316.2

Table A 5-14 Annual Maximum Daily Rainfall at A. Nue Tha, Lamphun (17042)

Water Year	1 day		2 day		3 day		5 day		Remarks
	Record	Date	Record	Date	Record	Date	Record	Date	
1952	98.5	28, Aug.	98.5	28, Aug.	116.1	17, Sep.	116.1	17, Sep.	
1953	1	127.0	2	142.9	3	160.0	3	160.0	1, Oct.
1954	4	99.0		109.6		109.6		146.0	29, May
1955		79.3	3	134.6	5	150.2	5	150.2	1, Sep.
1956		81.0		81.0		101.1		131.5	11, Jul.
1957		70.0		109.5		169.5		230.5	26, Sep.
1958		16.3		27.7		37.9		62.3	26, Sep.
1959		85.2		101.7		116.5		129.1	2, Jul.
1960		77.7		109.3		128.5		146.1	8, Sep.
1961		80.5		120.7		150.8		166.1	10, Aug.
1962		64.6		70.2		112.6		163.9	31, May
1963		59.0		95.6		135.6		150.1	29, Aug.
1964		60.2		101.1		112.3		126.6	19, Aug.
1965		59.6		104.3		139.8		210.1	26, May
1966		90.0		104.4		107.8		112.1	6, May
1967		60.0		96.5		127.4		146.8	27, Apr.
1968		83.5		99.0		106.5		107.9	26, May
1969		74.6		112.4		117.5		136.8	30, May
1970		98.5		123.5		123.5		172.3	9, Jul.
1971		112.5		174.7		179.7		179.7	10, Apr.
1972	2	75.0	1	75.0	1	95.0	1	135.5	16, Sep.
1973		53.5		80.6		108.8		155.7	7, Jan.
1974		112.2		112.2		137.3		157.3	29, Oct.
1975	3	95.2		96.8		96.8		112.0	24, Aug.
1976		98.7		105.2		105.1		106.3	11, Sep.
1977	5	77.0		77.0		98.0		105.0	28, Jun.
1978		70.8		116.4		116.4		118.7	19, May
1979		57.0		68.0		98.0		128.0	21, May
1980									

(Unit: mm)

Probability Analysis

1/2 Years	75	100	116	137
1/5	105	124	147	169
1/10	121	138	166	188
1/20	139	149	184	205
1/25	145	153	190	210
1/30	149	155	194	214
1/50	162	162	206	226
1/100	180	172	223	271

Table A 6-1 Monthly Runoff Record at P-1 Gaging Station
DA = 6,356sq.km

(Unit: MCM)

Water Year	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Total
1921	33.60	37.70	45.00	73.30	212.00	391.00	293.00	158.00	112.00	75.00	50.90	29.60	1,511.10
22	40.80	56.40	53.50	93.10	163.00	322.00	230.00	166.00	110.00	72.80	49.00	42.40	1,399.00
23	37.50	63.20	87.30	64.00	251.00	198.00	260.00	122.00	89.80	65.00	44.00	44.20	1,326.00
24	55.40	62.80	101.00	142.00	339.00	397.00	253.00	165.00	150.00	93.10	60.60	47.50	1,826.40
25	49.20	57.90	77.10	108.00	151.00	402.00	225.00	131.00	104.00	86.90	56.00	44.70	1,492.80
26	34.50	37.60	70.10	101.00	245.00	336.00	368.00	280.00	170.00	111.00	72.70	55.00	1,880.90
27	63.90	177.00	170.00	208.00	239.00	200.00	521.00	175.00	115.00	70.60	44.40	38.70	2,022.60
28	40.20	43.40	148.00	303.00	229.00	183.00	171.00	141.00	85.90	59.00	45.40	49.40	1,498.30
29	39.10	48.80	91.20	108.00	329.00	667.00	228.00	125.00	97.90	63.00	39.00	35.80	1,871.80
1930	33.20	96.20	85.90	234.00	247.00	336.00	223.00	122.00	83.50	62.80	39.20	33.90	1,596.70
31	29.80	32.20	28.60	33.10	94.90	232.00	73.10	36.40	37.10	33.80	30.10	27.90	689.00
32	55.10	31.50	38.90	176.00	125.00	391.00	353.00	150.00	105.00	72.10	52.10	46.70	1,576.40
33	43.90	89.00	90.00	299.00	674.00	524.00	254.00	148.00	114.00	87.90	65.50	48.40	2,437.70
34	44.70	43.50	80.30	144.00	231.00	357.00	360.00	130.00	106.00	75.80	49.40	40.70	1,662.40
35	34.10	76.20	88.40	189.00	242.00	454.00	342.00	239.00	159.00	102.00	74.40	54.20	2,054.30
36	49.90	85.00	80.90	227.00	192.00	309.00	136.00	73.70	73.20	55.40	51.90	59.50	1,393.50
37	47.40	92.60	117.00	210.00	200.00	653.00	241.00	127.00	137.00	95.00	56.80	47.80	2,024.60
38	44.20	183.00	328.00	269.00	606.00	555.00	381.00	240.00	180.00	133.00	79.90	77.80	3,076.90
39	61.10	83.30	121.00	193.00	551.00	635.00	384.00	231.00	236.00	142.00	93.10	91.70	2,822.20
1940	80.00	109.00	119.00	107.00	389.00	388.00	194.00	128.00	121.00	104.00	96.20	89.20	1,924.40
41	75.50	71.10	99.30	83.40	234.00	416.00	299.00	140.00	131.00	82.90	59.20	56.40	1,747.80
42	47.90	64.30	277.00	185.00	488.00	645.00	251.00	202.00	150.00	102.00	72.60	72.90	2,557.70
43	56.00	63.00	99.10	214.00	469.00	725.00	265.00	245.00	172.00	168.00	123.00	110.00	2,709.10
44	61.90	70.20	68.60	208.00	211.00	221.00	211.00	144.00	124.00	127.00	108.00	149.00	1,733.70
45	125.00	153.00	169.00	220.00	527.00	503.00	485.00	119.00	158.00	81.50	69.10	66.00	2,475.60
46	61.70	109.00	103.00	79.70	274.00	301.00	284.00	127.00	90.30	75.10	43.60	43.40	1,591.80
47	57.80	98.10	134.00	183.00	312.00	487.00	296.00	154.00	100.00	76.10	53.20	41.10	1,992.30
48	38.80	123.00	124.00	114.00	188.00	300.00	539.00	163.00	129.00	107.00	72.10	51.60	1,949.50
49	38.70	68.40	93.30	175.00	434.00	493.00	403.00	310.00	210.00	168.00	97.20	72.50	2,563.10
1950	49.70	88.50	155.00	178.00	272.00	467.00	531.00	265.00	189.00	152.00	99.30	75.40	2,521.90
51	54.20	63.20	189.00	218.00	317.00	470.00	506.00	192.00	173.00	113.00	76.40	65.90	2,437.70
52	47.60	56.50	78.10	122.00	319.00	735.00	300.00	196.00	146.00	107.00	104.00	58.60	2,299.80
53	50.70	106.00	134.00	147.00	433.00	498.00	346.00	235.00	170.00	103.00	67.30	82.60	2,369.60
54	51.10	143.00	145.00	68.90	186.00	281.00	318.00	121.00	114.00	73.40	43.20	38.20	1,582.80
55	31.30	63.20	162.00	146.00	432.00	420.00	233.00	143.00	89.70	58.70	38.70	25.10	1,842.70
56	28.10	114.00	92.70	190.00	527.00	647.00	273.00	154.00	126.00	63.10	37.10	27.30	2,279.20
57	22.00	29.80	111.00	65.30	208.00	445.00	258.00	102.00	63.80	37.30	56.60	17.30	1,396.10
58	17.20	40.10	52.30	89.90	180.00	313.00	181.00	82.80	55.50	32.90	19.70	14.90	1,079.30
59	11.80	45.00	80.60	95.10	278.00	581.00	293.00	98.00	76.60	46.50	34.80	23.40	1,663.80
1960	15.10	31.20	31.60	55.30	178.00	360.00	187.00	104.00	163.00	58.30	34.60	20.70	1,238.80
61	23.70	82.80	101.00	86.00	312.00	600.00	356.00	177.00	131.00	77.10	50.40	40.00	2,037.00
62	27.10	57.20	39.90	155.00*	229.00	165.00	304.00	104.00	79.70	37.10	26.50	22.80	1,247.30
63	18.60	19.80	62.20	90.00	388.00	266.00	381.00	401.00	170.00	96.20	47.90	26.30	1,967.00
64	21.60	134.00	99.70	210.00	199.00	473.00	388.00	202.00	141.00	74.60	45.20	26.60	2,014.70
65	22.90	37.50	99.80	48.50	206.00	349.00	319.00	332.00	191.00	91.00	39.40	23.00	1,759.10
66	16.90	50.30	61.50	52.00	323.00	433.00	195.00	153.00	102.00	59.50	26.90	26.70	1,499.80
67	33.20	68.10	92.20	69.10	253.00	646.00	298.00	144.00	97.30	43.00	24.10	16.30	1,784.30
68	47.20	76.50	99.70	133.00	364.00	243.00	221.00	112.00	67.90	38.70	27.40	17.80	1,448.20
69	8.13	72.80	143.00	148.00	579.00	273.00	212.00	155.00	86.20	41.30	23.50	19.70	1,761.63
1970	23.90	208.00	276.00	357.00	782.00	757.00	376.00	216.00	271.00	110.00	46.80	32.20	3,455.90
71	18.30	142.00	154.00	642.00	877.00	737.00	586.00	296.00	199.00	109.00	46.90	25.40	3,832.60
72	49.10	27.60	65.80	32.60	392.00	341.00	362.00	325.00	230.00	83.20	34.00	43.00	1,975.70
73	7.28	96.70	218.00	377.00	1,176.1	1,173.2	571.00	282.00	210.00	99.40	36.30	25.20	4,271.88
74	23.40	115.00	132.00	61.90	440.00	556.00	295.00	394.00	144.00	143.00	31.60	14.80	2,350.70
75	7.75	50.60	331.00	347.00	719.00	894.00	610.00	355.00	234.00	103.00	45.30	23.20	3,719.85
76	20.10	84.50	103.00	33.00	202.00	387.00	353.00	190.00	133.00	96.60	11.00	7.96	1,621.16
77	52.40	89.10	63.30	66.00	142.00	576.00	354.00	238.00	137.00	134.00	48.30	25.70	1,925.80
78	10.60	97.20	91.90	525.00	551.00	660.00	425.00	185.00	166.00	57.60	27.20	4.80	2,801.30
79	2.15	64.80	164.00	39.50	157.00	131.00	311.00	93.00	92.40	17.40	5.68	2.41	1,080.34
Mean	38.54	79.35	115.56	162.57	343.86	455.85	319.93	182.02	133.56	84.83	52.29	43.07	2,011.43

Data Source) Hydrology Division, RID

Note) *: referred to ECI report

**: referred to daily runoff record

Table A 6-2 Monthly Runoff Record at P-5 Gaging Station
DA = 1,665 sq.km

Water Year	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Total
1951	10.60	8.16	48.60	96.50	164.00	243.00	291.00	69.10	39.10	17.90	9.46	5.07	1,002.49
52	10.30	29.20	32.00	30.80	141.00	418.00	114.00	74.10	24.50	23.60	14.00	19.50	931.00
53	21.90	22.10	58.80	69.00	202.00	295.00	123.00	101.00	20.80	4.52	15.30	37.20	970.62
54	32.30	40.30	52.00	5.74	132.00	197.00	224.00	35.30	24.40	4.92	2.34	6.49	756.79
55	13.60	12.90	42.10	31.90	182.00	189.00	77.10	60.20	19.40	10.90	12.70	11.20	663.00
56	5.09	76.70	18.70	99.80	262.00	407.00	140.00	69.90	27.50	16.60	6.53	4.09	1,133.91
57	2.58	0.41	24.80	17.30	99.10	245.00	113.00	39.40	13.20	7.84	7.87	0.27	570.77
58	0.83	8.71	3.76	30.20	127.00	162.00	152.00	52.60	17.80	3.37	0.30	0.07	558.64
59	0.43	5.95	6.92	26.70	189.00	331.00	116.00	26.30	10.10	3.47	3.25	0.12	719.24
1960	0.20	7.07	3.35	28.20	107.00	261.00	110.00	56.10	43.00	5.94	3.55	1.32	626.73
61	0.68	21.70	41.40	26.80	244.00	353.00	215.00	62.60	25.10	8.24	7.22	4.74	1,010.48
62	0.27	7.64	5.41	41.20	81.60	191.00	326.00	40.70	10.10	0.08	0.00	0.00	704.00
63	0.00	0.00	1.72	15.30	143.00	108.00	155.00	233.00	16.20	2.13	0.90	0.00	675.25
64	0.57	19.10	7.74	65.10	42.60	202.00	200.00	51.20	8.94	0.08	0.16	0.00	597.49
65	0.00	0.00	3.04	0.08	62.10	120.00	115.00	178.00	9.49	1.73	0.10	0.00	489.54
66	0.00	0.41	6.04	0.79	136.00	264.00	61.10	51.70	4.23	0.11	0.04	0.00	524.42
67	0.74	7.09	22.10	30.20	88.50	341.00	154.00	81.40	24.20	13.20	10.90	5.64	778.97
68	22.50	51.50	35.30	36.10	118.00	106.00	80.10	58.10	12.20	2.20	0.56	1.11	503.67
69	1.02	7.99	22.50	31.80	291.00	127.00	84.30	66.30	9.68	3.95	1.67	1.33	648.54
1970	3.61	84.00	137.00	85.30	535.00	382.00	133.00	78.10	47.10	14.10	7.45	3.83	1,510.49
71	2.73	35.50	35.70	330.00	360.00	340.00	210.00	80.30	20.20	6.54	6.82	3.90	1,431.69
72	25.70	2.21	12.60	1.01	127.00	161.00	120.00	134.00	33.90	14.30	7.55	8.50	647.77
73	1.60	9.18	23.00	57.90	460.00	583.00	174.00	66.60	32.50	17.10	14.80	9.28	1,448.96
74	9.84	21.40	20.50	25.70	155.00	293.00	115.00	143.00	19.00	29.20	3.83	0.43	835.90
75	1.20	5.22	44.80	122.00	337.00	474.00	209.00	92.00	29.20	8.45	8.48	6.35	1,337.70
76	2.11	16.37*	22.40	2.60	43.30	123.00	113.00	85.60	13.50	15.40	2.90	2.47	442.65
77	11.60	13.30	5.11	5.18	88.40	297.00	127.00	69.10	16.20	11.10	2.69	3.43	650.11
78	0.58	30.20	5.58	165.00	228.00	246.00	150.00	44.60	15.30	1.64	1.29	0.95	889.14
79	1.34	24.60	32.40	11.40	66.00	68.10	113.00	20.80	8.88	2.62	1.44	0.92	351.50
Mean	6.34	19.62	26.74	51.37	179.71	259.56	148.78	75.90	20.54	8.66	5.31	4.77	807.30

Data Source) Hydrology Division, RFD
Notes) * Estimated from the average discharge of monthly daily records.

Table A 6-3 Monthly Runoff Record at P-13 Gaging Station
DA = 1,765 sg.km

Water Year	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Total
1952	15.50*	28.30*	33.10	48.60	153.00	291.00	126.00	74.60	63.40	52.50	37.10	28.80	931.90
53	25.00	37.60	74.60	63.20	128.00	159.00	145.00	95.70	61.90	46.50	32.70	34.60	903.80
54	20.60	58.20	47.70	39.90	64.10	113.00	109.00	47.80	36.20	28.20	19.00	17.30	601.00
55	19.30	52.50	74.40	56.70	123.00	135.00	103.00	69.20	45.80	34.90	27.70	21.50	743.00
56	21.40	54.80	41.80	71.50	158.00	164.00	85.10	71.10	48.50	36.10	25.60	20.80	798.70
57	11.20	14.60	45.90	42.90	71.20	151.00	94.10	42.20	29.90	26.40	19.20	14.90	563.50
58	12.50	17.70	29.90	41.90	79.00	98.10	54.70	32.30	26.30	23.00	15.20	12.70	443.30
59	10.90	20.20	27.80	46.00	82.20	193.00	136.00	70.40	36.30	29.00	21.30	18.10	691.20
1960	12.60	21.00	24.10	28.70	70.90	108.00	70.80	37.30	41.60	20.40	10.30	7.60	453.30
61	12.40	28.70	44.00	47.90	126.00	204.00	159.00	81.30	51.20	31.80	22.70	18.30	827.30
62	14.90	24.30	20.80	55.40	86.50	63.70	115.00	39.50	27.40	21.70	13.30	13.80	496.30
63	11.70	10.30	22.30	38.10	104.00	94.30	165.00	158.00	62.90	36.90	25.10	20.40	749.00
64	13.00	55.40	39.80	71.60	79.90	139.00	155.00	62.80	43.40	29.90	21.80	17.30	728.90
65	14.00	20.50	41.50	28.10	72.00	102.00	147.00	98.60	54.60	32.90	21.00	17.30	649.50
66	14.10	23.70	21.50	27.90	87.90	122.00	55.80	33.60	25.70	20.40	14.00	13.60	460.20
67	12.60	21.30	20.20	32.50	65.40	210.00	102.00	58.10	37.20	30.40	20.90	17.80	628.40
68	24.20	29.50	39.90	53.60	112.00	65.70	66.00	42.60	30.50	25.10	16.20	17.30	520.60
69	10.30	32.50	38.80	60.60	187.00	102.00	101.00	66.20	42.30	32.70	25.00	21.10	717.50
1970	20.80	42.80	64.40	111.00	189.00	204.00	110.00	68.90	68.10	45.50	28.80	25.10	978.40
71	26.70	31.80	45.60	126.00	190.00	145.00	172.00	85.60	58.10	36.10	22.20	18.00	957.10
72	29.50	23.40	35.50	31.00	89.60	87.90	91.10	64.40	46.30	53.10	23.50	21.60	576.90
73	15.30	30.60	44.60	94.10	458.00	349.00	163.00	77.60	47.30	35.70	24.80	22.20	1,362.20
74	19.70	28.90	31.80	25.80	96.70	103.00	67.90	65.20	53.80	34.70	18.90	16.60	543.00
75	14.00*	19.00	92.70	76.50	148.00	171.00	146.00	85.10	56.80	41.10	29.60	24.80	904.60
76	18.20	28.20	30.60	39.00	65.50	106.00	96.10	50.30	33.60	32.00	17.70	15.10	532.30
77	15.80	24.80	18.90	31.00	44.00	127.00	128.00	69.30	35.20	58.20	48.32**	15.80	596.32
78	13.20	19.60	17.50	97.30	112.00	174.00	110.00	50.10	56.00	27.80	19.40	16.60	693.50
79	15.10	23.60	40.50	30.10	59.70	60.90	129.00	29.10	22.00	17.80	15.30	11.80	452.90
Mean	16.59	28.71	39.65	54.18	117.24	144.38	114.38	65.25	42.94	52.10	22.59	18.60	696.61

Data Source)

Hydrology Division, RID

Note) *: referred to ECI report.

** : estimated from runoff at P-34 Gaging Station.

Table A 6-4 Monthly Runoff Record at P-30 Gaging Station

DA = 466 sq.km (Unit: MCM)

Water Year	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Total
1967								13.86	9.85	7.00	4.76	4.07	-
1968	5.15	10.22	8.53	8.68	26.15	24.87	26.11	10.60	7.59	4.80	2.21	1.93	136.84
1969	0.59	9.73	8.24	12.95	35.76	22.41	22.83	13.80	8.13	5.03	3.15	2.71	143.33
1970	3.19	9.25	27.38	18.16	89.52	49.42	23.41	14.31	15.56	8.22	5.31	4.46	268.19
1971	5.68	7.89	16.81	52.46	69.07	58.15	37.01	19.65	14.19	9.57	5.58	4.33	298.39
1972	-	4.04	-	5.60	44.69	34.93	29.39	19.95	14.65	9.30	5.46	4.96	-
1973	3.54	6.82	10.44	23.23	121.41	108.17	39.74	23.95	18.96	15.71	8.99	8.61	389.57
Mean 1967-73	3.23	7.99	14.28	20.18	64.10	49.66	29.75	16.59	12.70	8.52	5.07	4.44	236.51
1974	8.16	12.22	13.49	14.72	36.70	35.33	16.58	21.11	9.73	10.29	5.23	5.10	188.66
1975	3.14	5.09	15.17	28.16	73.76	47.29	23.89	7.88	3.94	1.38	0.39	0.00	210.09
1976	0.03	0.68	0.46	0.07	3.40	15.60	6.95	2.84	0.41	0.48	0.00	0.00	30.92
1977	0.00	0.36	0.00	1.16	7.51	16.00	7.62	1.46	0.03	0.03	0.01	0.00	34.18
1978	0.00	0.24	0.12	14.80	11.60	19.90	8.44	0.11	0.00	0.00	0.00	0.00	55.21
1979	4.66	11.50	13.40	10.10	15.90	18.50	20.80	7.54	5.56	3.99	2.44	1.63	116.02
Mean 1974-79	2.67	5.02	7.11	11.50	24.81	25.44	14.05	6.82	3.28	2.70	1.35	1.12	105.87
Mean 1967-79	2.92	6.50	10.37	15.84	44.46	37.55	21.90	12.08	8.35	5.83	3.35	2.91	172.06

Data Source) Hydrology Division, RID

Note) Reliability of data from 1974 to 1979 is low, due to adoption of inaccurate rating curve.

Table A 6-5 Monthly Runoff Record at P-34 Gaging Station
DA = 566 sq.km (Unit: MCN)

Water Year	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Total
1952	5.66	9.21	10.87	18.14	59.30	112.19	37.05	23.59	21.73	16.48	9.54	10.51	332.27
1953	5.70	11.01	24.50	24.83	57.75	64.15	41.19	30.88	21.15	14.66	8.94	13.24	518.00
1954	4.75	14.99	15.67	14.16	37.87	47.41	33.34	14.53	11.08	9.09	7.10	5.09	214.88
1955	4.47	10.03	24.43	21.85	56.19	55.42	32.04	21.72	14.84	11.13	8.27	7.07	267.46
1956	4.93	14.34	13.73	28.62	67.08	65.97	28.13	22.38	15.90	11.49	7.99	6.74	287.30
1957	2.73	6.56	15.08	15.54	40.08	61.24	50.10	12.40	8.61	8.54	7.12	5.96	211.96
1958	3.01	7.16	9.82	15.08	42.51	41.99	21.51	8.98	7.20	7.51	6.59	2.93	174.29
1959	2.66	7.65	9.13	16.95	43.50	76.52	39.23	22.14	11.12	9.33	7.41	5.47	251.11
1960	3.03	7.80	7.92	9.04	39.99	45.59	25.02	10.71	13.19	6.71	5.93	0.53	175.46
1961	2.99	9.29	14.45	17.82	57.13	80.53	44.25	25.90	16.95	10.18	7.60	5.56	292.65
1962	3.53	8.44	6.84	21.26	44.84	29.47	34.65	11.47	7.63	7.11	6.33	3.45	185.02
1963	2.84	5.73	7.33	13.34	50.28	40.60	45.55	52.39	21.54	11.74	7.92	6.55	265.81
1964	3.12	14.45	13.07	28.67	42.79	56.87	43.37	19.51	13.90	9.61	7.48	5.09	257.93
1965	3.33	7.71	13.63	8.76	40.33	43.41	41.63	31.88	18.29	10.52	7.37	5.09	251.95
1966	3.35	8.32	7.07	8.67	45.28	50.68	21.75	9.43	6.96	6.71	6.42	3.35	177.99
1967	3.03	7.86	6.64	10.78	38.28	82.71	31.82	16.84	11.97	8.51	5.78	4.95	229.17
1968	6.26	12.42	10.36	10.55	31.77	30.22	31.72	12.88	9.22	5.83	2.69	2.34	166.26
1969	0.72	11.82	10.01	15.73	41.02	27.23	27.74	16.77	9.88	6.11	5.83	3.29	174.15
1970	3.88	11.24	33.27	22.06	108.77	60.05	28.44	17.39	18.91	9.99	6.45	5.42	325.87
1971	4.47	9.59	20.42	63.74	83.92	70.65	44.97	23.87	17.24	11.63	6.78	5.26	362.54
1972	6.67	4.91	11.66	6.80	54.30	42.44	35.71	24.24	17.80	11.30	6.63	6.03	228.49
1973	4.30	8.29	12.68	28.22	147.51	131.43	48.28	29.10	23.04	19.09	10.92	10.46	473.32
1974	5.34	7.82	7.80	11.91	35.02	45.04	19.42	20.49	7.13	9.50	4.13	2.91	176.51
1975	1.84	4.15	23.17	65.51	127.44	102.82	58.93	32.62	23.61	17.04	13.29	12.62	483.02
1976	5.66	7.17	7.44	6.81	20.64	44.91	30.62	19.20	9.97	7.52	4.80	4.08	168.82
1977	4.67	9.22	4.11	13.68	27.20	48.95	22.49	16.42	12.33	11.76	11.05	9.52	191.40
1978	4.23	9.00	7.08	50.16	58.60	64.73	39.33	14.91	8.40	12.72	10.76	7.16	287.08
1979	3.75	14.00	16.50	10.80	23.80	24.00	28.20	7.59	4.48	5.89	13.20	1.07	153.28
Mean	3.89	9.29	13.02	20.70	54.40	58.83	34.52	20.36	13.72	10.28	7.58	5.71	252.30

Note) Apr. 1952 - Oct. 1967, Apr. and Jun. 1972 : estimated from P-15 runoff based on the relations mentioned in Table A 6-13

Nov. 1967 - Mar. 1974 : estimated from P-30 runoff by following equation;

$$Q_{34} = \frac{D.A. \text{ at P-34}}{D.A. \text{ at P-30}} \times Q_{13} = 1.215 \times Q_{13}$$

Q₃₄: Monthly Runoff at P-34
Q₃₀: Monthly Runoff at P-30

Table A 6-6 Monthly Runoff Record at P-36 Gaging Station
DA = 35 sq.km (Unit: MCM)

Water Year	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Total
1977	1.26	1.72	0.78	2.46	3.91	4.21	4.28	2.25	1.78	1.40	1.14	1.18	26.37
1978	0.98	1.02	0.91	2.17	3.44	4.37	6.96	2.86	1.96	1.44	0.90	1.01	28.02
1979	1.47	1.59	1.09	1.63	2.68	3.58	3.57	1.78	1.37	1.12	1.01	0.98	21.87
Mean	1.24	1.44	0.93	2.09	3.34	4.05	4.94	2.30	1.70	1.32	1.02	1.06	25.43

Data Source) Hydrology Division, RID

Table A 6-7 Monthly Runoff to Mae Kuang Weir (P-25 Gaging Station)

DA = 572 sq.km (Unit: MCM)

Water Year	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Total
1964	-	-	6.74	17.50	13.12	54.60	53.15	21.02	12.91	6.40	3.66	1.33	-
1965	2.18	5.68	7.51	7.57	23.15	36.94	36.10	21.23	9.33	6.49	2.95	1.85	158.98
1966	1.33	7.59	8.29	9.59	53.13	48.32	18.21	9.96	6.11	4.68	2.32	1.47	171.00
1967	3.70	6.10	7.90	13.30	28.20	112.40	25.00	10.40	12.60	8.90	5.60	5.50	259.40
1968	8.50	11.80	13.60	9.60	53.60	29.30	28.30	14.20	7.90	4.80	4.50	4.40	190.50
1969	4.70	11.20	7.80	12.70	38.50	27.60	17.80	12.30	9.40	2.60	4.10	3.20	151.90
1970	3.30	10.70	24.40	20.40	66.40	31.50	24.20	17.80	15.70	6.90	4.90	5.00	231.20
1971	2.70	9.20	12.90	57.10	62.70	55.70	40.00	23.60	14.80	7.70	5.80	5.10	297.50
1972	7.30	5.00	10.10	7.60	45.10	34.50	31.90	22.50	15.60	10.00	7.80	7.90	205.30
1973	5.70	13.40	16.00	28.80	67.90	-	-	-	-	-	-	-	-
1874	-	10.70	12.50	9.00	34.10	49.60	19.40	27.40	3.40	11.60	6.60	4.20	-
1975	3.50	3.90	21.00	48.00	113.80	92.80	56.20	34.60	22.20	12.40	8.70	7.00	424.10
1976	6.80	11.50	12.00	8.60	21.40	46.20	30.00	14.30	5.10	6.60	6.00	5.50	174.00
1977	6.40	8.80	6.10	13.70	43.40	55.90	32.30	15.20	9.10	8.80	7.20	5.70	212.60
1978	5.30	8.60	9.50	59.30	71.70	67.90	42.00	19.10	15.70	6.20	4.70	4.10	314.10
1979	3.60	16.00	16.60	10.90	15.20	19.10	21.80	7.50	4.85*	3.80	2.30	1.60	123.25
1980	1.50	2.40	12.60	19.50	37.50	51.80	15.40	12.30	15.62*	-	-	-	-
Mean	4.43	8.79	12.09	20.77	46.41	50.89	30.74	17.71	11.27	7.19	5.14	4.24	219.67

Data Source: Hydrology Division, RID

Note) * : O/M Office of Mae Kuang Project
- : Missing Data

Table A 6-8 Monthly Runoff Record through Mae Kuang Weir (P-25 Gaging Station)

DA = 572 sq.km (Unit: MCN)

Water Year	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Total
1964	-	-	1.81	8.78	3.50	47.00	43.10	14.00	12.40	0.13	0.00	0.00	-
1965	0.00	0.58	3.20	2.76	12.30	27.40	25.10	15.40	7.17	1.99	0.00	0.00	95.90
1966	0.00	5.26	4.53	1.49	41.80	39.80	4.54	5.53	4.75	0.00	0.00	0.00	108.00
1967	0.10	2.20	2.90	5.20	19.70	108.10	16.40	5.70	9.80	0.00	0.00	0.00	170.10
1968	4.40	10.80	9.50	1.90	41.90	17.60	15.70	7.60	6.60	0.00	0.00	0.00	116.00
1969	0.00	7.00	5.60	2.90	33.10	17.70	8.00	7.60	8.40	0.50	0.00	0.00	90.80
1970	0.10	10.50	21.60	12.60	61.80	24.60	12.90	12.50	15.70	2.60	0.00	0.00	174.90
1971	0.00	8.00	9.50	48.10	52.80	50.40	30.20	19.80	13.30	0.00	0.00	0.00	232.10
1972	1.60	0.20	4.50	0.00	29.20	20.20	15.50	16.90	15.60	2.70	0.00	0.00	106.40
1973	0.00	6.20	14.00	12.10	60.60	-	-	-	-	-	-	-	-
1974	-	3.10	9.80	2.50	24.10	41.50	5.70	23.50	1.00	3.80	0.00	0.00	-
1975	0.00	0.40	16.00	37.40	103.20	91.00	42.00	30.30	22.20	2.40	0.00	0.00	344.90
1976	0.00	6.30	8.80	0.00	3.70	26.60	7.60	5.40	4.80	0.00	0.00	0.00	63.20
1977	0.00	2.20	0.00	3.20	25.70	44.30	13.00	7.50	8.20	2.40	0.80	0.00	107.30
1978	0.00	1.60	1.00	45.60	61.20	60.90	32.30	13.40	12.20	0.00	0.00	0.00	228.20
1979	0.20	10.20	10.10	2.60	4.30	6.90	8.30	1.00	3.51*	0.00	0.00	0.00	47.11
1980	0.00	0.00	6.70	14.40	21.50	42.90	4.40	9.40	15.55*	-	-	-	-
Mean	0.33	4.68	7.62	11.85	35.32	41.68	17.80	12.22	10.07	1.10	0.05	0.00	142.72

Data Source: Hydrology Division, RID

Note) * : O/M Office of Mae Kuang Project
 - : Missing Data due to the destruction of the weir by the flood in August 1973.

