

**Table 1.3.2 General Features of La Esperanza Dam**

(under construction)

(1)	Hydrology	
	Catchment area	445 km <sup>2</sup>
	Annual mean basin rainfall	1,520 mm
	Annual mean inflow	376 MCM
	Runoff coefficient	56 %
	Probable max. flood	3,040 m <sup>3</sup> /s
(2)	Reservoir	
	Gross storage capacity	455 MCM
	Dead storage	64 MCM
	Effective storage	391 MCM
	Flood water level	EL. 67.7 m
	Normal high water level	EL. 66.0 m
	Low water level	EL. 37.0 m
	Riverbed level	EL. 22.0 m
	Reservoir area at FWL	24.0 km <sup>2</sup>
	Reservoir area at HWL	22.7 km <sup>2</sup>
(3)	Dam	
	Type	Zoned earthfill
	Height from foundation	57.0 m
	Crest elevation	EL. 69.0 m
	Crest length	696.0 m
	Dam volume	3,700,000 m <sup>3</sup>
(4)	Spillway	
	Type, : Control structure	Gated overflow weir
	: Water conveyance	Open chute
	: Energy dissipator	Stilling basin
	Length of overflow weir	39.0 m
	Overflow weir level	62.0 m
	Design peak discharge	900.0 m <sup>3</sup> /s
	Spillway gates	
	: No. of gates	4 Nos.
	: Type	Tainter gate
	: Dimensions	H = 4.0 m, W = 7.5 m
(5)	Outlet facilities	
	Irrigation outlet	Capacity 25 - 38 m <sup>3</sup> /s
	Low level outlet	Capacity 110 m <sup>3</sup> /s
	Outlet for river maintenance	Capacity 5 m <sup>3</sup> /s

**Table 1.3.3 General Features of Poza Honda Dam**

(constructed in 1971)

(1)	Hydrology	Catchment area	175 km <sup>2</sup>
		Annual mean basin rainfall	1,300 mm
		Annual mean inflow	95 MCM
		Runoff coefficient	42 %
		Probable max. flood	1,120 m <sup>3</sup> /s
(2)	Reservoir	Gross storage capacity	98 MCM
		Dead storage	13 MCM
		Emergency storage	10 MCM
		Effective storage	75 MCM
		Flood water level	EL. 112.3 m (110.3m)
		Normal high water level	EL. 108.5 m (106.5m)
		Emergency water level	EL. 93.5 m (91.5 m)
		Low water level	EL. 90.3 m (88.3 m)
		Riverbed level	EL. 75.0 m (73.0 m)
(3)	Dam	Reservoir area at HWL	4.9 km <sup>2</sup>
		Type	Homogeneous earthfill with asphalt facing
		Height	40 m
		Crest elevation	EL. 114.3 m (112.3 m)
		Crest length	531 m
(4)	Spillway	Type, Control structure	Non-gated overflow weir
		Water conveyance	Open chute
		Energy dissipator	Stilling basin
		Length of overflow weir	70 m
		Overflow weir level	EL. 108.5 m
(5)	Intake and Outlet	Design peak discharge	875 m <sup>3</sup> /s
		Intake level	EL. 89 m
		Outlet capacity	30 m <sup>3</sup> /s

Remarks: Elevation in parentheses show revised elevations based on leveling survey which was carried out by JICA Study Team.

Table 2.2.1 Irrigation Water Demand in Volume  
(5-year return period)

(Unit: 1,000 m<sup>3</sup>)

Scheme	Area (ha)	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
Carrizal-Chon	15,000	8,316	2,388	10,204	18,692	27,048	19,220	23,694	28,529	36,603	34,133	26,874	17,526	253,227
Amarillos	1,000	627	449	1,475	1,260	1,830	1,261	1,582	2,089	2,616	2,334	1,983	1,276	18,782
Guarango	1,500	1,784	1,906	3,526	3,192	3,456	2,380	2,705	3,325	4,258	4,039	3,185	2,165	35,921
Rio Chico	1,700	1,032	596	1,661	2,226	3,406	1,991	2,885	3,542	4,542	4,197	3,292	1,970	31,340
Pechiche-Pasa	850	997	648	1,726	1,749	1,925	1,357	1,547	1,896	2,417	2,288	1,808	1,195	19,553
Santa Ana	3,300	3,810	3,589	6,364	7,230	7,172	4,582	5,468	7,018	9,001	8,289	6,522	4,492	73,537
Mejia	1,250	1,438	1,357	2,402	2,719	2,696	1,722	2,066	2,656	3,413	3,142	2,419	1,695	27,725
Ceibal-Guayal	4,650	5,550	5,921	10,938	9,893	10,727	7,396	8,415	9,773	13,209	12,520	9,878	6,725	110,945
<b>Total</b>	<b>29,250</b>	<b>23,554</b>	<b>16,854</b>	<b>38,296</b>	<b>46,961</b>	<b>58,260</b>	<b>39,909</b>	<b>48,362</b>	<b>58,828</b>	<b>76,059</b>	<b>70,942</b>	<b>55,961</b>	<b>37,044</b>	<b>571,030</b>

Table 2.2.2: Irrigation Water Demand in Volume  
(Average year)

(Unit: 1,000 m<sup>3</sup>)

Scheme	Area (ha)	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
Carrizal-Chone	15,000	0	0	0	3,424	16,522	10,353	14,988	26,639	33,558	32,302	24,225	9,406	171,417
Amarillos	1,000	0	0	416	435	1,189	919	1,269	2,003	2,462	2,209	1,801	867	13,570
Guarango	1,500	785	658	2,268	2,458	2,855	2,084	2,432	3,313	4,201	4,027	3,155	1,850	30,086
Rio Chico	1,700	0	0	469	940	2,260	1,294	2,131	3,344	4,341	3,944	3,047	1,150	22,920
Pechiche-Pasaje	850	352	143	1,078	1,075	1,294	663	1,225	1,732	2,272	2,091	1,637	737	14,299
Santa Ana	3,300	1,314	1,321	3,749	5,449	5,833	3,611	4,684	6,914	8,800	8,173	6,185	3,782	59,815
Mejia	1,250	496	502	1,420	2,051	2,194	1,357	1,767	2,617	3,341	3,098	2,342	1,427	22,612
Ceibal-Guayaba	4,650	2,443	2,047	7,038	7,618	8,864	6,479	7,565	10,291	13,032	12,483	9,785	5,749	93,394
<b>Total</b>	<b>29,250</b>	<b>5,390</b>	<b>4,671</b>	<b>16,438</b>	<b>23,450</b>	<b>41,011</b>	<b>26,760</b>	<b>36,061</b>	<b>56,853</b>	<b>72,007</b>	<b>68,327</b>	<b>52,177</b>	<b>24,968</b>	<b>428,113</b>

Table 3.2.1 Monthly Rainfall at Dos Bocas Station

(Unit : mm)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1964	455.1	213.3	460.8	278.6	5.8	8.7	8.3	7.9	4.7	3.1	0.4	6.8	1,453.5
1965	194.2	266.3	564.2	312.8	328.9	30.3	6.7	2.3	0.5	0.0	0.0	137.8	1,844.0
1966	581.7	279.1	278.3	153.5	141.0	22.2	33.0	0.2	54.3	0.5	2.6	71.9	1,518.3
1967	753.7	458.4	186.6	51.8	103.3	0.5	0.0	0.2	3.0	6.7	0.9	22.3	1,587.4
1968	196.2	592.0	95.5	120.8	37.0	0.0	0.1	0.0	90.2	0.7	0.1	4.0	1,136.6
1969	239.1	122.3	470.8	183.7	345.4	33.9	0.5	5.7	0.0	13.2	43.0	12.3	1,469.9
1970	208.0	157.8	219.0	320.0	257.9	17.6	48.3	0.9	0.1	1.3	0.7	83.1	1,314.7
1971	159.9	331.9	604.1	73.1	22.8	13.5	3.0	1.4	41.7	1.5	1.5	45.5	1,299.9
1972	159.1	479.1	458.2	200.2	102.5	366.1	142.6	57.0	0.0	0.0	0.0	175.2	2,140.0
1973	541.7	80.5	449.3	218.9	252.9	47.2	4.6	5.6	0.0	1.7	0.0	47.3	1,649.7
1974	67.7	309.3	162.4	85.2	52.1	10.1	0.0	0.0	0.0	11.2	17.2	100.3	828.0
1975	443.6	630.0	436.6	120.1	29.0	2.4	12.8	2.7	32.5	47.4	3.0	143.0	1,903.1
1976	718.3	230.5	282.0	182.1	114.8	15.9	0.0	3.8	5.3	0.4	0.0	43.0	1,596.1
1977	405.0	370.0	501.0	88.0	38.5	0.0	0.0	1.6	19.1	7.4	0.0	48.5	1,479.1
1978	224.0	263.0	334.5	104.5	195.0	0.0	0.0	0.0	9.1	0.0	0.0	14.3	1,144.4
1979	325.8	209.9	169.4	219.9	199.9	30.5	10.0	0.0	9.7	4.0	0.0	1.8	1,180.9
1980	171.1	280.8	201.3	297.7	36.9	0.0	0.0	0.0	0.0	0.3	0.0	84.5	1,072.6
1981	135.6	533.8	288.4	270.5	0.0	0.0	43.0	0.0	0.0	5.0	5.0	88.9	1,370.2
1982	136.4	219.0	202.8	160.3	33.5	21.5	11.0	0.0	12.0	197.8	326.1	454.3	1,774.7
1983	493.7	381.6	659.1	477.5	375.2	294.5	421.2	227.4	161.7	13.4	10.2	87.5	3,603.0
1984	22.4	566.7	378.5	308.8	65.9	4.0	3.0	0.0	7.5	0.0	0.0	107.5	1,464.3
1985	127.1	214.6	291.9	176.9	12.4	23.8	0.0	0.0	0.0	0.0	0.0	155.2	1,001.9
1986	426.9	215.1	192.0	348.6	0.0	0.0	0.0	0.0	0.0	70.5	0.0	67.4	1,320.5
1987	341.3	727.8	555.8	497.9	203.4	0.0	0.0	50.4	0.0	0.0	0.0	79.4	2,456.0
1988	299.9	574.4	101.0	206.8	227.2	30.8	24.1	0.0	0.0	24.0	22.4	65.6	1,576.2
1989	542.8	423.3	144.9	365.5	35.2	30.4	0.0	0.0	23.0	10.6	0.0	72.0	1,647.7
1990	112.8	205.0	144.6	106.5	0.0	0.0	0.0	0.0	0.5	11.6	0.1	29.9	611.0
1991	204.0	316.0	335.9	152.8	43.4	77.7	1.4	5.9	0.2	1.5	0.0	59.0	1,197.8
1992	145.0	190.6	420.1	335.5	100.1	30.2	0.0	5.0	7.0	1.5	0.0	59.0	1,294.0
MAX	753.7	727.8	659.1	497.9	375.2	366.1	421.2	227.4	161.7	197.8	326.1	454.3	3,603.0
MEAN	304.6	339.4	330.7	221.3	115.9	36.3	26.7	13.0	17.1	15.0	14.9	81.6	1,518.5
MIN	22.4	80.5	95.5	51.8	0	0	0	0	0	0	0	1.8	611

Table 3.2.2 Monthly Rainfall at Chone Station

YEAR	(Unit : mm)												ANNUAL
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
1964	215.8	148.3	359.0	372.9	4.7	15.7	10.3	5.2	9.7	6.3	6.8	5.8	1,160.5
1965	123.2	160.6	346.1	339.6	101.3	75.0	59.5	26.3	7.1	23.4	10.2	37.0	1,309.3
1966	312.5	373.0	288.2	113.2	67.4	36.7	8.2	27.8	39.1	30.2	10.8	34.7	1,341.6
1967	408.1	411.5	87.6	50.1	54.3	8.5	9.9	3.9	39.0	3.8	0.0	6.4	1,063.1
1968	114.8	117.8	109.2	94.5	15.2	21.0	4.0	0.0	4.7	11.5	0.7	5.1	498.5
1969	142.0	59.2	251.4	169.5	115.6	145.8	80.0	3.0	2.4	1.4	21.9	12.6	1,004.8
1970	158.2	107.6	244.2	357.9	85.4	36.8	14.1	10.2	6.0	18.2	28.1	28.1	1,094.8
1971	71.6	238.0	629.0	60.2	18.2	18.0	0.0	4.1	14.3	26.2	2.0	24.3	1,105.9
1972	42.7	342.7	285.5	127.8	54.4	321.4	63.5	110.4	0.4	11.2	5.9	204.0	1,569.9
1973	290.5	115.0	352.7	194.6	148.9	26.6	32.9	7.1	18.0	7.2	4.1	33.7	1,231.3
1974	82.3	481.2	44.9	193.1	26.9	26.4	2.2	0.5	11.7	4.3	12.9	86.7	973.1
1975	410.8	424.5	516.5	221.6	7.9	55.6	20.0	5.7	8.0	11.2	4.7	75.2	1,761.7
1976	450.7	307.8	327.1	260.1	156.5	218.0	12.8	2.0	9.1	1.8	2.0	67.0	1,814.9
1977	407.4	486.9	354.6	145.1	0.0	23.3	0.0	2.8	13.5	6.3	0.2	33.8	1,473.9
1978	228.1	285.5	238.2	62.7	79.5	8.6	7.0	4.7	1.1	28.8	0.0	12.6	946.8
1979	169.2	247.9	123.6	85.4	22.0	68.5	0.0	0.9	15.0	4.4	1.0	0.9	738.8
1980	169.8	243.8	342.8	210.9	75.1	13.0	0.0	2.0	0.4	7.8	2.9	31.2	1,099.7
1981	162.9	291.2	229.8	229.8	1.4	5.8	15.6	6.3	10.8	4.6	1.1	25.0	984.3
1982	155.5	83.0	150.1	85.9	54.4	14.2	3.0	0.0	8.2	240.9	215.8	391.3	1,402.3
1983	548.7	593.0	541.5	284.1	681.6	395.3	310.1	133.8	114.5	9.2	8.5	62.8	3,683.1
1984	15.7	377.0	428.8	239.7	20.8	31.2	5.0	2.5	9.1	6.8	2.2	141.6	1,280.4
1985	124.4	234.1	153.1	108.0	38.4	9.0	6.3	7.1	4.4	3.0	3.6	92.6	784.0
1986	388.6	117.4	201.2	270.2	21.6	2.3	2.4	7.4	19.0	31.1	5.3	92.8	1,159.3
1987	216.3	652.6	380.0	504.1	124.1	2.2	14.4	68.3	14.3	9.7	6.6	58.7	2,051.3
1988	189.9	270.6	50.0	123.4	76.5	27.1	10.2	14.3	8.5	6.0	7.6	21.9	806.0
1989	319.9	434.3	145.1	244.7	60.2	31.0	7.7	4.1	11.5	22.1	0.9	29.3	1,310.8
1990	130.4	178.1	207.2	232.4	7.8	11.8	2.5	0.1	0.4	3.4	1.0	24.3	799.4
1991	103.8	253.3	127.4	69.6	13.1	15.2	3.5	5.0	0.3	0.6	12.5	32.9	637.2
1992	210.4	180.1	253.0	278.7	175.8	13.1	17.2	2.6	3.8	3.5	0.4	14.9	1,153.5
MAX	548.7	652.6	629.0	504.1	681.6	395.3	310.1	133.8	114.5	240.9	215.8	391.3	3,683.1
MEAN	219.5	283.3	267.5	197.6	79.6	57.8	24.9	16.1	13.9	18.8	13.1	58.2	1,250.4
MIN	15.7	59.2	44.9	50.1	0.0	2.2	0.0	0.0	0.3	0.6	0.0	0.9	498.5

Table 3.2.3 Monthly Rainfall at Portoviejo Station

YEAR	(Unit : mm)												ANNUAL
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
1964	59.7	45.8	205.0	69.1	5.1	8.3	0.0	0.5	0.0	4.4	0.6	0.9	400.4
1965	29.2	53.3	136.0	67.2	46.8	47.6	15.3	2.7	0.2	0.4	2.2	3.2	404.1
1966	78.0	94.2	112.5	68.0	18.9	7.0	3.1	8.3	8.2	1.7	1.8	10.5	412.2
1967	184.9	164.9	28.2	6.4	11.6	0.3	2.8	0.0	1.0	0.1	0.0	1.0	401.2
1968	56.9	66.0	21.9	34.0	0.5	1.7	0.0	1.0	0.9	0.0	1.0	2.1	186.0
1969	146.6	17.4	97.6	79.0	83.2	50.4	17.0	0.2	0.1	0.3	4.1	7.2	503.1
1970	46.2	52.5	118.8	84.5	65.5	3.1	0.3	0.2	2.0	0.1	1.3	7.9	382.4
1971	30.8	133.1	219.5	8.1	0.0	6.6	0.1	0.1	3.3	1.3	2.8	1.3	407.0
1972	75.8	199.6	245.7	81.1	2.7	84.1	20.5	6.3	3.6	1.6	0.7	18.3	740.0
1973	183.1	177.1	55.1	68.8	29.7	4.6	1.8	1.8	2.9	0.0	0.8	4.1	529.8
1974	24.1	114.7	54.6	50.1	13.3	5.4	0.6	0.1	1.8	4.4	5.8	24.2	299.1
1975	213.9	247.5	166.2	63.0	3.2	3.8	0.4	0.6	14.7	19.2	0.7	24.6	757.8
1976	202.4	121.2	124.5	65.8	44.9	19.2	7.6	0.0	2.9	0.2	2.0	8.8	599.5
1977	36.2	126.2	143.7	107.9	0.0	6.0	0.0	0.1	8.9	0.3	0.0	15.5	444.8
1978	52.8	73.6	58.8	122.2	11.5	0.0	4.4	0.0	0.4	0.0	0.0	1.1	324.8
1979	37.9	145.2	20.5	20.9	9.9	4.0	1.0	1.0	1.1	0.0	0.0	0.0	241.5
1980	39.1	33.1	50.7	54.4	12.8	2.2	0.0	0.0	0.1	0.3	0.9	0.4	234.0
1981	50.2	95.7	41.0	18.4	0.0	0.0	0.0	0.2	0.6	2.3	0.2	8.4	217.0
1982	20.0	7.3	28.9	6.5	9.7	2.6	0.0	0.0	1.1	35.2	98.3	116.7	326.3
1983	264.3	125.0	205.0	254.7	271.5	338.9	231.6	23.4	46.8	1.7	0.7	25.6	1,789.2
1984	1.7	202.4	116.5	31.6	29.5	2.9	0.6	0.0	0.0	0.1	8.5	120.1	513.9
1985	40.3	78.0	95.9	35.1	42.6	1.6	0.0	0.0	0.0	0.3	0.0	17.1	310.9
1986	283.9	44.2	75.7	80.0	3.7	0.0	0.7	0.0	0.0	3.5	0.0	3.8	495.5
1987	70.6	333.3	138.3	95.7	23.3	0.0	0.8	16.5	1.5	0.1	2.4	2.8	685.3
1988	51.1	96.1	30.0	66.5	23.8	0.0	0.8	0.2	12.2	0.0	1.3	6.8	288.8
1989	245.4	162.0	189.1	60.5	1.4	1.3	0.1	0.0	6.1	0.9	0.0	0.0	666.8
1990	32.2	76.3	59.3	38.8	0.9	1.7	0.0	0.0	0.0	0.0	0.1	8.8	218.1
1991	57.4	96.1	28.4	34.1	17.0	0.1	0.0	0.2	1.9	0.0	3.2	18.6	257.2
1992	107.1	139.1	295.0	235.7	145.8	9.4	0.5	0.0	0.0	0.0	0.0	8.8	941.4
MAX	283.9	333.3	295.0	254.7	271.5	338.9	231.6	23.4	46.8	35.2	98.3	120.1	1,789.2
MEAN	93.9	114.5	110.4	69.2	32.0	21.1	10.7	2.2	4.2	2.7	4.8	16.2	482.0
MIN	1.7	7.3	20.5	6.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	186.0

