TABLE A.2.3 MONTHLY TOTAL RAINFALL (1/5)
(BASIN RAINFALL)

at: W03
Basin Area 17.6 km2

(Unit : mm)

Hydrological Yea	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Total
1972	137.7	96.0	158.4	512.8	192.6	281.1	131.6	220.3	162.9	296.2	513.2	174.8	2877.5
1973	231.5	201.8	268.3	285.7	473.5	132.2	112.3	188.0	150.5	224.8	86.0	28.8	2383.5
1974	14.9	117.3	211.0	286.7	252.8	129.2	137.1	184.4	152.5	218.6	57.7	40.2	1802.4
1975	28.0	189.4	197.8	502.7	238.4	151.1	315.8	147.2	60.6			24.5	
1976	71.8	64.4	264.2		186.1	203.1		236.4		149.1	74.8	99.5	
1977	49.1	186.6	411.3	344.0	205.4	317.2	157.8	79.3	148.0	104.8	72.6	71.3	2147.3
1978	44.2	272.9	374.5	145.7	361.8	509.9	96.9	136.2	160.8	128.6	55.9	59.8	2347.2
1979	102.8	69.5	329.9	458.4	279.7	204.0	115.0	139.9	90.7	163.8	55.1	52.1	2060.8
1980	54.8	659.0	1177.8	447.8	598.1	321.0	185.6	94.6	142.8	68.8	104.0	98.8	3953.0
1981	69.7	68.6	257.8	87.6	241.7	626.7	69.3	72.5	138.8	121.1	115.1	84.9	1953.7
1982	91.1	225.4	255.2	1010.5	153.7	155.2	325.3	182.2	165.1	227.6	132.8	220.9	3145.1
1983	128.0	176.3	267.5	197.7	78.9	138.1	86.7	88.6	129.1	58.7	56.6	83.8	1489.8
1984	118.8	454.8	314.3	186.1	124.3	202.9	121.6	131.1	132.8	162.1	117.8	49.1	2115.8
1985	79.9	180.5	491.6	856.9	138.9	257.3	57.0	147.6	129.1	116.9	124.8	104.6	2684.9
1986	114.3	284.6	205.7	326.9	348.9	109.3	105.4	63.3	50.3	187.7	41.2	118.1	1955.7
Average	85.7	225.1	359.0	395.1	263.0	246.9	145.1	135.1	127.0	148.7	84.2	81.2	2296.0
Maximum	231.5	659.0	1177.8	1010.5	598.1	626.7	325.3	236.4	165.1	227.6	132.8	220.9	-
Minimum	14.9	64.4	197.8	87.6	78.9	109.3	57.0	63.3	50.3	58.7	41.2	24.5	-
Var.	52.2	156.0	240.8	260.3	137.6	147.6	81.7	49.3	35.4	53.7	30.0	47.9	635.4

Var. : Standard Deviation

TABLE A.2.3 MONTHLY TOTAL RAINFALL (2/5)
(BASIN RAINFALL)

at: W04
Basin Area 17.6 km2

(Unit : mm)

Hydrological Yea	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Total
1966	310.4	60.2	576.2	141.2	278.1	94.3	36.6	267.3	162.5	126.5	62.2	34.2	2149.6
1967	93.8	387.7	586.8	151.9	383.5	293.4	130.5	201.7	288.1	249.6	113.9	162.6	3043.6
1968	363.3	323.1	163.9	795.4	594.1	47.7	83.9	142.9	206.4	93.7	90.3	60.4	2964.9
1969	70.2	164.9	83.3	383.5	276.1	297.0	199.3	103.8	235.4	172.3	67.8	13.1	2066.8
1970	46.0	477.9	517.8	344.3	712.1	122.0	124.0	223.8	162.8	192.5	59.1	53.2	3035.5
1971	67.5	85.0	321.0					70.3	216.8	165.3	46.9	54.3	
1972	140.5	96.3	171.9	564.9	227.0	256.6	120.2	189.8	117.2	236.3	23.7	155.3	2299.5
1973	229.7	209.7	289.2	275.0	481.1	164.9	144.7	213.2	178.2	226.0	85.6	22.9	2520.2
1974	6.3	111.6	172.9	332.1	251.0	90.5	86.7	240.6	144.5	249.1	59.3	43.7	1788.3
1975	24.1	209.8	166.2	604.7	267.5	157.8	286.0	143.8	56.0	119.1	150.2	18.7	2204.1
1976	70.4	55.8	208.0	489.2	180.5	181.1	239.5	228.6	91.7	143.7	65.6	108.6	2062.8
1977	52.5	143.4	415.6	405.3	214.3	342.9	159.5	98.5	180.2	97.3	67.0	70.8	2247.3
1978	48.5	247.6	371.2	154.1	394.9	548.6	95.6	131.7	137.3	126.1	62.9	46.9	2365.5
1979	134.0	61.6	350.7	476.0	235.4	209.1	109.6	130.3	91.2	161.4	39.7	78.6	2077.7
1980	39.9	671.6	1189.8	386.2	620.3	355.1	190.7	94.3	150.3	62.2	98.6	114.5	3973.5
1981	71.4	78.4	232.0	81.9	215.3	681.8	72.8	67.7	124.1	110.4	121.0	68.1	1925.0
1982	75.8	260.1	258.1	1049.1	153.5	140.1	408.1	214.4	200.5	259.1	166.7	236.7	3422.3
1983	137.6	205.2	273.5	188.2	92.0	125.6	72.8	90.2	115.5	51.4	54.7	68.0	1474.6
1984	110.1	393.5	290.5	228.9	117.0	218.5	128.5	118.1	105.6	152.8	112.6	51.6	2027.6
1985	77.9	147.5	593.8	1007.4	213.3	241.6	75.9	163.6	158.9	124.7	129.6	105.1	3039.2
1986	141.8	362.1	239.9	367.8	390.1	132.6	151.0	72.3	60.5	213.3	29.2	126.4	2287.0
Average	110.1	226.3	355.8	421.4	314.8	235.1	145.8	152.7	151.6	158.7	81.3	80.6	2434.3
Maximum	363.3	671.6	1189.8	1049.1	712.1	681.8	408.1	267.3	288.1	259.1	166.7	236.7	-
Minimum	6.3	55.8	83.3	81.9	92.0	47.7	36.6	67.7	56.0	51.4	23.7	13.1	-
Var.	88.6	157.1	236.6	265.5	167.3	152.7	84.5	61.1	56.7	60.8	38.0	53.8	596.0

Var. : Standard Deviation

TABLE A.2.3 MONTHLY TOTAL RAINFALL (3/5)
(BASIN RAINFALL)

at: W05
Basin Area 20.7 km2

(Unit : mm)

Hydrological Yea	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Total
1966	266.3	99.9	462.6	179.0	323.2	103.1	44.7	257.5	154.2	127.9	84.1	32.7	2135.1
1967	80.8	333.5	585.4	151.1	407.2	321.6	119.2	162.7	269.2	206.8	108.9	213.4	2959.9
1968	236.5	365.9	131.7	806.7	576.6	48.1	108.3	126.8	202.1	84.0	109.2	69.5	2865.5
1969	102.5	162.3	99.6	367.2	244.7	316.6	211.6	109.6	239.2	179.2	74.1	21.6	2128.3
1970	65.6	537.0	596.9	292.4	725.8	92.8	138.2	231.3	134.6	165.0	67.1	52.7	3099.4
1971	59.3	72.3	325.8	520.4	136.8	312.7	194.8	65.7	185.0	138.9	34.2	48.8	2094.7
1972	151.5	80.3	242.6	584.6	253.4	277.9	159.9	246.0	162.8	377.1	37.6	202.5	2776.2
1973	226.3	162.6	291.4	266.2	474.7	131.1	137.6	238.2	155.9	241.6	97.2	24.8	2447.5
1974	15.8	139.1	303.4	308.7	300.8	92.4	158.8	154.8	170.1	233.7	66.6	51.1	1995.3
1975	41.8	135.6	184.8	687.0	245.3	160.4	244.0	143.3	101.9	124.8	153.1	29.0	2251.0
1976	69.9	78.6	250.3	516.4	189.4	233.0	281.6	245.0	84.4	170.3	54.1	138.7	2311.8
1977	73.7	276.9	466.7	366.8	141.5	309.3	170.0	74.9	178.4	83.7	75.5	62.7	2280.2
1978	57.5	330.2	382.3	136.7	361.8	643.4	93.9	137.1	173.3	136.3	85.5	37.4	2575.5
1979	136.7	92.2	384.8	516.2	229.1	185.9	100.1	119.7	85.4	191.1	48.0	76.5	2165.6
1980	88.0	770.2	1342.6	357.7	776.4	458.6	192.1	100.7	138.1	66.3	106.4	122.3	4519.3
1981	137.1	88.3	225.0	102.2	276.4	750.1	89.3	70.3	121.2	107.5	114.7	71.2	2153.4
1982	114.6	251.9	394.9	1052.0	195.7	133.6	391.7	189.9	186.7	278.2	205.7	228.1	3623.1
1983	169.5	236.8	316.7	194.5	96.5	153.3	88.0	91.2	134.5	69.8	62.7	89.7	1703.3
1984	111.3	375.1	276.9	223.6	117.6	197.2	132.5	107.7	97.6	149.1	125.8	56.7	1970.8
1985	89.0	148.0	631.7	1094.0	207.1	239.2	79.7	192.1	184.8	126.2	126.6	110.4	3228.9
1986	150.5	378.0	166.9	377.8	348.8	165.7	203.4	86.4	68.4	211.9	36.8	133.1	2327.7
Average	116.4	243.6	383.9	433.4	315.6	253.6	159.0	150.0	153.7	165.2	89.2	89.2	2553.0
Maximum	266.3	770.2	1342.6	1094.0	776.4	750.1	391.7	257.5	269.2	377.1	205.7	228.1	-
Minimum	15.8	72.3	99.6	102.2	96.5	48.1	44.7	65.7	68.4	66.3	34.2	21.6	-
Var.	64.4	172.7	259.0	275.3	182.6	174.2	77.6	62.4	49.8	73.9	41.2	61.2	640.4

Var. : Standard Deviation

TABLE A.2.3 MONTHLY TOTAL RAINFALL (4/5)
(BASIN RAINFALL)

at: W08
Basin Area 8.3 km2

(Unit : mm)

Hydrological Yea	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Total
1966	224.8	102.2	422.3	168.0	306.1	91.7	44.4	236.7	149.5	115.6	77.3	31.8	1970.4
1967	73.9	285.8	571.0	148.1	476.3	287.1	137.0	161.3	259.1	176.8	106.7	191.0	2874.0
1968	223.9	339.1	106.8	794.3	565.2	58.0	113.3	113.8	186.6	81.0	112.0	61.7	2755.6
1969	104.0	148.5	110.9	342.6	228.1	334.0	208.7	101.9	221.4	165.5	67.1	13.7	2046.2
1970	70.6	538.0	622.9	274.1	739.1	91.2	118.6	205.2	125.3	125.2	72.5	48.0	3030.9
1971	58.8	73.9	331.1	515.7	131.1	317.4	215.3	62.1	174.9	130.3	29.5	46.5	2086.5
1972	158.0	115.8	399.0	587.2	266.4	281.3	162.1	248.5	161.5	408.8	37.1	198.5	3024.4
1973	213.7	156.1	300.2	277.4	461.1	124.5	152.4	213.9	123.7	220.6	84.8	27.8	2356.2
1974	15.4	133.5	506.3	274.4	455.4	220.9	198.3	180.9	265.5	258.2	102.2	154.1	2764.9
1975	146.5	311.1	167.5	660.5	299.5	140.6	235.0	133.1	90.3	125.1	156.2	31.1	2496.5
1976	76.7	103.5	236.1	440.9	184.8	227.5	284.1	216.9	85.3	179.5	60.6	147.7	2243.6
1977	75.2	290.4	474.9	360.9	140.8	302.6	181.2	70.7	178.3	81.4	70.9	60.1	2287.5
1978	57.2	286.1	351.0	116.2	324.2	619.8	70.4	140.3	191.8	129.8	72.5	41.8	2401.1
1979	102.2	93.3	370.6	452.6	190.9	164.7	111.3	123.4	85.6	190.1	47.4	61.0	1993.1
1980	104.6	759.1	1368.9	298.5	701.3	383.9	159.4	96.4	110.6	53.7	86.1	111.6	4234.2
1981	99.3	87.2	170.8	101.1	288.5	716.8	94.7	73.9	114.4	103.5	102.8	82.8	2036.0
1982	128.3	282.2	273.8	1056.4	173.9	120.9	366.0	175.6	177.7	247.0	201.3	226.4	3429.5
1983	177.9	228.9	309.4	190.1	95.1	127.9	83.3	71.1	124.0	59.2	53.6	98.7	1619.1
1984	69.1	445.6	313.9	256.4	116.0	175.3	105.5	95.4	95.5	140.5	145.5	53.8	2012.6
1985	105.5	172.1	653.8	1050.0	205.2	194.0	74.8	168.1	161.3	107.3	117.0	96.8	3105.9
1986	119.9	366.9	159.4	364.1	328.2	120.5	201.6	73.5	64.5	187.2	36.3	107.7	2129.8
Average	114.6	253.3	391.5	415.7	318.0	242.9	158.0	141.1	149.8	156.5	87.6	90.1	2519.0
Maximum	224.8	759.1	1368.9	1056.4	739.1	716.8	366.0	248.5	265.5	408.8	201.3	226.4	-
Minimum	15.4	73.9	106.8	101.1	95.1	58.0	44.4	62.1	64.5	53.7	29.5	13.7	-
Var.	56.3	168.1	268.0	270.7	180.8	164.6	75.9	58.4	54.7	79.1	41.7	59.9	597.0

Var. : Standard Deviation

TABLE A.2.3 MONTHLY TOTAL RAINFALL (5/5)

(BASIN RAINFALL)

at: W10

Basin Area 13.2 km2

(Unit : mm)

Hydrological Yea	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Total
1966	174.5	107.0	385.4	158.1	319.4	106.8	29.4	179.2	141.3	107.9	94.0	31.3	1834.2
1967	80.2	321.3		139.4	493.8	299.2	108.0	152.8	225.7	165.4	105.1	162.5	2253.3
1968	228.5	347.1	82.2	878.1	519.8	64.0	99.1	98.0	174.4	83.2	112.3	72.9	2759.7
1969	110.7	147.8	116.7	231.6	269.2	325.9	211.2	103.5	224.1	159.7	58.1	16.1	1974.6
1970	67.9	615.9	591.8	315.9	702.3	131.5	111.1	182.1	119.3	155.2	74.2	54.5	3121.7
1971	62.5	90.7	403.5	486.8	127.9	325.7	208.0	55.8	178.2	127.2	34.2	48.0	2148.5
1972	175.6	66.6	308.4	598.9	262.6	300.0	175.8	284.2	163.5	366.1	38.9	196.1	2936.6
1973	194.6	178.9	320.4	283.9	487.1	118.8	179.5	190.2	140.5	247.4	76.8	40.9	2458.8
1974	17.3	149.0											166.2
1975			148.7	614.9	280.3	169.7	220.5	135.8	119.5	116.6	157.3	42.7	2006.0
1976	97.2	112.1	277.6	428.8	202.4	208.5	322.3	213.7	80.8	181.5	67.6	123.4	2316.1
1977	84.9	253.7	493.1	361.9	115.1	326.2	180.2	90.0	158.7	76.5	72.1	73.5	2285.7
1978	63.9	262.1	391.2	90.9	323.9	522.5	65.2	147.4	192.5	139.9	84.7	48.3	2332.3
1979	98.2	133.7	311.7	475.4	199.2	174.3	141.7	121.9	91.1	191.5	46.3	38.4	2023.2
1980	143.6	835.6	1357.2	262.5	832.9	347.6	204.0	91.8	127.6	62.5	96.5	103.1	4464.9
1981	80.0	85.7	159.3	117.9	310.4	636.4	94.9	69.8	107.1	112.0	114.3	103.9	1991.7
1982	140.6	291.7	273.5	1213.7	183.2	102.1	396.9	157.6	174.8	202.0	192.0	207.0	3535.0
1983	203.3	198.5	300.5	169.0	103.6	117.2	80.0	69.6	115.9	66.0	55.4	101.6	1580.6
1984	127.8	478.7	307.8	268.0	145.7	177.2	104.4	112.0	104.9	140.4	130.0	61.0	2157.8
1985	105.0	166.8	580.0	1019.9	237.4	181.4	78.0	173.0	157.5	135.2	129.0	112.4	3075.7
1986	116.6	394.1	173.5	354.9	320.8	126.0	217.4	61.3	57.4	225.4	35.0	122.6	2204.8
Average	118.6	261.8	367.5	423.5	321.8	238.0	161.4	134.5	142.7	153.1	88.7	88.0	2499.8
Maximum	228.5	835.6	1357.2	1213.7	832.9	636.4	396.9	284.2	225.7	366.1	192.0	207.0	-
Minimum	17.3	66.6	82.2	90.9	103.6	64.0	29.4	55.8	57.4	62.5	34.2	16.1	-
Var.	53.3	192.1	271.4	300.6	190.4	144.5	87.4	57.1	44.0	69.8	41.0	52.8	809.3

Var. : Standard Deviation

TABLE A.2.4 ONE-DAY MAXIMUM RAINFALL IN/AROUND GRNW BASIN

(Unit : mm)

	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
1 Beau Bois	274.3	365.8	143.9	183.8	87.5	139.9	216.4	279.8	228.6	61.0	-	101.8	147.5	167.6	153.9	-	186.5	403.9	76.2	276.5	211.6	126.0	480.1
2 Bagatelle (M)	157.6	237.7	89.3	178.9	80.2	196.0	152.4	115.8	128.0	29.3	-	97.5	115.8	94.5	128.0	-	79.9	219.5	62.5	152.4	156.2	71.1	264.2
3 *Mon Desert*	260.0	396.2	115.2	216.4	79.9	188.7	168.2	247.5	204.5	341.7	-	98.5	115.2	169.8	130.8	-	169.2	253.9	84.7	176.8	239.5	104.1	393.7
4 Minissy (M)	246.9	442.0	87.5	201.5	79.2	171.6	162.5	191.4	164.9	36.0	-	104.2	131.7	125.3	128.6	-	128.9	297.2	75.6	359.1	198.1	77.5	318.8
5 Bega	175.3	342.3	204.8	202.4	95.7	242.0	76.2	160.9	207.3	83.8	461.8	119.8	158.5	181.4	144.8	264.0	118.9	256.0	67.1	342.9	171.7	162.8	355.6
6 Reduit (Exper.St.)	148.4	398.4	214.9	174.3	92.7	158.5	150.0	182.9	136.9	76.8	559.6	124.7	96.0	117.7	130.8	264.0	119.5	298.7	68.6	-	188.1	168.9	334.3
7 Minissy (H)	283.2	332.8	256.0	185.9	78.3	141.7	95.4	228.9	161.2	73.2	560.5	101.8	99.1	170.4	144.2	-	144.5	358.4	84.1	298.7	159.3	131.3	408.9
8 Alma	297.5	274.9	118.9	195.1	102.1	160.0	205.7	259.1	219.5	52.7	-	120.4	206.7	171.3	121.9	-	236.2	291.1	123.7	243.8	237.2	142.2	436.1
9 Ebene	185.9	235.0	203.3	146.3	86.9	146.3	67.4	160.6	189.0	70.4	561.4	111.9	131.1	167.6	122.8	259.1	106.7	233.2	61.9	320.0	143.5	144.3	328.7
10 Cote d'Or	342.9	283.5	304.8	216.4	113.4	187.8	70.4	159.7	175.3	130.1	554.7	96.3	110.3	143.3	113.4	292.6	154.8	283.5	94.5	226.8	284.7	144.8	360.2
11 Bagatelle (H)	307.8	320.0	341.4	191.4	137.2	130.8	77.1	157.0	171.3	69.5	560.5	97.5	96.0	183.2	110.0	274.3	126.5	309.1	90.8	249.9	213.4	148.6	416.6
12 Valetta	344.4	219.5	129.5	188.7	153.3	199.0	166.7	214.9	187.5	52.4	-	137.2	200.3	201.2	166.1	-	203.6	410.0	113.7	250.9	192.0	125.0	356.6
13 Trianon	192.0	289.6	229.8	119.5	91.1	146.9	178.3	152.4	96.6	73.8	548.6	98.1	103.6	198.1	123.4	292.6	128.0	266.7	56.4	-	-	-	-
13'Phoenix	234.7	182.9	245.4	145.7	86.9	123.4	217.6	219.5	175.6	21.3	413.9	123.4	98.1	190.5	106.1	228.6	138.7	285.6	61.0	184.4	172.2	-	-
14 Highlands	242.0	304.8	261.5	181.7	96.9	190.5	51.8	177.4	185.9	86.0	353.6	147.8	117.3	-	131.7	-	135.3	309.1	86.3	264.3	196.6	163.8	355.6
15 Hermitage	306.9	383.4	258.5	196.0	135.6	240.8	88.1	170.7	189.0	174.7	451.1	107.3	121.9	176.8	136.2	225.6	178.3	248.1	102.1	275.2	191.0	144.8	368.3
16 Vacoas	139.4	226.0	214.0	125.6	78.9	133.0	207.1	146.2	103.7	67.3	455.9	128.7	93.9	191.5	90.2	289.0	139.2	210.8	66.7	207.3	190.1	88.4	256.8
17 Wooton	289.0	286.5	253.0	167.6	100.6	195.1	137.8	184.1	157.3	115.8	-	139.0	140.8	198.1	143.9	328.6	226.5	310.9	121.3	-	304.8	170.7	491.0
18 Curpipe (Exper.St.)				159.0	107.0	148.0	197.4	161.2	149.2	96.6	-	131.3	130.8	162.0	87.5	195.3	204.4	271.5	76.5	-	150.2	180.5	-
18'Curpipe Garden	225.0	305.0	300.0	150.0	108.0	100.0	-	185.0	112.0	90.0	-	123.0	85.0	210.0	130.5	280.0	-	-	-	-	-	-	-
19 Bellerive	339.2	365.8	343.2	196.0	136.6	223.4	160.3	217.3	192.6	163.4	417.3	135.6	117.3	245.7	178.3	-	190.9	402.0	100.8	270.9	193.8	144.1	397.6
20 Reunion	272.8	245.7	329.2	128.9	121.0	184.4	224.6	207.3	176.8	121.6	320.0	173.1	130.5	243.8	137.2	224.0	192.0	292.6	88.4	318.5	225.6	193.0	0.0
MAXIMUM POINT RAINFALL	344.4	442.0	343.2	216.4	153.3	242.0	224.6	279.8	228.6	341.7	561.4	173.1	206.7	245.7	178.3	328.6	236.2	410.0	123.7	359.1	304.8	193.0	491.0

Ref : Maximum point rainfalls extracted from existing daily rainfall data

TABLE A.2.5 TWO-DAY MAXIMUM RAINFALL IN/AROUND GRNW BASIN

(Unit : mm)

	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
1 Beau Bois	336.8	381.9	161.8	290.5	114.9	230.1	301.8	342.3	291.1	62.2	609.6	176.8	188.1	316.7	188.7	429.2	278.9	454.8	116.1	420.9	327.2	183.9	664.3
2 Bagatelle (M)	173.4	237.7	121.6	210.3	86.6	206.7	183.2	154.2	166.4	35.4	530.4	162.8	143.9	153.3	144.8	272.5	126.5	281.9	85.3	295.7	273.0	140.2	403.9
3 Mon Desert	303.3	405.4	143.6	296.9	96.9	221.3	253.9	372.2	287.4	563.0	565.1	161.8	178.3	206.3	171.9	522.4	230.1	320.3	96.0	331.6	410.4	185.1	501.7
4 Minissy (M)	275.2	443.8	125.0	255.4	97.5	193.9	219.5	229.2	232.9	48.2	515.1	148.4	164.6	201.5	139.6	428.5	192.3	335.6	107.6	495.3	349.2	143.5	504.2
5 Bega	194.2	513.3	374.0	274.6	100.6	249.6	105.2	202.1	259.1	122.8	501.4	186.8	192.0	300.2	163.1	335.3	172.2	321.0	80.5	347.5	321.6	243.8	570.5
6 Reduit (Exper.St.)	191.1	399.6	391.7	204.2	110.6	166.7	256.3	214.6	216.1	117.7	616.0	184.7	148.1	188.1	151.5	299.0	163.1	352.0	75.3	349.9	356.0	248.7	642.4
7 Minissy (H)	317.9	588.9	437.7	247.8	109.1	162.5	100.6	271.9	215.5	120.7	620.6	182.0	141.7	255.7	150.3	395.9	226.2	504.4	97.2	365.8	302.3	191.8	597.9
8 Alma	340.2	442.6	122.8	297.2	141.7	199.6	302.7	320.6	288.0	70.4	687.3	233.5	206.7	259.7	149.4	406.0	391.7	399.9	146.6	341.4	393.7	213.8	615.2
9 Ebene	205.1	352.7	380.7	179.2	93.3	164.6	82.6	193.5	236.2	115.2	610.2	175.3	176.8	268.5	138.7	315.5	162.2	287.1	73.5	327.7	279.4	212.9	526.8
10 Cote d'Or	379.5	545.6	557.8	297.2	148.4	193.2	84.7	195.1	278.9	143.3	556.3	184.7	175.6	213.7	151.8	414.5	270.7	338.9	108.5	311.8	495.0	224.0	533.9
11 Bagatelle (H)	336.8	556.3	546.5	244.8	150.0	162.8	108.2	194.5	240.2	109.1	613.9	186.5	137.8	266.4	133.2	378.3	217.9	462.4	108.5	313.9	368.8	193.8	615.2
12 Valetta	381.3	410.0	136.6	299.9	159.7	240.2	254.2	261.5	261.8	56.1	640.1	260.3	226.8	289.0	202.1	410.3	337.7	431.3	149.7	380.7	347.2	197.9	519.9
13 Trianon	209.7	341.4	290.8	175.3	99.1	166.7	228.6	174.7	127.1	98.5	549.6	169.2	159.4	216.4	134.4	292.6	169.2	291.1	67.1				
13'Phoenix	253.0	324.0	408.4	193.2	98.5	144.8	253.0	240.2	222.5	25.0	473.4	147.2	143.9	251.5	121.0	326.1	214.9	374.9	76.8	367.3	326.7		
14 Highlands	296.6	552.6	521.2	203.9	110.9	196.6	71.6	204.2	256.0	118.6	399.9	183.8	146.0	246.9	145.7	381.3	205.4	344.7	113.1	387.1	351.3	227.3	537.2
15 Hermitage	351.1	624.8	481.6	310.9	175.9	286.5	100.3	238.4	282.5	190.5	513.6	214.0	206.7	285.3	162.2	321.0	298.1	390.8	126.5	379.5	366.3	223.3	505.2
16 Vacoas	220.2	363.0	420.6	146.4	86.9	183.5	314.3	170.2	187.4	81.9	530.1	160.3	128.8	255.7	111.8	294.5	216.0	251.8	75.4	363.8	282.5	114.6	495.3
17 Wooton	345.9	504.4	435.9	246.9	178.3	235.6	210.9	258.2	225.6	141.7	518.2	203.9	210.6	299.3	180.7	369.1	314.9	490.7	135.3	433.4	436.2	263.3	742.5
18 Curpipe (Exper.St.)	-	-	-	190.2	155.3	215.0	362.2	219.4	202.6	137.8	655.3	177.4	169.2	248.0	126.5	277.7	221.1	451.9	100.7	-	288.2	183.0	450.5
18'Curpipe Garden	333.0	380.0	450.0	215.0	143.0	180.0	350.0	221.0	198.0	110.3	-	156.0	120.0	265.0	183.5	280.0	-	-	-	-	-	-	-
19 Bellerive	411.8	543.2	570.3	279.5	191.1	274.6	319.7	246.0	285.6	204.5	417.3	210.9	199.9	308.8	282.5	353.9	304.4	492.5	131.2	386.6	383.8	216.4	621.0
20 Reunion	292.0	399.6	470.9	165.5	133.2	245.1	406.3	254.5	248.4	136.2	330.7	220.7	182.9	371.9	200.3	334.7	216.4	335.3	104.5	318.5	349.0	193.0	-
MAXIMUM POINT RAINFALL	411.8	624.8	570.3	310.9	191.1	286.5	406.3	372.2	291.1	563.0	687.3	260.3	226.8	371.9	282.5	522.4	391.7	504.4	149.7	495.3	495.0	263.3	742.5

Ref : Maximum point rainfalls extracted from existing daily rainfall data

TABLE A.2.6 THREE-DAY MAXIMUM RAINFALL IN/AROUND GRNW BASIN

(Unit : mm)

	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
1 Beau Bois	359.1	394.7	220.4	418.5	142.3	298.4	338.3	358.1	379.8	64.0	609.6	179.2	288.0	365.2	254.2	604.4	327.7	563.3	119.8	452.3	375.2	188.7	682.1
2 Bagatelle (M)	185.6	241.7	122.2	275.2	95.4	227.4	187.5	170.7	243.2	35.4	530.4	162.8	171.3	189.9	193.9	391.4	146.3	310.9	98.5	309.4	323.0	141.5	418.6
3 Mon Desert	328.9	412.4	226.5	407.8	112.5	267.0	301.4	459.9	356.3	581.9	565.1	162.8	263.7	234.1	212.4	687.0	263.7	395.6	105.5	381.9	477.5	187.6	522.0
4 Minissy (M)	280.4	449.0	126.8	297.8	118.0	226.5	249.6	239.0	318.2	48.2	515.1	148.4	220.1	247.2	192.9	568.8	223.7	420.6	118.6	515.4	405.1	146.0	522.0
5 Bega	204.2	515.7	382.2	332.5	100.6	283.8	105.2	215.8	332.2	168.6	518.8	186.8	222.5	318.2	196.6	446.5	188.1	343.2	99.4	358.7	366.1	246.9	580.7
6 Reduit (Exper.St.)	215.2	404.2	406.9	242.6	111.9	190.2	282.9	227.7	289.9	152.4	616.9	185.3	181.7	211.2	177.1	424.6	179.5	383.4	85.0	362.4	410.0	249.6	653.8
7 Minissy (H)	327.7	600.5	453.8	320.6	126.2	230.1	105.8	282.2	283.2	121.6	620.6	182.0	214.9	290.8	210.6	549.9	260.0	575.2	107.6	386.2	337.4	196.4	644.6
8 Alma	361.5	467.6	171.9	396.8	179.8	288.0	341.4	352.0	387.7	73.2	687.3	236.5	369.7	317.6	210.3	550.2	488.3	517.2	166.7	390.1	448.3	217.6	639.3
9 Ebene	208.2	359.1	397.5	232.6	98.8	176.5	86.3	204.8	297.2	144.8	620.3	192.3	208.5	274.9	166.1	434.3	183.5	317.6	84.1	333.8	318.3	214.4	537.0
10 Cote d'Or	390.1	559.3	580.6	391.7	191.1	263.3	111.9	222.8	348.1	153.0	556.3	184.7	246.6	273.1	220.4	564.5	351.1	404.5	121.0	338.9	571.5	224.0	550.7
11 Bagatelle (H)	343.5	569.1	571.2	311.8	159.4	216.4	119.5	226.8	302.7	131.1	617.5	187.5	199.6	286.2	177.4	546.8	269.7	528.2	118.3	345.9	423.2	195.8	671.1
12 Valetta	402.6	430.1	192.9	381.9	161.5	345.6	302.7	296.3	381.3	59.4	640.1	260.3	287.7	325.5	313.3	519.1	420.0	470.0	160.0	405.4	399.3	202.2	553.7
13 Trianon	213.4	345.9	309.1	226.8	108.5	182.9	264.9	208.8	129.8	117.7	549.6	169.2	173.7	221.0	163.7	344.4	188.7	336.8	76.5	-	-	-	-
13'Phoenix	262.1	332.5	431.3	248.7	106.7	210.3	262.7	278.3	302.7	26.5	476.4	188.4	206.0	274.0	157.0	446.5	260.6	428.2	88.7	379.5	365.5	-	-
14 Highlands	339.5	564.8	551.1	243.2	127.1	236.2	89.9	227.7	313.6	140.8	399.9	184.7	193.2	267.0	185.3	518.8	235.0	406.6	131.4	407.2	403.9	227.3	571.2
15 Hermitage	377.0	644.7	514.5	327.1	185.9	353.6	126.5	251.5	380.1	210.9	515.7	214.0	279.2	306.6	212.4	378.9	368.2	476.7	143.9	404.2	418.1	224.3	579.4
16 Vacoas	231.2	377.2	451.3	192.7	102.8	217.4	362.7	187.0	227.6	122.9	532.2	162.4	174.4	278.5	181.7	361.1	275.8	290.8	81.1	385.6	321.0	153.9	505.4
17 Wooton	381.0	541.0	475.5	289.3	199.9	317.6	265.8	261.5	342.3	183.2	518.2	207.6	210.9	326.7	235.3	549.6	446.5	574.5	156.1	446.5	492.6	318.8	868.1
18 Curpipe (Exper.St.)				234.7	171.3	278.0	444.6	220.8	286.4	160.8	749.8	187.1	187.2	279.0	178.7	393.2	253.2	542.1	123.2	422.5	348.7	205.2	-
18'Curpipe Garden	353.0	405.0	460.0	275.0	159.5	252.0	423.5	226.0	298.0	161.0	-	216.0	178.0	295.0	238.5	389.0	-	-	-	-	-	-	-
19 Bellerive	458.4	572.1	605.6	285.6	213.4	341.1	395.9	315.8	420.3	216.7	483.1	214.6	256.0	331.6	321.0	522.7	401.7	645.6	138.0	418.4	441.5	238.6	693.5
20 Reunion	304.2	416.4	489.2	195.1	194.2	331.9	503.2	266.4	319.1	162.5	330.7	221.3	248.4	396.2	300.8	506.0	276.1	335.3	128.6	325.2	394.7	221.4	
MAXIMUM POINT RAINFALL	458.4	644.7	605.6	418.5	213.4	353.6	503.2	459.9	420.3	581.9	749.8	260.3	369.7	396.2	321.0	687.0	488.3	645.6	166.7	515.4	571.5	318.8	868.1

Ref : Maximum point rainfalls extracted from existing daily rainfall data

TABLE A.2.7 PROBABLE ONE-DAY RAINFALL

Unit : mm

Return Year	Gumbel	Pearson III	Harzen	Log-Normal (IWAI)	Maximum
10000	1168	1147	1053	1140	1168
1000	935	894	842	890	935
200	771	729	700	728	771
100	701	661	642	661	701
50	630	594	581	594	630
20	536	505	501	507	536
10	463	440	438	440	463
5	387	371	374	371	387
2	272	268	271	268	272

PROBABLE TWO-DAY RAINFALL

Unit : mm

Return Year	Gumbel	Pearson III	Harzen	Log-Normal (IWAI)	Maximum
10000	1674	1799	1208	1397	1799
1000	1339	1381	1032	1165	1381
200	1104	1114	894	985	1114
100	1003	1003	845	906	1003
50	901	895	781	827	901
20	765	751	696	718	765
10	661	647	619	631	661
5	551	538	541	538	551
2	386	378	398	388	398

PROBABLE THREE-DAY RAINFALL

Unit : mm

Return Year	Gumbel	Pearson III	Harzen	Log-Normal (IWAI)	Maximum
10000	1849	1999	1273	1360	1999
1000	1486	1551	1110	1189	1551
200	1231	1260	973	1037	1260
100	1122	1140	930	969	1140
50	1011	1021	867	898	1021
20	864	863	783	798	864
10	751	748	703	715	751
5	632	626	623	622	632
2	454	446	470	464	470

TABLE A.2.8 DEW POINT TEMPERATURE

Cyclone GERVAISE Unit : °C

Time	VACOAS			PLAISANCE		
	5/Feb.	6/Feb.	7/Feb.	5/Feb.	6/Feb.	7/Feb.
00	20.4	22.2	21.9	22	24.6	21.8
01				22.1	24.6	22.5
02				23.1	24.8	23.9
03		22.6		24.4	24.7	23.3
04		22.5		25	24.4	23.3
05		21.9		24.6	24.6	23.3
06	23	21.6	22.7	24.6	24.6	22.3
07		21.7		24.3	24.3	23.1
08		21.7		23.8	24.2	22.8
09	21.4	21.9	22.9	24.3	24.7	23
10		21.8		24.2	24.5	23.5
11		21.8		24.8	24.5	24
12	21.9	21.9	23.1	24.9	24.5	24.1
13		21.6		25.8	24.1	23.1
14		21.7		24.8	23.9	22.9
15		22.6		24.6	24.4	22.7
16		23		24.7	24.9	22.8
17		23.2		24.6	24.7	23.3
18	22	23	22.4	24.2	24.7	23.2
19		22.3		23.9	23.8	22.9
20		22		23.7	23.7	22.8
21				24.2	23.4	22.7
22					22.5	22.8
23					22	

TABLE A.3.1 MONTHLY MEAN DISCHARGE (1/6)

Station :W03
River :The Plaines Wilhems River (Unit : m^3/s)

Hydrological Year	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul	Aug.	Sep.	Oct.	Annual Average
1972			0.28	0.34	0.36	0.34	0.37	0.37	0.33	0.29	0.29	0.37	
1973	0.79	0.40	0.44	0.37	1.48	0.38	0.37	0.37	0.38	0.39	0.41	0.34	0.51
1974	0.15	0.17	0.19	0.35	0.38	0.37	0.34	0.37	0.35	0.31	0.37	0.23	0.30
1975	0.16	0.21	0.23	0.27	0.48	0.35	0.57	0.32	0.23	0.34	0.34	0.27	0.31
1976	0.21	0.19	0.15	0.52	0.29	0.36	0.24	0.90	0.28	0.29	0.29	0.28	0.33
1977	0.19	0.19	0.22	0.28	0.30	0.32	0.28	0.28	0.26	0.14	0.14	0.14	0.23
1978	0.10	0.24	1.32	0.14	0.09	0.43	0.17	0.18	0.16	0.16	0.16	0.14	0.27
1979	0.08	0.12	0.31	0.20	0.68	0.22	0.19	0.21	0.21	0.26	0.12	0.14	0.23
1980	0.11	0.97	12.10	1.31	3.01	1.90	0.43	0.19	0.31	0.27	0.23	0.23	1.75
1981	0.18	0.12	0.14	0.18	0.21	0.47	0.23	0.24	0.25	0.22	0.25	0.21	0.23
1982	0.20	0.24	0.26	6.03	0.33	0.26	0.85	0.30	0.54	0.40	0.26	0.27	0.83
1983	0.28	0.62	0.41	0.23	0.21	0.21	0.20	0.18	0.22	0.14	0.09	0.07	0.24
1984	0.13	3.05	0.30	0.29	0.24	0.14	0.13	0.14	0.15	0.17	0.18	0.16	0.42
1985	0.12	0.22	0.72	5.97	0.25	0.47	0.24	0.25	0.25	0.23	0.22	0.25	0.76
1986	0.19	1.14	0.30	0.31	0.32	0.30	0.25	0.23	0.16	0.21	0.15	0.18	0.31
Average	0.21	0.56	1.22	1.17	0.59	0.44	0.32	0.30	0.27	0.25	0.23	0.21	0.48
Maximum	0.79	3.05	12.10	6.03	3.01	1.90	0.85	0.90	0.54	0.40	0.41	0.34	1.75
Minimum	0.08	0.12	0.14	0.14	0.09	0.14	0.13	0.14	0.15	0.14	0.09	0.07	0.23
Var.	0.17	0.76	3.03	1.99	0.75	0.41	0.18	0.18	0.10	0.08	0.09	0.07	0.40

Var. : Standard Deviation

TABLE A.3.1 MONTHLY MEAN DISCHARGE (2/6)

Station :W04
River :The Terre Rouge River (Unit : m^3/s)

Hydrological Year	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul	Aug.	Sep.	Oct.	Annual Average
1966			0.67	0.39	0.67	0.15	0.09	0.49	0.18	0.17	0.07	0.09	
1967	0.07	0.61	0.95	0.28	0.99	0.67	0.23	0.66	0.68	0.63	0.13	0.14	0.50
1968	1.04	0.93	0.36	2.50	2.20	0.25	0.19	0.18	0.26	0.15	0.08	0.07	0.68
1969	0.07	0.08	0.07	0.48	0.30	0.98	0.23	0.39	0.55	0.44	0.09	0.07	0.31
1970	0.08	0.46	3.22	1.78	3.41	0.56	0.29	0.44	0.41	0.40	0.09	0.09	0.94
1971	0.07	0.07	0.32	0.46	0.26	0.94	0.44	0.14	0.76	0.17	0.10	0.17	0.33
1972	0.09	0.09	0.16	0.98	0.24	0.42	0.24	0.27	0.35	1.15	0.16	0.15	0.36
1973	0.68	0.28	0.88	0.42	1.39	0.30	0.21	0.30	0.49	0.61	0.32	0.09	0.50
1974	0.08	0.08	0.08	0.13	0.22	0.12	0.10	0.16	0.28	0.95	0.11	0.18	0.21
1975	0.14	0.21	0.19	0.67	0.47	0.31	1.09	0.44	0.12	0.09	0.31	0.12	0.35
1976	0.08	0.14	0.16	1.01	0.22	0.52	0.90	0.99	0.12	0.17	0.09	0.09	0.37
1977	0.09	0.10	0.34	0.60	0.38	0.42	0.20	0.16	0.11	0.10	0.09	0.07	0.22
1978	0.11	0.29	1.39	0.10	0.31	1.77	0.25	0.18	0.15	0.13	0.08	0.15	0.41
1979	0.11	0.15	0.50	0.46	1.03	0.43	0.14	0.13	0.09	0.59	0.07	0.11	0.32
1980	0.10	2.36	8.59	1.52	2.06	1.34	0.36	0.21	0.22	0.11	0.14	0.08	1.42
1981	0.08	0.10	0.08	0.10	0.10	1.39	0.21	0.16	0.10	0.12	0.10	0.12	0.22
1982	0.09	0.08	0.15	4.99	0.40	0.24	1.21	0.55	0.82	0.88	0.27	0.34	0.83
1983	0.28	0.68	0.59	0.25	0.16	0.15	0.20	0.13	0.19	0.11	0.09	0.07	0.24
1984	0.09	1.91	1.26	0.28	0.17	0.17	0.15	0.11	0.12	0.17	0.13	0.09	0.39
1985	0.08	0.22	1.33	4.36	0.83	0.66	0.18	0.21	0.29	0.12	0.11	0.13	0.71
1986	0.17	1.59	0.34	0.66	0.88	0.42	0.20	0.14	0.16	0.27	0.12	0.13	0.42
Average	0.18	0.52	1.03	1.07	0.79	0.58	0.34	0.31	0.31	0.36	0.13	0.12	0.48
Maximum	1.04	2.36	8.59	4.99	3.41	1.77	1.21	0.99	0.82	1.15	0.32	0.34	1.42
Minimum	0.07	0.07	0.07	0.10	0.10	0.12	0.09	0.11	0.09	0.09	0.07	0.07	0.21
Var.	0.24	0.65	1.83	1.31	0.83	0.45	0.31	0.22	0.22	0.31	0.07	0.06	0.29

Var. : Standard Deviation

TABLE A.3.1 MONTHLY MEAN DISCHARGE (3/6)

Station :W05
River :The Cascade River (Unit : m^3/s)

Hydrological Year	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul	Aug.	Sep.	Oct.	Annual Average
1966			0.67	0.47	0.45	0.19	0.12	0.57	0.21	0.37	0.15	0.12	
1967	0.09	0.46	1.02	0.26	1.27	1.15	0.35	0.46	1.08	1.01	0.48	0.44	0.67
1968	0.92	1.09	0.31	3.47	2.65	0.38	0.26	0.29	0.59	0.46	0.22	0.20	0.90
1969	0.19	0.17	0.14	0.48	0.47	1.30	0.47	0.51	0.95	0.52	0.25	0.15	0.47
1970	0.15	0.65	3.24	1.78	4.22	0.63	0.35	0.97	0.30	0.47	0.16	0.16	1.09
1971	0.15	0.15	0.16	0.68	0.23	1.23	0.67	0.48	0.48	0.21	0.16	0.15	0.40
1972	0.21	0.15	0.18	1.31	0.45	1.01	0.42	0.83	0.77	1.52	0.35	0.31	0.63
1973	0.53	0.47	0.76	0.52	1.18	0.51	0.32	0.89	0.71	1.06	0.84	0.42	0.68
1974	0.32	0.21	0.24	0.52	0.55	0.35	0.26	0.49	0.61	1.19	0.43	0.28	0.45
1975	0.26	0.30	0.20	1.05	0.83	0.51	1.33	0.73	0.52	0.44	0.45	0.31	0.58
1976	0.20	0.16	0.13	0.98	0.47	1.24	1.48	1.27	0.52	0.58	0.35	0.33	0.64
1977	0.29	0.39	1.21	0.92	0.44	0.84	0.60	0.39	0.48	0.40	0.28	0.19	0.54
1978	0.17	0.35	1.61	0.36	0.71	2.33	0.74	0.57	0.70	0.52	0.39	0.24	0.72
1979	0.22	0.17	0.56	1.27	1.61	0.71	0.42	0.39	0.33	0.68	0.24	0.20	0.57
1980	0.17	3.08	8.15	1.56	3.38	2.14	0.93	0.64	0.49	0.31	0.29	0.29	1.79
1981	0.28	0.24	0.19	0.17	0.27	2.24	0.64	0.45	0.32	0.32	0.29	0.18	0.47
1982	0.21	0.30	0.52	6.14	0.93	0.54	2.02	0.96	1.12	1.33	0.80	0.84	1.31
1983	0.82	1.19	1.56	0.76	0.41	0.38	0.24	0.25	0.30	0.22	0.15	0.17	0.54
1984	0.17	2.13	2.09	0.72	0.36	0.53	0.45	0.32	0.32	0.37	0.28	0.21	0.66
1985	0.19	0.37	2.48	6.67	1.18	1.25	0.51	0.55	0.99	0.50	0.43	0.25	1.28
1986	0.31	2.06	0.57	0.97	1.06	0.97	0.52	0.36	0.22	0.43	0.21	0.20	0.66
Average	0.29	0.70	1.24	1.48	1.10	0.97	0.62	0.59	0.57	0.62	0.34	0.27	0.73
Maximum	0.92	3.08	8.15	6.67	4.22	2.33	2.02	1.27	1.12	1.52	0.84	0.84	1.79
Minimum	0.09	0.15	0.13	0.17	0.23	0.19	0.12	0.25	0.21	0.21	0.15	0.12	0.40
Var.	0.21	0.79	1.76	1.74	1.04	0.61	0.45	0.26	0.27	0.37	0.18	0.15	0.35