This table shows release flow through the Mae Kuang Weir.

Table A 6-9 Monthly Total Diverted Flow at Mae Kuang Weir (P-25 Gaging Station)

(Unit: MCM)

Water Year	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Total
1964	-	-	4.93	8.72	9.62	7.60	10.05	7.02	0.51	6.27	3.66	1.33	-
1965	2.18	3.10	4.51	4.81	10.85	9.54	11.00	5.33	2.16	4.50	2.95	1.85	63.08
1966	1.53	2.03	3.76	8.10	11.33	8.52	13.67	4.43	1.56	4.68	2.32	1.47	63.00
1967	3.60	3.90	5.00	8.10	8.50	4.30	8.60	4.70	2.80	8.90	5.60	5.30	69.30
1968	4.10	1.00	4.10	7.70	11.70	11.70	12.60	6.60	1.30	4.80	4.50	4.40	74.50
1969	4.70	4.20	2.20	9.80	5.40	9.90	9.80	4.70	1.00	2.10	4.10	3.20	61.10
1970	3.20	0.20	2.80	7.80	4.60	6.90	11.30	5.30	0.00	4.30	4.90	5.00	56.30
1971	2.70	1.20	3.40	9.00	9.90	5.30	9.80	3.80	1.50	7.70	5.80	5.10	65.20
1972	5.70	4.80	5.60	7.60	15.90	14.30	16.40	5.60	0.00	7.30	7.80	7.90	98.90
1973	5.70	7.20	2.00	16.70	7.30	0.00	4.10	25.80	20.50	10.00	4.80	7.30	109.40
1974	5.50	7.60	2.70	6.50	10.00	8.10	13.70	3.90	2.40	7.80	6.60	4.20	79.00
1975	5.50	3.50	5.00	10.60	10.60	1.80	14.20	4.50	0.00	10.00	8.70	7.00	79.20
1976	6.80	5.20	3.20	8.60	17.70	19.60	22.40	8.90	0.50	6.60	6.00	5.50	110.80
1977	6.40	6.60	6.10	10.50	17.70	11.60	19.30	7.70	0.90	6.40	6.40	5.70	105.30
1978	5.30	7.00	8.50	13.70	10.50	7.00	9.70	5.70	3.50	6.20	4.70	4.10	85.90
1979	3.40	5.80	6.50	8.30	10.90	12.20	13.50	6.50	1.54*	3.80	2.30	1.60	76.14
1980	1.50	2.40	5.90	5.10	16.00	8.90	11.00	2.90	0.07*				
Mean	4.10	4.11	4.47	8.92	11.09	8.66	12.42	6.57	2.33	6.33	5.07	4.43	78.50

Data Source: Hydrology Division, RID

Note: * : O/M Office of Mae Kuang Project
- : Missing Data

This table shows total intake water to Mae Kuang Project.

Table A 6-10 Monthly Diverted Flow Record to Koh Matan Canal (P-25 A) from Mae Kuang Weir
(Unit: MCM)

Water Year	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Total
1964	-	-	2.99	4.48	4.76	4.30	6.11	2.80	0.51	3.17	1.80	0.00	-
1965	0.85	1.63	3.72	2.37	5.60	5.00	4.94	2.81	2.16	2.25	1.50	0.73	33.56
1966	0.56	1.69	3.63	4.18	6.65	6.18	7.32	2.39	0.62	1.93	0.78	0.54	36.47
1967	1.00	3.30	4.10	4.00	4.20	3.20	4.30	2.10	1.80	2.00	1.80	1.50	33.30
1968	1.40	0.80	1.20	3.00	5.10	5.10	5.10	2.00	0.70	1.50	1.50	1.30	28.70
1969	1.20	1.50	0.80	4.20	3.70	4.40	4.70	2.10	0.40	0.70	1.20	0.80	25.70
1970	0.60	0.10	1.40	3.80	3.70	4.50	5.00	2.60	0.00	1.30	1.00	1.50	25.50
1971	0.80	1.00	1.30	3.30	4.20	0.80	3.40	1.40	0.40	3.10	1.70	1.10	22.50
1972	1.20	0.10	3.50	3.60	7.40	6.30	5.70	1.30	0.00	3.60	2.40	1.90	37.00
1973	1.00	2.60	1.20	7.10	1.70	0.00	0.10	14.40	16.70	2.70	1.90	1.40	50.80
1974	0.40	0.00	0.00	1.90	3.40	2.70	6.40	1.50	1.20	1.90	1.60	0.70	21.70
1975	0.60	1.10	3.80	2.90	4.10	0.60	9.40	1.40	0.00	3.10	2.60	1.20	30.80
1976	0.60	1.20	1.60	2.90	8.50	9.60	11.50	3.30	0.10	0.00	0.00	0.00	39.30
1977	1.30	3.80	3.60	4.50	7.70	5.60	7.70	2.70	0.40	2.00	0.80	1.70	41.80
1978	2.00	5.40	3.80	6.40	4.30	1.80	3.90	1.60	2.00	2.40	1.50	1.60	36.70
1979	1.00	4.00	4.60	3.80	4.70	6.00	6.40	1.70	-	1.30	0.50	0.50	-
1980	0.60	0.70	2.90	2.70	6.20	6.10	5.70	1.20	1.80	2.06	1.41	1.03	53.51
Mean	0.94	1.81	2.60	3.83	5.05	4.25	5.75	2.78	1.80	2.06	1.41	1.03	33.51

Data Source: Hydrology Division, RID

Note) - : Missing Data

Table A 6-11 Monthly Diverted Flow Record to Muang Wa Canal (P-25 B) from Mae Kuang Weir
(Unit: MCM)

Water Year	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Total
1964	-	-	0.71	1.43	1.63	1.94	2.01	0.90	0.00	1.01	0.50	0.28	-
1965	0.12	0.23	0.11	0.50	1.41	1.27	1.95	0.95	0.00	1.10	0.40	0.24	8.26
1966	0.15	0.13	0.13	1.20	1.59	1.23	2.28	0.14	0.26	0.85	0.21	0.09	8.24
1967	0.40	0.30	0.20	1.20	1.30	1.00	1.60	0.00	0.00	1.30	0.80	0.90	9.00
1968	1.00	0.20	0.30	1.30	2.40	2.00	2.40	0.80	0.20	0.40	0.60	0.50	12.10
1969	0.90	0.20	0.60	1.90	1.40	1.70	0.10	0.40	0.00	0.30	0.60	0.60	8.70
1970	0.30	0.00	0.10	0.20	0.90	1.10	1.70	0.80	0.00	0.50	0.80	0.80	7.20
1971	0.30	0.20	0.70	3.40	1.50	2.40	1.90	0.70	0.00	0.00	0.40	0.30	11.80
1972	0.00	0.10	0.20	0.80	1.50	1.80	2.60	0.70	0.00	0.60	0.40	0.50	9.20
1973	0.50	0.50	0.80	1.90	0.90	0.00	1.20	1.60	0.00	0.00	0.00	0.40	7.80
1974	0.30	1.20	1.30	0.40	1.10	1.80	2.70	0.60	0.00	0.10	0.90	0.30	10.70
1975	0.30	0.20	0.60	2.60	3.20	1.20	0.80	0.50	0.00	0.30	0.20	0.70	10.60
1976	0.70	0.80	0.10	0.60	3.00	4.00	2.00	0.60	0.00	0.00	0.00	0.00	11.80
1977	0.20	0.00	0.50	1.10	1.40	1.00	2.90	1.00	0.00	0.20	0.50	0.40	9.20
1978	0.90	0.80	0.30	1.60	2.40	1.60	1.70	1.20	1.30	0.30	0.30	0.20	12.60
1979	0.30	0.90	0.50	1.30	1.80	1.30	2.20	0.70	-	0.20	0.20	0.20	-
1980	0.20	0.30	0.10	0.50	6.40	0.70	0.80	0.40					
Mean	0.41	0.38	0.43	1.29	1.99	1.53	1.81	0.70	0.12	0.45	0.41	0.40	9.92

Data Source: Hydrology division, RID

Note) - : Missing Data

Table A 6-12 Monthly Diverted Flow Record to Pha Taek Canal (P-25 C) from Mae Kuang Weir
(Unit: MCM)

Water Year	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Total
1964	-	-	1.23	2.81	3.23	1.36	1.93	3.32	0.00	2.09	1.56	1.05	-
1965	1.21	1.24	0.48	1.94	3.84	3.27	4.11	2.09	0.00	1.15	1.05	0.88	21.26
1966	0.64	0.21	0.00	2.72	3.09	1.11	4.07	1.90	0.48	1.90	1.33	0.84	18.29
1967	2.20	0.30	0.70	2.90	3.00	0.10	2.70	2.60	1.00	5.60	3.00	2.90	27.00
1968	1.70	0.00	2.60	3.40	4.20	4.60	5.10	3.80	0.40	2.90	2.40	2.60	33.70
1969	2.60	2.50	0.80	3.70	0.30	3.80	5.00	2.20	0.60	1.10	2.30	1.80	26.70
1970	2.30	0.10	1.30	3.80	0.00	1.30	4.60	1.90	0.00	2.50	3.10	2.70	23.60
1971	1.60	0.00	1.40	2.30	4.20	2.10	4.50	1.70	1.10	4.60	3.70	3.70	30.90
1972	4.50	4.60	1.90	3.20	7.00	6.20	8.10	3.60	0.00	3.10	5.00	5.50	52.70
1973	4.20	4.10	0.00	7.70	4.70	0.00	2.80	7.80	3.80	7.30	2.90	5.50	50.80
1974	4.80	6.40	1.40	4.20	5.50	3.60	4.60	1.80	1.20	5.80	4.10	3.20	46.60
1975	2.60	2.20	0.60	5.10	3.30	0.00	4.00	2.40	0.00	6.60	5.90	5.10	37.80
1976	5.50	3.20	1.50	5.10	6.20	6.00	8.90	5.00	0.20	6.60	6.00	5.50	59.70
1977	4.90	2.80	2.00	4.90	8.60	5.00	8.70	4.00	0.50	4.20	5.10	3.60	54.30
1978	2.40	0.80	4.40	5.70	3.80	3.60	4.10	2.90	0.20	3.50	2.90	2.30	36.60
1979	2.10	0.90	1.40	3.20	4.40	4.90	4.90	4.10	-	2.30	1.60	0.90	-
1980	0.70	1.40	2.90	1.90	3.40	2.10	4.50	1.30					
Mean	2.75	1.92	1.45	3.80	4.04	2.88	4.86	3.08	0.63	3.83	3.25	3.00	35.49

Data Source: Hydrology Division, RID
Note) - : Missing Data

Table A 6-13. Correlation of Monthly Runoff at P-13 and P-34 Gaging Stations

<u>Month</u>	<u>Correlation Coefficient</u>	<u>Coefficients of Regression Equation ^{1/}</u>	
		<u>a</u>	<u>b</u>
April	0.66	0.215	0.32
May	0.43	0.193	3.74
June	0.80	0.328	0.01
July	0.74	0.458	-4.10
August	0.79	0.311	17.94
September	0.90	0.364	6.29
October	0.65	0.218	9.58
November	0.84	0.345	-2.18
December	0.82	0.392	-3.11
January	0.54	0.304	0.51
February	0.18	0.135	4.54
March	0.55	0.471	-3.05

Note)

1. This analysis is based on monthly runoff data for 13 years from 1967 to 1979.

2. ^{1/} ... Regression equation as follows;

$$Q_{34} = a \times Q_{13} + b$$

Q₃₄ : Monthly runoff at P-34 (MCM)

Q₁₃ : Monthly runoff at P-13 (MCM)

a, b : Coefficients

Table A 7-1 Maximum Discharge at P-1 Gaging Station

River : Mae Ping River
Station : Nawarat Bridge
Drainage Area : 6,355 sq.km
Left Bank Elevation : 304.66 (MSL, m)
Right Bank Elevation : 304.25 (MSL, m)

Water Year	Momentary			Daily Mean		
	Gage Height (MSL, m)	Discharge (cms)	Date	Gage Height (MSL, m)	Discharge (cms)	Date
1921				303.96	321	Sep
1922				303.58	245	Oct
1923				304.00	331	Oct
1924				304.18	382	Sep
1925				304.05	344	Sep
1926				303.72	271	Oct
1927				304.27	412	Oct
1928				303.78	283	Jul
1929				304.48	498	Sep
1930				303.78	283	Sep
1931				303.08	164	Sep
1932				304.23	398	Sep
1933				304.63	602	Aug
1934				304.44	479	Oct
1935				304.18	382	Sep
1936				303.69	265	Sep
1937				304.49	563	Sep
1938		one time daily reading		304.48	498	Aug
1939				304.36	446	Aug
1940				303.98	326	Aug
1941				303.85	293	Sep
1942				304.38	454	Sep
1943				304.53	522	Sep
1944				304.23	398	Jul
1945				304.58	570	Sep
1946				304.33	345	Sep
1947				304.62	423	Aug
1948				304.57	408	Oct
1949				304.23	323	Sep
1950				304.58	411	Sep
1951				304.60	416	Oct
1952				304.90	490	Sep
1953				304.64	430	Aug
1954	304.69	447	Oct. 10	304.67	440	Oct
1955	304.43	335	Sep. 1	304.37	327	Sep
1956	304.68	460	Aug. 16	304.67	457	Aug
1957	304.66	453	Sep. 3	304.61	420	Sep
1958	304.49	392	Sep. 9	304.13	322	Sep
1959	304.53	383	Sep. 28	304.49	374	Sep
1960	304.02	294	Sep. 1	303.98	287	Sep
1961	304.55	386	Aug. 24	304.51	379	Aug
1962	303.76	257	Aug. 11	303.76	257	Aug
1963	304.65	422	Oct. 30	304.65	422	Oct
1964	304.17	338	Oct. 6	304.16	336	Oct
1965	304.76	437	Oct. 29	304.76	437	Oct
1966	304.00	339	Oct. 31	303.92	326	Oct
1967	304.63	485	Sep. 27	304.62	482	Sep
1968	303.88	316	Aug. 17	303.87	315	Aug
1969	304.56	452	Aug. 20	304.51	444	Aug
1970	304.37	494	Sep. 14	304.31	484	Sep
1971	304.46	582	Aug. 30	304.46	582	Aug
1972	303.59	425	Aug. 27	303.51	408	Aug
1973	304.67	729	Aug. 25	304.65	716	Aug
1974	304.10	590	Aug. 20	303.84	524	Aug
1975	304.72	699	Sep. 23	304.64	679	Sep
1976	303.96	505	Sep. 29	303.79	473	Sep
1977	304.50	662	Sep. 24	304.43	640	Sep
1978	304.48	569	Jul. 5	304.38	552	Jul
1979	303.82	461	Oct. 11	303.74	445	Oct
Max.	304.76	729		304.90	716	

Data Source : Processing Section, Hydrology Division, RID

Table A 7-2 Annual Maximum Discharge at P-5 Gaging Station

River : Mae Kuang River
 Station : Tha Sing Bridge
 Drainage Area : 1,665 sq.km
 Left Bank Elevation : 295.508 (MSL,m)
 Right Bank Elevation : 295.790 (MSL,m)

Water Year	Momentary			Daily Mean		
	Gage Height (MSL, m)	Discharge (cms)	Date	Gage Height (MSL, m)	Discharge (cms)	Date
1951	294.20	212	Sep. 9	294.15	209	Sep. 9
1952	294.74	251	Sep.22	294.73	250	Sep.22
1953	293.66	177	Sep.17	293.65	176	Sep.17
1954	294.38	258	Oct.10	294.33	252	Sep.10
1955	293.72	132	Aug.27	293.72	129	Aug.27
1956	294.68	267	Aug.16	294.66	265	Aug.16
1957	295.12	253	Sep. 5	294.56	225	Sep. 5
1958	293.02	128	Sep.24	292.98	127	Sep.24
1959	294.13	243	Aug.25	294.10	239	Aug.25
1960	293.68	154	Sep.17	293.63	151	Sep.17
1961	294.62	242	Aug.24	294.57	238	Aug.24
1962	294.30	219	Oct.18	294.24	215	Oct.18
1963	294.30	219	Nov. 2	294.30	219	Nov. 3
1964	293.90	192	Sep.10	293.80	186	Sep.10
1965	294.70	248	Oct.31	294.52	235	Nov. 1
1966	293.65	176	Sep.14	293.57	171	Sep.19
1967	294.99	246	Sep.28	294.95	244	Sep.28
1968	292.67	121	Aug.17	292.62	118	Aug.17
1969	294.98	296	Aug.24	294.92	291	Aug.24
1970	294.64	286	Aug.22	294.64	286	Aug.22
1971	294.93	319	Aug.30	294.92	318	Aug.31
1972	293.71	212	Sep.28	293.67	209	Sep.28
1973	295.10	376	Aug.26	295.05	368	Aug.26
1974	294.09	244	Sep.16	294.08	244	Sep.16
1975	295.10	350	Aug.29	294.88	326	Aug.29
1976	293.06	144	Oct. 1	292.67	121	Oct. 1
1977	293.53	180	Sep.17	293.48	177	Sep.17
1978	293.84	207	Aug.16	293.83	207	Aug.16
1979	292.82	136	Oct. 5	292.68	128	Oct. 5
Max.	295.12	376		295.05	368	

Data Source : Processing Section, Hydrology Division, RID

Table A 7-3 Annual Maximum Discharge at P-19 A Gaging Station

River : Mae Ping River
 Station : Ban Tha Sala
 Drainage Area : 14,023 sq.km
 Left Bank Elevation : 274.859 (MSL,m)
 Right Bank Elevation : 274.069 (MSL,m)

Water Year	Momentary			Daily Mean		
	Gage Height (MSL, m)	Discharge (cms)	Date	Gage Height (MSL, m)	Discharge (cms)	Date
1958	274.84	424	Sep.26	274.83	416	Sep.26
1959	276.24	929	Sep.29	276.22	919	Sep.29
1960	275.07	524	Sep.17	275.04	494	Aug.21
1961	276.62	988	Oct.23	276.50	940	Oct.23
1962	275.88	883	Oct.17	275.85	868	Oct.17
1963	275.57	778	Nov. 3	275.57	778	Nov. 3
1964	276.08	831	Oct. 6	276.06	824	Oct. 6
1965	275.91	753	Nov. 4	275.88	742	Nov. 4
1966	275.99	737	Sep.19	275.86	695	Sep.20
1967	276.93	1,086	Sep.30	276.89	1,069	Sep.30
1968	274.64	365	Sep.17	274.61	361	Sep.17
1969	276.30	856	Aug.26	276.26	843	Aug.26
1970	276.43	970	Aug.22	276.39	953	Aug.22
1971	276.64	939	Aug.31	276.62	931	Aug.31
1972	275.20	501	Sep.28	275.19	498	Sep.29
1973	277.21	1,888	Sep.21	277.12	1,751	Sep.21
1974	275.49	637	Sep.17	275.48	634	Sep.17
1975	276.98	1,105	Aug.30	276.87	1,065	Aug.30
1976	275.96	775	Oct.29	275.88	747	Oct.29
1977	276.21	840	Sep.23	276.16	822	Sep.24
1978	275.74	696	Aug.18	275.71	686	Aug.17
1979	275.09	513	Oct. 7	275.05	503	Oct.12
Max.	277.21	1,888		277.12	1,751	

Data Source : Processing Section, Hydrology Division, RID

Table A 7-4 Annual Maximum Discharge at P-30 Gaging Station

River : Mae Kuang River
 Station : Ban Kiang Kha Mai
 Drainage Area : 466 sq.km
 Left Bank Elevation : (MSL,m)
 Right Bank Elevation : (MSL,m)

Water Year	Momentary			Daily Mean		
	Gage Height (MSL, m)	Discharge (cms)	Date	Gage Height (MSL, m)	Discharge (cms)	Date
1967				Stream gaging began on Nov. 1, 1969		
1968	346.54	55	Aug.15	346.54	55	Aug.15
1969	347.14	88	Aug.22	346.42	47	Aug.22
1970	348.04	212	Aug.24	347.38	125	Aug.25
1971	347.66	149	Jul.14	347.14	106	Jul.14
1972	347.96	188	Aug.25	347.17	108	Aug.25
1973	349.38	425	Aug.24	347.95	205	Aug.24
1974	347.28	118	Sep.12	346.78	75	Aug.18
1975	348.12	216	Aug.25	346.93	87	Aug.25
1976	346.60	48	Sep.28	346.39	32	Sep.28
1977	346.81	69	Sep.22	346.50	40	Sep.22
1978		-	-	-	-	-
1979	346.46	52	Oct. 3	346.02	26.9	Oct. 5
Max.	349.38	425		347.95	205	

Note) */ : Referred to daily discharge record sheet

Data Source : Processing Section, Hydrology Division, RID

Table A 7-5 Annual Maximum Discharge at P-34 Gaging Station

River : Mae Kuang River
 Station : Ban Pha Taek
 Drainage Area : 566 sq.km
 Left Bank Elevation : (MSL,m)
 Right Bank Elevation : (MSL,m)

Water Year	Momentary			Daily Mean		
	Gage Height (MSL, m)	Discharge (cms)	Date	Gage Height (MSL, m)	Discharge (cms)	Date
1974	341.85	229	Sep.12	341.11	96	Sep.12
1975	342.42	347	Aug.25	341.77	214	Sep.22
1976	341.19	85	Sep.28	340.99	49	Sep.28
1977	342.08	197	Sep. 7	341.42	100	Sep.22
1978	343.05	347	Jul. 3	342.43	242	Jul. 3
1979	341.13	51.5	Oct. 3	341.03	43.4	Oct. 3
Max.	343.05	347		342.43	242	

Data Source : Processing Section, Hydrology Division, RID

Table A 8-1 Flood Situation in the Mae Kuang Basin in 1969

Flood of Mae Kuang River (P.5)

Flood Order: 4th

Date: 24/Aug. Qmax: 291 cms, WL: 294.92 m

Date	P.1				P.5				P.19A				Discharge at Upper Mae Kuang Basin				Rainfall (mm)			
	W.L.	Q	W.L.	Q	W.L.	Q	W.L.	Q	W.L.	Q	W.L.	Q	P.54	P.50	Chiang Mai	Doi Saket	P.25	Mae Fack	Phrao	
	m	cms	m	cms	m	cms	m	cms	m	cms	m	cms	cms	cms	(07813)	(07052)	(07341)	(07460)	(07122)	
-9 15/Aug.	303.48	287	292.22	109	-	-	-	-	-	-	-	-	-	-	10.1	0.0	0.2	21.5	1.8	
-8 16	303.82	336	292.63	135	-	-	-	-	-	-	-	-	-	-	6.0	0.0	2.2	0.0	10.7	
-7 17	303.61	306	292.47	123	-	-	-	-	-	-	-	-	-	-	54.0	10.9	15.3	0.0	39.6	
-6 18	303.12	238	292.36	117	-	-	-	-	-	-	-	-	-	-	14.1	28.7	41.4	44.1	23.4	
-5 19	303.78	331	292.58	130	-	-	-	-	-	-	-	-	-	-	22.5	8.8	28.0	55.1	8.2	
-4 20	304.42	429	292.89	148	-	-	-	-	-	-	-	-	-	-	19.3	37.7	40.6	22.7	25.7	
-3 21	304.51	444	293.22	168	-	-	-	-	-	-	-	-	-	-	4.4	34.0	21.8	46.8	11.5	
-2 22	304.48	439	294.10	228	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	33.4	0.0	
-1 23	304.45	434	294.73	276	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	0.0	0.0	
0 24/Aug.	304.25	402	294.92	291	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	0.0	0.0	
1 25	303.87	344	294.64	268	-	-	-	-	-	-	-	-	-	-	0.6	0.0	0.0	0.0	0.0	
2 26	303.47	286	294.25	239	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	0.0	0.0	
3 27	303.16	244	293.80	206	-	-	-	-	-	-	-	-	-	-	14.1	0.0	0.0	0.0	3.8	
4 28	302.98	219	293.26	170	-	-	-	-	-	-	-	-	-	-	0.0	0.0	1.1	4.0	0.0	
5 29	302.84	201	292.55	128	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.9	0.0	0.0	
6 30	302.50	157	291.80	87	-	-	-	-	-	-	-	-	-	-	2.3	7.0	1.8	25.5	0.7	
7 31	302.50	157	291.51	73	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	0.0	0.0	
8 1/Sep.	302.36	140	291.21	59	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	0.0	0.0	
9 2	302.16	116	290.91	45	-	-	-	-	-	-	-	-	-	-	16.8	16.0	16.3	10.0	6.2	
10 3	302.00	97	290.68	36	-	-	-	-	-	-	-	-	-	-	21.5	15.0	16.1	11.2	0.2	
11 4	302.16	116	290.63	34	-	-	-	-	-	-	-	-	-	-	2.5	0.0	6.9	21.4	0.0	
12 5	302.59	169	291.00	49	-	-	-	-	-	-	-	-	-	-	14.6	0.0	0.0	0.0	0.0	
13 6	302.69	182	291.42	68	-	-	-	-	-	-	-	-	-	-	0.0	0.0	5.3	0.0	0.0	
14 7	302.49	156	291.52	73	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	0.0	0.0	
15 8	302.22	123	291.40	68	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	0.0	0.0	
16 9	302.04	102	291.22	59	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	0.0	0.0	
17 10	301.95	92	290.99	49	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	0.0	0.0	
18 11	301.93	90	290.72	38	-	-	-	-	-	-	-	-	-	-	0.7	0.0	0.0	0.0	0.0	
19 12	301.83	79	290.75	39	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	0.0	0.0	
20 13	301.80	75	290.83	42	-	-	-	-	-	-	-	-	-	-	5.6	0.0	0.0	0.0	0.0	