Table 3.2.4 Monthly Rainfall at Rocafuerte Station (INAMHI)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1964	33.6	55.0	191.9	65.4	5.6	0.0	1.1	0.0	0.0	0.0	0.0	0.0	353.6
1965	12.4	54.4	131.1	81.0	29.5	36.6	2.4	2.0	1.0	3.6	0.0	1.9	355.9
1966	104.8	122.5	79.2	31.3	19.7	1.4	0.0	0.0	5.8	0.0	1.2	0.6	366.5
1967	80.6	184.3	81.7	22.0	12.3	0.0	2.8	0.0	3.2	0.0	0.0	0.5	387.4
1968	66.1	79.2	9.5	4.2	0.0	1.6	4.0	0.0	2.3	0.0	0.0	42.7	209.6
1969	110.5	14.5	96.1	22.7	27.1	9.4	0.0	0.0	0.0	0.0	1.8	3.4	285.5
1970	72.2	32.9	35.0	81.9	86.4	2.3	1.2	0.0	0.2	0.0	1.2	3.6	316.9
1971	24.9	81.7	230.0	11.6	0.0	6.2	0.0	0.4	0.8	0.2	0.0	1.2	357.0
1972	22.4	157.3	169.8	110.9	4.3	70.6	0.9	3.2	0.0	0.0	0.0	20.5	559.9
1973	149.3	115.0	55.4	39.7	19.1	1.5	0.0	0.0	0.0	0.0	0.0	0.0	380.0
1974	25.2	84.9	78.7	32.9	9.7	4.7	0.0	0.0	2.0	0.0	0.0	0.0	268.1
1975	182.3	261.1	133.1	48.4	4.5	7.5	0.5	1.5	4.0	9.0	1.5	5.6	659.0
1976	176.7	201.4	176.3	82.0	33.1	11.6	0.0	0.0	10.6	0.0	0.0	12.5	704.2
1977	94.7	111.7	183.4	80.5	0.5	9.2	0.0	0.0	4.0	0.0	0.0	0.0	484.0
1978	46.9	94.0	59.9	2.3	2.2	0.0	0.5	0.0	2.5	0.0	0.0	0.0	208.3
1979	50.1	129.6	23.2	11.5	4.9	0.6	0.0	0.0	8.1	0.2	0.0	0.0	228.2
1980	41.2	83.9	62.7	42.6	13.0	2.8	0.0	0.0	0.0	0.2	8.2	0.3	254.9
1981	64.2	147.5	31.2	12.5	0.0	0.0	0.0	0.0	0.0	1.5	0.6	2.5	260.0
1982	26.2	4.0	15.9	9.7	7.8	6.2	0.8	0.0	0.7	27.2	49.5	60.8	208.8
1983	273.0	185.2	170.1	188.9	337.4	196.9	235.0	13.7	52.8	1.1	1.9	33.0	1,689.0
1984	0.0	303.1	131.3	12.6	8.2	5.6	0.0	0.2	0.0	0.0	3.1	143.6	607.7
1985	42.8	62.2	10.6	10.4	63.7	0.3	0.0	1.0	0.0	0.0	0.0	17.3	208.3
1986	180.0	5.3	17.9	94.5	1.7	0.0	0.0	0.0	0.0	3.9	0.0	0.0	303.3
1987	0.0	257.0	122.7	49.9	38.6	0.0	1.0	9.4	0.0	0.0	3.0	8.2	489.8
1988	32.8	60.3	38.1	31.9	24.6	0.0	0.0	0.0	1.2	0.0	0.0	3.5	192.4
1989	119.9	228.3	126.0	31.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	506.3
1990	10.2	76.3	20.6	13.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.9	138.2
1991	45.4	46.4	31.0	30.5	5.4	0.0	0.0	0.0	0.0	0.0	2.2	6.4	167.3
1992	70.9	130.9	284.2	212.2	89.8	0.0	0.0	0.0	0.0	0.0	0.0	1.0	789.0
MAX	273.0	303.1	284.2	212.2	337.4	196.9	235.0	13.7	52.8	27.2	49.5	143.6	1,689.0
MEAN	74.5	116.2	96.4	50.7	29.3	12.9	8.6	1.1	3.4	1.6	2.6	14.4	411.7
MIN	0.0	4.0	9.5	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	138.2



Table 3.2.5 Monthly Rainfall at Calcutta Station

YEAR	(Unit : mm)												ANNUAL
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
1964	114.4	213.7	392.4	267.3	5.9	9.7	5.4	9.1	0.7	4.0	4.9	10.4	1,038.3
1965	134.8	111.8	469.8	234.3	78.2	54.6	56.1	1.3	6.9	31.7	5.1	27.1	1,211.7
1966	239.5	257.3	216.5	110.9	71.0	29.3	5.4	20.5	8.8	16.2	3.3	15.8	994.5
1967	393.9	267.7	78.9	38.9	18.2	5.0	7.4	0.7	46.4	0.0	0.0	1.7	858.8
1968	67.6	88.0	54.1	128.2	12.9	9.0	1.7	1.4	24.6	6.4	0.0	3.4	397.3
1969	198.3	32.6	211.4	175.4	114.7	96.2	12.2	0.6	0.0	0.4	8.3	14.8	864.9
1970	138.5	130.3	175.8	399.8	55.9	46.9	7.1	0.7	3.1	4.2	6.5	13.1	981.9
1971	81.4	246.6	554.8	58.7	10.4	13.6	1.2	0.6	6.8	14.3	6.1	12.5	1,007.0
1972	113.8	259.4	193.8	174.0	40.3	208.6	26.6	51.6	4.7	7.1	14.7	84.0	1,178.6
1973	252.3	217.6	180.2	98.1	128.0	23.0	24.1	3.5	8.5	2.5	1.6	7.4	946.8
1974	67.4	328.3	119.8	94.5	16.0	13.0	3.1	0.0	8.7	0.5	66.9	84.3	802.5
1975	398.3	397.2	479.1	206.2	11.4	9.9	8.0	1.8	2.2	16.6	2.9	102.6	1,536.2
1976	138.8	214.8	556.7	198.9	106.2	116.8	57.4	10.6	8.1	1.4	0.0	26.3	1,436.0
1977	310.9	267.5	257.1	140.3	0.5	18.1	1.5	0.0	14.4	2.1	0.0	24.7	1,037.1
1978	209.5	280.5	178.0	18.9	79.4	0.0	9.9	0.0	10.0	1.3	0.0	1.7	789.2
1979	127.1	216.9	118.2	80.2	59.0	10.0	0.0	0.0	1.4	3.3	0.0	0.0	616.1
1980	75.5	192.9	281.3	189.0	46.5	4.5	0.0	0.0	0.0	0.0	0.0	62.3	862.0
1981	65.4	278.5	263.0	191.7	0.0	3.2	9.7	0.5	3.7	1.2	2.4	6.5	825.8
1982	60.8	143.7	118.0	186.7	16.5	5.8	7.3	0.0	26.3	76.8	127.7	230.7	1,000.3
1983	497.6	365.0	270.9	331.7	357.7	336.6	485.5	85.2	118.2	0.0	7.3	79.4	2,935.1
1984	3.6	304.9	354.4	59.7	4.9	11.6	0.0	2.5	5.5	3.9	3.6	150.6	905.2
1985	132.9	176.6	120.8	122.3	24.0	7.1	5.5	0.0	0.0	0.0	0.0	71.0	660.2
1986	173.5	256.9	270.4	162.3	60.8	53.0	40.6	10.1	14.6	9.0	14.6	60.8	1,126.6
1987	237.1	351.1	369.6	221.8	83.2	72.4	55.4	13.9	20.0	12.3	20.0	83.2	1,540.0
1988	123.2	182.4	192.0	115.2	43.2	37.6	28.8	7.2	10.4	6.4	10.4	43.2	800.0
1989	200.2	296.4	312.0	187.2	70.2	61.1	46.8	11.7	18.9	10.4	16.9	70.2	1,300.0
1990	94.7	125.4	132.0	79.2	29.7	25.8	19.8	4.9	7.2	4.4	7.2	29.7	550.0
1991	92.4	136.8	144.0	86.4	32.4	28.2	21.6	5.4	7.8	4.6	7.8	32.4	600.0
1992	154.0	228.0	240.0	144.0	54.0	47.0	36.0	9.0	13.0	8.0	13.0	54.0	1,000.0
MAX	497.6	397.2	556.7	399.8	357.7	336.6	485.5	85.2	118.2	76.8	127.7	230.7	2,935.1
MEAN	168.5	226.5	252.2	155.2	56.2	46.8	33.9	8.7	13.8	8.6	13.1	48.4	1,031.1
MIN	3.6	32.6	54.1	18.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	397.3

\* Estimated Monthly Values

Table 3.2.6 Monthly Rainfall at Chamotete - Jesús María Station

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1964	120.1	89.2	383.7	226.3	0.0	4.5	0.4	5.9	0.0	0.0	1.3	0.0	831.4
1965	111.7	147.6	488.4	216.7	267.0	22.1	0.0	2.0	0.0	0.0	1.0	97.0	1,353.5
1966	569.8	161.7	199.0	96.8	110.2	15.5	18.9	0.5	57.4	0.0	2.3	38.6	1,270.7
1967	773.1	359.4	106.2	15.0	78.7	0.0	0.0	0.5	0.0	0.4	1.5	0.0	1,334.8
1968	114.1	506.7	14.0	62.9	23.4	0.0	0.0	0.0	105.6	0.0	1.2	0.0	827.9
1969	164.8	50.0	393.9	128.0	280.8	25.0	0.0	4.4	0.0	6.2	20.1	0.0	1,073.2
1970	148.0	139.9	252.1	324.7	87.2	84.3	5.5	0.0	1.2	2.4	6.5	18.7	1,070.5
1971	96.6	243.0	518.2	72.6	6.7	39.3	4.0	0.7	3.6	6.2	6.7	13.9	1,011.5
1972	99.4	192.3	424.4	130.5	115.8	283.1	18.6	44.6	59.8	8.8	29.0	166.8	1,573.1
1973	401.3	339.9	415.3	166.2	179.2	46.0	10.3	4.6	10.7	2.2	0.9	29.8	1,606.4
1974	40.7	419.8	112.7	72.6	6.7	38.5	1.1	0.0	7.3	3.0	9.6	57.2	769.2
1975	519.6	455.7	355.7	191.1	34.1	34.0	9.2	2.4	5.6	31.6	3.1	45.7	1,687.8
1976	529.7	375.3	411.0	324.4	194.2	124.5	32.8	5.3	3.7	0.0	1.4	45.4	2,047.7
1977	278.0	318.4	343.7	180.0	11.7	16.4	0.0	0.6	5.6	2.2	0.0	60.7	1,217.3
1978	177.4	232.6	203.1	79.8	80.7	3.0	0.4	0.0	0.4	0.3	0.0	4.8	782.5
1979	124.7	192.4	189.8	109.6	38.9	27.6	7.1	0.0	3.6	4.4	10.7	10.7	719.5
1980	65.4	131.2	247.5	305.3	112.4	4.6	0.0	1.6	0.0	0.0	6.6	4.6	879.2
1981	100.0	430.6	139.1	195.8	103.9	2.2	9.7	1.6	1.0	0.0	0.0	23.8	1,007.7
1982	128.5	88.3	159.8	39.5	42.9	3.4	27.7	0.0	12.0	186.9	179.4	456.4	1,324.8
1983	413.7	421.0	427.3	527.4	353.7	238.8	381.5	187.4	241.7	1.1	3.8	24.3	3,221.7
1984	235.2	594.6	461.7	75.9	14.0	3.4	1.3	1.6	18.0	0.0	0.0	81.6	1,487.3
1985	97.3	182.3	265.1	239.2	57.0	56.2	1.4	0.4	1.3	0.4	0.0	65.7	966.3
1986	602.9	119.3	73.9	200.3	16.3	5.9	13.0	0.7	0.9	20.9	1.4	29.2	1,084.7
1987	276.0	584.9	262.3	461.8	155.5	5.6	8.0	53.0	4.3	9.0	13.7	49.8	1,863.9
1988	152.8	368.0	94.7	287.8	114.9	5.5	5.5	4.4	10.3	0.0	23.1	40.7	1,707.7
1989	702.4	396.3	264.0	253.7	30.7	13.7	3.8	0.9	32.3	12.5	0.6	25.4	1,736.3
1990	87.4	99.1	254.9	241.9	2.1	0.0	5.2	0.0	0.2	0.2	0.0	58.1	749.1
1991	166.0	171.9	339.0	102.2	83.5	38.3	0.0	2.8	1.1	0.0	17.5	27.8	950.1
1992	453.3	378.4	656.8	424.2	413.0	78.0	3.3	1.8	0.6	1.0	0.4	34.7	2,445.5
MAX	773.1	594.6	656.8	527.4	413.0	283.1	381.5	187.4	241.7	186.9	179.4	456.4	3,221.7
MEAN	287.2	282.4	291.6	198.4	104.0	42.0	19.6	11.3	20.3	10.3	11.8	52.1	1,311.1
MIN	40.7	50.0	14.0	15.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	719.5

(Unit : mm)

□ • Corrected Values Through Double Mass Curve

Table 3.2.7 Monthly Rainfall at Santa Ana Station

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1964	110.8	43.4	319.0	226.5	6.0	10.7	3.7	0.0	0.0	0.0	0.0	4.6	724.7
1965	39.3	89.0	376.0	147.0	73.4	61.0	32.6	0.0	21.6	2.8	0.0	7.6	850.3
1966	185.4	146.4	141.0	40.9	2.8	7.6	0.0	2.8	15.2	1.8	10.8	3.8	558.5
1967	329.2	319.4	111.2	24.4	23.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	807.8
1968	96.2	75.8	31.8	32.4	0.0	0.0	0.0	0.0	7.4	0.0	0.7	5.9	250.2
1969	121.8	69.5	168.5	272.0	200.9	74.3	20.5	2.9	1.7	0.8	68.5	32.4	1,033.6
1970	102.4	114.0	152.8	222.3	93.2	19.8	6.3	0.6	1.5	0.4	1.1	5.5	719.9
1971	80.2	199.0	349.1	35.5	3.0	34.0	0.0	0.3	10.9	3.2	10.5	14.6	740.3
1972	119.9	208.5	219.3	97.9	37.1	211.3	63.5	31.9	0.6	8.2	3.1	53.8	1,055.1
1973	175.9	166.3	260.3	197.0	107.8	92.9	3.6	0.0	5.1	0.0	0.0	13.6	1,022.5
1974	27.4	191.9	112.2	65.7	28.0	22.8	0.0	0.0	0.0	3.4	0.0	52.8	504.2
1975	319.0	330.6	332.4	164.4	5.6	40.6	5.6	0.0	20.6	1.3	6.5	39.9	1,266.5
1976	320.1	304.2	210.6	162.9	72.5	170.6	36.0	10.1	1.8	0.0	0.0	74.0	1,362.8
1977	120.3	213.0	227.6	104.0	16.0	66.8	0.0	0.0	54.0	0.0	0.0	33.5	835.2
1978	132.8	137.0	198.1	28.7	81.5	51.9	13.0	2.9	8.3	1.3	6.5	21.2	683.2
1979	68.6	164.7	101.4	112.8	52.0	18.3	0.0	0.0	0.0	0.0	0.0	0.0	517.8
1980	91.4	63.8	140.4	121.8	121.7	2.8	0.0	0.0	0.0	0.0	9.0	1.7	552.6
1981	45.0	198.3	236.2	140.1	6.7	0.0	4.8	0.0	0.0	0.0	0.0	2.9	634.0
1982	56.7	26.0	80.9	43.2	55.1	0.0	1.5	0.0	4.3	67.6	83.8	257.7	676.8
1983	387.9	320.2	342.5	280.1	463.5	243.5	222.2	78.8	84.4	0.0	0.0	28.0	2,451.1
1984	11.4	222.1	292.1	43.5	8.3	12.3	0.0	0.0	0.0	0.0	0.0	136.6	726.3
1985	90.5	122.3	154.0	110.2	27.2	19.8	0.0	4.8	3.2	0.0	4.6	59.3	595.9
1986	319.7	117.2	154.1	128.9	52.2	3.5	3.0	0.0	3.4	9.4	0.0	0.8	792.2
1987	235.9	235.0	191.9	208.7	150.4	3.1	0.0	88.8	10.8	0.0	0.0	17.2	1,141.8
1988	143.7	199.6	146.6	143.7	85.8	6.3	0.0	0.6	7.4	0.0	18.7	39.0	791.4
1989	154.1	220.1	251.5	138.3	87.0	73.4	26.2	9.4	13.6	10.5	8.4	55.6	1,048.1
1990	58.3	83.3	95.1	52.3	32.9	27.8	9.9	3.6	5.2	3.9	3.2	21.0	396.5
1991	60.3	86.2	98.5	54.2	34.1	28.7	10.3	3.7	5.3	4.1	3.3	21.7	410.4
1992	161.7	131.0	264.0	145.2	91.3	77.0	27.5	9.9	14.3	11.0	8.8	58.3	1,000.0
MAX	387.9	330.6	376.0	280.1	463.5	243.5	222.2	88.8	84.4	67.6	83.8	257.7	2,451.1
MEAN	143.6	165.4	198.6	122.2	69.6	47.6	16.9	8.7	10.4	4.5	8.5	36.7	832.8
MIN	11.4	26.0	31.8	24.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	250.2

\* Estimated Monthly Values

Table 3.2.8 Monthly Rainfall at Boyacá Station

YEAR	(Unit :mm)												ANNUAL
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
1964	152.2	185.4	193.7	124.0	65.1	51.0	36.0	22.7	2.6	8.5	8.0	0.8	850.0
1965	112.6	143.6	255.7	215.6	72.0	41.4	12.7	13.6	15.6	15.6	23.3	11.1	932.8
1966	160.1	166.4	274.2	92.9	49.0	18.8	12.6	22.6	10.3	23.0	4.9	18.7	853.5
1967	219.4	283.3	43.9	41.5	101.3	9.2	9.9	5.0	11.5	5.0	0.0	3.3	733.3
1968	114.1	290.2	78.7	101.2	4.0	31.2	0.7	4.6	4.2	5.3	0.0	4.7	638.9
1969	67.2	37.3	222.1	135.2	90.8	49.4	19.7	3.8	2.3	1.5	17.3	13.7	660.3
1970	158.1	80.6	194.2	353.6	71.2	13.8	12.5	4.7	16.9	16.5	10.4	15.1	947.6
1971	53.4	218.5	280.8	24.3	5.8	46.0	8.8	5.7	9.2	25.7	0.0	12.0	690.2
1972	61.3	224.7	217.5	120.8	23.9	172.3	28.4	14.5	25.5	6.6	6.2	71.4	973.1
1973	259.8	177.9	192.6	127.8	106.0	16.9	19.7	12.2	10.8	11.2	3.1	6.1	944.1
1974	99.0	281.4	77.6	95.3	23.1	8.9	7.8	2.3	10.4	6.9	5.0	46.4	664.1
1975	376.6	412.8	346.8	121.4	8.2	9.9	25.0	7.0	4.5	3.2	6.4	27.4	1,349.2
1976	316.4	129.1	135.3	127.3	89.1	44.3	9.0	8.6	6.4	0.0	5.0	21.4	891.9
1977	191.2	267.0	214.6	122.6	2.3	122.2	28.4	9.7	32.9	46.6	0.3	11.1	1,048.9
1978	196.5	171.9	121.0	28.5	13.7	1.1	8.9	4.1	23.4	41.7	7.5	32.6	650.9
1979	106.0	261.8	64.9	53.7	9.9	25.3	1.3	10.2	19.1	8.2	1.5	35.0	596.9
1980	62.8	160.8	214.7	64.3	69.8	9.1	1.9	5.6	0.6	5.3	9.7	11.0	615.6
1981	150.7	191.7	190.9	120.3	0.2	2.5	18.2	23.8	75.3	5.2	4.6	32.6	816.0
1982	90.1	41.6	203.0	60.8	25.8	11.3	1.9	0.0	4.4	71.1	132.2	106.2	748.4
1983	244.6	208.2	425.4	391.1	441.3	162.0	246.2	73.6	86.0	12.1	18.1	26.8	2,335.4
1984	147.9	282.7	191.4	118.3	56.6	41.8	26.1	12.2	21.7	17.4	13.9	40.0	970.0
1985	168.6	208.2	218.1	134.9	64.4	47.6	29.7	13.9	24.8	19.8	15.9	45.6	991.5
1986	65.8	81.3	85.2	52.6	25.2	18.6	11.6	5.4	9.7	7.8	6.2	17.8	387.2
1987	248.4	306.8	321.4	198.7	94.9	70.1	43.8	20.5	36.5	29.2	23.4	67.2	1,460.9
1988	124.8	154.2	161.6	99.9	47.7	35.2	22.0	10.3	18.4	14.7	11.8	33.8	734.4
1989	120.4	148.7	155.8	96.3	46.0	34.0	21.2	9.9	17.7	14.2	11.3	32.6	708.1
1990	103.9	128.3	134.4	83.1	39.7	29.3	18.3	8.5	15.3	12.2	9.8	28.1	610.9
1991	109.2	134.9	141.4	87.4	41.8	30.8	19.3	9.0	16.1	12.9	10.3	29.6	642.7
1992	170.0	210.0	220.0	136.0	65.0	48.0	30.0	14.0	25.0	20.0	16.0	46.0	1,000.0
MAX	376.6	412.8	425.4	391.1	441.3	172.3	246.2	73.6	86.0	71.1	132.2	106.2	2,335.4
MEAN	153.5	192.7	192.3	121.7	60.5	41.4	25.2	12.3	19.2	16.1	13.2	29.2	877.5
MIN	53.4	37.3	43.9	24.3	0.2	1.1	0.7	0.0	0.6	0.0	0.0	0.8	387.2