Var. : Standard Deviation

TABLE A.3.1 MONTHLY MEAN DISCHARGE (4/6)

Station :W08
River :The Profonde River (Unit : m^3/s)

Hydrological Year	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul	Aug.	Sep.	Oct.	Annual Average
1966			0.434	0.217	0.356	0.177	0.133	0.154	0.149	0.149	0.179	0.125	
1967	0.07	0.17	0.61	0.24	0.69	0.63	0.30	0.26	0.41	0.27	0.21	0.18	0.34
1968	0.50	0.49	0.18	0.64	0.62	0.16	0.12	0.13	0.15	0.15	0.15	0.11	0.28
1969	0.07	0.10	0.09	0.26	0.49	0.54	0.29	0.20	0.44	0.42	0.30	0.24	0.29
1970	0.10	0.55	1.68	0.76	1.51	0.30	0.28	0.32	0.37	0.35	0.28	0.24	0.56
1971	0.24	0.13	0.22	0.62	0.29	0.76	0.40	0.23	0.31	0.28	0.25	0.19	0.33
1972	0.18	0.11	0.14	0.49	0.40	0.40	0.22	0.29	0.25	0.73	0.25	0.25	0.31
1973	0.32	0.25	0.35	0.33	0.59	0.27	0.21	0.26	0.21	0.30	0.24	0.14	0.29
1974	0.13	0.12	0.08	0.29	0.35	0.19	0.13	0.12	0.16	0.29	0.14	0.11	0.18
1975	0.16	0.10	0.12	0.50	0.42	0.28	0.37	0.20	0.19	0.20	0.15	0.12	0.23
1976	0.16	0.10	0.15	0.42	0.20	0.34	0.50	0.38	0.23	0.22	0.19	0.18	0.26
1977	0.15	0.26	0.48	0.51	0.25	0.30	0.22	0.17	0.19	0.12	0.15	0.13	0.24
1978	0.11	0.17	0.62	0.15	0.25	0.73	0.26	0.20	0.24	0.18	0.14	0.14	0.27
1979	0.18	0.10	0.18	0.48	0.35	0.27	0.19	0.14	0.11	0.23	0.17	0.18	0.21
1980	0.19	1.37	4.08	0.58	1.75	0.93	0.44	0.28	0.21	0.16	0.12	0.12	0.85
1981	0.11	0.13	0.11	0.10	0.12	0.85	0.31	0.18	0.13	0.12	0.10	0.13	0.20
1982	0.16	0.19	0.22	2.58	0.46	0.26	0.57	0.42	0.35	0.39	0.35	0.31	0.52
1983	0.33	0.44	0.34	0.30	0.20	0.19	0.11	0.07	0.07	0.06	0.05	0.05	0.18
1984	0.12	1.29	0.57	0.37	0.20	0.17	0.12	0.12	0.09	0.12	0.09	0.09	0.28
1985	0.08	0.13	0.83	2.46	0.55	0.45	0.23	0.22	0.25	0.17	0.18	0.15	0.47
1986	0.15	0.84	0.24	0.50	0.50	0.29	0.22	0.14	0.17	0.24	0.16	0.17	0.30
Average	0.18	0.35	0.56	0.61	0.50	0.40	0.27	0.21	0.22	0.24	0.18	0.16	0.32
Maximum	0.50	1.37	4.08	2.58	1.75	0.93	0.57	0.42	0.44	0.73	0.35	0.31	0.85
Minimum	0.07	0.10	0.08	0.10	0.12	0.16	0.11	0.07	0.07	0.06	0.05	0.05	0.18
Var.	0.10	0.38	0.86	0.64	0.40	0.23	0.13	0.09	0.10	0.14	0.07	0.06	0.16

Var. : Standard Deviation

TABLE A.3.1 MONTHLY MEAN DISCHARGE (5/6)

Station :W10
River :The Moka River (Unit : m^3/s)

Hydrological Year	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul	Aug.	Sep.	Oct.	Annual Average
1966		0.19	0.40	0.32	0.92	0.34	0.15	0.16	0.24	0.20	0.20	0.11	
1967	0.08	0.79	0.81	0.28	1.26	1.09	0.39	0.32	0.81	0.55	0.41	0.27	0.59
1968	0.83	0.80	0.30	1.82	1.33	0.37	0.24	0.27	0.32	0.23	0.23	0.16	0.58
1969	0.11	0.20	0.13	0.39	1.00	1.20	0.64	0.34	0.64	0.48	0.25	0.14	0.46
1970	0.11	1.40	2.66	1.53	2.63	0.64	0.34	0.48	0.35	0.45	0.23	0.11	0.91
1971	0.12	0.08	0.66	0.88	0.42	1.36	0.78	0.36	0.51	0.39	0.24	0.18	0.50
1972	0.24	0.15	0.49	0.89	0.65	1.09	0.61	0.86	0.59	1.55	0.39	0.45	0.66
1973	0.52	0.51	1.01	1.07	1.07	0.50	0.58	0.63	0.63	0.65	0.46	0.23	0.65
1974	0.15	0.21	0.33	1.01	0.86	0.45	0.31	0.41	0.65	1.19	0.43	0.24	0.52
1975	0.15	0.36	0.28	0.72	0.86	0.51	0.97	0.54	0.40	0.32	0.38	0.19	0.47
1976	0.14	0.12	0.22	1.02	0.67	0.94	1.70	1.11	0.49	0.51	0.30	0.27	0.62
1977	0.18	0.34	0.94	0.82	0.33	0.73	0.60	0.39	0.47	0.37	0.21	0.17	0.46
1978	0.13	0.32	1.56	0.46	0.64	1.81	0.58	0.45	0.82	0.65	0.37	0.24	0.67
1979	0.17	0.18	0.73	1.23	0.86	0.56	0.55	0.42	0.29	0.73	0.30	0.18	0.52
1980	0.16	2.70	12.02	0.99	7.86	1.10	0.78	0.47	0.38	0.28	0.22	0.19	2.26
1981	0.16	0.13	0.14	0.17	0.38	2.07	0.58	0.28	0.23	0.23	0.24	0.18	0.40
1982	0.33	0.42	0.61	6.77	0.69	0.35	1.23	0.68	0.74	0.78	0.68	0.61	1.16
1983	0.71	0.86	1.01	0.60	0.35	0.22	0.18	0.17	0.20	0.18	0.14	0.14	0.40
1984	0.19	3.14	1.33	0.64	0.37	0.37	0.26	0.27	0.28	0.43	0.31	0.24	0.65
1985	0.19	0.44	2.43	6.09	0.82	0.70	0.34	0.56	0.62	0.51	0.45	0.31	1.12
1986	0.24	1.96	0.57	1.05	0.92	0.46	0.56	0.34	0.26	0.51	0.28	0.23	0.61
Average	0.24	0.73	1.36	1.37	1.18	0.80	0.59	0.45	0.47	0.53	0.32	0.23	0.69
Maximum	0.83	3.14	12.02	6.77	7.86	2.07	1.70	1.11	0.82	1.55	0.68	0.61	2.26
Minimum	0.08	0.08	0.13	0.17	0.33	0.22	0.15	0.16	0.20	0.18	0.14	0.11	0.40
Var.	0.20	0.84	2.48	1.69	1.57	0.49	0.36	0.22	0.19	0.32	0.12	0.11	0.41

Var. : Standard Deviation

TABLE A.3.1 MONTHLY MEAN DISCHARGE (6/6)

Station :W12
River :The Moka River (Unit : m^3/s)

Hydrological Year	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul	Aug.	Sep.	Oct.	Annual Average
1966	0.57	0.34	1.54	0.40	0.60	0.59	0.18	0.24	0.23	0.20	0.19	0.13	0.43
1967	0.10	2.98	1.62	0.54	0.40	1.08	0.52	0.31	0.50	0.43	0.38	0.44	0.77
1968	0.41	1.20	0.39	2.01	1.61	0.44	0.24	0.30	0.25	0.31	0.23	0.16	0.63
1969	0.11	0.16	0.11	0.38	0.42	0.84	0.96	0.38	0.59	0.57	0.31	0.17	0.42
1970	0.09	0.61	1.43	1.57	2.91	1.32	0.32	0.36	0.34	0.34	0.27	0.16	0.81
1971	0.08	0.08	0.36	1.05	0.37	0.47	0.54	0.49	0.30	0.32	0.27	0.15	0.37
1972	0.19	0.19	0.31	1.12	0.66	0.61	0.40	0.77	0.52	1.13	0.49	0.32	0.56
1973	0.39	0.47	0.81	0.71	1.29	0.31	0.35	0.49	0.51	0.60	0.40	0.17	0.54
1974	0.07	0.13	0.37	0.97	0.98	0.52	0.25	0.45	0.44	0.60	0.42	0.15	0.45
1975	0.06	0.27	0.30	1.61	1.00	0.59	0.53	0.44	0.48	0.34	0.37	0.19	0.52
1976	0.21	0.15	0.20	1.08	0.59	0.48	0.88	0.75	0.48	0.46	0.30	0.19	0.48
1977	0.26	0.34	0.79	1.63	0.41	0.57	0.47	0.36	0.39	0.29	0.18	0.16	0.49
1978	0.07	0.22	0.55	0.44	0.50	1.04	0.61	0.32	0.35	0.33	0.28	0.20	0.41
1979	0.14	0.17	0.38	0.90	0.55	0.44	0.57	0.38	0.23	0.31	0.31	0.16	0.38
1980	0.14	0.71	2.40	1.74	2.41	1.61	0.49	0.26	0.13	0.24	0.15	0.16	0.87
Average	0.19	0.53	0.77	1.08	0.98	0.73	0.49	0.42	0.38	0.43	0.30	0.19	0.54
Maximum	0.57	2.98	2.40	2.01	2.91	1.61	0.96	0.77	0.59	1.13	0.49	0.44	0.87
Minimum	0.06	0.08	0.11	0.38	0.37	0.31	0.18	0.24	0.13	0.20	0.15	0.13	0.37
Var.	0.15	0.71	0.65	0.51	0.75	0.36	0.21	0.15	0.13	0.22	0.09	0.08	0.15

Var. : Standard Deviation

TABLE A.3.2 RATING TABLE (1/4)

W03		W04		W05		W08		W10		W13	
Discharg (m^3/sec)	Height (m)	Discharge (m^3/sec)	Height (m)	Discharge (m^3/sec)	Height (m)	Discharge (m^3/sec)	Height (m)	Discharge (m^3/sec)	Height (m)	Discharge (m^3/sec)	Height (m)
0.000	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.05	-0.02	0.000	0.00
0.004	0.01	0.008	0.01	0.008	0.01	0.004	0.01	0.10	0.07	0.010	0.01
0.011	0.02	0.022	0.02	0.022	0.02	0.011	0.02	0.15	0.10	0.027	0.02
0.019	0.03	0.039	0.03	0.038	0.03	0.019	0.03	0.20	0.12	0.049	0.03
0.029	0.04	0.059	0.04	0.058	0.04	0.028	0.04	0.25	0.13	0.074	0.04
0.040	0.05	0.082	0.05	0.080	0.05	0.039	0.05	0.30	0.15	0.102	0.05
0.053	0.06	0.107	0.06	0.104	0.06	0.051	0.06	0.35	0.17	0.133	0.06
0.066	0.07	0.134	0.07	0.131	0.07	0.064	0.07	0.40	0.18	0.167	0.07
0.080	0.08	0.163	0.08	0.159	0.08	0.078	0.08	0.45	0.19	0.203	0.08
0.095	0.09	0.193	0.09	0.189	0.09	0.092	0.09	0.50	0.20	0.241	0.09
0.111	0.10	0.226	0.10	0.220	0.10	0.108	0.10	0.55	0.21	0.282	0.10
0.127	0.11	0.260	0.11	0.253	0.11	0.124	0.11	0.60	0.23	0.324	0.11
0.145	0.12	0.295	0.12	0.288	0.12	0.141	0.12	0.65	0.24	0.368	0.12
0.163	0.13	0.332	0.13	0.324	0.13	0.158	0.13	0.70	0.25	0.414	0.13
0.181	0.14	0.370	0.14	0.361	0.14	0.177	0.14	0.80	0.26	0.462	0.14
0.201	0.15	0.410	0.15	0.399	0.15	0.196	0.15	0.90	0.28	0.511	0.15
0.221	0.16	0.450	0.16	0.439	0.16	0.215	0.16	1.00	0.30	0.562	0.16
0.242	0.17	0.493	0.17	0.480	0.17	0.235	0.17	1.50	0.28	0.614	0.17
0.263	0.18	0.536	0.18	0.523	0.18	0.256	0.18	2.00	0.29	0.668	0.18
0.285	0.19	0.581	0.19	0.566	0.19	0.277	0.19	2.50	0.31	0.723	0.19
0.308	0.20	0.627	0.20	0.611	0.20	0.299	0.20	3.00	0.34	0.780	0.20
0.331	0.21	0.674	0.21	0.657	0.21	0.321	0.21	3.50	0.37	0.838	0.21
0.355	0.22	0.722	0.22	0.704	0.22	0.344	0.22	4.00	0.39	0.897	0.22
0.379	0.23	0.771	0.23	0.752	0.23	0.368	0.23	4.50	0.42	0.958	0.23
0.404	0.24	0.821	0.24	0.801	0.24	0.391	0.24	5.00	0.45	1.020	0.24
0.430	0.25	0.873	0.25	0.851	0.25	0.416	0.25	5.50	0.47	1.083	0.25
0.456	0.26	0.926	0.26	0.902	0.26	0.441	0.26	6.00	0.49	1.147	0.26
0.482	0.27	0.979	0.27	0.955	0.27	0.466	0.27	6.50	0.51	1.212	0.27
0.509	0.28	1.034	0.28	1.008	0.28	0.492	0.28	7.00	0.53	1.279	0.28
0.537	0.29	1.090	0.29	1.062	0.29	0.519	0.29	7.50	0.55	1.347	0.29
0.565	0.30	1.146	0.30	1.118	0.30	0.546	0.30	8.00	0.57	1.416	0.30
0.594	0.31	1.204	0.31	1.174	0.31	0.573	0.31	8.50	0.59	5.50	0.64
1.50	0.45	1.263	0.32	1.231	0.32	0.601	0.32	9.00	0.61	6.00	0.65
2.00	0.47	1.323	0.33	1.290	0.33	0.630	0.33	9.50	0.63	6.50	0.66
2.50	0.49	1.384	0.34	1.349	0.34	0.659	0.34	10.00	0.64	7.00	0.66
3.00	0.51	1.446	0.35	1.409	0.35	0.688	0.35	11.00	0.69	7.50	0.67
3.50	0.53	1.508	0.36	1.470	0.36	0.718	0.36	12.00	0.72	8.00	0.68
4.00	0.55	1.572	0.37	1.533	0.37	0.748	0.37	13.00	0.75	8.50	0.68
4.50	0.57	1.637	0.38	1.596	0.38	0.779	0.38	14.00	0.79	9.00	0.69
5.00	0.58	1.703	0.39	1.660	0.39	0.810	0.39	15.00	0.81	9.50	0.69
5.50	0.60	1.769	0.40	1.725	0.40	0.842	0.40	16.00	0.82	10.00	0.70
6.00	0.61	1.837	0.41	1.791	0.41	0.874	0.41	17.00	0.84	11.00	0.71
6.50	0.63	1.906	0.42	1.857	0.42	0.906	0.42	18.00	0.85	12.00	0.72
7.00	0.64	1.975	0.43	1.925	0.43	0.939	0.43	19.00	0.87	13.00	0.73
7.50	0.65	2.046	0.44	1.994	0.44	0.973	0.44	20.00	0.88	14.00	0.74
8.00	0.67	2.117	0.45	2.063	0.45	1.007	0.45	22.00	0.91	15.00	0.75
8.50	0.68	2.189	0.46	3.50	0.62	1.041	0.46	24.00	0.94	16.00	0.76
9.00	0.69	3.50	0.61	4.00	0.64	1.076	0.47	26.00	0.97	17.00	0.76
9.50	0.70	4.00	0.63	4.50	0.65	1.111	0.48	28.00	0.99	18.00	0.77
10.00	0.72	4.50	0.64	5.00	0.67	1.147	0.49	30.00	1.02	19.00	0.78
11.00	0.74	5.00	0.66	5.50	0.68	1.183	0.50	32.00	1.04	20.00	0.79
12.00	0.76	5.50	0.67	6.00	0.70	1.219	0.51	34.00	1.06	22.00	0.80
13.00	0.78	6.00	0.69	6.50	0.71	1.256	0.52	36.00	1.08	24.00	0.82
14.00	0.80	6.50	0.70	7.00	0.73	1.293	0.53	38.00	1.11	26.00	0.83
15.00	0.82	7.00	0.71	7.50	0.74	1.331	0.54	40.00	1.13	28.00	0.85
16.00	0.84	7.50	0.73	8.00	0.76	1.369	0.55	45.00	1.18	30.00	0.86
17.00	0.86	8.00	0.74	8.50	0.77	1.408	0.56	50.00	1.22	32.00	0.87
18.00	0.88	8.50	0.75	9.00	0.79	1.447	0.57	55.00	1.27	34.00	0.89
19.00	0.90	9.00	0.77	9.50	0.80	1.487	0.58	60.00	1.31	36.00	0.90

TABLE A.3.2 RATING TABLE (2/4)

W03		W04		W05		W08		W10		W13	
Discharg (m^3/sec)	Height (m)	Discharge (m^3/sec)	Height (m)	Discharge (m^3/sec)	Height (m)	Discharge (m^3/sec)	Height (m)	Discharge (m^3/sec)	Height (m)	Discharge (m^3/sec)	Height (m)
20.00	0.92	9.50	0.78	10.00	0.81	1.527	0.59	65.00	1.35	38.00	0.91
22.00	0.97	10.00	0.80	11.00	0.84	1.567	0.60	70.00	1.39	40.00	0.92
24.00	1.01	11.00	0.83	12.00	0.86	1.608	0.61	75.00	1.42	45.00	0.95
26.00	1.05	12.00	0.85	13.00	0.88	2.50	0.76	80.00	1.46	50.00	0.98
28.00	1.08	13.00	0.88	14.00	0.90	3.00	0.79	85.00	1.50	55.00	1.01
30.00	1.12	14.00	0.90	15.00	0.91	3.50	0.81	90.00	1.53	60.00	1.04
32.00	1.14	15.00	0.92	16.00	0.93	4.00	0.83	95.00	1.56	65.00	1.06
34.00	1.17	16.00	0.94	17.00	0.94	4.50	0.84	100.00	1.59	70.00	1.09
36.00	1.20	17.00	0.95	18.00	0.96	5.00	0.86	105.00	1.62	75.00	1.11
38.00	1.23	18.00	0.97	19.00	0.97	5.50	0.88	110.00	1.65	80.00	1.13
40.00	1.25	19.00	0.98	20.00	0.99	6.00	0.89	115.00	1.68	85.00	1.15
45.00	1.31	20.00	0.99	22.00	1.01	6.50	0.91	120.00	1.71	90.00	1.17
50.00	1.37	22.00	1.02	24.00	1.04	7.00	0.92	125.00	1.74	95.00	1.19
55.00	1.42	24.00	1.04	26.00	1.07	7.50	0.94	130.00	1.77	100.00	1.21
60.00	1.47	26.00	1.07	28.00	1.09	8.00	0.95	135.00	1.80	105.00	1.23
65.00	1.52	28.00	1.09	30.00	1.11	8.50	0.97	140.00	1.82	110.00	1.25
70.00	1.57	30.00	1.12	32.00	1.14	9.00	0.98	145.00	1.85	115.00	1.27
75.00	1.61	32.00	1.14	34.00	1.16	9.50	0.99	150.00	1.87	120.00	1.29
80.00	1.66	34.00	1.16	36.00	1.18	10.00	1.01	155.00	1.90	125.00	1.31
85.00	1.70	36.00	1.18	38.00	1.20	11.00	1.03	160.00	1.92	130.00	1.33
90.00	1.74	38.00	1.20	40.00	1.22	12.00	1.06	165.00	1.95	135.00	1.34
95.00	1.78	40.00	1.22	45.00	1.27	13.00	1.08	170.00	1.97	140.00	1.36
100.00	1.82	45.00	1.27	50.00	1.32	14.00	1.10	175.00	1.99	145.00	1.38
105.00	1.86	50.00	1.32	55.00	1.36	15.00	1.13	180.00	2.02	150.00	1.40
110.00	1.90	55.00	1.36	60.00	1.41	16.00	1.15	185.00	2.04	155.00	1.41
115.00	1.94	60.00	1.41	65.00	1.45	17.00	1.17	190.00	2.06	160.00	1.43
120.00	1.98	65.00	1.45	70.00	1.49	18.00	1.19	195.00	2.08	165.00	1.45
125.00	2.01	70.00	1.49	75.00	1.53	19.00	1.21	200.00	2.10	170.00	1.46
130.00	2.05	75.00	1.53	80.00	1.57	20.00	1.24	205.00	2.12	175.00	1.48
135.00	2.08	80.00	1.57	85.00	1.60	22.00	1.32	210.00	2.14	180.00	1.49
140.00	2.12	85.00	1.61	90.00	1.64	24.00	1.36	215.00	2.17	185.00	1.51
145.00	2.15	90.00	1.65	95.00	1.68	26.00	1.41	220.00	2.18	190.00	1.53
150.00	2.18	95.00	1.68	100.00	1.71	28.00	1.44	225.00	2.20	195.00	1.54
155.00	2.21	100.00	1.72	105.00	1.75	30.00	1.47	230.00	2.22	200.00	1.56
160.00	2.25	105.00	1.75	110.00	1.78	32.00	1.49	235.00	2.24	205.00	1.57
165.00	2.28	110.00	1.79	115.00	1.81	34.00	1.51	240.00	2.26	210.00	1.59
170.00	2.31	115.00	1.82	120.00	1.85	36.00	1.54	245.00	2.28	215.00	1.60
175.00	2.34	120.00	1.85	125.00	1.88	38.00	1.56	250.00	2.30	220.00	1.62
180.00	2.37	125.00	1.89	130.00	1.91	40.00	1.58	255.00	2.32	225.00	1.63
185.00	2.40	130.00	1.92	135.00	1.94	45.00	1.63	260.00	2.34	230.00	1.65
190.00	2.43	135.00	1.95	140.00	1.97	50.00	1.68	265.00	2.35	235.00	1.66
195.00	2.46	140.00	1.98	145.00	2.00	55.00	1.73	270.00	2.37	240.00	1.67
200.00	2.49	145.00	2.01	150.00	2.03	60.00	1.78	275.00	2.39	245.00	1.69
205.00	2.51	150.00	2.04	155.00	2.06	65.00	1.82	280.00	2.41	250.00	1.70
210.00	2.54	155.00	2.07	160.00	2.09	70.00	1.87	285.00	2.42	255.00	1.72
215.00	2.57	160.00	2.10	165.00	2.12	75.00	1.91	290.00	2.44	260.00	1.73
220.00	2.60	165.00	2.13	170.00	2.14	80.00	1.95	295.00	2.46	265.00	1.74
225.00	2.62	170.00	2.16	175.00	2.17	85.00	1.99	300.00	2.48	270.00	1.76
230.00	2.65	175.00	2.19	180.00	2.20	90.00	2.03	305.00	2.49	275.00	1.77
235.00	2.68	180.00	2.22	185.00	2.23	95.00	2.07	310.00	2.51	280.00	1.78
240.00	2.70	185.00	2.24	190.00	2.25	100.00	2.10	315.00	2.53	285.00	1.80

TABLE A.3.2 RATING TABLE (3/4)

W03		W04		W05		W08		W10		W13	
Discharg (m^3/sec)	Height (m)	Discharge (m^3/sec)	Height (m)	Discharge (m^3/sec)	Height (m)	Discharge (m^3/sec)	Height (m)	Discharge (m^3/sec)	Height (m)	Discharge (m^3/sec)	Height (m)
245.00	2.73	190.00	2.27	195.00	2.28	105.00	2.14	320.00	2.54	290.00	1.81
250.00	2.76	195.00	2.30	200.00	2.30	110.00	2.18	325.00	2.56	295.00	1.82
255.00	2.78	200.00	2.32	205.00	2.33	115.00	2.21	330.00	2.58	300.00	1.84
260.00	2.81	205.00	2.35	210.00	2.36	120.00	2.25	335.00	2.59	305.00	1.85
265.00	2.83	210.00	2.38	215.00	2.38	125.00	2.28	340.00	2.61	310.00	1.86
270.00	2.85	215.00	2.40	220.00	2.41	130.00	2.32	345.00	2.63	315.00	1.88
275.00	2.88	220.00	2.43	225.00	2.43	135.00	2.35	350.00	2.64	320.00	1.89
280.00	2.90	225.00	2.45	230.00	2.46	140.00	2.38	355.00	2.66	325.00	1.90
285.00	2.93	230.00	2.48	235.00	2.48	145.00	2.41	360.00	2.67	330.00	1.92
290.00	2.95	235.00	2.51	240.00	2.50	150.00	2.45	365.00	2.69	335.00	1.93
295.00	2.97	240.00	2.53	245.00	2.53	155.00	2.48	370.00	2.71	340.00	1.94
300.00	2.99	245.00	2.56	250.00	2.55	160.00	2.51	375.00	2.72	345.00	1.95
305.00	3.02	250.00	2.58	255.00	2.57	165.00	2.54	380.00	2.74	350.00	1.97
310.00	3.04	255.00	2.60	260.00	2.60	170.00	2.57	385.00	2.75	355.00	1.98
315.00	3.06	260.00	2.63	265.00	2.62	175.00	2.60	390.00	2.77	360.00	1.99
320.00	3.08	265.00	2.65	270.00	2.64	180.00	2.63	395.00	2.78	365.00	2.00
325.00	3.10	270.00	2.68	275.00	2.67	185.00	2.66	400.00	2.80	370.00	2.01
330.00	3.12	275.00	2.70	280.00	2.69	190.00	2.69	420.00	2.86	375.00	2.03
335.00	3.14	280.00	2.72	285.00	2.71	195.00	2.71	440.00	2.92	380.00	2.04
340.00	3.16	285.00	2.75	290.00	2.73	200.00	2.74	460.00	2.97	385.00	2.05
345.00	3.18	290.00	2.77	295.00	2.76	205.00	2.77	480.00	3.03	390.00	2.06
350.00	3.20	295.00	2.79	300.00	2.78	210.00	2.80	500.00	3.08	395.00	2.07
355.00	3.22	300.00	2.82	305.00	2.80	215.00	2.82	550.00	3.22	400.00	2.09
360.00	3.24	305.00	2.84	310.00	2.82	220.00	2.85	600.00	3.34	420.00	2.13
365.00	3.26	310.00	2.86	315.00	2.84	225.00	2.88	650.00	3.46	440.00	2.18
370.00	3.28	315.00	2.88	320.00	2.86	230.00	2.90	700.00	3.58	460.00	2.22
375.00	3.30	320.00	2.91	325.00	2.88	235.00	2.93	750.00	3.70	480.00	2.27
380.00	3.32	325.00	2.93	330.00	2.90	240.00	2.96	800.00	3.81	500.00	2.31
385.00	3.33	330.00	2.95	335.00	2.93	245.00	2.98	850.00	3.92	550.00	2.42
390.00	3.35	335.00	2.97	340.00	2.95	250.00	3.01	900.00	4.03	600.00	2.52
395.00	3.37	340.00	2.99	345.00	2.97	255.00	3.03	950.00	4.14	650.00	2.62
400.00	3.39	345.00	3.02	350.00	2.99	260.00	3.06	1000.00	4.24	700.00	2.72
420.00	3.46	350.00	3.04	355.00	3.01	265.00	3.09	1100.00	4.44	750.00	2.82
440.00	3.54	355.00	3.06	360.00	3.03	270.00	3.11	1200.00	4.64	800.00	2.91
480.00	3.68	365.00	3.10	370.00	3.07	280.00	3.16	1400.00	5.02	900.00	3.09
500.00	3.75	370.00	3.12	375.00	3.09	285.00	3.18	1500.00	5.20	950.00	3.18
550.00	3.92	375.00	3.14	380.00	3.11	290.00	3.21	1600.00	5.37	1000.00	3.26
600.00	4.09	380.00	3.16	385.00	3.13	295.00	3.23	1700.00	5.54	1100.00	3.69
650.00	4.25	385.00	3.18	390.00	3.14	300.00	3.25	1800.00	5.71	1200.00	3.84
700.00	4.40	390.00	3.20	395.00	3.16	305.00	3.28	1900.00	5.88	1300.00	3.96
750.00	4.55	395.00	3.23	400.00	3.18	310.00	3.30	2000.00	6.04	1400.00	4.08
800.00	4.70	400.00	3.24	420.00	3.25	315.00	3.33	2100.00	6.20	1500.00	4.19
850.00	4.84	420.00	3.33	440.00	3.33	320.00	3.35	2200.00	6.36	1600.00	4.30
900.00	4.99	440.00	3.40	460.00	3.40	325.00	3.37	2300.00	6.51	1700.00	4.41
950.00	5.13	460.00	3.48	480.00	3.46	330.00	3.39	2400.00	6.66	1800.00	4.52
1000.00	5.26	480.00	3.56	500.00	3.53	335.00	3.42	2500.00	6.81	1900.00	4.62
1100.00	5.53	500.00	3.63	550.00	3.69	340.00	3.44	2600.00	6.96	2000.00	4.72
1200.00	5.78	550.00	3.81	600.00	3.85	345.00	3.46	2700.00	7.11	2100.00	4.82
1300.00	6.03	600.00	3.99	650.00	4.01	350.00	3.48	2800.00	7.25	2200.00	4.92
1400.00	6.26	650.00	4.15	700.00	4.15	355.00	3.51	2900.00	7.39	2300.00	5.02
1500.00	6.49	700.00	4.32	750.00	4.29	360.00	3.53	3000.00	7.53	2400.00	5.11

TABLE A.3.2 RATING TABLE (4/4)

W03		W04		W05		W08		W10		W13	
Discharg (m^3/sec)	Height (m)	Discharge (m^3/sec)	Height (m)	Discharge (m^3/sec)	Height (m)	Discharge (m^3/sec)	Height (m)	Discharge (m^3/sec)	Height (m)	Discharge (m^3/sec)	Height (m)
1600.00	6.72	750.00	4.48	800.00	4.43	365.00	3.55			2500.00	5.21
1700.00	6.93	800.00	4.63	850.00	4.57	370.00	3.57			2600.00	5.30
1800.00	7.15	850.00	4.78	900.00	4.70	375.00	3.59			2700.00	5.39
1900.00	7.36	900.00	4.92	950.00	4.83	380.00	3.62			2800.00	5.48
2000.00	7.57	950.00	5.05	1000.00	4.96	385.00	3.64			2900.00	5.57
2100.00	7.77	1000.00	5.18	1100.00	5.21	390.00	3.66			3000.00	5.65
2200.00	7.97	1100.00	5.43	1200.00	5.45	395.00	3.68				
2300.00	8.17	1200.00	5.68	1300.00	5.69	400.00	3.70				
2400.00	8.36	1300.00	5.91	1400.00	5.92	420.00	3.78				
2500.00	8.56	1400.00	6.14	1500.00	6.14	440.00	3.86				
2600.00	8.74	1500.00	6.37	1600.00	6.36	460.00	3.94				
2700.00	8.93	1600.00	6.59	1700.00	6.57	480.00	4.02				
2800.00	9.12	1700.00	6.80	1800.00	6.78	500.00	4.10				
2900.00	9.30	1800.00	7.02	1900.00	6.99	550.00	4.28				
3000.00	9.48	1900.00	7.22	2000.00	7.19	600.00	4.46				
		2000.00	7.43	2100.00	7.39	650.00	4.63				
		2100.00	7.63	2200.00	7.58	700.00	4.79				
		2200.00	7.82	2300.00	7.77	750.00	4.95				
		2300.00	8.02	2400.00	7.96	800.00	5.10				
		2400.00	8.21	2500.00	8.15	850.00	5.24				
		2500.00	8.39	2600.00	8.33	900.00	5.38				
		2600.00	8.58	2700.00	8.51	950.00	5.51				
		2700.00	8.76	2800.00	8.69	1000.00	5.63				
		2800.00	8.94	2900.00	8.87	1100.00	5.88				
		2900.00	9.12	3000.00	9.05	1200.00	6.12				
		3000.00	9.30			1300.00	6.36				
						1500.00	6.82				
						1600.00	7.05				
						1700.00	7.27				
						1800.00	7.48				
						1900.00	7.69				
						2000.00	7.89				
						2100.00	8.09				
						2200.00	8.29				
						2300.00	8.48				
						2400.00	8.66				
						2500.00	8.85				
						2600.00	9.03				
						2700.00	9.21				
						2800.00	9.38				
						2900.00	9.56				
						3000.00	9.72				

TABLE A.3.3 ANNUAL RUNOFF RATIO

(after abstraction)

Hydrological Year	W03	W04	W05	W08
1967		0.30	0.35	0.45
1968		0.42	0.48	0.39
1969		0.27	0.33	0.53
1970		0.55	0.54	0.70
1971			0.29	0.60
1972		0.28	0.35	0.39
1973	0.23	0.35	0.43	0.47
1974	0.18	0.21	0.35	0.24
1975		0.28	0.39	0.36
1976		0.33	0.42	0.43
1977	0.11	0.18	0.36	0.41
1978	0.12	0.31	0.43	0.42
1979	0.12	0.27	0.40	0.41
1980	0.47	0.64	0.61	0.77
1981	0.12	0.21	0.33	0.37
1982	0.28	0.44	0.55	0.58
1983	0.17	0.29	0.48	0.43
1984	0.21	0.34	0.51	0.53
1985	0.30	0.42	0.61	0.58
1986	0.17	0.33	0.43	0.54
Average	0.21	0.34	0.43	0.48
Maximum	0.47	0.64	0.61	0.77
Minimum	0.11	0.18	0.29	0.24
Var.	0.10	0.11	0.09	0.12

Var. : Standard Deviation

TABLE A.3.4 COEFFICIENT FOR ADDITIONAL FLOW DOWNSTREAM

Moka River

Date	W10	A-6	Pailles Canal	W002	Total of (2) to (4)	Increase Ratio
	(1)	(2)	(3)	(4)	(5)	
Area (km2)	15.1	24.7	-	-	-	1.64
3/Jun.	300	304	142	2	448	1.49
8/Sep.	166	193	85*)	2	280	1.69
30/Oct.	70	46	45	2	93	1.33
3/Nov.	70	40	54	2	96	1.37
				Average		1.47

*) : estimate from formula

Plaines Wilhems River

Date	W03	B-1	P.W Canal	Total of (2)+(3)	Increase Ratio
	(1)	(2)	(3)	(5)	
Area (km2)	27.5	31	-	-	1.13
3/Jun.	297	50*)	297	347	
8/Sep.	116	-	116	-	-
30/Oct.	84	59	84	143	1.70
3/Nov.	98	59	98	157	1.60
			Average		1.65

*) : Estimated volume from field observation

Other rivers (Terre Rouge, Cascade, Profonde)

Date	W04+W05+W08	B-4	Bagatelle Canal	W026	Total of (2) to (4)	Increase Ratio
	(1)	(2)	(3)	(4)	(5)	
Area (km2)	46.9	55.0	-	-	-	1.17
3/Jun.	1200	-	345	25*)	-	-
8/Sep.	509	-	163	25	-	-
30/Oct.	496	-	113	25	-	-
3/Nov.	380	128	115	25	527 **)	1.39
				Average		1.39

*) Information from CWA

**) Discharges of W04,W05 and W08 are included.

TABLE A.3.5 EVAPOLATION FROM DAM RESERVOIR

Unit : mm/day

	Nov.			Dec.			Jan.		
	1-10	11-20	21-	1-10	11-20	21-	1-10	11-20	21-
A-pan	5.6	5.6	5.7	5.6	5.7	5.8	5.8	5.9	5.5
x 0.7	3.9	3.9	4.0	4.0	4.0	4.0	4.1	4.1	3.9

	Feb.			Mar.			Apr.		
	1-10	11-20	21-	1-10	11-20	21-	1-10	11-20	21-
A-pan	5.7	5.3	5.4	5.0	5.0	4.7	4.6	4.3	4.1
x 0.7	4.0	3.7	3.8	3.5	3.5	3.3	3.2	3.0	2.9

	May			Jun.			Jul.		
	1-10	11-20	21-	1-10	11-20	21-	1-10	11-20	21-
A-pan	3.8	3.6	3.4	3.4	3.2	3.3	3.3	3.4	3.5
x 0.7	2.6	2.5	2.4	2.4	2.2	2.3	2.3	2.3	2.5

	Aug.			Sep.			Oct.		
	1-10	11-20	21-	1-10	11-20	21-	1-10	11-20	21-
A-pan	3.7	3.8	4.0	4.4	4.6	4.9	5.0	5.3	5.3
x 0.7	2.6	2.7	2.8	3.1	3.2	3.4	3.5	3.7	3.7

Source: monthly evaporation at Reduit (1961-1980)

TABLE A.3.6 AVERAGE WATER BALANCE (1966-1986) (with leakage)

Total Water Requirement : 1.05 m^3/sec

LWL : 139.0 m HWL : 189.0 m

Effective Storage : 6.4 MCM Dead Storage : .275 MCM

SEASON		INFLOW* Resi (MCM)	INFLOW* Dam (MCM)	PIPELINE SUPPLY (MCM)	RELEASE (MCM)	SPILLOUT (MCM)	DEFICIT & NUMBER (MCM)		WATER LEVEL (m)	EVAPORATION (MCM)	LEAKAGE (MCM)
NOV.	1	0.28	0.47	0.18	0.45	0.17	0.00	0	185.2	0.010	0.020
	2	0.24	0.40	0.18	0.50	0.11	0.00	0	184.0	0.010	0.019
	3	0.32	0.51	0.19	0.47	0.23	0.00	0	183.0	0.009	0.017
DEC.	1	0.47	0.68	0.19	0.40	0.30	0.00	0	182.6	0.009	0.015
	2	0.71	0.90	0.20	0.33	0.52	0.00	0	182.4	0.009	0.015
	3	1.32	1.56	0.22	0.29	0.98	0.00	0	184.7	0.009	0.017
JAN.	1	0.69	0.88	0.20	0.21	0.54	0.00	0	185.0	0.010	0.016
	2	1.60	1.82	0.19	0.23	1.53	0.00	0	185.2	0.010	0.018
	3	2.74	2.92	0.24	0.15	2.64	0.00	0	185.6	0.010	0.021
FEB.	1	3.42	3.99	0.24	0.04	3.45	0.00	0	187.8	0.009	0.020
	2	2.95	3.97	0.24	0.06	3.87	0.00	0	187.8	0.009	0.024
	3	2.03	2.44	0.20	0.05	2.34	0.00	0	187.9	0.009	0.020
MAR.	1	2.03	2.55	0.24	0.03	2.38	0.00	0	188.4	0.009	0.024
	2	2.54	2.95	0.24	0.01	2.86	0.00	0	188.6	0.010	0.025
	3	2.13	2.40	0.26	0.05	2.27	0.00	0	188.8	0.009	0.028
APR.	1	1.39	1.59	0.24	0.04	1.48	0.00	0	189.0	0.009	0.026
	2	1.51	2.08	0.24	0.06	1.98	0.00	0	189.0	0.008	0.026
	3	1.20	1.77	0.24	0.06	1.68	0.00	0	189.0	0.008	0.026
MAY.	1	0.96	1.24	0.24	0.07	1.14	0.00	0	189.0	0.007	0.026
	2	0.75	1.00	0.23	0.11	0.87	0.00	0	188.9	0.007	0.026
	3	0.88	1.15	0.25	0.15	1.00	0.00	0	188.8	0.007	0.029
JUN.	1	0.74	1.02	0.23	0.13	0.89	0.00	0	188.7	0.006	0.026
	2	0.68	0.95	0.23	0.12	0.78	0.00	0	188.7	0.006	0.025
	3	0.63	0.91	0.22	0.16	0.71	0.00	0	188.8	0.006	0.025
JUL.	1	0.55	0.81	0.21	0.18	0.61	0.00	0	188.8	0.006	0.026
	2	0.57	0.80	0.22	0.17	0.61	0.00	0	188.8	0.006	0.026
	3	0.71	1.00	0.24	0.17	0.80	0.00	0	188.7	0.007	0.028
AUG.	1	0.63	0.83	0.21	0.15	0.65	0.00	0	188.7	0.007	0.025
	2	0.77	1.13	0.22	0.15	0.96	0.00	0	188.6	0.007	0.025
	3	0.77	1.13	0.24	0.16	0.94	0.00	0	188.6	0.008	0.028
SEP.	1	0.56	0.71	0.21	0.19	0.51	0.00	0	188.5	0.008	0.025
	2	0.49	0.56	0.21	0.22	0.34	0.00	0	188.3	0.008	0.025
	3	0.40	0.49	0.20	0.29	0.23	0.00	0	188.0	0.009	0.025
OCT.	1	0.40	0.58	0.20	0.34	0.29	0.00	0	187.6	0.009	0.024
	2	0.31	0.46	0.20	0.39	0.15	0.00	0	187.0	0.010	0.023
	3	0.29	0.45	0.21	0.48	0.10	0.00	0	186.2	0.010	0.024
		38.69	49.10	7.88	7.06	40.92	0.00	0	-	0.301	0.835

* Dam : inflow into TRO dam reservoir

Resi: river flow of residual basin

TABLE A.3.7 AVERAGE WATER BALANCE (1966-1986) (without leakage)

Total Water Requirement : 1.05 m^3/sec

LWL : 139.0 m HWL : 189.0 m

Effective Storage : 6.4 MCM Dead Storage : .275 MCM

SEASON		INFLOW* Resi (MCM)	INFLOW* Dam (MCM)	PIPELINE SUPPLY (MCM)	RELEASE (MCM)	SPILLOUT (MCM)	DEFICIT & NUMBER (MCM)		WATER LEVEL (m)	EVAPORATION (MCM)	LEAKAGE (MCM)
NOV.	1	0.28	0.47	0.18	0.47	0.18	0.00	0	185.2	0.010	0.000
	2	0.24	0.40	0.18	0.52	0.11	0.00	0	184.0	0.010	0.000
	3	0.32	0.51	0.19	0.48	0.23	0.00	0	183.0	0.009	0.000
DEC.	1	0.47	0.68	0.19	0.41	0.30	0.00	0	182.6	0.009	0.000
	2	0.71	0.90	0.20	0.34	0.53	0.00	0	182.4	0.009	0.000
	3	1.32	1.56	0.22	0.30	0.99	0.00	0	184.7	0.009	0.000
JAN.	1	0.69	0.88	0.20	0.22	0.55	0.00	0	185.0	0.010	0.000
	2	1.60	1.82	0.19	0.24	1.54	0.00	0	185.2	0.010	0.000
	3	2.74	2.92	0.24	0.16	2.65	0.00	0	185.6	0.010	0.000
FEB.	1	3.42	3.99	0.24	0.04	3.47	0.00	0	187.8	0.009	0.000
	2	2.95	3.97	0.24	0.06	3.89	0.00	0	187.8	0.009	0.000
	3	2.03	2.44	0.20	0.05	2.35	0.00	0	187.9	0.009	0.000
MAR.	1	2.03	2.55	0.24	0.03	2.40	0.00	0	188.4	0.009	0.000
	2	2.54	2.95	0.24	0.02	2.88	0.00	0	188.6	0.010	0.000
	3	2.13	2.40	0.26	0.05	2.29	0.00	0	188.8	0.009	0.000
APR.	1	1.39	1.59	0.24	0.04	1.50	0.00	0	189.0	0.009	0.000
	2	1.51	2.08	0.24	0.07	2.00	0.00	0	189.0	0.008	0.000
	3	1.20	1.77	0.24	0.06	1.69	0.00	0	189.0	0.008	0.000
MAY.	1	0.96	1.24	0.24	0.08	1.16	0.00	0	189.0	0.007	0.000
	2	0.75	1.00	0.23	0.12	0.89	0.00	0	188.9	0.007	0.000
	3	0.88	1.15	0.25	0.16	1.02	0.00	0	188.8	0.007	0.000
JUN.	1	0.74	1.02	0.23	0.14	0.91	0.00	0	188.7	0.006	0.000
	2	0.68	0.95	0.23	0.14	0.79	0.00	0	188.7	0.006	0.000
	3	0.63	0.91	0.22	0.17	0.72	0.00	0	188.8	0.006	0.000
JUL.	1	0.55	0.81	0.21	0.20	0.62	0.00	0	188.8	0.006	0.000
	2	0.57	0.80	0.22	0.18	0.62	0.00	0	188.8	0.006	0.000
	3	0.71	1.00	0.24	0.19	0.81	0.00	0	188.7	0.007	0.000
AUG.	1	0.63	0.83	0.21	0.17	0.66	0.00	0	188.7	0.007	0.000
	2	0.77	1.13	0.22	0.17	0.97	0.00	0	188.6	0.007	0.000
	3	0.77	1.13	0.24	0.18	0.95	0.00	0	188.6	0.008	0.000
SEP.	1	0.56	0.71	0.21	0.21	0.52	0.00	0	188.5	0.008	0.000
	2	0.49	0.56	0.21	0.24	0.35	0.00	0	188.3	0.008	0.000
	3	0.40	0.49	0.20	0.31	0.23	0.00	0	188.0	0.009	0.000
OCT.	1	0.40	0.58	0.20	0.36	0.29	0.00	0	187.6	0.009	0.000
	2	0.31	0.46	0.20	0.41	0.16	0.00	0	187.0	0.010	0.000
	3	0.29	0.45	0.21	0.50	0.11	0.00	0	186.2	0.010	0.000
		38.69	49.10	7.88	7.50	41.32	0.00	0	-	0.301	0.000