Table A 8-2 Flood Situation in the Mae Kuang Basin in 1970

Flood of Mae Kuang River (P.S)

Flood Order: 5th

Date: 22/Aug. Qmax: 286 cms, WL: 294.64 m

Date	P.1				P.5				P.19A				Discharge at Upper Mae Kuang Basin		Rainfall (mm)			
	W.L. m	Q cms	W.L. m	Q cms	W.L. m	Q cms	W.L. m	Q cms	W.L. m	Q cms	W.L. m	Q cms	P.34 cms	P.30 cms	Chiang Mai (07813)	Doi Saket (07052)	P.25 (07341)	Mae Faek (07460)
-9	302.49	204	292.35	134	274.56	349	-	12	0.2	9.1	2.1	0	41.3					
-8	302.45	199	291.91	108	274.46	326	-	22	66.0	17.7	25.0	24.9	0.0					
-7	303.08	288	292.77	159	274.70	384	-	19	7.8	63.0	31.9	5.9	0.0					
-6	303.61	369	292.78	160	274.92	445	-	27	0.6	0.0	2.3	39.4	4.1					
-5	303.66	377	292.86	165	274.97	459	-	22	1.2	0.0	0.1	3.3	1.2					
-4	303.40	336	293.11	180	275.06	484	-	31	19.0	10.8	19.0	4.1	0.3					
-3	303.24	312	293.29	192	275.16	514	-	24	38.9	47.4	1.9	9.5	22.1					
-2	303.17	301	293.50	206	275.33	567	-	53	48.1	34.7	28.1	59.5	4.8					
-1	303.77	394	294.23	256	276.09	831	-	51	2.7	17.5	48.0	4.6	12.2					
0	303.97	426	294.64	286	276.39	953	-	38	2.0	0.0	1.6	20.7	3.7					
1	303.69	381	294.52	277	276.24	890	-	23	9.7	47.8	56.0	0.0	46.6					
2	303.57	362	294.30	261	276.13	847	-	123	14.9	35.6	26.1	30.3	52.3					
3	303.55	359	294.15	250	276.09	831	-	130	0.2	2.8	0.2	11.5	0.2					
4	304.07	443	294.45	272	276.00	797	-	55	2.0	0.0	0.0	0.0	13.2					
5	304.24	472	294.62	284	275.93	771	-	41	23.0	0.0	7.1	0.0	0.0					
6	303.79	397	294.56	280	275.90	760	-	30	3.0	14.6	0.5	6.2	12.6					
7	303.49	350	294.40	268	275.94	775	-	27	0.6	14.8	21.0	7.4	4.3					
8	303.25	313	294.14	250	275.95	778	-	24	0.0	0.0	2.2	0.0	0.0					
9	302.95	268	293.78	225	275.81	728	-	19	0.4	9.0	12.7	0.6	7.7					
10	302.78	244	293.42	201	275.62	662	-	20	2.1	14.2	7.8	3.9	6.4					
11	302.67	229	292.68	153	275.34	570	-	18	0.0	0.0	0.0	0.0	0.0					
12	302.48	203	292.08	118	275.05	481	-	17	0.0	0.0	0.0	0.0	0.0					
13	302.29	177	291.59	90	274.56	349	-	17	0.0	0.0	0.0	0.0	0.0					
14	302.20	165	291.24	72	274.25	279	-	14	0.0	0.0	0.0	0.0	0.0					
15	302.13	156	290.93	57	274.01	228	-	15	21.4	11.6	24.4	0.0	0.0					
16	302.16	160	290.98	59	274.06	239	-	24	20.4	4.1	5.5	12.1	15.8					
17	302.93	265	291.51	86	274.35	301	-	22	11.4	7.2	7.2	3.8	16.7					
18	303.44	342	291.57	89	274.79	419	-	27	0.4	0.0	3.3	5.6	12.6					
19	303.56	361	291.91	108	274.90	448	-	18	4.9	0.0	1.1	0.0	0.0					
20	303.47	347	291.86	105	274.91	451	-	14	12.0	112.4	34.4	0.0	7.4					

Table A 8-3 Flood Situation in the Mae Kuang Basin in 1971

Flood of Mae Kuang River (P.5)

Flood Order: 3rd

Date: 31/Aug Qmax: 318 cms, WL: 294.92 m

Date	P.1		P.5		P.19A		Discharge at Upper Mae Kuang Basin		Rainfall (mm)				
	W.L. m	Q cms	W.L. m	Q cms	W.L. m	Q cms	P.34 cms	P.30 cms	Chiang Mai (07813)	Doi Saket (07052)	P.35 (07341)	Mae Fack (07460)	Phrao (07122)
-9	304.25	541	293.29	196	274.96	452	-	36	22.6	6.5	7.5	2.1	0.5
-8	304.25	541	293.99	246	275.42	566	-	28	8.6	7.0	7.3	15.6	6.1
-7	304.01	496	294.17	260	275.79	667	-	22	0.0	11.0	30.9	0.0	0.0
-6	303.66	432	294.10	254	276.03	755	-	52	24.6	44.0	46.5	2.1	11.2
-5	303.51	405	294.02	248	276.07	747	-	61	7.1	45.0	25.5	59.5	1.6
-4	303.66	455	294.12	256	276.15	772	-	62	8.7	30.4	28.6	52.3	32.5
-3	303.93	481	294.39	276	276.28	814	-	61	40.6	16.9	45.5	79.6	59.2
-2	304.25	541	294.60	293	276.46	875	-	66	1.0	33.0	15.5	34.9	9.1
-1	304.46	582	294.84	312	276.55	906	-	41	0.5	2.2	1.0	1.3	0.0
0	304.42	574	294.92	318	276.62	731	-	29	15.1	0.0	0.0	3.8	0.0
1	304.26	545	294.88	315	276.53	899	-	26	1.0	30.3	9.5	0.0	0.0
2	303.88	471	294.69	300	276.45	872	-	28	71.4	15.3	7.3	15.6	0.0
3	303.64	428	294.47	282	276.43	865	-	26	22.7	0.0	0.5	3.8	0.0
4	303.47	398	294.23	264	276.42	861	-	20	0.0	3.0	1.3	0.0	9.5
5	303.40	385	293.90	240	276.36	841	-	18	0.1	1.1	0.0	0.0	0.0
6	303.27	363	293.56	215	276.11	760	-	14	0.0	0.0	0.0	0.0	0.0
7	303.04	324	293.04	178	275.84	681	-	12	0.7	8.0	0.0	0.0	12.0
8	302.85	291	292.26	127	275.55	600	-	82	14.5	54.0	79.6	37.0	19.4
9	303.04	324	292.76	160	275.26	525	-	76	0.1	2.2	0.3	6.8	0.0
10	303.28	365	293.39	205	275.10	483	-	47	0.0	0.0	0.8	0.0	0.0
11	303.26	361	293.58	216	275.07	478	-	55	0.0	0.0	0.0	0.0	0.0
12	302.85	291	293.22	191	275.06	476	-	27	0.0	0.0	0.0	0.0	0.0
13	302.56	245	292.43	138	274.96	452	-	20	0.0	0.0	0.0	0.0	0.0
14	302.34	211	291.66	91	274.65	382	-	17	0.0	0.0	0.0	0.0	0.0
15	302.23	194	291.24	68	274.27	304	-	15	0.0	0.0	0.0	0.0	0.0
16	302.22	193	290.98	55	274.07	264	-	15	0.0	2.0	0.0	0.0	0.0
17	302.41	221	290.85	47	273.97	244	-	15	34.7	26.0	20.8	0.0	17.7
18	302.43	224	291.06	59	274.29	308	-	20	3.6	5.0	52.8	35.0	3.7
19	302.54	241	291.39	76	274.98	457	-	15	13.5	2.0	0.6	2.0	9.9
20	302.72	270	291.41	77	275.25	522	-	13	0.0	0.0	7.6	0.0	0.0

Table A 8-4 Flood Situation in the Mae Kuang Basin in 1973

Flood of Mae Kuang River (P.5)

Flood Order: 1st

Date: 26/Aug. Qmax: 368 cms, WL: 295.05 m

Date	Daily Discharge and Water Level				Discharge at Upper Mae Kuang Basin				Rainfall (mm)				
	P.1 W.L. m	Q cms	P.5 W.L. m	Q cms	P.19A W.L. m	Q cms	P.34 cms	P.30 cms	Chiang Mai (07813)	Doi Saket (07052)	P.25 (07341)	Mae Fack (07460)	Phrao (07122)
-9	302.78	297	293.28	188	275.66	656	-	15	0.0	0.0	0.7	1.8	0.0
-8	302.45	240	292.36	131	275.35	556	-	13	4.3	7.5	9.6	0.0	2.1
-7	302.53	254	292.18	120	274.90	430	-	13	2.2	1.5	4.4	13.8	17.2
-6	302.74	290	291.34	74	274.56	347	-	12	1.7	0.0	1.1	0.4	3.2
-5	302.90	319	291.12	63	274.43	318	-	10	6.8	2.1	1.4	0.0	6.9
-4	302.78	297	290.94	55	274.40	311	-	10	3.5	24.1	5.7	1.1	23.1
-3	302.60	266	290.98	57	274.31	292	-	40	69.4	124.2	160.0	39.7	84.5
-2	303.64	459	292.89	164	-	-	-	205	0.0	2.6	1.0	88.5	1.6
-1	304.65	716	294.47	292	275.50	602	-	86	4.7	0.0	0.0	3.6	5.7
0	304.54	664	295.05	368	275.80	706	-	64	0.7	15.0	3.6	0.0	19.8
1	304.29	593	294.84	335	276.08	826	-	112	34.6	62.9	50.0	37.5	52.6
2	304.24	582	294.61	302	276.74	1,306	-	133	3.3	0.0	3.6	40.8	66.1
3	304.59	685	294.60	301	276.86	1,430	-	94	5.0	6.0	3.7	0.0	10.9
4	304.60	689	294.92	347	276.79	1,356	-	79	3.3	0.0	0.0	5.3	0.0
5	304.57	677	294.95	353	276.88	1,452	-	60	13.2	0.0	10.6	4.8	0.0
6	304.43	627	294.82	332	277.04	1,647	-	53	10.6	4.3	0.0	8.4	0.0
7	304.22	578	294.55	294	276.92	1,498	-	49	0.0	0.0	0.0	0.0	4.4
8	303.92	515	294.31	265	276.72	1,286	-	59	14.1	14.1	15.4	0.0	6.2
9	303.86	503	294.07	243	276.48	1,074	-	54	4.1	4.1	0.0	18.5	7.0
10	303.89	509	293.86	227	276.27	928	-	44	1.0	1.0	0.0	0.0	3.2
11	303.55	441	293.70	216	276.07	822	-	43	0.0	0.0	0.0	0.0	0.0
12	303.28	389	293.50	202	275.91	748	-	40	3.2	0.0	0.0	0.0	0.0
13	303.14	363	293.14	179	275.71	674	-	47	12.8	6.4	10.7	0.0	3.8
14	303.21	376	293.66	213	275.55	619	-	43	4.6	17.6	10.3	22.3	0.0
15	303.35	402	293.68	214	275.45	586	-	44	0.0	2.0	0.0	23.0	0.0
16	303.13	361	293.83	225	275.26	529	-	53	12.0	0.0	0.0	0.0	0.0
17	303.20	374	293.81	223	275.20	512	-	43	0.0	2.3	0.0	0.0	0.0
18	303.15	364	293.55	206	275.24	524	-	43	9.9	0.0	0.0	3.2	14.3
19	303.16	366	293.35	192	275.24	524	-	39	0.0	44.3	10.5	0.0	0.0
20	303.16	366	291.96	108	275.22	518	-	37	0.0	0.0	2.7	0.0	70.1

Table A 8-5 Flood Situation in the Mae Kuang Basin in 1975

Flood of Mae Kuang River (P.5)

Flood Order: 2nd

Date: 29/Aug. Qmax: 326 cms, WL: 294.88 m

Date	Daily Discharge and Water Level										Rainfall (mm)				
	P.1 W.L. m	Q cms	P.5 W.L. m	Q cms	P.19A W.L. m	Q cms	Discharge at Upper Mae Kuang Basin		Chiang Hai (07813)	Doi Saket (07052)	P.25 (07341)	Mae Fack (07460)	Phrao (07122)		
							P.34 cms	P.30 cms							
-9	302.74	284	291.70	80	273.87	231	49	35	51.9	15.1	16.9	11.9	42.1		
-8	302.68	274	292.61	134	274.40	338	40	22	57.8	9.5	6.9	13.7	6.2		
-7	302.91	313	292.95	157	274.61	384	43	20	24.1	4.1	7.3	1.5	23.8		
-6	302.76	287	292.91	154	274.77	422	36	19	8.2	0.0	0.0	8.5	17.5		
-5	302.74	284	292.54	130	274.74	415	26	12	26.3	72.3	45.7	0.0	40.1		
-4	302.60	261	292.56	118	274.65	393	161	81	27.5	38.7	40.4	54.6	23.2		
-3	303.37	398	293.17	173	274.89	451	69	69	2.0	8.4	26.5	2.4	10.0		
-2	304.00	529	193.89	231	275.59	647	83	59	3.6	16.8	10.4	4.8	20.2		
-1	303.87	501	294.35	273	275.69	677	84	57	12.5	58.8	17.4	51.0	2.0		
0	303.84	494	294.88	326	276.17	838	89	61	29.2	20.2	19.7	25.2	10.1		
1	303.84	494	294.87	325	276.87	1,065	59	58	21.8	29.0	40.7	0.0	0.0		
2	303.83	492	294.57	295	276.81	1,044	51	31	1.1	3.5	4.7	6.1	13.4		
3	303.75	475	294.53	271	276.67	993	57	32	0.0	0.4	3.5	1.7	6.5		
4	303.54	432	294.11	251	276.48	928	58	22	29.5	0.0	1.4	1.6	10.1		
5	303.54	393	293.99	240	276.32	876	35	20	0.0	2.5	0.0	5.7	0.0		
6	303.07	342	293.82	224	276.20	838	31	16	17.1	0.0	0.0	5.0	0.0		
7	302.79	292	293.63	209	276.01	777	27	14	6.8	0.0	0.0	0.0	2.5		
8	302.42	233	293.26	180	275.82	716	26	12	35.5	2.3	2.9	0.0	0.0		
9	302.39	229	293.25	179	275.65	665	24	10	18.0	41.7	41.4	13.3	0.0		
10	302.40	230	293.14	171	275.51	624	29	15	0.6	2.2	10.9	27.4	0.0		
11	302.60	261	293.15	172	275.49	618	27	12	0.0	0.0	0.0	2.5	0.0		
12	302.43	234	292.93	156	275.43	601	22	9.72	0.3	2.6	8.2	0.0	0.0		
13	302.22	205	292.59	120	275.20	534	42	20	17.6	51.7	95.8	18.2	79.2		
14	302.55	223	292.66	138	274.98	474	89	37	5.0	0.0	10.5	31.0	0.0		
15	303.18	362	293.19	175	275.03	487	33	20	0.0	0.0	0.0	1.9	0.0		
16	303.85	496	293.35	187	275.11	509	25	15	0.7	0.0	0.0	0.0	0.0		
17	303.12	351	293.20	175	275.18	528	33	17	4.1	0.0	0.0	0.0	0.0		
18	302.69	275	292.99	160	275.21	537	23	12	13.9	0.0	0.0	0.0	0.0		
19	302.48	242	292.99	160	275.21	537	24	14	0.2	0.8	4.0	0.0	0.0		
20	302.55	223	292.52	128	275.19	531	30	17	22.3	0.0	1.2	1.0	0.0		

Table A 9 Runoff Coefficients of Recorded Floods

Flood	P. 30 Station				P. 34 Station				Remarks
	Rainfall (R) mm	Direct Runoff (Re) mm	Loss (R-Re) mm	Base Flow cms	Direct Runoff (Re) mm	Loss (R-Re) mm	Base Flow cms	$f = \frac{Re}{R}$ %	
Aug. 1970	91.8	48.4	43.4	21	-	-	-	53	Based on Estimated Recession Curve
"	113.1	53.0	60.1	21	-	-	-	47	23 - 30 August
Aug. 1973	168.7	80.7	88.0	11	-	-	-	48	Based on Estimated Recession Curve
"	232.5	163.1	69.4	10	-	-	-	70	23 Aug. - 2 Sep.
Sep. 1974	94.5	9.5*	85.2*	8-14*	11.1	83.4	12-16	10*	11 - 21 September
"	155.0	24.2*	130.8*	8*	20.8	134.2	12	16*	Based on Estimated Recession Curve
Aug. 1975	86.1	24.9*	61.2*	10*	27.9	58.2	21	29*	24 Aug. - 5 Sep.
"	210.4	72.7*	137.7*	10*	84.6	125.8	21	35*	Based on Estimated Recession Curve
Jul. 1978	186.8	26.4*	160.4*	0*	40.0	146.8	0	14*	1 - 7 July
"	197.5	-	-	-	42.3	155.2	0	21	

Note: 1) * low reliability because of inaccurate rating curve.

2) This table is based on the data of Table A 10-1 - A 10-5.

Table A 10-3 Hourly Record of Flood (September 1974)

Q: Discharge at P30 & P34
R: Rainfall at (P25) Uae Kuang (07341) (mm)
Period: 10 - 24 Sep. 1974

Time (hr)	10 Sep.		11 Sep.		12 Sep.		13 Sep.		14 Sep.		15 Sep.		16 Sep.		17 Sep.		18 Sep.		19 Sep.		20 Sep.		21 Sep.		22 Sep.		23 Sep.		24 Sep.						
	R	Q	R	Q	R	Q	R	Q	R	Q	R	Q	R	Q	R	Q	R	Q	R	Q	R	Q	R	Q	R	Q	R	Q	R	Q					
0-1	-	-	-	-	8.28	12*	24*	27*	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
1-2	-	-	6.28	25*	22*	25*	22*	25*	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
2-3	-	-	26	48*	22	23*	22	23*	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
3-4	-	-	57	90*	22*	23*	22*	23*	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
4-5	-	-	102	150*	21*	22*	21*	22*	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
5-6	9.36	13	8.64	12	117	229	20	22	14	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
6-7	-	-	102	190*	20*	22*	20*	22*	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
7-8	-	-	92	160*	19*	21*	19*	21*	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
8-9	-	13	86	136	19	21	16	22	16	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
9-10	-	-	79	130*	19*	21*	19*	21*	17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
10-11	-	-	71	105*	18*	20*	18*	20*	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
11-12	9.36	13	8.64	12	65	91	18**	20	16	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
12-13	-	-	60	80*	17*	20*	17*	20*	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13-14	-	-	54	70*	17*	19*	17*	19*	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14-15	-	13	51	59	17	19	16	34	16	34	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15-16	-	-	44	53*	16*	19*	16*	19*	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16-17	-	-	41	47*	16*	18*	16*	18*	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17-18	9.00	13	8.64	12	37	43	16	18	20	46	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18-19	-	-	12*	35	40*	15*	18*	15*	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19-20	2.9	-	94.5	12*	1.2	32	38*	24.3	15*	17*	18.5	29	37	0	3.7	0	1.2	0	3.7	0	7.9	0	0	1.7	0	0	0	0	12.3	0	0	0	0	0	
20-21	-	-	12*	30	35	15	17*	15	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21-22	-	-	12*	28	33*	15*	17*	15*	29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22-23	-	-	12*	26	31*	14*	16*	14*	28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23-24	9.00	-	8.28	12*	25	29*	14	16*	27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	36.72	65	34.20	132	1,276.56	1,914	431	481	447	183	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ave.	9.18	13.0	8.55	12.0	53.2	79.8	18.0	20.0	18.6	30.5	30	28	17	18	14	14	15	14	18	23	15	16	15	16	12	13	11	10	10	9.46	11	11	11	11	

Note: * Estimated on hydrograph (Figure A 9-3)

Table A 10-4 Hourly Record of Flood (August 1973)

Q - Discharge at P30 R P34 (cms)
 R - Rainfall at P25, Mue Kuang (07341) (mm)
 Period: 25 Aug - 5 Sep, 1973

Time (hr)	21 Aug.		22 Aug.		23 Aug.		24 Aug.		25 Aug.		26 Aug.		27 Aug.		28 Aug.		29 Aug.		30 Aug.		31 Aug.		1 Sep.		2 Sep.		3 Sep.		4 Sep.		5 Sep.	
	Q	R	Q	R	Q	R	Q	R	Q	R	Q	R	Q	R	Q	R	Q	R	Q	R	Q	R	Q	R	Q	R	Q	R	Q	R		
0-1	27	-	13	-	10	22*	89	133*	72	106*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
1-2	27	-	13	-	9.72	22*	83	123*	70	102*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
2-3	27	-	13	-	9.72	22*	79	110**	71	104*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
3-4	25	-	13	-	10	22*	71	100**	67	97*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
4-5	23	-	12	-	10	21*	71	84**	63	94*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
5-6	22	41	13	28	10	37	67	80	62	80	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
6-7	21	40	13	28	10	41	65	78	61	81	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
7-8	20	39	13	28	15	44	61	74	61	85	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
8-9	20	38	12	28	27	64	59	71	63	86	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
9-10	19	37	12	27	62	99	57	69	61	88	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
10-11	19	37	12	27	95	144	55	66	65	90	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
11-12	18	36	12	26	115	186	52	64	67	93	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
12-13	18	35	12	26	197	261	51	61	65	94	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
13-14	17	34	12	26	216	347	49	60	64	90	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
14-15	17	33	12	26	186	347	50	59	61	85	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
15-16	17	33	12	25	147	271	51	63	58	80	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
16-17	16	33	11	25	142	228	52	69	53	75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
17-18	16	32	11	24	147	225	78	73	52	72	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
18-19	15	-	11	24*	163	253*	81	120*	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
19-20	0	15	-	45.7	11	24*40.4	155	240*	26.5	92	138*	10.4	49	-	17.4	-	19.7	-	10.7	-	4.7	-	1.4	-	0	-	0	-	0	-		
20-21	15	-	11	23*	132	203*	103	155*	48	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
21-22	14	-	11	23*	116	177*	95	142*	48	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
22-23	14	-	10	23*	106	161*	81	120*	46	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
23-24	14	-	10	23*	97	146*	75	110*	45	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Total	451	468	285	484	2,187.44	3,581	1,670	2,222	1,424	1,605	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Ave.	18.8	36.0	11.9	25.5	91.1	149	69.6	92.6	59.3	89.2	57	84	61	89	38	59	41	51	33	57	22	38	40	35	16	11	14	37	14	37		

Note: * Estimated by regression equation $Q(P34) = 1.626 Q(P30) - 11.5$

** Estimated value has been adjusted on hydrograph (Figure A 9-4)

Table A 10-5 Hourly Record of Flood (July 1978)

Q: Discharge at P30 & P34 (cms)
R: Rainfall at (P25) Mae Kuang (07341) (mm)
Period: 1 - 7 Jul. 1978

Time (hr)	1 July		2 July		3 July		4 July		5 July		6 July		7 July		8 July	
	R	Q	R	Q	R	Q	R	Q	R	Q	R	Q	R	Q	R	Q
0-1	0	-	0.3	0	-	87	150*	0	29	0	52*	0	6.90	15*	-	-
1-2	0	-	1.3	0	-	118	170*	0	27	0	46*	0	6.60	15*	-	-
2-3	0	-	16.3	0	-	132	184*	0	24	0	41*	0	6.50	15*	-	-
3-4	0	-	22.5	0	-	142	200*	0	22	0	36*	5.8	5.70	14*	-	-
4-5	0	-	3.0	0	-	135	250*	0	20	0	32*	0.2	5.70	14*	-	-
5-6	0	2.75	0.1	0	0	161	255	0	19	0	29	0.3	5.40	14	-	-
6-7	0	-	0.2	0	2*	194	306	0	18	0	28	0	5.10	14*	-	-
7-8	0	-	-	0	4*	208	347	0	16	0	27	0	4.80	13*	-	-
8-9	0	2.50	-	0	12	0	195	344	0	15	26	0	4.50	13	-	-
9-10	0	-	-	0.12	14*	0	185	313	0	14	24*	0	4.50	15*	-	-
10-11	0	-	-	0.58	16*	0	176	278	0	15	25*	0	4.02	15*	-	-
11-12	0	2.25	-	1.42	19	0	154	245	0	12	22	0	4.02	13	-	-
12-13	0	-	-	4.50	23*	0	138	213	0	12	21*	0	3.81	13*	-	-
13-14	0	-	-	11	30*	0	122	181	0	11	20*	0	3.66	12*	-	-
14-15	0	2.00	-	15	39	0	109	170*	1.9	10	19	0	3.66	12	-	-
15-16	0	-	-	16	38*	0	99	150*	0	10	19*	0	3.48	12*	-	-
16-17	0	-	-	15	37*	0	85	150*	0	9.72	18*	0	3.50	12*	-	-
17-18	0	2.00	-	15	36	0	73	120*	0	9.36	18	0	3.30	12	-	-
18-19	0	-	-	14	34*	0	63	105*	0	9.00	17*	0	3.30	-	-	-
19-20	0	-	-	142.4	12	53*	0	53	94*	0	8.28	17*	1.9	3.12	-	-
20-21	0	-	-	18	42*	0	46	80*	0	7.92	17*	0	2.94	-	-	-
21-22	0	-	-	22	60*	0	41	73*	0	7.56	16*	0	2.94	-	-	-
22-23	0	-	-	23	80*	0	36	64*	0	7.56	16*	0	2.76	-	-	-
23-24	0.7	-	-	35	110*	0	32	58*	0	7.20	16*	0	2.58	-	-	-
Total	0	11.5	202.62	629	2,784	4,463	1.9	338.60	600	102.42	239	-	-	-	-	-
Ave.	0	2.3	8.44	33.1	116	186	14.1	25.0	4.27	13.3	9.5	-	-	-	-	7.9

Note: * estimated on hydrograph (Figure A 9-5)