\* Corrected Values Through Double Mass Curve

Table 3.2.9 Monthly Evaporation Class A Land Pan at Portoviejo Station

(Unit: mm)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1964	146.7	128.3	90.4	98.2	160.9	113.0	115.6	143.6	151.6	137.3	148.1	198.5	1,632.2
1965	184.8	157.3	132.5	112.8	138.7	137.0	140.4	155.7	142.2	151.9	146.8	185.1	1,785.2
1966	132.0	77.5	84.1	101.8	106.6	96.9	114.1	106.2	128.8	137.4	142.8	153.7	1,381.9
1967	95.7	64.9	84.0	137.2	122.0	93.7	112.4	138.8	121.5	132.8	136.5	146.0	1,385.5
1968	142.6	145.6	186.1	181.3	157.7	124.9	139.5	140.7	146.8	150.9	147.3	196.9	1,860.3
1969	144.2	147.9	143.7	124.7	111.7	92.6	130.7	148.7	152.2	158.0	152.0	165.5	1,671.9
1970	152.2	132.0	168.9	121.9	121.5	106.0	129.6	149.7	162.9	169.5	149.4	158.0	1,721.6
1971	141.7	112.0	109.3	127.9	138.1	104.7	122.9	144.4	146.9	139.1	127.7	130.6	1,545.3
1972	123.5	93.7	119.2	127.6	131.2	90.5	101.6	119.4	132.1	145.3	138.6	122.1	1,444.8
1973	94.3	82.0	129.4	132.1	129.6	98.8	113.7	134.8	132.0	139.3	141.2	129.9	1,457.1
1974	147.4	111.7	145.9	130.9	150.1	110.9	121.6	181.2	139.1	149.9	149.4	119.4	1,657.5
1975	99.7	76.9	126.0	108.4	117.7	94.5	93.8	116.7	118.6	142.9	133.1	142.4	1,370.7
1976	83.1	100.0	122.1	122.6	122.2	114.3	123.9	118.6	138.5	142.2	124.6	144.9	1,457.0
1977	118.3	118.5	137.6	137.1	164.1	121.6	128.7	145.4	187.7	153.7	153.3	141.6	1,707.6
1978	119.7	101.4	139.3	137.2	135.2	114.9	138.3	160.2	168.3	169.9	158.7	161.9	1,705.0
1979	125.3	125.3	145.9	126.9	138.2	110.5	140.6	153.2	141.6	154.6	154.4	153.7	1,670.2
1980	146.9	133.8	135.8	140.8	136.0	124.0	159.0	152.9	167.9	155.7	158.1	158.3	1,769.2
1981	148.3	100.0	140.9	138.3	159.5	154.1	131.6	146.2	149.7	155.4	149.6	157.3	1,730.9
1982	152.4	147.7	163.5	163.3	144.4	139.3	152.5	198.8	194.2	142.6	136.4	118.9	1,854.0
1983	104.4	108.9	143.6	130.0	125.5	119.2	113.0	123.0	99.4	107.4	106.4	124.3	1,405.1
1984	169.0	122.2	108.6	139.5	123.5	107.9	116.0	124.3	149.4	155.3	128.5	97.8	1,542.0
1985	118.6	125.8	136.1	144.2	150.8	123.7	130.9	152.8	155.2	162.2	158.0	130.4	1,688.7
1986	89.4	133.5	145.8	125.9	127.1	132.0	138.4	166.5	160.0	135.0	135.4	157.6	1,646.6
1987	117.8	88.2	144.1	126.5	118.7	119.5	109.2	123.3	131.5	131.9	161.1	147.8	1,519.6
1988	142.8	110.3	142.2	133.9	127.1	112.2	126.1	142.1	136.8	140.6	131.5	147.9	1,593.5
1989	110.0	101.4	118.3	129.1	125.2	96.4	110.1	150.0	137.1	141.7	156.3	154.3	1,529.9
1990	151.6	113.8	152.4	137.1	157.9	131.7	148.8	173.4	175.1	169.8	168.8	171.5	1,851.9
1991	150.1	105.0	162.0	179.4	165.8	155.8	192.0	155.9	182.4	163.8	148.4	150.1	1,910.7
1992	110.9	104.3	121.7	116.2	117.4	103.1	108.1	120.6	121.8	140.5	142.1	166.5	1,473.2
MAX	184.8	157.3	186.1	181.3	165.8	155.8	192.0	198.8	194.2	169.9	168.8	198.5	1,910.7
MEAN	129.8	112.8	133.8	131.2	135.3	115.3	127.7	144.4	147.3	147.5	144.3	149.4	1,619.6
MIN	83.1	64.9	84	98.2	106.6	90.5	93.8	106.2	99.4	107.4	106.4	97.8	1,370.7

Table 3.2.10 Estimated Long-term Runoff in m<sup>3</sup>/sec  
for Chico River in Alajuela

YEAR	(Unit: m <sup>3</sup> /s)												
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN
1964	1.44	1.12	6.60	6.75	2.01	1.54	1.32	1.17	1.07	0.92	0.84	0.72	2.13
1965	0.67	1.04	8.85	7.57	7.54	2.66	1.69	1.50	1.37	1.18	1.06	0.94	3.01
1966	9.83	8.02	6.19	3.76	3.02	2.28	1.94	1.72	1.58	1.35	1.24	1.06	3.50
1967	14.73	18.07	9.42	3.43	2.43	1.97	1.69	1.50	1.38	1.18	1.06	0.93	4.82
1968	0.86	8.83	2.26	1.35	1.03	0.93	0.80	0.71	0.68	0.56	0.51	0.44	1.58
1969	0.54	0.43	4.91	3.04	5.20	2.02	1.46	1.30	1.19	1.02	0.93	0.80	1.90
1970	0.82	1.23	3.03	6.63	2.98	2.10	1.47	1.30	1.19	1.02	0.94	0.81	1.96
1971	0.74	2.36	11.53	5.04	1.76	1.50	1.26	1.12	1.02	0.88	0.80	0.69	2.39
1972	0.64	1.52	8.23	4.63	2.80	5.72	2.39	1.97	1.81	1.51	1.38	1.48	2.84
1973	7.31	11.43	13.76	9.30	6.65	3.56	2.64	2.34	2.14	1.84	1.68	1.44	5.34
1974	1.28	6.10	3.38	2.05	1.47	1.36	1.16	1.03	0.94	0.81	0.74	0.64	1.75
1975	7.82	15.95	14.48	10.41	3.96	2.50	2.04	1.81	1.66	1.42	1.30	1.12	5.37
1976	8.50	13.55	14.92	14.53	10.03	6.21	3.17	2.57	2.35	2.02	1.85	1.59	6.77
1977	2.86	7.48	9.34	6.92	2.70	2.20	1.88	1.67	1.53	1.31	1.20	1.04	3.34
1978	1.33	3.47	3.72	2.13	1.65	1.32	1.13	1.01	0.92	0.79	0.72	0.62	1.57
1979	0.61	1.57	2.24	1.58	0.91	0.78	0.67	0.59	0.54	0.46	0.43	0.37	0.90
1980	0.33	0.50	2.27	5.55	2.68	1.18	0.99	0.87	0.80	0.69	0.63	0.54	1.42
1981	0.50	6.69	3.89	3.75	2.27	1.46	1.25	1.10	1.01	0.87	0.80	0.68	2.02
1982	0.69	0.73	1.08	0.52	0.42	0.37	0.31	0.28	0.26	0.50	1.41	1.44	1.28
1983	12.60	16.85	16.85	21.30	18.34	14.40	15.36	10.93	10.27	4.33	3.46	2.97	12.31
1984	3.62	15.69	17.92	9.61	3.94	3.04	2.60	2.31	2.11	1.81	1.66	1.44	5.48
1985	1.36	2.19	4.26	5.18	2.29	1.78	1.44	1.27	1.17	1.00	0.92	0.79	1.97
1986	10.43	6.97	2.59	3.53	1.71	1.50	1.29	1.14	1.05	0.90	0.82	0.71	2.72
1987	1.89	14.88	11.07	15.76	9.02	3.52	2.28	2.04	1.84	1.58	1.45	1.25	5.60
1988	1.34	6.41	3.03	5.60	3.39	2.05	1.73	1.54	1.41	1.21	1.11	0.95	2.48
1989	12.71	17.26	12.59	11.04	4.09	2.45	2.05	1.82	1.67	1.43	1.31	1.12	5.80
1990	1.02	1.10	2.72	4.34	1.39	1.17	1.00	0.89	0.81	0.70	0.64	0.55	1.36
1991	0.79	1.73	5.69	2.65	1.52	1.12	0.93	0.82	0.75	0.65	0.59	0.51	1.48
1992	5.30	11.26	20.14	20.52	19.42	10.59	3.85	2.63	2.40	2.06	1.89	1.62	8.47
MAX	14.73	18.07	20.14	21.30	19.42	14.40	15.36	10.93	10.27	4.33	3.46	2.97	12.31
MEAN	5.88	7.05	7.83	6.84	4.39	2.87	2.13	1.76	1.62	1.24	1.15	1.26	3.50
MIN	0.33	0.43	1.08	0.52	0.42	0.37	0.31	0.28	0.26	0.46	0.43	0.37	0.90

Table 3.2.1.1 Estimated Long-term Runoff in m<sup>3</sup>/sec for Grande River in A. J. Mosquito

(Unit: m<sup>3</sup>/s)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN
1964	12.99	9.61	15.31	19.31	4.08	1.29	0.94	0.77	0.65	0.51	0.43	0.34	5.52
1965	0.42	1.68	10.06	14.62	5.71	1.81	0.66	0.29	0.22	0.17	0.15	0.12	2.99
1966	4.30	15.32	14.14	7.04	2.25	0.79	0.44	0.37	0.32	0.25	0.20	0.17	3.80
1967	8.37	19.31	7.28	1.90	0.79	0.42	0.33	0.27	0.23	0.18	0.15	0.12	3.28
1968	0.21	0.68	0.75	0.59	0.06	0.04	0.03	0.03	0.02	0.02	0.01	0.01	0.20
1969	0.24	0.15	3.80	4.47	2.64	3.46	1.50	0.32	0.26	0.21	0.18	0.14	1.45
1970	0.54	0.89	4.88	12.94	4.43	0.82	0.25	0.19	0.16	0.13	0.11	0.09	2.12
1971	0.12	3.30	23.52	8.07	0.94	0.26	0.19	0.15	0.13	0.10	0.09	0.07	3.08
1972	0.06	6.41	10.70	5.58	1.24	9.93	2.98	2.29	0.45	0.35	0.29	1.35	3.47
1973	8.35	5.11	12.82	9.37	5.68	1.04	0.50	0.34	0.29	0.23	0.19	0.15	3.67
1974	0.19	14.30	3.05	4.94	0.60	0.24	0.16	0.13	0.11	0.09	0.07	0.11	2.00
1975	10.02	20.28	25.15	15.85	2.79	1.05	0.44	0.33	0.28	0.22	0.18	0.17	6.40
1976	11.55	15.00	15.35	13.39	7.66	8.52	1.16	0.42	0.35	0.28	0.24	0.20	6.18
1977	8.92	22.42	18.68	9.47	0.87	0.33	0.24	0.19	0.16	0.13	0.11	0.09	5.13
1978	1.76	9.39	8.81	2.22	1.00	0.24	0.18	0.15	0.12	0.10	0.08	0.07	2.01
1979	0.57	5.74	2.98	1.28	0.20	0.28	0.10	0.06	0.07	0.05	0.05	0.04	0.95
1980	0.44	5.06	11.88	9.39	2.59	0.31	0.18	0.15	0.12	0.10	0.08	0.07	2.53
1981	0.60	8.00	8.39	8.75	0.70	0.20	0.16	0.13	0.11	0.09	0.07	0.06	2.27
1982	0.48	0.45	1.39	0.67	0.19	0.03	0.02	0.02	0.01	1.54	5.27	14.15	2.02
1983	24.69	34.19	30.88	20.58	32.40	26.34	19.28	9.38	4.91	0.77	0.48	0.47	17.03
1984	0.31	7.69	17.30	13.22	2.22	0.57	0.32	0.26	0.22	0.17	0.15	0.37	3.57
1985	1.02	5.73	4.17	2.21	0.41	0.18	0.14	0.12	0.10	0.08	0.07	0.10	1.19
1986	9.26	5.26	5.79	9.58	1.35	0.28	0.22	0.18	0.15	0.12	0.10	0.15	2.70
1987	2.54	26.99	21.61	26.23	11.26	1.49	0.38	0.44	0.24	0.19	0.16	0.14	7.64
1988	1.37	7.69	1.46	1.74	0.79	0.21	0.13	0.10	0.09	0.07	0.06	0.05	1.15
1989	4.16	18.02	8.61	9.88	2.50	0.60	0.31	0.25	0.21	0.17	0.14	0.11	3.75
1990	0.36	2.41	4.87	7.34	0.58	0.17	0.13	0.10	0.09	0.07	0.06	0.05	1.35
1991	0.14	4.49	2.77	0.76	0.11	0.09	0.07	0.06	0.05	0.04	0.03	0.03	0.72
1992	1.39	4.01	8.07	11.17	7.67	1.06	0.36	0.27	0.23	0.18	0.15	0.12	2.89
MAX	24.69	34.19	30.88	26.23	32.40	26.34	19.28	9.38	4.91	1.54	5.27	14.15	17.03
MEAN	5.98	9.64	10.50	8.71	3.98	3.14	1.10	0.61	0.36	0.23	0.32	0.66	3.48
MIN	0.06	0.15	0.75	0.59	0.06	0.03	0.02	0.02	0.01	0.02	0.01	0.01	0.20

Table 3.2.12 Estimated Long-term Runoff in m<sup>3</sup>/sec for Carrizal River in Calcuta

(Unit : m<sup>3</sup>/s)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN
1964	25.36	27.26	52.28	49.46	18.31	8.49	4.03	1.77	0.79	0.33	0.14	0.06	15.69
1965	0.95	10.91	51.34	51.77	50.80	22.21	8.68	4.33	1.93	0.80	0.36	0.56	17.05
1966	37.40	42.97	42.12	31.91	23.49	11.35	6.60	3.24	1.83	0.67	0.30	0.27	16.85
1967	52.92	71.59	46.53	23.56	15.62	7.65	3.56	1.53	0.68	0.28	0.12	0.05	18.67
1968	1.35	45.69	22.14	15.68	7.02	3.55	1.49	0.64	0.55	0.12	0.05	0.02	8.19
1969	2.05	3.02	36.67	30.35	42.31	19.38	8.48	4.27	1.91	0.80	0.39	0.15	12.48
1970	1.99	5.02	13.95	32.17	34.40	14.23	8.60	4.43	1.98	0.82	0.37	0.24	9.85
1971	1.46	20.45	61.28	33.18	12.91	6.85	3.20	1.38	0.69	0.25	0.11	0.07	11.82
1972	1.05	34.11	53.77	42.06	23.82	42.86	29.01	15.03	7.62	3.38	1.50	3.00	21.43
1973	42.46	25.69	50.20	41.33	37.91	18.09	8.29	4.18	1.88	0.78	0.35	0.17	19.28
1974	0.16	10.44	11.93	9.74	6.23	3.31	1.42	0.61	0.27	0.11	0.05	0.19	3.71
1975	22.41	73.06	70.84	42.54	17.52	8.50	4.22	1.90	0.94	0.52	0.16	1.20	20.32
1976	56.05	47.11	44.29	34.80	21.59	9.96	4.99	2.17	0.96	0.40	0.18	0.09	18.55
1977	13.85	39.16	60.80	33.30	13.59	6.43	2.84	1.21	0.55	0.22	0.10	0.05	14.34
1978	2.61	16.18	33.16	21.04	22.35	8.96	4.45	1.93	0.86	0.35	0.16	0.07	9.34
1979	5.81	14.86	16.58	23.84	24.30	11.27	5.77	2.63	1.17	0.48	0.21	0.09	8.92
1980	0.67	11.24	16.54	31.93	13.14	6.42	2.88	1.23	0.55	0.23	0.10	0.09	7.09
1981	0.74	39.46	38.55	40.75	13.43	6.28	3.05	1.28	0.57	0.24	0.10	0.14	12.05
1982	0.89	7.36	13.51	15.56	7.23	3.99	1.76	0.75	0.34	1.78	18.46	45.88	9.79
1983	65.52	71.07	90.03	87.54	72.24	60.31	63.99	47.88	34.68	13.56	7.50	5.53	51.65
1984	2.80	46.35	51.70	51.71	24.82	10.04	5.16	2.28	1.01	0.42	0.18	0.29	16.40
1985	1.16	8.98	24.47	23.70	8.78	4.89	2.18	0.93	0.41	0.17	0.08	0.46	6.35
1986	23.81	28.38	25.42	41.25	14.19	7.02	3.14	1.35	0.60	0.33	0.11	0.11	12.14
1987	10.98	76.13	83.12	86.34	55.10	21.91	8.89	5.52	2.77	1.15	0.51	0.37	29.40
1988	9.13	55.46	29.67	29.23	29.59	13.23	7.10	3.47	1.54	0.66	0.30	0.22	14.97
1989	30.86	54.97	33.83	47.91	20.06	10.32	5.29	2.33	1.06	0.43	0.19	0.15	17.28
1990	0.51	5.50	7.59	8.52	4.09	1.91	0.79	0.34	0.15	0.06	0.03	0.01	2.46
1991	1.29	18.06	33.34	25.09	10.25	7.38	3.38	1.46	0.65	0.27	0.12	0.07	8.45
1992	0.75	5.36	34.54	45.44	25.69	12.08	6.15	2.80	1.25	0.52	0.23	0.14	11.25
MAX	65.52	76.13	90.03	87.54	72.24	60.31	63.99	47.88	34.68	13.56	18.46	45.88	51.65
MEAN	14.38	31.58	39.66	36.27	23.13	12.72	7.57	4.34	2.42	1.04	1.12	2.06	14.08
MIN	0.16	3.02	7.59	8.52	4.09	1.91	0.79	0.34	0.15	0.06	0.03	0.01	2.46