* Dam : inflow into TRO dam reservoir
Resi: river flow of residual basin

TABLE A.3.8 FREQUENCY OF DEFICIT AND SUPPLY REDUCTION RATIO (1966-1986)

: Numbers of 10-day deficit series Water demand :1.00 cumec + 5 % loss at Pailles treatment plant

Period	Effective Storage Volume (MCM) 0.00	0.50	1.00	1.50	2.00	2.50	3.00	3.50	4.00	4.50	5.00	5.50	6.00	6.50	7.00	Required Volume (MCM)
1966 - 1967	24 (0.19)	14 (0.28)	9 (0.37)	7 (0.40)	5 (0.44)	5 (0.32)	3 (0.34)	1 (0.45)	-	-	-	-	-	-	-	3.889
1967 - 1968	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000
1968 - 1969	25 (0.23)	16 (0.32)	15 (0.30)	13 (0.30)	11 (0.30)	9 (0.31)	8 (0.27)	5 (0.32)	2 (0.51)	1 (0.44)	-	-	-	-	-	4.883
1969 - 1970	7 (0.34)	5 (0.36)	4 (0.30)	3 (0.21)	1 (0.06)	-	-	-	-	-	-	-	-	-	-	2.053
1970 - 1971	13 (0.33)	11 (0.33)	10 (0.31)	8 (0.31)	7 (0.28)	5 (0.27)	4 (0.19)	-	-	-	-	-	-	-	-	3.668
1971 - 1972	13 (0.27)	11 (0.27)	9 (0.26)	6 (0.30)	4 (0.30)	3 (0.21)	1 (0.05)	-	-	-	-	-	-	-	-	3.046
1972 - 1973	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000
1973 - 1974	9 (0.13)	6 (0.10)	-	-	-	-	-	-	-	-	-	-	-	-	-	0.997
1974 - 1975	10 (0.09)	4 (0.07)	-	-	-	-	-	-	-	-	-	-	-	-	-	0.739
1975 - 1976	11 (0.21)	7 (0.25)	6 (0.19)	4 (0.15)	1	-	-	-	-	-	-	-	-	-	-	2.003
1976 - 1977	5 (0.09)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.369
1977 - 1978	13 (0.19)	9 (0.20)	8 (0.16)	4 (0.17)	1 (0.11)	-	-	-	-	-	-	-	-	-	-	2.091
1978 - 1979	8 (0.11)	2 (0.15)	-	-	-	-	-	-	-	-	-	-	-	-	-	0.754
1979 - 1980	9 (0.16)	4 (0.21)	1 (0.27)	-	-	-	-	-	-	-	-	-	-	-	-	1.230
1980 - 1981	21 (0.14)	17 (0.14)	12 (0.15)	8 (0.15)	5 (0.12)	1 (0.01)	-	-	-	-	-	-	-	-	-	2.509
1981 - 1982	14 (0.12)	6 (0.19)	3 (0.20)	1 (0.01)	-	-	-	-	-	-	-	-	-	-	-	1.508
1982 - 1983	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.000
1983 - 1984	22 (0.33)	20 (0.33)	17 (0.36)	13 (0.43)	11 (0.45)	10 (0.44)	9 (0.42)	8 (0.40)	7 (0.38)	5 (0.41)	4 (0.37)	4 (0.23)	1 (0.23)	-	-	6.285
1984 - 1985	9 (0.16)	6 (0.15)	3 (0.11)	-	-	-	-	-	-	-	-	-	-	-	-	1.278
1985 - 1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.111
Total failur (days)	2130	1380	970	670	460	330	250	140	90	60	40	40	10	0	0	-
Annual Ave. (days)	106.5	69.0	48.5	33.5	23	16.5	12.5	7	4.5	3	2	2	0.5	0	0	-
Reliability (%)	70.82	81.10	86.71	90.82	93.70	95.48	96.58	98.08	98.77	99.18	99.45	99.45	99.86	100.00	100.00	-

Ref: *Figure in bracket shows supply reduction ratio during the failure in order to cope with deficit
*Water through Soreze pipe line (0.052 cumec)is considered not to be used for Pailles treatment plant

TABLE A.3.9 RELIABILITY OF WATER SUPPLY

(%)

Demand (m^3/sec)	Effective Storage (MCM) 8.0	7.0	6.0	5.0	4.0	3.0	2.0	0.0
0.6	100.0	100.0	100.0	100.0	100.0	100.0	100.0	96.9
0.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0	94.3
0.8	100.0	100.0	100.0	100.0	100.0	100.0	99.9	89.2
0.9	100.0	100.0	100.0	100.0	100.0	99.5	98.5	83.7
1.0	100.0	100.0	100.0	99.6	99.3	98.4	96.8	79.4
1.1	100.0	99.9	99.5	99.1	98.5	96.7	93.2	74.0
1.2	99.5	99.3	98.9	98.0	96.4	93.7	90.3	70.9
1.3	99.1	98.4	97.6	96.0	93.7	90.9	85.8	66.1
1.4	97.7	96.7	95.2	93.2	90.7	86.1	82.4	62.3
1.5	96.1	94.1	92.0	89.9	85.7	81.8	77.7	57.7
1.6	92.9	91.1	89.2	85.8	82.1	78.4	74.2	54.1
1.7	90.3	88.3	85.3	82.4	78.6	74.6	70.8	49.8
1.8	87.9	85.0	82.4	79.3	75.3	72.0	68.4	47.4
1.9	84.4	81.4	78.6	75.2	72.4	68.9	65.6	44.7
2.0	80.4	77.6	76.0	72.2	69.7	67.0	62.9	42.1

100%
95%
90%

TABLE A.3.10 AVERAGE WATER BALANCE (1966 - 1986) (1/5)
(WITHOUT THE PROJECT)

Total Water Requirement : 0.80 m^3/sec (Demand as of 1988)
LWL : 121 m
HWL : 121 m
Effective Storage : 0.0 MCM Dead Storage : 0.0 MCM

SEASON		INFLOW* Resi (MCM)	INFLOW* Dam (MCM)	PIPELINE SUPPLY (MCM)	RELEASE (MCM)	SPILLOUT (MCM)	DEFICIT & NUMBER (MCM)		WATER LEVEL (m)	EVAPORATION (MCM)	LEAKAGE (MCM)
NOV.	1	0.28	0.47	0.18	0.22	0.25	0.06	9	121.0	0.000	0.0
	2	0.24	0.40	0.18	0.24	0.16	0.07	10	121.0	0.000	0.0
	3	0.32	0.51	0.19	0.24	0.28	0.06	9	121.0	0.000	0.0
DEC.	1	0.47	0.68	0.19	0.22	0.46	0.03	5	121.0	0.000	0.0
	2	0.71	0.90	0.20	0.16	0.74	0.04	7	121.0	0.000	0.0
	3	1.32	1.56	0.22	0.13	1.43	0.03	6	121.0	0.000	0.0
JAN.	1	0.69	0.88	0.20	0.09	0.78	0.02	2	121.0	0.000	0.0
	2	1.60	1.82	0.19	0.07	1.74	0.05	4	121.0	0.000	0.0
	3	2.74	2.92	0.24	0.06	2.85	0.02	2	121.0	0.000	0.0
FEB.	1	3.42	3.99	0.24	0.01	3.98	0.00	0	121.0	0.000	0.0
	2	2.95	3.97	0.24	0.03	3.94	0.00	1	121.0	0.000	0.0
	3	2.03	2.44	0.20	0.02	2.42	0.00	1	121.0	0.000	0.0
MAR.	1	2.03	2.55	0.24	0.01	2.54	0.00	0	121.0	0.000	0.0
	2	2.54	2.95	0.24	0.00	2.95	0.00	0	121.0	0.000	0.0
	3	2.13	2.40	0.26	0.00	2.39	0.00	0	121.0	0.000	0.0
APR.	1	1.39	1.59	0.24	0.01	1.59	0.00	0	121.0	0.000	0.0
	2	1.51	2.08	0.24	0.01	2.07	0.00	0	121.0	0.000	0.0
	3	1.20	1.77	0.24	0.01	1.76	0.00	0	121.0	0.000	0.0
MAY.	1	0.96	1.24	0.24	0.03	1.22	0.00	0	121.0	0.000	0.0
	2	0.75	1.00	0.23	0.05	0.95	0.00	1	121.0	0.000	0.0
	3	0.88	1.15	0.25	0.06	1.09	0.01	1	121.0	0.000	0.0
JUN.	1	0.74	1.02	0.23	0.05	0.97	0.01	1	121.0	0.000	0.0
	2	0.68	0.95	0.23	0.05	0.90	0.00	0	121.0	0.000	0.0
	3	0.63	0.91	0.22	0.06	0.85	0.00	1	121.0	0.000	0.0
JUL.	1	0.55	0.81	0.21	0.07	0.75	0.00	1	121.0	0.000	0.0
	2	0.57	0.80	0.22	0.07	0.73	0.00	0	121.0	0.000	0.0
	3	0.71	1.00	0.24	0.08	0.92	0.00	0	121.0	0.000	0.0
AUG.	1	0.63	0.83	0.21	0.06	0.77	0.00	0	121.0	0.000	0.0
	2	0.77	1.13	0.22	0.06	1.06	0.00	1	121.0	0.000	0.0
	3	0.77	1.13	0.24	0.07	1.06	0.00	1	121.0	0.000	0.0
SEP.	1	0.56	0.71	0.21	0.07	0.63	0.00	1	121.0	0.000	0.0
	2	0.49	0.56	0.21	0.08	0.48	0.01	1	121.0	0.000	0.0
	3	0.40	0.49	0.20	0.12	0.37	0.01	2	121.0	0.000	0.0
OCT.	1	0.40	0.58	0.20	0.15	0.42	0.01	3	121.0	0.000	0.0
	2	0.31	0.46	0.20	0.20	0.26	0.02	4	121.0	0.000	0.0
	3	0.29	0.45	0.21	0.25	0.20	0.04	7	121.0	0.000	0.0
		38.69	49.10	7.88	3.11	46.00	0.51	81	-	0.000	0.0

TABLE A.3.10 AVERAGE WATER BALANCE (1966 - 1986) (2/5)
(WITHOUT THE PROJECT)

Total Water Requirement : 0.78 m^3/sec (Demand as of 1990)
LWL : 121 m
HWL : 121 m
Effective Storage : 0.0 MCM Dead Storage : 0.0 MCM

SEASON		INFLOW* Resi (MCM)	INFLOW* Dam (MCM)	PIPELINE SUPPLY (MCM)	RELEASE (MCM)	SPILLOUT (MCM)	DEFICIT & NUMBER (MCM)		WATER LEVEL (m)	EVAPORATION (MCM)	LEAKAGE (MCM)
NOV.	1	0.28	0.47	0.18	0.22	0.25	0.06	9	121.0	0.000	0.0
	2	0.24	0.40	0.18	0.23	0.17	0.07	9	121.0	0.000	0.0
	3	0.32	0.51	0.19	0.23	0.29	0.05	8	121.0	0.000	0.0
DEC.	1	0.47	0.68	0.19	0.21	0.47	0.02	5	121.0	0.000	0.0
	2	0.71	0.90	0.20	0.16	0.75	0.03	6	121.0	0.000	0.0
	3	1.32	1.56	0.22	0.13	1.44	0.03	5	121.0	0.000	0.0
JAN.	1	0.69	0.88	0.20	0.09	0.79	0.02	2	121.0	0.000	0.0
	2	1.60	1.82	0.19	0.07	1.75	0.05	4	121.0	0.000	0.0
	3	2.74	2.92	0.24	0.06	2.86	0.02	2	121.0	0.000	0.0
FEB.	1	3.42	3.99	0.24	0.01	3.98	0.00	0	121.0	0.000	0.0
	2	2.95	3.97	0.24	0.02	3.94	0.00	1	121.0	0.000	0.0
	3	2.03	2.44	0.20	0.02	2.42	0.00	1	121.0	0.000	0.0
MAR.	1	2.03	2.55	0.24	0.01	2.54	0.00	0	121.0	0.000	0.0
	2	2.54	2.95	0.24	0.00	2.95	0.00	0	121.0	0.000	0.0
	3	2.13	2.40	0.26	0.00	2.39	0.00	0	121.0	0.000	0.0
APR.	1	1.39	1.59	0.24	0.00	1.59	0.00	0	121.0	0.000	0.0
	2	1.51	2.08	0.24	0.01	2.07	0.00	0	121.0	0.000	0.0
	3	1.20	1.77	0.24	0.01	1.76	0.00	0	121.0	0.000	0.0
MAY.	1	0.96	1.24	0.24	0.02	1.22	0.00	0	121.0	0.000	0.0
	2	0.75	1.00	0.23	0.04	0.96	0.00	1	121.0	0.000	0.0
	3	0.88	1.15	0.25	0.06	1.10	0.01	1	121.0	0.000	0.0
JUN.	1	0.74	1.02	0.23	0.04	0.98	0.01	1	121.0	0.000	0.0
	2	0.68	0.95	0.23	0.04	0.91	0.00	0	121.0	0.000	0.0
	3	0.63	0.91	0.22	0.05	0.86	0.00	0	121.0	0.000	0.0
JUL.	1	0.55	0.81	0.21	0.06	0.75	0.00	1	121.0	0.000	0.0
	2	0.57	0.80	0.22	0.06	0.74	0.00	0	121.0	0.000	0.0
	3	0.71	1.00	0.24	0.07	0.93	0.00	0	121.0	0.000	0.0
AUG.	1	0.63	0.83	0.21	0.06	0.77	0.00	0	121.0	0.000	0.0
	2	0.77	1.13	0.22	0.06	1.07	0.00	1	121.0	0.000	0.0
	3	0.77	1.13	0.24	0.07	1.06	0.00	1	121.0	0.000	0.0
SEP.	1	0.56	0.71	0.21	0.07	0.64	0.00	1	121.0	0.000	0.0
	2	0.49	0.56	0.21	0.07	0.49	0.01	1	121.0	0.000	0.0
	3	0.40	0.49	0.20	0.11	0.38	0.01	2	121.0	0.000	0.0
OCT.	1	0.40	0.58	0.20	0.14	0.43	0.01	1	121.0	0.000	0.0
	2	0.31	0.46	0.20	0.19	0.27	0.01	4	121.0	0.000	0.0
	3	0.29	0.45	0.21	0.24	0.21	0.03	6	121.0	0.000	0.0
		38.69	49.10	7.88	2.93	46.18	0.44	73	-	0.000	0.0

TABLE A.3.10 AVERAGE WATER BALANCE (1966 - 1986) (3/5)
(WITHOUT THE PROJECT)

Total Water Requirement : 0.92 m^3/sec (Demand as of 2000)
LWL : 121 m
HWL : 121 m
Effective Storage : 0.0 MCM Dead Storage : 0.0 MCM

SEASON		INFLOW* Resi (MCM)	INFLOW* Dam (MCM)	PIPELINE SUPPLY (MCM)	RELEASE (MCM)	SPILLOUT (MCM)	DEFICIT & NUMBER (MCM)	WATER LEVEL (m)	EVAPORATION (MCM)	LEAKAGE (MCM)
NOV.	1	0.28	0.47	0.18	0.26	0.21	0.11 10	121.0	0.000	0.0
	2	0.24	0.40	0.18	0.28	0.13	0.13 13	121.0	0.000	0.0
	3	0.32	0.51	0.19	0.26	0.25	0.12 14	121.0	0.000	0.0
DEC.	1	0.47	0.68	0.19	0.26	0.42	0.07 11	121.0	0.000	0.0
	2	0.71	0.90	0.20	0.18	0.73	0.09 10	121.0	0.000	0.0
	3	1.32	1.56	0.22	0.15	1.41	0.07 7	121.0	0.000	0.0
JAN.	1	0.69	0.88	0.20	0.13	0.75	0.03 4	121.0	0.000	0.0
	2	1.60	1.82	0.19	0.10	1.72	0.08 5	121.0	0.000	0.0
	3	2.74	2.92	0.24	0.08	2.83	0.03 3	121.0	0.000	0.0
FEB.	1	3.42	3.99	0.24	0.03	3.96	0.00 0	121.0	0.000	0.0
	2	2.95	3.97	0.24	0.04	3.93	0.01 1	121.0	0.000	0.0
	3	2.03	2.44	0.20	0.02	2.41	0.01 1	121.0	0.000	0.0
MAR.	1	2.03	2.55	0.24	0.02	2.53	0.00 0	121.0	0.000	0.0
	2	2.54	2.95	0.24	0.00	2.95	0.00 0	121.0	0.000	0.0
	3	2.13	2.40	0.26	0.02	2.37	0.00 0	121.0	0.000	0.0
APR.	1	1.39	1.59	0.24	0.02	1.57	0.00 0	121.0	0.000	0.0
	2	1.51	2.08	0.24	0.03	2.05	0.00 0	121.0	0.000	0.0
	3	1.20	1.77	0.24	0.03	1.73	0.00 0	121.0	0.000	0.0
MAY.	1	0.96	1.24	0.24	0.05	1.19	0.00 1	121.0	0.000	0.0
	2	0.75	1.00	0.23	0.07	0.93	0.01 1	121.0	0.000	0.0
	3	0.88	1.15	0.25	0.10	1.06	0.01 2	121.0	0.000	0.0
JUN.	1	0.74	1.02	0.23	0.07	0.95	0.02 2	121.0	0.000	0.0
	2	0.68	0.95	0.23	0.08	0.87	0.00 1	121.0	0.000	0.0
	3	0.63	0.91	0.22	0.10	0.81	0.01 1	121.0	0.000	0.0
JUL.	1	0.55	0.81	0.21	0.11	0.70	0.01 1	121.0	0.000	0.0
	2	0.57	0.80	0.22	0.12	0.68	0.00 1	121.0	0.000	0.0
	3	0.71	1.00	0.24	0.13	0.87	0.00 0	121.0	0.000	0.0
AUG.	1	0.63	0.83	0.21	0.10	0.73	0.00 1	121.0	0.000	0.0
	2	0.77	1.13	0.22	0.10	1.02	0.01 1	121.0	0.000	0.0
	3	0.77	1.13	0.24	0.11	1.02	0.01 1	121.0	0.000	0.0
SEP.	1	0.56	0.71	0.21	0.12	0.59	0.01 2	121.0	0.000	0.0
	2	0.49	0.56	0.21	0.14	0.42	0.01 3	121.0	0.000	0.0
	3	0.40	0.49	0.20	0.19	0.30	0.02 3	121.0	0.000	0.0
OCT.	1	0.40	0.58	0.20	0.22	0.35	0.04 7	121.0	0.000	0.0
	2	0.31	0.46	0.20	0.26	0.20	0.05 9	121.0	0.000	0.0
	3	0.29	0.45	0.21	0.30	0.15	0.09 11	121.0	0.000	0.0
		38.69	49.10	7.88	4.28	44.82	1.05 127	-	0.000	0.0

TABLE A.3.10 AVERAGE WATER BALANCE (1966 - 1986) (4/5)
(WITHOUT THE PROJECT)

Total Water Requirement : 1.00 m^3/sec (Demand as of 2010)
LWL : 121 m
HWL : 121 m
Effective Storage : 0.0 MCM Dead Storage : 0.0 MCM

SEASON		INFLOW* Resi (MCM)	INFLOW* Dam (MCM)	PIPELINE SUPPLY (MCM)	RELEASE (MCM)	SPILLOUT (MCM)	DEFICIT & NUMBER (MCM)		WATER LEVEL (m)	EVAPORATION (MCM)	LEAKAGE (MCM)
NOV.	1	0.28	0.47	0.18	0.28	0.19	0.15	14	121.0	0.000	0.0
	2	0.24	0.40	0.18	0.29	0.11	0.19	17	121.0	0.000	0.0
	3	0.32	0.51	0.19	0.27	0.24	0.17	15	121.0	0.000	0.0
DEC.	1	0.47	0.68	0.19	0.27	0.41	0.11	12	121.0	0.000	0.0
	2	0.71	0.90	0.20	0.18	0.72	0.12	11	121.0	0.000	0.0
	3	1.32	1.56	0.22	0.17	1.39	0.10	7	121.0	0.000	0.0
JAN.	1	0.69	0.88	0.20	0.15	0.73	0.05	4	121.0	0.000	0.0
	2	1.60	1.82	0.19	0.12	1.69	0.09	6	121.0	0.000	0.0
	3	2.74	2.92	0.24	0.10	2.82	0.04	3	121.0	0.000	0.0
FEB.	1	3.42	3.99	0.24	0.04	3.95	0.00	0	121.0	0.000	0.0
	2	2.95	3.97	0.24	0.05	3.92	0.01	1	121.0	0.000	0.0
	3	2.03	2.44	0.20	0.03	2.40	0.01	1	121.0	0.000	0.0
MAR.	1	2.03	2.55	0.24	0.03	2.53	0.00	0	121.0	0.000	0.0
	2	2.54	2.95	0.24	0.01	2.94	0.00	0	121.0	0.000	0.0
	3	2.13	2.40	0.26	0.04	2.35	0.00	0	121.0	0.000	0.0
APR.	1	1.39	1.59	0.24	0.03	1.56	0.00	0	121.0	0.000	0.0
	2	1.51	2.08	0.24	0.05	2.03	0.00	0	121.0	0.000	0.0
	3	1.20	1.77	0.24	0.05	1.71	0.00	0	121.0	0.000	0.0
MAY.	1	0.96	1.24	0.24	0.06	1.18	0.00	1	121.0	0.000	0.0
	2	0.75	1.00	0.23	0.09	0.91	0.01	1	121.0	0.000	0.0
	3	0.88	1.15	0.25	0.12	1.03	0.02	2	121.0	0.000	0.0
JUN.	1	0.74	1.02	0.23	0.09	0.93	0.03	2	121.0	0.000	0.0
	2	0.68	0.95	0.23	0.10	0.85	0.01	1	121.0	0.000	0.0
	3	0.63	0.91	0.22	0.14	0.77	0.01	1	121.0	0.000	0.0
JUL.	1	0.55	0.81	0.21	0.15	0.66	0.01	1	121.0	0.000	0.0
	2	0.57	0.80	0.22	0.15	0.65	0.00	2	121.0	0.000	0.0
	3	0.71	1.00	0.24	0.16	0.84	0.00	1	121.0	0.000	0.0
AUG.	1	0.63	0.83	0.21	0.13	0.70	0.01	1	121.0	0.000	0.0
	2	0.77	1.13	0.22	0.13	0.99	0.01	2	121.0	0.000	0.0
	3	0.77	1.13	0.24	0.14	0.99	0.01	1	121.0	0.000	0.0
SEP.	1	0.56	0.71	0.21	0.16	0.55	0.02	3	121.0	0.000	0.0
	2	0.49	0.56	0.21	0.18	0.38	0.02	3	121.0	0.000	0.0
	3	0.40	0.49	0.20	0.23	0.26	0.04	8	121.0	0.000	0.0
OCT.	1	0.40	0.58	0.20	0.26	0.32	0.06	9	121.0	0.000	0.0
	2	0.31	0.46	0.20	0.29	0.17	0.09	11	121.0	0.000	0.0
	3	0.29	0.45	0.21	0.33	0.13	0.13	13	121.0	0.000	0.0
		38.69	49.10	7.88	5.09	44.01	1.53	154	-	0.000	0.0

TABLE A.3.10 AVERAGE WATER BALANCE (1966 - 1986) (5/5)
(WITHOUT THE PROJECT)

Total Water Requirement : 1.05 m^3/sec (Demand as of 2030)
LWL : 121 m
HWL : 121 m
Effective Storage : 0.0 MCM Dead Storage : 0.0 MCM

SEASON		INFLOW* Resi (MCM)	INFLOW* Dam (MCM)	PIPELINE SUPPLY (MCM)	RELEASE (MCM)	SPILLOUT (MCM)	DEFICIT & NUMBER (MCM)		WATER LEVEL (m)	EVAPORA-TION (MCM)	LEAKAGE (MCM)
NOV.	1	0.28	0.47	0.18	0.29	0.18	0.18	16	121.0	0.000	0.0
	2	0.24	0.40	0.18	0.29	0.11	0.22	17	121.0	0.000	0.0
	3	0.32	0.51	0.19	0.27	0.24	0.20	15	121.0	0.000	0.0
DEC.	1	0.47	0.68	0.19	0.28	0.40	0.14	13	121.0	0.000	0.0
	2	0.71	0.90	0.20	0.19	0.72	0.15	11	121.0	0.000	0.0
	3	1.32	1.56	0.22	0.18	1.38	0.12	7	121.0	0.000	0.0
JAN.	1	0.69	0.88	0.20	0.17	0.71	0.06	6	121.0	0.000	0.0
	2	1.60	1.82	0.19	0.13	1.68	0.11	6	115.2	0.000	0.0
	3	2.74	2.92	0.24	0.11	2.81	0.05	4	121.0	0.000	0.0
FEB.	1	3.42	3.99	0.24	0.04	3.94	0.00	0	121.0	0.000	0.0
	2	2.95	3.97	0.24	0.05	3.92	0.01	1	121.0	0.000	0.0
	3	2.03	2.44	0.20	0.04	2.40	0.01	1	121.0	0.000	0.0
MAR.	1	2.03	2.55	0.24	0.03	2.52	0.00	0	121.0	0.000	0.0
	2	2.54	2.95	0.24	0.02	2.93	0.00	0	121.0	0.000	0.0
	3	2.13	2.40	0.26	0.05	2.34	0.00	0	121.0	0.000	0.0
APR.	1	1.39	1.59	0.24	0.04	1.55	0.00	0	121.0	0.000	0.0
	2	1.51	2.08	0.24	0.07	2.01	0.00	0	121.0	0.000	0.0
	3	1.20	1.77	0.24	0.06	1.70	0.00	0	121.0	0.000	0.0
MAY.	1	0.96	1.24	0.24	0.08	1.17	0.01	1	121.0	0.000	0.0
	2	0.75	1.00	0.23	0.11	0.89	0.01	2	121.0	0.000	0.0
	3	0.88	1.15	0.25	0.13	1.02	0.03	3	121.0	0.000	0.0
JUN.	1	0.74	1.02	0.23	0.11	0.91	0.03	2	121.0	0.000	0.0
	2	0.68	0.95	0.23	0.13	0.82	0.01	1	121.0	0.000	0.0
	3	0.63	0.91	0.22	0.16	0.75	0.01	1	121.0	0.000	0.0
JUL.	1	0.55	0.81	0.21	0.18	0.63	0.01	1	121.0	0.000	0.0
	2	0.57	0.80	0.22	0.17	0.63	0.01	2	121.0	0.000	0.0
	3	0.71	1.00	0.24	0.18	0.82	0.01	3	121.0	0.000	0.0
AUG.	1	0.63	0.83	0.21	0.16	0.67	0.01	3	121.0	0.000	0.0
	2	0.77	1.13	0.22	0.15	0.98	0.02	3	121.0	0.000	0.0
	3	0.77	1.13	0.24	0.16	0.97	0.01	2	121.0	0.000	0.0
SEP.	1	0.56	0.71	0.21	0.18	0.52	0.03	3	121.0	0.000	0.0
	2	0.49	0.56	0.21	0.21	0.36	0.03	5	121.0	0.000	0.0
	3	0.40	0.49	0.20	0.26	0.24	0.06	9	121.0	0.000	0.0
OCT.	1	0.40	0.58	0.20	0.28	0.30	0.08	10	121.0	0.000	0.0
	2	0.31	0.46	0.20	0.30	0.16	0.11	14	121.0	0.000	0.0
	3	0.29	0.45	0.21	0.34	0.11	0.16	15	121.0	0.000	0.0
		38.69	49.10	7.88	5.61	43.49	1.89	177	-	0.000	0.0

TABLE A.3.11 WATER SUPPLY CONDITION WITHOUT THE PROJECT

(hydrological condition of 1983)

Unit : m^3/sec

	Year				
	1988	1990	2000	2010	2030
(a) Demand	0.800	0.780	0.920	1.000	1.050
(b) Deficit	0.063	0.060	0.124	0.170	0.199
(c) : (a)-(b)	0.737	0.720	0.796	0.830	0.851
Capacity of Existing Facilities					
(d) Pailles pipelines	0.622	0.618	0.591	0.502	0.470
(e) Montebello pipeline	0.283	0.283	0.283	0.283	0.283
(f) : (d)+(e)	0.905	0.901	0.874	0.785	0.753
(g) Supply by Existing facilities	0.737	0.720	0.796	0.785	0.753
(h) : (g)/(a)	(0.92)	(0.92)	(0.87)	(0.79)	(0.72)

(average hydrological condition)

Unit : m^3/sec

	Year				
	1988	1990	2000	2010	2030
(a) Demand	0.800	0.780	0.920	1.000	1.050
(b) Deficit	0.016	0.014	0.033	0.048	0.060
(c) : (a)-(b)	0.784	0.766	0.887	0.952	0.990
Capacity of Existing Facilities					
(d) Pailles pipelines	0.622	0.618	0.591	0.502	0.470
(e) Montebello pipeline	0.283	0.283	0.283	0.283	0.283
(f) : (d)+(e)	0.905	0.901	0.874	0.785	0.753
(g) Supply by Existing facilities	0.784	0.766	0.874	0.785	0.753
(h) : (g)/(a)	(0.98)	(0.98)	(0.95)	(0.79)	(0.72)

TABLE A.5.1 RELATIONSHIP BETWEEN SEDIMENT AND SPECIFIC DISCHARGE

Station / Area	Sediment (mg/lit)	Discharge (m3/sec)	Speci.discharge (m3/sec/km2)
E04 (River Bateau)	170	0.17	0.318
Area= 0.537	245	0.90	1.676
(km2)	79	0.21	0.392
	73	0.31	0.572
	100	0.30	0.559
	119	0.24	0.454
	127	0.38	0.704
	90	0.26	0.490
	100	0.27	0.493
E05 (River Vacoas)	110	0.33	0.543
Area= 0.602	104	0.33	0.541
(km2)	150	0.23	0.384
	58	0.17	0.281
	54	0.94	1.560
	88	0.31	0.510
	92	0.43	0.708
	72	0.94	1.562
E06 (River Gontran)	116	0.52	1.044
Area= 0.494	75	0.16	0.329
(km2)	103	0.14	0.274
	169	0.44	0.889
	132	0.26	0.519
	104	0.19	0.389
	189	0.32	0.638
	111	0.15	0.306
	146	0.26	0.529
	159	0.63	1.268
W04 (River Terre Rouge)	770	60.00	3.409
Area= 17.6			
(km2)			
W13 (GRNW)	240	620.00	5.487
Area= 113.2			
(km2)			

Ref: (1) Data at E04,E05 and E06 are daily mean.
(2) Data at W13 and W04 are instanteous figures.

Table A.5.2 ESTIMATED SEDIMENT YIELD (TR0) RESERVOIR)

Year	(1) Sediment (m^3)	(2) Discharge (MCM)	Maximum sediment per day (m^3)	Maximum daily mean discharge (m^3/sec)	Specific discharge (m^3/sec)
1966	872.5	30.1	188.5	14.4	0.26
1967	4361.1	59.4	2310.2	50.4	0.92
1968	9595.5	81.5	2220.9	49.4	0.90
1969	904.0	40.3	104.1	10.7	0.19
1970	5902.6	83.5	703.7	27.8	0.51
1971	1614.8	39.1	312.4	18.5	0.34
1972	3403.0	62.6	739.1	28.5	0.52
1973	4047.7	66.4	785.4	29.4	0.54
1974	735.7	36.3	65.0	8.5	0.15
1975	7356.1	55.2	4607.8	71.1	1.30
1976	1161.2	43.5	112.8	11.1	0.20
1977	2190.6	52.0	183.4	14.2	0.26
1978	2029.6	51.3	297.1	18.1	0.33
1879	1073.4	40.0	68.9	8.7	0.16
1980	15476.0	121.1	1211.1	36.5	0.66
1981	2251.0	41.9	333.3	19.1	0.35
1982	7238.6	90.6	1080.4	34.4	0.63
1983	681.1	34.7	91.0	10.0	0.18
1984	1851.3	40.6	594.5	25.6	0.47
1985	8292.9	80.0	972.5	32.7	0.60
1986	1890.1	50.9	184.1	14.2	0.26
Average	3949	57.2	-	-	-

Ref: (1) Simulation under hydrological condition of recent 20 years
(2) Discharge at TR0 damsite
(3) Trap ratio is set to be 70 %.

TABLE A.6.1 MOKA RIVER DIVERSION WORKS

Daily Mean Discharge (m3/s)	Design Discharge (m3/s)	Velo. (m/s)	Flow Area (m2)	Base Width (m)	Height (m)	Slope (1/i)	Excavation Total(m3) (m3)	Lining Total(m2) (m2)	COST (Rs.1000) Excav.	Concre.	Rein.Bar	Total
0.1	0.5	0.48	1.0	0.0	1.00	85.00	5596	1325	337	298	112	747
0.2	1.0	0.57	1.8	0.0	1.35	85.00	6127	1705	369	383	144	896
0.3	1.5	0.63	2.4	0.0	1.55	85.00	6647	1956	401	440	165	1,005
0.5	2.5	0.73	3.4	0.6	1.60	85.00	7901	2252	476	506	190	1,172
1	5	0.87	5.8	1.0	1.95	85.00	10083	2860	608	642	241	1,491
2	10	1.03	9.7	1.0	2.65	85.00	13065	3696	788	831	311	1,930
4	20	1.23	16.3	1.9	3.20	85.00	18811	4717	1,134	1,060	397	2,591
6	30	1.35	22.3	4.8	2.90	85.00	27238	5571	1,642	1,252	469	3,363
10	50	1.54	32.5	5.1	3.70	85.00	35213	6653	2,123	1,495	561	4,178
20	100	1.84	54.5	5.0	5.30	85.00	50825	8507	3,064	1,911	717	5,692
30	150	2.03	73.8	5.1	6.40	85.00	64967	9879	3,916	2,220	832	6,968
50	250	2.31	108.4	5.0	8.20	85.00	89459	11969	5,393	2,689	1,008	9,090

TABLE A.6.2 ANNUAL COST AND REVENUE OF ELECTRIC POWERPLANT
(CASE I) (1/6)

Tailrace water level : EL. 118.0 m
Diversion from Moka River : Daily mean 0.0 m^3/sec

Install Discharge (m^3/sec)	Install Capacity (Kw)	3-hr Peak (Mwh)	Off-Peak(MWh) 12-hr (I)	Off-Peak(MWh) 24-hr (II)	Revenue (Rs.10^3)	Cost (Rs.10^3) Power House	Cost (Rs.10^3) Power Equip.	Cost (Rs.10^3) Penstock	Cost (Rs.10^3) Diver-sion(*)	Cost (Rs.10^3) Total	Annuatized Cost (Rs.10^3)	Net Annual Revenue (Rs.10^3)
0.2	86	121	484	362	677	339	735	0	0	1,074	131	547
0.4	172	242	966	718	1350	560	1,372	0	0	1,932	235	1,116
0.6	259	363	1444	1057	2014	751	1,977	0	0	2,728	332	1,682
0.8	345	484	1915	1286	2627	926	2,561	0	0	3,487	424	2,203
1.0	431	605	2374	1236	3119	1,089	3,131	0	0	4,220	513	2,606
2.0	862	1208	3515	1026	4672	1,803	5,842	0	0	7,645	929	3,743
3.0	1294	1807	3806	948	5593	2,424	8,415	0	0	10,838	1,317	4,276
4.0	1725	2399	3810	861	6271	2,990	10,901	0	0	13,891	1,688	4,583
6.0	2587	3505	3456	703	7252	4,021	15,702	0	0	19,723	2,397	4,856
8.0	3450	4214	3204	589	7856	4,963	20,342	0	0	25,305	3,075	4,781
10.0	4312	4723	2996	488	8260	5,844	24,867	0	0	30,711	3,732	4,528
12.0	5174	5135	2801	395	8561	6,679	29,301	0	0	35,980	4,372	4,189

(*) Design discharge for diversion channel is set 5 times as large as daily mean discharge.

TABLE A.6.2 ANNUAL COST AND REVENUE OF ELECTRIC POWERPLANT (CASE I) (2/6)

Tailrace water level : EL. 118.0 m

Diversion from Moka River : Daily mean 0.3 m^3/sec

Install Discharge (m^3/sec)	Install Capacity (Kw)	3-hr Peak (Mwh)	Off-Peak(MWh) 12-hr (I)	Off-Peak(MWh) 24-hr (II)	Revenue (Rs.10^3)	Cost (Rs.10^3) Power House	Power Equip.	Penstock	Diver-sion(*)	Total	Annuatized Cost (Rs.10^3)	Net Annual Revenue (Rs.10^3)
5.0	2156	3015	4628	916	7687	3,519	13,326	0	985	17,830	2,167	5,520
6.0	2587	3613	4432	790	8198	4,021	15,702	0	985	20,708	2,516	5,681
7.0	3018	4149	4189	711	8615	4,501	18,039	0	985	23,525	2,859	5,756
8.0	3450	4582	3983	648	8944	4,963	20,342	0	985	26,290	3,195	5,749
9.0	3881	4963	3782	592	9218	5,410	22,617	0	985	29,012	3,525	5,693
10.0	4312	5293	3599	537	9446	5,844	24,867	0	985	31,696	3,852	5,595
11.0	4743	5579	3446	478	9643	6,267	27,094	0	985	34,346	4,174	5,469
12.0	5174	5833	3302	424	9811	6,679	29,301	0	985	36,965	4,492	5,319
13.0	5606	6061	3170	378	9960	7,083	31,490	0	985	39,558	4,807	5,153

Diversion from Moka River : Daily mean 0.5 m^3/sec

5.0	2156	3022	5017	993	8037	3,519	13,326	0	1,229	18,075	2,196	5,841
6.0	2587	3605	4851	874	8556	4,021	15,702	0	1,229	20,953	2,546	6,010
7.0	3018	4104	4676	776	8976	4,501	18,039	0	1,229	23,769	2,888	6,087
8.0	3450	4538	4493	695	9319	4,963	20,342	0	1,229	26,535	3,224	6,094
9.0	3881	4941	4291	629	9613	5,410	22,617	0	1,229	29,257	3,555	6,058
10.0	4312	5309	4081	569	9863	5,844	24,867	0	1,229	31,940	3,881	5,982
11.0	4743	5640	3891	510	10084	6,267	27,094	0	1,229	34,590	4,203	5,881
12.0	5174	5934	3714	457	10274	6,679	29,301	0	1,229	37,210	4,522	5,753
13.0	5606	6195	3551	411	10439	7,083	31,490	0	1,229	39,802	4,837	5,603

(*) Design discharge for diversion channel is set 5 times as large as daily mean discharge.

TABLE A.6.2 ANNUAL COST AND REVENUE OF ELECTRIC POWERPLANT
(CASE I) (3/6)

Tailrace water level : EL. 118.0 m

Diversion from Moka River : Daily mean 1.0 m^3/sec

Install Discharge (m^3/sec)	Install Capacity (Kw)	3-hr Peak (Mwh)	Off-Peak(MWh) 12-hr (I)	Off-Peak(MWh) 24-hr (II)	Revenue (Rs.10^3)	Cost (Rs.10^3) Power House	Power Equip.	Penstock	Diver-sion(*)	Total	Annuatized Cost (Rs.10^3)	Net Annual Revenue (Rs.10^3)
5.0	2156	3025	5327	1188	8367	3,519	13,326	0	1,661	18,506	2,249	6,118
6.0	2587	3609	5246	1042	8944	4,021	15,702	0	1,661	21,384	2,599	6,346
7.0	3018	4110	5126	914	9398	4,501	18,039	0	1,661	24,201	2,941	6,457
8.0	3450	4546	4995	808	9774	4,963	20,342	0	1,661	26,966	3,277	6,497
9.0	3881	4949	4829	720	10090	5,410	22,617	0	1,661	29,688	3,608	6,482
10.0	4312	5320	4647	643	10359	5,844	24,867	0	1,661	32,372	3,934	6,425
11.0	4743	5657	4464	578	10591	6,267	27,094	0	1,661	35,022	4,256	6,335
12.0	5174	5963	4294	517	10797	6,679	29,301	0	1,661	37,641	4,574	6,223
13.0	*5606*	*6241*	*4127*	*462*	*10976*	*7,083*	*31,490*	0	*1,661*	*40,234*	*4,889*	*6,087*

Diversion from Moka River : Daily mean 2.0 m^3/sec

5.0	2156	3026	5372	1303	8450	3,519	13,326	0	2,244	19,089	2,320	6,130
6.0	2587	3610	5325	1202	9073	4,021	15,702	0	2,244	21,967	2,669	6,403
7.0	3018	4111	5246	1097	9568	4,501	18,039	0	2,244	24,784	3,012	6,557
8.0	3450	4547	5154	991	9976	4,963	20,342	0	2,244	27,549	3,348	6,628
9.0	3881	4951	5039	886	10326	5,410	22,617	0	2,244	30,271	3,678	6,648
10.0	4312	5322	4903	793	10626	5,844	24,867	0	2,244	32,955	4,004	6,621
11.0	4743	5659	4760	707	10881	6,267	27,094	0	2,244	35,605	4,326	6,555
12.0	5174	5966	4614	635	11103	6,679	29,301	0	2,244	38,224	4,645	6,459
13.0	5606	6244	4473	570	11299	7,083	31,490	0	2,244	40,817	4,960	6,340

(*) Design discharge for diversion channel is set 5 times as large as daily mean discharge.

TABLE A.6.2 ANNUAL COST AND REVENUE OF ELECTRIC POWERPLANT (CASE I) (4/6)

Tailrace water level : EL. 118.0 m

Diversion from Moka River : Daily mean 3.0 m^3/sec

Install Discharge (m^3/sec)	Install Capacity (Kw)	3-hr Peak (Mwh)	Off-Peak(MWh) 12-hr (I)	Off-Peak(MWh) 24-hr (II)	Revenue (Rs.10^3)	Cost (Rs.10^3) Power House	Power Equip.	Penstock	Diver-sion(*)	Total	Annuatized Cost (Rs.10^3)	Net Annual Revenue (Rs.10^3)
5.0	2156	3026	5379	1319	8462	3,519	13,326	0	2,676	19,521	2,372	6,090
6.0	2587	3610	5335	1234	9094	4,021	15,702	0	2,676	22,399	2,722	6,372
7.0	3018	4111	5261	1152	9602	4,501	18,039	0	2,676	25,216	3,064	6,538
8.0	3450	4547	5177	1061	10022	4,963	20,342	0	2,676	27,981	3,400	6,622
9.0	3881	4951	5070	968	10384	5,410	22,617	0	2,676	30,703	3,731	6,653
10.0	4312	5322	4954	867	10696	5,844	24,867	0	2,676	33,386	4,057	6,639
11.0	4743	5659	4827	782	10965	6,267	27,094	0	2,676	36,036	4,379	6,586
12.0	5174	5966	4697	706	11199	6,679	29,301	0	2,676	38,656	4,697	6,502

Diversion from Moka River : Daily mean 3.5 m^3/sec

5.0	2156	3026	5379	1323	8464	3,519	13,326	0	2,861	19,706	2,395	6,070
6.0	2587	3610	5337	1238	9097	4,021	15,702	0	2,861	22,584	2,744	6,353
7.0	3018	4111	5263	1163	9609	4,501	18,039	0	2,861	25,401	3,087	6,522
8.0	3450	4547	5182	1076	10032	4,963	20,342	0	2,861	28,166	3,423	6,609
9.0	3881	4951	5075	988	10396	5,410	22,617	0	2,861	30,888	3,753	6,643
10.0	4312	5322	4961	889	10711	5,844	24,867	0	2,861	33,572	4,079	6,631
11.0	4743	5659	4839	802	10982	6,267	27,094	0	2,861	36,221	4,401	6,580
12.0	5174	5966	4714	727	11221	6,679	29,301	0	2,861	38,841	4,720	6,501

(*) Design discharge for diversion channel is set 5 times as large as daily mean discharge.

TABLE A.6.2 ANNUAL COST AND REVENUE OF ELECTRIC POWERPLANT (CASE I) (5/6)

Tailrace water level : EL. 118.0 m

Diversion from Moka River : Daily mean 4.0 m^3/sec

Install Discharge (m^3/sec)	Install Capacity (Kw)	3-hr Peak (Mwh)	Off-Peak(MWh) 12-hr (I)	Off-Peak(MWh) 24-hr (II)	Revenue (Rs.10^3)	Cost (Rs.10^3) Power House	Cost (Rs.10^3) Power Equip.	Cost (Rs.10^3) Penstock	Cost (Rs.10^3) Diver-sion(*)	Cost (Rs.10^3) Total	Annuatized Cost (Rs.10^3)	Net Annual Revenue (Rs.10^3)
7.0	3018	4111	5265	1168	9612	4,501	18,039	0	3,032	25,571	3,107	6,505
8.0	3450	4547	5185	1084	10037	4,963	20,342	0	3,032	28,337	3,443	6,594
9.0	3881	4951	5078	1002	10404	5,410	22,617	0	3,032	31,059	3,774	6,629
10.0	4312	5322	4965	902	10719	5,844	24,867	0	3,032	33,742	4,100	6,619
11.0	4743	5659	4846	815	10993	6,267	27,094	0	3,032	36,392	4,422	6,571
12.0	5174	5966	4724	741	11234	6,679	29,301	0	3,032	39,012	4,741	6,494
13.0	5606	6245	4600	678	11445	7,083	31,490	0	3,032	41,604	5,056	6,389

Diversion from Moka River : Daily mean 6.0 m^3/sec

5.0	2156	3026	5380	1330	8468	3,519	13,326	0	3,615	20,460	2,486	5,982
6.0	2587	3610	5339	1245	9101	4,021	15,702	0	3,615	23,338	2,836	6,265
7.0	3018	4111	5269	1177	9619	4,501	18,039	0	3,615	26,155	3,178	6,440
8.0	3450	4547	5190	1097	10047	4,963	20,342	0	3,615	28,920	3,514	6,533
9.0	3881	4951	5083	1023	10416	5,410	22,617	0	3,615	31,642	3,845	6,571
10.0	4312	5322	4971	935	10737	5,844	24,867	0	3,615	34,326	4,171	6,565
11.0	4743	5659	4856	847	11014	6,267	27,094	0	3,615	36,975	4,493	6,521
12.0	5174	5966	4739	773	11259	6,679	29,301	0	3,615	39,595	4,811	6,448

(*) Design discharge for diversion channel is set 5 times as large as daily mean discharge.