Table A 12 Flood Computation Program by Unit Hydrograph

```

C *** COMPUTATION OF RUNOFF BY UNITHYDROGRAPH ***
  DIMENSION UD(61),HYD(90),R(24),T(90),NAME(6)
  DATA UD/4.7,26.4,42.2,71.1,24.8,20.6,18.4,17.9,16.9,16.3,14.2,12.6
  1      ,12.1,11.6,11.1,10.5,10.0,2*9.5,9.0,8.4,7.9,2*7.4,2*6.9,6.3,
  2      2*5.8,2*5.3,4.7,3*4.2,2*3.7,4*3.2,3*2.6,4*2.1,1.6,5*1.1,
  3      7*0.5/
  DATA UR/10.0/,NR/24/,NU/61/
  CALL PRCNT(6HSZUNIT: ----- *-1/
  READ(1,2) BASE ----- Base Flow (cms)
100 READ(1,1,END=999) (NAME(I),I=1,6) ----- Flood Identification
  READ(1,2) (R(I),I=1,NR) ----- Rainfall (mm/3 hrs)
  DO 110 J=1,NR
110 R(I)=R(I)/UR
  N=NU+NR-1
  DO 120 I=1,N
120 HYD(I)=BASE
  DO 130 K=1,NR
  L=NU+K-1
  J=0
  DO 140 I=K,L
  J=J+1
140 HYD(I)=HYD(I)+R(K)*UD(J)
130 CONTINUE
  DO 150 I=1,N
150 T(I)=HYD(I)*3600.*3.*1E-6
  DO 160 I=2,N
160 T(I)=T(I)+T(I-1)
  NS=0
  NE=0
  WRITE(2,3) (NAME(I),I=1,6)
  DO 170 I=1,N
  NE=NE+3
  WRITE(2,4) I,NS,NE,HYD(I),T(I)
170 NS=NS+3
  GO TO 100
999 STOP
  1 FORMAT(6A4)
  2 FORMAT(16F5.0)
  3 FORMAT(1H1,6A4///
  1 1H ,6X, 'TIME', 2X, 'DISCHARGE', 1X, 'ACCUMULATION' /
  2 1H ,5X, ' (HRS)', 5X, ' (CMS)', 8X, ' (MCM)' /
  3 1H ,4X, 7(' '), 1X, 9(' '), 1X, 12(' '))
  4 FORMAT(1H ,13, 1X, 13, '-', 13, 2X, F8.0, 2X, F11.3)
  EI"

```

Note) *-1/ System Sub-program; not effect for computation

Table A 14 Design Flood Discharge

1/2 PROBABLE FLOOD			1/5 PROBABLE FLOOD			1/10 PROBABLE FLOOD			1/20 PROBABLE FLOOD			1/50 PROBABLE FLOOD			1/100 PROBABLE FLOOD			PROBABLE MAXIMUM FLOOD		
TIME (HRS)	DISCHARGE (CMS)	ACCUMULATION (MCM)	TIME (HRS)	DISCHARGE (CMS)	ACCUMULATION (MCM)	TIME (HRS)	DISCHARGE (CMS)	ACCUMULATION (MCM)	TIME (HRS)	DISCHARGE (CMS)	ACCUMULATION (MCM)	TIME (HRS)	DISCHARGE (CMS)	ACCUMULATION (MCM)	TIME (HRS)	DISCHARGE (CMS)	ACCUMULATION (MCM)	TIME (HRS)	DISCHARGE (CMS)	ACCUMULATION (MCM)
1 0-3	20.	217.	1 0-3	20.	218.	1 0-3	20.	218.	1 0-3	20.	218.	1 0-3	20.	219.	1 0-3	20.	220.	1 0-3	20.	218.
2 3-6	21.	441.	2 3-6	21.	445.	2 3-6	21.	446.	2 3-6	22.	451.	2 3-6	22.	460.	2 3-6	23.	468.	2 3-6	23.	468.
3 6-9	23.	684.	3 6-9	24.	699.	3 6-9	25.	712.	3 6-9	26.	732.	3 6-9	29.	774.	3 6-9	31.	805.	3 6-9	31.	805.
4 9-12	26.	960.	4 9-12	28.	1002.	4 9-12	31.	1051.	4 9-12	35.	1112.	4 9-12	42.	1228.	4 9-12	47.	1315.	4 9-12	47.	1315.
5 12-15	29.	1273.	5 12-15	34.	1371.	5 12-15	41.	1496.	5 12-15	49.	1637.	5 12-15	60.	1881.	5 12-15	70.	2076.	5 12-15	70.	2076.
6 15-18	41.	1719.	6 15-18	58.	1999.	6 15-18	74.	2294.	6 15-18	93.	2640.	6 15-18	125.	3228.	6 15-18	151.	3711.	6 15-18	151.	3711.
7 18-21	64.	2627.	7 18-21	138.	3485.	7 18-21	184.	4279.	7 18-21	241.	5248.	7 18-21	342.	6916.	7 18-21	421.	8256.	7 18-21	421.	8256.
8 21-24	155.	4304.	8 21-24	268.	6379.	8 21-24	368.	8255.	8 21-24	492.	10565.	8 21-24	699.	14464.	8 21-24	866.	17612.	8 21-24	866.	17612.
9 24-27	189.	6340.	9 24-27	329.	9934.	9 24-27	457.	13186.	9 24-27	612.	17177.	9 24-27	861.	23763.	9 24-27	1066.	29123.	9 24-27	1066.	29123.
10 27-30	129.	7738.	10 27-30	219.	12296.	10 27-30	300.	16423.	10 27-30	397.	21670.	10 27-30	539.	29581.	10 27-30	659.	36198.	10 27-30	659.	36198.
11 30-33	115.	8976.	11 30-33	187.	14312.	11 30-33	245.	19069.	11 30-33	314.	24857.	11 30-33	410.	34066.	11 30-33	489.	41475.	11 30-33	489.	41475.
12 33-36	113.	10196.	12 33-36	172.	16171.	12 33-36	215.	21386.	12 33-36	284.	27706.	12 33-36	331.	37581.	12 33-36	389.	45811.	12 33-36	389.	45811.
13 36-39	116.	11451.	13 36-39	177.	18056.	13 36-39	215.	23690.	13 36-39	259.	30508.	13 36-39	319.	41031.	13 36-39	365.	49558.	13 36-39	365.	49558.
14 39-42	119.	12735.	14 39-42	177.	19965.	14 39-42	213.	25992.	14 39-42	256.	33272.	14 39-42	310.	44377.	14 39-42	351.	53346.	14 39-42	351.	53346.
15 42-45	122.	14059.	15 42-45	180.	21910.	15 42-45	215.	28312.	15 42-45	255.	36029.	15 42-45	303.	47653.	15 42-45	340.	57018.	15 42-45	340.	57018.
16 45-48	125.	15380.	16 45-48	179.	23838.	16 45-48	210.	30579.	16 45-48	246.	38686.	16 45-48	285.	50733.	16 45-48	315.	60418.	16 45-48	315.	60418.
17 48-51	124.	16730.	17 48-51	178.	25759.	17 48-51	205.	32795.	17 48-51	237.	41246.	17 48-51	268.	53632.	17 48-51	292.	63571.	17 48-51	292.	63571.
18 51-54	125.	18078.	18 51-54	178.	27680.	18 51-54	204.	35002.	18 51-54	234.	43770.	18 51-54	260.	56443.	18 51-54	280.	66590.	18 51-54	280.	66590.
19 54-57	121.	19388.	19 54-57	176.	29578.	19 54-57	204.	37208.	19 54-57	232.	46279.	19 54-57	255.	59197.	19 54-57	271.	69519.	19 54-57	271.	69519.
20 57-60	117.	20647.	20 57-60	173.	31445.	20 57-60	204.	39413.	20 57-60	232.	48780.	20 57-60	251.	61909.	20 57-60	264.	72375.	20 57-60	264.	72375.
21 60-63	117.	21907.	21 60-63	173.	33318.	21 60-63	205.	41622.	21 60-63	230.	51266.	21 60-63	246.	64567.	21 60-63	257.	75148.	21 60-63	257.	75148.
22 63-66	117.	23170.	22 63-66	174.	35197.	22 63-66	206.	43844.	22 63-66	229.	53739.	22 63-66	242.	67178.	22 63-66	250.	77845.	22 63-66	250.	77845.
23 66-69	117.	24438.	23 66-69	175.	37087.	23 66-69	207.	46075.	23 66-69	228.	56200.	23 66-69	238.	69745.	23 66-69	243.	80469.	23 66-69	243.	80469.
24 69-72	119.	25719.	24 69-72	177.	39003.	24 69-72	209.	48337.	24 69-72	229.	58676.	24 69-72	237.	72308.	24 69-72	241.	83076.	24 69-72	241.	83076.
25 72-75	118.	26993.	25 72-75	177.	40914.	25 72-75	209.	50588.	25 72-75	227.	61129.	25 72-75	233.	74823.	25 72-75	235.	85613.	25 72-75	235.	85613.
26 75-78	113.	28217.	26 75-78	169.	42743.	26 75-78	199.	52739.	26 75-78	217.	63488.	26 75-78	222.	77218.	26 75-78	223.	88027.	26 75-78	223.	88027.
27 78-81	102.	29316.	27 78-81	151.	44373.	27 78-81	177.	54651.	27 78-81	194.	65366.	27 78-81	202.	79400.	27 78-81	206.	90255.	27 78-81	206.	90255.
28 81-84	88.	30271.	28 81-84	129.	45769.	28 81-84	152.	56293.	28 81-84	169.	67391.	28 81-84	180.	81332.	28 81-84	188.	92286.	28 81-84	188.	92286.
29 84-87	85.	31185.	29 84-87	123.	47101.	29 84-87	145.	57859.	29 84-87	162.	69137.	29 84-87	174.	83228.	29 84-87	182.	94258.	29 84-87	182.	94258.
30 87-90	81.	32059.	30 87-90	117.	48349.	30 87-90	138.	59349.	30 87-90	154.	70798.	30 87-90	166.	85015.	30 87-90	174.	96129.	30 87-90	174.	96129.
31 90-93	78.	32905.	31 90-93	113.	49592.	31 90-93	135.	60787.	31 90-93	149.	72405.	31 90-93	161.	86753.	31 90-93	169.	97958.	31 90-93	169.	97958.
32 93-96	75.	33714.	32 93-96	108.	50755.	32 93-96	126.	62150.	32 93-96	141.	73927.	32 93-96	152.	88395.	32 93-96	160.	99663.	32 93-96	160.	99663.
33 96-99	72.	34487.	33 96-99	102.	51840.	33 96-99	120.	63442.	33 96-99	133.	75366.	33 96-99	143.	89944.	33 96-99	151.	101308.	33 96-99	151.	101308.
34 99-102	69.	35233.	34 99-102	98.	52923.	34 99-102	115.	64684.	34 99-102	128.	76391.	34 99-102	139.	91440.	34 99-102	146.	102882.	34 99-102	146.	102882.
35 102-105	66.	35950.	35 102-105	94.	53938.	35 102-105	110.	65867.	35 102-105	122.	78067.	35 102-105	131.	92858.	35 102-105	138.	104370.	35 102-105	138.	104370.
36 105-108	65.	36647.	36 105-108	91.	54922.	36 105-108	106.	67014.	36 105-108	118.	79345.	36 105-108	128.	94238.	36 105-108	134.	105821.	36 105-108	134.	105821.
37 108-111	62.	37316.	37 108-111	87.	55860.	37 108-111	101.	68102.	37 108-111	112.	80553.	37 108-111	120.	95532.	37 108-111	125.	107176.	37 108-111	125.	107176.
38 111-114	59.	37957.	38 111-114	83.	56753.	38 111-114	96.	69135.	38 111-114	106.	81993.	38 111-114	112.	96747.	38 111-114	117.	108440.	38 111-114	117.	108440.
39 114-117	56.	38581.	39 114-117	80.	57617.	39 114-117	92.	70132.	39 114-117	102.	82793.	39 114-117	109.	97920.	39 114-117	113.	109662.	39 114-117	113.	109662.
40 117-120	56.	39188.	40 117-120	78.	58456.	40 117-120	90.	71101.	40 117-120	99.	84881.	40 117-120	106.	99066.	40 117-120	111.	110859.	40 117-120	111.	110859.
41 120-123	54.	39772.	41 120-123	74.	59258.	41 120-123	85.	72024.	41 120-123	94.	86881.	41 120-123	100.	100148.	41 120-123	104.	111985.	41 120-123	104.	111985.
42 123-126	53.	40340.	42 123-126	72.	60035.	42 123-126	83.	72918.	42 123-126	91.	85866.	42 123-126	97.	101198.	42 123-126	101.	113080.	42 123-126	101.	113080.
43 126-129	50.	40885.	43 126-129	68.	60774.	43 126-129	78.	73764.	43 126-129	86.	86793.	43 126-129	91.	102180.	43 126-129	94.	114098.	43 126-129	94.	114098.
44 129-132	49.	41415.	44 129-132	66.	61490.	44 129-132	76.	74583.	44 129-132	83.	87691.	44 129-132	88.	103132.	44 129-132	92.	115087.	44 129-132	92.	115087.
45 132-135	48.	41932.	45 132-135	64.	62185.	45 132-135	74.	75379.	45 132-135	81.	88564.	45 132-135	86.	104162.	45 132-135	90.	116056.	45 132-135	90.	116056.
46 135-138	47.	42437.	46 135-138	63.	62863.	46 135-138	72.	76134.	46 135-138	79.	89417.	46 135-138	84.	105178.	46 135-138	88.	117009.	46 135-138	88.	117009.
47 138-141	45.	42920.	47 138-141	59.	63506.	47 138-141	68.	76885.	47 138-141	74.	89137.	47 138-141	78.	102141.	47 138-141	81.	117884.	47 138-141	81.	117884.
48 141-144	44.	43390.	48 141-144	58.	64127.	48 141-144	65.	77581.	48 141-144	71.	90786.	48 141-144	75.	103634.	48 141-144	78.	118730.	48 141-144	78.	118730.
49 144-147	44.	43850.	49 144-147	56.	64731.	49 144-147	63.	78276.	49 144-147	69.	91734.	49 144-147	73.	104426.	49 144-147	76.	119552.	49 144-147	76.	119552.
50 147-150	41.	44290.	50 147-150	53.	65304.	50 147-150	60.	78921.	50 147-150	65.	92433.	50 147-150	68.	106160.	50 147-150	70.	120307.	50 147-150	70.	120307.
51 150-153	40.	44718.	51 150-153	51.	65858.	51 150-153	58.	79544.	51 150-153	62.	93108.	51 150-153	66.	108868.	51 150-153	68.	120307.	51 150-153	68.	120307.
52 153-156	39.	45137.	52 153-156	50.	66397.	52 153-156	56.	80150.	52 153-156	61.	93763.</									

Table A 15 Estimated Monthly Suspended Sediment Yield at P-34 Gaging Station (Unit: tons)

Water Year	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Total
1952	62*	396*	552*	1,547*	16,768*	60,477*	6,509*	2,624*	2,225*	1,275*	425*	516*	93,376
1953	151*	566*	2,852*	2,909*	15,897*	19,641*	8,055*	4,511*	2,107*	1,008*	373*	821*	58,871
1954	104*	1,054*	1,152*	940*	6,801*	10,689*	5,264*	963*	574*	385*	234*	120*	28,280
1955	92*	470*	2,816*	2,249*	15,045*	14,633*	4,859*	2,223*	1,033*	579*	318*	232*	44,549
1956	112*	964*	883*	3,872*	21,488*	20,778*	5,739*	2,560*	1,187*	617*	297*	211*	56,508
1957	34*	200*	1,067*	1,133*	7,264*	17,889*	4,285*	720*	345*	340*	236*	72*	33,945
1958	41*	238*	450*	1,067*	8,582*	8,372*	2,179*	376*	241*	262*	202*	39*	22,050
1959	32*	359*	589*	1,349*	8,989*	28,005*	7,302*	2,310*	578*	406*	255*	139*	50,026
1960	42*	283*	292*	381*	7,589*	9,879*	2,954*	536*	815*	209*	163*	1*	23,144
1961	41*	402*	979*	1,492*	15,556*	31,036*	9,304*	5,167*	1,349*	484*	269*	143*	64,222
1962	57*	332*	2,171*	2,129*	9,555*	4,107*	5,688*	615*	271*	235*	186*	55*	23,447
1963	37*	152*	250*	833*	12,301*	7,824*	9,862*	13,068*	2,186*	645*	292*	199*	47,379
1964	45*	979*	800*	3,885*	8,696*	15,414*	8,935*	1,791*	905*	431*	260*	120*	42,261
1965	51*	277*	870*	358*	7,720*	8,952*	8,229*	4,810*	1,573*	517*	253*	120*	33,730
1966	52*	322*	232*	350*	9,745*	12,224*	2,229*	415*	225*	209*	191*	52*	26,246
1967	42*	288*	205*	435*	6,951*	32,750*	4,792*	1,093*	548*	283*	144*	102*	47,741
1968	299	763	534	470	7,122	4,238	4,436	652	336	139	24	24	19,049
1969	2	653*	536	1,138	8,984	2,888	3,363	1,141	381	153	67	54	19,360
1970	88	155	7,576	2,251	61,082	12,905	2,985	1,167	1,433	387	183	120	90,932
1971	87	557	3,650	23,587	33,875	25,314	8,698	2,144	1,102	522	211	-15	99,858
1972	207*	103	636*	110	21,166	11,678	4,776	2,581	1,195	489	196	157	43,394
1973	80	333	703	3,680	122,907	58,835	8,543	3,108	1,914	1,351	503	421	202,378
1974	140	286	464	955	6,450	11,915	1,423	2,026	209	444	78	36	21,426
1975	18	157	3,482	20,974	71,977	57,639	13,008	4,192	2,077	1,080	709	633	175,946
1976	139	226	346	208	2,508	9,276	3,650	1,495	393	284	104	69	18,698
1977	121	558	87	1,158	4,428	16,297	3,604	1,056	581	524	525	370	29,327
1978	100	545	340	40,927	12,713	18,556	6,517	870	286	692	489	218	82,253
1979	65*	919*	1,278*	545*	2,672*	2,717*	3,758*	268*	93*	161*	816*	5*	13,297
Mean	84	466	1,201	4,326	19,104	10,104	5,677	2,224	934	505	286	164	54,095

Note) This table has been estimated by the manner as follows;

1. Water Year 1974 - 1978 (Apr. 1974 - Mar. 1979) estimated from the daily discharge records at P-34 Gaging Station with the following regression equation;

$$Q_s = 0.99 Q_w^{1.92} \text{ (see Figure A 12)}$$

2. Nov. 1967 - Mar. 1974

estimated by the same equation mentioned above from the daily discharge converted to P-34 Gaging Station from P-30 Gaging Station multiplying the drainage area ratio of 1.215.

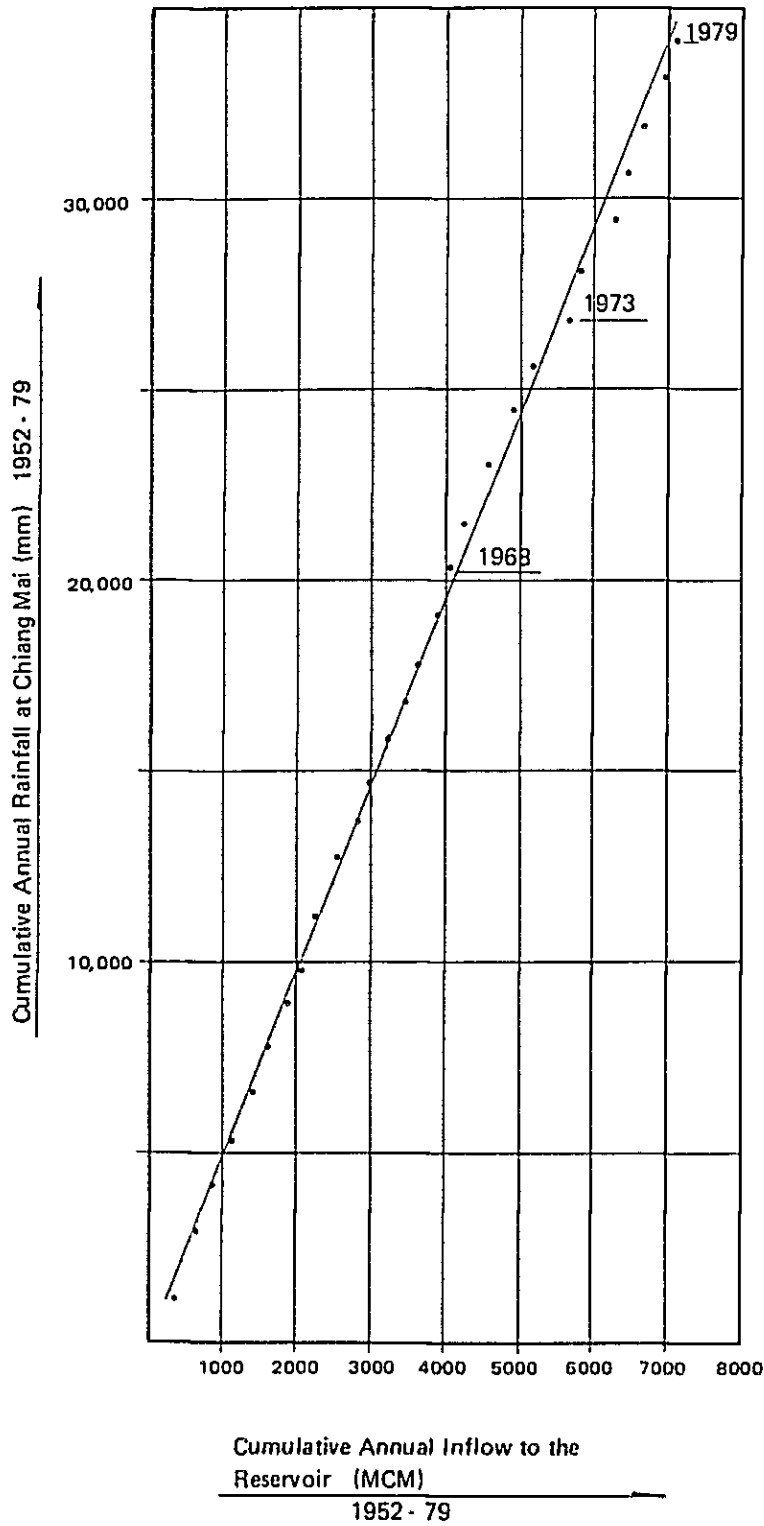
3. Water Year 1952 - 1967, 1979 (marked by *) estimated from the monthly discharge at P-34 Gaging Station (see Table A 6-5) based on the monthly correlation analysis using the data derived from above two computations (Item 1 and 2). Adapted regression equation is as follows;

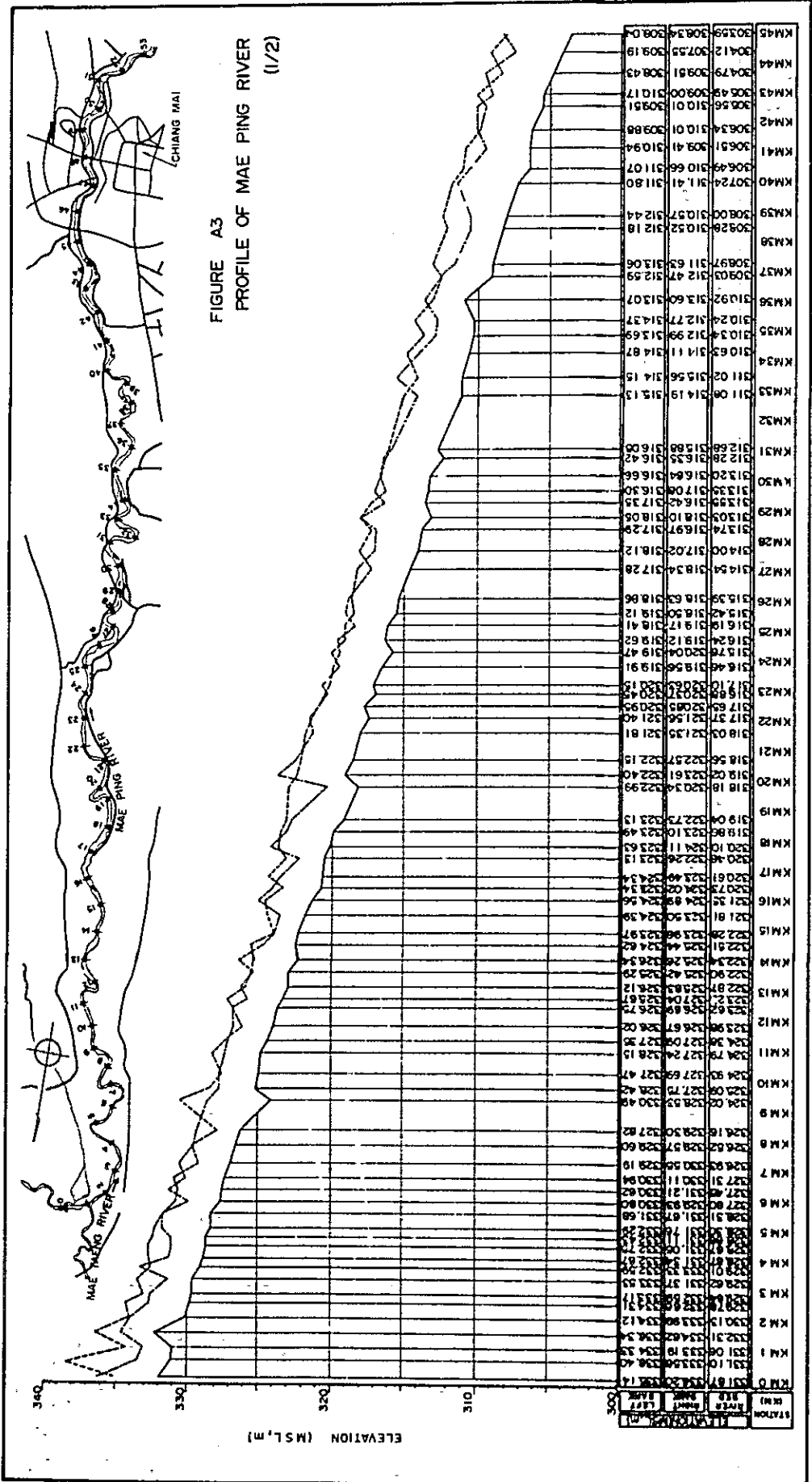
$$Q_{sm} = 1.513 Q_{wm}^{2.612}$$

Q_{sm} : Monthly Suspended Sediment Yield (tons/month)

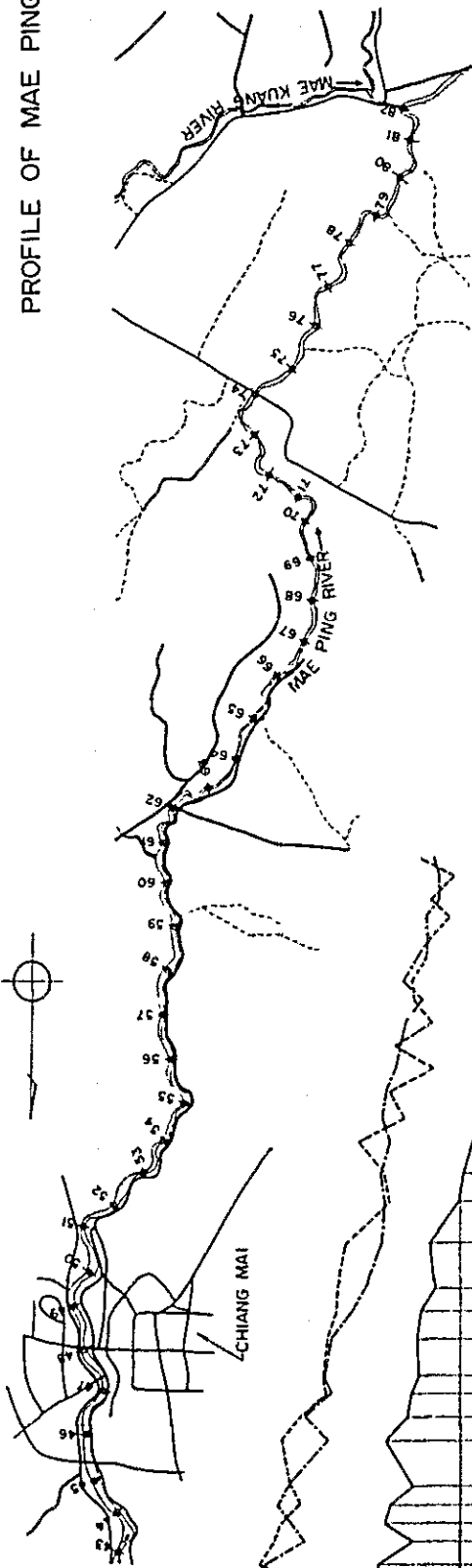
Q_{wm} : Monthly Runoff at P-34 Gaging Station (NCM/month)