Table 3.2.1.3 Estimated Long-term Runoff in m<sup>3</sup>/sec  
at Proposed La Esperanza Damsite

(Unit : m<sup>3</sup>/s)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN
1964	21.57	23.19	44.48	42.09	15.58	7.23	3.43	1.51	0.67	0.28	0.12	0.05	13.35
1965	0.81	9.28	43.68	44.05	43.22	18.90	7.38	3.68	1.65	0.68	0.30	0.48	14.51
1966	31.83	36.56	35.84	27.15	19.99	9.66	5.62	2.76	1.56	0.57	0.25	0.23	14.34
1967	45.03	60.91	39.59	20.04	13.29	6.51	3.03	1.30	0.58	0.24	0.11	0.05	15.89
1968	1.15	38.87	18.84	13.34	5.97	3.02	1.27	0.54	0.47	0.10	0.04	0.02	6.97
1969	1.75	2.57	31.20	25.82	36.00	16.49	7.21	3.63	1.62	0.68	0.33	0.13	10.62
1970	1.69	4.27	11.87	27.38	29.27	12.11	7.32	3.77	1.69	0.70	0.31	0.20	8.38
1971	1.24	17.40	52.14	28.23	10.98	5.83	2.72	1.17	0.59	0.22	0.10	0.06	10.06
1972	0.89	29.03	45.75	35.79	20.27	36.47	24.68	12.79	6.49	2.88	1.28	2.55	18.24
1973	36.13	21.85	42.71	35.17	32.26	15.40	7.05	3.56	1.60	0.66	0.29	0.14	16.40
1974	0.14	8.88	10.15	8.28	5.30	2.82	1.20	0.52	0.23	0.10	0.04	0.16	3.15
1975	19.07	62.16	60.27	36.20	14.91	7.23	3.59	1.62	0.80	0.44	0.14	1.02	17.29
1976	47.69	40.09	37.69	29.61	18.37	8.47	4.24	1.85	0.82	0.34	0.15	0.08	15.78
1977	11.78	33.32	51.73	28.33	11.57	5.47	2.41	1.03	0.47	0.19	0.08	0.05	12.20
1978	2.22	13.77	28.21	17.91	19.02	7.63	3.79	1.64	0.73	0.30	0.13	0.06	7.95
1979	4.94	12.65	14.11	20.28	20.67	9.59	4.91	2.24	0.99	0.41	0.18	0.07	7.59
1980	0.57	9.56	14.08	27.17	11.18	5.46	2.45	1.05	0.47	0.19	0.09	0.08	6.03
1981	0.63	33.58	32.80	34.67	11.42	5.34	2.59	1.09	0.48	0.20	0.09	0.12	10.25
1982	0.76	6.26	11.49	13.24	6.15	3.39	1.49	0.64	0.29	1.51	15.71	39.04	8.33
1983	55.75	60.47	76.61	74.48	61.47	51.31	54.45	40.74	29.51	11.54	6.38	4.70	43.95
1984	2.38	39.44	43.99	44.00	21.11	8.54	4.39	1.94	0.86	0.36	0.16	0.25	13.95
1985	0.99	7.64	20.82	20.17	7.47	4.16	1.85	0.79	0.35	0.15	0.07	0.40	5.41
1986	20.26	24.15	21.63	35.09	12.08	5.97	2.67	1.15	0.51	0.28	0.09	0.10	10.33
1987	9.34	64.78	70.72	73.46	46.88	18.64	7.57	4.70	2.35	0.98	0.44	0.31	25.01
1988	7.77	47.19	25.24	24.87	25.17	11.26	6.04	2.95	1.31	0.56	0.25	0.18	12.73
1989	26.26	46.77	28.79	40.76	17.07	8.78	4.50	1.98	0.90	0.37	0.16	0.13	14.71
1990	0.44	4.68	6.46	7.25	3.48	1.62	0.67	0.29	0.13	0.05	0.02	0.01	2.09
1991	1.10	15.36	28.37	21.35	8.72	6.28	2.88	1.25	0.55	0.23	0.10	0.06	7.19
1992	0.64	4.56	29.39	38.66	21.86	10.27	5.23	2.38	1.06	0.44	0.20	0.12	9.57
MAX.	55.75	64.78	76.61	74.48	61.47	51.31	54.45	40.74	29.51	11.54	15.71	39.04	43.95
MEAN	12.24	26.87	33.75	30.86	19.68	10.82	6.44	3.61	2.06	0.88	0.95	1.75	12.49
MIN.	0.14	2.57	6.46	7.25	3.48	1.62	0.67	0.29	0.13	0.05	0.02	0.01	2.09

Table 3.2.14 Estimated Long-term Runoff in m<sup>3</sup>/sec  
at Poza Honda Damsite

YEAR	(Unit: m <sup>3</sup> /s)												
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN
1964	1.34	1.04	6.13	6.27	1.87	1.43	1.23	1.09	1.00	0.86	0.78	0.67	1.98
1965	0.62	0.96	8.22	7.03	7.01	2.47	1.57	1.39	1.27	1.09	1.00	0.88	2.79
1966	9.13	7.45	5.75	3.49	2.81	2.11	1.80	1.60	1.47	1.25	1.15	0.99	3.25
1967	13.69	16.79	8.75	3.19	2.26	1.83	1.57	1.39	1.28	1.10	1.01	0.86	4.48
1968	0.80	8.20	2.10	1.26	0.95	0.87	0.74	0.66	0.63	0.52	0.48	0.41	1.47
1969	0.50	0.40	4.56	2.82	4.83	1.88	1.36	1.20	1.10	0.95	0.87	0.74	1.77
1970	0.76	1.14	2.81	6.16	2.76	1.95	1.37	1.21	1.11	0.95	0.87	0.75	1.82
1971	0.69	2.20	10.71	4.68	1.64	1.39	1.17	1.04	0.95	0.82	0.75	0.64	2.22
1972	0.60	1.41	7.65	4.30	2.60	5.31	2.22	1.83	1.68	1.40	1.28	1.38	2.64
1973	6.79	10.61	12.79	8.64	6.17	3.31	2.46	2.17	1.99	1.71	1.56	1.34	4.96
1974	1.19	5.66	3.14	1.90	1.37	1.26	1.07	0.95	0.87	0.75	0.69	0.59	1.62
1975	7.27	14.81	13.45	9.67	3.68	2.32	1.90	1.68	1.54	1.32	1.21	1.04	4.99
1976	7.90	12.59	13.86	13.49	9.32	5.77	2.94	2.39	2.18	1.87	1.72	1.48	6.29
1977	2.66	6.95	8.68	6.43	2.50	2.05	1.75	1.55	1.42	1.22	1.12	0.96	3.11
1978	1.24	3.23	3.46	1.98	1.53	1.23	1.05	0.93	0.86	0.73	0.67	0.58	1.46
1979	0.56	1.46	2.08	1.47	0.84	0.73	0.62	0.55	0.50	0.43	0.40	0.34	0.83
1980	0.31	0.46	2.11	5.15	2.49	1.10	0.92	0.81	0.74	0.64	0.59	0.50	1.32
1981	0.47	6.21	3.62	3.49	2.11	1.35	1.16	1.03	0.94	0.81	0.74	0.63	1.88
1982	0.64	0.68	1.00	0.48	0.39	0.34	0.29	0.26	0.24	0.47	1.31	8.17	1.19
1983	11.71	15.65	15.65	19.79	17.03	13.38	14.27	10.15	9.54	4.02	3.21	2.76	11.43
1984	3.37	14.58	16.64	8.93	3.66	2.82	2.42	2.14	1.96	1.68	1.54	1.34	5.09
1985	1.26	2.03	3.96	4.81	2.13	1.65	1.33	1.18	1.08	0.93	0.85	0.74	1.83
1986	9.69	6.48	2.40	3.28	1.59	1.39	1.20	1.06	0.97	0.83	0.76	0.66	2.53
1987	1.76	13.82	10.28	14.64	8.93	3.27	2.12	1.90	1.71	1.47	1.34	1.16	5.20
1988	1.25	5.95	2.82	5.21	3.15	1.90	1.61	1.43	1.31	1.12	1.03	0.88	2.31
1989	11.81	16.03	11.69	10.25	3.80	2.27	1.90	1.69	1.55	1.33	1.22	1.04	5.38
1990	0.95	1.02	2.53	4.03	1.29	1.08	0.93	0.83	0.76	0.65	0.59	0.51	1.26
1991	0.74	1.61	5.29	2.46	1.41	1.04	0.86	0.76	0.70	0.60	0.55	0.47	1.37
1992	4.92	10.46	18.71	19.06	18.04	9.83	3.58	2.44	2.23	1.91	1.75	1.50	7.87
MAX	13.69	16.79	18.71	19.79	18.04	13.38	14.27	10.15	9.54	4.02	3.21	2.76	11.43
MEAN	3.61	6.55	7.27	6.36	4.97	2.67	1.98	1.63	1.50	1.15	1.07	1.17	3.25
MIN	0.31	0.40	1.00	0.48	0.39	0.34	0.29	0.26	0.24	0.43	0.40	0.34	0.34

Table 3.2.15 Estimated Long-term Runoff in m<sup>3</sup>/sec  
at Santa Ana New Diversion Dam site

YEAR	(Units: m <sup>3</sup> /s)												
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN
1964	3.65	2.55	15.46	16.63	5.04	3.91	3.35	2.97	2.72	2.34	2.14	1.84	5.22
1965	1.67	2.20	19.75	16.41	13.71	5.67	4.06	3.59	3.29	2.82	2.59	2.23	6.50
1966	16.18	14.70	12.01	7.51	5.98	4.95	4.24	3.75	3.45	2.95	2.71	2.32	6.73
1967	28.17	39.67	20.62	7.59	5.43	4.62	3.96	3.51	3.22	2.76	2.53	2.17	10.35
1968	2.00	13.30	3.29	2.49	2.00	1.83	1.57	1.39	1.29	1.09	1.00	0.86	2.68
1969	1.06	0.89	8.65	8.08	12.15	5.17	3.65	3.22	2.95	2.53	2.32	1.99	4.39
1970	2.02	2.85	6.15	13.88	6.52	4.42	3.31	2.93	2.69	2.31	2.11	1.81	4.25
1971	1.67	5.20	25.83	10.24	3.95	3.48	2.94	2.61	2.39	2.05	1.88	1.61	5.32
1972	1.53	4.14	17.46	9.52	5.54	12.17	5.58	4.61	4.17	3.53	3.24	3.10	6.22
1973	12.81	21.97	28.24	20.12	13.84	8.48	6.41	5.67	5.19	4.46	4.08	3.50	11.23
1974	3.11	11.12	6.71	4.51	3.36	3.08	2.63	2.34	2.14	1.84	1.68	1.45	3.66
1975	16.03	35.88	34.25	24.37	8.88	6.11	5.04	4.46	4.09	3.51	3.22	2.76	12.38
1976	17.64	30.95	32.24	30.24	19.10	13.33	7.67	6.41	5.87	5.04	4.62	3.97	14.77
1977	5.86	15.16	19.76	13.84	6.14	5.33	4.54	4.03	3.69	3.17	2.90	2.50	7.24
1978	2.99	6.99	8.57	4.55	3.69	2.97	2.54	2.25	2.06	1.77	1.62	1.39	3.45
1979	1.33	3.36	4.27	3.36	1.92	1.62	1.37	1.22	1.12	0.96	0.88	0.75	1.85
1980	0.69	0.96	4.02	9.41	5.12	2.43	2.05	1.81	1.66	1.43	1.31	1.12	2.67
1981	1.03	11.59	9.08	8.30	4.40	3.17	2.72	2.41	2.21	1.90	1.74	1.49	4.17
1982	1.42	1.44	1.83	1.06	0.87	0.76	0.65	0.58	0.53	0.78	2.05	17.19	2.43
1983	29.06	38.98	39.54	47.44	45.55	36.24	35.96	23.67	20.37	9.78	8.51	7.31	28.53
1984	7.35	29.40	37.22	18.12	8.35	7.11	6.10	5.41	4.96	4.25	3.90	3.40	11.30
1985	3.25	4.91	8.67	9.85	4.57	3.74	3.11	2.76	2.53	2.17	1.99	1.71	4.11
1986	20.94	13.91	6.29	7.89	4.13	3.60	3.09	2.74	2.51	2.15	1.97	1.69	5.91
1987	4.19	29.89	22.59	31.72	19.50	7.51	5.53	5.00	4.49	3.85	3.53	3.03	11.74
1988	3.20	12.87	7.11	11.46	7.18	4.71	4.01	3.56	3.26	2.80	2.56	2.21	5.41
1989	21.29	33.10	26.11	22.06	8.95	6.11	5.08	4.50	4.13	3.54	3.24	2.79	11.74
1990	2.53	2.69	4.91	6.77	2.72	2.39	2.05	1.82	1.66	1.43	1.31	1.13	2.62
1991	1.34	2.70	8.72	3.93	2.37	1.86	1.55	1.38	1.26	1.08	0.99	0.85	2.34
1992	8.21	19.35	38.54	38.74	35.19	17.93	7.62	6.15	5.63	4.83	4.43	3.80	15.87
MAX	29.06	39.67	39.54	47.44	45.55	36.24	35.96	23.67	20.37	9.78	8.51	7.31	28.53
MEAN	7.66	14.23	16.48	14.14	9.18	6.32	4.91	4.03	3.64	2.87	2.66	2.33	7.42
MIN	0.69	0.89	1.83	1.06	0.87	0.76	0.65	0.58	0.53	0.78	2.05	17.19	1.85

Table 3.2.16 Estimated Long-term Runoff in m<sup>3</sup>/sec for Carrizal River in La Estancilla

YEAR	(Unit: m <sup>3</sup> /s)												
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN
1964	20.03	31.04	59.06	66.91	40.25	25.89	15.17	6.64	4.90	2.54	1.38	0.69	23.04
1965	1.13	8.84	49.77	62.93	65.44	44.77	26.92	16.33	9.59	5.09	2.81	1.73	24.61
1966	30.99	49.12	53.92	49.24	39.75	27.65	17.95	11.06	6.86	3.67	2.05	1.16	24.45
1967	45.71	78.29	64.63	46.17	32.80	21.92	12.87	7.35	4.18	2.17	1.18	0.60	26.49
1968	1.24	35.41	27.71	25.39	16.52	10.84	6.17	3.46	2.13	1.06	0.57	0.29	10.90
1969	1.92	2.85	31.72	37.25	49.86	36.64	23.03	14.35	8.56	4.59	2.58	1.32	17.89
1970	2.23	5.12	13.94	36.78	41.94	29.01	19.96	12.92	7.89	4.29	2.41	1.30	14.82
1971	1.68	17.85	62.69	50.42	30.55	20.34	11.92	6.78	3.90	2.01	1.09	0.56	17.48
1972	1.11	29.32	54.83	56.62	41.24	56.01	45.10	32.09	21.62	12.58	7.38	5.76	30.31
1973	38.52	37.85	57.49	57.09	54.47	37.87	23.76	14.62	8.68	4.64	2.58	1.33	28.24
1974	0.78	10.53	13.76	14.45	11.38	8.10	4.79	2.75	1.56	0.81	0.45	0.39	5.81
1975	21.38	73.47	87.91	72.07	43.22	27.52	16.20	9.25	5.32	2.87	1.54	1.68	30.20
1976	45.71	56.15	63.90	57.56	42.05	28.14	17.18	9.97	5.66	2.93	1.59	0.82	27.64
1977	12.82	39.95	65.88	53.53	32.49	20.88	11.90	6.66	3.74	1.92	1.04	0.53	20.95
1978	2.61	16.59	34.38	29.95	30.88	21.07	13.12	7.74	4.49	2.36	1.30	0.66	13.76
1979	4.53	14.60	19.09	27.93	30.84	22.69	14.82	9.06	5.37	2.87	1.59	0.81	12.85
1980	0.88	9.48	19.09	35.85	24.18	16.58	9.88	5.66	3.23	1.68	0.91	0.50	10.66
1981	0.80	33.49	44.08	52.63	30.62	19.77	11.52	6.50	3.67	1.90	1.03	0.58	17.22
1982	0.89	6.01	12.61	18.98	13.50	9.69	5.80	3.34	1.91	2.21	14.97	44.31	11.19
1983	75.88	95.02	110.82	119.48	19.03	99.27	98.67	79.97	64.04	37.64	24.53	16.01	70.03
1984	9.72	45.36	61.34	66.52	44.86	28.94	17.43	10.13	5.82	3.04	1.66	1.09	24.66
1985	1.68	9.20	23.88	29.38	18.92	13.06	7.68	4.39	2.49	1.29	0.70	0.67	9.45
1986	18.86	32.68	35.37	50.48	30.97	20.65	12.08	6.82	3.84	2.04	1.09	0.61	17.96
1987	9.75	70.32	94.24	109.30	86.18	54.89	32.06	19.93	12.06	6.51	3.64	2.03	41.74
1988	8.20	49.46	41.64	42.44	41.09	28.89	18.85	11.68	6.96	3.74	2.08	1.14	21.35
1989	25.02	57.43	50.38	62.84	40.80	27.82	17.20	10.08	5.81	3.03	1.65	0.91	25.25
1990	0.88	4.94	8.20	10.70	7.92	5.35	3.06	1.72	0.97	0.50	0.27	0.14	3.72
1991	1.04	14.34	32.17	32.67	21.56	16.18	9.96	5.89	3.42	1.80	0.99	0.52	11.71
1992	0.96	5.88	32.82	50.53	39.45	27.76	17.70	10.65	6.23	3.29	1.82	0.97	16.51
MAX	75.88	95.02	110.82	119.48	86.18	99.27	98.67	79.97	64.04	37.64	24.53	16.01	70.03
MEAN	13.34	32.43	45.77	49.18	35.27	27.87	18.72	12.06	7.76	4.31	3.00	3.07	21.06
MIN	0.78	2.85	8.20	10.70	7.92	5.35	3.06	1.72	0.97	0.50	0.37	0.14	3.72

Table 3.2.17 Estimated Long-term Runoff in m<sup>3</sup>/sec at Proposed La Ciénega Diversion Damsite