TABLE A.6.2 ANNUAL COST AND REVENUE OF ELECTRIC POWERPLANT
(CASE I) (6/6)

Tailrace water level : EL. 118.0 m
Diversion from Moka River : Daily mean 8.0 m^3/sec

Install Discharge (m^3/sec)	Install Capacity (Kw)	3-hr Peak (Mwh)	Off-Peak(MWh) 12-hr (I)	24-hr (II)	Revenue (Rs.10^3)	Cost (Rs.10^3) Power House	Power Equip.	Penstock	Diver-sion(*)	Total	Annuatized Cost (Rs.10^3)	Net Annual Revenue (Rs.10^3)
5.0	2156	3026	5380	1333	8469	3,519	13,326	0	4,096	20,941	2,545	5,924
6.0	2587	3610	5339	1248	9102	4,021	15,702	0	4,096	23,819	2,894	6,208
7.0	3018	4111	5271	1178	9621	4,501	18,039	0	4,096	26,635	3,237	6,384
8.0	3450	4547	5192	1100	10050	4,963	20,342	0	4,096	29,401	3,573	6,478
9.0	3881	4951	5086	1026	10420	5,410	22,617	0	4,096	32,123	3,903	6,516
10.0	4312	5322	4974	946	10743	5,844	24,867	0	4,096	34,806	4,229	6,514
11.0	4743	5659	4859	860	11022	6,267	27,094	0	4,096	37,456	4,551	6,470
12.0	5174	5966	4744	787	11269	6,679	29,301	0	4,096	40,076	4,870	6,399

(*) Design discharge for diversion channel is set 5 times as large as daily mean discharge.

TABLE A.6.3 ANNUAL COST AND REVENUE OF ELECTRIC POWERPLANT
(CASE II)

Tailrace water level : EL. 76.0 m
Diversion from Moka River : Daily mean 3.0 m^3/sec

Install Discharge (m^3/sec)	Install Capacity (Kw)	3-hr Peak (Mwh)	Off-Peak(MWh) 12-hr (I)	Off-Peak(MWh) 24-hr (II)	Revenue (Rs.10^3)	Cost (Rs.10^3) Power House	Power Equip.	Penstock	Diver-sion(*)	Total	Annuatized Cost (Rs.10^3)	Net Annual Revenue (Rs.10^3)
1.0	776	900	3578	2261	4,846	1,302	3,713	48,101	2,676	55,792	6,780	(1,933)
2.0	1552	1798	6086	2434	8,000	2,165	6,928	71,314	2,676	83,083	10,096	(2,096)
3.0	2328	2695	7293	2274	9,977	2,917	9,979	90,128	2,676	105,700	12,844	(2,867)
4.0	3105	3590	7827	2096	11,408	3,604	12,928	106,590	2,676	125,798	15,286	(3,878)
5.0	3881	4478	7966	1953	12,527	4,248	15,803	121,512	2,676	144,239	17,527	(5,000)
6.0	4657	5344	7901	1825	13,464	4,860	18,621	135,319	2,676	161,475	19,622	(6,158)
7.0	5433	6093	7782	1705	14,220	5,445	21,392	148,267	2,676	177,780	21,603	(7,384)
8.0	6209	6738	7658	1570	14,840	6,009	24,124	160,527	2,676	193,335	23,493	(8,653)
9.0	6985	7335	7500	1432	15,375	6,555	26,822	172,216	2,676	208,268	25,308	(9,933)
10.0	7762	7884	7330	1283	15,838	7,086	29,489	183,422	2,676	222,673	27,058	(11,221)
11.0	8538	8382	7141	1157	16,234	7,603	32,131	194,213	2,676	236,622	28,753	(12,519)
12.0	9314	8836	6950	1044	16,581	8,109	34,748	204,640	2,676	250,172	30,400	(13,819)

(*) Design discharge for diversion channel is set 5 times as large as daily mean discharge.

TABLE A.6.4 AVERAGE SEASONAL POWER OUTPUT
(1966 - 1986)

Total Water Requirement : 1.05 m^3/sec
LWL : 139.0 m ; HWL : 189.0 m ; TWL : 118.0 m
Effective Storage : 6.4 MCM Dead Storage : .275 MCM
Diversion from River Moka : 3.0 m3/sec (daily mean)
Installed Discharge : 9.0 m^3/sec
Installed Capacity : 3900 kW

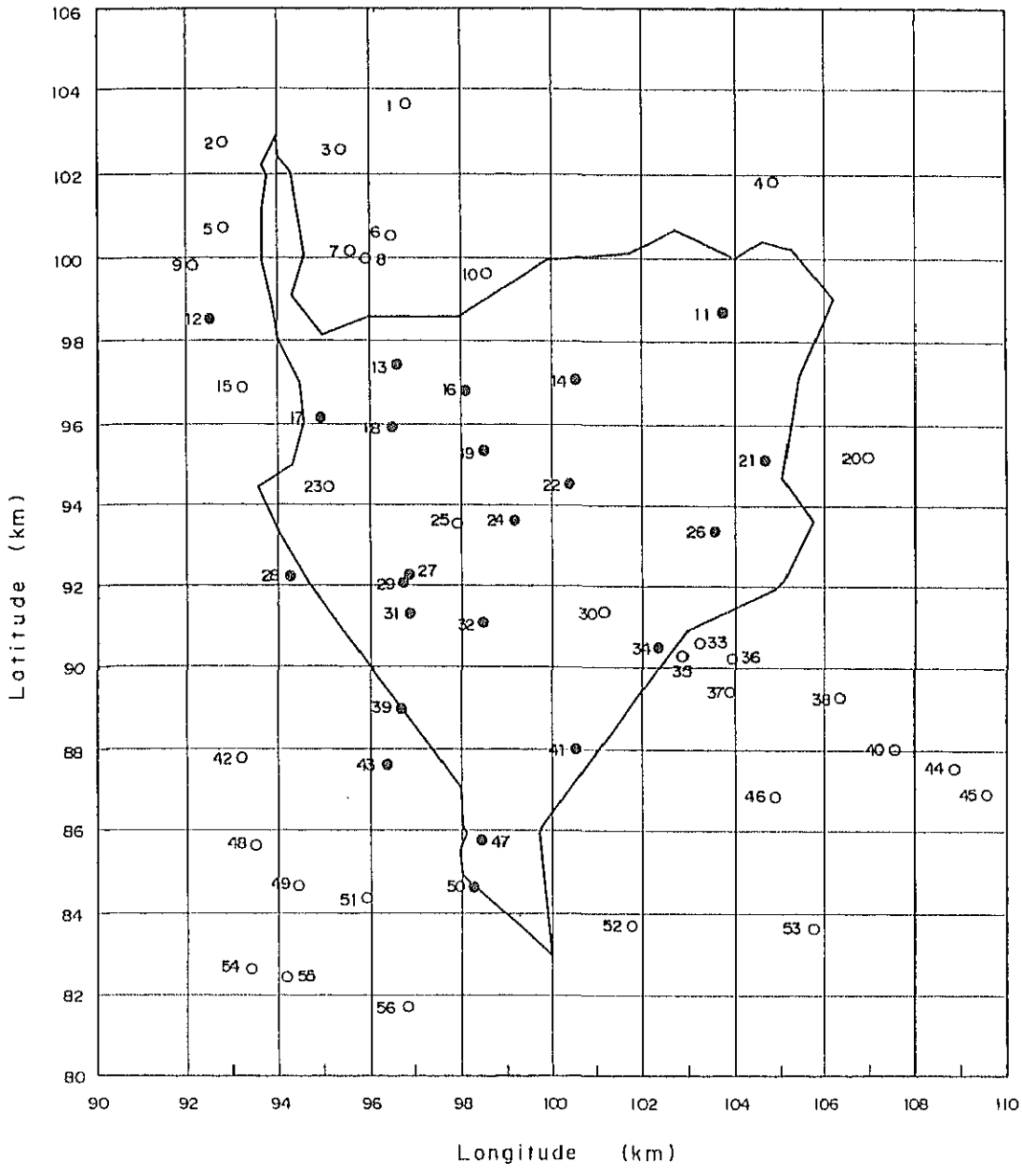
		(*) W/S (MWh)	(**) Spillout (MWh)	Peak (MWh)	Off-peak (I) (MWh)	Off-peak (II) (MWh)	Total (MWh)
Nov.	1	86.2	51.3	115.4	22.1	0.0	137.5
	2	92.4	33.5	111.1	14.8	0.0	125.9
	3	84.9	58.7	109.4	34.2	0.0	143.6
Dec.	1	75.0	101.7	109.7	67.0	0.0	176.7
	2	62.1	159.0	117.5	93.5	10.0	221.0
	3	55.4	258.5	132.3	145.2	36.5	314.0
Jan.	1	44.9	181.7	127.2	99.3	0.0	226.5
	2	44.6	327.4	133.1	170.8	68.1	372.0
	3	30.6	428.3	139.6	249.5	69.8	458.9
Feb.	1	11.8	726.0	139.2	425.1	173.5	737.8
	2	14.8	671.5	143.3	401.0	142.0	686.3
	3	12.6	407.3	121.0	239.3	59.5	419.8
Mar.	1	9.9	532.4	149.8	308.6	83.8	542.2
	2	11.5	554.0	150.3	306.1	109.1	565.5
	3	14.7	497.3	164.4	284.4	63.1	511.9
Apr.	1	15.0	387.5	150.1	221.3	31.1	402.5
	2	23.4	414.0	149.0	232.3	56.1	437.4
	3	21.5	402.5	148.5	244.4	31.1	424.0
May	1	24.3	300.1	147.2	172.5	4.6	324.3
	2	28.6	241.0	143.9	125.7	0.0	269.6
	3	36.0	271.9	157.2	146.5	4.3	308.0
Jun.	1	36.3	239.4	146.1	129.6	0.0	275.7
	2	37.2	208.9	142.8	103.3	0.0	246.1
	3	43.2	191.3	145.4	89.1	0.0	234.5
Jul.	1	47.0	168.8	145.3	70.5	0.0	215.8
	2	43.3	170.2	143.9	69.5	0.0	213.4
	3	42.2	217.4	154.2	105.4	0.0	259.6
Aug.	1	42.0	182.2	143.6	80.6	0.0	224.2
	2	37.1	241.8	143.2	114.2	21.5	278.9
	3	42.1	249.3	157.7	133.1	0.6	291.4
Sep.	1	48.0	151.9	139.4	60.4	0.0	199.8
	2	55.5	113.0	137.0	31.5	0.0	168.5
	3	67.1	79.9	126.8	20.2	0.0	147.0
Oct.	1	74.9	82.4	122.4	32.0	2.9	157.3
	2	80.9	53.1	117.4	16.6	0.0	134.0
	3	95.9	40.1	126.2	9.8	0.0	136.0
Total		1593.0	9395.1	4950.6	5069.8	967.7	10988.1

(*) Electricity generated by water which is to be used as water supply to Pailles Treatment plant

(**) Electricity generated by water which is otherwise unused as spilt water through spillway

FIGURES

Fig. A.2.1



No.	Station	No.	Station	No.	Station
1	Line Barracks	21	Alma	39	Vacoas
2	Pte. aux Sables	22	Cote d'Or	40	Dubreuil Factory
4	Industries	23	Ebene	41	Wooton
5	Richelieu	24	Bagatelle (H)	42	Holyrood
6	Les Guibies	25	Camoene	43	Reunion
7	Pailles	26	Valetta	44	Dubreuil (3E,3N,3W)
9	Les Rosieres	27	Maurifoods (Trianon)	45	La Pipe
10	Montagne (MDA)	28	Quatre Bornes	46	Chartreuse
11	Beau Bois (MDA)	29	Trianon	47	Curepipe Garden
12	Chebel	30	Hermitage	48	Moon
13	Bagatelle	31	Phoenix	49	Henrietta
14	Mon Desert Alma	32	Highlands	50	Curepipe experi. St.
15	Barkly	33	Belle Rive (1N)	51	La Marie
16	Minissy (MDA)	34	Belle Rive (SIRI)	52	XVI Mile
17	Bega	35	Belle Rive (2N)	53	Bananes
18	Reduit Experi. St.	36	Belle Rive (1E)	54	Tamarin (Res.)
19	Minissy (H)	37	Belle Rive (2E)	55	Bonnefin
20	Bonne Veine	38	Piton du Milieu	56	Good End

LEGEND

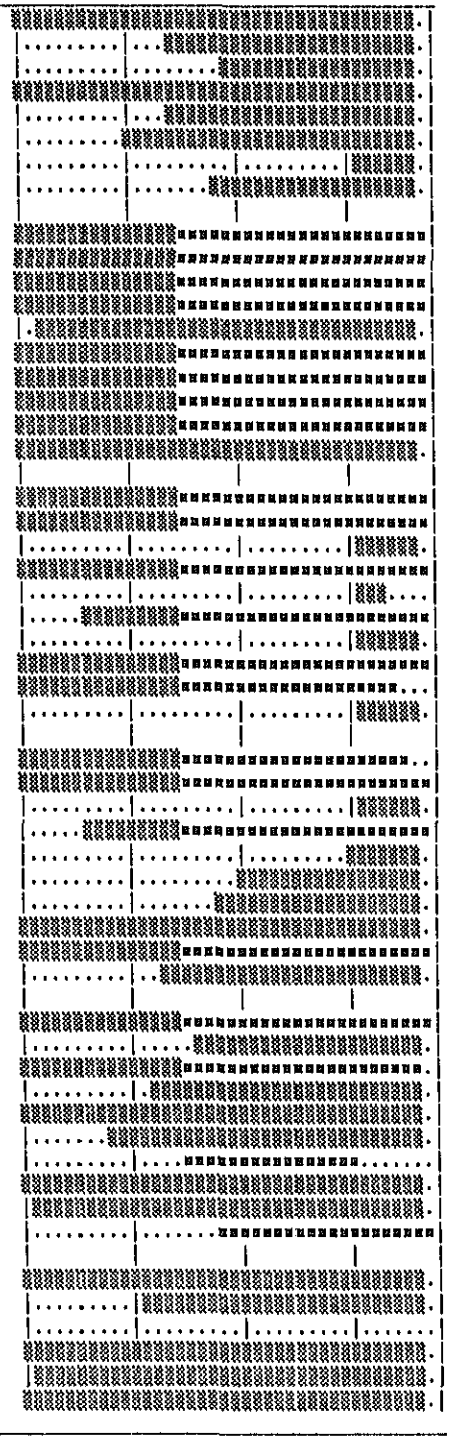
- ○ Rainfall Station
- ● " (Selected)
- —— Boundary of GRNW Basin

LOCATION OF RAINFALL STATIONS IN AND AROUND GRNW

GOVERNMENT OF MAURITIUS
PORT LOUIS WATER SUPPLY PROJECT
JAPAN INTERNATIONAL COOPERATION AGENCY

Fig. A.2.2

No.	(1) Ident	(2) Ident		Name of Station	Lat. (km)	Long. (km)
1	BB112			Line Barracks	97	295
2	DD101			Pte. aux Sables	102	272
4	BB313			Industries	107	341
5	DD203			Richelieu	113	272
6	BB214			Les Guibies	114	293
7	BB215			Pailles	116	288
9	DD204			Les Rosieres	118	268
10	119305			Montagne (MDA)	119	305
11	FF301	W18.MDA	(**)	Beau Bois (MDA)	124	335
12	*DD306*	*V6.MED*	(**)	*Chebel*	125	270
13	DD308	W4.MDA	(**)	Bagatelle (MDA)	131	292
14	FF302	W12.MDA	(**)	Mon Desert Alma	133	316
15	134274			Barkly	134	274
16	FF304	W6.MDA	(**)	Minissy (H)	143	306
17	DD312	W1.H	(**)	Bega	137	285
18	DD314	-	(**)	Le Reduit Experi. St.	139	293
19	FF303	W7.H	(**)	Minissy (MDA)	135	302
20	EE301	E15.MDA		Bonne Veine	143	353
21	FF405	W19.MDA	(**)	Alma	144	340
22	FF306	W11.H	(**)	Cote d'Or	147	315
23	147285			Ebene	147	285
24	FF307	W9.H	(**)	Bagatelle (H)	151	308
25	1532301			Camoene	152	301
26	FF408	W17.MDA	(**)	Valetta	152	334
27	FF310		(**)	Maurifoods (Trianon)	159	295
28	155288		(**)	Quatre Bornes	155	288
29	DD317	W3.MDA	(**)	Trianon	150	291
30	FF411	W14.H		Hermitage	161	318
31	FF312		(**)	Phoenix	164	295
32	FF313	W8.H	(**)	Highlands	164	305
33	FF414	E18.CWA		Belle Rive (1N)	166	333
34	FF415	W15.SIR	(**)	Belle Rive (SIR)	168	326
35	EE403	W16.CWA		Belle Rive (2N)	170	330
36	EE404	E17.CWA		Belle Rive (1E)	170	335
37	EE406	E16.CWA		Belle Rive (2E)	174	335
38	EE307	-		Piton du Milieu	175	346
39	FF316	.MET	(**)	Vacoas	176	294
40	EE310	E14.DUB		Dubreuil Factory	188	348
41	FF418	-	(**)	Wooton	182	316
42	FF320	T6.MED		Holyrood	186	275
43	FF319	T10.MED	(**)	Reunion	184	293
44	EE308	E13.CWA		Dubreuil (3N)	184	361
45	EE311	E12.CWA		La Pipe	188	368
46	EE309			Chartreuse	188	341
47	194304		(**)	Curpipe Gardens	194	304
48	FF321	T7.MED		Moon	192	276
49	FF422	T8.MED		Henrietta	199	281
50	FF423		(**)	Curepipe experi. St.	200	303
51	FF424	T9.MED		La Marie	201	290
52	EE412	G4.CWA		XVI Mile	205	323
53	220333	G3.RB		Bananes	220	333
54	FF425	S9.CEB		Tamarin (Res.)	211	275
55	FF426	S7.MED		Bonnefin	214	283
56	FF427	T11.CWA		Good End	216	294

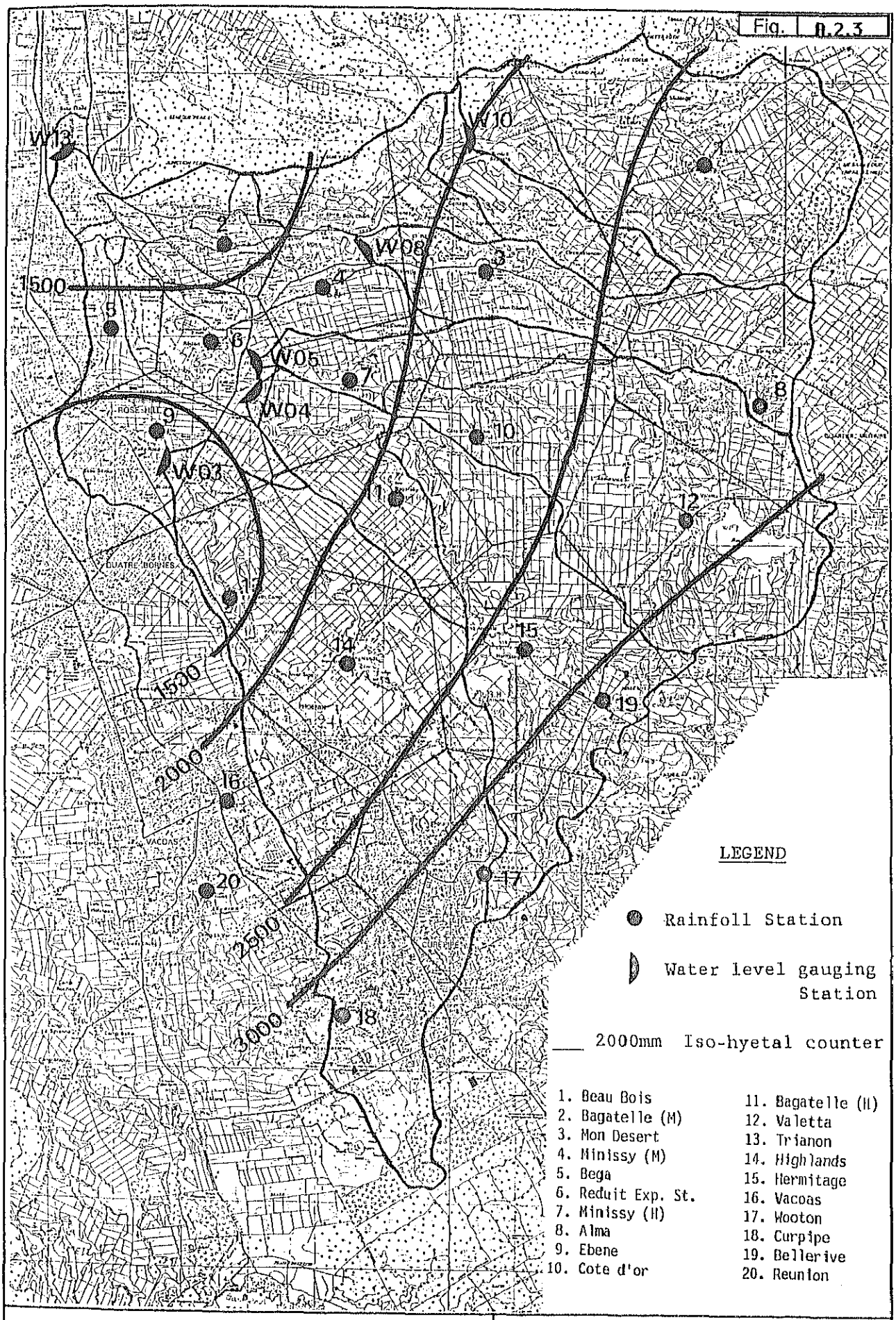


Ref: (1) Identifier by Meteorological Service
(2) Identifier by Hydrological section,CWA
(**) Selected stations for daily dase analysis (1965-1987)
▒▒ Period in which monthly data are available
▪▪ Period in which daily data are available

DURATION OF RECORD OF RAINFALL STATIONS

GOVERNMENT OF MAURITIUS
PORT LOUIS WATER SUPPLY PROJECT
JAPAN INTERNATIONAL COOPERATION AGENCY

Fig. D.2.3



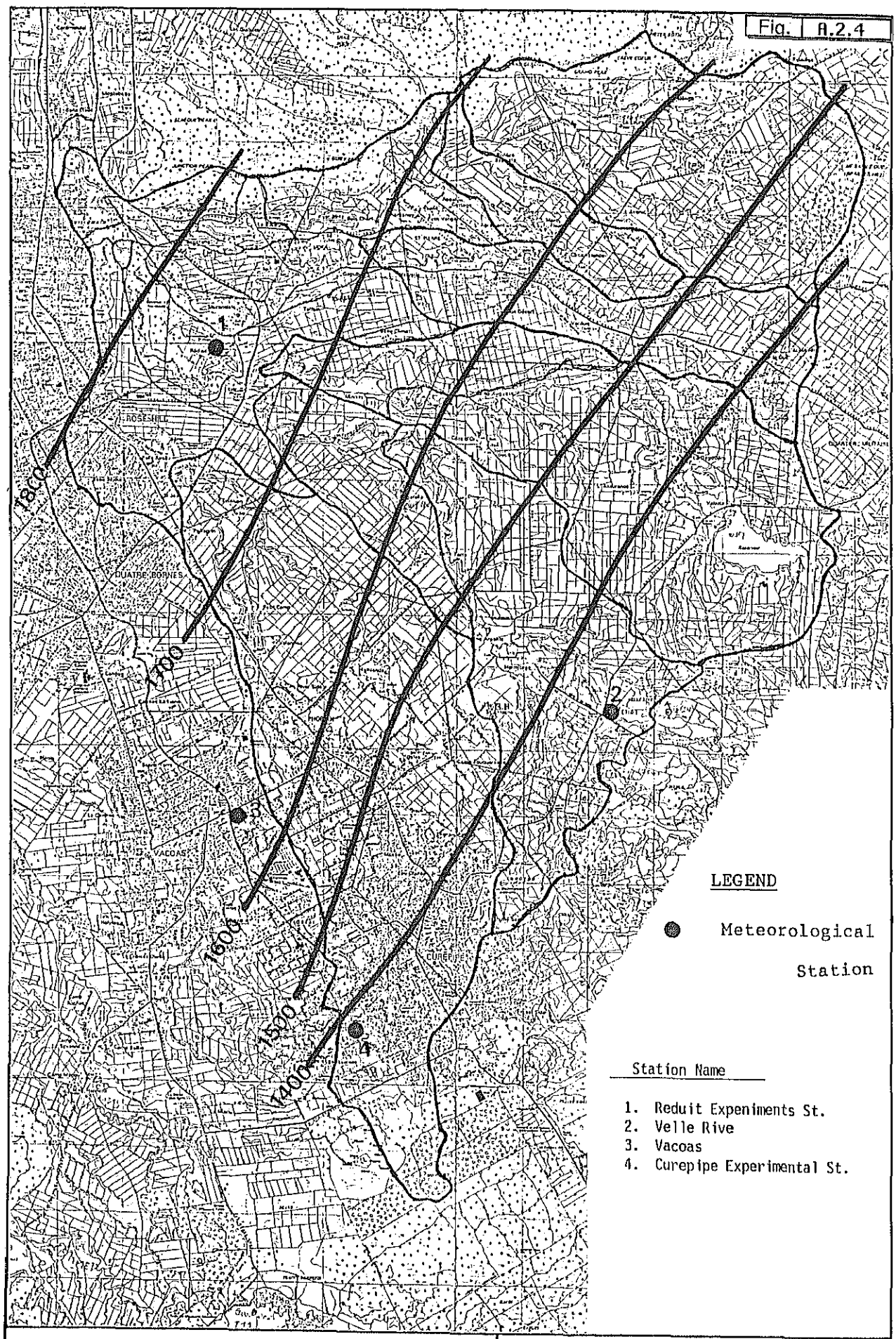
LEGEND

- Rainfoll Station
- Water level gauging Station
- 2000mm Iso-hyetal counter

LOCATION MAP OF WATER LEVEL GAUGING STATION AND SELECTED RAINFALL STATION

GOVERNMENT OF MAURITIUS
PORT LOUIS WATER SUPPLY PROJECT
JAPAN INTERNATIONAL COOPERATION AGENCY

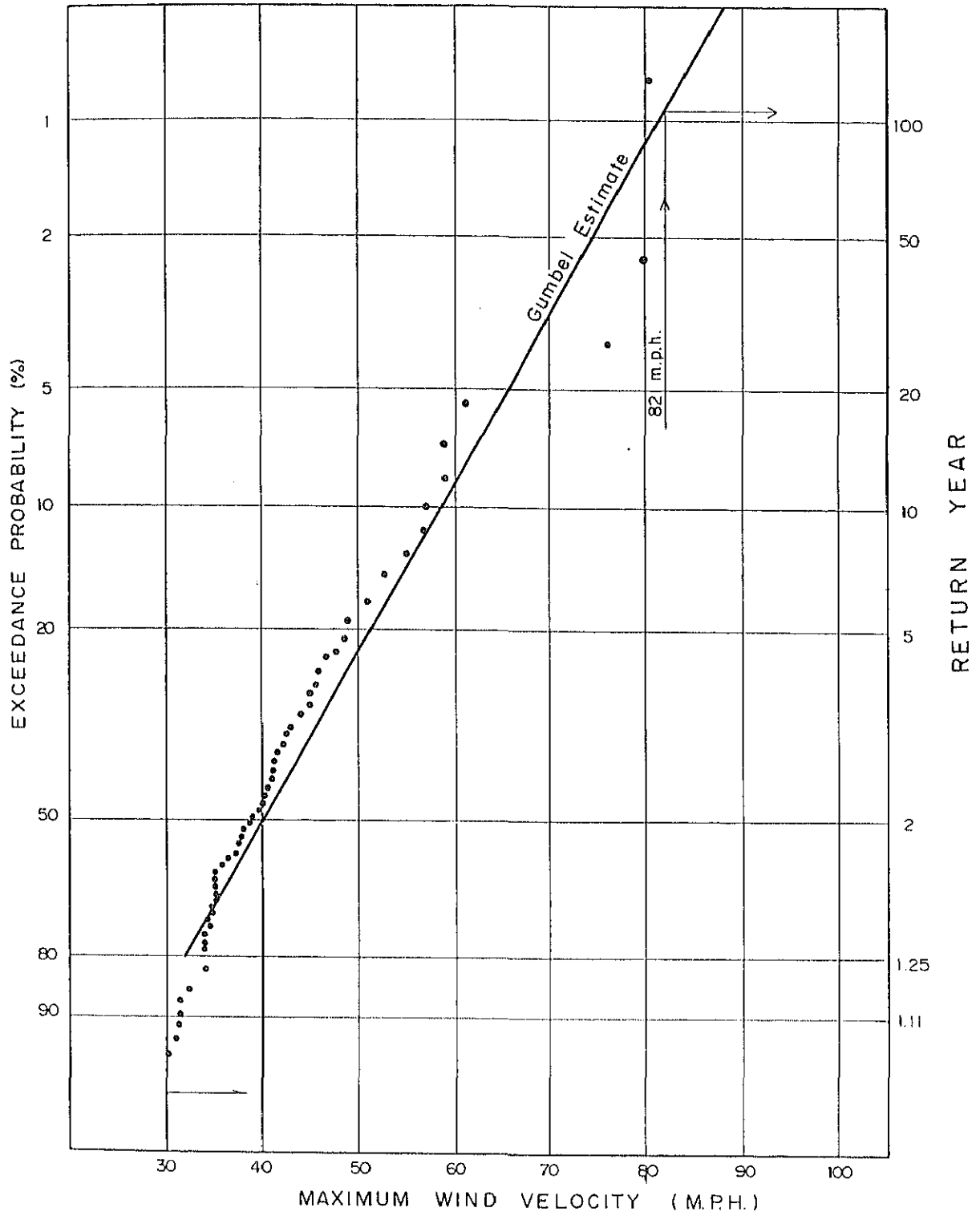
Fig. A.2.4



EVAPORATION IN THE GRNW BASIN

GOVERNMENT OF MAURITIUS
PORT LOUIS WATER SUPPLY PROJECT
JAPAN INTERNATIONAL COOPERATION AGENCY

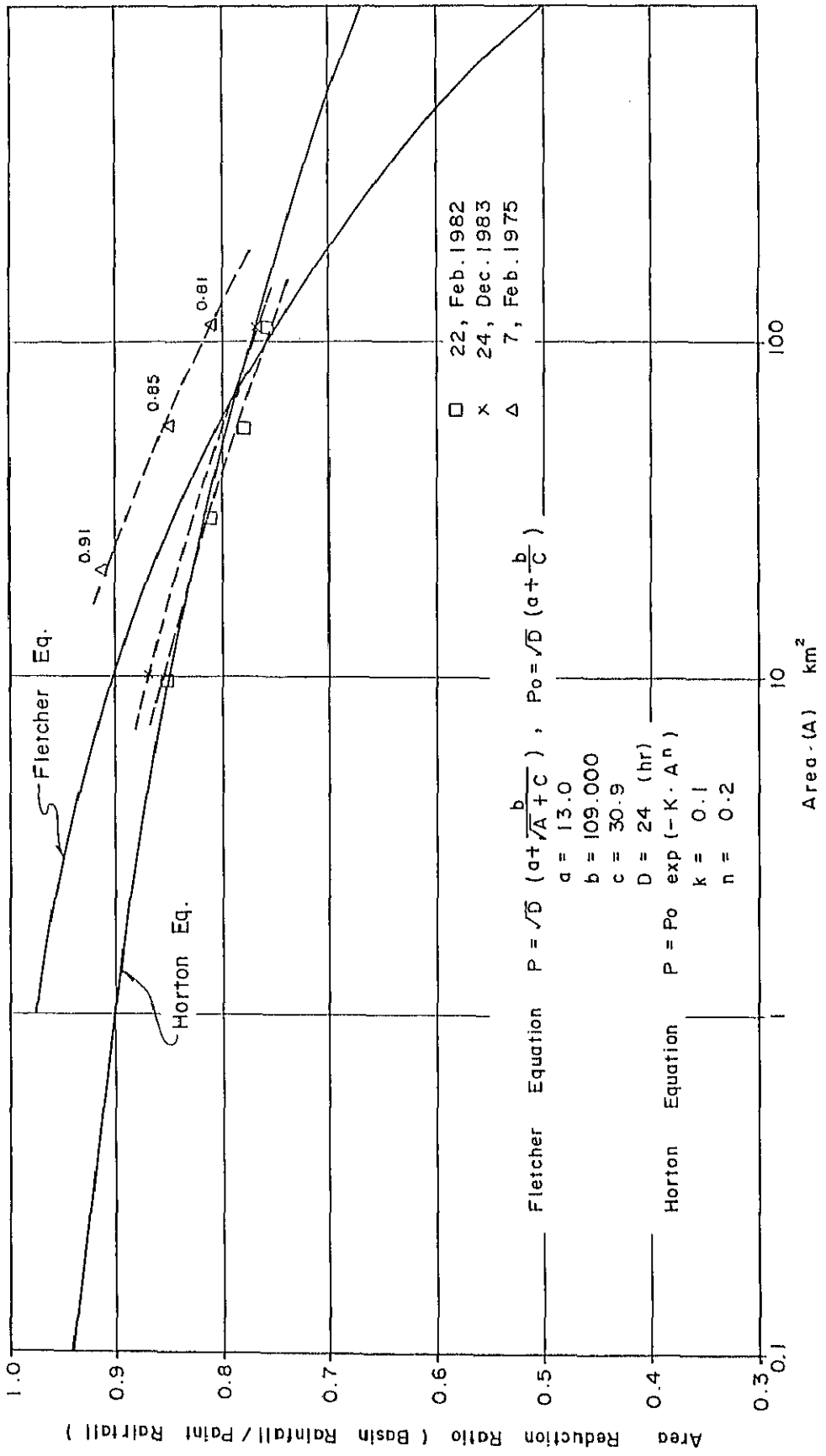
Fig. A.2.5



Annual highest wind speed of 30 MPH and above over a whole hour

PROBABILITY OF ANNUAL MAXIMUM WIND SPEED	GOVERNMENT OF MAURITIUS PORT LOUIS WATER SUPPLY PROJECT JAPAN INTERNATIONAL COOPERATION AGENCY

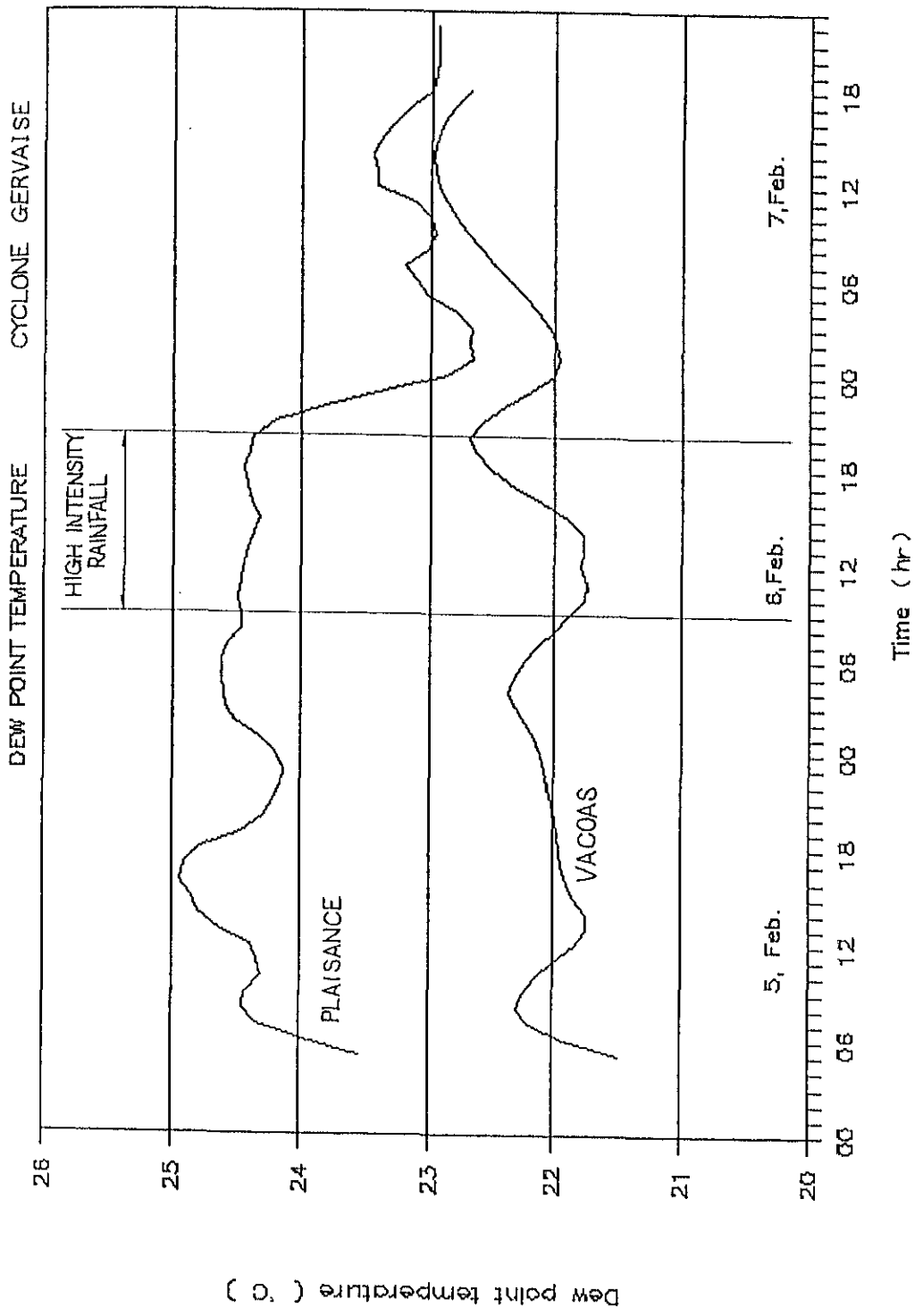
Fig. A.2.6



RELATIONSHIP BETWEEN AREA AND RAINFALL

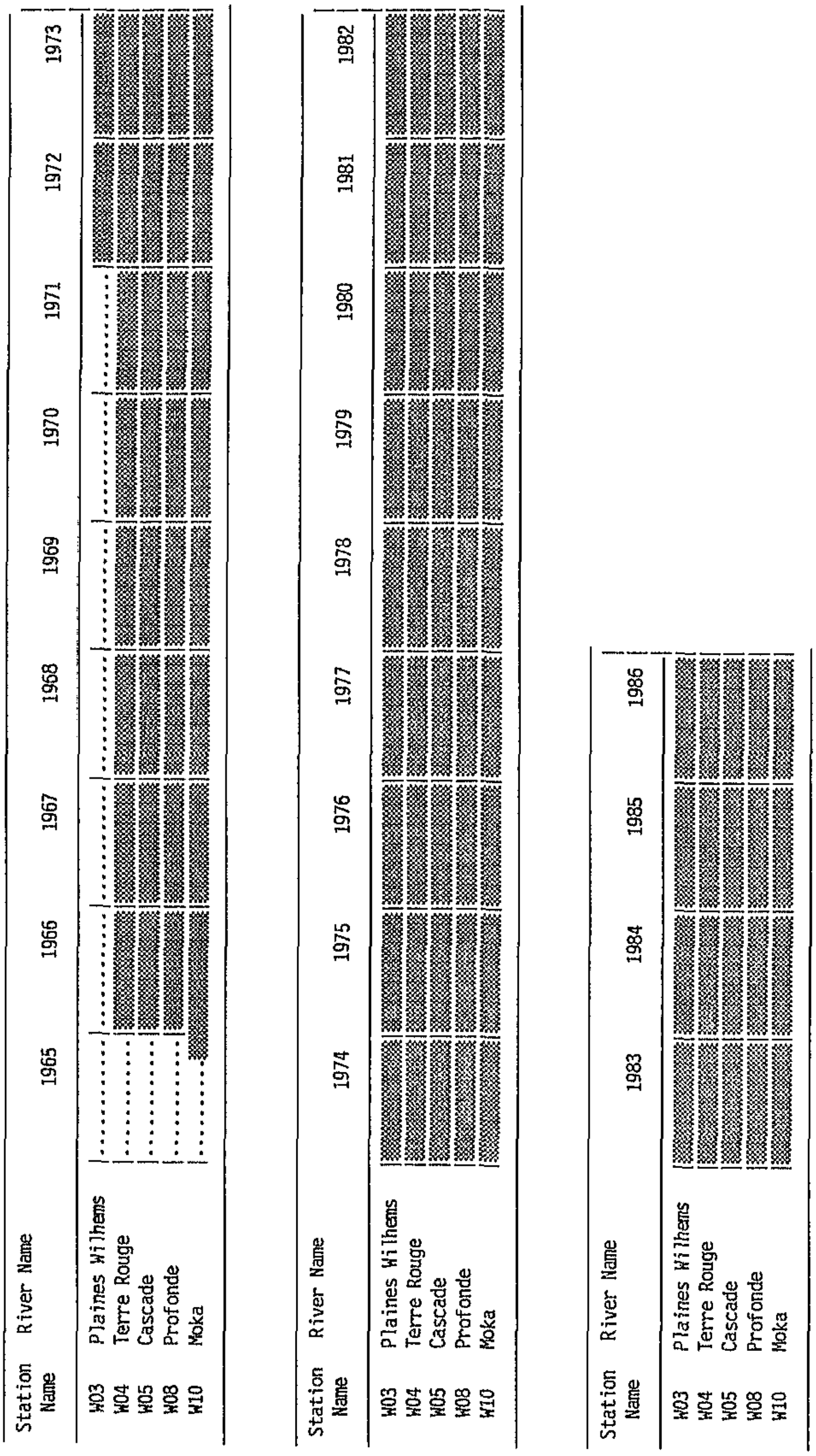
GOVERNMENT OF MAURITIUS
PORT LOUIS WATER SUPPLY PROJECT
JAPAN INTERNATIONAL COOPERATION AGENCY