FIGURE A 2 CORRELATION OF RESERVOIR INFLOW AND RAINFALL AT CHIANG MAI





PROFILE OF MAE PING RIVER
(2/2)

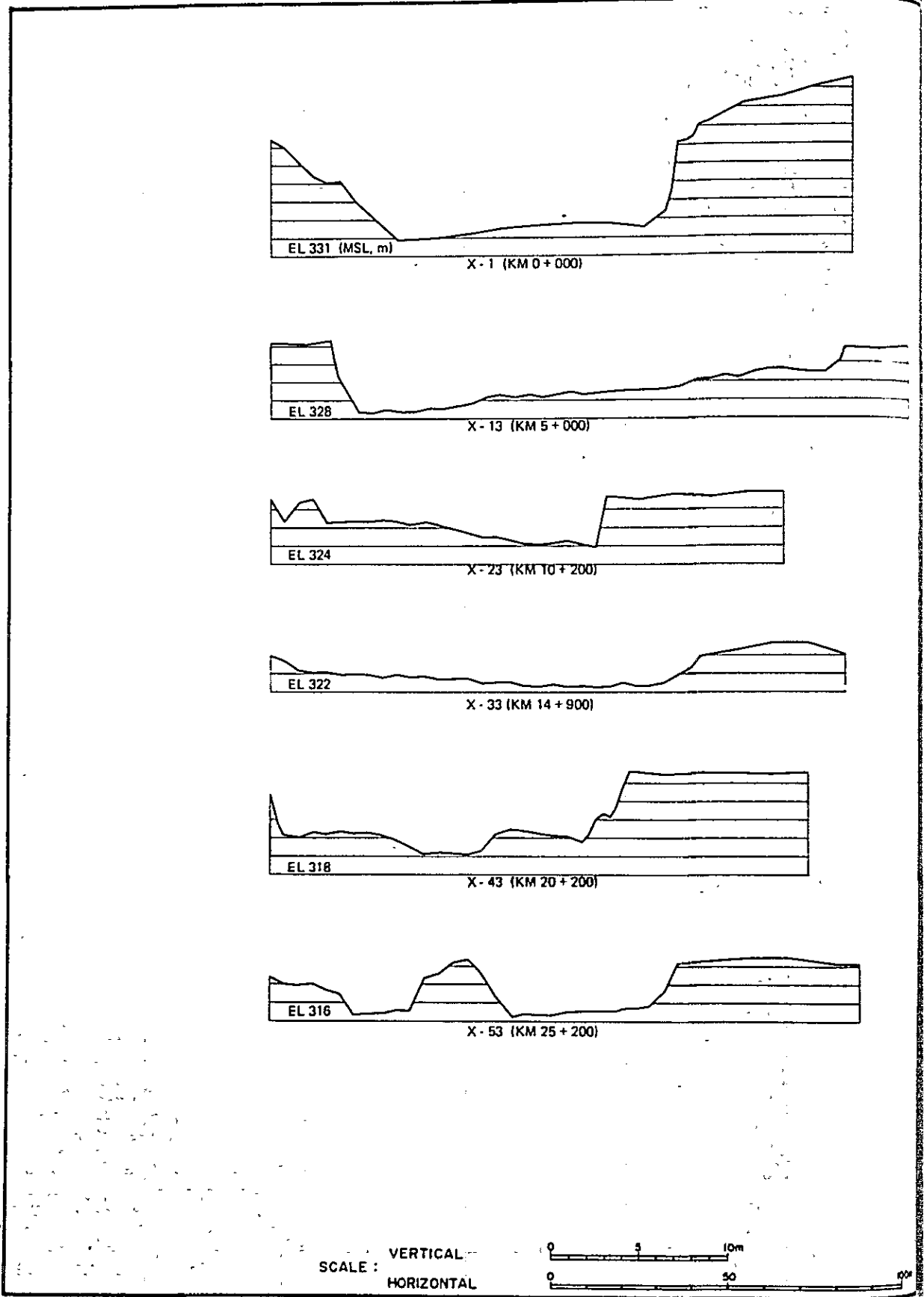


ELEVATION (MSL, m)

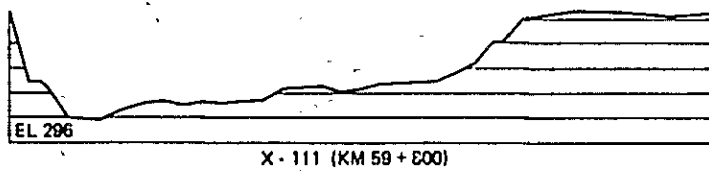
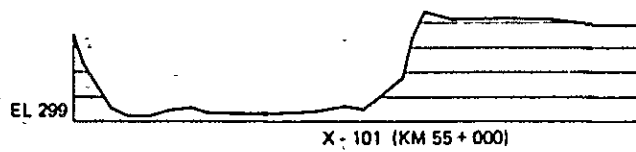
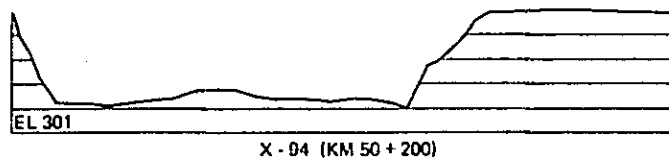
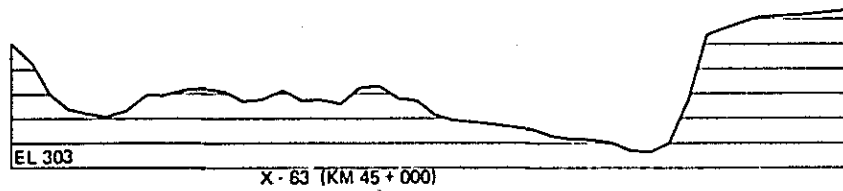
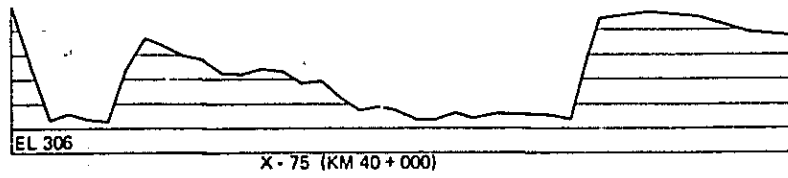
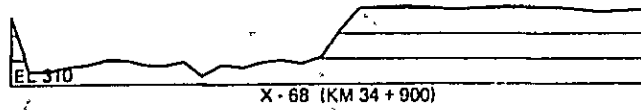
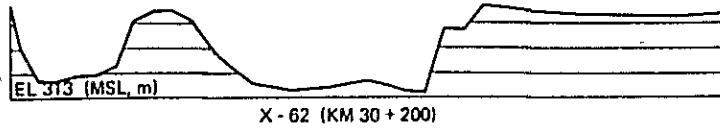
STATION (KM)	RIVER BED	RIGHT BANK	LEFT BANK
KM82	286.00		
KM81			
KM80			
KM79			
KM78			
KM77			
KM76			
KM75			
KM74			
KM73			
KM72			
KM71			
KM70			
KM69			
KM68			
KM67			
KM66			
KM65			
KM64			
KM63			
KM62			
KM61	296.46	301.16	301.78
KM60	296.90	300.96	300.30
	296.97	300.97	301.31
KM59	297.28	301.53	300.52
	297.56	301.41	301.41
KM58	297.45	301.92	301.55
	298.16	302.47	302.14
KM57	298.43	301.67	302.00
	298.56	302.43	301.23
KM56	298.44	302.64	302.87
	298.36	302.85	301.20
KM55	299.18	303.32	303.12
	299.22	303.40	302.47
KM54	299.52	303.14	304.56
	299.88	303.57	303.39
KM53	300.04	303.39	303.13
KM52	301.35	303.55	305.04
KM51	301.15	304.27	305.43
	301.77	304.80	305.51
KM50	301.96	305.74	305.85
KM49	301.83	306.03	306.05
	302.15	305.69	305.93
KM48	302.33	305.87	307.94
	302.13	307.64	307.50
KM47	302.01	308.11	307.12
	302.36	307.47	307.96
KM46	302.15	306.96	308.38
	302.53	308.66	308.88
KM45	302.53	308.66	308.88

FIGURE A 4 CROSS-SECTION OF MAE PING RIVER

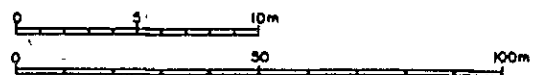
(1/2)



(2/2)



SCALE : VERTICAL
HORIZONTAL



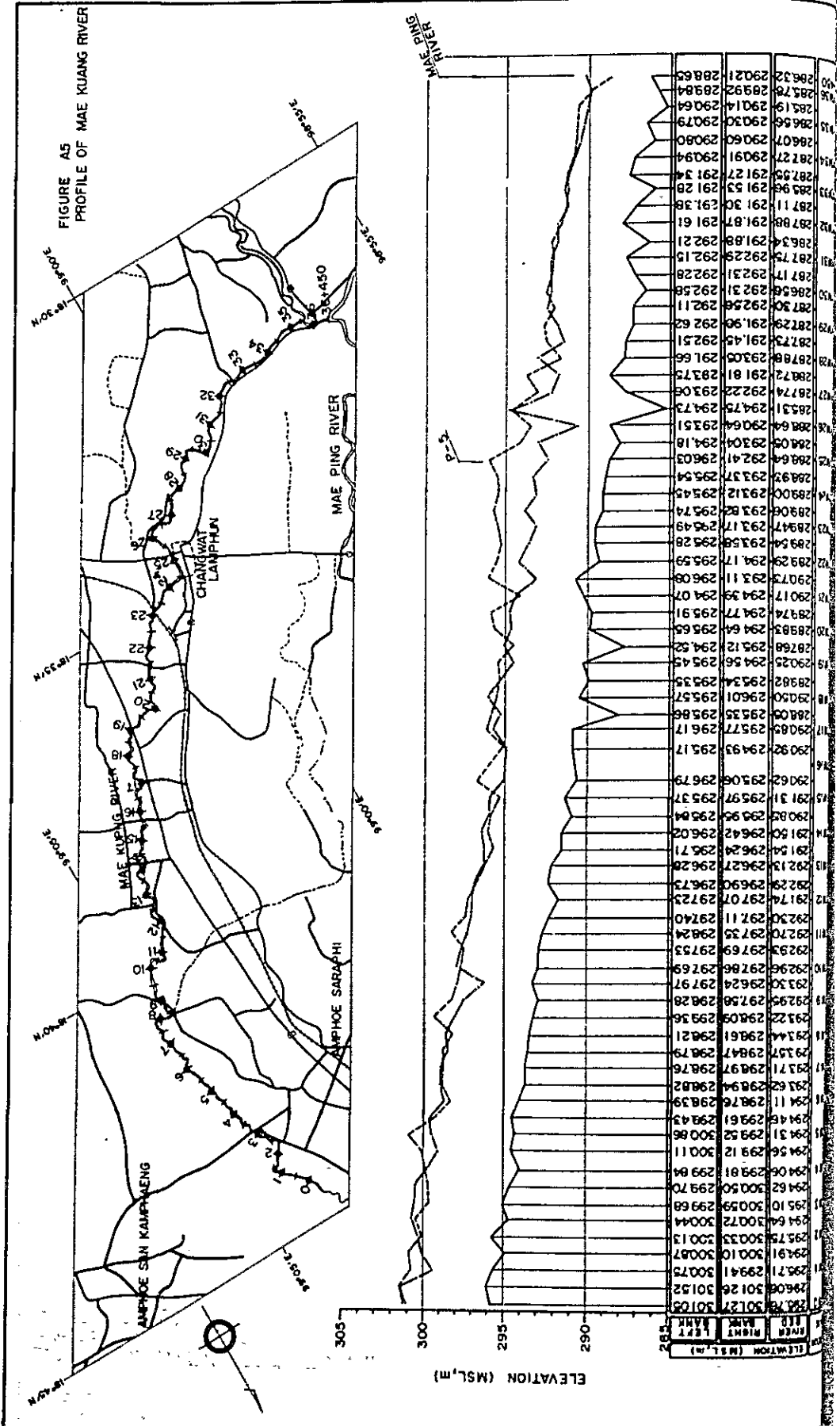
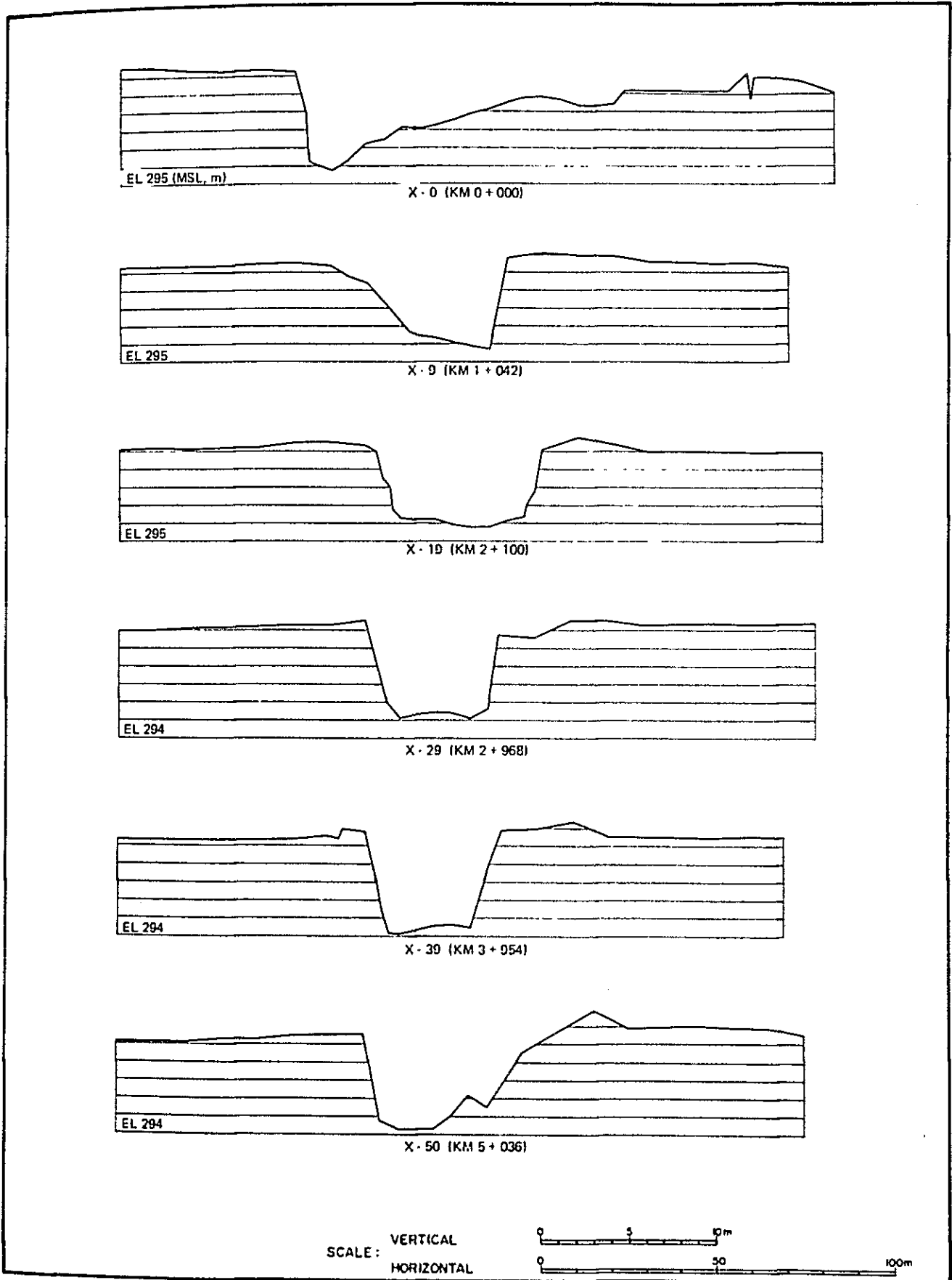
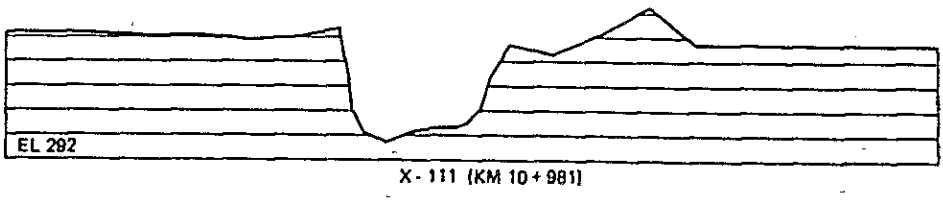
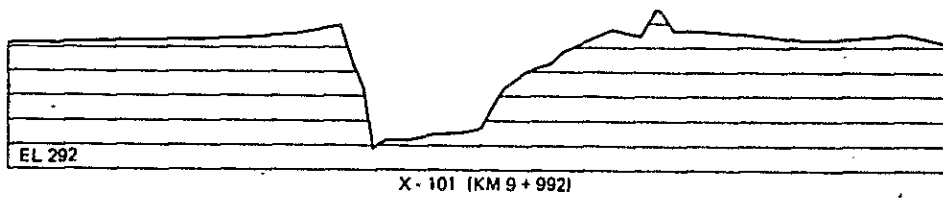
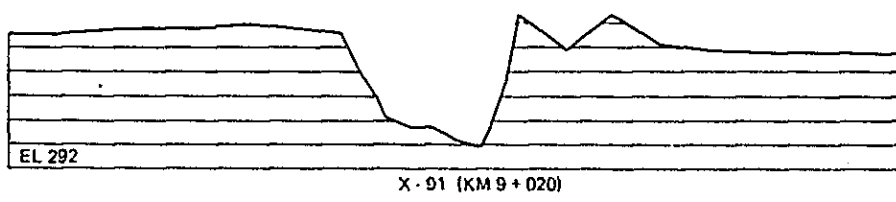
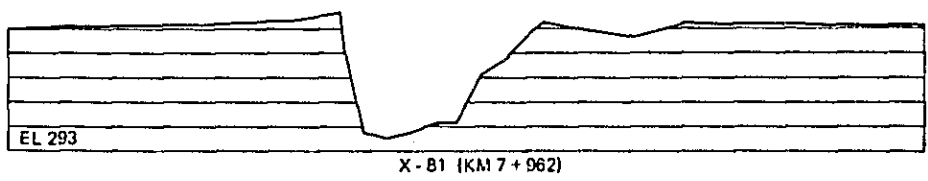
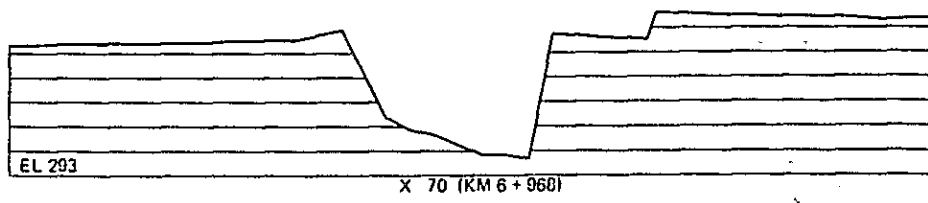
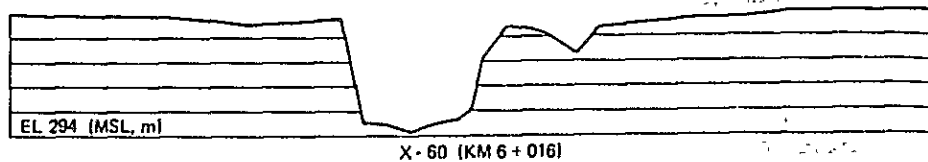


FIGURE A 6 CROSS-SECTION OF MAE KUANG RIVER

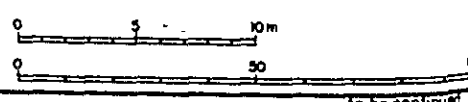
(1/5)



(2/5)

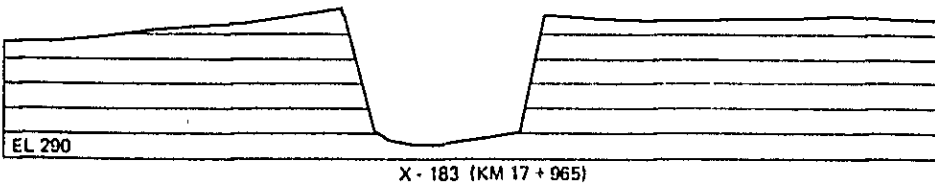
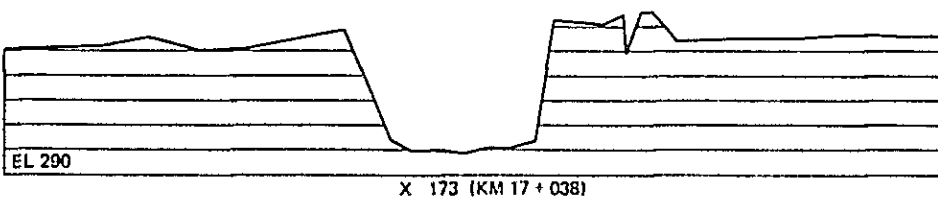
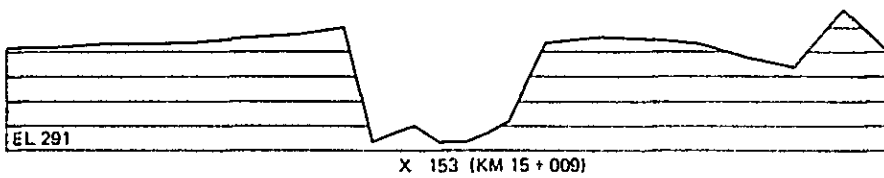
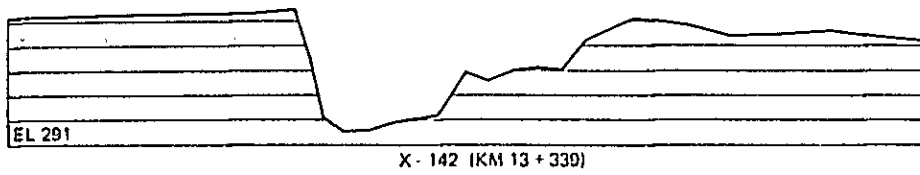
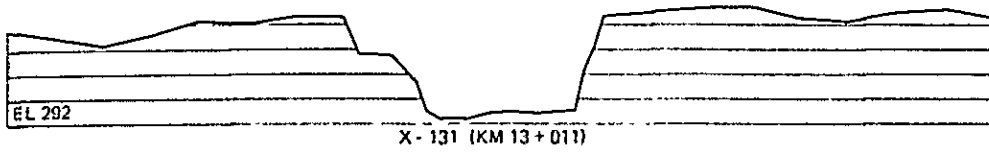
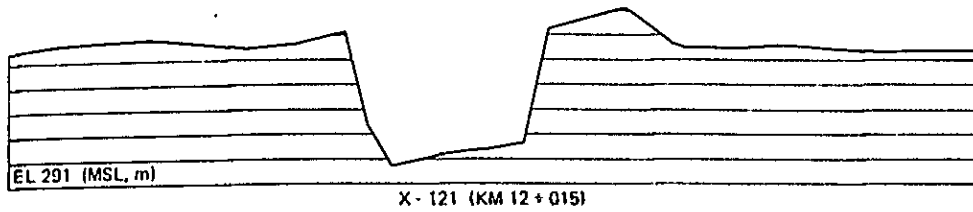


SCALE: VERTICAL
HORIZONTAL

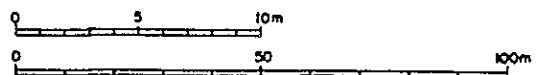


to be continued

(3/5)

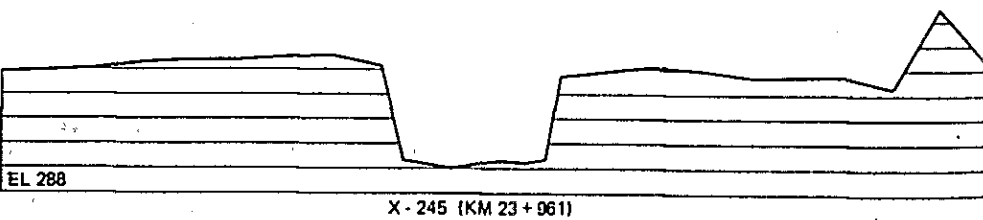
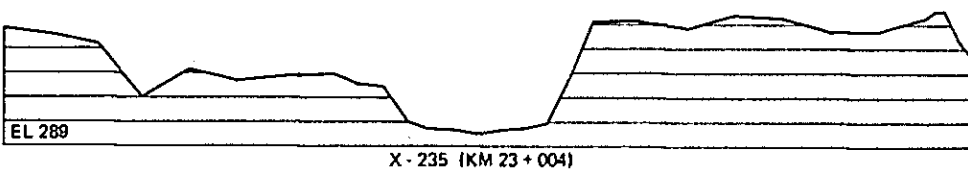
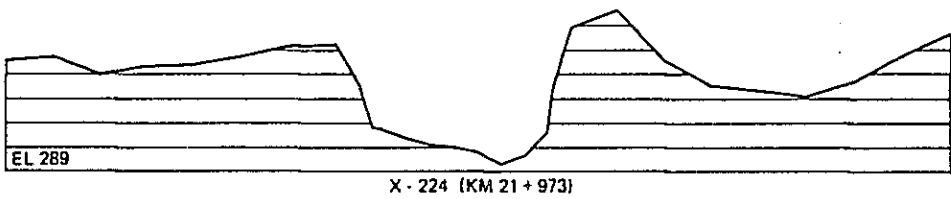
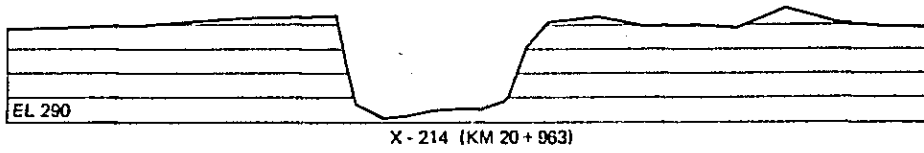
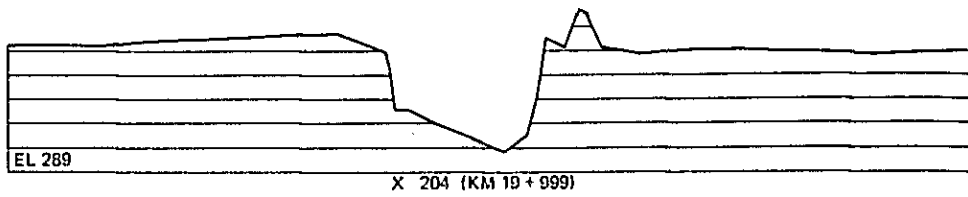
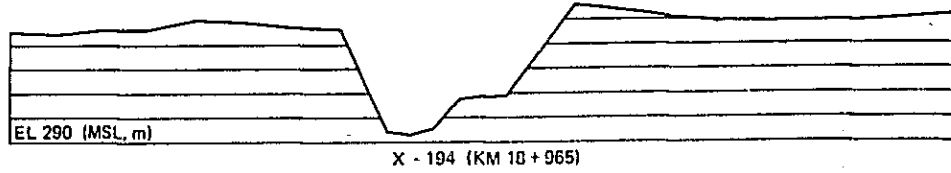