YEAR	(Unit: m <sup>3</sup> /s)												
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN
1964	1.72	1.72	8.26	9.64	5.16	4.18	3.37	2.86	2.56	2.16	1.96	1.68	3.77
1965	1.52	1.86	10.54	10.97	11.45	7.05	5.11	4.14	3.56	2.93	2.61	2.22	5.33
1966	11.58	12.12	10.55	8.24	6.76	5.61	4.64	4.03	3.65	3.12	2.85	2.45	6.30
1967	17.82	25.82	17.22	10.43	7.56	6.02	4.72	3.94	3.46	2.89	2.61	2.22	8.73
1968	2.00	10.46	4.93	3.78	2.89	2.47	2.03	1.75	1.60	1.34	1.23	1.05	2.96
1969	1.12	1.01	5.73	4.82	7.36	4.69	3.63	3.09	2.76	2.33	2.12	1.82	3.37
1970	1.72	2.15	4.10	8.58	5.64	4.60	3.57	3.05	2.73	2.32	2.11	1.81	3.53
1971	1.64	3.41	14.48	9.11	5.35	4.34	3.42	2.86	2.52	2.11	1.91	1.62	4.40
1972	1.47	2.57	10.73	8.06	5.94	8.84	5.61	4.70	4.19	3.50	3.17	2.98	5.14
1973	9.45	16.26	19.82	16.42	13.08	9.51	7.29	6.05	5.31	4.43	3.99	3.40	9.58
1974	3.00	8.13	5.90	4.69	3.68	3.28	2.76	2.42	2.21	1.90	1.74	1.51	3.44
1975	9.56	21.61	22.11	18.74	10.95	8.11	6.14	5.00	4.32	3.56	3.18	2.69	9.66
1976	10.85	18.75	22.07	23.34	18.55	14.05	9.57	7.53	6.39	5.20	4.60	3.86	12.06
1977	4.78	10.25	13.45	12.02	7.39	6.10	4.93	4.20	3.75	3.17	2.89	2.47	6.28
1978	2.60	4.99	5.58	4.43	3.61	3.11	2.63	2.32	2.12	1.82	1.67	1.45	3.03
1979	1.34	2.46	3.14	2.75	2.03	1.79	1.50	1.32	1.21	1.04	0.95	0.82	1.70
1980	0.74	0.89	2.75	6.71	4.56	3.15	2.50	2.10	1.86	1.57	1.42	1.21	2.46
1981	1.10	7.75	5.87	6.06	4.56	3.59	2.94	2.53	2.27	1.93	1.76	1.51	3.49
1982	1.42	1.47	1.67	1.23	1.01	0.89	0.75	0.66	0.60	0.79	1.83	10.42	1.90
1983	17.33	24.67	26.26	33.55	31.94	28.75	28.67	22.62	20.66	12.91	10.35	8.19	22.16
1984	7.78	21.58	26.40	18.80	11.76	9.33	7.34	6.12	5.39	4.51	4.07	3.48	10.55
1985	3.17	4.05	6.21	7.73	5.12	4.32	3.53	3.06	2.77	2.36	2.16	1.86	3.86
1986	12.97	11.25	6.45	6.91	4.60	3.91	3.20	2.76	2.48	2.11	1.93	1.66	5.02
1987	2.73	18.75	16.92	23.42	17.46	10.69	7.61	6.04	5.08	4.11	3.62	3.04	9.96
1988	2.89	8.31	5.56	8.36	6.41	5.00	4.12	3.57	3.23	2.76	2.52	2.17	4.58
1989	15.52	24.28	20.89	19.60	11.33	8.27	6.27	5.09	4.38	3.60	3.22	2.72	10.43
1990	2.41	2.48	3.93	5.99	3.45	2.95	2.44	2.12	1.92	1.64	1.50	1.29	2.68
1991	1.45	2.56	6.83	4.72	3.44	2.80	2.26	1.93	1.73	1.47	1.34	1.15	2.64
1992	6.19	14.49	27.27	31.66	31.96	22.57	13.16	9.51	7.63	5.93	5.07	4.14	14.97
MAX	17.82	25.82	27.27	33.55	31.96	28.75	28.67	22.62	20.66	12.91	10.35	8.19	22.16
MEAN	5.44	9.87	11.57	11.41	8.79	6.90	5.37	4.39	3.87	3.09	2.77	2.65	6.34
MIN	0.74	0.89	1.67	1.23	1.01	0.89	0.75	0.66	0.60	0.79	0.95	0.82	1.70

Table 3.2.18 Estimated Long-term Runoff in m<sup>3</sup>/sec for Portoviejo River in El Celbal

(Unit: m<sup>3</sup>/s)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN
1964	4.29	6.04	21.51	30.82	24.36	20.73	16.94	14.57	13.13	11.19	10.26	8.84	15.22
1965	7.92	8.30	23.79	30.39	30.61	25.82	20.47	17.21	15.25	12.84	11.66	10.00	17.96
1966	20.65	27.79	28.07	26.71	23.19	21.06	18.04	16.04	14.80	12.82	11.87	10.30	19.28
1967	34.64	67.64	57.94	45.16	33.69	27.62	21.89	18.40	16.30	13.72	12.46	10.67	30.01
1968	9.56	18.88	14.17	11.87	9.46	8.25	6.86	5.98	5.44	4.66	4.28	3.69	8.59
1969	3.72	3.67	9.99	13.46	19.17	17.29	14.20	12.26	11.07	9.45	8.67	7.48	10.87
1970	6.87	7.57	10.03	19.39	17.88	15.77	12.90	11.11	10.02	8.55	7.83	6.75	11.22
1971	6.07	9.25	34.16	31.43	23.19	18.92	14.92	12.48	11.02	9.26	8.39	7.18	15.52
1972	6.48	9.75	27.28	28.77	23.38	27.45	22.63	19.42	17.43	14.78	13.50	11.79	18.56
1973	20.98	39.59	50.82	51.38	43.90	37.37	30.12	25.65	22.94	19.44	17.74	15.25	31.27
1974	13.60	20.34	18.15	16.71	14.01	12.68	10.83	9.62	8.85	7.66	7.08	6.14	12.14
1975	20.68	57.27	71.01	70.12	51.11	40.12	30.54	24.84	21.45	17.72	15.88	13.48	36.19
1976	27.34	52.50	65.56	72.68	61.71	52.94	41.17	33.93	29.61	24.65	22.22	18.93	41.94
1977	18.32	28.32	37.55	39.17	31.02	26.78	22.09	19.14	17.33	14.81	13.59	11.73	23.32
1978	11.02	14.75	16.59	15.80	13.49	12.06	10.20	9.00	8.25	7.11	6.56	5.68	10.88
1979	5.16	7.40	7.93	7.86	6.39	5.57	4.62	4.02	3.65	3.12	2.87	2.47	5.09
1980	2.23	2.39	4.84	11.02	10.42	8.72	7.01	5.97	5.33	4.52	4.12	3.54	5.84
1981	3.19	12.78	14.40	15.81	13.07	11.26	9.29	8.04	7.28	6.23	5.72	4.93	9.33
1982	4.47	4.50	4.07	3.66	3.10	2.80	2.39	2.12	1.95	1.89	3.08	17.80	4.32
1983	44.48	73.30	85.14	109.22	120.42	123.78	120.43	101.21	87.06	64.98	53.52	42.61	85.51
1984	36.45	58.17	75.90	67.51	51.18	42.58	34.17	28.99	25.86	21.87	19.92	17.22	39.99
1985	15.59	17.09	18.89	21.80	18.37	16.31	13.69	12.00	10.96	9.42	8.67	7.51	14.19
1986	27.81	32.37	24.78	24.23	19.20	16.56	13.67	11.84	10.73	9.17	8.42	7.26	17.17
1987	8.27	41.45	49.10	64.48	56.43	44.33	33.55	27.21	23.41	19.28	17.23	14.60	33.28
1988	13.24	21.21	19.10	23.08	20.64	18.22	15.30	13.42	12.26	10.54	9.71	8.41	15.43
1989	27.51	56.54	61.02	61.00	45.64	36.61	28.41	23.48	20.54	17.13	15.45	13.18	33.88
1990	11.72	11.82	11.76	13.87	11.26	9.93	8.32	7.29	6.65	5.71	5.26	4.55	9.01
1991	4.35	5.76	10.50	9.86	7.88	6.68	5.42	4.64	4.16	3.53	3.23	2.78	5.73
1992	8.66	24.66	59.50	84.51	90.90	75.96	54.38	41.61	34.15	27.10	23.56	19.56	45.38
MAX	44.48	73.30	85.14	109.22	120.42	123.78	120.43	101.21	87.06	64.98	53.52	42.61	85.51
MED	14.66	25.56	32.19	35.23	30.86	27.04	22.22	18.67	16.44	13.56	12.16	10.84	21.62
MIN	2.23	2.39	4.07	3.66	3.10	2.80	2.39	2.12	1.95	1.89	2.87	2.47	4.32

Table 3.2.19 Estimated Long-term Runoff in m<sup>3</sup>/sec for Portoviejo River  
(Confluent with Chico River)

YEAR	(Unit m <sup>3</sup> /s)												MEAN
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
1964	7.61	5.39	30.91	31.14	10.60	8.88	7.62	6.75	6.19	5.31	4.87	4.18	10.79
1965	3.74	4.41	33.66	26.89	21.13	10.74	8.35	7.38	6.76	5.80	5.32	4.58	11.56
1966	22.52	22.00	20.81	14.32	11.40	9.79	8.39	7.44	6.82	5.85	5.36	4.60	11.61
1967	46.86	75.14	35.68	14.36	11.18	9.89	8.49	7.53	6.90	5.92	5.42	4.65	19.34
1968	4.25	18.48	4.80	4.05	3.29	3.01	2.58	2.29	2.11	1.80	1.65	1.42	4.14
1969	1.92	1.48	12.87	13.80	20.74	9.56	6.99	6.18	5.66	4.86	4.45	3.82	7.69
1970	3.74	4.87	10.26	22.99	11.17	7.56	5.93	5.25	4.81	4.13	3.79	3.25	7.31
1971	2.96	8.89	49.36	17.18	7.71	6.97	5.93	5.26	4.82	4.13	3.79	3.25	10.02
1972	3.08	9.43	36.05	18.99	10.42	21.59	10.68	9.05	8.19	6.98	6.40	5.78	12.22
1973	21.57	40.79	49.03	34.01	23.25	16.09	12.90	11.43	10.47	8.99	8.23	7.07	20.32
1974	6.27	17.61	10.97	8.09	6.14	5.62	4.81	4.26	3.91	3.35	3.07	2.65	6.40
1975	28.20	72.04	68.50	45.32	16.72	12.97	10.91	9.67	8.87	7.61	6.97	5.99	24.48
1976	31.74	58.36	58.94	52.21	30.90	23.76	15.89	13.76	12.61	10.82	9.91	8.52	27.29
1977	10.11	25.75	35.62	24.90	12.22	10.92	9.32	8.26	7.57	6.50	5.95	5.11	13.52
1978	5.54	11.35	14.28	8.46	6.48	5.32	4.54	4.03	3.69	3.17	2.90	2.49	6.02
1979	2.33	6.09	6.25	4.80	2.70	2.29	1.95	1.73	1.59	1.36	1.25	1.07	2.78
1980	0.99	1.31	5.67	13.12	6.91	3.52	3.00	2.66	2.44	2.09	1.92	1.65	3.77
1981	1.51	16.65	13.63	12.23	6.38	5.05	4.33	3.84	3.52	3.02	2.77	2.37	6.28
1982	2.21	2.20	2.46	1.61	1.36	1.20	1.03	0.91	0.83	1.05	2.92	27.49	3.77
1983	57.79	74.75	78.00	94.67	96.36	83.00	79.57	47.13	38.17	21.77	19.62	16.85	58.97
1984	15.65	51.39	68.75	31.26	17.34	15.43	13.24	11.74	10.76	9.23	8.46	7.45	21.73
1985	6.99	9.54	15.25	15.89	8.17	6.88	5.80	5.14	4.71	4.04	3.71	3.19	7.44
1986	38.45	23.56	12.13	14.55	8.04	7.11	6.10	5.41	4.95	4.25	3.90	3.34	10.98
1987	6.56	58.30	43.36	56.48	31.91	14.65	11.95	10.71	9.71	8.33	7.64	6.56	22.18
1988	6.49	21.10	11.99	18.72	11.74	8.38	7.17	6.36	5.83	5.00	4.58	3.94	9.28
1989	34.75	60.04	49.67	38.18	16.46	12.79	10.79	9.56	8.76	7.52	6.89	5.91	21.78
1990	5.32	5.63	8.03	9.75	4.43	3.98	3.41	3.03	2.77	2.38	2.18	1.87	4.40
1991	2.09	4.12	11.36	4.90	3.00	2.41	2.03	1.80	1.65	1.41	1.29	1.11	3.10
1992	11.03	29.65	71.89	73.97	64.60	30.17	15.63	13.43	12.31	10.56	9.68	8.31	29.27
MAX	57.79	75.14	78.00	94.67	96.36	83.00	79.57	47.13	38.17	21.77	19.62	16.85	58.97
MEAN	13.53	25.53	30.01	25.06	16.45	12.40	9.98	8.00	7.15	5.77	5.34	5.46	13.74
MIN	0.99	1.31	2.46	1.61	1.36	1.20	1.03	0.91	0.83	1.05	2.92	27.49	2.78

Table 3.2.20 Estimated Long-term Runoff in m<sup>3</sup>/sec for Chlico River  
(Confluent with Portoviejo River)

YEAR	(Unit m <sup>3</sup> /s)												
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN
1964	2.99	2.57	13.69	11.99	4.67	4.09	3.51	3.11	2.85	2.44	2.24	1.92	4.67
1965	1.73	2.05	13.52	11.06	10.00	4.86	3.84	3.41	3.12	2.68	2.45	2.12	5.07
1966	12.79	11.60	10.16	7.15	5.92	4.92	4.22	3.74	3.43	2.94	2.69	2.31	5.99
1967	22.76	34.49	15.77	6.72	5.41	4.78	4.11	3.64	3.34	2.86	2.62	2.25	9.06
1968	2.05	11.76	2.71	2.21	1.81	1.66	1.42	1.26	1.17	0.99	0.91	0.78	2.39
1969	1.08	0.75	6.46	3.68	6.86	2.98	2.37	2.10	1.93	1.65	1.51	1.30	2.72
1970	1.27	1.63	3.70	8.99	4.37	3.01	2.31	2.05	1.88	1.61	1.48	1.27	2.80
1971	1.15	3.17	22.27	7.52	3.42	3.10	2.64	2.34	2.15	1.84	1.69	1.45	4.40
1972	1.32	3.47	17.25	9.43	5.03	9.31	4.51	3.94	3.60	3.06	2.81	2.58	5.53
1973	11.67	21.52	22.64	13.58	9.68	6.81	5.70	5.05	4.63	3.97	3.64	3.12	9.33
1974	2.77	8.45	4.92	3.59	2.76	2.54	2.17	1.93	1.76	1.51	1.39	1.20	2.92
1975	13.03	34.67	29.96	18.26	7.33	5.96	5.06	4.49	4.11	3.53	3.23	2.78	11.03
1976	14.52	26.70	28.97	25.61	15.39	10.11	7.31	6.41	5.88	5.04	4.62	3.97	12.88
1977	4.80	11.91	17.23	12.23	5.87	5.23	4.49	3.98	3.65	3.13	2.87	2.46	6.49
1978	2.52	5.22	5.47	3.53	2.61	2.23	1.91	1.70	1.55	1.33	1.22	1.05	2.53
1979	0.98	2.70	2.64	1.64	0.98	0.87	0.74	0.66	0.60	0.52	0.47	0.41	1.10
1980	0.37	0.58	2.65	6.46	2.65	1.51	1.29	1.15	1.05	0.90	0.83	0.71	1.68
1981	0.66	9.40	4.56	4.30	2.59	2.01	1.72	1.53	1.40	1.20	1.10	0.95	2.62
1982	0.89	0.89	1.01	0.63	0.53	0.48	0.41	0.36	0.33	0.47	1.48	12.16	1.64
1983	25.70	33.32	34.19	44.54	43.04	37.22	38.64	22.73	19.18	10.76	9.67	8.31	27.28
1984	7.94	31.38	35.63	16.08	8.76	7.76	6.66	5.90	5.41	4.64	4.25	3.73	11.51
1985	3.43	4.44	6.39	6.87	3.80	3.12	2.63	2.33	2.13	1.83	1.68	1.44	3.34
1986	18.30	9.82	4.39	5.91	3.15	2.84	2.44	2.16	1.98	1.70	1.56	1.34	4.62
1987	2.05	30.05	21.82	27.06	13.76	6.61	5.46	4.86	4.43	3.81	3.49	2.99	10.53
1988	2.84	8.78	4.21	7.51	4.51	3.27	2.80	2.48	2.27	1.95	1.79	1.54	3.66
1989	20.03	33.67	24.59	17.93	7.04	5.73	4.91	4.35	3.99	3.42	3.14	2.69	10.96
1990	2.40	2.54	3.75	5.09	2.10	1.90	1.63	1.44	1.32	1.14	1.04	0.89	2.10
1991	1.07	2.13	6.28	2.64	1.60	1.29	1.09	0.97	0.89	0.76	0.70	0.60	1.67
1992	5.94	17.46	40.74	43.48	38.68	17.11	7.98	6.81	6.24	5.36	4.91	4.21	16.58
MAX	25.70	34.67	40.74	44.54	43.04	37.22	38.64	22.73	19.18	10.76	9.67	12.16	27.28
MEAN	6.52	12.65	14.05	11.58	7.74	5.63	4.62	3.69	3.32	2.66	2.46	2.50	6.45
MIN	0.37	0.58	1.01	0.63	0.53	0.48	0.41	0.36	0.33	0.47	0.47	0.41	1.10



Table 3.2.21 Estimated Long-term Runoff in m<sup>3</sup>/sec  
at Estuary of Portoviejo River

YEAR	(Unit: m <sup>3</sup> /s)												
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN
1964	4.66	6.58	23.67	32.03	25.16	21.47	17.57	15.13	13.65	11.63	10.66	9.19	15.95
1965	8.23	8.61	24.25	30.81	30.82	26.01	20.63	17.35	15.37	12.94	11.76	10.08	18.07
1966	20.77	28.28	28.48	26.90	23.32	21.18	18.14	16.13	14.88	12.89	11.93	10.35	19.44
1967	34.71	68.86	58.76	45.67	34.10	28.00	22.22	18.69	16.57	13.95	12.67	10.85	30.42
1968	9.72	19.08	14.30	11.98	9.56	8.34	6.94	6.04	5.50	4.71	4.33	3.73	8.69
1969	3.86	3.71	10.11	13.49	19.20	17.31	14.22	12.28	11.09	9.47	8.68	7.49	10.91
1970	6.89	7.58	10.04	19.45	18.01	15.77	12.91	11.12	10.03	8.55	7.83	6.75	11.24
1971	6.07	9.29	35.94	31.57	23.28	19.00	14.99	12.55	11.08	9.31	8.44	7.22	15.73
1972	6.51	10.07	28.71	29.99	23.83	27.93	22.98	19.73	17.71	15.02	13.72	11.98	19.02
1973	21.36	40.42	51.21	51.65	44.11	37.55	30.28	25.79	23.07	19.55	17.84	15.34	31.51
1974	13.68	20.45	18.29	16.78	14.05	12.73	10.87	9.65	8.89	7.68	7.10	6.16	12.19
1975	21.18	62.07	74.17	71.75	52.31	41.22	31.48	25.68	22.22	18.38	16.49	14.00	37.58
1976	28.13	55.46	69.08	74.82	63.12	54.18	42.23	34.87	30.48	25.40	22.90	19.52	43.35
1977	18.87	29.09	39.40	40.21	31.57	27.28	22.53	19.52	17.68	15.11	13.87	11.97	23.93
1978	11.24	15.03	16.81	15.95	13.62	12.18	10.31	9.09	8.33	7.18	6.63	5.74	11.01
1979	5.21	7.66	7.98	7.90	6.42	5.59	4.64	4.04	3.67	3.14	2.88	2.49	5.14
1980	2.24	2.44	4.90	11.04	10.43	8.72	7.02	5.97	5.34	4.52	4.12	3.54	5.86
1981	3.20	13.19	14.43	15.81	13.08	11.26	9.29	8.05	7.28	6.23	5.72	4.94	9.37
1982	4.48	4.50	4.07	3.66	3.10	2.80	2.39	2.12	1.95	1.89	3.08	17.82	4.32
1983	47.15	77.44	88.71	113.58	130.24	132.19	129.24	104.98	90.31	67.68	55.99	44.73	90.19
1984	38.33	62.24	79.47	69.71	53.03	44.28	35.63	30.28	27.04	22.89	20.86	18.16	41.83
1985	16.34	17.85	19.45	22.31	18.82	16.72	14.04	12.31	11.24	9.66	8.90	7.70	14.61
1986	28.38	32.54	24.91	24.43	19.31	16.66	13.75	11.92	10.79	9.23	8.47	7.31	17.31
1987	8.31	42.78	50.43	65.11	56.88	44.71	33.88	27.51	23.68	19.51	17.45	14.79	33.75
1988	13.40	21.38	19.23	23.20	20.74	18.31	15.37	13.49	12.32	10.59	9.76	8.45	15.52
1989	27.61	58.99	62.93	61.87	46.32	37.22	28.94	23.95	20.97	17.50	15.79	13.47	34.63
1990	11.98	12.08	11.97	14.06	11.42	10.07	8.45	7.40	6.75	5.80	5.34	4.62	9.16
1991	4.41	5.83	10.55	9.90	7.92	6.72	5.45	4.66	4.18	3.55	3.25	2.79	5.77
1992	8.68	24.98	63.70	89.90	93.51	77.44	55.64	42.72	35.17	27.97	24.36	20.25	47.03
MAX	47.15	77.44	88.71	113.58	130.24	132.19	129.24	104.98	90.31	67.68	55.99	44.73	90.19
MEAN	15.02	26.50	33.31	36.05	31.63	27.68	23.83	19.07	16.80	13.86	12.44	11.08	22.19
MIN	2.24	2.44	4.07	3.66	3.10	2.80	2.39	2.12	1.95	1.89	2.88	2.49	4.32