Fig. A.2.7



DEW POINT TEMPERATURE	GOVERNMENT OF MAURITIUS PORT LOUIS WATER SUPPLY PROJECT JAPAN INTERNATIONAL COOPERATION AGENCY

Fig. A.3.1

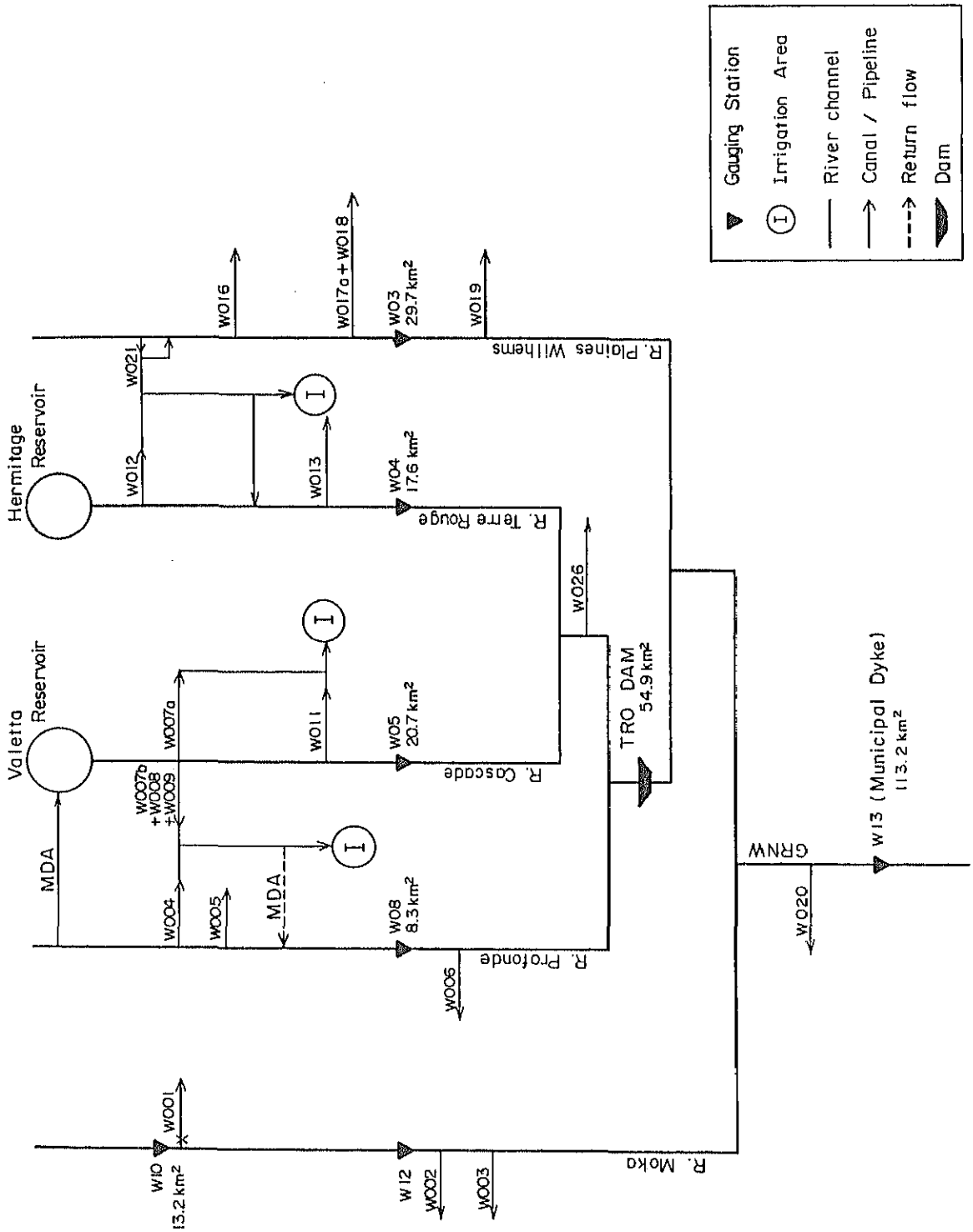


DURATION OF RECORD OF WATER LEVEL GAUGING STATIONS

GOVERNMENT OF MAURITIUS
PORT LOUIS WATER SUPPLY PROJECT

JAPAN INTERNATIONAL COOPERATION AGENCY

Fig. A.3.2

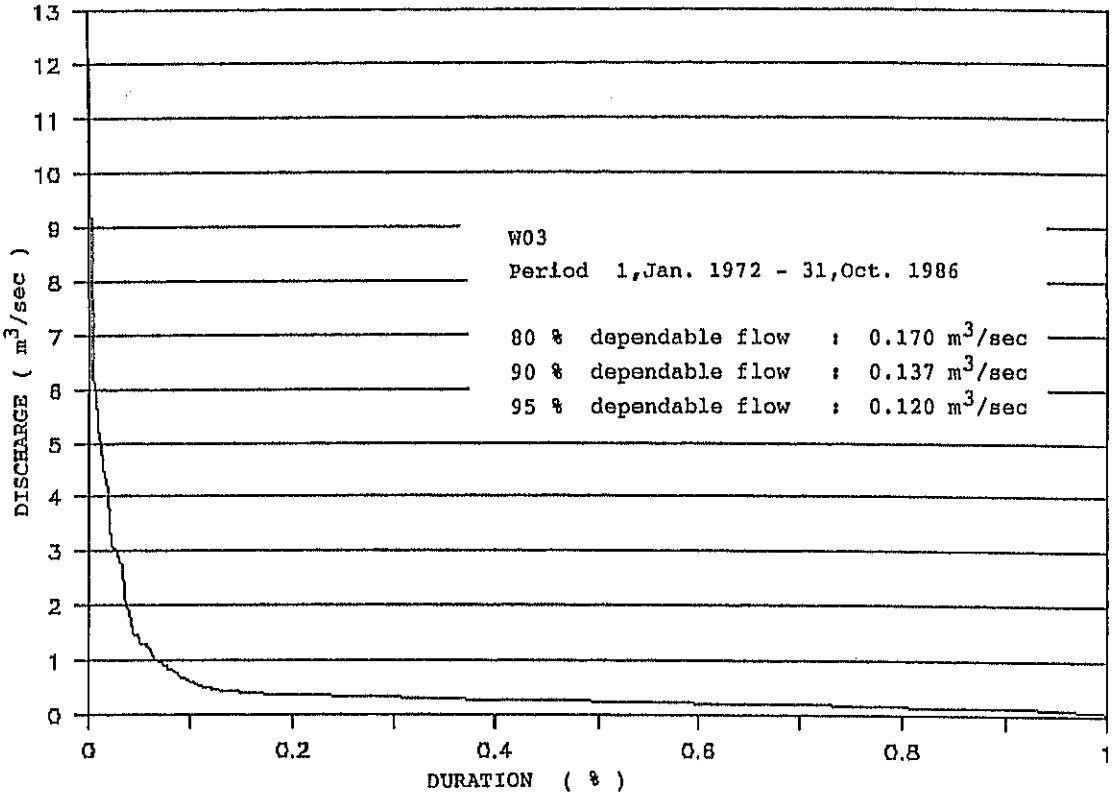


SIMPLIFIED RIVER FLOW DIAGRAM

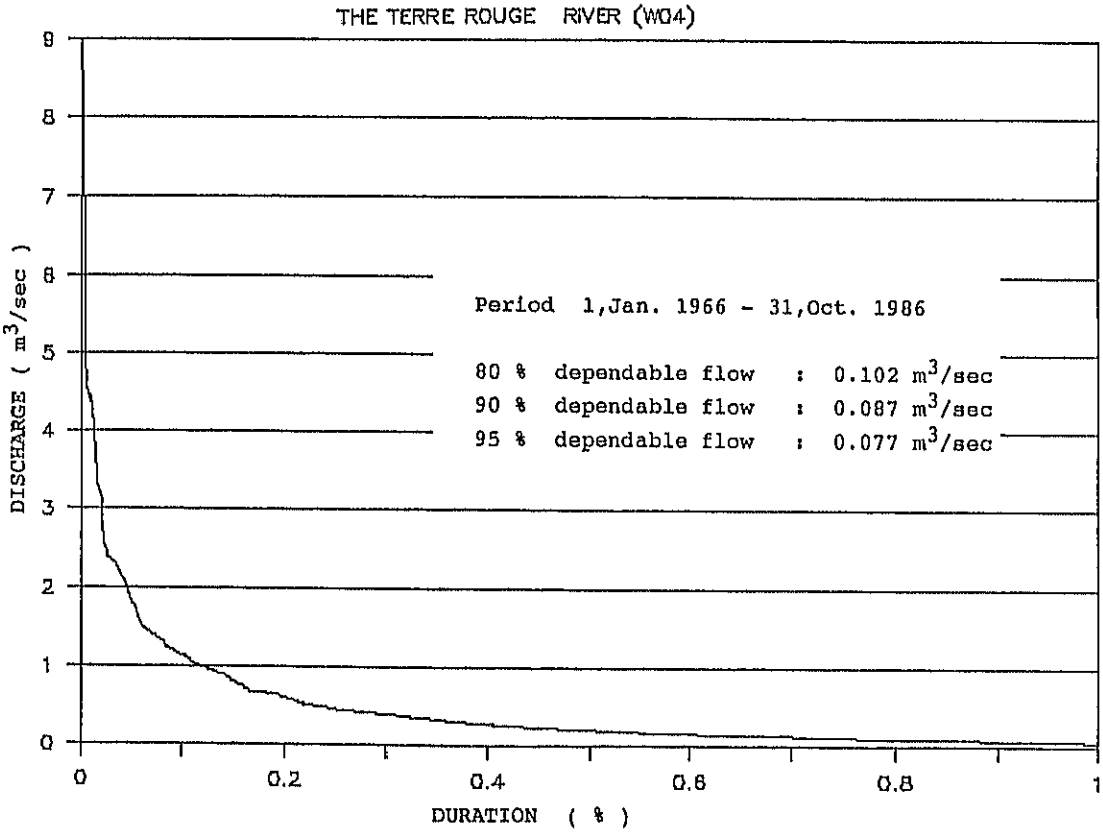
GOVERNMENT OF MAURITIUS
PORT LOUIS WATER SUPPLY PROJECT
JAPAN INTERNATIONAL COOPERATION AGENCY

Fig. A.3.3(1)

THE PLAINE WILHEMS RIVER (W03)

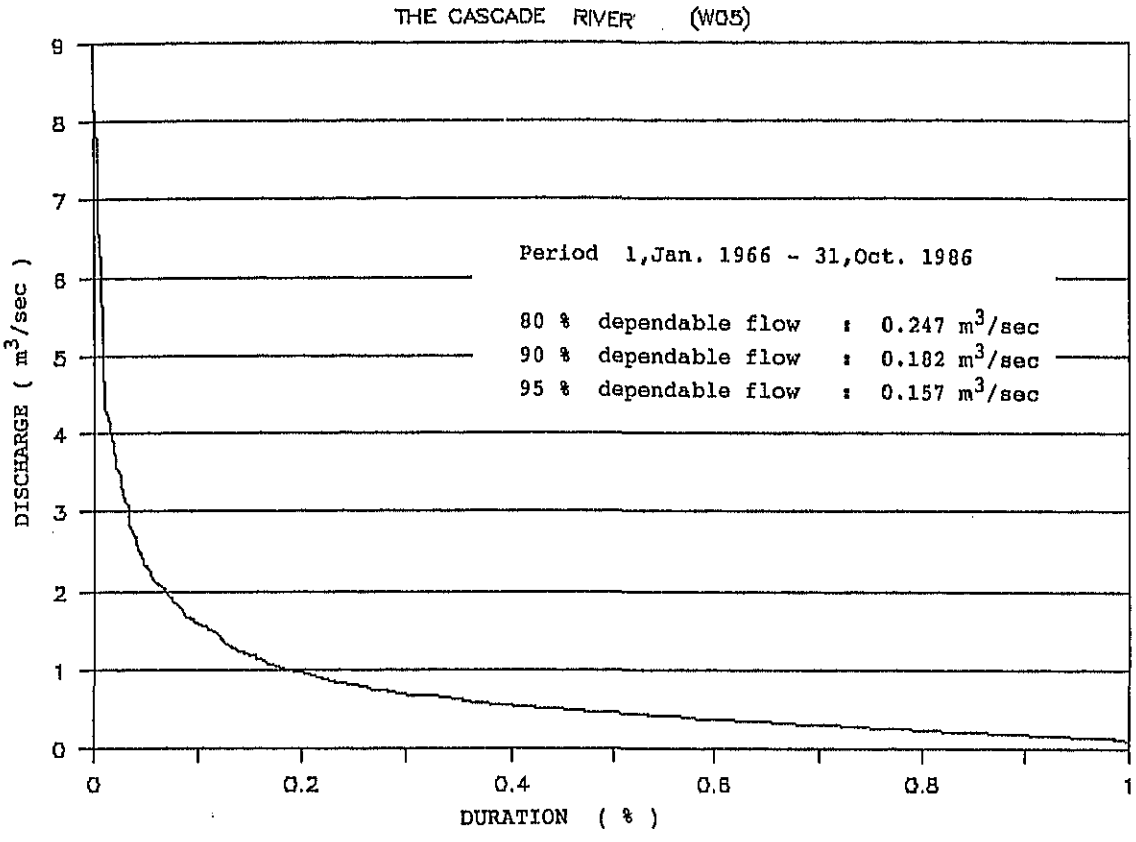


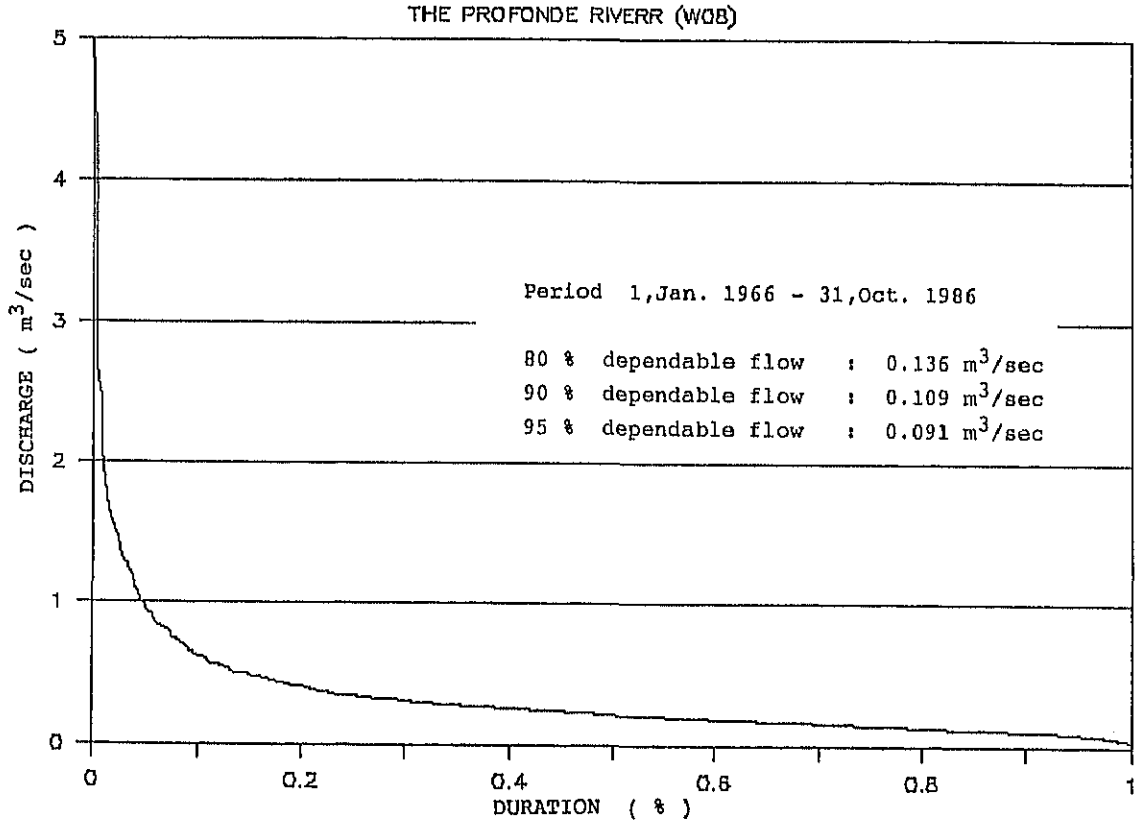
THE TERRE ROUGE RIVER (W04)



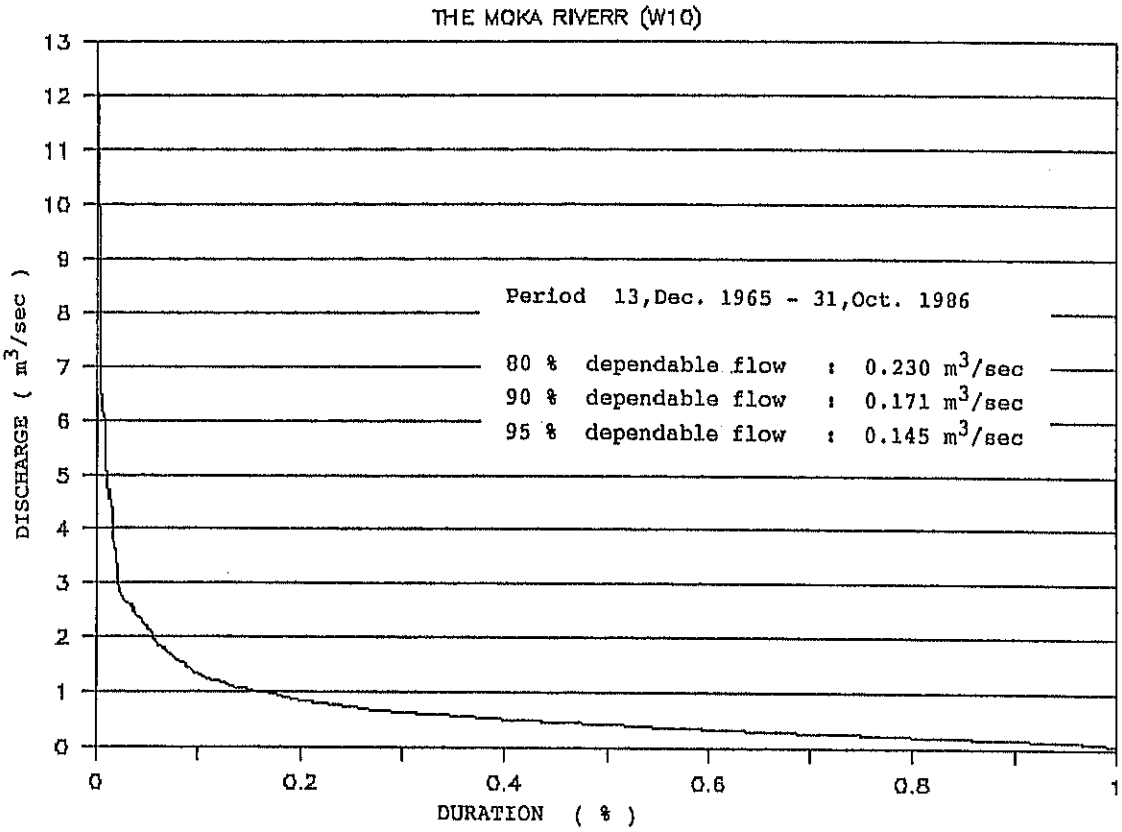
DURATION CURVES OF TRIBUTARIES	GOVERNMENT OF MAURITIUS PORT LOUIS WATER SUPPLY PROJECT JAPAN INTERNATIONAL COOPERATION AGENCY

Fig. A.3.3(2)



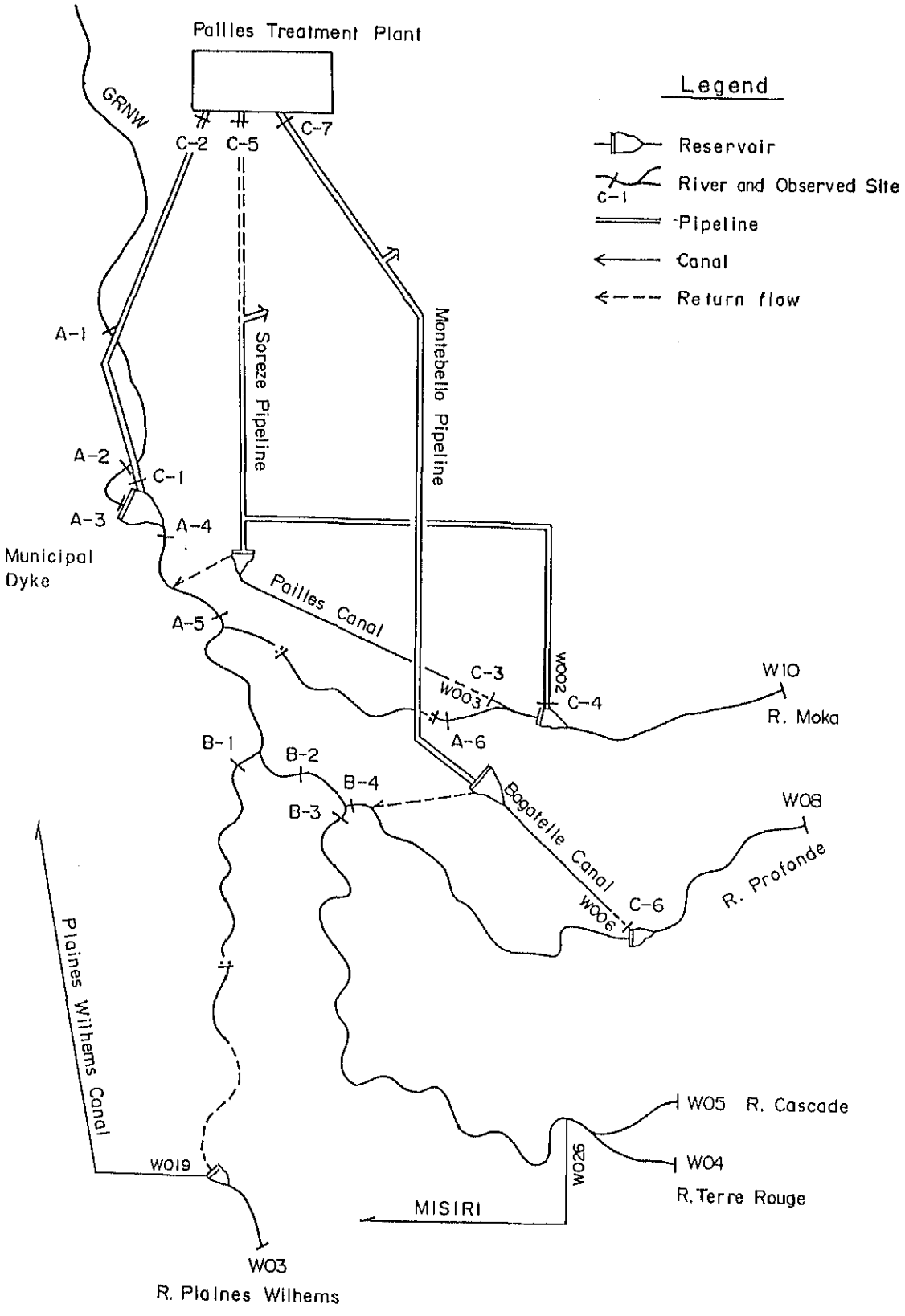


DURATION CURVES OF TRIBUTARIES	GOVERNMENT OF MAURITIUS PORT LOUIS WATER SUPPLY PROJECT JAPAN INTERNATIONAL COOPERATION AGENCY



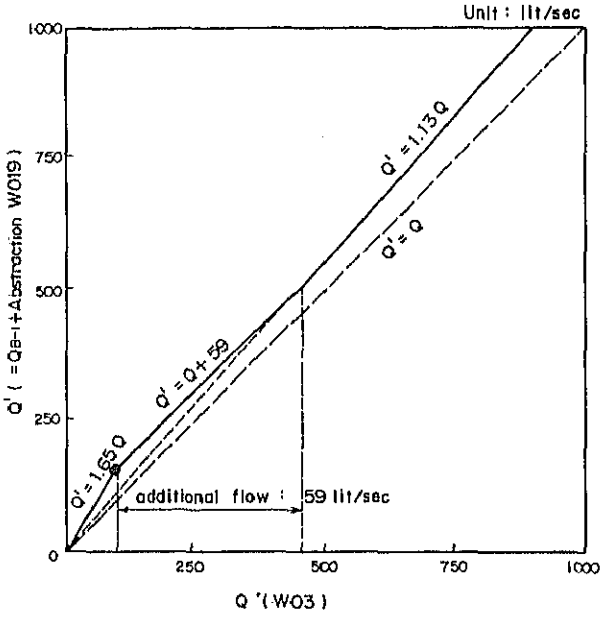
DURATION CURVES OF TRIBUTARIES	GOVERNMENT OF MAURITIUS PORT LOUIS WATER SUPPLY PROJECT JAPAN INTERNATIONAL COOPERATION AGENCY

Fig. A.3.4

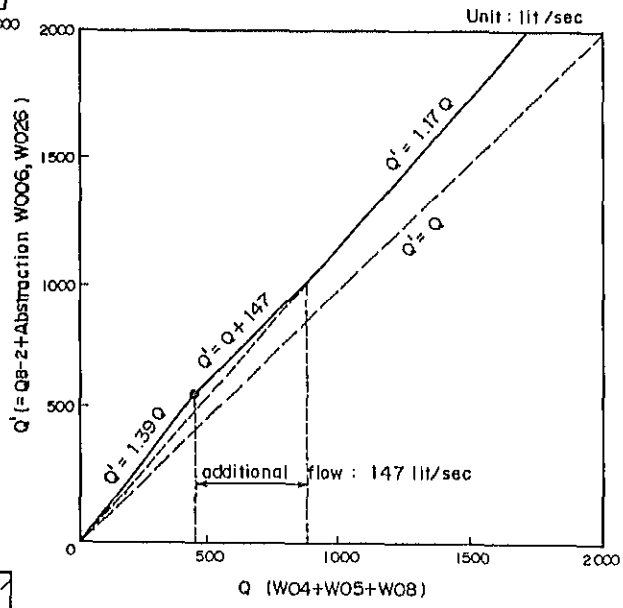


FLOW DIAGRAM OF GRNW AND EXISTING PIPELINES	GOVERNMENT OF MAURITIUS PORT LOUIS WATER SUPPLY PROJECT JAPAN INTERNATIONAL COOPERATION AGENCY

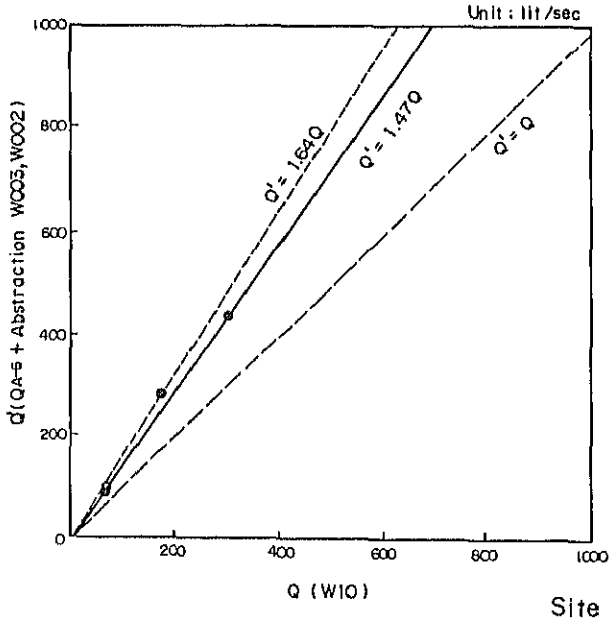
Fig. A.3.5



Plaines Wilhems river



Terre Rouge river
(downstream of three tributaries)



Moka river

Site Indicate (ex. B-4) : See Fig. A.3.4

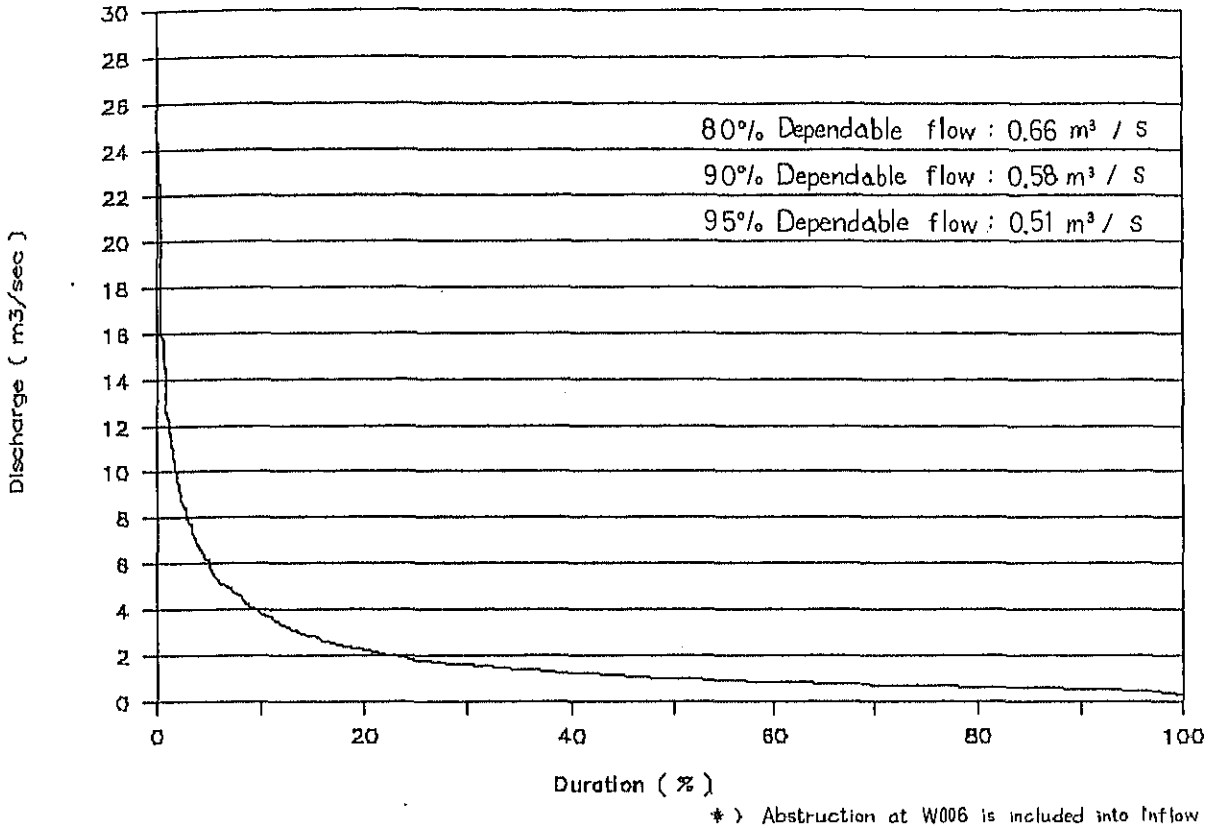
—— *applied lien to estimate discharge at sites which are located downstream of gauging stations*

COEFFICIENT TO ESTIMATE DISCHARGE DOWNSTREAM OF GAUGING STATIONS	GOVERNMENT OF MAURITIUS PORT LOUIS WATER SUPPLY PROJECT JAPAN INTERNATIONAL COOPERATION AGENCY

Fig. A.3.6

Duration Curve

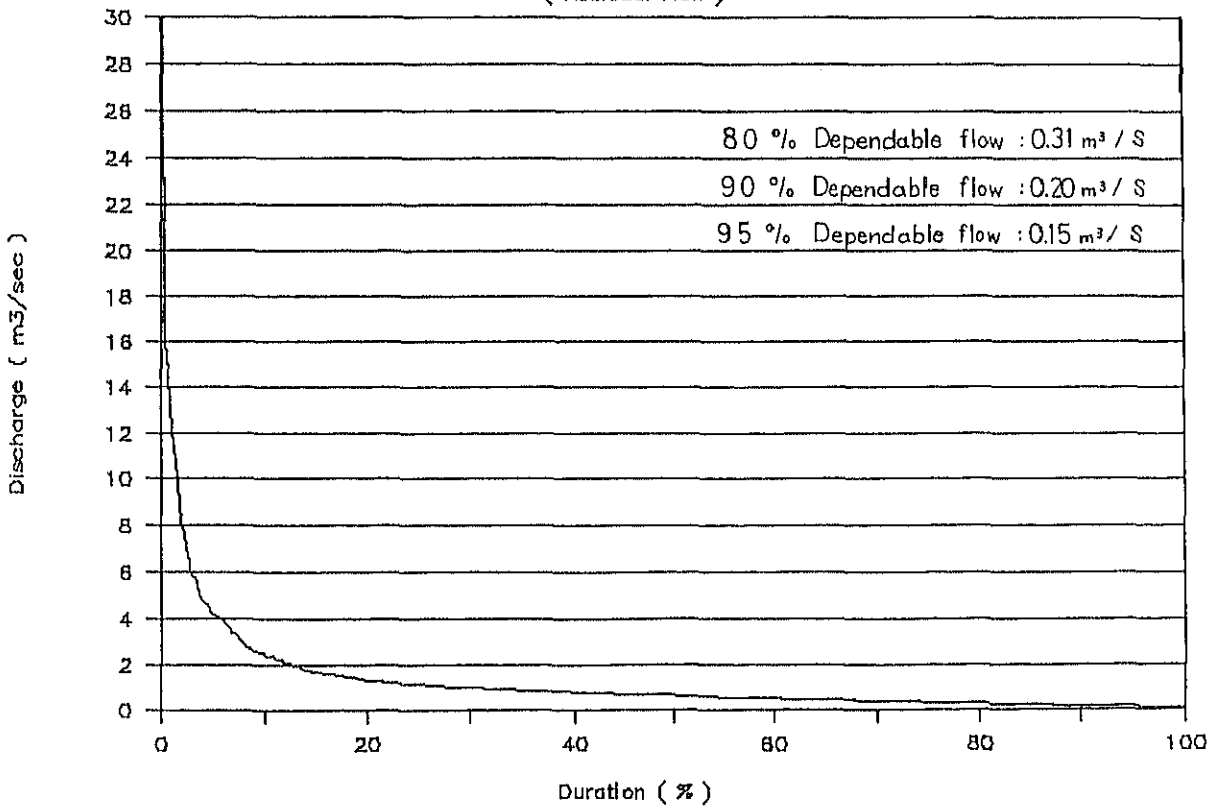
(Inflow into TRO Dam reservoir)



*) Abstruction at W006 is included into Inflow

Duration Curve

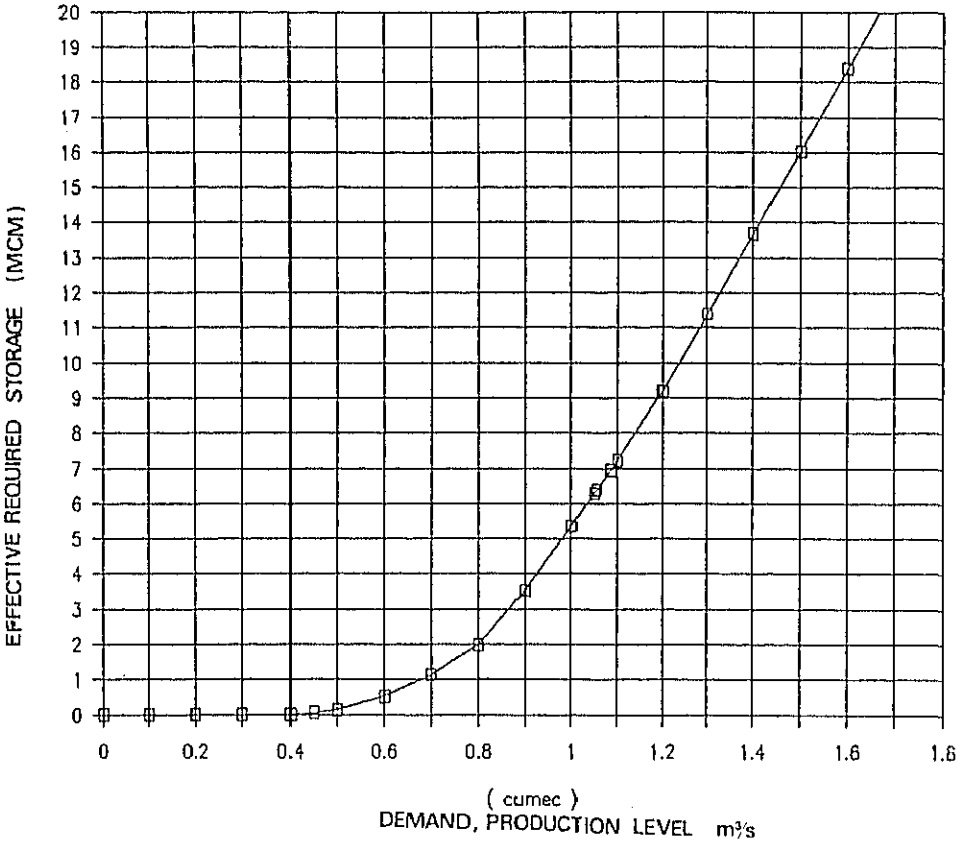
(Residual Flow)

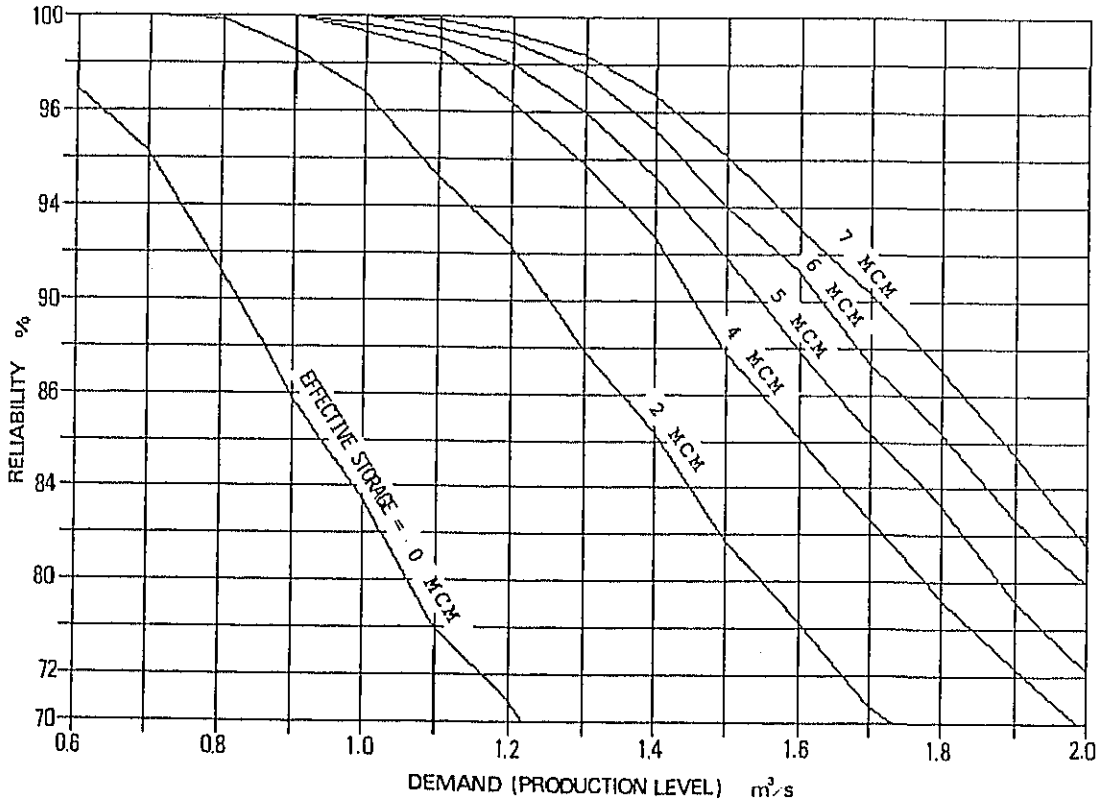


*) Abstruction of W002, W003 are precedently reduced

DROUGHT DURATION CURVE	GOVERNMENT OF MAURITIUS PORT LOUIS WATER SUPPLY PROJECT JAPAN INTERNATIONAL COOPERATION AGENCY

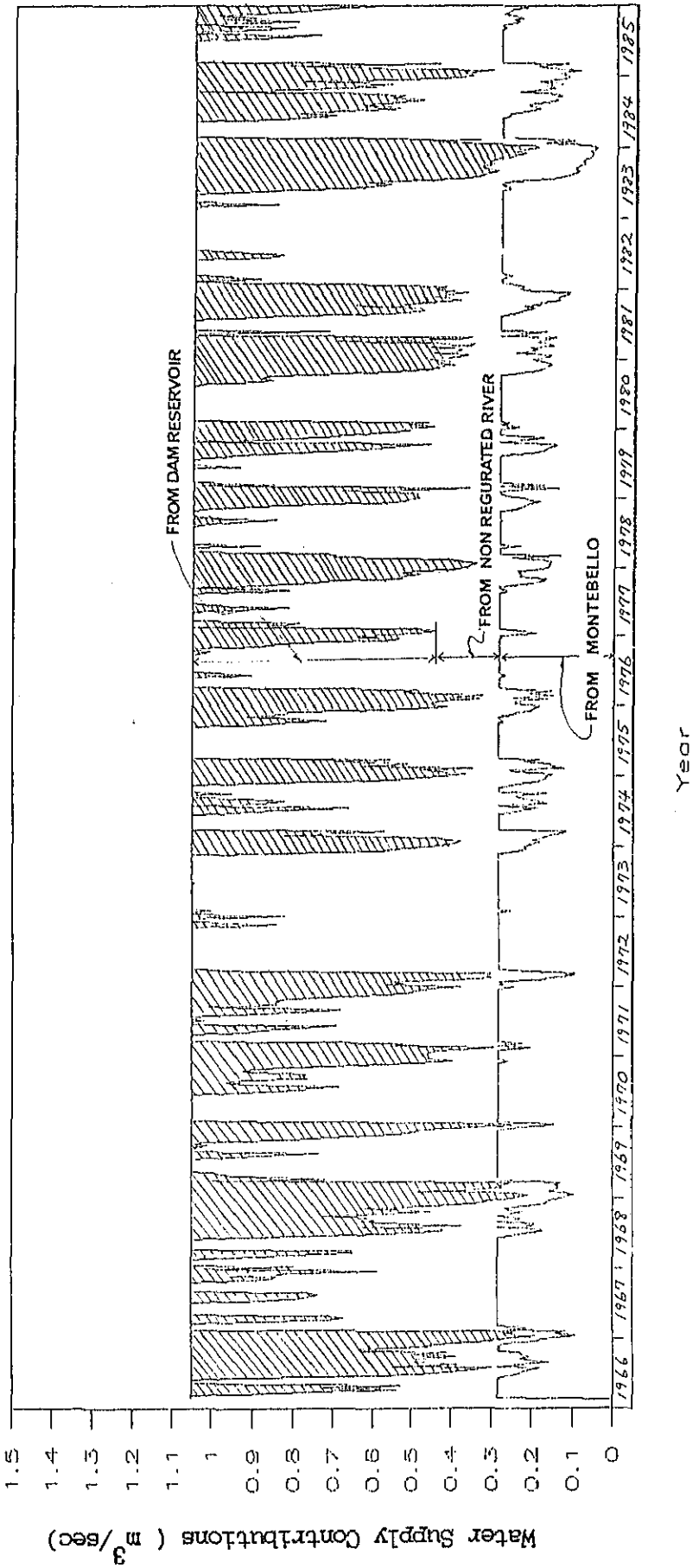
Fig. A.3.7





REQUIRED STORAGE VOLUME AND RELIABILITY	GOVERNMENT OF MAURITIUS PORT LOUIS WATER SUPPLY PROJECT JAPAN INTERNATIONAL COOPERATION AGENCY

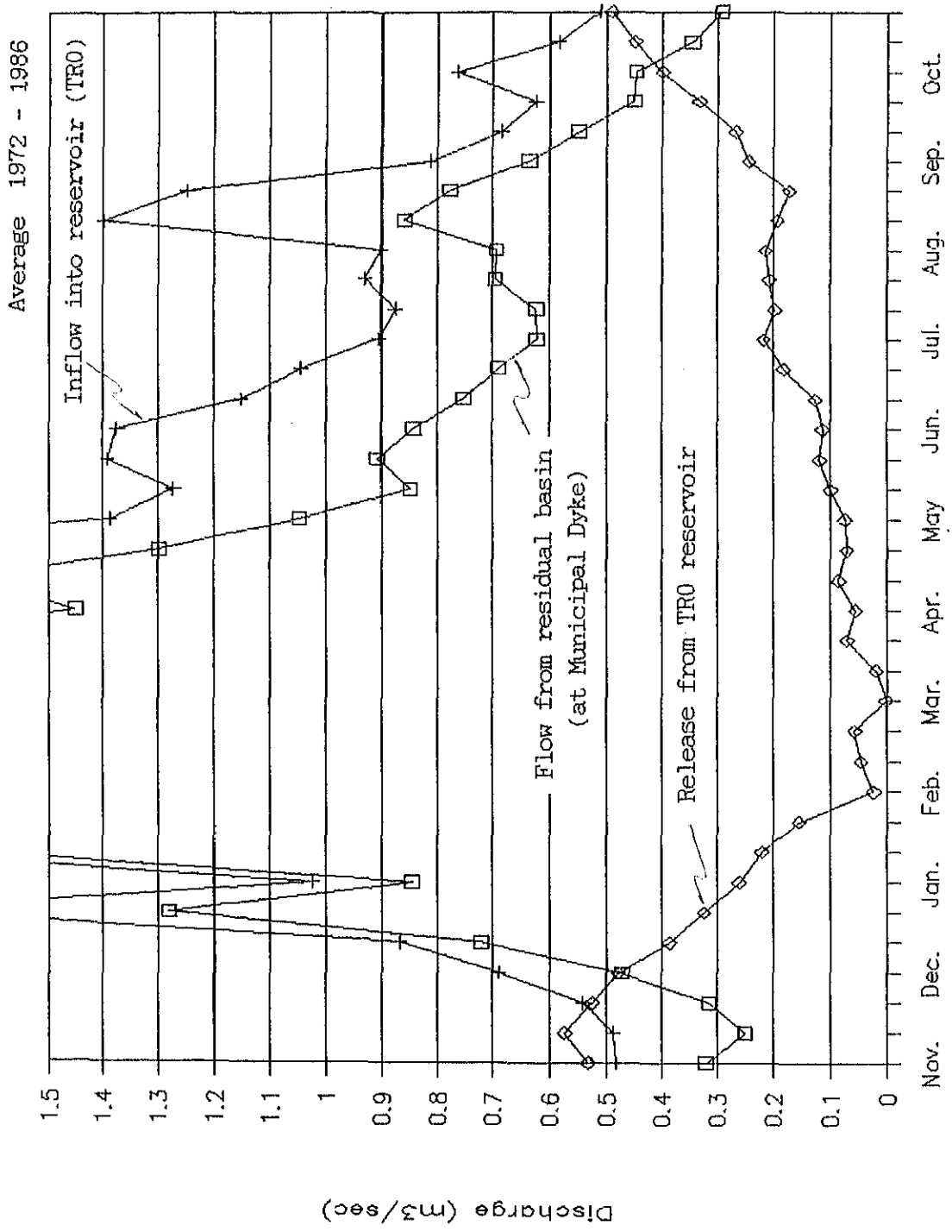
Fig. A.3.8



WATER SUPPLY FROM DAM RESERVOIR

GOVERNMENT OF MAURITIUS
PORT LOUIS WATER SUPPLY PROJECT
JAPAN INTERNATIONAL COOPERATION AGENCY

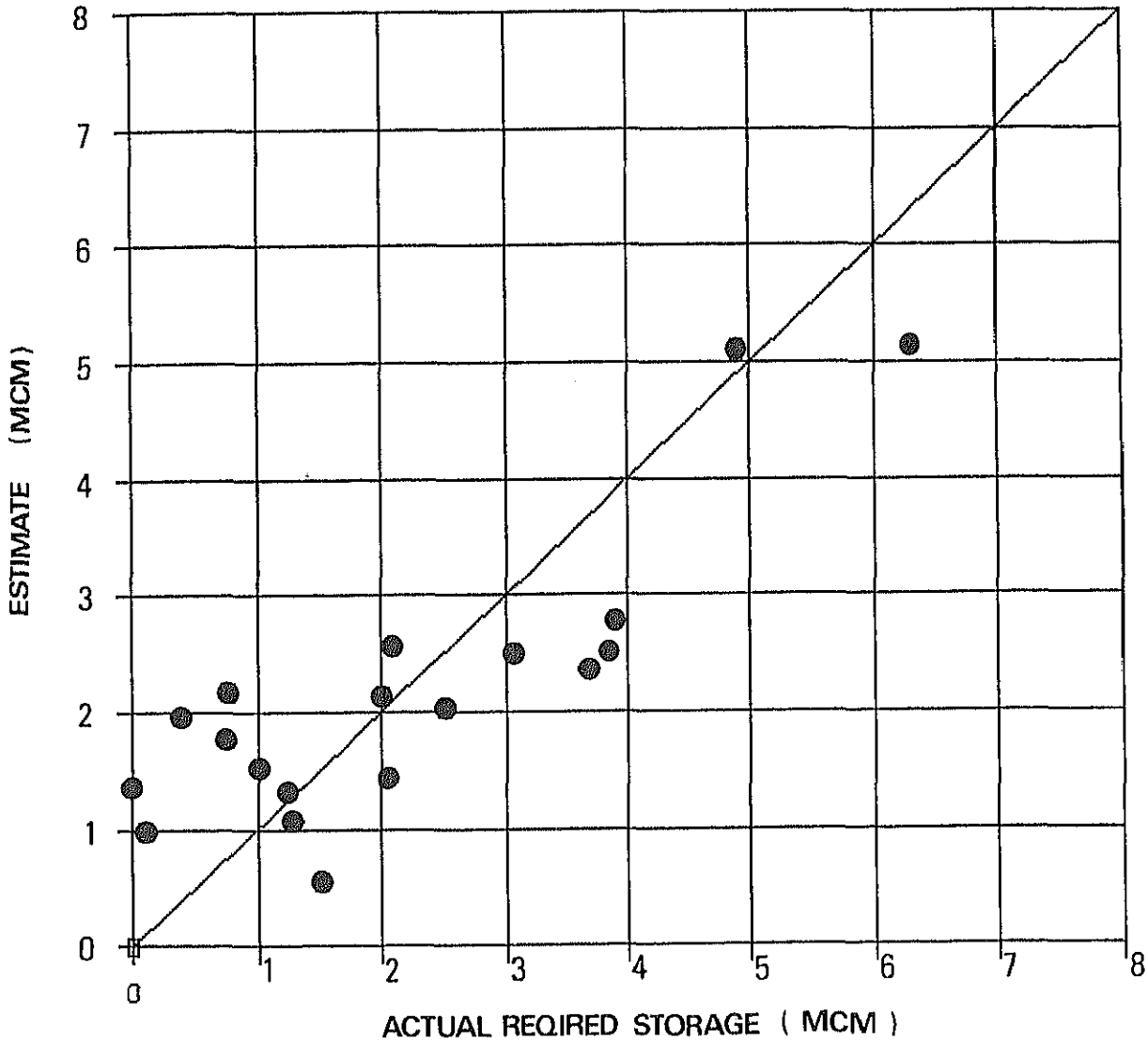
Fig. A.3.9



SEASONAL AVERAGE OF RELEASED WATER FROM TRO DAM RESERVOIR

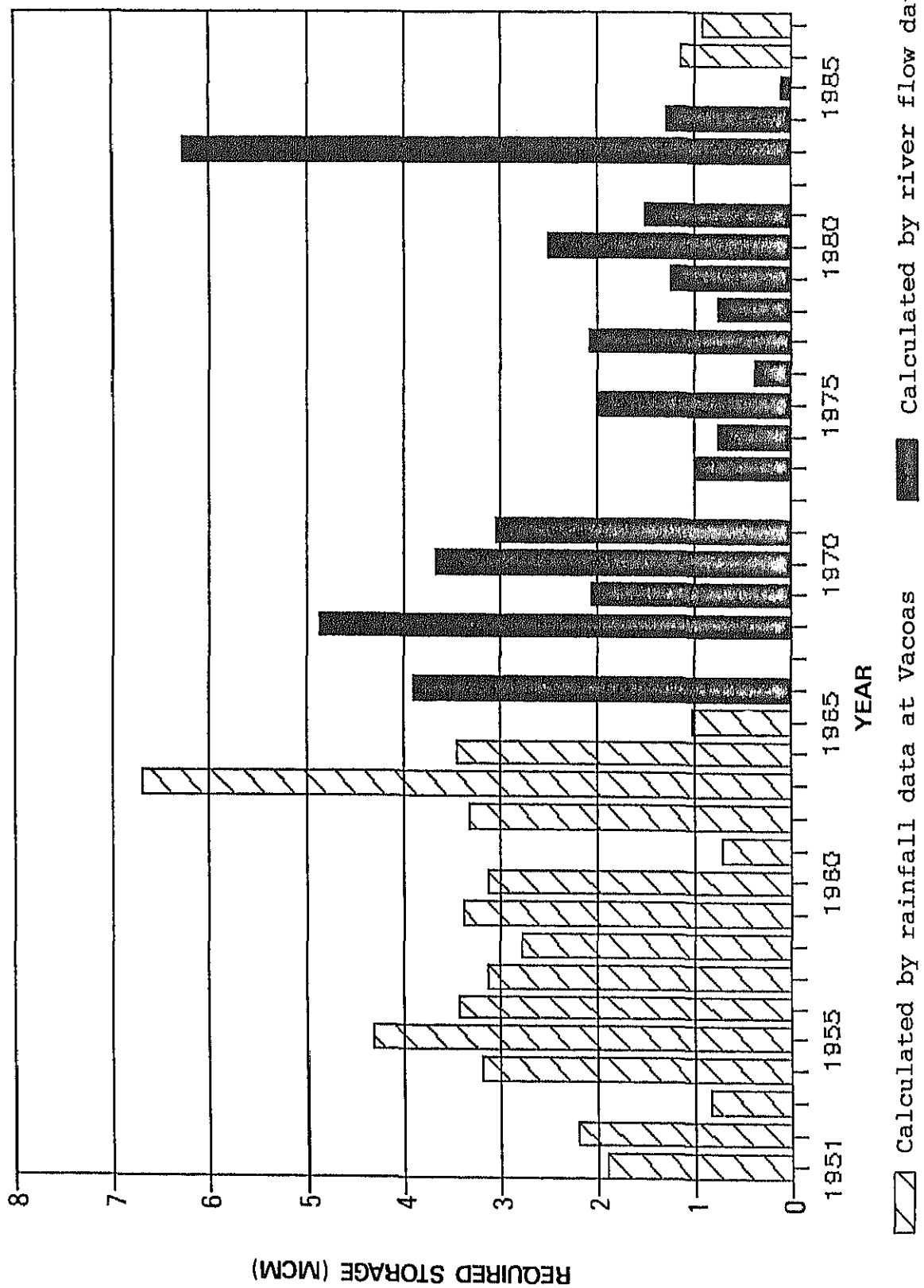
GOVERNMENT OF MAURITIUS
PORT LOUIS WATER SUPPLY PROJECT
JAPAN INTERNATIONAL COOPERATION AGENCY