SCALE : VERTICAL
HORIZONTAL

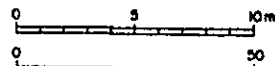


to be continued

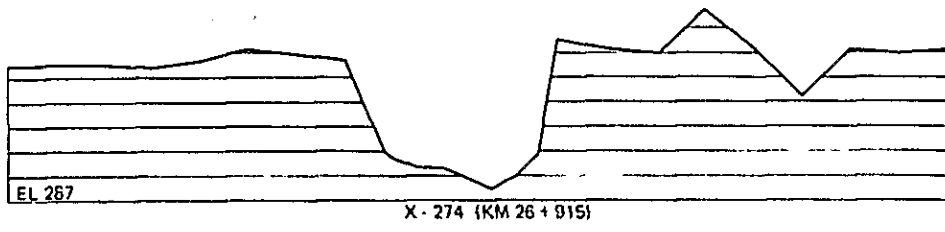
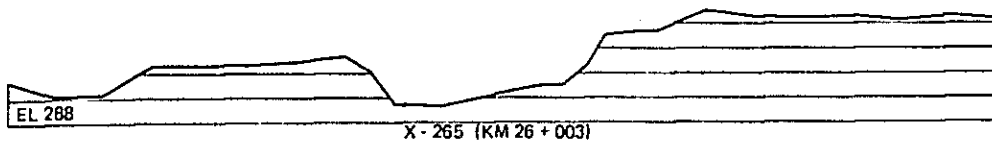
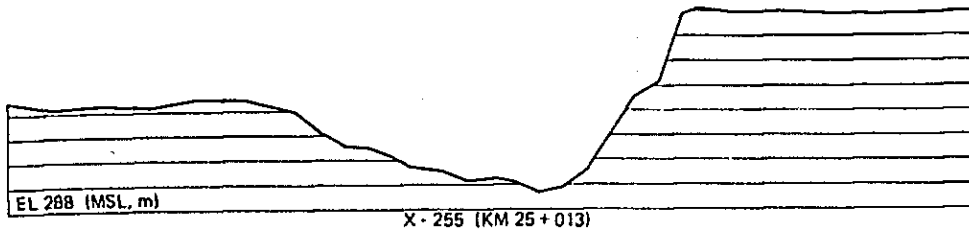
(4/5)



SCALE : VERTICAL
HORIZONTAL



to be continued



SCALE: VERTICAL
HORIZONTAL

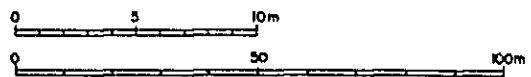
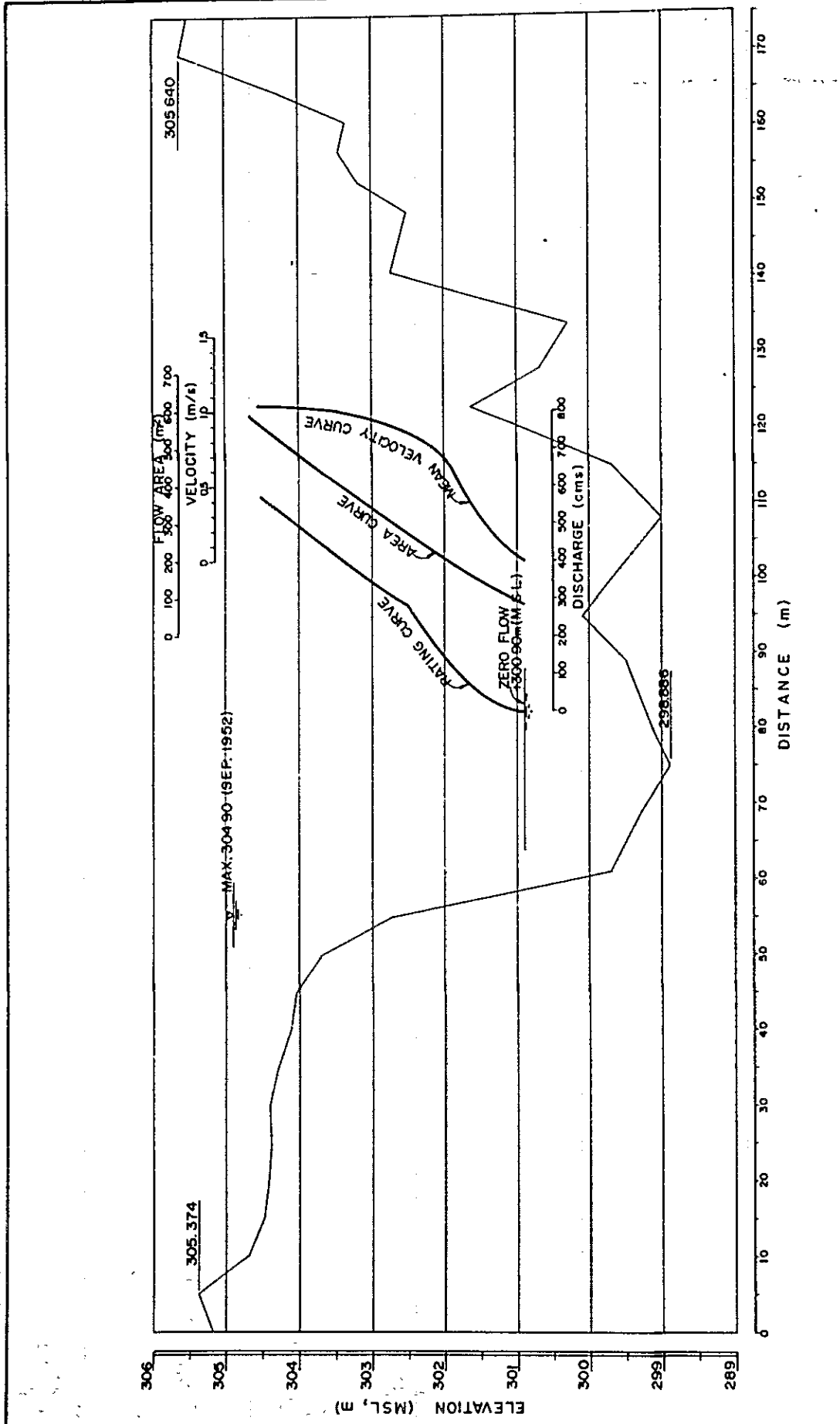
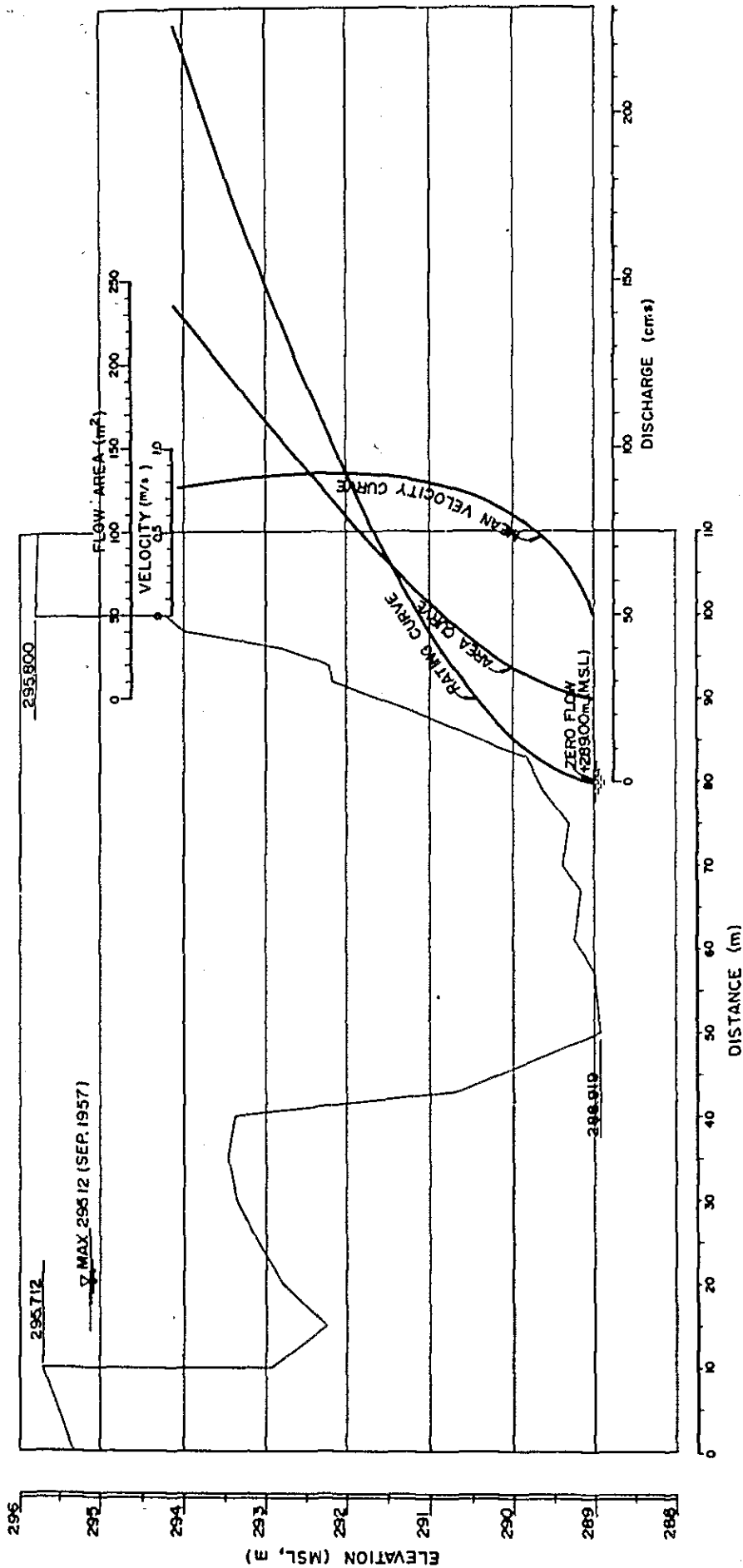


FIGURE A7-1 CROSS-SECTION AND RATING CURVE AT P-1 GAGING STATION



NOTE) CROSS-SECTION SURVEYED ON 30TH OCT. 1979
RATING CURVE NO 147775 C 09-467 Y (WATER YEAR 1978)

FIGURE A7-2 CROSS-SECTION AND RATING CURVE AT P-5 GAGING STATION



NOTE) CROSS-SECTION : SURVEYED ON 29TH OCT. 1979
 RATING CURVE : NO. 147/79 C. 09610 Y (WATER YEAR 1978)
 DATA SOURCE) PROCESSING SECTION, HYDROLOGY DIVISION, RID

FIGURE A7-3 CROSS-SECTION AND RATING CURVE AT P-30 GAGING STATION

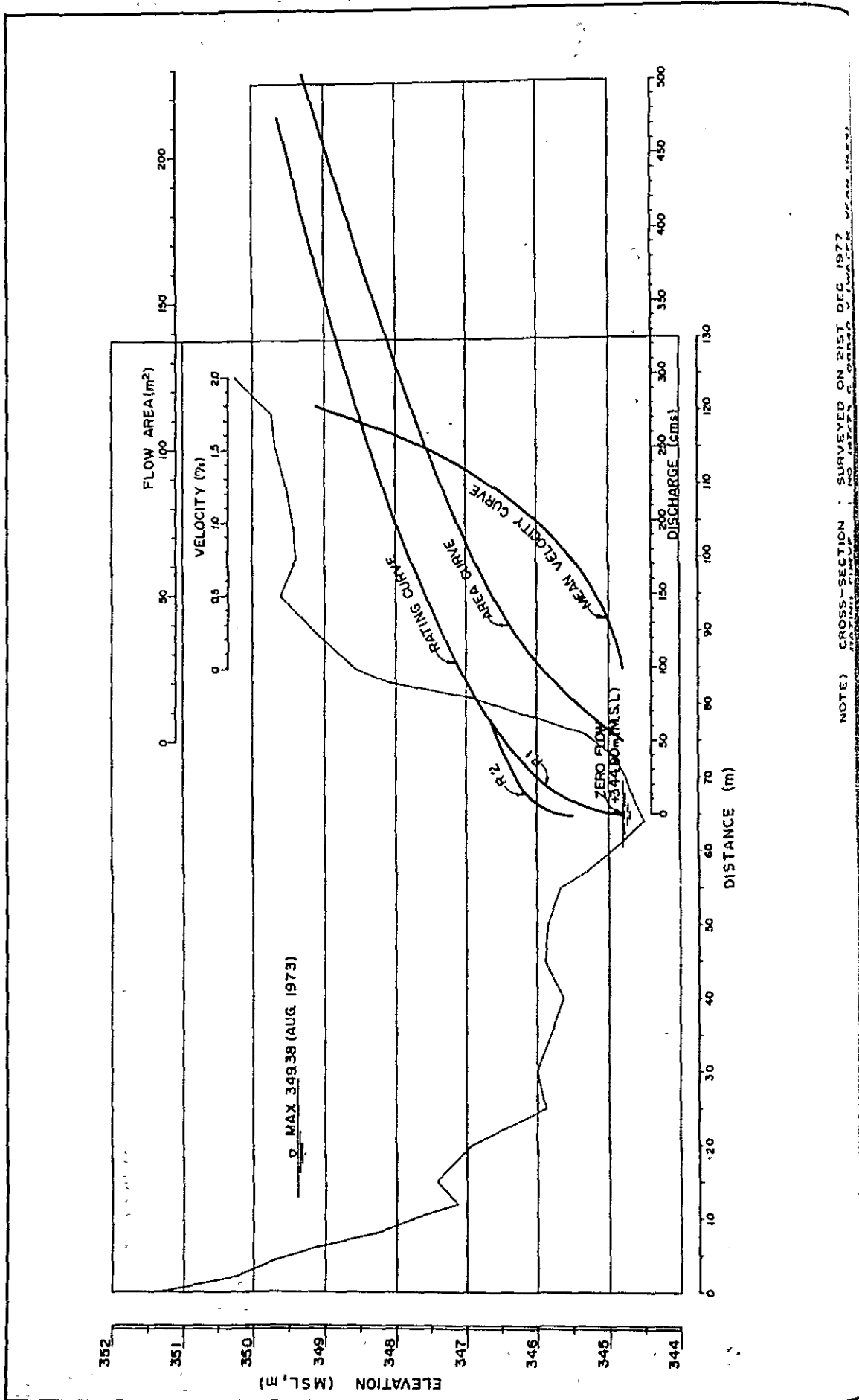
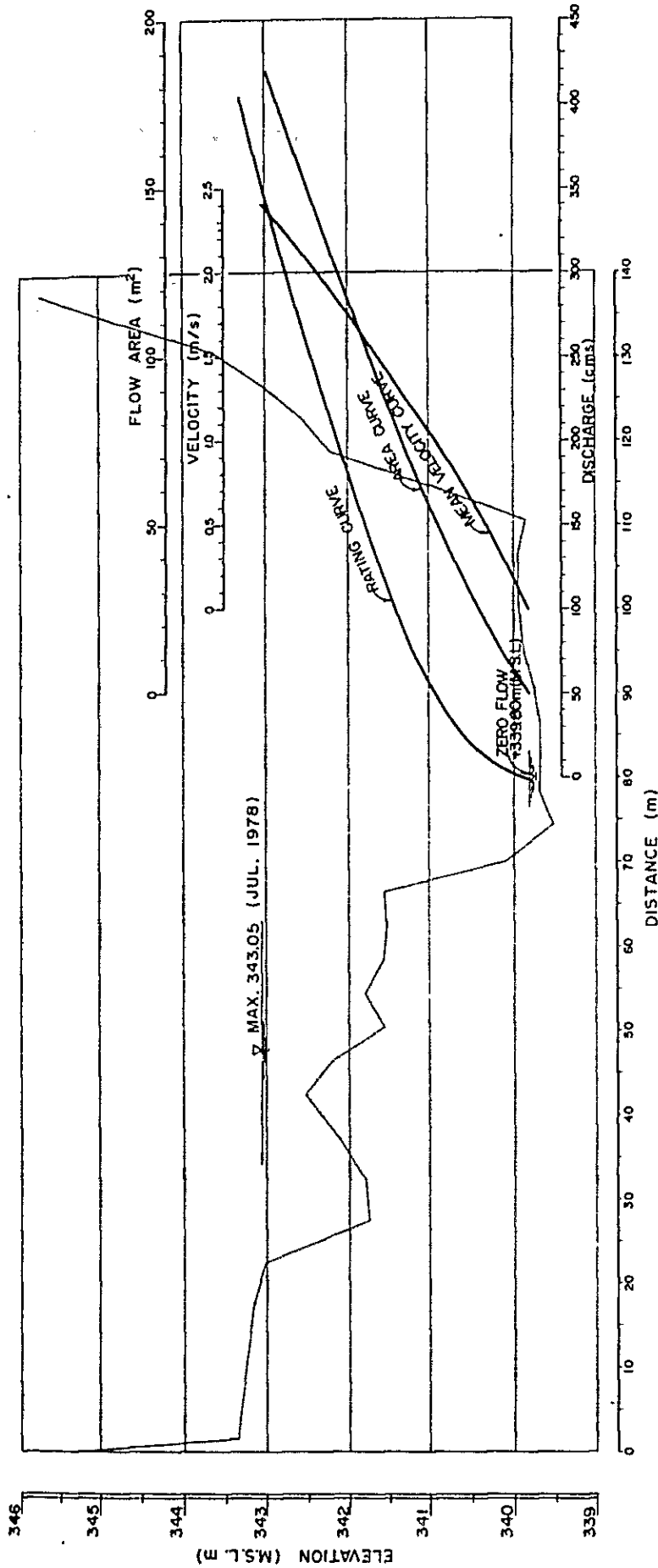
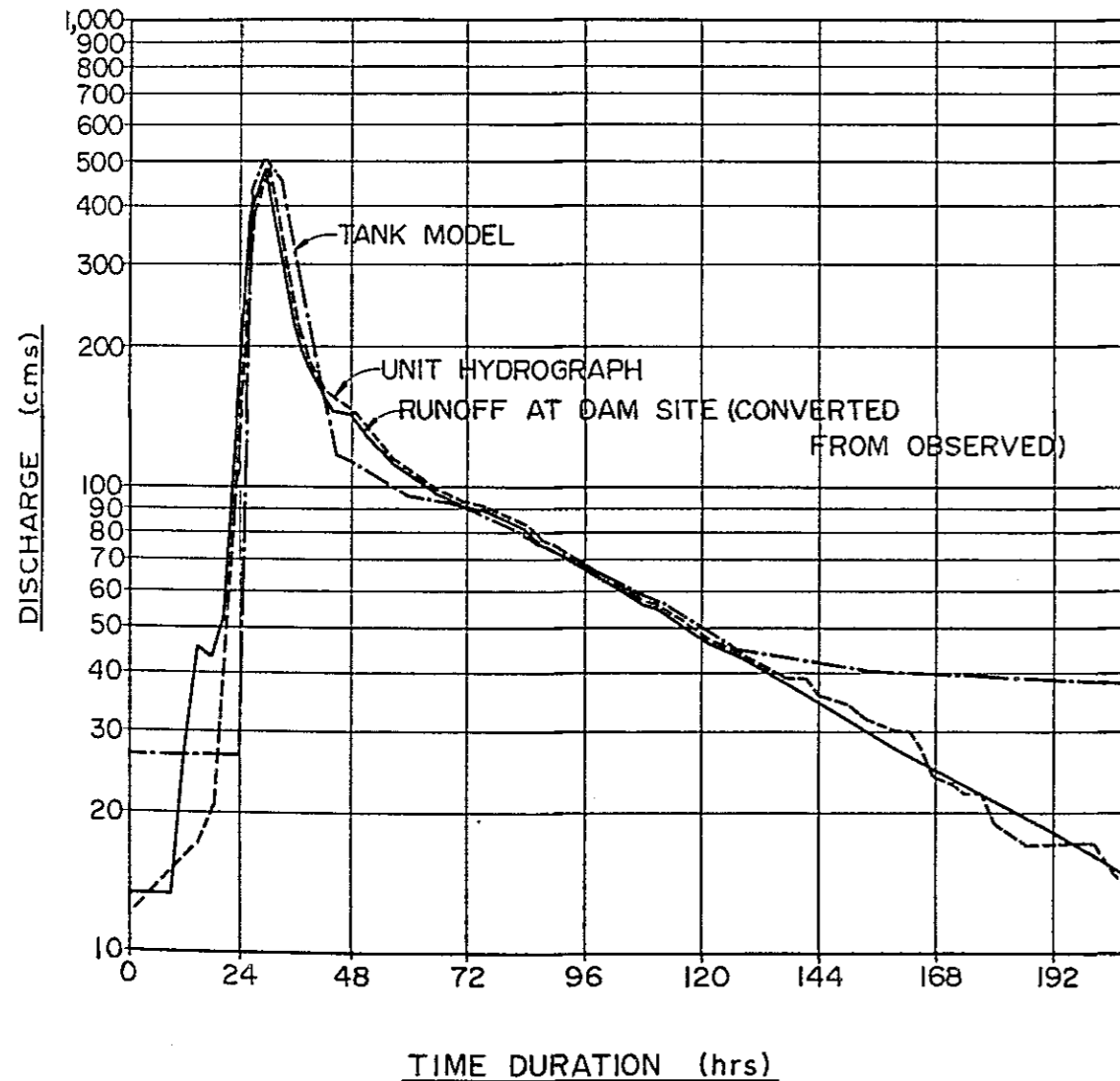
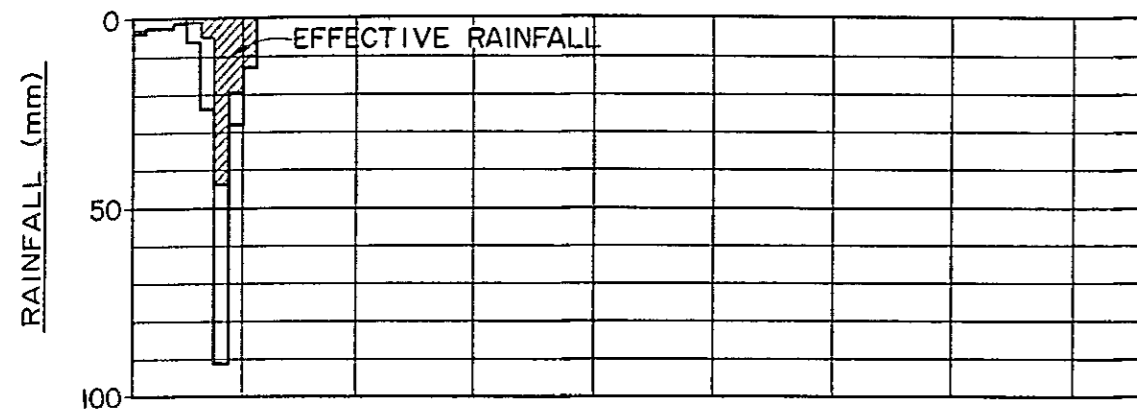


FIGURE A7-4 CROSS-SECTION AND RATING CURVE AT P-34 GAGING STATION



NOTE) CROSS-SECTION : SURVEYED ON 7TH DEC. 1977
 RATING CURVE : NO. 147/79 C. 09588 Y (WATER YEAR 1978)
 DATA SOURCE) PROCESSING SECTION, HYDROLOGY DIVISION, RID

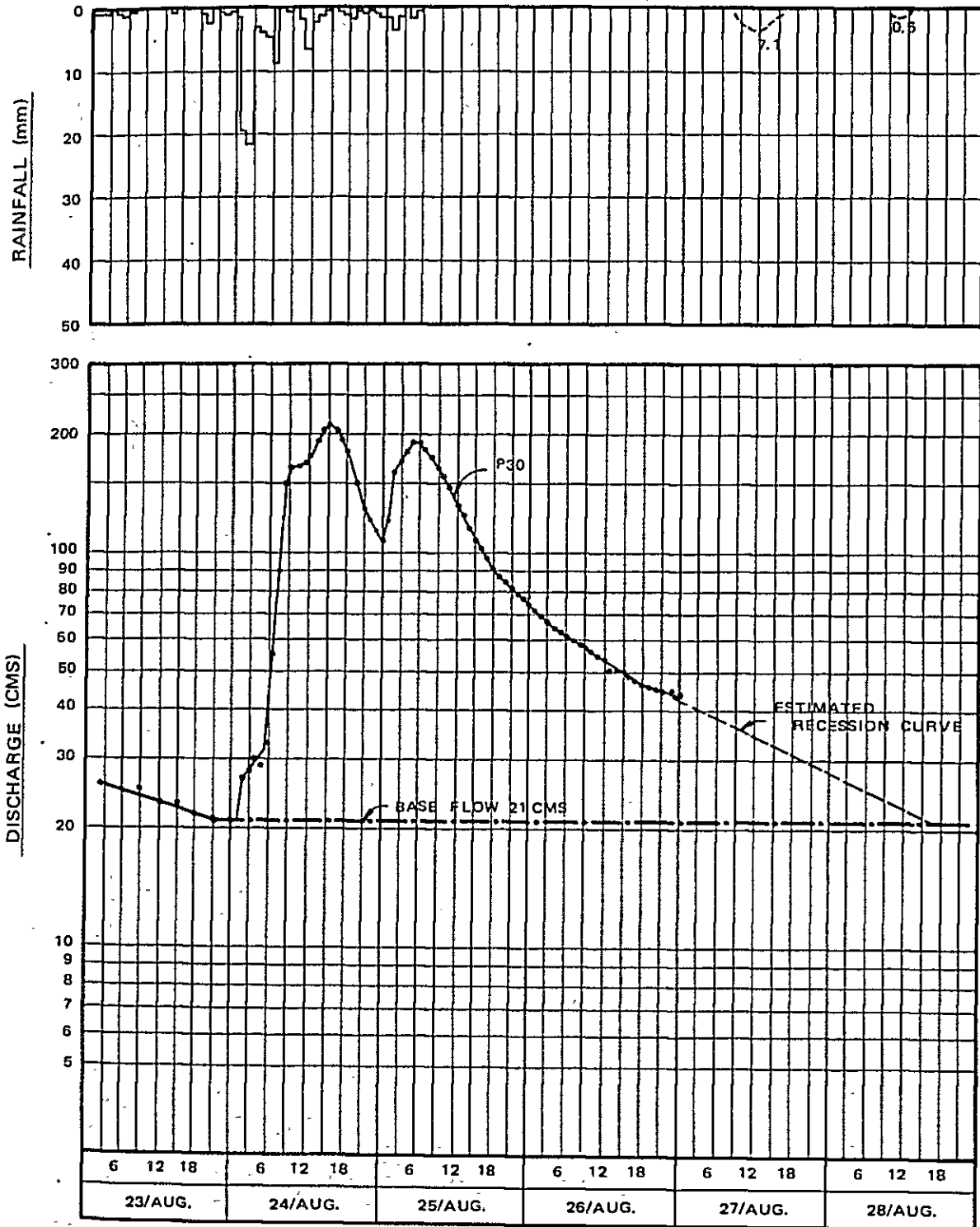
FIGURE A8 VERIFICATION OF APPLIED RUNOFF MODELS



Time (hrs)	Rainfall (mm)			Runoff (cms)		Estimated Runoff at Dam Site (cms)	
	Observed	Effective	Effective	Observed at P-30	Converted at dam site	Tank Model	Unit Hydrograph
0 - 3	30.1 ^{1/}	0.1 ^{2/}	0.1 ^{3/}	11.0 ^{4/}	13.4 ^{5/}	26.5 ^{6/}	13.7 ^{7/}
3 - 6	2.6	0.2	0.2	11.0	13.4	26.5	14
6 - 9	2.3	0.2	0.2	11.0	13.4	26.5	15
9 - 12	0.9	0.2	0.2	22.7	27.7	26.4	16
12 - 15	3.9	0.5	0.4	36.7	44.8	26.4	17
15 - 18	23.6	5.8	5.2	35.3	43.1	26.3	20
18 - 21	91.3	49.7	44.4	43.7	53.4	26.3	53
21 - 24	28.1	22.3	19.9	139.0	169.7	26.2	177
24 - 27	13.0	11.3	10.1	315.0	384.6	423.5	386
27 - 30				400.0	488.4	497.9	494
30 - 33				277.7	339.1	452.9	340
33 - 36				186.7	228.0	325.6	237
36 - 39				152.0	185.6	227.8	172
39 - 42				131.3	160.3	152.6	161
42 - 45				119.3	145.7	117.9	153
45 - 48				117.3	143.2	113.4	146
48 - 51				106.7	130.3	108.6	134
51 - 54				99.0	120.9	103.6	122
54 - 57				93.0	113.6	98.5	114
57 - 60				88.7	108.3	95.5	109
60 - 63				83.7	102.2	94.4	104
63 - 66				79.7	97.3	92.9	100
66 - 69				76.7	93.7	91.0	96
69 - 72				74.0	90.4	88.8	92
72 - 75				73.7	90.0	86.5	90
75 - 78				71.0	86.7	84.0	87
78 - 81				68.0	83.0	81.4	83
81 - 84				66.3	81.0	78.7	79
84 - 87				61.3	74.8	76.0	75
87 - 90				60.3	73.6	73.2	73
90 - 93				57.0	69.6	70.5	70
93 - 96				55.0	67.2	67.8	69
96 - 99				52.0	63.5	65.2	66
99 - 102				50.0	61.1	62.6	62
102 - 105				48.0	58.6	60.0	60
105 - 108				46.0	56.2	57.6	58
108 - 111				45.0	54.9	55.2	56
111 - 114				43.0	52.5	52.9	53
114 - 117				41.0	50.1	50.7	49
117 - 120				39.0	47.6	48.6	48
120 - 123				38.0	46.4	46.5	47
123 - 126				36.0	44.0	45.1	45
126 - 129				35.0	42.7	44.5	43
129 - 132				33.0	40.3	44.0	41
132 - 135				32.0	39.1	43.4	40
135 - 138				31.0	37.9	42.8	39
138 - 141				30.0	36.6	42.3	39
141 - 144				28.0	34.2	41.7	36
144 - 147				27.0	33.0	41.2	35
147 - 150				26.0	31.7	40.7	34
150 - 153				25.0	30.5	40.2	32
153 - 156				24.0	29.3	40.2	31
156 - 159				23.0	28.1	40.1	30
159 - 162				22.0	26.9	40.0	30
162 - 165				21.0	25.6	40.0	27
165 - 168				20.0	24.4	39.9	24
168 - 171				20.0	24.4	39.8	23
171 - 174				19.0	23.2	39.7	22
174 - 177				18.0	22.0	39.5	22
177 - 180				17.0	20.8	39.4	22
180 - 183				17.0	20.8	39.3	19
183 - 186				16.0	19.5	39.2	18
186 - 189				15.0	18.3	39.0	17
189 - 192				15.0	18.3	38.0	17
192 - 195				14.0	17.1	38.7	17
195 - 198				14.0	17.1	38.5	17
198 - 201				13.0	15.9	38.4	17
201 - 204				12.0	14.7	38.2	15
204 - 207				12.0	14.7	38.0	14
Total	168.7	90.3	80.7	4,240.8 (45.8 MCM)	5,178.4 (55.9 MCM)	5,546.1 (59.9 MCM)	5,176 (55.9 MCM)