Table 3.2.2.2 Estimated Long-term Runoff in m<sup>3</sup>/sec for Carrizal River  
(Confluent with Chone River)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN
1964	31.94	44.10	101.34	105.04	38.56	18.38	8.66	3.80	1.68	0.70	0.31	0.13	29.55
1965	1.35	12.51	93.12	100.09	85.05	38.59	18.41	9.20	4.12	1.72	0.76	0.68	30.47
1966	49.83	79.45	83.66	62.13	42.13	22.72	12.38	5.88	3.09	1.19	0.52	0.36	30.28
1967	82.97	127.19	80.15	40.20	25.67	13.51	5.96	2.56	1.17	0.47	0.21	0.09	31.68
1968	1.22	47.83	22.71	22.95	10.72	5.24	2.19	0.94	0.59	0.18	0.08	0.03	9.56
1969	2.94	2.60	52.47	50.49	66.36	36.82	18.36	9.29	4.15	1.72	0.80	0.32	20.53
1970	2.79	7.10	24.79	73.34	61.06	27.45	15.78	7.88	3.51	1.46	0.65	0.34	18.85
1971	1.35	29.27	126.02	67.31	25.85	14.05	6.46	2.78	1.31	0.52	0.23	0.11	22.94
1972	1.11	51.97	88.11	73.63	38.85	77.54	47.06	28.21	15.04	6.51	2.89	5.11	36.34
1973	67.85	51.46	91.64	74.10	65.61	30.84	16.00	7.83	3.51	1.45	0.65	0.29	34.27
1974	0.31	28.32	23.87	23.76	13.67	7.24	3.10	1.33	0.59	0.24	0.12	0.40	8.58
1975	46.39	139.43	152.27	100.19	39.90	20.09	10.30	4.69	2.17	1.03	0.39	1.50	43.20
1976	79.09	81.71	104.45	84.15	52.25	31.28	16.04	7.75	3.48	1.44	0.64	0.31	38.55
1977	28.31	83.44	115.57	68.79	26.04	13.15	5.78	2.47	1.12	0.45	0.20	0.10	28.79
1978	5.07	36.27	61.81	35.27	34.55	16.09	7.57	3.27	1.45	0.60	0.26	0.11	16.86
1979	5.54	24.54	27.26	36.22	33.36	18.39	9.22	4.04	1.79	0.74	0.33	0.14	13.46
1980	0.83	17.10	40.55	63.58	27.83	13.93	6.28	2.69	1.19	0.50	0.22	0.16	14.57
1981	1.06	59.83	69.75	76.76	25.02	12.43	5.61	2.35	1.05	0.43	0.19	0.13	21.22
1982	0.95	7.68	16.41	24.73	12.33	6.76	2.92	1.25	0.56	2.62	23.65	78.29	14.85
1983	135.99	159.58	176.29	167.83	156.89	138.07	144.29	96.76	68.12	26.64	14.98	10.39	107.99
1984	4.95	78.89	103.92	93.19	40.18	18.99	9.44	4.11	1.82	0.76	0.33	0.85	29.79
1985	3.06	20.55	41.46	40.75	17.40	9.31	4.02	1.72	0.76	0.31	0.14	0.50	11.67
1986	33.38	50.86	55.66	78.33	29.68	15.74	7.31	3.17	1.40	0.69	0.26	0.27	23.06
1987	17.45	138.57	154.82	161.49	98.74	41.04	19.35	11.58	5.80	2.44	1.08	0.83	54.43
1988	12.12	82.76	49.58	48.88	43.26	22.22	12.07	5.66	2.51	1.07	0.47	0.30	23.41
1989	39.61	99.05	73.93	91.94	40.57	22.57	12.01	5.55	2.53	1.04	0.45	0.33	32.47
1990	1.03	8.72	15.09	19.17	9.39	4.59	1.91	0.82	0.36	0.15	0.06	0.03	5.11
1991	1.33	22.60	47.07	35.55	15.96	10.01	4.36	1.87	0.83	0.34	0.15	0.08	11.68
1992	1.86	13.55	63.27	81.69	47.70	24.09	12.87	6.00	2.69	1.12	0.49	0.28	21.30
MAX	135.99	159.58	176.29	167.83	156.89	138.07	144.29	96.76	68.12	26.64	23.65	78.29	107.99
MEAN	22.82	55.41	74.38	69.82	42.23	25.21	15.37	8.46	4.77	2.82	1.78	3.53	27.88
MIN	0.31	2.68	15.09	19.17	9.39	4.59	1.91	0.82	0.36	0.15	0.06	0.03	5.11

Table 3.2.2.3 Estimated Long-term Runoff in m<sup>3</sup>/sec for Chone River  
(Confluent with Carrizal River)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN
1964	50.24	39.16	56.30	66.93	14.73	5.26	3.79	3.06	2.60	2.06	1.74	1.38	20.61
1965	1.65	6.36	37.11	53.22	19.82	5.87	2.06	1.06	0.84	0.67	0.56	0.45	10.81
1966	13.02	51.59	52.85	23.90	8.00	2.83	1.69	1.41	1.20	0.94	0.78	0.63	13.40
1967	26.99	70.03	25.04	6.46	3.37	1.64	1.29	1.05	0.90	0.70	0.59	0.47	11.54
1968	0.83	5.03	3.53	2.65	0.24	0.19	0.14	0.11	0.09	0.08	0.06	0.05	1.08
1969	0.66	0.44	13.58	16.05	9.37	10.57	4.19	1.08	0.90	0.71	0.60	0.48	4.89
1970	2.12	3.16	17.61	51.11	16.97	2.86	0.94	0.72	0.61	0.48	0.41	0.33	8.11
1971	0.41	12.32	82.58	26.20	2.71	1.02	0.71	0.58	0.49	0.39	0.33	0.26	10.67
1972	0.25	22.32	39.33	20.70	4.15	33.97	9.17	6.27	1.58	1.21	1.02	0.86	11.97
1973	30.29	21.42	46.48	33.23	19.66	3.52	1.82	1.29	1.09	0.86	0.72	0.58	13.41
1974	0.74	50.34	10.99	16.05	1.95	0.85	0.61	0.50	0.42	0.33	0.28	0.36	6.95
1975	38.07	80.44	95.21	57.86	9.48	3.34	1.63	1.23	1.04	0.82	0.69	0.62	24.20
1976	40.61	51.61	52.07	45.30	25.34	25.96	3.43	1.63	1.37	1.08	0.92	0.76	20.84
1977	27.54	78.55	66.32	33.69	2.96	1.54	0.94	0.77	0.65	0.51	0.43	0.35	17.85
1978	6.38	32.96	30.14	6.75	2.69	0.83	0.65	0.53	0.45	0.36	0.30	0.24	6.86
1979	1.91	22.52	10.24	4.12	0.66	0.82	0.34	0.28	0.24	0.19	0.16	0.13	3.47
1980	1.25	16.00	41.75	30.20	8.14	1.03	0.65	0.53	0.45	0.36	0.30	0.24	8.41
1981	2.20	28.12	31.01	30.27	2.22	0.78	0.62	0.50	0.43	0.33	0.28	0.23	8.08
1982	1.52	1.29	5.91	2.47	0.60	0.11	0.08	0.06	0.05	3.76	15.72	45.21	6.40
1983	84.50	116.77	112.95	81.94	122.10	94.52	71.05	33.09	16.92	2.84	1.92	1.75	61.70
1984	1.35	30.91	61.23	45.57	7.73	2.19	1.23	0.99	0.84	0.66	0.56	1.08	12.86
1985	4.11	21.94	18.55	10.09	1.95	0.77	0.58	0.47	0.40	0.32	0.27	0.36	4.98
1986	25.47	14.83	17.16	28.44	3.62	1.05	0.81	0.67	0.56	0.45	0.38	0.44	7.82
1987	9.83	95.72	80.42	92.34	39.19	5.91	1.59	1.61	0.98	0.76	0.64	0.58	27.46
1988	4.72	25.78	7.01	6.98	2.85	0.85	0.52	0.42	0.35	0.28	0.23	0.19	4.18
1989	12.07	59.06	30.19	32.72	7.78	2.07	1.15	0.92	0.78	0.62	0.52	0.42	12.36
1990	1.29	8.18	16.27	22.94	1.88	0.62	0.46	0.38	0.32	0.25	0.21	0.17	4.41
1991	0.60	14.63	10.25	3.08	0.44	0.32	0.24	0.20	0.17	0.13	0.11	0.09	2.52
1992	4.98	16.53	31.56	39.63	25.10	3.75	1.43	1.06	0.89	0.71	0.60	0.47	10.56
MAX	84.50	116.77	112.95	92.34	122.10	94.52	71.05	33.09	16.92	3.76	15.72	45.21	61.70
MEAN	13.64	34.41	38.86	30.79	12.61	7.42	3.92	2.15	1.30	0.79	1.08	2.14	12.94
MIN	0.25	0.44	3.53	2.47	0.24	0.11	0.08	0.06	0.05	0.08	0.06	0.05	1.08

Table 3.2.2.4 Estimated Long-term Runoff in m<sup>3</sup>/sec at Estuary of Chone River

YEAR	(Unit: m <sup>3</sup> /s)												
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN
1964	68.76	90.97	138.94	166.69	98.91	58.40	33.24	20.23	13.46	8.98	6.82	5.11	59.21
1965	5.35	16.66	94.90	141.73	117.70	76.28	43.54	25.33	15.02	8.54	5.44	3.70	46.18
1966	40.82	102.21	134.43	110.31	73.66	47.71	29.05	17.92	11.68	7.20	4.98	3.52	48.62
1967	70.89	167.01	122.21	79.69	51.33	31.90	18.48	11.09	7.18	4.59	3.34	2.42	47.51
1968	3.05	43.71	31.56	29.78	18.38	11.73	6.62	3.86	2.51	1.52	1.05	0.73	12.88
1969	2.70	3.24	44.55	61.48	70.59	58.51	37.36	22.49	13.55	7.72	4.92	3.11	27.52
1970	5.58	9.60	33.84	108.78	87.77	53.81	32.25	19.44	11.75	6.72	4.29	2.78	31.38
1971	2.78	30.67	150.67	115.11	62.30	36.28	19.58	10.93	6.54	3.85	2.59	1.77	36.92
1972	2.01	50.39	104.96	102.56	64.98	99.73	72.88	51.71	33.43	19.37	11.94	11.23	52.10
1973	71.18	84.41	122.53	119.02	100.40	63.43	37.56	22.61	13.98	8.33	5.60	3.78	54.40
1974	3.18	59.11	42.34	43.15	26.67	17.03	9.81	5.87	3.78	2.41	1.77	1.58	18.06
1975	64.69	189.66	237.57	196.34	103.09	58.35	31.70	17.92	10.84	6.54	4.44	3.87	77.08
1976	82.21	119.79	143.07	141.01	103.60	79.00	44.32	25.38	15.21	8.90	5.92	4.02	64.37
1977	37.64	127.73	165.08	132.55	68.11	40.02	20.70	11.54	7.02	4.28	2.97	2.10	51.65
1978	9.97	52.02	76.71	56.72	45.54	30.46	18.07	10.66	6.55	3.94	2.67	1.82	26.26
1979	5.97	40.32	36.33	39.82	36.77	28.03	17.79	10.76	6.38	3.84	2.51	1.64	19.20
1980	2.37	22.98	65.24	82.63	54.63	32.45	17.79	9.98	5.92	3.46	2.32	1.60	25.11
1981	3.60	60.29	89.52	103.40	55.79	32.25	17.36	9.63	5.80	3.36	2.27	1.58	32.07
1982	2.68	6.94	19.36	24.21	17.50	11.99	7.00	4.05	2.44	5.13	26.94	85.87	17.84
1983	177.01	255.24	292.24	295.25	309.96	274.93	249.58	178.57	128.14	69.39	41.70	25.92	191.49
1984	17.34	87.50	140.97	145.01	86.01	50.42	27.98	16.07	9.84	5.97	4.13	3.69	49.58
1985	8.07	37.21	59.01	58.17	34.32	21.35	12.14	7.15	4.52	2.83	2.02	1.81	20.72
1986	36.55	56.45	65.22	92.15	56.96	35.11	19.81	11.39	6.91	4.19	2.84	2.11	32.47
1987	21.28	168.84	220.27	252.01	181.58	104.67	54.83	31.69	18.97	10.73	6.74	4.57	89.68
1988	13.62	74.84	67.07	63.14	53.08	37.39	23.60	14.48	8.93	5.25	3.44	2.31	30.60
1989	32.96	112.83	108.16	121.56	77.15	48.43	28.36	16.77	10.28	6.09	4.07	2.82	47.46
1990	3.45	13.71	26.32	37.00	21.58	12.81	7.05	4.11	2.61	1.66	1.21	0.89	11.03
1991	2.03	25.20	46.24	42.98	26.93	18.15	10.53	6.10	3.68	2.15	1.44	0.97	15.53
1992	6.04	28.48	77.48	108.50	85.93	53.55	30.81	17.98	10.87	6.36	4.21	2.86	36.09
MAX	177.01	255.24	292.24	295.25	309.96	274.93	249.58	178.57	128.14	69.39	41.70	25.92	191.49
MEAN	27.72	73.72	101.96	105.89	75.56	52.56	33.79	21.23	13.72	8.94	6.02	6.56	43.90
MIN	2.01	3.24	19.36	24.21	17.50	11.73	6.62	3.86	2.44	1.52	1.05	0.73	11.03

Table 3.2.25 Estimated Long-term Runoff in MCM for Chico River in Alajuela

(Unit: MCM)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1964	3.66	2.81	17.68	17.50	5.38	3.99	3.54	3.13	2.77	2.46	2.18	1.93	67.22
1965	1.79	2.52	23.70	19.62	20.20	6.89	4.53	4.02	3.55	3.16	2.80	2.52	95.30
1966	26.33	19.40	16.58	9.75	8.09	5.91	5.20	4.61	4.10	3.62	3.21	2.84	109.62
1967	39.45	43.71	25.23	8.89	6.51	5.11	4.53	4.02	3.58	3.16	2.80	2.49	149.48
1968	2.30	22.12	6.05	3.50	2.76	2.41	2.14	1.90	1.76	1.50	1.32	1.18	48.96
1969	1.45	1.04	13.15	7.88	13.93	5.24	3.91	3.48	3.08	2.73	2.41	2.14	60.44
1970	2.20	2.98	8.12	17.18	7.98	5.44	3.94	3.48	3.08	2.73	2.44	2.17	61.74
1971	1.98	5.71	30.88	13.06	4.71	3.89	3.37	3.00	2.64	2.36	2.07	1.85	75.54
1972	1.71	3.81	22.04	12.00	7.50	14.83	6.40	5.28	4.69	4.04	3.58	3.06	89.85
1973	19.58	27.65	36.85	24.11	17.81	9.23	7.07	6.27	5.55	4.93	4.35	3.86	167.25
1974	3.43	14.76	9.05	5.31	3.94	3.53	3.11	2.76	2.44	2.17	1.92	1.71	54.12
1975	20.95	38.59	38.78	26.98	10.61	6.48	5.46	4.85	4.30	3.80	3.37	3.00	167.17
1976	22.77	33.95	39.96	37.66	26.86	16.10	8.49	6.88	6.09	5.41	4.80	4.26	213.23
1977	7.66	18.10	25.02	17.94	7.23	5.70	5.04	4.47	3.97	3.51	3.11	2.79	104.52
1978	3.56	8.39	9.96	5.52	4.42	3.42	3.03	2.71	2.38	2.12	1.87	1.66	49.04
1979	1.63	3.80	6.00	4.10	2.44	2.02	1.79	1.58	1.40	1.23	1.11	0.99	28.10
1980	0.88	1.25	6.08	14.39	7.18	3.06	2.65	2.33	2.07	1.85	1.63	1.45	44.82
1981	1.34	16.18	10.42	9.72	6.08	3.78	3.35	2.95	2.62	2.33	2.07	1.82	62.66
1982	1.85	1.77	2.89	1.35	1.12	0.96	0.83	0.75	0.67	1.34	3.65	23.57	40.76
1983	33.75	40.76	45.13	55.21	49.12	37.32	41.14	29.27	26.62	11.60	8.97	7.95	386.85
1984	9.70	39.31	48.00	24.91	10.55	7.88	6.96	6.19	5.47	4.85	4.30	3.86	171.97
1985	3.64	5.30	11.41	13.43	6.13	4.61	3.86	3.40	3.03	2.68	2.38	2.12	61.99
1986	27.04	16.86	6.94	9.15	4.58	3.89	3.46	3.05	2.72	2.41	2.13	1.90	85.02
1987	5.06	36.00	29.65	40.85	25.77	9.12	6.11	5.46	4.77	4.23	3.76	3.35	174.13
1988	3.59	16.06	8.12	14.52	9.08	5.31	4.63	4.12	3.65	3.24	2.88	2.54	77.75
1989	34.04	41.76	33.72	28.62	10.95	6.35	5.49	4.87	4.33	3.83	3.40	3.00	180.36
1990	2.73	2.66	7.29	11.25	3.72	3.03	2.68	2.38	2.10	1.87	1.66	1.47	42.85
1991	2.12	4.19	15.24	6.87	4.07	2.90	2.49	2.20	1.94	1.74	1.53	1.37	46.65
1992	14.20	28.21	53.94	53.19	52.01	27.45	10.31	7.04	6.22	5.52	4.90	4.34	267.34
MAX	39.45	43.71	53.94	55.21	53.01	37.32	41.14	29.27	26.62	11.60	8.97	7.95	386.85
MEAN	10.40	17.23	20.96	17.74	11.75	7.44	5.71	4.71	4.19	3.72	3.29	2.99	109.82
MIN	0.88	1.04	2.89	1.35	1.12	0.96	0.83	0.75	0.67	1.34	3.65	23.57	40.76

Table 3.2.26 Estimated Long-term Runoff in MCM for Grande River in A. J. Mosquito