Fig. A.3.10



RELATION BETWEEN ACTUAL AND ESTIMATED ANNUAL REQUIRED STORAGE	GOVERNMENT OF MAURITIUS PORT LOUIS WATER SUPPLY PROJECT JAPAN INTERNATIONAL COOPERATION AGENCY

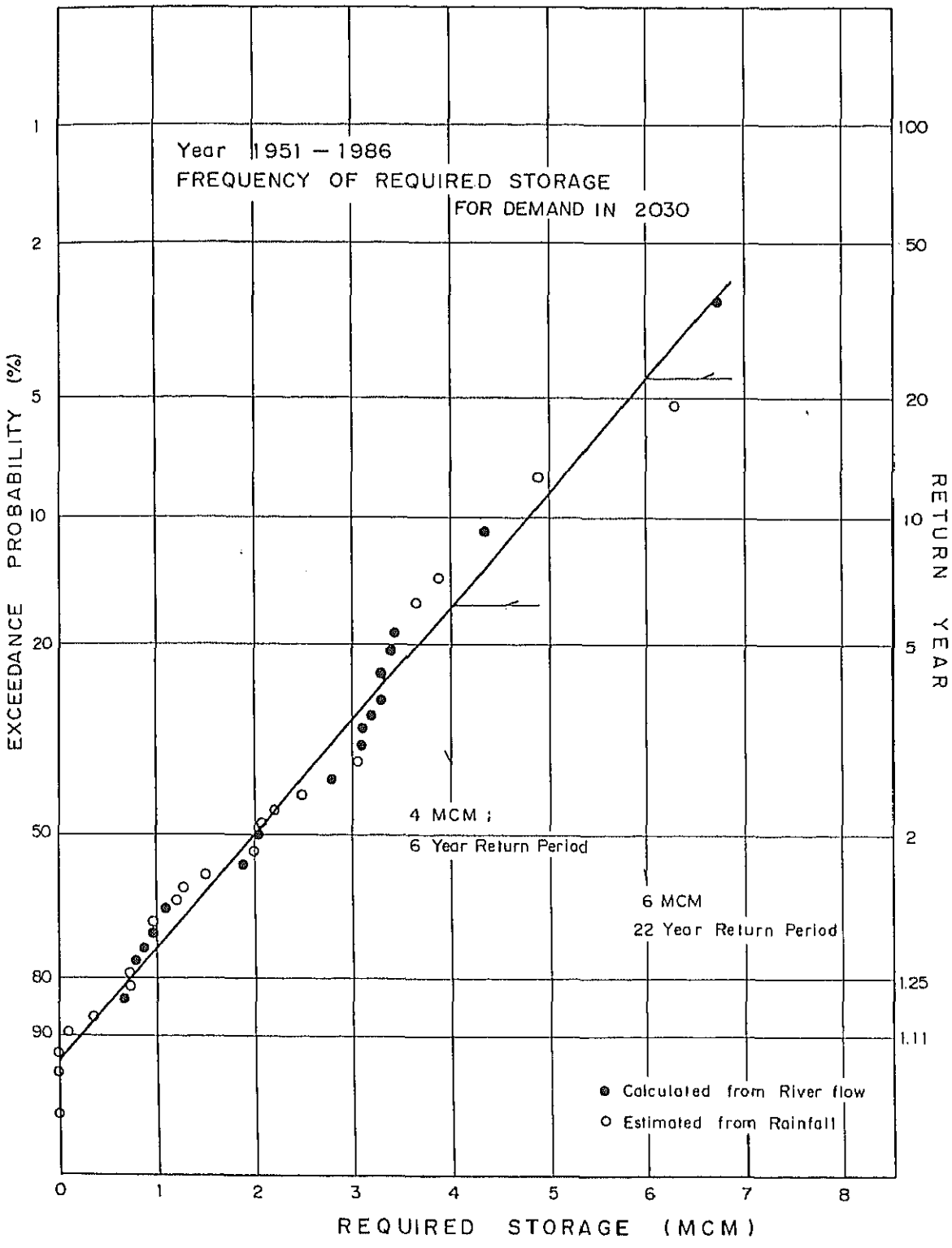
Fig. A.3.11



ANNUAL REQUIRED STORAGE
(1951 - 1987)

GOVERNMENT OF MAURITIUS
PORT LOUIS WATER SUPPLY PROJECT
JAPAN INTERNATIONAL COOPERATION AGENCY

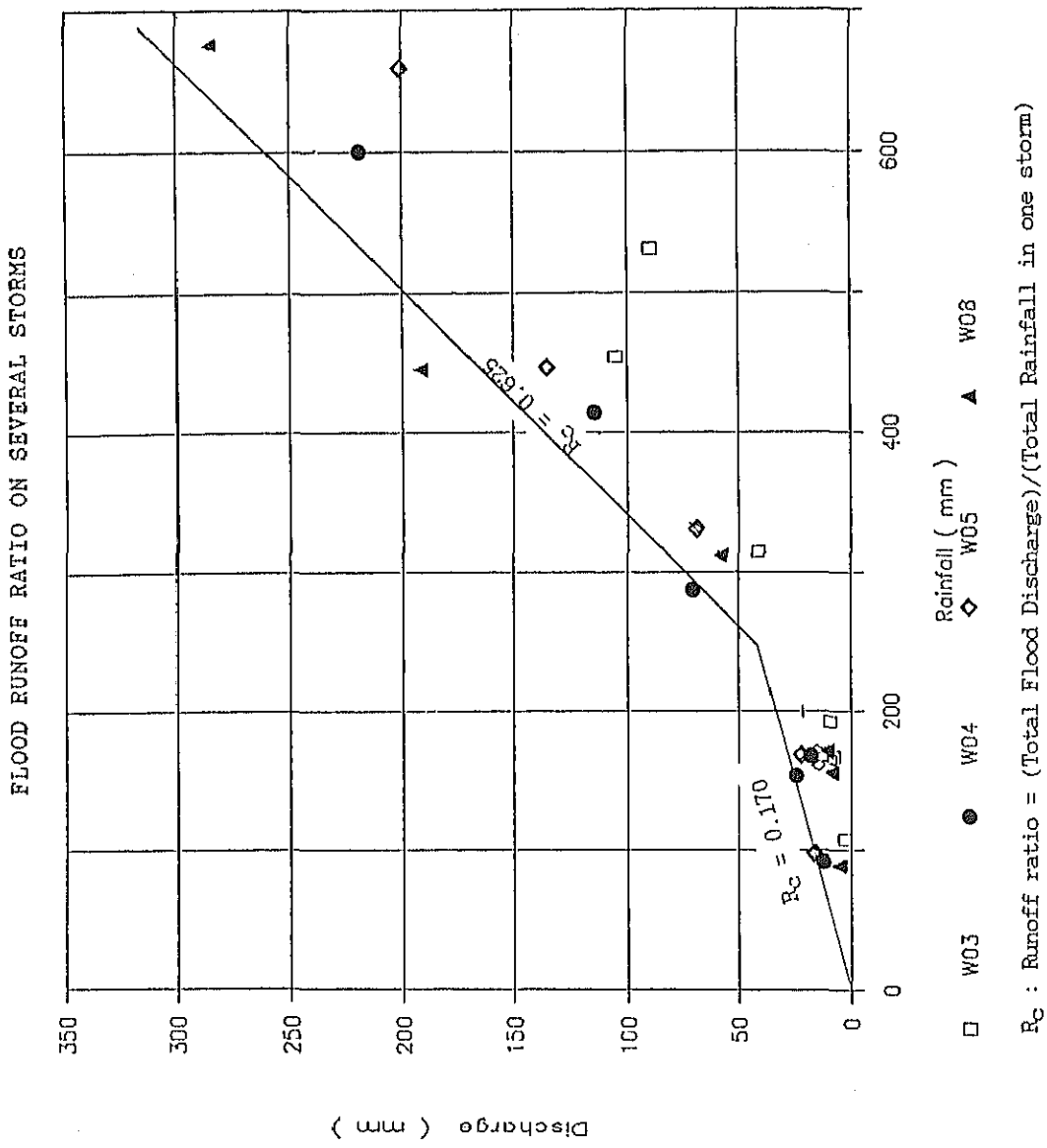
Fig. A.3.12



PROBABILITY OF ANNUAL REQUIRED STORAGE

GOVERNMENT OF MAURITIUS
PORT LOUIS WATER SUPPLY PROJECT
JAPAN INTERNATIONAL COOPERATION AGENCY

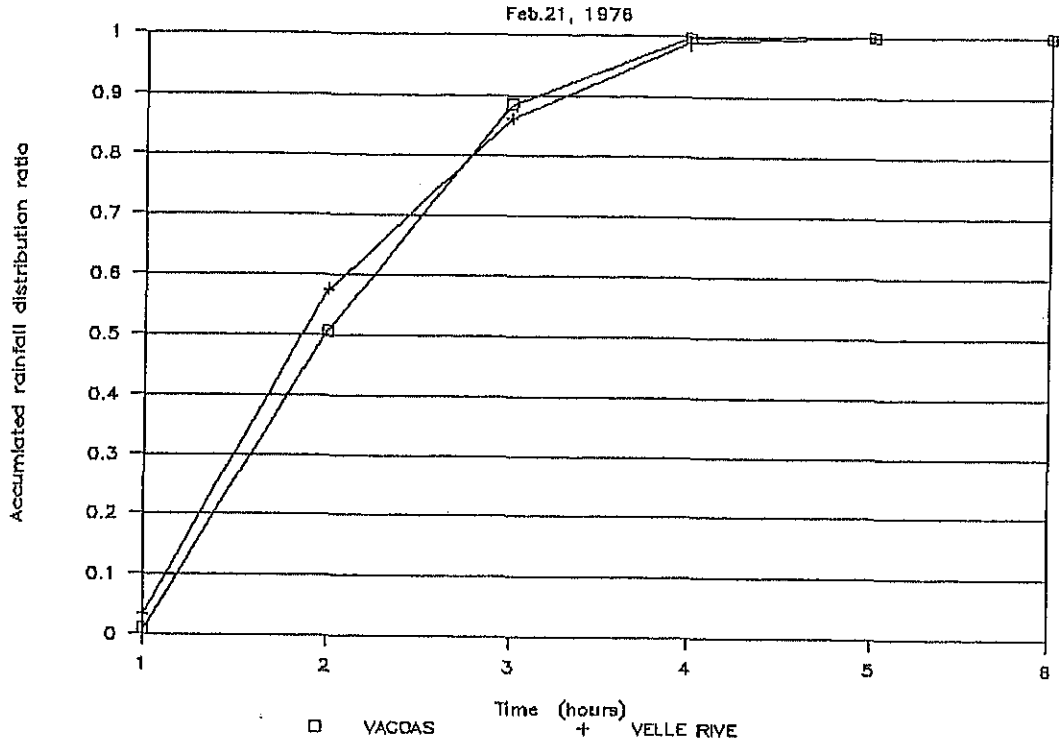
Fig. A.4.1

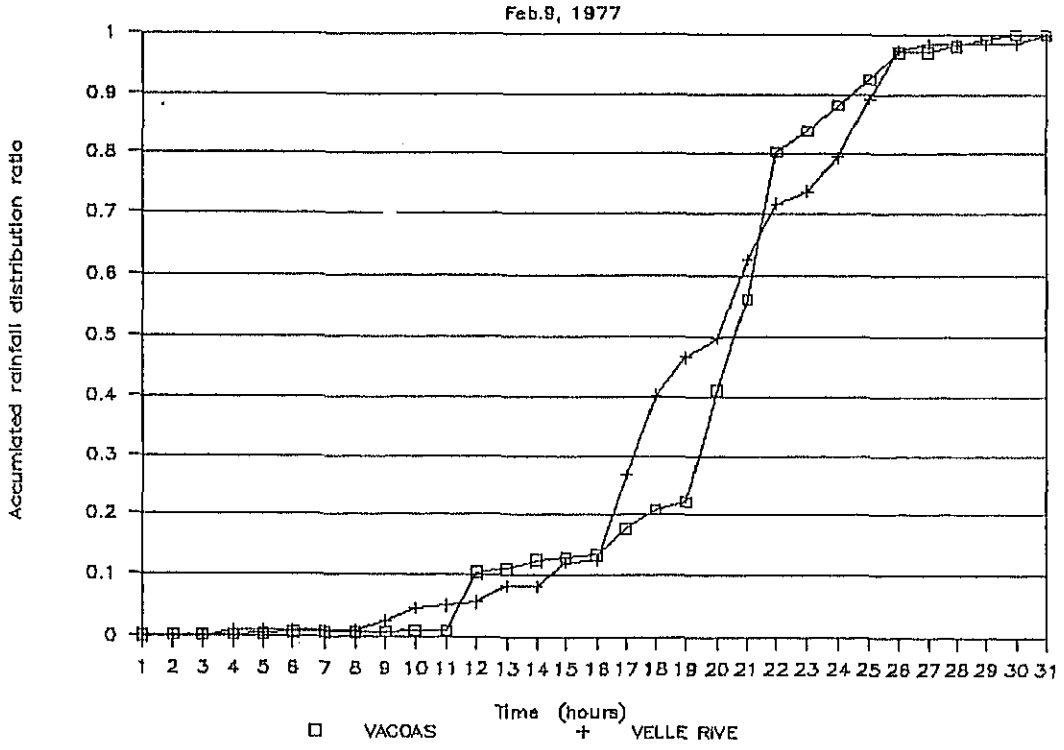


EFFECTIVE RAINFALL ANALYSIS

GOVERNMENT OF MAURITIUS
PORT LOUIS WATER SUPPLY PROJECT
JAPAN INTERNATIONAL COOPERATION AGENCY

Fig. A.4.2 (1)

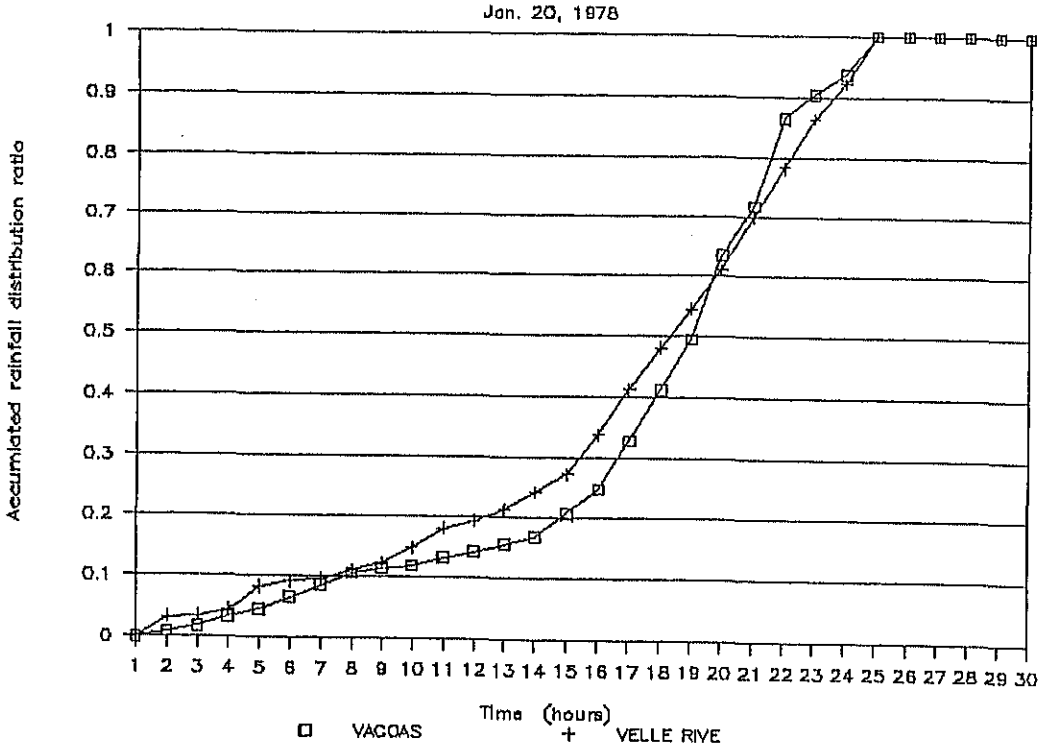


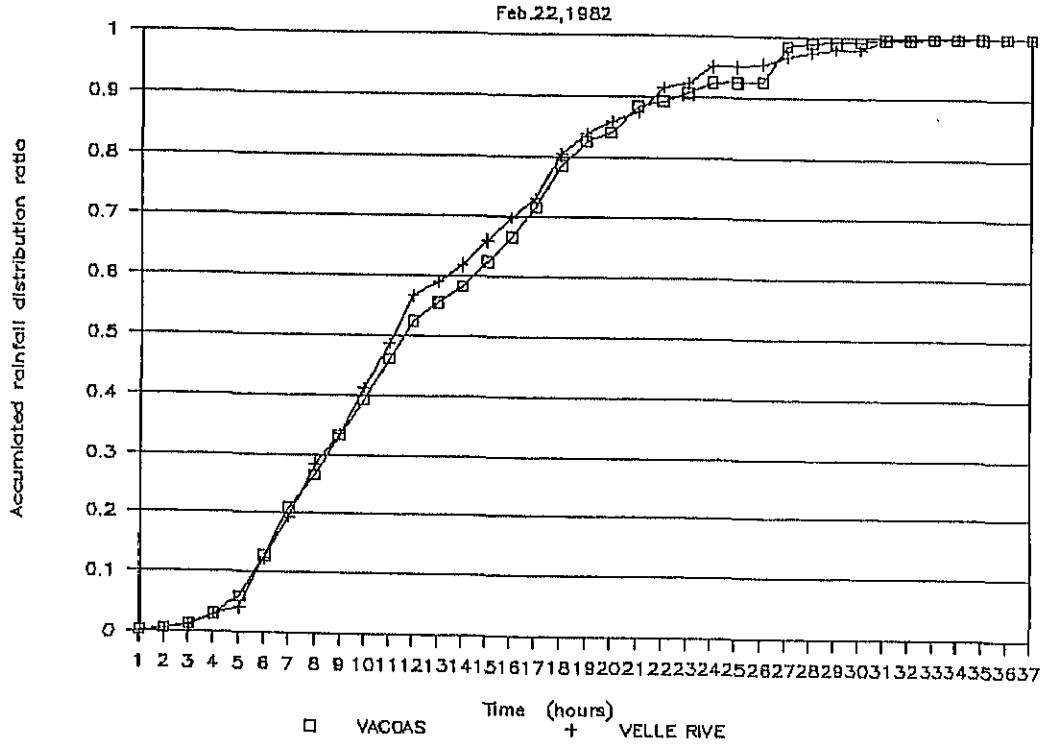


HOURLY RAINFALL PATTERN
(VOCAS AND VELLE RIVER)

GOVERNMENT OF MAURITIUS
PORT LOUIS WATER SUPPLY PROJECT
JAPAN INTERNATIONAL COOPERATION AGENCY

Fig. A.4.2 (2)

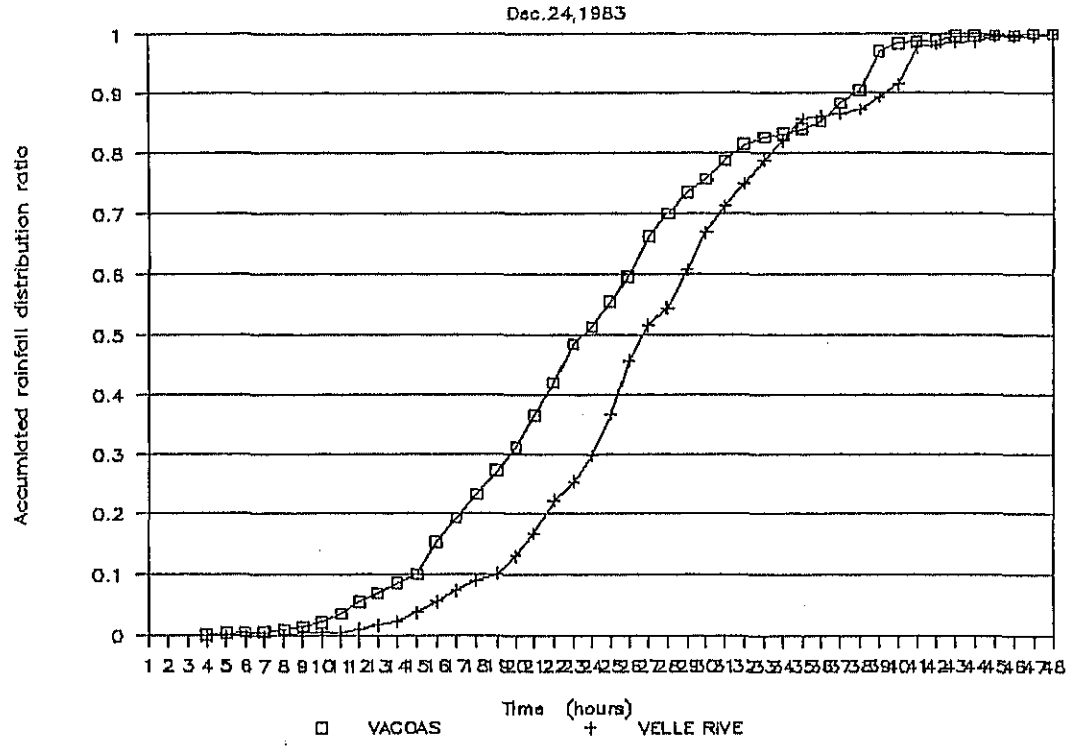


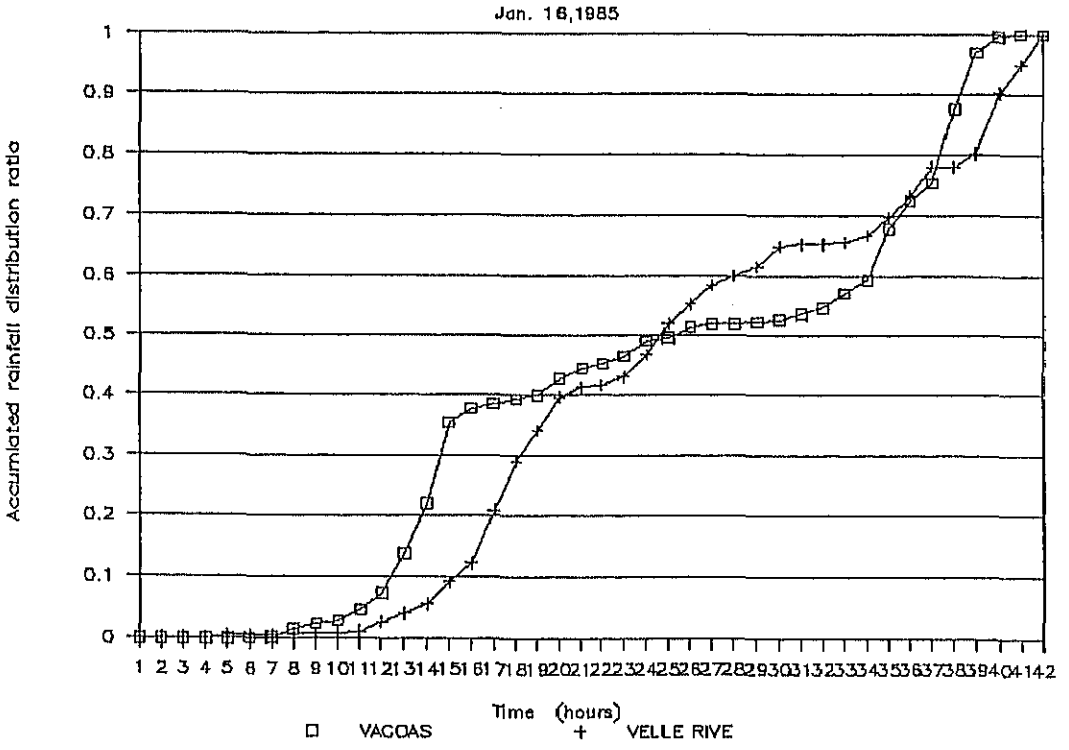


HOURLY RAINFALL PATTERN (VOCAS AND VELLE RIVER)

GOVERNMENT OF MAURITIUS
PORT LOUIS WATER SUPPLY PROJECT

JAPAN INTERNATIONAL COOPERATION AGENCY



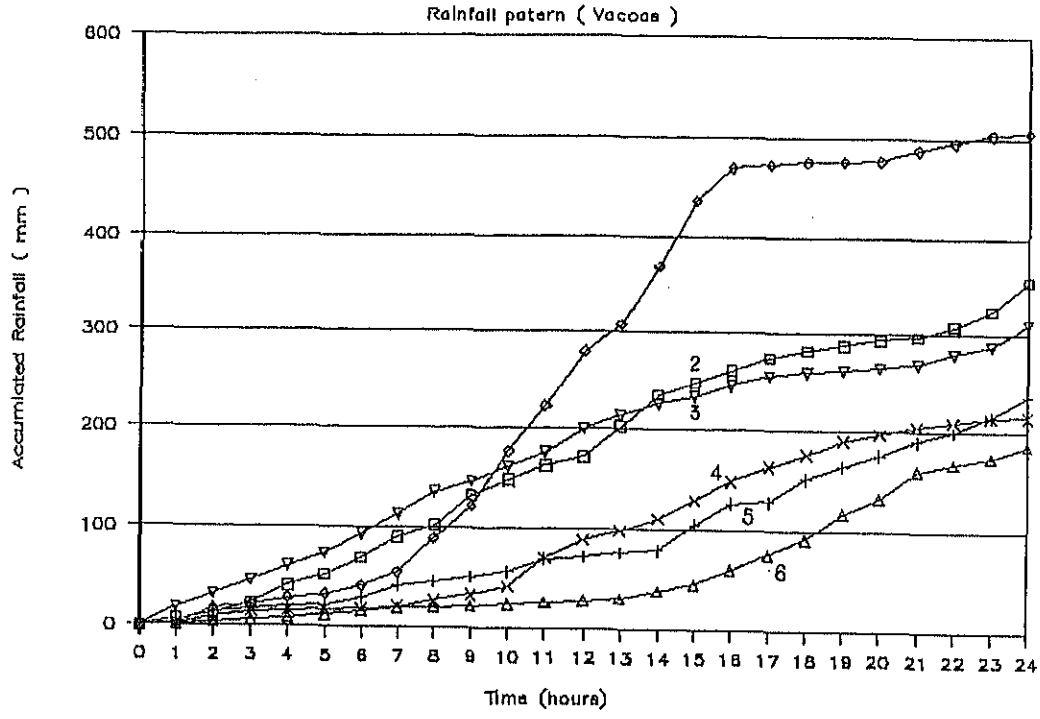


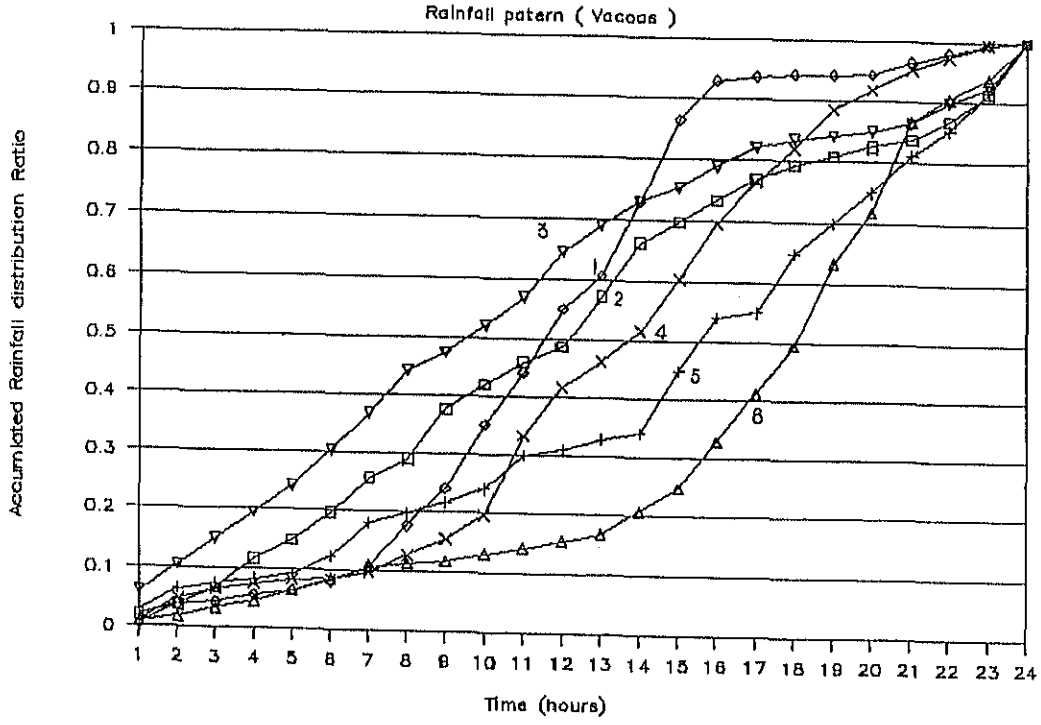
HOURLY RAINFALL PATTERN
(VOCAS AND VELLE RIVER)

GOVERNMENT OF MAURITIUS
PORT LOUIS WATER SUPPLY PROJECT

JAPAN INTERNATIONAL COOPERATION AGENCY

Fig. A.4.3



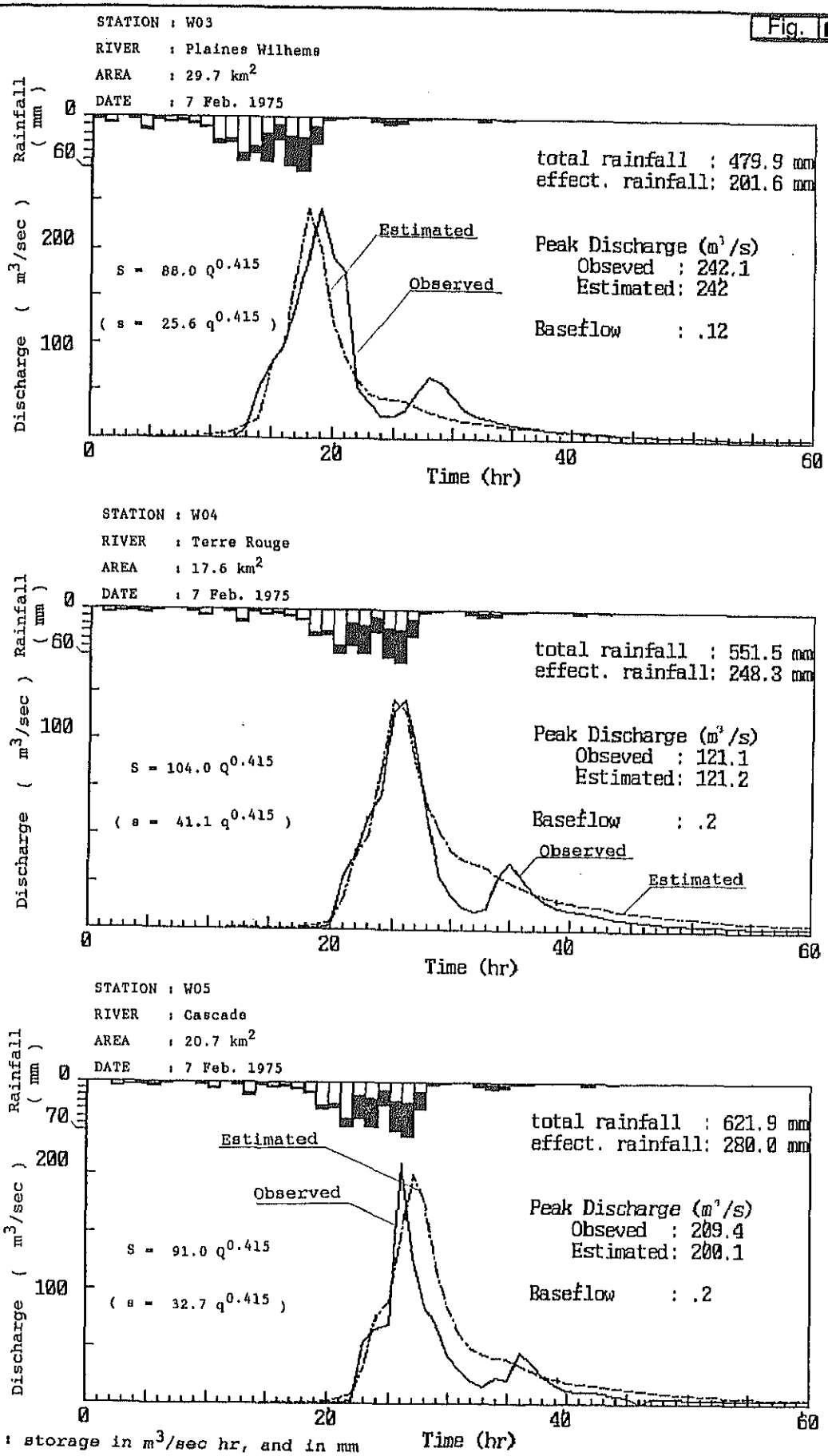


1. 6. February 1975
2. 14. January 1967
3. 24. December 1983
4. 7. February 1971
5. 4, February 1982
6. 20, January 1978

HOURLY RAINFALL PATTERNS OF HEAVY STORMS

GOVERNMENT OF MAURITIUS
PORT LOUIS WATER SUPPLY PROJECT
JAPAN INTERNATIONAL COOPERATION AGENCY

Fig. A.4.4 (1)



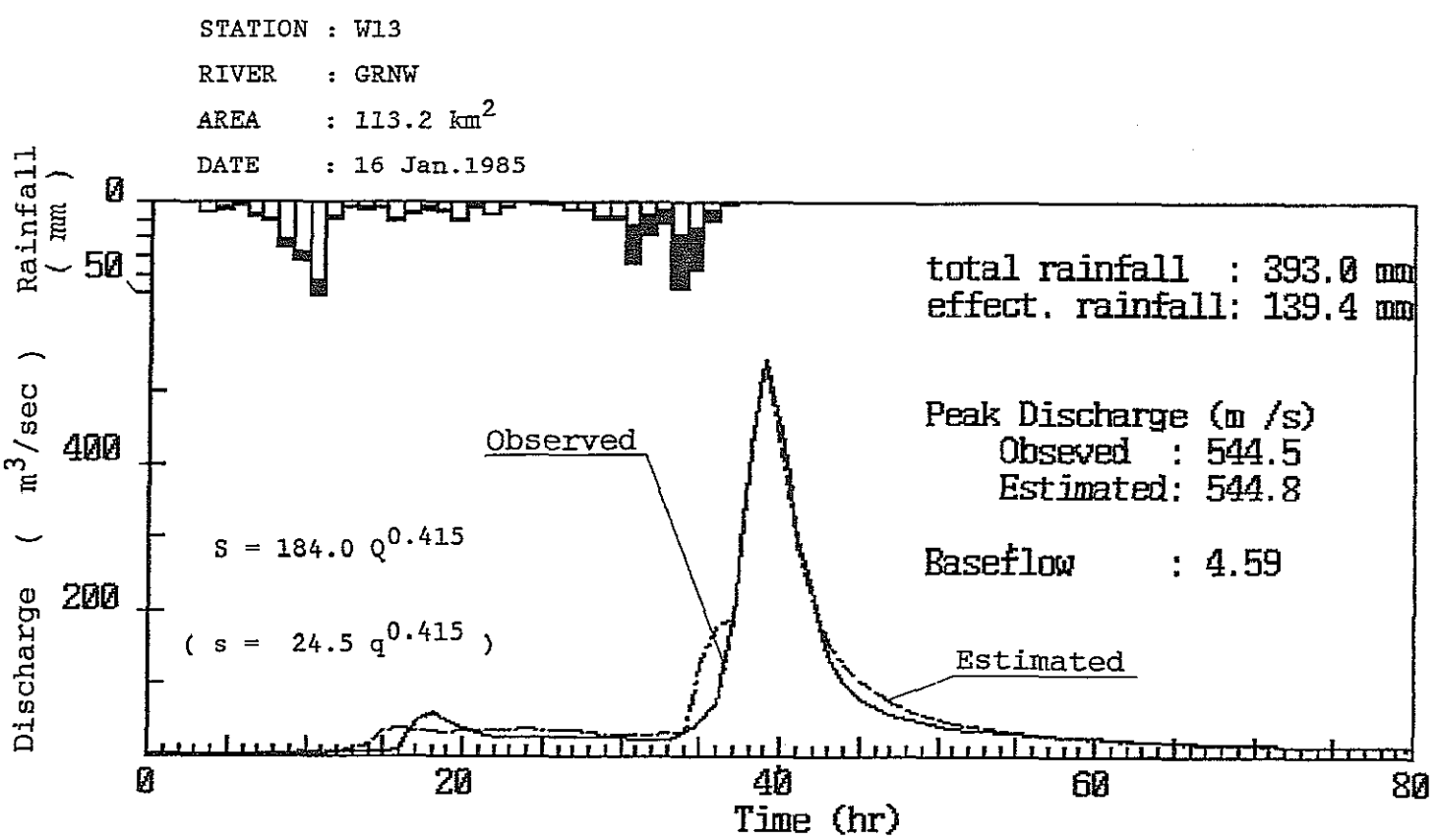
S, s : storage in $m^3/sec\ hr$, and in mm

Q, q : discharge in m^3/sec, and in mm/hr

CALIBRATION OF FLOOD MODEL

GOVERNMENT OF MAURITIUS
PORT LOUIS WATER SUPPLY PROJECT
JAPAN INTERNATIONAL COOPERATION AGENCY

CALIBRATION OF FLOOD MODEL



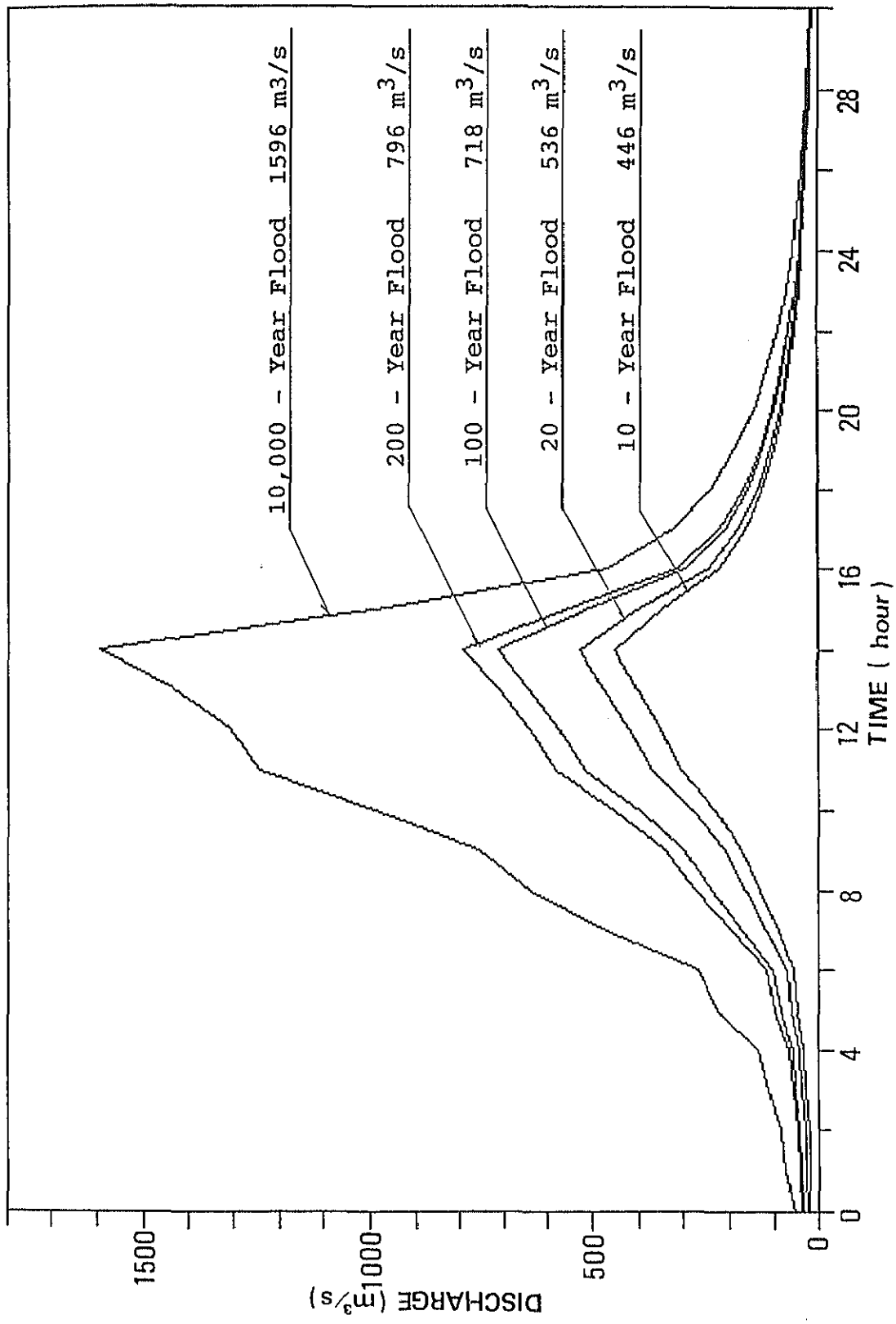
S, s : storage in m^3/sec hr, and in mm

Q, q : discharge in m^3/sec, and in mm/hr

GOVERNMENT OF MAURITIUS
PORT LOUIS WATER SUPPLY PROJECT
JAPAN INTERNATIONAL COOPERATION AGENCY

Fig. A.4.4 (2)