Note: 1/ 3 hour Rainfall at Mae Kuang Weir (07341)
 2/ Effective Rainfall estimated by following equation:
 $R_e = 0.0175 R^{1.641}$ R_e - Effective Rainfall R - Cumulative Rainfall
 3/ Effective Rainfall adjusted to be equivalent to direct runoff.
 $Direct\ Runoff = Runoff - Base\ Flow = 55.9\ MCM - 13.4\ cms \times 207\ hrs \times 3600\ sec/hr$
 4/ 3 hour Discharge of 1973 Flood at P-30
 5/ Converted by Area Ratio
 $Runoff^{5/} = 1.221 \times Runoff^{4/}$ $1.221 = \frac{D.A.\ at\ Dam\ Site}{D.A.\ at\ P-30} = \frac{569\ sq\ km}{466\ sq\ km}$
 6/ Input Data = Rainfall^{1/}
 7/ Input Data = Effective Rainfall^{2/}

FIGURE A 9-1 HYDROGRAPH OF FLOOD (AUGUST 1970)



TIME DURATION

FIGURE A9-2 HYDROGRAPH OF FLOOD (AUGUST 1973)

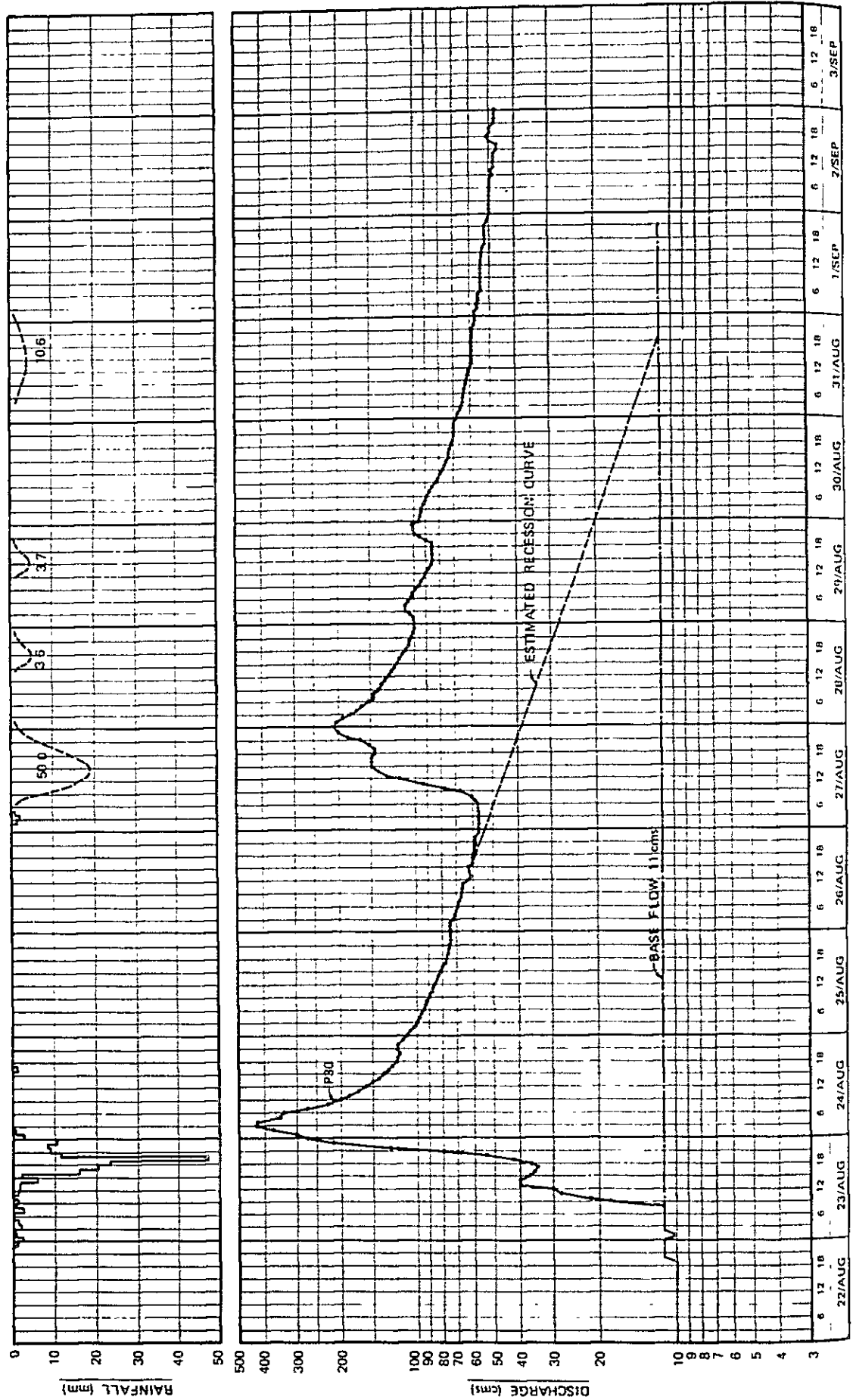


FIGURE A 9-3 HYDROGRAPH OF FLOOD (SEPTEMBER 1974)

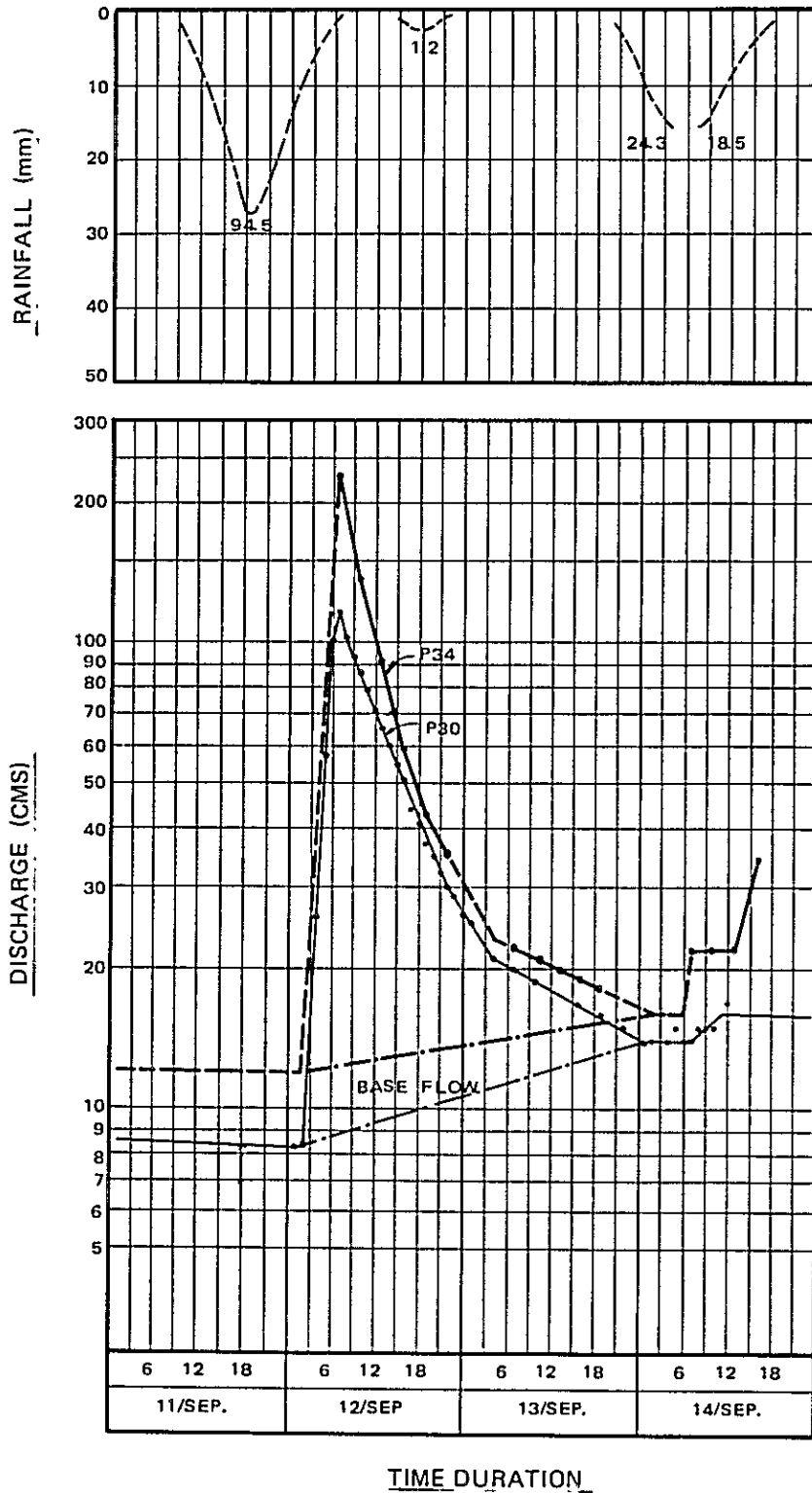
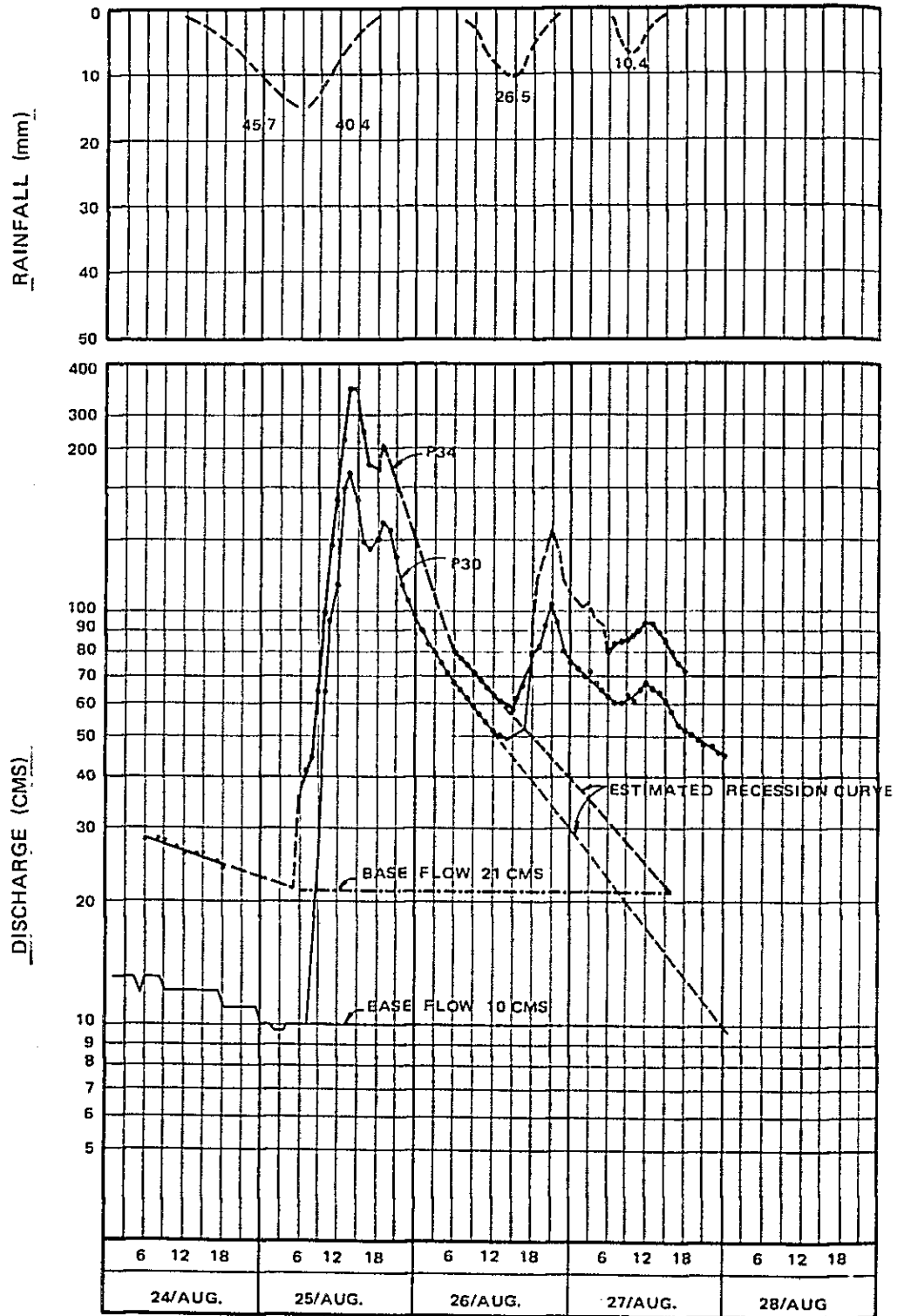


FIGURE A 9-4 HYDROGRAPH OF FLOOD (AUGUST 1975)



TIME DURATION

FIGURE A 9-5 HYDROGRAPH OF FLOOD (JULY 1978)

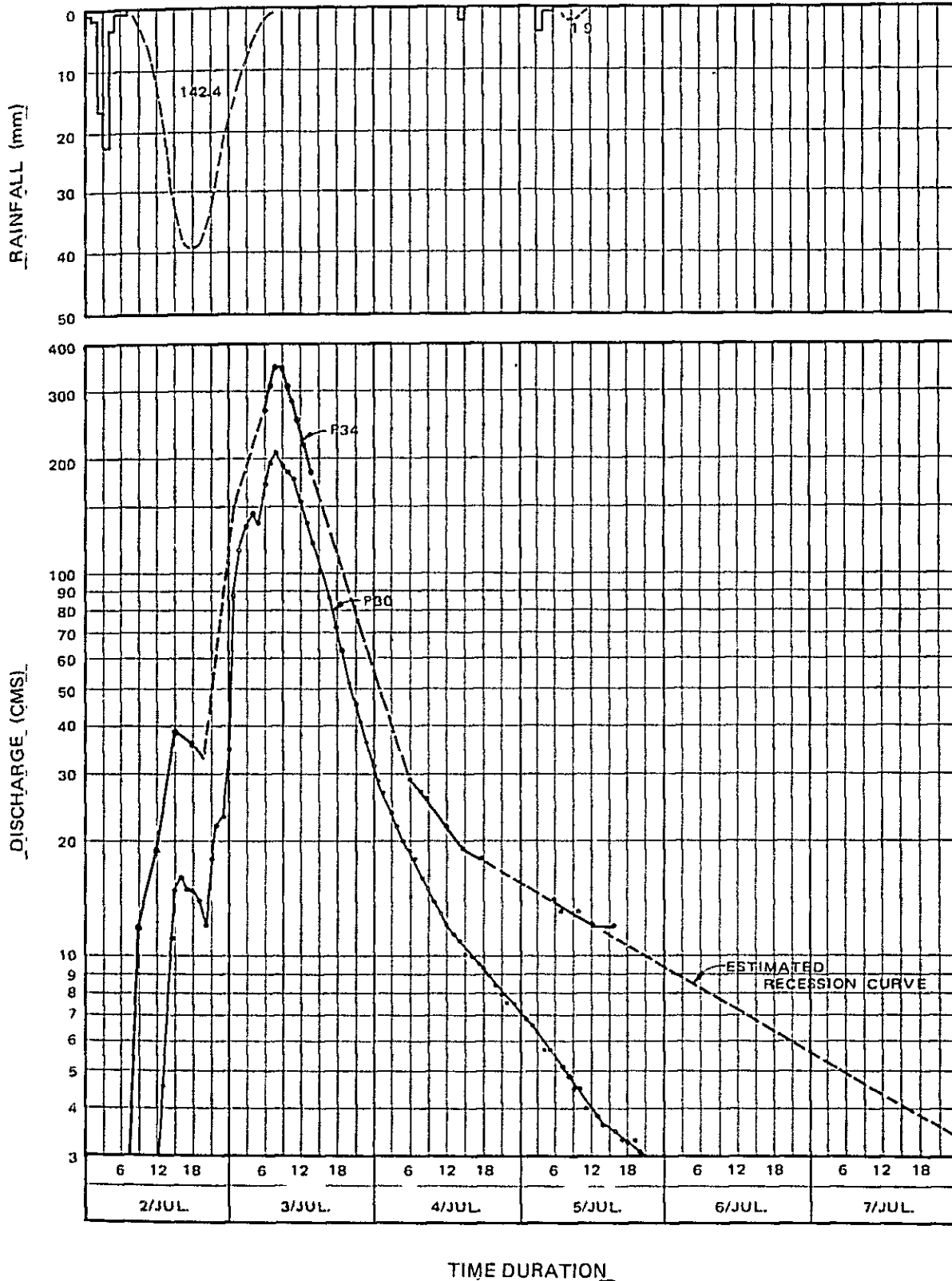


FIGURE A10 APPLIED TANK MODEL
AT MAE KUANG DAM SITE

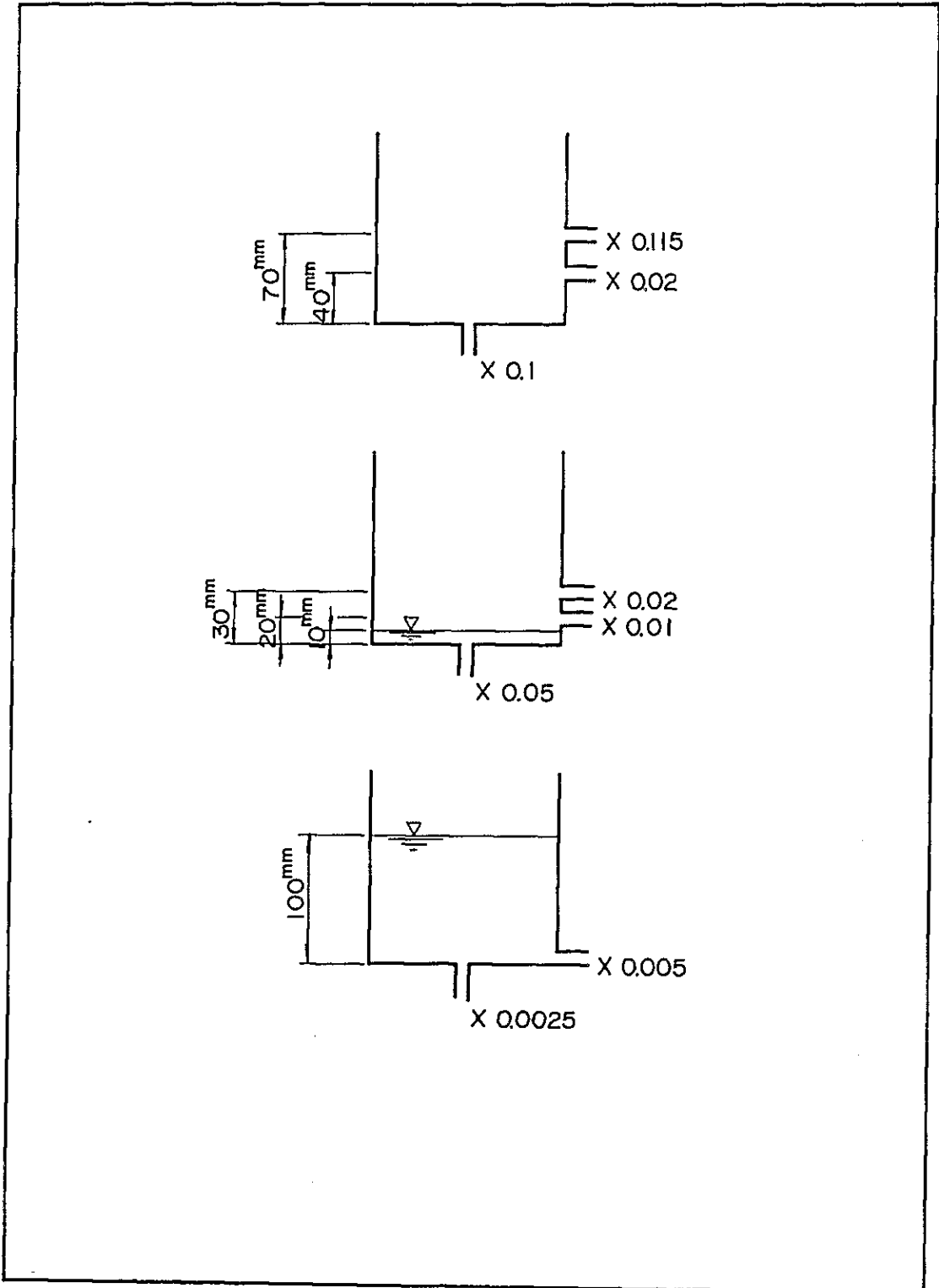
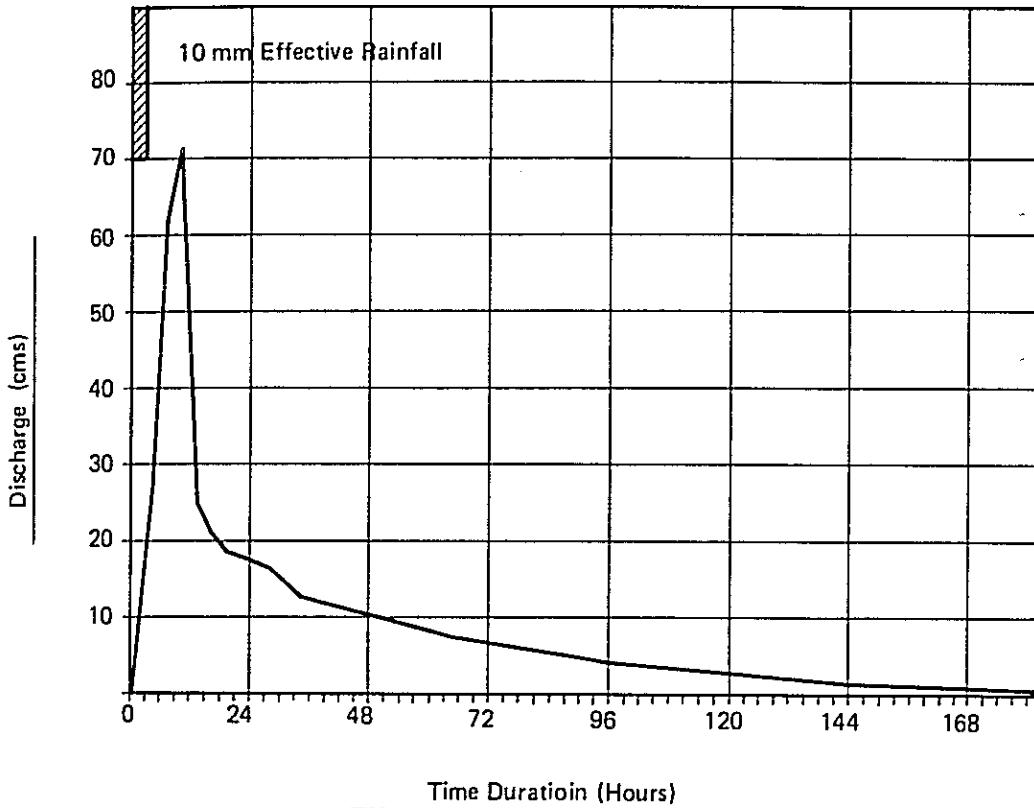
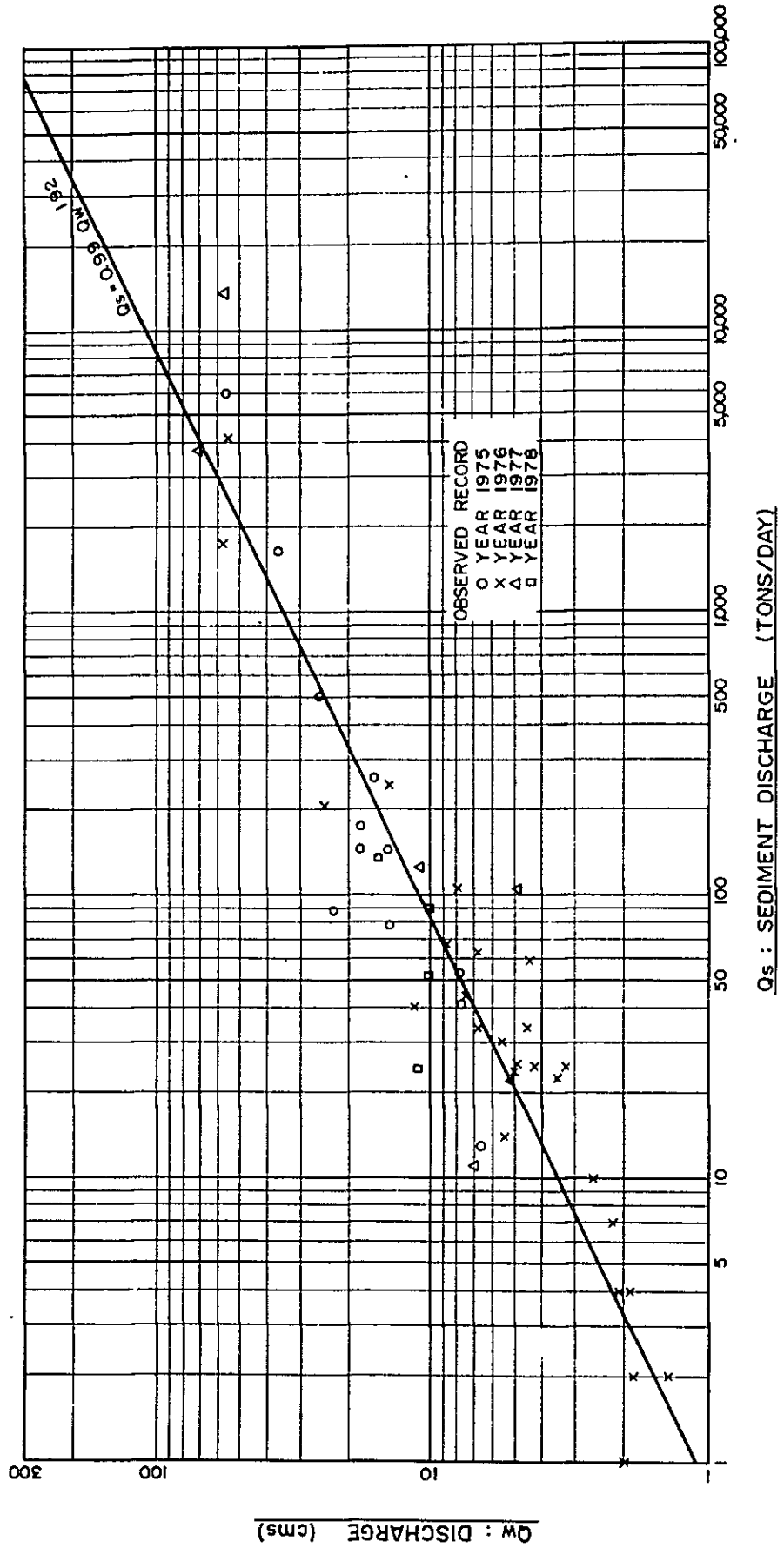