(Unit: MCM)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1964	34.79	24.08	41.01	50.05	10.93	3.34	2.52	2.06	1.68	1.37	1.11	0.91	173.86
1965	1.12	4.06	26.94	37.90	15.29	4.69	1.77	0.78	0.57	0.46	0.39	0.32	94.29
1966	11.52	37.06	37.87	18.25	6.03	2.05	1.18	0.99	0.83	0.67	0.52	0.46	117.42
1967	22.42	46.71	19.50	4.92	2.12	1.09	0.88	0.72	0.60	0.48	0.39	0.32	100.16
1968	0.56	1.70	2.01	1.53	0.16	0.10	0.08	0.08	0.05	0.05	0.03	0.03	6.39
1969	0.64	0.36	10.18	11.59	7.07	6.97	4.02	0.86	0.67	0.56	0.47	0.37	45.76
1970	1.45	2.15	13.07	33.54	11.87	2.13	0.67	0.51	0.41	0.35	0.29	0.24	96.67
1971	0.32	7.98	63.00	20.92	2.52	0.67	0.51	0.40	0.34	0.27	0.23	0.19	97.35
1972	0.16	16.06	28.66	14.46	3.32	25.74	7.98	6.13	1.17	0.94	0.75	3.62	106.99
1973	22.36	12.36	34.34	24.29	15.21	2.70	1.34	0.91	0.75	0.62	0.49	0.40	115.77
1974	0.51	34.59	8.17	12.80	1.61	0.62	0.43	0.35	0.29	0.24	0.18	0.29	60.09
1975	26.84	49.06	67.36	41.08	7.47	2.72	1.18	0.88	0.73	0.59	0.47	0.46	198.84
1976	30.94	37.58	41.11	34.71	20.57	22.08	3.11	1.12	0.91	0.75	0.62	0.54	194.04
1977	23.89	54.24	50.03	24.55	2.33	0.86	0.64	0.51	0.41	0.35	0.29	0.24	158.33
1978	4.71	22.72	23.60	5.75	2.68	0.62	0.48	0.40	0.31	0.27	0.21	0.19	61.94
1979	1.53	13.89	7.98	3.32	0.54	0.73	0.27	0.21	0.18	0.13	0.13	0.11	29.01
1980	1.18	12.68	31.82	24.34	6.94	0.80	0.48	0.40	0.31	0.27	0.21	0.19	79.61
1981	1.61	19.35	22.47	22.68	1.87	0.52	0.43	0.35	0.29	0.24	0.18	0.16	70.15
1982	1.29	1.09	3.72	1.74	0.51	0.08	0.05	0.05	0.03	4.12	13.66	37.90	64.24
1983	66.13	82.71	82.71	53.34	86.78	68.27	51.64	25.12	12.73	2.05	1.24	1.26	534.00
1984	0.83	19.27	46.34	34.27	5.95	1.48	0.86	0.70	0.57	0.46	0.39	0.99	112.08
1985	2.73	13.86	11.17	5.73	1.10	0.47	0.37	0.32	0.26	0.21	0.18	0.27	36.68
1986	24.80	12.72	15.51	24.83	3.62	0.73	0.59	0.48	0.39	0.32	0.26	0.40	84.65
1987	6.80	65.29	57.88	67.99	30.16	3.86	1.02	1.18	0.62	0.51	0.41	0.37	236.10
1988	3.67	19.27	3.91	4.51	2.12	0.54	0.35	0.27	0.23	0.19	0.16	0.13	35.34
1989	11.14	43.59	23.06	25.61	6.70	1.56	0.83	0.67	0.54	0.46	0.36	0.29	114.81
1990	0.96	5.83	13.04	19.03	1.55	0.44	0.35	0.27	0.23	0.19	0.16	0.13	42.18
1991	0.37	10.86	7.42	1.97	0.29	0.23	0.19	0.16	0.13	0.11	0.08	0.08	21.90
1992	3.72	10.05	21.61	28.95	20.54	2.75	0.96	0.72	0.60	0.48	0.39	0.32	91.10
MAX	66.13	82.71	82.71	67.99	86.78	68.27	51.64	25.12	12.73	4.12	13.66	37.90	534.00
MEAN	10.66	23.49	28.12	22.57	9.58	5.55	2.94	1.64	0.93	0.61	0.84	1.76	108.68
MIN	0.16	0.36	2.01	1.53	0.16	0.08	0.05	0.05	0.03	0.05	0.03	0.03	6.39

Table 3.2.27 Estimated Long-term Runoff in MCM for Carrizal River in Calcuta

( Unit : MCM )

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1964	67.92	68.30	140.03	128.20	49.04	22.01	10.79	4.74	2.05	0.86	0.36	0.16	494.49
1965	2.54	26.39	137.51	134.19	136.06	57.57	23.25	11.60	5.00	2.14	0.93	1.50	538.69
1966	100.17	103.95	112.81	82.71	62.92	29.42	17.68	8.68	4.74	1.79	0.78	0.72	526.38
1967	141.74	173.19	124.63	61.07	41.84	19.83	9.54	4.10	1.76	0.75	0.31	0.13	578.88
1968	3.62	114.48	59.30	40.64	18.80	9.20	3.99	1.71	1.43	0.32	0.13	0.05	253.68
1969	5.49	7.31	98.22	78.67	113.32	50.23	22.71	11.44	4.95	2.14	1.01	0.40	395.89
1970	5.33	12.14	37.36	83.38	92.14	36.88	23.03	11.87	5.13	2.20	0.96	0.84	311.07
1971	3.91	49.47	164.13	86.00	34.58	17.76	8.57	3.70	1.79	0.67	0.29	0.19	371.05
1972	2.81	85.47	144.02	109.02	63.80	111.09	77.70	40.26	19.75	9.05	3.89	8.04	674.89
1973	113.72	62.15	134.46	107.13	101.54	46.89	22.20	11.20	4.87	2.09	0.91	0.46	607.61
1974	0.43	25.26	31.95	25.25	16.69	8.58	3.80	1.63	0.70	0.29	0.13	0.51	115.22
1975	60.02	176.75	189.74	110.26	46.93	22.03	11.30	5.09	2.44	1.39	0.41	3.21	629.58
1976	150.12	118.04	118.63	90.20	57.83	25.82	13.37	5.81	2.49	1.07	0.47	0.24	584.08
1977	37.10	94.74	162.85	86.31	36.40	16.67	7.61	3.24	1.43	0.59	0.26	0.19	447.31
1978	6.99	39.14	88.82	54.54	59.86	23.22	11.92	5.17	2.23	0.94	0.41	0.19	293.43
1979	15.56	35.95	44.41	61.79	65.09	29.21	15.45	7.04	3.03	1.29	0.54	0.24	279.61
1980	1.79	28.16	44.30	82.76	35.19	16.64	7.71	3.29	1.43	0.62	0.26	0.24	222.41
1981	1.98	95.46	103.25	105.62	35.97	16.28	8.17	3.43	1.48	0.64	0.26	0.37	372.92
1982	2.38	17.81	36.19	40.33	19.36	10.34	4.71	2.01	0.86	4.77	47.85	122.88	309.52
1983	175.49	171.93	241.14	226.90	193.49	156.32	171.39	128.24	89.89	35.32	19.44	14.81	1625.37
1984	7.50	116.13	138.47	134.03	66.48	26.02	13.82	6.11	2.62	1.12	0.47	0.78	513.55
1985	3.11	21.72	65.54	61.43	23.52	12.67	5.84	2.49	1.06	0.46	0.21	1.23	199.28
1986	63.77	68.66	68.08	106.92	38.01	18.20	8.41	3.62	1.56	0.88	0.29	0.29	378.68
1987	29.41	184.17	222.63	223.79	147.58	56.79	23.81	14.78	7.18	3.08	1.32	0.99	915.54
1988	24.45	138.96	79.47	75.76	79.25	34.29	19.02	9.29	3.99	1.77	0.78	0.59	467.63
1989	82.66	132.98	90.61	124.18	53.73	26.75	14.17	6.24	2.75	1.15	0.49	0.40	536.11
1990	1.37	13.31	20.33	22.08	10.95	4.95	2.12	0.91	0.39	0.16	0.08	0.03	76.67
1991	3.46	43.69	89.30	65.03	27.45	19.13	9.05	3.91	1.68	0.72	0.31	0.19	263.93
1992	2.01	13.43	92.51	117.78	68.81	31.31	16.47	7.50	3.24	1.39	0.60	0.37	353.43
MAX	175.49	184.17	241.14	226.90	193.49	156.32	171.39	128.24	89.89	35.32	47.85	122.88	1625.37
MEAN	38.51	77.21	106.23	94.08	61.95	33.97	20.26	11.95	6.27	2.78	1.50	5.52	469.90
MIN	0.43	7.31	20.33	23.08	10.95	4.95	2.12	0.91	0.39	0.16	0.08	0.03	76.67

Table 3.2.28 Estimated Long-term Runoff in MCM  
at Proposed La Esperanza Dam site

(Unit : MCM)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1964	57.77	58.10	119.14	109.10	41.73	18.74	9.19	4.04	1.74	0.75	0.31	0.13	420.74
1965	2.17	22.45	116.99	114.18	115.76	48.99	19.77	9.86	4.28	1.82	0.78	1.29	458.32
1966	85.25	88.45	95.99	70.37	53.54	25.04	15.05	7.39	4.04	1.53	0.65	0.62	447.93
1967	120.61	147.35	106.04	51.94	35.60	16.87	8.12	3.48	1.50	0.64	0.29	0.13	492.58
1968	3.08	97.39	50.46	34.58	15.99	7.83	3.40	1.45	1.22	0.27	0.10	0.05	215.82
1969	4.69	6.22	83.57	66.93	96.42	42.74	19.31	9.72	4.20	1.82	0.86	0.35	336.82
1970	4.53	10.33	31.79	70.97	78.40	31.39	19.61	10.10	4.38	1.87	0.80	0.54	264.70
1971	3.32	42.09	139.65	73.17	29.41	15.11	7.29	3.13	1.53	0.59	0.26	0.16	315.72
1972	2.38	72.74	122.54	92.77	54.29	94.53	66.10	34.26	16.82	7.71	3.32	6.83	574.29
1973	96.77	52.86	114.39	91.16	86.41	39.92	18.88	9.54	4.15	1.77	0.75	0.37	516.97
1974	0.37	21.48	27.19	21.46	14.20	7.31	3.21	1.39	0.60	0.27	0.10	0.43	98.01
1975	51.08	150.38	161.43	93.83	39.93	18.74	9.62	4.34	2.07	1.18	0.36	2.73	535.69
1976	127.73	100.45	100.95	76.75	49.20	21.95	11.36	4.96	2.13	0.91	0.39	0.21	496.99
1977	31.55	80.61	138.55	73.43	30.99	14.18	6.45	2.76	1.22	0.51	0.21	0.13	380.59
1978	5.95	33.31	75.56	46.42	50.94	19.78	10.15	4.39	1.89	0.80	0.34	0.16	249.70
1979	13.23	30.60	37.79	52.57	55.36	24.86	13.15	6.00	2.57	1.10	0.47	0.19	237.88
1980	1.53	23.95	37.71	70.42	29.94	14.15	6.56	2.81	1.22	0.51	0.23	0.21	189.26
1981	1.69	81.24	87.85	89.86	30.59	13.84	6.94	2.92	1.24	0.54	0.23	0.32	317.26
1982	2.04	15.14	30.77	34.32	16.47	8.79	3.99	1.71	0.75	4.04	40.72	104.56	263.32
1983	149.32	146.29	205.19	193.05	164.64	133.00	145.84	109.12	76.49	30.91	16.54	12.59	1,382.97
1984	6.37	98.82	117.82	114.05	56.54	22.14	11.76	5.20	2.23	0.96	0.41	0.67	436.97
1985	2.65	18.48	55.76	52.28	20.01	10.78	4.96	2.12	0.91	0.40	0.18	1.07	169.60
1986	54.26	58.42	57.93	90.95	32.36	15.47	7.15	3.08	1.32	0.75	0.23	0.27	322.21
1987	25.02	156.72	189.42	190.41	125.56	48.31	20.28	12.59	6.09	2.62	1.14	0.83	778.99
1988	20.81	118.24	67.60	64.46	67.42	29.19	16.18	7.90	3.40	1.50	0.65	0.48	397.82
1989	70.33	113.15	77.11	105.65	45.72	22.76	12.05	5.30	2.33	0.99	0.41	0.35	456.16
1990	1.18	11.32	17.30	18.79	9.32	4.20	1.79	0.78	0.34	0.13	0.05	0.03	65.24
1991	2.95	37.16	75.99	55.34	23.36	16.28	7.71	3.35	1.43	0.62	0.26	0.16	224.59
1992	1.71	11.43	78.72	100.21	58.55	26.62	14.01	6.37	2.75	1.18	0.52	0.32	302.38
MAX.	149.32	156.72	205.19	193.05	164.64	133.00	145.84	109.12	76.49	30.91	16.54	12.59	1,382.97
MEAN	32.77	65.70	90.39	79.98	52.71	28.05	17.24	9.66	5.34	2.37	2.47	4.70	391.36
MIN.	0.37	6.22	17.30	18.79	9.32	4.20	1.79	0.78	0.34	0.13	0.05	0.03	65.24



Table 3.2.29 Estimated Long-term Runoff in MCM  
at Poza Honda Damsite

(Units: MCM)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1964	3.59	2.61	16.42	16.25	5.01	3.71	3.29	2.92	2.59	2.30	2.02	1.79	62.51
1965	1.66	2.32	22.02	18.22	18.78	6.40	4.21	3.72	3.29	2.92	2.59	2.36	88.49
1966	24.45	18.02	15.40	9.05	7.53	5.47	4.82	4.29	3.81	3.35	2.98	2.65	101.82
1967	36.67	40.62	23.44	8.27	6.05	4.74	4.21	3.72	3.32	2.95	2.62	2.30	138.90
1968	2.14	20.55	5.62	3.27	2.54	2.26	1.98	1.77	1.63	1.39	1.24	1.10	45.50
1969	1.34	0.97	12.21	7.31	12.94	4.87	3.64	3.21	2.85	2.54	2.26	1.98	56.13
1970	2.04	2.76	7.53	15.97	7.39	5.05	3.67	3.24	2.88	2.54	2.26	2.01	57.33
1971	1.85	5.32	28.69	12.13	4.39	3.60	3.13	2.79	2.46	2.20	1.94	1.71	70.22
1972	1.61	3.53	20.49	11.15	6.96	13.76	5.95	4.90	4.35	3.75	3.32	3.70	83.47
1973	18.19	25.67	34.26	22.39	16.53	8.58	6.59	5.81	5.16	4.58	4.04	3.59	155.38
1974	3.19	13.69	8.41	4.92	3.67	3.27	2.87	2.54	2.26	2.01	1.79	1.58	50.19
1975	19.47	35.83	36.02	25.06	9.86	6.01	5.09	4.50	3.99	3.54	3.14	2.79	155.30
1976	21.16	31.55	37.12	34.97	24.96	14.96	7.87	6.40	5.65	5.01	4.46	3.96	198.07
1977	7.12	16.81	23.25	16.67	6.70	5.31	4.69	4.15	3.68	3.27	2.90	2.57	97.12
1978	3.32	7.81	9.27	5.13	4.10	3.19	2.81	2.49	2.23	1.96	1.74	1.55	45.60
1979	1.50	3.53	5.57	3.81	2.25	1.89	1.66	1.47	1.30	1.15	1.04	0.91	26.08
1980	0.83	1.15	5.65	13.35	6.67	2.85	2.46	2.17	1.92	1.71	1.53	1.34	41.64
1981	1.26	15.02	9.70	9.05	5.65	3.50	3.11	2.76	2.44	2.17	1.92	1.69	58.25
1982	1.71	1.65	2.68	1.24	1.04	0.88	0.78	0.70	0.62	0.62	0.62	21.88	37.84
1983	31.36	37.86	41.92	51.30	45.61	34.68	38.22	27.19	24.73	10.77	8.32	7.39	359.35
1984	9.03	36.53	44.57	23.15	9.80	7.31	6.48	5.73	5.08	4.50	3.99	3.59	159.76
1985	3.37	4.91	10.61	12.47	5.70	4.28	3.56	3.16	2.80	2.49	2.20	1.98	57.54
1986	25.95	15.68	6.43	8.50	4.26	3.60	3.21	2.84	2.51	2.22	1.97	1.77	78.95
1987	4.71	33.43	27.53	37.95	23.92	8.48	5.68	5.09	4.43	3.94	3.47	3.11	161.74
1988	3.35	14.91	7.55	13.50	8.44	4.92	4.31	3.83	3.40	3.00	2.67	2.36	72.24
1989	31.63	38.78	31.31	26.57	10.18	5.88	5.09	4.53	4.02	3.56	3.16	2.79	167.50
1990	2.54	2.47	6.78	10.45	3.46	2.80	2.49	2.22	1.97	1.74	1.53	1.37	39.81
1991	1.98	3.89	14.17	6.38	3.78	2.70	2.30	2.04	1.81	1.61	1.43	1.26	43.34
1992	13.18	26.21	50.11	49.40	48.32	25.48	9.59	6.54	5.78	5.12	4.54	4.02	248.27
MAX	36.67	40.62	50.11	51.30	48.32	34.68	38.22	27.19	24.73	10.77	8.32	21.88	359.35
MEAN	9.66	16.80	19.47	16.48	10.91	6.91	5.30	4.37	3.90	3.09	2.77	3.14	102.91
MIN	0.83	0.97	2.68	1.24	1.04	0.88	0.78	0.70	0.62	0.62	0.62	0.91	26.08

Table 3.2.30 Estimated Long-term Runoff in MCM at Santa Ana New Diversion Damsite

(Unit : MCM)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1964	9.78	6.39	41.41	43.10	13.50	10.13	8.97	7.95	7.05	6.27	5.55	4.93	165.03
1965	4.47	5.32	52.90	42.53	36.72	14.70	10.87	9.62	8.53	7.55	6.71	5.97	205.90
1966	43.34	35.56	32.17	19.47	16.02	12.83	11.36	10.04	8.94	7.90	7.02	6.21	210.86
1967	75.45	95.97	55.23	19.67	14.54	11.98	10.61	9.40	8.35	7.39	6.56	5.81	320.96
1968	5.36	33.32	8.81	6.45	5.36	4.74	4.21	3.72	3.34	2.92	2.59	2.30	83.13
1969	2.84	2.15	23.17	20.94	32.54	13.40	9.78	8.62	7.65	6.78	6.01	5.33	139.21
1970	5.41	6.89	16.47	35.98	17.46	11.46	8.87	7.85	6.97	6.19	5.47	4.85	133.86
1971	4.47	12.58	69.18	26.54	10.58	9.02	7.87	6.99	6.19	5.49	4.87	4.31	168.11
1972	4.10	10.37	46.76	24.68	14.84	31.54	14.95	12.35	10.81	9.45	8.40	8.30	196.55
1973	34.31	53.15	75.64	52.15	37.07	21.98	17.17	15.19	13.45	11.95	10.58	9.37	352.00
1974	8.33	26.90	17.97	11.69	9.00	7.98	7.04	6.27	5.55	4.93	4.35	3.88	113.90
1975	42.93	86.80	91.74	63.17	23.78	15.84	13.50	11.95	10.60	9.40	8.35	7.39	385.45
1976	47.25	77.55	86.35	78.38	51.16	35.07	20.54	17.17	15.22	13.50	11.98	10.63	464.79
1977	15.70	36.68	52.93	35.87	16.45	13.82	12.16	10.79	9.56	8.49	7.52	6.70	226.65
1978	8.01	16.91	22.95	11.79	9.88	7.70	6.80	6.03	5.34	4.74	4.20	3.72	108.08
1979	3.56	8.13	11.44	8.71	5.14	4.20	3.67	3.27	2.90	2.57	2.28	2.01	57.88
1980	1.85	2.41	10.77	24.39	13.71	6.30	5.49	4.85	4.30	3.83	3.40	3.00	84.29
1981	2.76	28.04	24.32	21.51	11.78	8.22	7.29	6.45	5.73	5.09	4.51	3.99	129.69
1982	3.80	3.48	4.90	2.75	2.33	1.97	1.74	1.55	1.37	2.09	5.31	46.04	77.35
1983	77.83	94.30	105.90	122.96	122.00	93.93	96.32	63.40	52.80	26.19	22.06	19.58	897.28
1984	19.69	73.66	99.69	46.97	22.36	18.43	16.34	14.49	12.86	11.38	10.11	9.11	355.08
1985	8.70	11.88	23.22	25.53	12.24	9.69	8.33	7.39	6.56	5.81	5.16	4.58	129.10
1986	56.09	33.65	16.85	20.45	11.06	9.33	8.28	7.34	6.51	5.76	5.11	4.53	184.94
1987	11.22	72.31	60.51	82.22	52.23	19.47	14.81	13.39	11.64	10.31	9.15	8.12	365.37
1988	8.57	32.25	19.04	29.70	19.23	12.21	10.74	9.54	8.45	7.50	6.64	5.92	169.78
1989	57.02	80.08	69.93	57.18	23.97	15.84	13.61	12.05	10.70	9.48	8.40	7.47	365.74
1990	6.78	6.51	13.15	17.55	7.29	6.19	5.49	4.87	4.30	3.83	3.40	3.03	82.38
1991	3.64	6.53	23.36	10.19	6.35	4.82	4.15	3.70	3.27	2.89	2.57	2.28	73.73
1992	21.99	48.48	103.23	100.41	94.25	46.47	20.41	16.47	14.59	12.94	11.48	10.18	500.91
MAX	77.83	95.97	105.90	122.96	122.00	93.93	96.32	63.40	52.80	26.19	22.06	19.58	897.28
MEAN	20.53	34.77	44.14	36.65	24.58	16.53	13.15	10.78	9.43	7.68	6.89	7.57	232.69
MIN	1.85	2.15	4.90	2.75	2.33	1.97	1.74	1.55	1.37	2.09	2.28	2.01	57.88