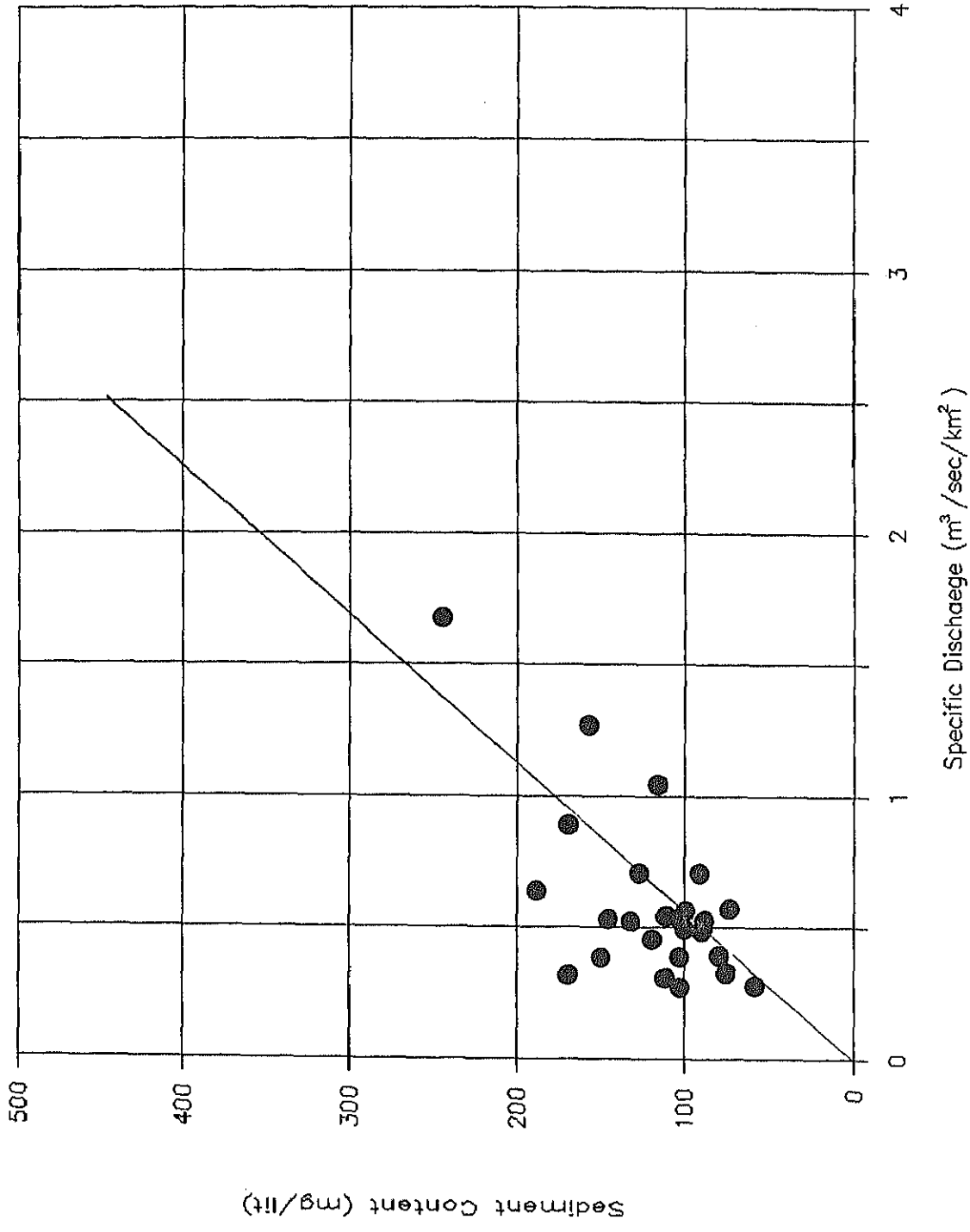
Fig. A.4.5



DESIGN FLOODS

GOVERNMENT OF MAURITIUS
PORT LOUIS WATER SUPPLY PROJECT
JAPAN INTERNATIONAL COOPERATION AGENCY

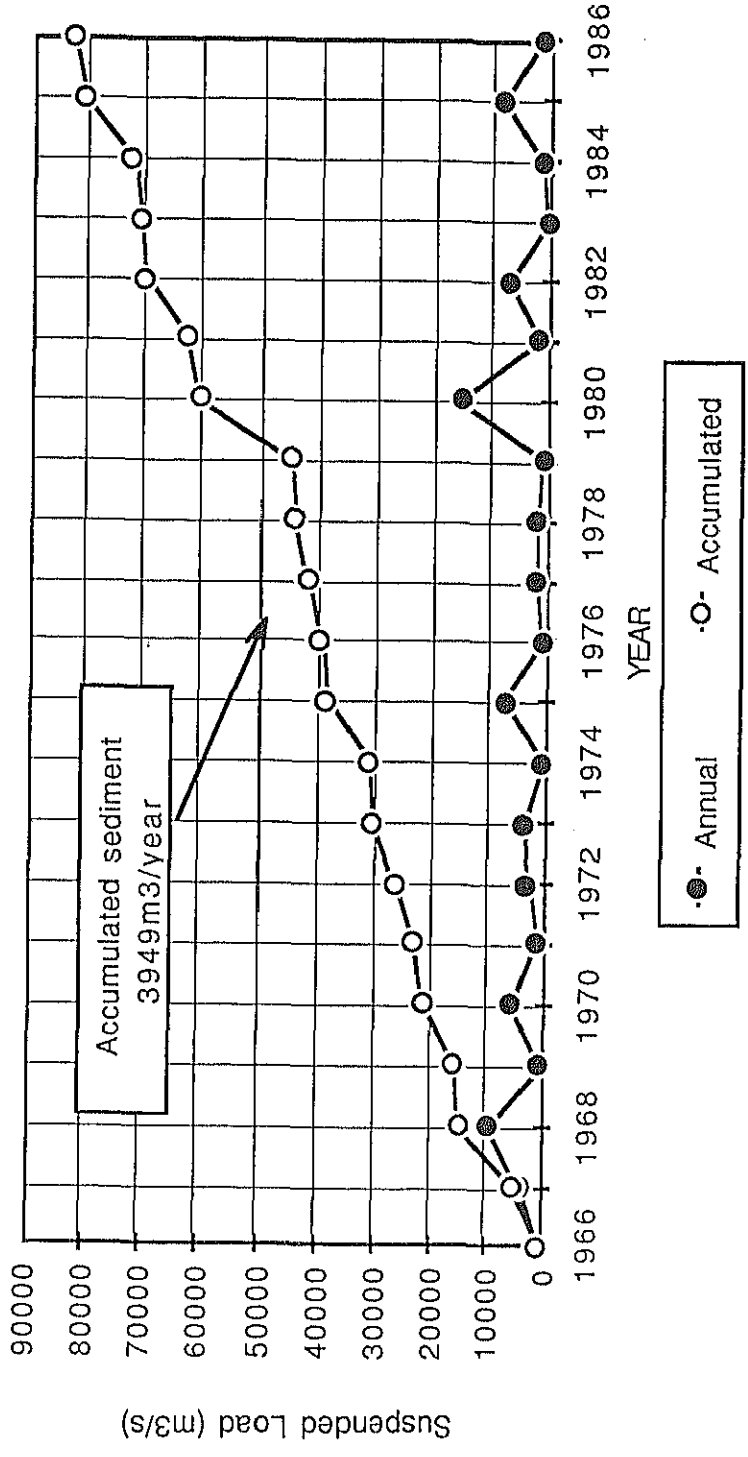
Fig. A.5.1



RELATIONSHIP BETWEEN SEDIMENT AND SPECIFIC DISCHARGE

GOVERNMENT OF MAURITIUS
PORT LOUIS WATER SUPPLY PROJECT
JAPAN INTERNATIONAL COOPERATION AGENCY

Fig. A.5.2

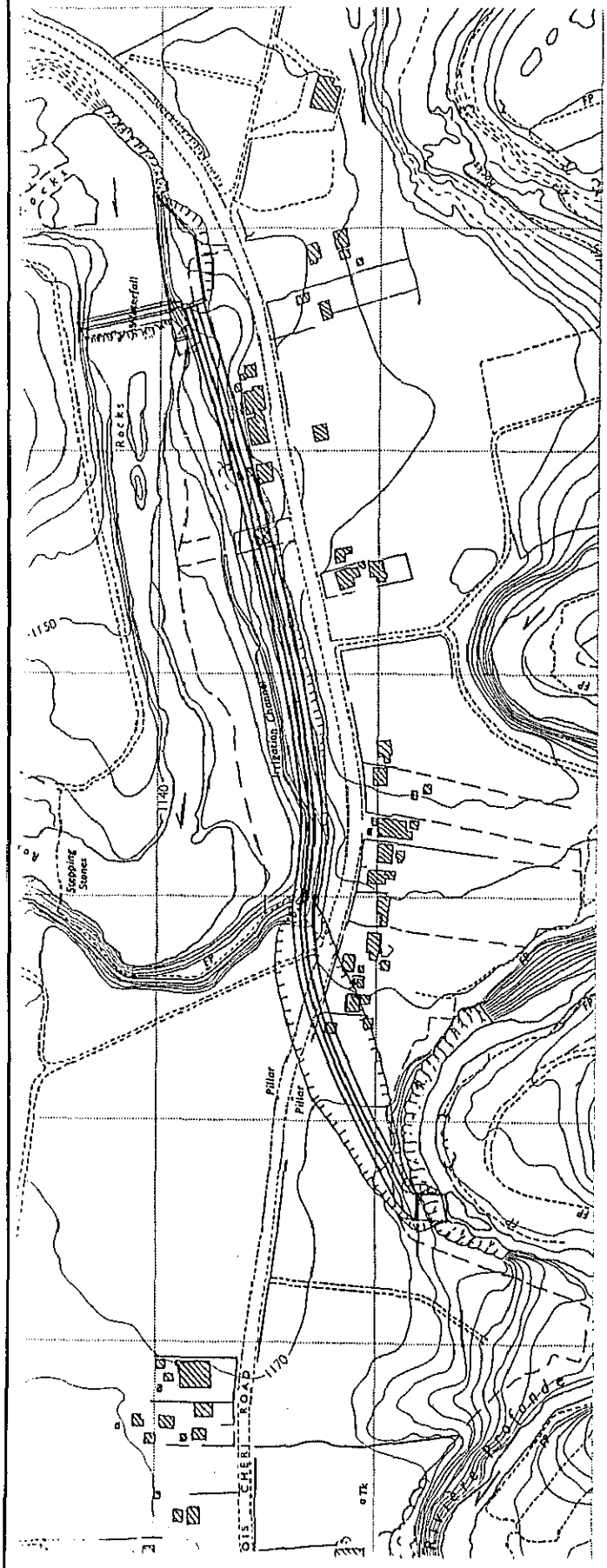


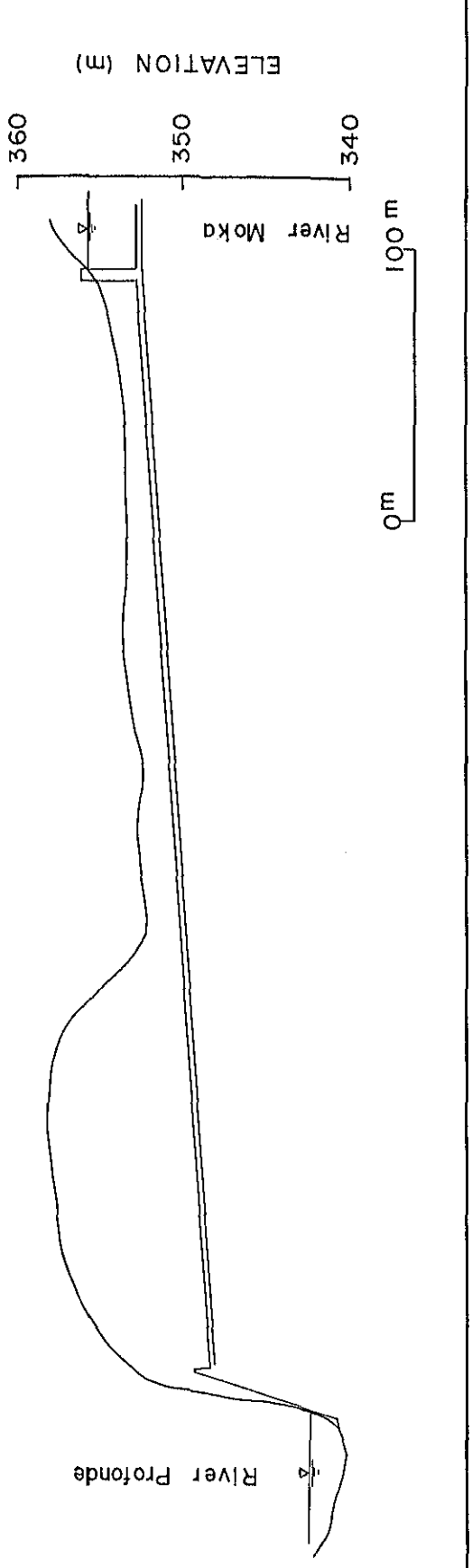
SEDIMENT TRANSPORT (WASH LOAD)

GOVERNMENT OF MAURITIUS
PORT LOUIS WATER SUPPLY PROJECT

JAPAN INTERNATIONAL COOPERATION AGENCY

Fig. A.6.1





DIVERSION WORKS OF THE MOKA RIVER

GOVERNMENT OF MAURITIUS
PORT LOUIS WATER SUPPLY PROJECT

JAPAN INTERNATIONAL COOPERATION AGENCY

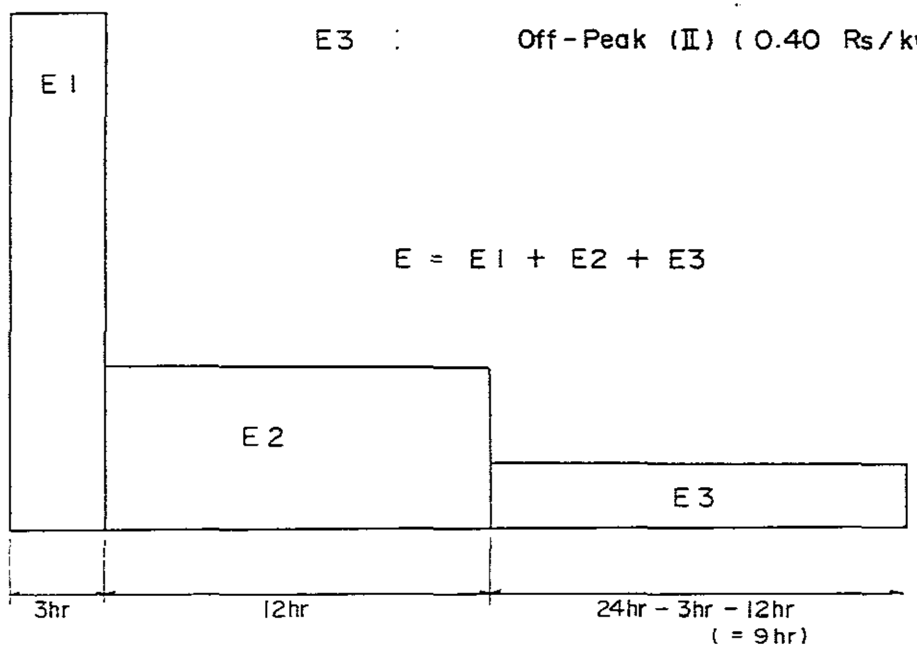
Fig. A.6.2

E1 : 3hr Peak (1.20 Rs /kwh)

E2 : 12hr Off-Peak (I) (0.80 Rs/kwh)

E3 : Off-Peak (II) (0.40 Rs/kwh)

E = E1 + E2 + E3



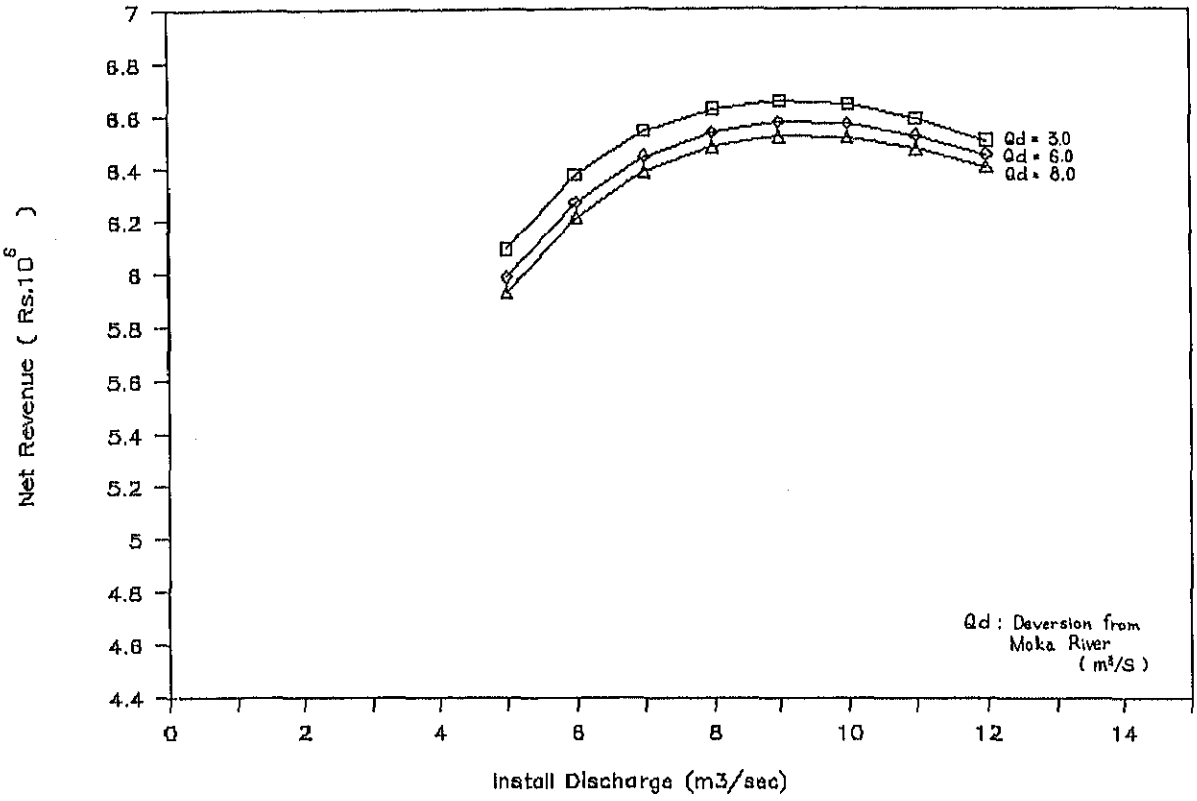
Operation is to be performed to maximize 3hr Peak load, then the rest of power output is served as 12hr Off-Peak (I) and Off-Peak (III).

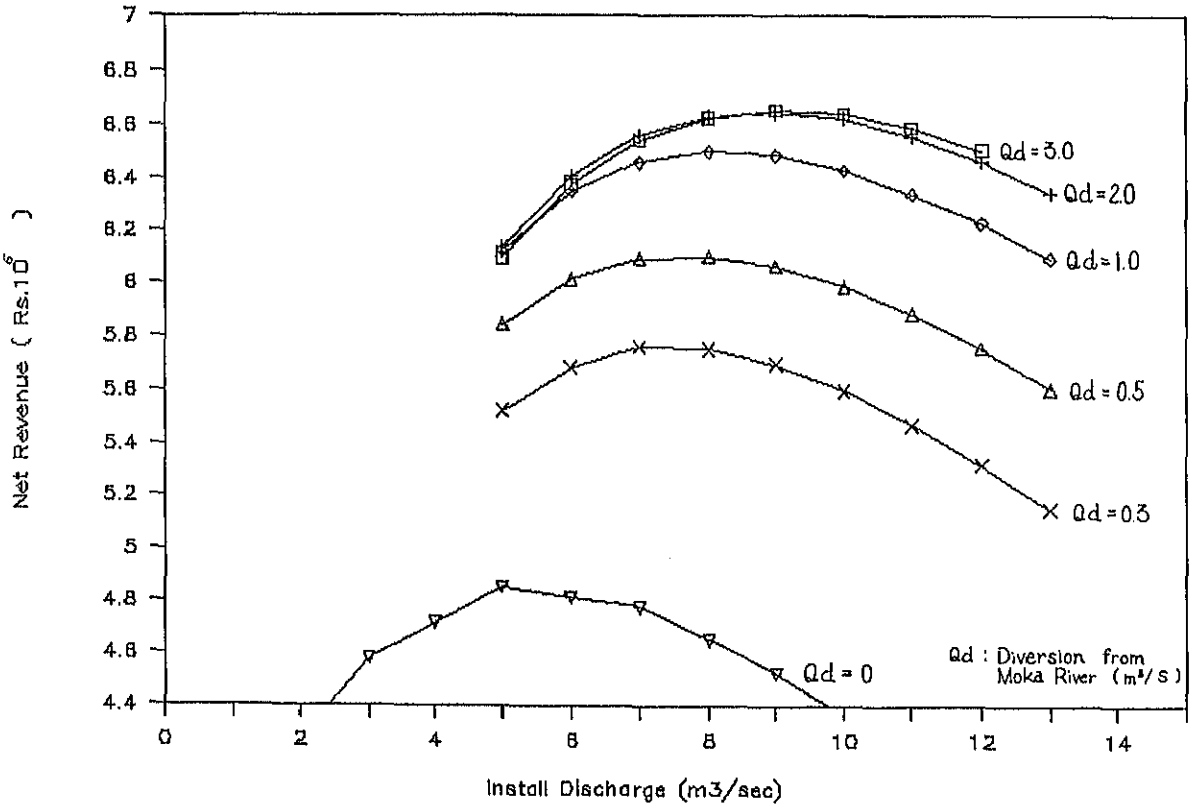
TARIFF OF ERECTRICITY APPLIED

GOVERNMENT OF MAURITIUS
PORT LOUIS WATER SUPPLY PROJECT

JAPAN INTERNATIONAL COOPERATION AGENCY

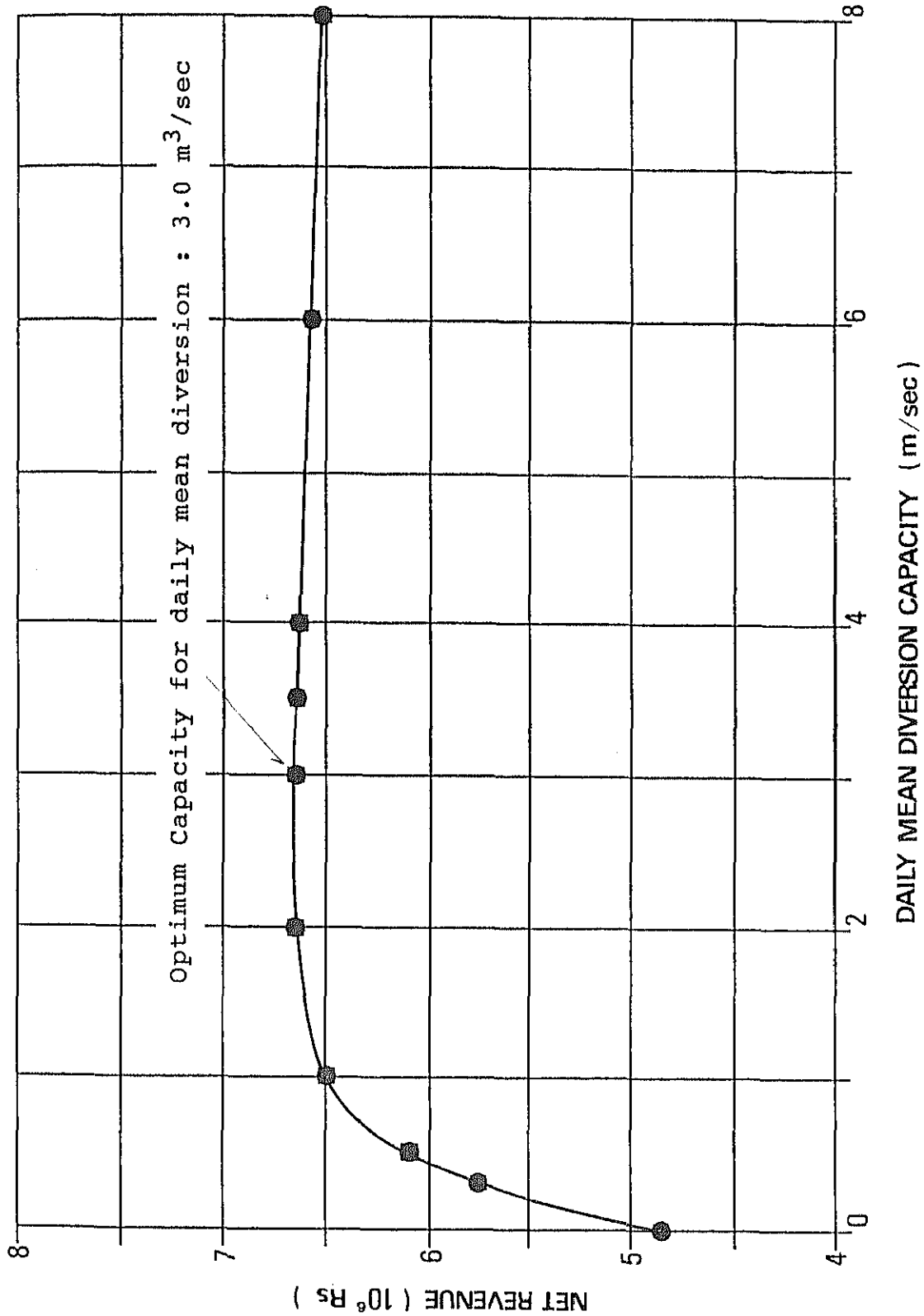
Fig. A.6.3





RELATIONSHIP BETWEEN INSTALLED DISCHARGE AND NET REVENUE	GOVERNMENT OF MAURITIUS PORT LOUIS WATER SUPPLY PROJECT JAPAN INTERNATIONAL COOPERATION AGENCY

Fig. A.6.4



OPTIMUM DIVERSION FLOW VOLUME FREOM THE MOKA RIVER

GOVERNMENT OF MAURITIUS
PORT LOUIS WATER SUPPLY PROJECT
JAPAN INTERNATIONAL COOPERATION AGENCY

D A T A B O O K

I DIRECT MEASUREMENT 1

II DEW POINT TEMPERATURE 24

III RESERVOIR OPERATION 39
(1) PROGRAM 39
(2) WATER BALANCE (WITHOUT LEAKAGE FROM RESERVOIR) 48
(3) WATER BALANCE (WITH LEAKAGE FROM RESERVOIR) 69

IV SEDIMENT 90
(1) STATION E04 90
(2) STATION E05 99
(3) STATION E06 107

I DIRECT MEASUREMENT

1. General

The Grand River North West (GRNW),which is the main source of Port Louis Water Supply Project,consists of five tributaries. Water level record has been intensively processed for about 20 years for each tributary, that is, Moka river at W10, Profonde river at W08,Cascade river at W05, Terre Rouge river at W04 and Plaines Wilhems river at W03.

These five gauging stations are located at 'Highland',central plateau. On the other hand, proposed intake site for the project will be located at Municipal Dyke or its adjacent site. The residual area between gauging stations and Municipal Dyke is 24 km^2 ,or 21 per cent of catchment area of GRNW at Municipal Dyke.

It is reported that some leakage loss of water may occur in the river stretches. Such a loss of water, if any, should be taken into account in the planning. Discharge measurement in Phase I did not detect any symptom of water loss in the river stretches. However, in view of the significance of its effect on the planning if any, the discharge measurement was executed again to confirm the matter.

Furthermore, coefficients to estimate additional flows from residual basin in the downstream of gauging stations, which are required for the simulation for analysing necessary effective storage of reservoir, are also confirmed.

2. Direct flow measurement sites and methods

Direct flow measurements were carried out by Hydrological section, CWA and JICA team on October 29 and 30,1988 and November 1 and 3 ,1988. The measuring site had been previously selected and also cleaned to be a good condition for current metering. Locations of the sites and their conditions are shown in Attachment I-1. Methods of measurement are as follows:

Site	Method/Instrument	Date
A-1	Volumetrical measurement	29/Oct., 30/Oct.
A-2	- do -	29/Oct.
	(leakage from pipe Ø27")	
A-4	Current flow meter	30/Oct., 3/Nov.
A-5	- do -	- do -
A-6	- do -	- do -
B-1	- do -	- do -
B-2	- do -	- do -
B-3	- do -	- do -
B-4	- do -	- do -
C-2	Ultra sonic flow meter	29/Oct., 30/Oct., 1/Nov.
C-3	Current flow meter	- do -
C-4	- do -	- do -
C-6	- do -	- do -
W03	Gauge reading,automatic recorder	- do -
W04	- do -	- do -
W05	- do -	- do -
W08	- do -	- do -
W10	- do -	- do -

3. Flow condition and others

There was no severe rainfall which may influence river flow during the measurement work and for previous few weeks. It was considered to be suitable for measurement in general.

The most influential factor is CEB power station which is located at Reduit. CEB power station has 7700 m^3 regulation reservoir downstream of W04 and W05 and release impounded water for power generation at 6-7 hours interval (5-6 hours for storing water and 1 hour for generation). Power station stops releasing after generation,but river flow downstream continue to decrease gradually because of storage function of river channel. This influence continues for about 5 hours.

On Oct.30, and Nov.3, CEB was requested to stop operation by CWA. The followings are CEB operation in these days.

Time	Condition
30/Oct.	
0:00	Generation stop
0:00 - 6:00	Storing water into reservoir
6:00 - 7:10	Generation
7:00 - 13:35	Storing water into reservoir
13:35 - 17:45	Spillout over the weir occurred
17:45 - 19:00	Generation
1/Nov.	
0:00	Generation stop
0:00 - 6:00	Storing water into reservoir
6:00 - 7:10	Generation
7:00 - 12:30	Storing water into reservoir
12:30 - 13:30	Generation
13:30 - 19:00	Storing water into reservoir
19:00 - 20:00	Generation
20:00 -	Storing water into reservoir
2 - 3 /Nov.	
22:55	Generation stop
22:55 - 8:00	Storing water into reservoir
8:00 - 16:25	Spillout over the weir occurred
16:25 - 17:25	Generation
17:25 -	Storing water into reservoir

On Oct.30, CEB station stoped operation at 7:00 and began to spill water at 13:30. Therefore, flow downstream of power station was still infuenced during direct measurement as shown Attachment I-3 (1). Flow at B-3,Terre Rouge river at the confluence with Profonde river decrease from 305 lit/sec to 171 lit/sec for 1.5 hours.)

On the other hand, CEB station stoped operation at 22:00 of previous day of Nov.3. Spill-out over the weir began at 8:00 and the water was all stored at pond,which is located between the reservoir and power station and has the capacity of about 9000 m^3. Therefore, there is no influence of neither CEB operation nor spill out during the direct measurement of the day.

4. Results

4-1 Leakage from Municipal Dyke, Municipal Pipelines

There can be seen no flow through section A-2, upstream pipe bridge. Leakage water from Ø27" pipe falls into the river channel at the bridge and its total amount was 42 lit/sec. The flow volume at section A-1, downstream pipe bridge,is 47 lit/sec. Inflow volume through three pipes of Ø18",Ø19",Ø27" into Pailles Treatment plant are 113 lit/sec, 134 lit/sec, 332 lit/sec respectively.

From these findings,the following conclusions are deduced.

- Leakage water from Ø27" pipe at A-2 is main source of river flow downstream of Municipal Dyke. Its contribution is about 90 %.

- Leakage from three pipes is 8 % in the present condition and this proportion can be reduced to be 1 % by repair of Ø27" pipe at A-2. In this case almost river flow will disapear .
- Seepage through foundation of Municipal Dyke is negligible. In case water level of Municipal Dyke reservoir is near the low flow section of the weir, seepage through dam abut occurs. This volume is ,however, less than 0.010 cumec as observed in June-

August,1988.

4-2 Loss of surface water along GRNW

To certify the loss or gain of surface water along GRNW, total amount of flow at five gauging stations and total flow through Municipal pipelines are compared with data observed on Nov.1.

a) Flow at gauging stations

Flows at five gauging stations were given from staff reading and rating table which have been used by hydrological section,CWA. As for station W10 (Moka river), one direct measurement work was carried out and rating table was modified according to the result in order to assure such a low flow condition of the rating curve. Relation between modified and original rating curves is as follows,

$$Q_{mod} = 0.1625 \cdot (Q_{org}-45.31)^{1.342} + 25.49 \quad (Q_{org} <= 296)$$
$$= Q_{org} \quad (Q_{org} > 296)$$

where,

Q_{mod} : discharge calculated by modified rating curve (lit/sec)
Q_{org} : discharge calculated by original rating curve (lit/sec)

b) Flow at Municipal Dyke

Flow of three pipelines are measured by ultra sonic flow meter at the inlet of Pailles treatment plant. Actual discharge at Municipal dyke is estimated by adding 8 % of total flow as leakage (see 4-1).

CEB power station operated regularly on Nov.1. Flow at Municipal Dyke changed with about 7 hours cycle,which coincide with interval of CEB generation. The relation between flow at gauging stations, CEB power station and Municipal Dyke is shown in Attachment I-2 and this figure indicates that total accumulated discharge ,or average should be considered according to the cycle.

c) Average flow at five Gauging Stations and at Municipal Dyke

Period of a cycle 10:30 to 17:45 is used for an average flow at Municipal Dyke. The corresponding released flow from CEB power station is stored from 6:00 to 13:00 by surface flow of the Cascade and Terre Rouge river(W04,W05). As for W03,W08 and W10, traveling time of 1.5 hours to Municipal Dyke is estimated. Then, average flows at these sites are compared as follows,

Station	River/Canal	Considered period	Average
Gauging Station		29/Oct	
W03	Plaines Wilhems	9:00 - 16:00	79.2
W04	Terre Rouge	6:00 - 13:00	130.4
W05	Cascade	6:00 - 13:00	176.3
W08	Profonde	9:00 - 16:00	114.5
W10	MOka	9:00 - 16:00	69.6
		Sub total (1)	570.0
Abstraction			
W019	Plaines Wilhems canal	* measured on 30/Oct ,3/Nov	79.2
W006	Bagatelle canal	* measured on 30/Oct ,3/Nov	115.1
W003	Pailles canal	* measured on 30/Oct ,3/Nov	53.7
W002	DWS pipeline(Soreze)	* measured on 15/Oct,14/Nov (Valve is fixed)	2.0
W026	MSRI	* information from CWA	25.0
		Subtotal (2)	275.0
Municipal Pipeline		29/Oct	
Ø18" pipe		10:30 - 17:30	114.0
Ø19" pipe		10:30 - 17:30	132.0
Ø27" pipe		10:30 - 17:30	253.8
Leakage		11:15, 13:10, 15:20	50.3
		Sub total (3)	549.1

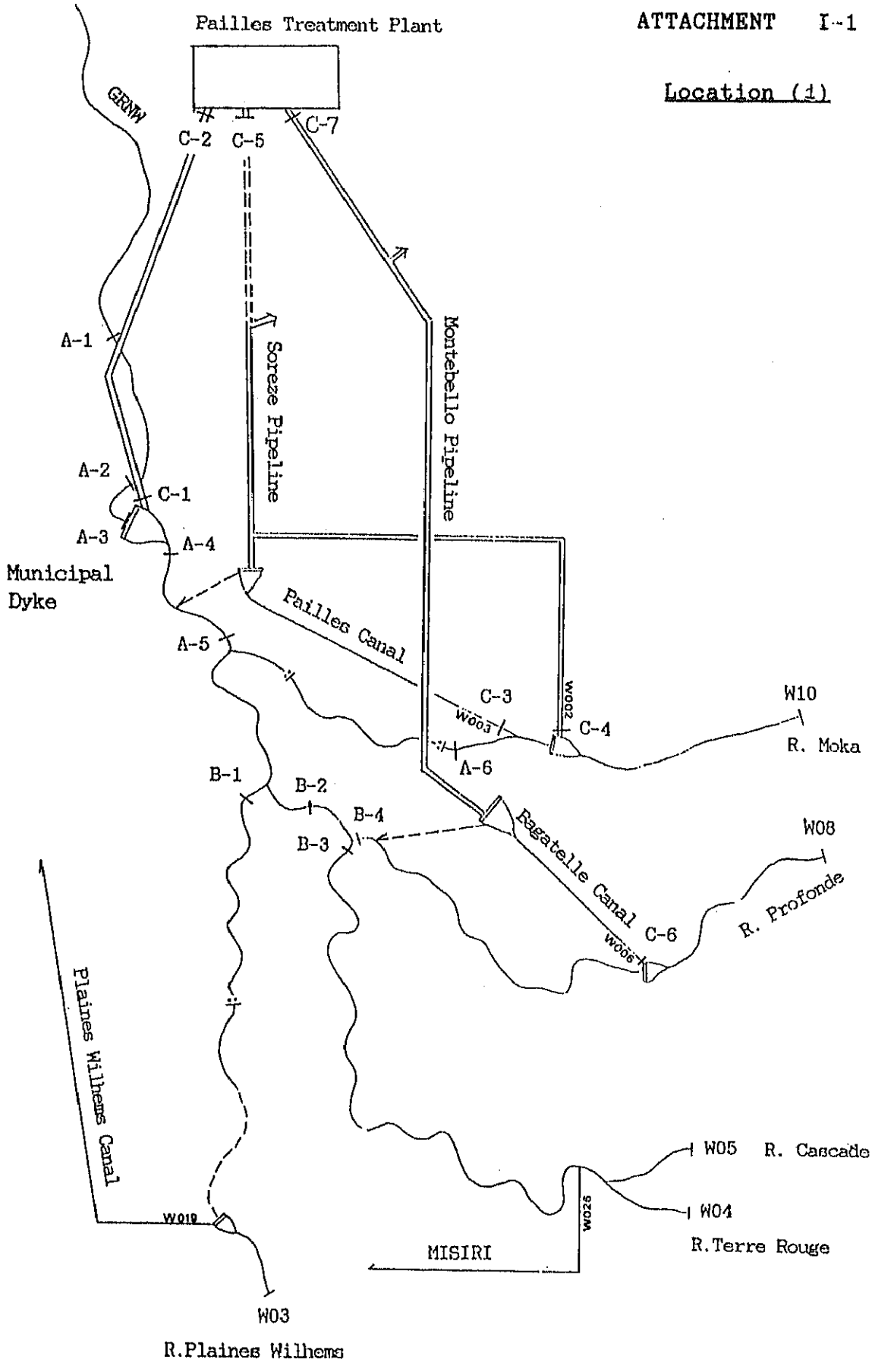
Total additional gain downstream of the gauging stations		(3)+(2)-(1)	254.1

According to the above balance table, the following conclusions are deduced .

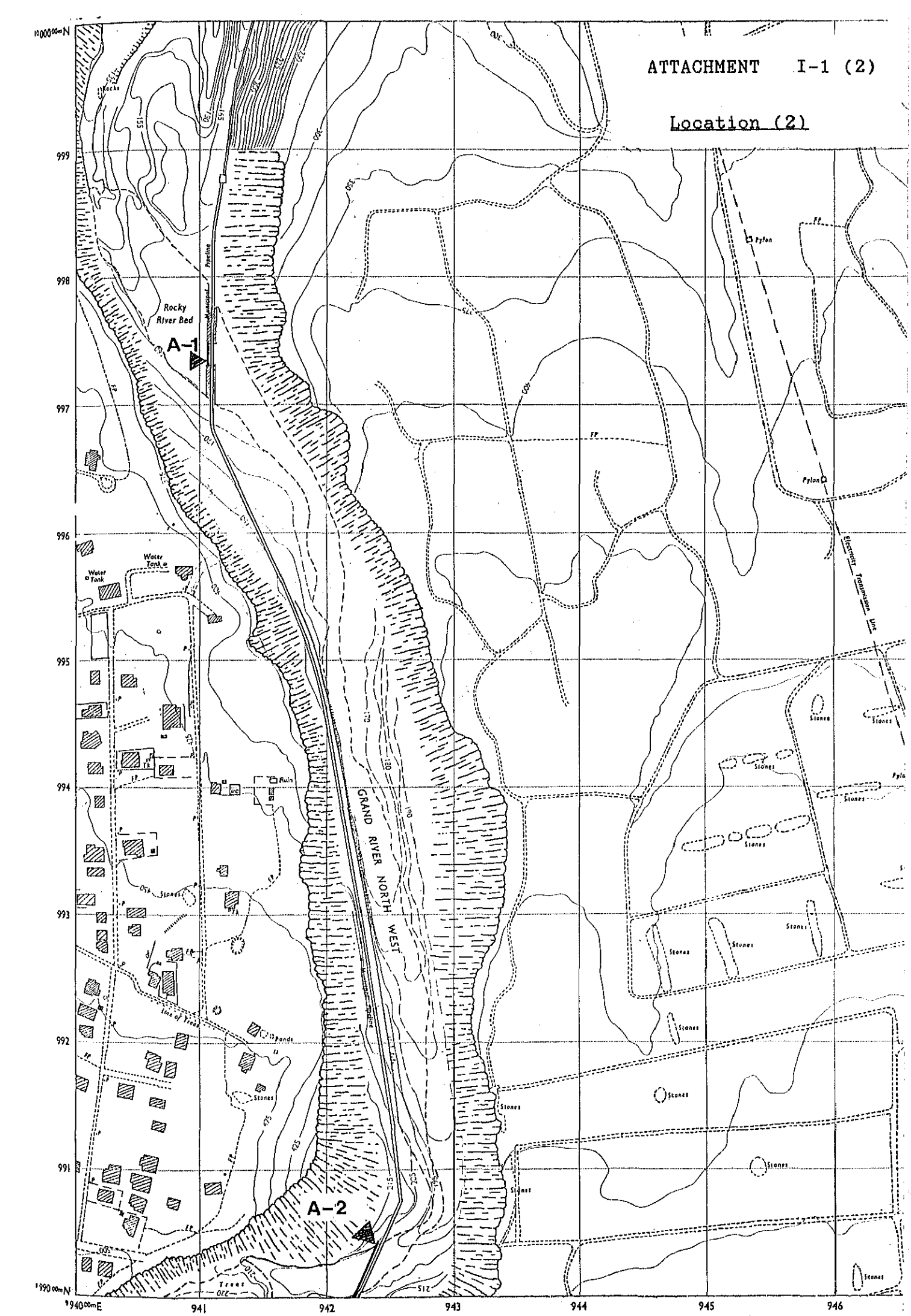
- It seems as if there is loss along the river channel. But ,if abstractions between gauging stations and Municipal Dyke are taken into consideration, total gain at Municipal Dyke reach 804 lit/sec and additional volume is 254 lit/sec, or, 45% of the accumulated flow at five gauging stations.