FIGURE A 11 APPLIED UNIT HYDROGRAPH AT MAE KUANG DAM SITE



Time (hr)	Discharge (cms)	Time (hr)	Discharge (cms)	Time (hr)	Discharge (cms)	Time (hr)	Discharge (cms)
0 - 3	4.7	48 - 51	10.0	96 - 99	4.2	144 - 147	1.6
3 - 6	26.4	51 - 54	9.5	99 - 102	4.2	147 - 150	1.1
6 - 9	62.2	54 - 57	9.5	102 - 105	4.2	150 - 153	1.1
9 - 12	71.1	57 - 60	9.0	105 - 108	3.7	153 - 156	1.1
12 - 15	24.8	60 - 63	8.4	108 - 111	3.7	156 - 159	1.1
15 - 18	20.6	63 - 66	7.9	111 - 114	3.2	159 - 162	1.1
18 - 21	18.4	66 - 69	7.4	114 - 117	3.2	162 - 165	0.5
21 - 24	17.9	69 - 72	7.4	117 - 120	3.2	165 - 168	0.5
24 - 27	16.9	72 - 75	6.9	120 - 123	3.2	168 - 171	0.5
27 - 30	16.3	75 - 78	6.9	123 - 126	2.6	171 - 174	0.5
30 - 33	14.2	78 - 81	6.3	126 - 129	2.6	174 - 177	0.5
33 - 36	12.6	81 - 84	5.8	129 - 132	2.6	177 - 180	0.5
36 - 39	12.1	84 - 87	5.8	132 - 135	2.1	180 - 183	0.5
39 - 42	11.6	87 - 90	5.3	135 - 138	2.1		
42 - 45	11.1	90 - 93	5.3	138 - 141	2.1		
45 - 48	10.5	93 - 96	4.7	141 - 144	2.1		

FIGURE A12 SUSPENDED SEDIMENT RATING CURVE OF MAE KUANG RIVER
AT P-34 GAGING STATION



APPENDIX B. SOIL

APPENDIX B SOIL

Appendix B-1 Method of Profile Description for Soil Survey

Table B 1-1 Sheet for Soil Profile Survey

Appendix B-2 Soil Profile Description, Profile No.1 - No.22

Table B 2-1 Mechanical Composition of Soil Samples

Table B 2-2 Major Chemical Properties at Soil Samples

Method of Profile Description for Soil Survey

1. Methods of examination of the profile pit

During the field studies, at the selected sites, a pit one meter deep wherever possible, was dug so that the soil profile could be examined. Profile examination was undertaken for the following items:

a) General information on the site

- (1) Date of examination
- (2) Location
- (3) Elevation
- (4) Land form

To provide an understanding of the situation of the profile, it is necessary to describe its position and the form of the surrounding land. The following terms are used:

Physiographic position

Plateau, summit, crest (escarpment), convex, slope, terrace, valley bottom, plain, depression, etc.

Surrounding land form

Flat or almost flat ---- Slopes not steeper than 2%
Undulating ----- Steepest slopes between 2 and 8%
Rolling ----- Steepest slopes between 8 and 16%
Hilly ----- Steepest slopes between 16 and 30%,
the range of elevation being moderate
Steeply dissected ----- Steepest slopes above 30%, the range
of elevation being moderate

Mountainous ----- Topography shows great variations in elevation

Where there are any natural or artificial forms of microtopography, they should be described. For example, gilgai, terracing, levees (natural or artificial), etc.

(5) Land use or vegetation

Vegetation should be described in simple terms. If the land is in use, the nature of the use should be described. In the case of farmland, the major crops should be listed and as much information as possible given on methods of soil management, use of fertilizer, rotation, yield, etc.

b) General Information on the Soil

(1) Parent materials

This term should include information on the origin of the parent material and, where possible, on the nature of parent rock. For example, colluvial material derived from granitic rocks, residual material derived from basalt, calcareous alluvial of the flood plain, etc.

(2) Drainage condition

The following definition for soil drainage classes is used. Drainage classes are estimated by judging ground water level, topography, existence of compact layer, soil texture, development of soil structure, etc. More exact determination of this property requires actual physical measurement.

Very poor drained: Water is removed from the soil so slowly that the water table remains as or on the surface, most of time.

Poorly drained: Water is removed so slowly that the soil remains wet for a long period of time. The water table is commonly at or near the surface during a considerable part of the year.

Imperfectly drained: Water is removed from the soil slowly enough to keep it wet for a long period of time but not all the time.

Moderately well drained: Water is removed from the soil somewhat slowly, so that the profile is wet for a short period of time.

Well drained: Water is removed from the soil readily but not rapidly.

Somewhat excessively drained: Water is removed from the soil rapidly.

Excessively drained: Water is removed from the soil very rapidly.

c) Soil profile description

(1) Thickness and boundary of soil horizons

Identification of soil horizons

At first the soil profile is divided into different horizons by means of any visible characteristics. Individual soil horizons identified are designated according to the ABC system of horizon nomenclature.

Boundary

Boundary is recorded according to the clarity as follows:

Abrupt ----- Changing with 1 cm width

Clear ----- Changing 1 to 3 cm width

Gradual ----- Changing 3 to 5 cm width

Diffuse ----- Changing over 5 cm width

Shapes of boundary may be described as "smooth", "wavy" or "irregular".

(2) Soil texture

Soil texture classification system adopted by the International Society of Soil Science (ISSS) is recommended in Japan. Textural classes are divided as follows:

Soils containing less than 15% clay

- ° Coarse sand ----- CoS
- ° Fine sand ----- FS
- ° Loamy coarse sand ----- LCoS
- ° Loamy fine sand ----- LFS
- ° Coarse sandy loam ----- CoSL
- ° Fine sandy loam ----- FSL
- ° Loam ----- L
- ° Silty loam ----- SiL

Soils containing 15 to 25% clay

- ° Sandy clay loam ----- SCL
- ° Clay loam ----- CL
- ° Silty clay loam ----- SiCL

Soils containing 25 to 45% clay

- ° Sandy clay ----- SC
- ° Light clay ----- LiC
- ° Silty clay ----- SiC

Soils containing more than 45% clay

- ° Heavy clay ----- HC

Remark 1. Adjective "coarse and fine" indicates a content of more than 45% of coarse sand or more than 45% of fine sand, respectively.

Remark 2. The size of the soil particles is divided into four fractions according to the method recommended by ISSS as follows:

<u>Fraction name</u>	<u>Size of particle, mm in diameter</u>
Coarse sand (CoS)	2 to 0.2
Fine sand (FS)	0.2 to 0.02
Silt (Si)	0.02 to 0.002
Clay (C)	less than 0.002

(3) Gravel

The absence or presence, size, quantity, shape, the degree of weathering of gravel and stones larger than 2 mm in diameter and/or kind of rock if possible are recorded.

Size

Very fine ----- Less than 0.5 cm in the longest diameter
Fine ----- 0.5 to 2 cm in the longest diameter
Medium ----- 2 to 10 cm in the longest diameter
Coarse ----- More than 10 cm in the longest diameter

Quantity (on the basis of exposed surface)

Few ----- Less than 5%
Common ----- 5 to 10%
Many ----- 10 to 20%
Abundant ----- 20 to 50%
Gravel layer ----- More than 50%

(4) Humus

When the laboratory results are available, humus contents are divided into the following four classes:

Less than 2% ----- None
2 to 5% ----- With some humus (dark gray in color)
5 to 10% ----- Rich in humus (very dark color)
10 to 20% ----- Very rich in humus (black in color)
More than 20% ----- Humus soil (deep black and friable)

(5) Peat and muck

The absence or presence, quantity of peat and muck are recorded.

(6) Soil color

Under the field conditions, soil color is determined by comparison with the Standard Soil Color Chart published by Nippon Shikisai-Sha, Tokyo, expressed in the same color notation as the Munsell Soil Color Chart. Soils are not always homogeneous, often stained and mottled showing mosaic-like pattern, therefore, component colors are described according to Munsell color notation.

(7) Soil structure

Soil structure in the field is described according to the shape, size and degree of distinctness.

Shape

Plate-like: Plate-like, with one dimension (the vertical) limited and considerably less than the other two; arranged around horizontal plane, faces mostly horizontal.

Prismatic: Prism-like, with one dimension (the horizontal) limited and considerably less than the vertical; arranged around a vertical line; vertical faces well defined; vertices angular.

Columnar: Prism-like, as the above, but caps of prism are round.

Angular blocky: Blocks or polyhedrons arranged around a point; all three dimensions are of almost equal magnitude; plane or curved surfaces that are casts of the molds formed by the faces of the surrounding peds; faces flattened; most vertices sharply angular.

Sub-angular blocky: Blocks or polyhedrons, as the above, but with mixed round and flattened faces with many rounded vertices.

Granular: Spheroid or polyhedrons, arranged around a point; all three dimensions are of almost equal magnitude; plane or curved surfaces which have slight or no accommodation to the faces of surrounding peds. Peds are relatively non-porous.

Crumb: Spheroid or polyhedrons as the above, but peds porous.

Grade

Structureless: No observable aggregation or no orderly arrangement of natural lines of weakness; coherent material; massive; non coherent material; single grain

Weak: Poorly formed indistinct peds barely observable in place.

Moderate: Well formed distinct peds, moderately durable and evident, but not distinct, in undisturbed soil.

Strong: Durable peds that are evident in undisplaced soil, adhere weakly to one another, withstand displacement and become separated when soil is disturbed.

Size

	<u>Very fine</u>	<u>Fine</u>	<u>Medium</u>	<u>Coarse</u>	<u>Very Coarse</u>
Granular, crumb	<1mm	1-2	2-5	5-10	>10mm
Plate-like	<1mm	1-2	2-5	5-10	>10mm
Angular blocky, Sub-angular blocky	<5mm	5-10	10-20	20-50	>50mm
Prismatic, columnar	<10mm	10-20	20-50	50-100	>100mm

(8) Pores

Pores are concerned with cavities within the soil mass and clod surface. The nature and abundance of pores are undoubtedly of importance in relation to the physical properties of the soil.

Size

The size may be divided on the basis of the diameter into the following classes:

- Very fine ----- Less than 0.5 mm
- Fine ----- 0.5 to 2 mm
- Medium ----- 2 to 5 mm
- Coarse ----- More than 5 mm

Abundance

The abundance is described by evaluating the proportion occupied by the pores, as follows:

Few ----- Pore space occupies less than 5% of the clod

Common ----- Pore space occupies 5 to 10% of the clod

Many ----- Pore space occupies 10 to 30% of the clod

Abundant --- Pore space occupies more than 30% of the clod

(9) Oxidative sediments (Mottlings)

The presence of oxidative sediments or color mottlings in a soil profile may be of great significance in relation to soil forming process or drainage pattern. Oxidative sediments mainly consist of various compounds of iron and manganese oxides. The shape, abundance, contrast and color of mottles should be recorded.

Shape

Tubular: Tube-shaped hollow mottles, formed around coarse root channels more than 2 mm in diameter.

Fine tubular: Tube-shaped mottles formed around root channels less than 2 mm in diameter.

Diffuse tubular: Tubular mottles with diffuse borders

Filmly: Film-like mottles with dominant two-dimensional extensions

Spotty: Round shaped mottles with slightly diffuse borders

Cloudy: Faint mottles with three dimensional extensions and diffuse borders

Concretion: Round shaped hard separation, with concentric internal structure.

Abundance

Few ----- Mottles occupy less than 2% of the exposed surface
Common ----- Mottles occupy 2 to 10% of the exposed surface
Many ----- Mottles occupy 10 to 20% of the exposed surface
Abundant --- Mottles occupy 20 to 50% of the exposed surface
Mosaic ----- Mottles occupy more than 50% of the exposed surface

Contrast

Faint: Indistinct mottles, detected only on close examination; hue and chroma of matrix and mottles closely related.

Distinct: Mottles not striking but readily seen; matrix and mottles differ by 1 to 2 hues and several units in chroma and value.

Prominent: Conspicuous mottles are an outstanding feature of the horizon; matrix and mottles differ by several units of hue, value and chroma

Color of mottles

In most cases, the standard color name may be given to describe the color of mottles. Munsell color notation should be applied if necessary.

(10) Compactness

Compactness is determined with Yamanaka's cone penetrometer. Values in mm read on this apparatus show the strength of resistance of the soil to the penetration of conical part of the instrument, consequently, the values indicate not only the compactness of soil but also its adhesion capacity. The grade is expressed as follows:

	<u>Values recorded</u>
Loose -----	Less than 10 mm
Slightly compact -----	11 to 18 mm
Compact -----	19 to 24 mm
Very compact -----	24 to 29 mm
Extremely compact -----	More than 30 mm

(11) Electric conductivity

Portable EC meter, μ mho/cm. 25°C

(12) Plasticity

For the determination of plasticity in the field, supply enough moisture to the soil material and roll it between thumb and fingers. When the soil material no more adheres to the fingers, it becomes a wire. Degree of plasticity is described as follows:

<u>Non plastic</u>	<u>No wire is formed</u>
Very slightly plastic	Wire formed but easily deformable
Slightly plastic	Wire about 2 mm in diameter is formed
Plastic	Wire about 1 mm in diameter is formed
Very plastic	Wire more than 1 cm in length is formed

(13) Stickiness

For the determination of stickiness in the field, soil material is pressed between thumb and fingers, and its adherence is recorded. Degree of stickiness is described as follows:

Non sticky: After release of pressure, practically no soil material adheres to thumb or fingers.

Slightly sticky: After release of pressure, soil material adheres to both thumb and fingers, but comes off from either one rather cleanly.

Sticky: After release of pressure, soil material adheres to both thumb and fingers and tends to stretch somewhat.

Very sticky: After release of pressure, soil material adheres strongly to both thumb and forefinger and is definitely stretched when fingers are separated.

(14) Root distribution

For each horizon, the distribution of plant root is described on the basis of exposed surface as follows:

Few -----	Less than 5%
Common -----	5 to 10%
Many -----	10 to 20%
Abundant -----	More than 20%

No.		Location										Land Use		Weather			
Topography		Geology					Parent material					Vegetation					
Profile	Depth cm	Horizon	Sample	Texture	Gravel	Humus	Peat, Muck	Color	Structure	Porosity	Mottle	EC μ mho/ cm, 25°C	Permeability	Compactness	Stickiness	Plasticity	Rooting
	- 10																
	- 20																
	- 30																
	- 40																
	- 50																
	- 60																
	- 70																
	- 80																
	- 90																
	-100																
Soil Unit	Soils																Soil Series
Note	Date:																Surveyer:

Soil Profile Description, Profile No.1 - No.22

Profile No.1

Date of survey : 11 June 1981
Location : Doi Saket, Changwat Chiang Mai
Physiographic position : Low terrace, lower part
Surrounding land form : Flat to, gently undulating
Land use : Paddy field
Parent material : Old alluvial deposits
Great soil group : Low Humic Gley Soils
Soil series : San Sai Series (Sai)

Profile description;

Apg: 0 - 20 cm, Brownish gray (7.5YR5/1) sandy loam (SL) with some humus, common distinct fine tubular and filmy orange (7.5YR6/6) mottles, weak medium subangular blocky structure, common fine pores, slightly compact (12 mm), slightly plastic, slightly sticky EC 202 μ mho/cm.25°C, common roots. Clear smooth boundary

Blg: 20 - 35 cm, Dull orange (7.5YR7/3) sandy loam (SL), common distinct fine tubular and filmy brown (7.5YR4/4) mottles, weak medium subangular blocky structure, common fine pores, slightly compact (17 mm), very slightly plastic, slight sticky, EC 258 μ mho/cm.25°C, few roots. Gradual smooth boundary

B2g: 35 - 70 cm, Light brownish gray (5YR7/2) loamy sand (LS), common distinct cloudy orange (7.5YR6/6) mottles, single grain, common fine pores, slightly compact (18 mm) non plastic, non sticky, EC 240 μ mho/cm.25°C. Gradual smooth boundary

Cg: 70 - 100 cm, Light gray (5YR8/2) loamy sand (LS), few distinct cloudy orange (7.5YR6/6) mottles, single grain, common fine cores, compact (22 mm), non plastic, non sticky, EC 240 μ mho/cm.25°C

* Ground water level: 70 cm

Profile No.2

Date of survey : 11 June 1981
Location : Ban Ton Pao, Changwat Chiang Mai
Physiographic position : Semi-recent terrace
Surrounding land form : Flat to gently undulating
Land use : Paddy field
Parent material : Semi-recent alluvial deposits
Great soil group : Low Humic Gley Soils
Soil series : Hang Dong Series (Hd)

Profile description;

- Apg: 0 - 15 cm, Grayish brown (7.5YR6/2) sandy loam (SL), with some humus, common distinct failmy brown (7.5YR4/6) mottles, weak medium subangular blocky structure, many fine pores, slightly compact, slightly plastic, slightly sticky, common roots. Clear smooth boundary
- Blg: 15 - 35 cm, Grayish brown (7.5YR5/2) sandy loam (SL), common distinct failmy bright brown (7.5YR5/6) mottles, weak medium subangular blocky structure, common fine pores, slightly compact, slightly plastic, slightly sticky, few roots. Gradual smooth boundary
- B2g: 35 - 70 cm, Dull brown (7.5YR5/3) sandy loam (SL), common distinct cloudy bright brown (7.5YR5/6) mottles, moderate medium subangular blocky structure, common fine pores, slightly compact, slightly plastic, slightly sticky. Clear smooth boundary
- IICg: 70 - 100 cm, Brown (7.5YR4/6) light clay (LiC), common distinct cloudy brown (7.5YR4/4) mottles, weak coarse subangular blocky strucutre, common fine pores, compact plastic, sticky

Profile No.3

Date of survey : 11 June 1981
Location : Ban Pa Khang, Changwat Chiang Mai

Physiographic position : Semi-recent terrace
Surrounding land form : Flat to gently undulating
Land use : Paddy field
Parent material : Semi-recent alluvial deposits
Great soil group : Low Humic Gley Soils
Soil series : Hang Dong Series (Hd)

Profile description;

Apg: 0 - 15 cm, Dull yellowish brown (10YR4/3) loam (L), with some humus, common distinct filmy reddish brown (5YR4/8) mottles, weak medium subangular blocky structure, many fine pores, slightly compact, slightly plastic, slightly sticky, common roots. Clear smooth boundary

Blg: 15-- 27 cm, Brownish gray (10YR5/1) clay loam (CL), common distinct filmy reddish brown (5YR4/8) mottles, weak medium subangular blocky structure, common fine pores, slightly compact, plastic slightly sticky, few roots. Gradual smooth boundary

IIC1g: 27 - 55 cm, Grayish yellow brown (10YR5/2) sandy loam (SL), common distinct cloudy bright reddish brown (5YR5/8) mottles, weak coarse subangular blocky structure, many fine pores, slightly compact, slightly plastic, slightly sticky. Clear smooth boundary

IIC2g: 55 - 70 cm. Grayish yellow brown (10YR6/2) sand (S), single grain, many fine pores, non plastic, non sticky. Clear smooth boundary

IIIC3g: 70 - 100 cm, Dull yellowish brown (10YR5/3) sandy clay (SC), common distinct cloudy bright reddish brown (5YR5/8) mottles, weak coarse subangular blocky structure, common fine pores, compact, plastic, sticky

Profile No.4

Date of survey : 11 June 1981
 Location : Ban Mae Pong near Huai Bom, Changwat
 Chiang Mai
 Physiographic position : Alluvial plain
 Surrounding land form : Flat
 Land use : paddy field
 Parent material : Fresh water alluvial deposits
 Great soil group : Fresh water alluvial soils
 Soil series : Ratchaburi Series (Rb)

Profile description:

- Apg: 0 - 15 cm, Brownish black (10YR3/2) light clay (LiC) with some humus, common distinct fine tubular reddish brown (5YR4/6) mottles, weak medium subangular blocky structure, common fine pores, slightly compact (15 mm), plastic, sticky, EC 240 μ mho/cm.25°C, common roots. Clear smooth boundary
- Blg: 15 - 35 cm, Brownish gray (10YR4/1) light clay (LiC) with some humus, common distinct fine tubular reddish brown (5YR4/3) mottles, weak medium subangular blocky structure, common fine pores, slightly compact (14 mm), plastic, sticky, EC 254 μ mho/cm.25°C, common roots. Gradual smooth boundary
- B2g: 35 - 70 cm, Brownish gray (10YR5/1) light clay (LiC) with some humus, common distinct spotty bright brown (7.5YR5/6) mottles, weak coarse subangular blocky structure, few fine pores, slightly compact (18 mm), plastic, sticky, EC 296 μ mho/cm. 25°C few roots. Clear smooth boundary
- IICg: 70 - 100 cm, Grayish yellow brown (10 YR5/2) heavy clay (HC), common distinct spotty bright brown (7.5YR5/6) mottles, weak coarse subangular blocky structure, few fine pores, compact (21 mm), plastic, sticky, EC 260 μ mho/cm.25°C
- * Water in irrigation canal, EC 190 μ mho/cm.25°C

Profile No.5

Date of survey : 12 June 1981
Location : Ban Doi Kamphra, Changwat Chiang Mai
Physiographic position : Low terrace, higher part
Surrounding land form : Gently undulating
Land use : Upland field
Parent material : Old alluvial deposits
Great soil group : Regosols
Soil series : Nam Pong Series (Ng)

Profile description;

- A: 0 - 20 cm, Dull orange (5YR7/4) fine sand (FS), single grain, many fine pores, compact (21 mm), EC 240 μ mho/cm.25°C, common roots. Gradual smooth boundary
- C1: 20 - 80 cm, Dull orange (5YR7/3) fine sand (FS), single grain, many fine pores, compact (23 mm), EC 240 μ mho/cm.25°C, few roots. Gradual smooth boundary
- IIC2: 80 - 100 cm, Dull orange (5YR7/3) fine sand (FS), common medium angular gravels (10%), single grain, many fine pores, compact (23 mm), EC 240 μ mho/cm.25°C

Profile No.6

Date of survey : 12 June 1981
Location : Ban Huai Som, Changwat Chiang Mai
Physiographic position : Low terrace, higher part
Surrounding land form : Gently undulating
Land use : Paddy field
Parent material : Old alluvial deposits
Great soil group : Regosols
Soil series : Nam Pong Series (Ng)

Profile description;

- Apg: 0 - 15 cm, Grayish yellow brown (10YR4/2) fine sandy loam (FSL) with some humus, common distinct fine tubular brown (7.5YR4/6) mottles, weak medium subangular blocky structure, many fine pores, slightly compact, common roots. Gradual smooth boundary
- A2g: 15 - 30 cm, Dull yellowish brown (10YR4/3) fine sandy loam (FSL) with some humus, common distinct fine tubular brown (7.5YR4/6) mottles, weak medium subangular blocky structure, common fine pores, compact, few roots. Clear smooth boundary
- B2g: 30 - 75 cm, Dull brown (7.5YR6/3) loamy sand (LS), common distinct cloudy bright brown (7.5YR5/8) mottles, single grain, many fine pores, slightly compact. Gradual smooth boundary
- Cg: 75 - 100 cm, Dull orange (7.5YR7/3) loamy sand (LS), common distinct cloudy bright brown (7.5YR5/8) mottles, single grain, many fine pores

Profile No.7

Date of survey : 12 June 1981
Location : San Kamphaeng, Changwat Chiang Mai
Physiographic position : Semi-recent terrace
Surrounding land form : Flat to gently undulating
Land use : Paddy field
Parent material : Semi-recent alluvial deposits
Great soil group : Low Humic Gley Soils
Soil series : Hang Dong Series (Hd)

Profile description;

- Apg: 0 - 13 cm, Grayish olive (5R6/2) light clay (LiC) with some humus, common distinct fine tubular brown (7.5YR4/6) mottles, moderate medium subangular blocky structure, common fine pores, slightly compact (13 mm), plastic, sticky, EC 204 μ mho/cm.25°C, many roots. Clear smooth boundary

- A2g: 13 - 27 cm, Grayish olive (5Y5/2) heavy clay (HC) with some humus, common distinct fine tubular brown (10YR4/6) mottles moderate medium subangular blocky structure, few fine pores, compact (20 mm), very plastic, very sticky, EC 264 μ mho/cm. 25°C common roots. Gradual smooth boundary
- B2g: 27 - 45 cm, Gray (5Y5/1) heavy clay (HC), common distinct fine tubular brown (10YR4/6) mottles, weak medium subangular blocky structure, common fine pores, slightly compact (16 mm), very plastic, very sticky, EC 255 μ mho/cm. 25°C, few roots. Clear smooth boundary
- IIC1g: 45 - 75 cm, Dark grayish yellow (2.5Y5/2) light clay (LC), few distinct cloudy yellowish brown (10YR5/6) mottles, weak coarse subangular blocky structure, few fine pores compact (21 mm), very plastic, very sticky, EC 250 μ mho/cm. 25°C. Clear smooth boundary
- IIC2g: 75 - 100 cm, Grayish yellow (2.6Y6/2) light clay (LiC), few distinct cloudy yellowish brown (10YR5/6) mottles, weak coarse subangular blocky structure, few fine pores, compact (21 mm), very plastic, very sticky

Profile No.8

Date of survey	:	12 June 1981
Location	:	Ban Bo Sang, Changwat Chiang Mai
Physiographic position	:	Low terrace, lower part
Surrounding land form	:	Flat to gently undulating
Land use	:	Paddy field
Parent material	:	Old alluvial deposits
Great soil group	:	Low Humic Gley Soils
Soil series	:	LP/Sai (San Sai Series)