ATTACHMENT I-1 (1)

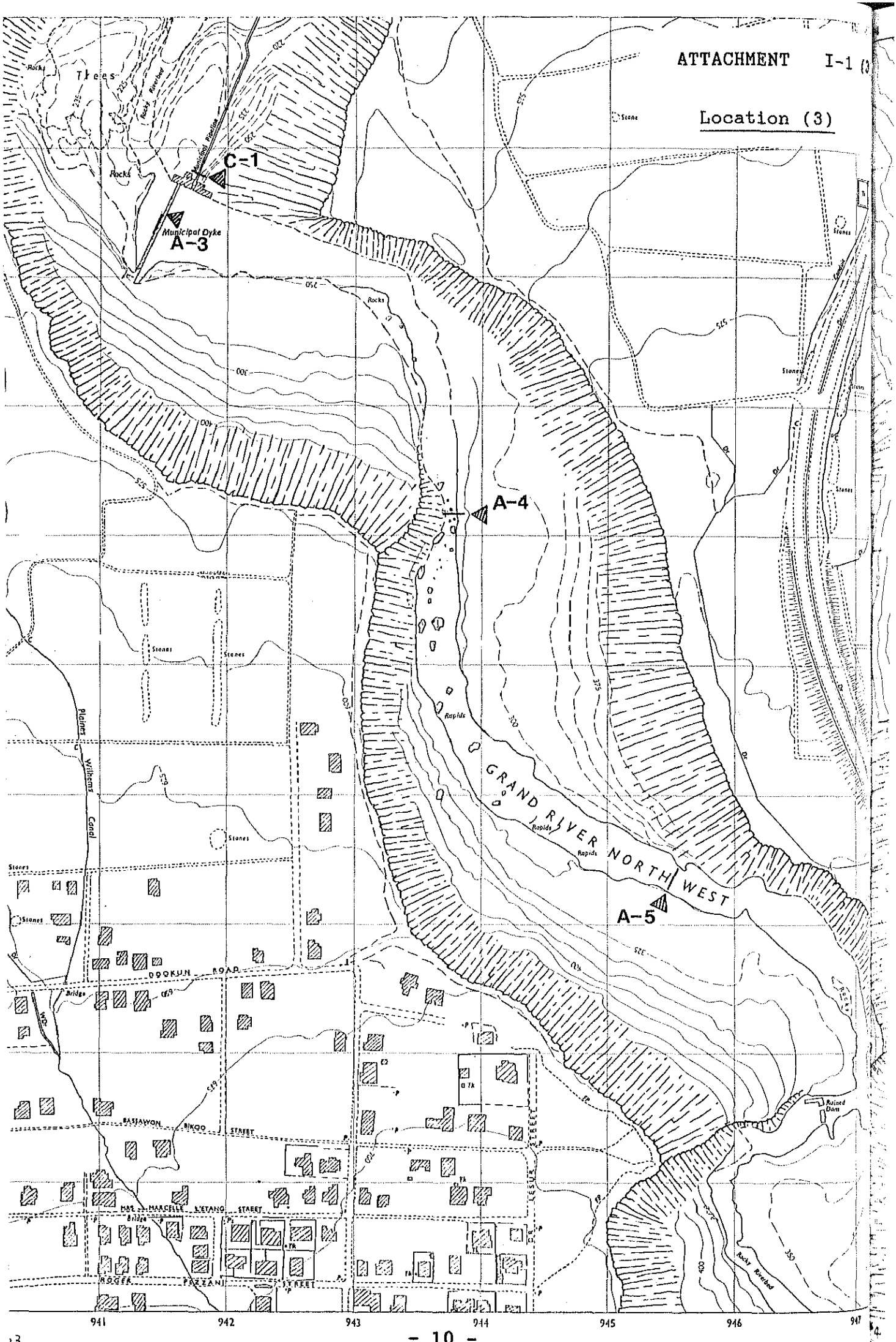
Location (1)

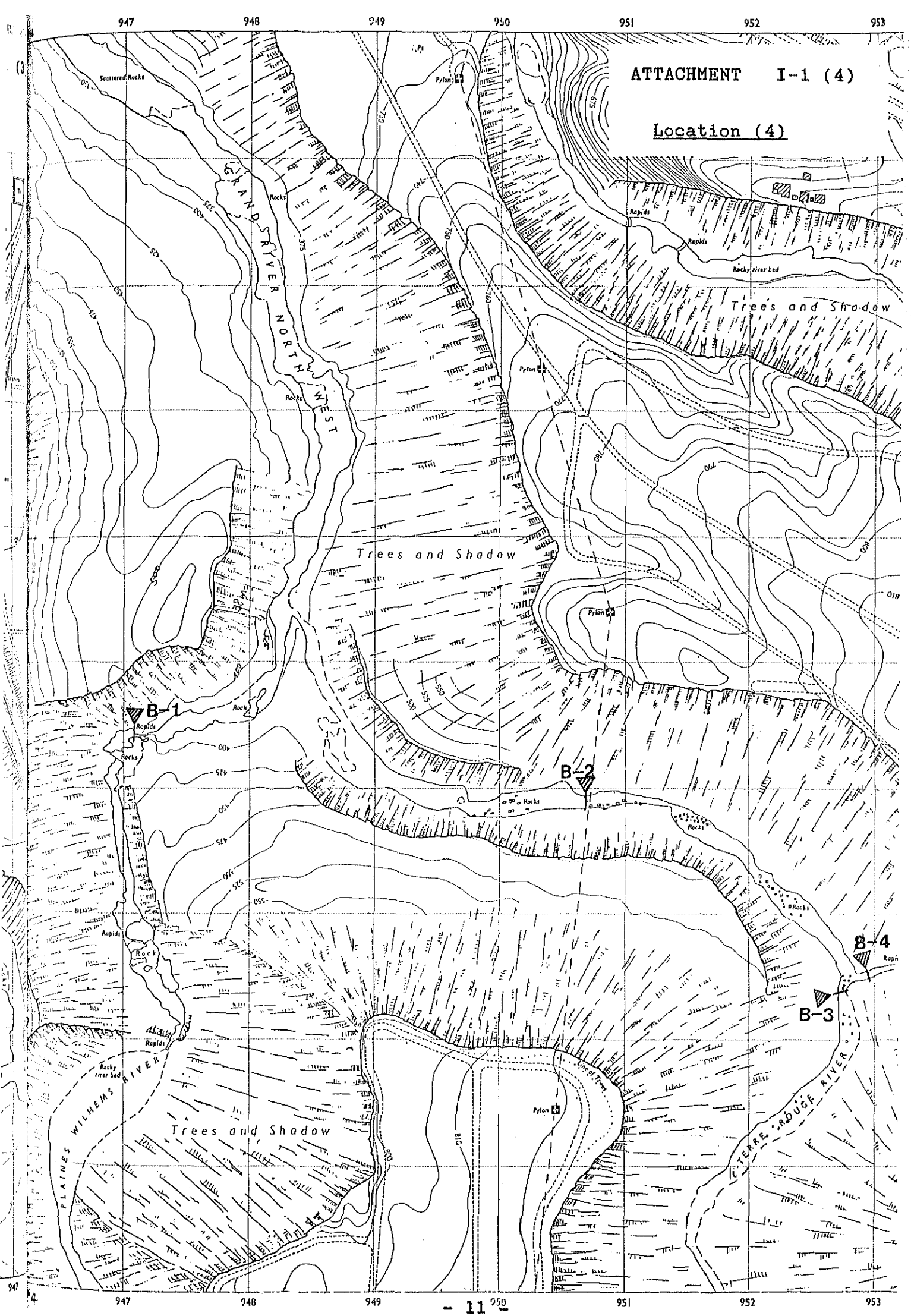


FLOW DIAGRAM OF GRNW AND EXISTING PIPELINES	GOVERNMENT OF MAURITIUS PORT LOUIS WATER SUPPLY PROJECT JAPAN INTERNATIONAL COOPERATION AGENCY


ATTACHMENT I-1 (2)
Location (2)
10000.00mN
999
998
997
996
995
994
993
992
991
9990.00mN
9940.00mE
941
942
943
944
945
946
Rocky River Bed
A-1
A-2
Pipeline
Municipal
Water Tank
Water Tank
Ruin
GRAND RIVER NORTH WEST
Pylon
Pylon
Electricity Transmission Line
Stones
Line of Trees
Ponds
Trees

D.O.S. 029


ATTACHMENT I-1 (3)
Location (3)
C-1
A-3
Municipal Dyke
A-4
A-5
GRAND RIVER NORTH WEST
Rapids
Rapids
Rapids
Plaines Wilhems Canal
DOOKUN ROAD
BASSAWON BIKOO STREET
MAR. MARCELLE L'ETANG STREET
ROGER PAZZANI STREET
LESLIE STREET
Ruined Dam
Rocky Riverbed
Municipal Pipeline
Trees
Rocks
Stones
Bridge
941
942
943
944
945
946
947


ATTACHMENT I-1 (4)
Location (4)
947
948
949
950
951
952
953
GRAND RIVER NORTH WEST
PLAINES WILHEMS RIVER
TERRE ROUGE RIVER
Trees and Shadow
Trees and Shadow
Trees and Shadow
Rapids
Rocky river bed
Rocks
Pylon
Line of Trees
B-1
B-2
B-3
B-4

SITE INVESTIGATION

DATE : 19th of October, 1988

PARTICIPANTS : Mr. Kuwabara (JICA)
Mr. Mowlabacus (CWA)
Mr. Durup (CWA)

This site investigation was carried out to decide the sites for direct measurement whose purpose is to elaborate the water balance along the reaches of Soreze area of the GRNW. It is said that huge amount of leakage may occur along the reaches, which influences the scheme of the project.

1. Identified Measurement sections

The following measurement sites are identified and packaged into three parts according to the access condition and instrument used for these measurements as shown in Fig-1. They are ,

Part A (From the Municipal pipe line bridge 1000 m downstream of Municipal Dyke to the old dike upstream of the confluence with the Moka river)

site A-1 : pipe bridge 1000 m downstream of Municipal Dyke
(GRNW) condition : good
small amount of flow passing over the ditch of the concrete base of pipe bridge (about 50 lit/sec is observed),

site A-2 : pipe bridge 150 m downstream of Municipal Dyke
(GRNW) condition : fair
There is no flow passing through the concrete base of the pipe bridge

site A-3 : weir with iron brade at Municipal Dyke
(GRNW) condition : good
There is no flow over the low flow section of the weir. There also can not be seen any leakage through dam at this time.

site A-4 : upstream of Municipal dyke reservoir
(GRNW) condition : fair
A site usually used for direct measurement by CWA. The riverbed is already cleaned for measurement. Additional clearing work of 1 day is necessary,

site A-5 : downstream of the confluence with the Moka river (GRNW)

condition : fair

preparatory work of half day to clear rock of river bed to make the flow stable is required. There may exist riverbed water because of thick deposit of boulders in the river channel.

site A-6 : some 200 m downstream of Pailles Canal Intake of the Moka river

condition : good- fair

This river section is covered with lava, though there observed some turbulence.

Part B (Confluence with the the Plaines Wilhems river ,and confluence with the Profonde river and the terre Rouge river. upstream of the confluence with the Moka river)

site B-1 : on the Plaines Wilhems river and located at 150 m upstream of the confluence with the Terre Rouge river

condition : good

This river section is covered with lava and flow is uniform. 1 hour preparatory work to clear deposit of the river bed is necessary.

site B-2 : on the Terre Rouge River and located at 250 m upstream of the confluence with the Plaines Wilhems river.

condition : good-fair

This river section is covered with lava and flow is relatibly stable. No preparatory work is necessary.

site B-3 : on the Terre Rouge river and located just upstream of the confluence with the Profonde river.

condition : good - fair

This river section is covered with lava and flow is stable. No preparatory work is necessary.

site B-4 : on the Profonde river and located just upstream of the confluence with the Terre Rouge river.

condition : good

This river section is covered with lava and flow is uniform. No preparatory work is necessary.

Part C (Pipe line system connected to Pailles treatment ; Measurements are to be conducted by means of ultra sonic flow meter.)

site C-1 : three pipes at the intake of Municipal Dyke (Municipal pipe line)

site C-2 : three pipes just before connected to Pailles treatment (Municipal pipe line)

site C-3 : Pailess Canal whose water is abstracted from the Moka river. (W003)

site C-4 : beginning of pipe line (Mount Ory DWS; W002) at Soreze dam

site C-5 : pipe just before connected to Pailles treatment (Soreze pipe line)

site C-6 : beginning of Bagatelle canal (W006)

site C-7 : Montebello pipe line just before conected to Pailles treatment

2. Findings

(1) River flow at the confluence of the Profonde river and the Terre Rouge river

Flow at section B-4 (Profonde)is roughly estimated to be 0.05 cumec (2.0 m x 0.2 m x 0.1 m/s)

Flow at section B-3 (Terre Rouge) is roughly estimated to be 0.08 cumec (2.5 m x 0.1 m x 0.3 m/s)

Flow at section B-2 is (Terre Rouge) is roughly estimated to be 0.15 cumec

(2) River flow at the confluence of the GRNW river and the Moka river

There are many boulders on the river bed at site A-3. The site is relatively good for measurement , but some part may run through the deposit as river bed water.

There is no over flow through the concrete basement of pipe bridge which crosses GRNW at 150 m downstream from Municipal Dyke, which indicates that leakage through the dam or its foundation is negligible. At the bridge, leakage water from Ø 700 pipe pours into the river channel (about 50 lit/sec). Whole amount of the water is pumped up at the another pipe bridge some 1000 m downstream of Municipal Dyke.

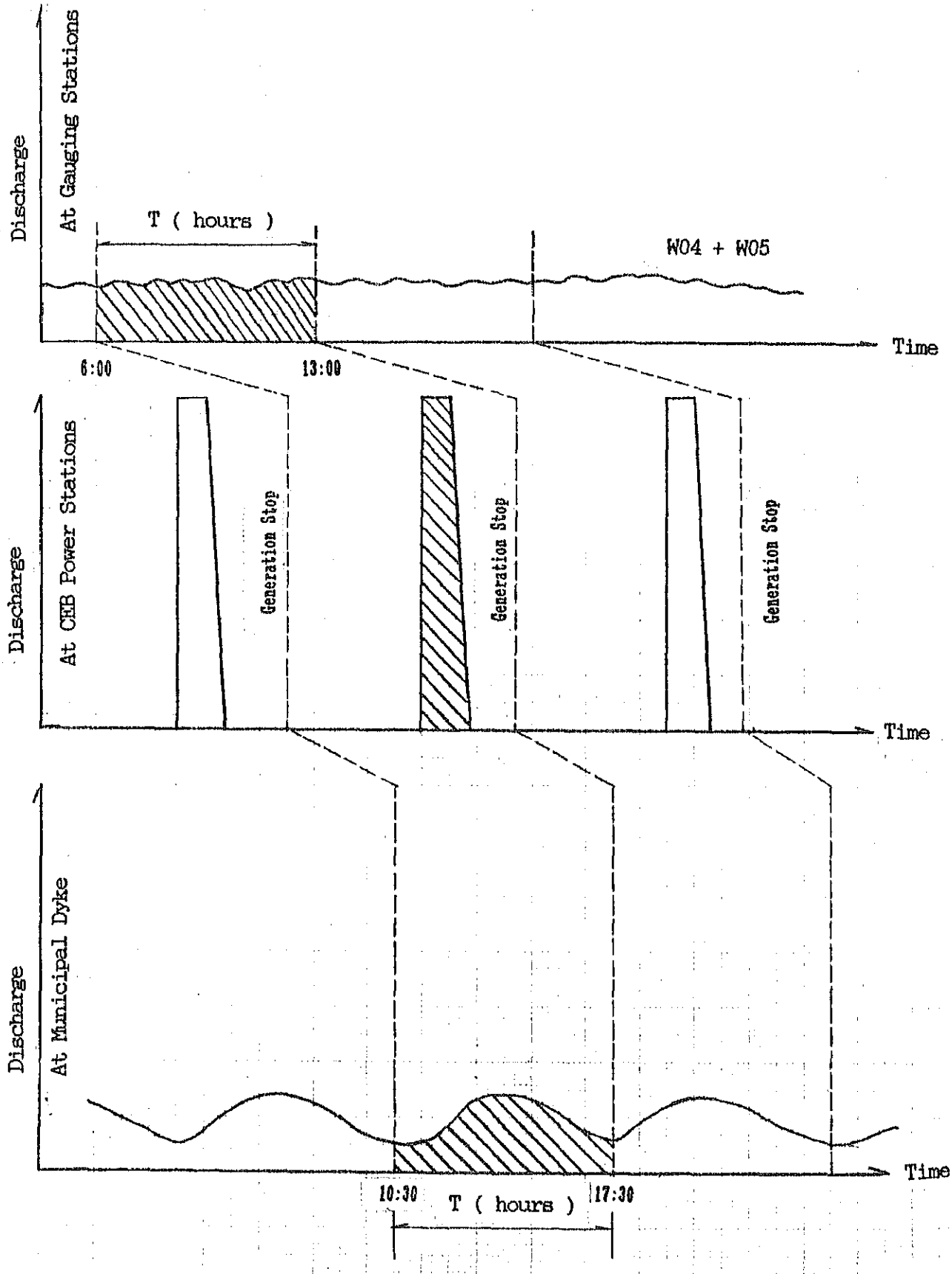
(3) According to the personnel at Pailles treatment plant,

a. Water through Soreze pipe line are usually abstracted by the community located at Soreze area and the amount reaches Pailles treatment is not reliable. The amount at the time is only less than one lit/sec.

b. Maximum capacity of Montebello pipe line is 17 m^3/min (283 lit/sec).

c. Some water is abstracted from Montebello pipe line for irrigation. The total amount is less than 10 lit/sec.

Influence due to CEB's Power Station



WATER BALANCE ALONG GRNW

Date	Time	W03	W04	W05	W08	W10	Sum (1)	Sum (2)	Sum (3)	A-1	A-4	A-5	A-6	B-1	B-2	B-3	B-4	C-2	C-3	C-4	C-6	W026
30/Oct.	8.0	92.9	99.1	177.0	147.3	69.6	310.3	403.2	568.6	50.3									42.7	2.0	113.0	25.0
	8.5	91.8	99.1	195.6	147.3	69.6	328.9	420.7	593.7	50.3								529.3	42.7	2.0	113.0	25.0
	9.0	90.6	99.1	214.3	147.3	69.6	347.6	438.2	618.9	50.3								519.8	42.7	2.0	113.0	25.0
	9.5	89.5	99.1	232.9	147.3	69.6	366.2	455.7	644.0	50.3							55.7	510.3	42.7	2.0	113.0	25.0
	10.0	88.3	99.1	251.5	147.3	69.6	384.8	473.1	669.1	50.3			46.4					563.3	42.7	2.0	113.0	25.0
	10.5	87.3	99.1	254.0	147.3	69.6	387.3	474.6	671.9	50.3						305.0		616.3	42.7	2.0	113.0	25.0
	11.0	86.2	99.1	256.5	147.3	69.6	389.8	476.0	674.7	50.3								622.8	42.7	2.0	113.0	25.0
	11.5	85.2	99.1	259.0	147.3	69.6	392.3	477.5	677.5	50.3								629.3	42.7	2.0	113.0	25.0
	12.0	84.1	99.1	261.4	147.3	69.6	394.7	478.8	680.1	50.3					226.5	226.5		639.6	42.7	2.0	113.0	25.0
	12.5	84.1	99.1	261.4	147.3	69.6	394.7	478.8	680.1	50.3								650.0	42.7	2.0	113.0	25.0
	13.0	84.1	99.1	261.4	147.3	69.6	394.7	478.8	680.1	50.3		453.0						660.3	42.7	2.0	113.0	25.0
	13.5	84.1	99.1	261.4	131.7	67.9	377.5	461.6	656.0	50.3				58.5				596.3	42.7	2.0	113.0	25.0
	14.0	84.1	99.1	264.7	116.0	66.3	363.4	447.5	636.3	50.3								561.3	42.7	2.0	113.0	25.0
	14.5	84.1	99.1	268.0	116.0	64.6	365.0	449.1	638.5	50.3	399.0							545.3	42.7	2.0	113.0	25.0
	15.0	84.1	99.1	271.3	116.0	64.6	368.3	452.4	643.1	50.3								522.3	42.7	2.0	113.0	25.0
	15.5	84.1	99.1	271.3	116.0	64.6	368.3	452.4	643.1	50.3								505.3	42.7	2.0	113.0	25.0
	16.0	84.1	99.1	271.3	118.9	64.6	371.2	455.3	647.1	50.3								483.3	42.7	2.0	113.0	25.0
	16.5	86.2	99.1	271.3	121.8	64.6	374.1	460.3	652.5	50.3								471.3	42.7	2.0	113.0	25.0
	17.0	88.3	99.1	271.3	121.8	64.6	374.1	462.4	653.8	50.3								445.3	42.7	2.0	113.0	25.0
		86.5	99.1	251.3	135.7	67.8	371.2	457.7	648.9	50.3	?	?	46.4	58.5	?	?	55.7	581.6	42.7	2.0	113.0	25.0

Reference (1) : Accumulated discharge at four gauging stations (W04,W05,W08,W10)
Abstraction such as W006(Bagatelle canal),W003(Pailles canal),W002,w026 are considered.

(2) : Accumulated discharge at five gauging stations (W03,W04,W05,W08 and W10)
Abstraction such as W006(Bagatelle canal),W003(Pailles canal),W002,w026 are considered.

(3) : Accumulated discharge at five gauging stations and additional flow from residual area
Additional flow are 65 % of Plaines Wilhems River,
47 % of Moka River,
39 % of other three tributaries.
(This case is used for estimate of inflow at Municipal Dyke)
Abstraction such as W019(Plaines Wilhems canal),W006(Bagatelle canal),W003(Pailles canal),W002,w026 are considered.

Water Balance along GRNW (1)

Water Balance along GRNW (2)

WATER BALANCE ALONG GRNW

Date	Time	W03	W04	W05	W08	W10	Sum (1)	Sum (2)	Sum (3)	A-1	A-4	A-5	A-6	B-1	B-2	B-3	B-4	C-2 (4)	C-3	C-4	C-6	W026
1/Nov.	4.0	79.6	99.1	155.5	150.1	69.6	276.5	356.1	520.8										53.7	2.0	115.1	25.0
	4.5	79.6	99.8	156.6	153.7	69.6	283.8	363.4	528.2										53.7	2.0	115.1	25.0
	5.0	79.6	100.5	157.6	157.2	69.6	289.1	368.7	535.6										53.7	2.0	115.1	25.0
	5.5	79.6	101.2	158.7	160.8	69.6	294.4	374.0	542.9										53.7	2.0	115.1	25.0
	6.0	79.6	102.0	159.7	164.3	69.6	299.8	379.4	550.3										53.7	2.0	115.1	25.0
	6.5	79.6	101.6	164.0	155.1	69.6	294.5	374.1	543.0										53.7	2.0	115.1	25.0
	7.0	79.6	101.2	168.4	145.9	69.6	289.2	368.8	535.7										53.7	2.0	115.1	25.0
	7.5	79.6	100.9	172.7	136.6	69.6	284.0	363.6	528.4										53.7	2.0	115.1	25.0
	8.0	79.6	100.5	177.0	127.4	69.6	278.7	358.3	521.1										53.7	2.0	115.1	25.0
	8.5	79.6	100.2	177.0	124.6	69.6	275.5	355.1	516.7										53.7	2.0	115.1	25.0
	9.0	79.6	99.8	177.0	121.8	69.6	272.4	352.0	512.3										53.7	2.0	115.1	25.0
	9.5	79.6	99.5	177.0	118.9	69.6	269.2	348.8	507.8	50.3								448.0	53.7	2.0	115.1	25.0
	10.0	79.6	99.1	177.0	116.1	69.6	266.0	345.6	503.4	50.3								437.7	53.7	2.0	115.1	25.0
	10.5	79.6	126.0	178.1	116.1	69.6	294.0	373.6	542.3	50.3								427.7	53.7	2.0	115.1	25.0
	11.0	79.6	152.9	179.2	116.1	69.6	322.0	401.6	581.3	50.3								502.6	53.7	2.0	115.1	25.0
	11.5	79.6	179.8	180.3	116.1	69.6	350.0	429.6	620.2	50.3								590.0	53.7	2.0	115.1	25.0
	12.0	79.6	206.7	181.4	116.1	69.6	378.0	457.6	659.1	50.3								636.4	53.7	2.0	115.1	25.0
	12.5	79.6	197.5	185.9	115.4	69.6	372.6	452.2	651.5	50.3								650.8	53.7	2.0	115.1	25.0
	13.0	79.6	188.3	190.3	114.7	69.6	367.1	446.7	643.9	50.3								644.6	53.7	2.0	115.1	25.0
	13.5	79.3	179.1	194.8	114.0	69.6	361.7	440.9	636.2	50.3								631.4	53.7	2.0	115.1	25.0
	14.0	79.0	169.9	199.2	113.3	69.6	356.2	435.2	628.4	50.3								611.5	53.7	2.0	115.1	25.0
	14.5	78.7	160.8	205.1	111.9	69.6	350.7	429.4	620.6	50.3								583.0	53.7	2.0	115.1	25.0
	15.0	78.4	150.1	210.9	110.5	69.6	345.3	423.6	612.8	50.3								555.2	53.7	2.0	115.1	25.0
	15.5	78.1	140.2	216.8	109.0	69.6	339.8	417.8	605.0	50.3								528.3	53.7	2.0	115.1	25.0
	16.0	77.8	130.3	222.6	107.6	69.6	334.3	412.1	597.1	50.3								499.7	53.7	2.0	115.1	25.0
	16.5	77.5	123.9	222.6	107.6	69.6	327.9	405.4	588.1	50.3								478.6	53.7	2.0	115.1	25.0
	17.0	77.1	117.6	222.6	107.6	69.6	321.6	398.7	579.0	50.3								456.3	53.7	2.0	115.1	25.0
	17.5	76.8	111.2	222.6	107.6	69.6	315.2	392.0	570.0	50.3								439.7	53.7	2.0	115.1	25.0
	18.0	76.5	104.8	222.6	107.6	69.6	308.8	385.3	560.9	50.3								430.8	53.7	2.0	115.1	25.0
	18.5	76.2	103.4	222.6	107.6	69.6	307.4	383.6	558.7	50.3								493.8	53.7	2.0	115.1	25.0
	19.0	75.9	102.0	222.6	107.6	69.6	306.0	381.9	556.5	50.3									53.7	2.0	115.1	25.0
	19.5	75.6	100.5	222.6	107.6	69.6	304.5	380.1	554.4	50.3									53.7	2.0	115.1	25.0
	20.0	75.3	99.1	222.6	107.6	69.6	303.1	378.4	552.2	50.3									53.7	2.0	115.1	25.0
Time		9:00 -16:00	6:00 -13:00	6:00 -13:00	9:00 -16:00	9:00 -16:00												10:30 -17:30				
Average		79.2	130.4	176.3	114.5	69.6	295.0	374.2	543.5	50.3								549.1	53.7	2.0	115.1	25.0
				Error(%) for (4)			-46.3	-31.8	-1.0										Abstraction Total :			275.0

Reference (1) : Accumulated discharge at four gauging stations (W04,W05,W08,W10)

(2) : Accumulated discharge at five gauging stations (W03,W04,W05,W08 and W10)

(3) : Accumulated discharge at five gauging stations and additional flow from residual area
Additional flow are 65 % of Plaines Wilhems River,
47 % of Moka River,
39 % of other three tributaries.
(This case is used for estimate of inflow at Municipal Dyke for water balance *simulation*)
Abstraction such as W019(Plaines Wilhems canal),W006(Bagatelle canal),W003(Pailles canal),W002,W026 are considered.

Water Balance along GRNW (3)

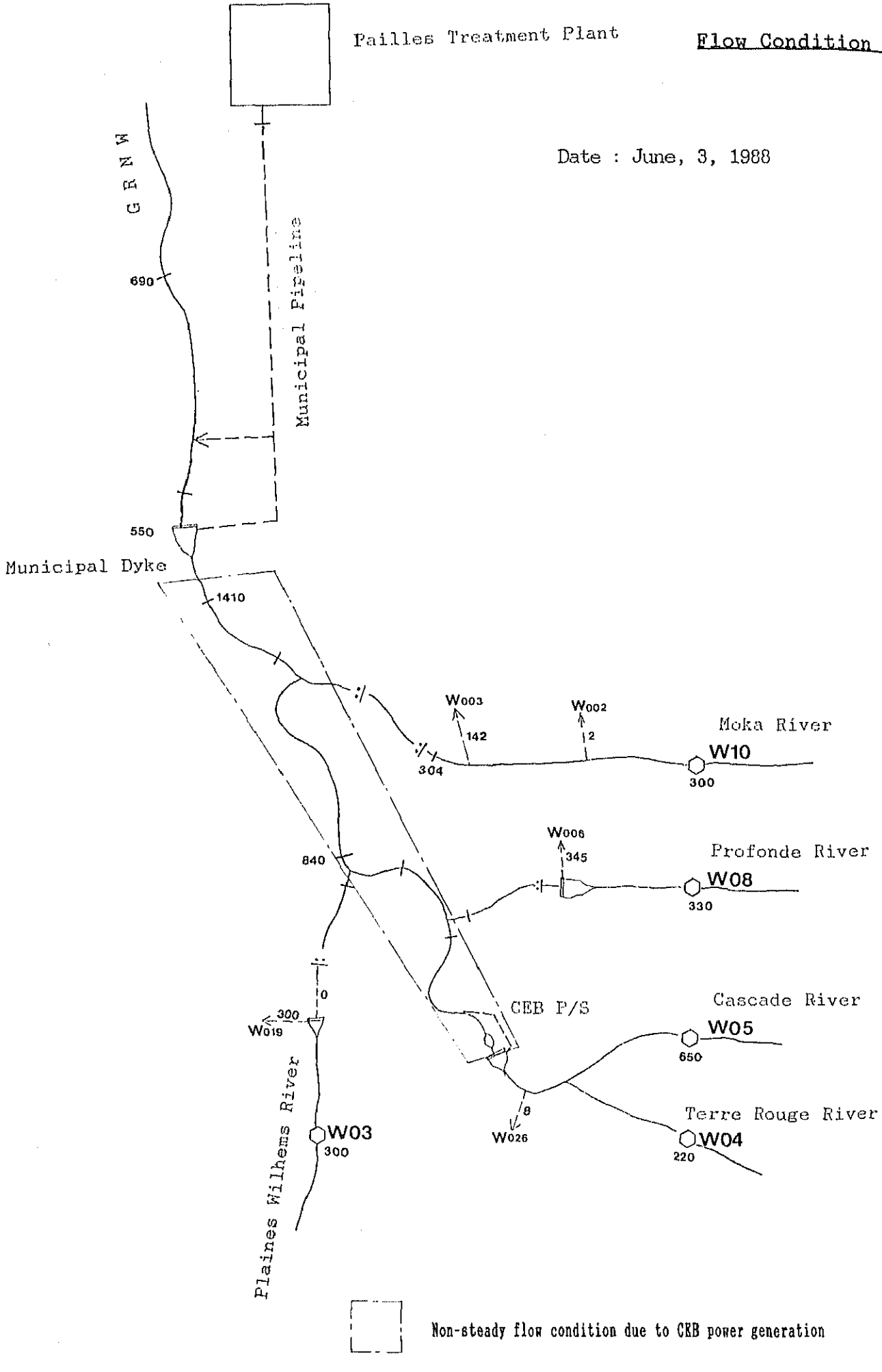
WATER BALANCE ALONG GRNW (3/3)

Date	Time	W03	W04	W05	W08	W10	Sum (1)	Sum (2)	Sum (3)	A-1	A-4	A-5	A-6	B-1	B-2	B-3	B-4	C-2 (4)	C-3	C-4	C-6	W026
3/Nov.	4.0	92.9	109.0	123.2	114.7	69.6	220.7	313.6	449.1											2.0		25.0
	4.5	92.9	108.0	126.2	114.7	69.6	222.7	315.6	451.8											2.0		25.0
	5.0	92.9	106.9	129.2	114.7	69.6	224.6	317.5	454.5											2.0		25.0
	5.5	92.9	105.9	132.1	114.7	69.6	226.5	319.4	457.1											2.0		25.0
	6.0	92.9	104.8	135.1	114.7	69.6	228.4	321.3	459.8											2.0		25.0
	6.5	92.9	104.1	139.1	114.7	69.6	231.8	324.7	464.4											2.0		25.0
	7.0	92.9	103.4	143.2	114.7	69.6	235.1	328.0	469.1											2.0		25.0
	7.5	92.9	102.7	147.2	114.7	69.6	238.4	331.3	473.7											2.0		25.0
	8.0	92.9	102.0	151.2	114.7	69.6	241.7	334.6	478.3											2.0		25.0
	8.5	92.9	102.0	152.3	117.9	69.6	246.0	338.9	484.2											2.0		25.0
	9.0	92.9	102.0	153.4	121.1	69.6	250.2	343.1	490.1								48.8			2.0	115.1	25.0
	9.5	92.9	102.0	154.4	124.2	69.6	254.5	347.4	496.0							62.3			53.7	2.0		25.0
	10.0	92.9	102.0	155.5	127.4	69.6	258.7	351.6	501.9											2.0		25.0
	10.5	92.9	102.7	150.4	127.4	69.6	254.3	347.2	495.8				39.9		127.9					2.0		25.0
	11.0	92.9	103.4	145.3	127.4	69.6	249.9	342.8	489.7					58.8						2.0		25.0
	11.5	92.9	104.1	140.2	127.4	69.6	245.5	338.4	483.6											2.0		25.0
	12.0	92.9	104.8	135.1	127.4	69.6	241.1	334.0	477.5											2.0		25.0
	12.5	92.9	104.1	133.1	124.6	69.6	235.6	328.5	469.8											2.0		25.0
	13.0	92.9	103.4	131.2	121.8	69.6	230.1	323.0	462.2											2.0		25.0
	13.5	92.9	102.7	129.2	118.9	69.6	224.6	317.5	454.5			286.0								2.0		25.0
	14.0	92.9	102.0	127.2	116.1	69.6	219.1	312.0	446.9											2.0		25.0
	14.5	92.9	101.3	124.3	116.1	69.6	215.5	308.4	441.8		270.0									2.0		25.0
	15.0	92.9	100.6	121.3	116.1	69.6	211.8	304.7	436.7											2.0		25.0
	15.5	92.9	99.8	118.4	116.1	69.6	208.1	301.0	431.6											2.0		25.0
	16.0	92.9	99.1	115.4	116.1	69.6	204.4	297.3	426.5											2.0		25.0
	16.5	92.9	99.6	116.4	118.2	69.6	208.0	300.9	431.5											2.0		25.0
	17.0	92.9	100.2	117.3	120.4	69.6	211.7	304.6	436.5											2.0		25.0
	17.5	92.9	100.7	118.3	122.5	69.6	215.3	308.2	441.5											2.0		25.0
	18.0	92.9	101.3	119.2	124.6	69.6	218.9	311.8	445.5											2.0		25.0
	18.5	92.9	101.4	115.5	122.5	69.6	213.2	306.1	438.6											2.0		25.0
	19.0	92.9	101.6	111.7	120.4	69.6	207.5	300.4	430.7											2.0		25.0
	19.5	92.9	101.8	108.0	118.2	69.6	201.8	294.7	422.8											2.0		25.0
	20.0	92.9	102.0	104.2	116.1	69.6	196.1	289.0	414.9											2.0		25.0
Average		92.9	102.8	131.0	119.4	69.6	227.0	319.9	457.9		270.0	286.0	39.9	58.8	127.9	62.3	48.8		53.7	2.0	115.1	25.0

Reference (1) : Accumulated discharge at four gauging stations (W04,W05,W08,W10)
Abstraction such as W006(Bagatelle canal),W003(Pailles canal),W002,w026 are considered.

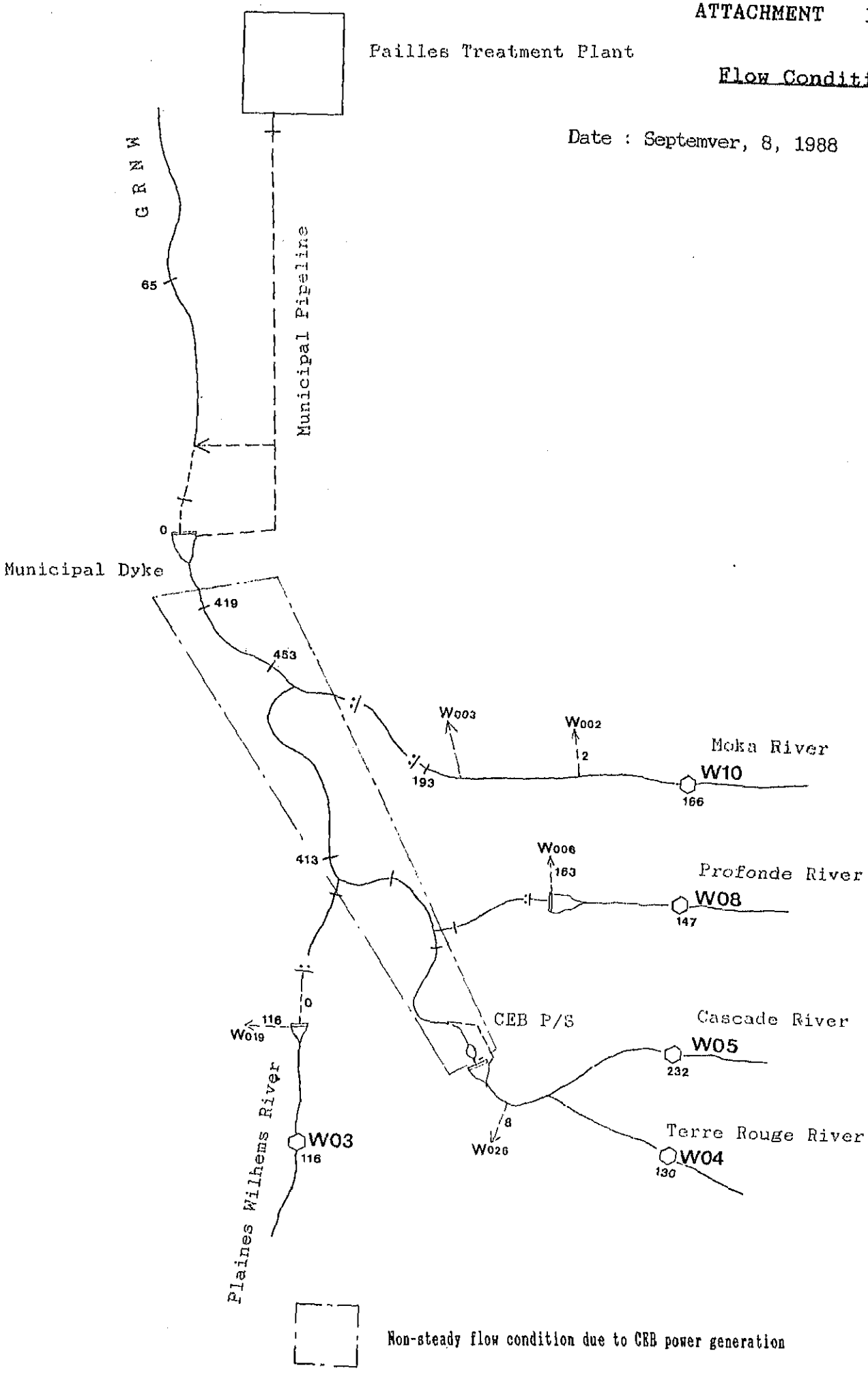
(2) : Accumulated discharge at five gauging stations (W03,W04,W05,W08 and W10)
Abstraction such as W006(Bagatelle canal),W003(Pailles canal),W002,w026 are considered.

(3) : Accumulated discharge at five gauging stations and additional flow from residual area
Additional flow are 65 % of Plaines Wilhems River,
47 % of Moka River,
39 % of other three tributaries.
(This case is used for estimate of inflow at Municipal Dyke)
Abstraction such as W013(Plaines Wilhems canal),*W006(Bagatelle canal)*,*W003(Pailles canal)*,W002,w026 are considered.


Pailles Treatment Plant
Flow Condition (1)
Date : June, 3, 1988
G R N W
690
Municipal Pipeline
550
Municipal Dyke
1410
W003
142
W002
2
304
Moka River
W10
300
W006
345
840
Profonde River
W08
330
0
300
W019
CEB P/S
Cascade River
W05
650
Plaines Wilhems River
W03
300
8
W026
Terre Rouge River
W04
220
Non-steady flow condition due to CEB power generation

Flow Condition (2)

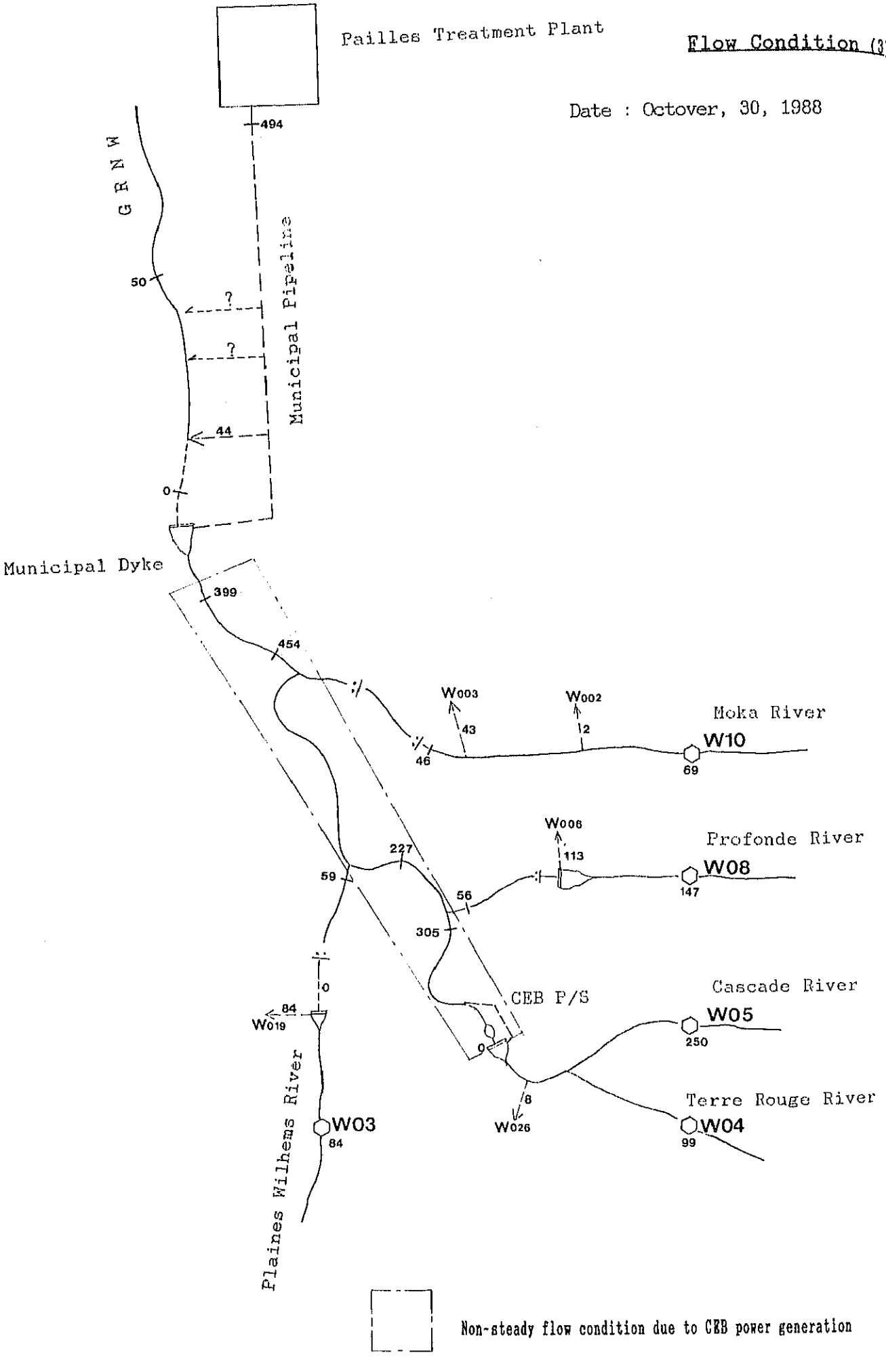
Date : Septemver, 8, 1988



Non-steady flow condition due to CEB power generation

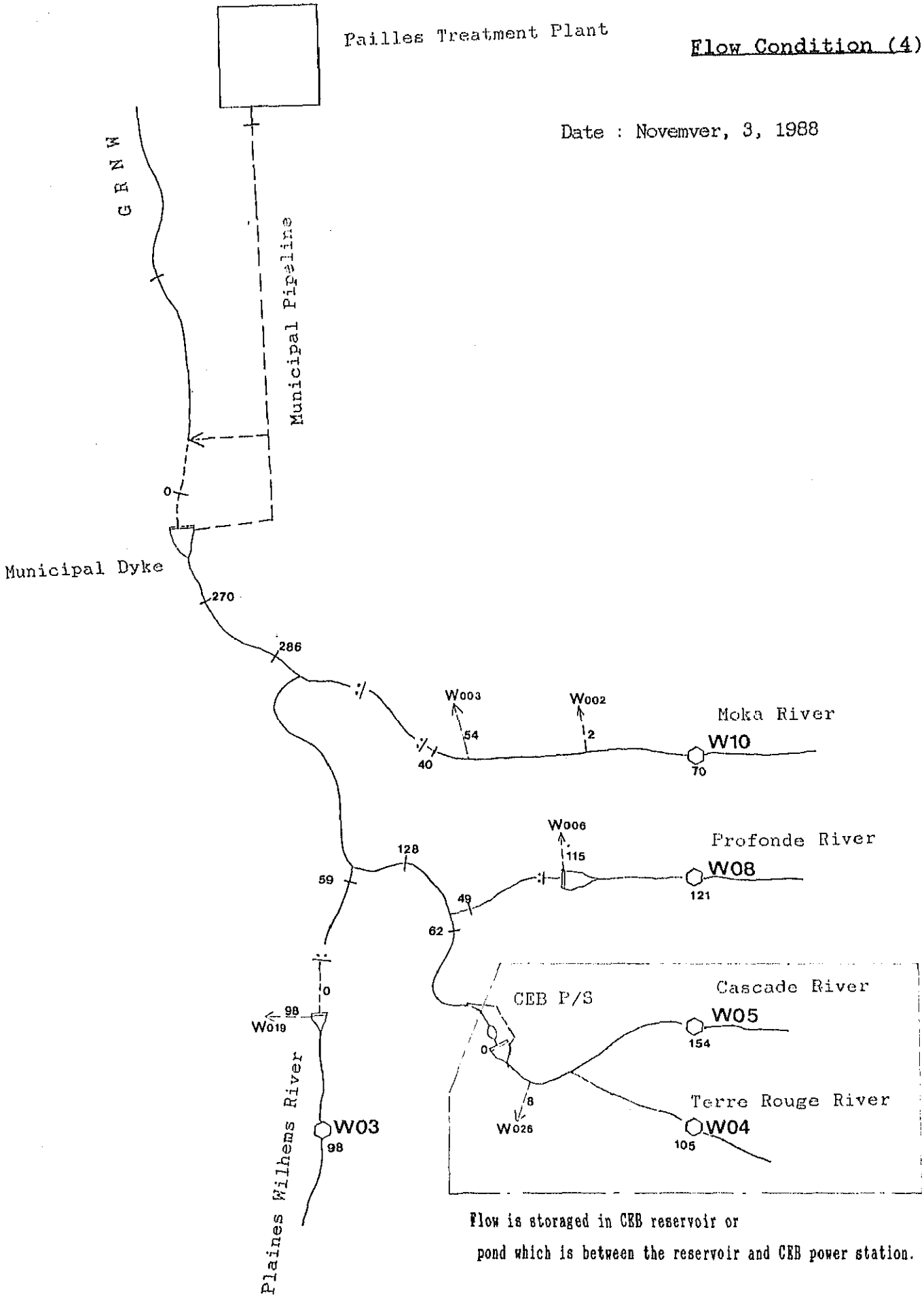
Flow Condition (3)

Date : Octover, 30, 1988



Flow Condition (4)

Date : Novemver, 3, 1988



Flow is storaged in CEB reservoir or pond which is between the reservoir and CEB power station.