Table 3.2.3.1 Estimated Long-term Runoff in MCM for Carrizal River in La Estancilla

(Unit: MCM)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1964	53.65	77.77	158.19	173.43	107.81	67.11	40.63	23.14	12.70	6.80	3.58	1.85	726.65
1965	3.03	21.39	133.30	163.11	175.27	116.04	72.10	43.74	24.86	13.63	7.28	4.63	778.40
1966	83.00	118.83	144.42	127.63	106.47	71.67	48.08	29.62	17.78	9.83	5.31	3.11	765.75
1967	122.43	189.40	173.10	119.67	87.85	56.82	34.47	19.69	10.83	5.81	3.06	1.61	824.74
1968	3.32	88.72	74.22	65.81	44.25	28.10	16.53	9.27	5.52	2.94	1.48	0.78	340.83
1969	5.14	6.89	84.96	96.55	133.55	94.97	61.68	38.44	22.19	12.29	6.69	3.54	566.89
1970	5.97	12.39	37.34	95.33	112.33	75.19	53.46	34.60	20.45	11.49	6.25	3.48	498.29
1971	4.50	43.18	167.91	130.69	81.83	52.72	31.93	18.16	10.11	5.38	2.83	1.50	550.73
1972	2.97	73.46	146.86	146.76	110.46	145.18	120.80	85.95	56.04	33.69	19.13	15.43	956.72
1973	103.17	91.57	153.98	147.98	145.89	98.16	63.64	39.16	22.50	12.43	6.69	3.56	888.72
1974	2.09	25.47	36.85	37.45	30.48	21.00	12.83	7.37	4.04	2.17	1.17	1.04	181.97
1975	57.26	177.74	235.46	186.81	115.76	71.33	43.39	24.78	13.79	7.69	3.99	4.50	942.49
1976	122.43	140.69	171.15	149.20	112.63	72.94	46.01	26.70	14.67	7.85	4.12	2.20	870.58
1977	34.34	96.65	176.45	138.75	87.02	54.12	31.87	17.84	9.69	5.14	2.70	1.42	655.99
1978	6.99	40.13	92.08	77.63	82.71	54.61	35.14	20.73	11.64	6.32	3.37	1.77	433.13
1979	12.13	35.32	51.13	72.39	82.60	58.81	39.69	24.27	13.92	7.69	4.12	2.17	404.25
1980	2.36	23.75	51.13	92.92	64.76	42.98	26.46	15.16	8.37	4.50	2.36	1.34	336.10
1981	2.14	81.02	118.06	136.42	82.01	51.24	30.86	17.41	9.51	5.09	2.67	1.55	537.99
1982	2.38	14.54	33.77	49.20	36.16	25.12	15.53	8.95	4.95	5.92	38.80	118.68	354.00
1983	203.24	229.87	296.82	309.69	50.97	257.31	264.28	214.19	165.99	100.81	63.58	42.88	2199.64
1984	26.03	113.65	164.29	172.42	120.15	75.01	46.68	27.13	15.09	6.14	4.30	2.92	775.83
1985	4.50	22.26	63.96	76.15	50.68	33.85	20.57	11.76	6.45	3.46	1.81	1.79	297.24
1986	50.51	79.06	94.74	130.84	82.95	53.52	32.36	18.27	9.95	5.46	2.83	1.63	562.13
1987	26.11	170.12	252.41	283.31	230.82	142.27	85.87	53.38	31.26	17.44	9.43	5.44	1307.87
1988	21.96	123.93	111.53	110.00	110.06	74.88	50.49	31.28	18.04	10.02	5.39	3.05	670.64
1989	67.01	138.93	134.94	162.88	109.28	72.11	46.07	27.00	15.06	8.12	4.28	2.44	788.11
1990	2.36	11.95	21.96	27.73	21.21	13.87	8.20	4.61	2.51	1.34	0.70	0.37	116.82
1991	2.79	34.69	86.16	84.68	57.75	41.94	26.68	15.78	8.86	4.82	2.57	1.39	368.10
1992	2.57	14.73	87.91	130.97	105.66	71.95	47.41	28.32	16.15	8.81	4.72	2.60	522.01
MAX	203.24	229.87	296.82	309.69	230.82	257.31	264.28	214.19	165.99	100.81	63.58	118.68	2199.64
MEAN	35.74	79.25	122.59	127.46	94.46	72.34	50.13	32.31	20.10	11.55	7.77	8.23	661.81
MIN	2.09	6.89	21.96	27.73	21.21	13.87	8.20	4.61	2.51	1.34	0.70	0.37	116.82

Table 3.2.32 Estimated Long-term Runoff in MCM at Proposed La Ciénega Diversion Dam Site

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1964	4.61	4.31	22.12	24.99	13.82	10.83	9.03	7.66	6.64	5.79	5.08	4.50	119.37
1965	4.07	4.55	28.23	28.43	30.67	18.27	13.69	11.09	9.23	7.85	6.77	5.95	168.79
1966	31.02	29.32	28.26	21.36	18.11	14.54	12.43	10.79	9.46	8.36	7.39	6.56	197.59
1967	47.73	62.46	46.12	27.03	20.25	15.60	12.64	10.55	8.97	7.74	6.77	5.95	271.82
1968	5.36	26.21	13.20	9.80	7.74	6.40	5.44	4.69	4.15	3.59	3.19	2.81	92.57
1969	3.00	2.44	15.35	12.49	19.71	12.16	9.72	8.28	7.15	6.24	5.50	4.87	106.92
1970	4.61	5.20	10.98	22.24	15.11	11.92	9.56	8.17	7.08	6.21	5.47	4.85	111.40
1971	4.39	8.25	38.78	23.61	14.33	11.25	9.16	7.66	6.53	5.65	4.95	4.34	138.91
1972	3.94	6.44	28.74	20.89	15.94	22.91	15.03	12.59	10.86	9.37	8.22	7.98	162.61
1973	25.31	39.34	53.09	42.56	35.03	24.65	19.53	16.20	13.76	11.87	10.34	9.11	300.78
1974	8.04	19.67	15.80	12.16	9.86	8.50	7.39	6.48	5.73	5.09	4.51	4.04	107.27
1975	25.61	52.28	59.22	48.57	29.33	21.02	16.45	13.39	11.20	9.54	8.24	7.20	302.04
1976	29.06	46.98	59.11	60.50	49.68	36.42	25.63	20.17	16.56	13.93	11.92	10.34	380.31
1977	12.80	24.80	36.02	31.16	19.79	15.81	13.20	11.25	9.72	8.49	7.49	6.62	197.16
1978	6.96	12.07	14.95	11.48	9.67	8.06	7.04	6.21	5.50	4.87	4.33	3.88	95.03
1979	3.59	5.95	8.41	7.13	5.44	4.64	4.02	3.54	3.14	2.79	2.46	2.20	53.29
1980	1.98	2.23	7.37	17.39	12.21	8.16	6.70	5.62	4.82	4.21	3.68	3.24	77.62
1981	2.95	18.75	15.72	15.71	12.21	9.31	7.87	6.78	5.88	5.17	4.56	4.04	108.95
1982	3.80	3.56	4.47	3.19	2.71	2.31	2.01	1.77	1.56	2.12	4.74	27.91	60.13
1983	46.42	59.68	70.33	86.96	85.55	74.52	76.79	60.59	53.55	34.58	26.83	21.94	697.73
1984	20.84	54.07	70.71	48.73	31.50	24.18	19.66	16.39	13.97	12.08	10.55	9.32	332.00
1985	8.49	9.80	16.63	20.04	13.71	11.20	9.45	8.20	7.18	6.32	5.60	4.98	121.60
1986	34.74	27.22	17.28	17.91	12.32	10.13	8.57	7.39	6.43	5.65	5.00	4.45	157.09
1987	7.31	45.36	45.32	60.70	46.76	27.71	20.38	16.18	13.17	11.01	9.38	8.14	311.43
1988	7.74	20.82	14.89	21.67	17.17	12.96	11.04	9.56	8.37	7.39	6.53	5.81	143.96
1989	41.57	58.74	55.95	50.80	30.35	21.44	16.79	13.63	11.35	9.64	8.35	7.20	325.90
1990	6.45	6.00	10.53	15.53	9.24	7.65	6.54	5.68	4.98	4.39	3.89	3.46	64.32
1991	3.88	6.19	18.29	12.23	9.21	7.26	6.05	5.17	4.48	3.94	3.47	3.08	83.27
1992	16.58	36.31	73.04	82.06	85.60	58.50	35.25	25.47	19.78	15.88	13.14	11.09	472.70
MAX	47.73	62.46	73.04	86.96	85.60	74.52	76.79	60.59	53.55	34.58	26.83	27.91	697.73
MEAN	14.58	24.10	31.00	29.56	23.54	17.87	14.38	11.76	10.04	8.37	7.18	7.10	199.40
MIN	1.98	2.23	4.47	3.19	2.71	2.31	2.01	1.77	1.56	2.12	2.46	2.20	53.29

(Unit: MCM)

Table 3.2.33 Estimated Long-term Runoff in MCM for Portoviejo River in El Ceibal

(Unit: MCM)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1964	11.49	15.13	57.61	79.89	65.25	53.73	45.37	39.02	34.03	29.97	26.59	23.68	481.77
1965	21.21	20.08	63.72	78.77	81.99	66.93	54.83	46.10	39.53	34.39	30.22	26.78	564.54
1966	55.31	67.23	75.18	69.23	62.11	54.59	48.32	42.96	38.36	34.34	30.77	27.59	605.99
1967	92.78	163.63	155.19	117.05	90.24	71.59	58.63	49.28	42.25	36.75	32.30	28.58	938.27
1968	25.61	47.31	37.95	30.77	25.34	21.38	18.37	16.02	14.10	12.48	11.09	9.88	270.30
1969	9.96	8.88	26.76	34.89	51.34	44.82	38.03	32.84	28.69	25.31	22.47	20.03	344.03
1970	18.40	18.31	26.86	50.26	47.89	40.88	34.55	29.76	25.97	22.90	20.30	18.08	354.16
1971	16.26	22.38	91.49	81.47	62.11	49.04	39.96	33.43	28.56	24.80	21.75	19.23	490.48
1972	17.36	24.43	73.07	74.57	62.62	71.15	60.61	52.01	45.18	39.59	34.99	31.58	587.16
1973	56.19	95.78	136.12	133.18	117.58	96.86	80.67	68.70	59.46	52.07	45.98	40.85	983.44
1974	36.43	49.21	48.61	43.31	37.52	32.87	29.01	25.77	22.94	20.52	18.35	16.45	380.97
1975	55.39	138.55	190.19	181.75	136.89	103.99	81.80	66.53	55.60	47.46	41.16	36.10	1135.42
1976	73.23	131.54	175.60	188.39	165.28	137.22	110.27	90.88	76.75	66.02	57.59	50.70	1323.47
1977	49.07	68.51	100.57	101.53	83.08	69.41	59.17	51.26	44.92	39.67	35.23	31.42	733.84
1978	29.52	35.68	44.43	40.95	36.13	31.26	27.32	24.11	21.38	19.04	17.00	15.21	342.05
1979	13.82	17.90	21.24	20.37	17.11	14.44	12.37	10.77	9.46	8.36	7.44	6.62	159.90
1980	5.97	5.99	12.96	28.56	27.91	22.60	18.78	15.99	13.82	12.11	10.68	9.48	184.85
1981	8.54	30.92	38.57	40.98	35.01	29.19	24.88	21.53	18.87	16.69	14.83	13.20	283.21
1982	11.97	10.89	10.90	9.49	8.30	7.26	6.40	5.68	5.05	5.06	7.98	47.68	136.66
1983	119.14	177.33	228.04	283.10	322.53	320.84	322.56	271.08	225.66	174.04	138.72	114.13	2697.16
1984	97.63	145.75	203.29	174.99	137.08	110.37	91.52	77.65	67.03	58.56	51.63	46.12	1261.63
1985	41.76	41.34	50.59	56.51	49.20	42.28	36.67	32.14	28.41	25.23	22.47	20.11	446.71
1986	74.49	78.31	66.37	62.80	51.43	42.92	36.61	31.71	27.81	24.56	21.82	19.45	538.29
1987	22.15	100.28	131.51	167.13	151.14	114.90	89.86	72.88	60.68	51.64	44.66	39.10	1045.94
1988	35.46	53.14	51.16	59.82	55.28	47.23	40.98	35.94	31.78	28.23	25.17	22.53	486.72
1989	73.68	136.78	163.44	158.11	122.24	94.89	76.09	62.89	53.24	45.88	40.05	35.30	1082.60
1990	31.39	28.59	31.50	35.95	30.16	25.74	22.28	19.53	17.24	15.29	13.63	12.19	283.49
1991	11.65	13.93	28.12	25.56	21.11	17.31	14.52	12.43	10.78	9.45	8.37	7.45	180.69
1992	23.19	61.79	159.36	219.05	243.47	196.89	145.65	111.45	88.52	72.58	61.07	52.39	1435.41
MAX	119.14	177.33	228.04	283.10	322.53	320.84	322.56	271.08	225.66	174.04	138.72	114.13	2697.16
MOD	29.28	63.40	86.22	91.33	82.67	70.09	59.52	50.01	42.62	36.31	31.53	29.03	681.01
MIN	5.97	5.99	10.90	9.49	8.30	7.26	6.40	5.68	5.05	5.06	7.44	6.62	156.66

Table 3.2.34 Estimated Long-term Runoff in MCM for Portoviejo River  
(Confluent with Chico River)

(Unit: MCM)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1964	20.38	13.51	82.79	80.71	28.39	23.02	20.41	18.08	16.04	14.22	12.62	11.20	341.37
1965	10.02	10.67	90.15	69.70	56.59	27.84	22.36	19.77	17.52	15.53	13.79	12.27	366.22
1966	60.32	53.22	55.74	37.12	30.53	25.38	22.47	19.93	17.68	15.67	13.89	12.32	364.26
1967	125.51	181.78	95.57	37.22	29.94	25.63	22.74	20.17	17.88	15.86	14.05	12.45	598.81
1968	11.38	46.30	12.86	10.50	8.81	7.80	6.91	6.13	5.47	4.82	4.28	3.80	129.07
1969	5.14	3.58	34.47	35.77	55.55	24.78	18.72	16.55	14.67	13.02	11.53	10.23	244.02
1970	10.02	11.78	27.48	59.59	29.92	19.60	15.88	14.06	12.47	11.06	9.82	8.70	230.38
1971	7.93	21.51	132.21	44.53	20.65	18.07	15.88	14.09	12.49	11.06	9.82	8.70	316.94
1972	8.25	23.63	96.56	49.22	27.91	55.96	28.61	24.24	21.23	18.70	16.59	15.48	386.36
1973	57.77	98.68	131.32	88.15	62.27	41.71	34.55	30.61	27.14	24.08	21.33	18.94	636.56
1974	16.79	42.60	29.38	20.97	16.45	14.57	12.88	11.41	10.13	8.97	7.96	7.10	199.22
1975	75.53	174.28	183.47	117.47	44.78	33.62	29.22	25.90	22.99	20.38	18.07	16.04	761.76
1976	85.01	146.23	157.86	135.33	82.76	61.59	42.56	36.85	32.69	28.98	25.69	22.82	858.37
1977	27.08	62.29	95.40	64.54	32.73	28.30	24.96	22.12	19.62	17.41	15.42	13.69	423.58
1978	14.84	27.46	38.25	21.93	17.36	13.79	12.16	10.79	9.56	8.49	7.52	6.67	188.81
1979	6.24	14.73	16.74	12.44	7.23	5.94	5.22	4.63	4.12	3.64	3.24	2.87	87.05
1980	2.65	3.28	15.19	34.01	18.51	9.12	8.04	7.12	6.32	5.60	4.98	4.42	119.24
1981	4.04	40.28	36.51	31.70	17.09	13.09	11.60	10.29	9.12	8.09	7.18	6.35	195.33
1982	5.92	5.32	6.59	4.17	3.64	3.11	2.76	2.44	2.15	2.81	2.57	2.33	120.11
1983	154.78	180.84	208.92	245.38	258.09	215.14	213.12	126.23	98.94	58.31	50.86	45.13	1,855.73
1984	41.92	128.76	184.14	81.03	46.44	39.99	35.46	31.44	27.89	24.72	21.93	19.95	683.68
1985	18.72	23.08	40.85	41.19	21.88	17.83	15.53	13.77	12.21	10.82	9.62	8.54	234.04
1986	102.98	57.00	32.49	37.71	21.53	18.43	16.34	14.49	12.83	11.38	10.11	8.95	344.24
1987	17.57	141.04	116.14	146.40	85.47	37.97	32.01	28.69	25.17	22.31	19.80	17.57	690.13
1988	17.38	52.87	32.11	48.52	31.44	21.72	19.20	17.03	15.11	13.39	11.87	10.55	291.22
1989	93.07	145.25	133.04	98.96	44.09	33.15	28.90	25.61	22.71	20.14	17.86	15.83	678.60
1990	14.25	13.62	21.51	25.27	11.87	10.32	9.13	8.12	7.18	6.37	5.65	5.01	138.29
1991	5.60	9.97	30.43	12.70	8.04	6.25	5.44	4.82	4.28	3.78	3.34	2.97	97.60
1992	29.54	74.29	192.55	191.73	173.02	78.20	41.86	35.97	31.91	28.28	25.09	22.26	924.71
MAX	154.78	181.78	208.92	245.38	258.09	215.14	213.12	126.23	98.94	58.31	50.86	45.13	1,855.73
MEAN	36.23	62.34	80.37	64.96	44.59	32.13	26.72	21.43	18.54	15.45	13.84	14.64	431.23
MIN	2.65	3.28	6.59	4.17	3.64	3.11	2.76	2.44	2.15	2.81	2.57	2.33	87.05

Table 3.2.35 Estimated Long-term Runoff in MCM for Chico River  
(Confluent with Portoviejo River)

(Unit: MCM)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1964	8.01	6.44	36.67	31.08	12.51	10.60	9.40	8.33	7.39	6.54	5.81	5.14	147.90
1965	4.63	4.96	36.21	28.67	26.78	12.60	10.29	9.13	8.09	7.18	6.35	5.68	160.57
1966	34.26	28.06	27.21	18.53	15.86	12.75	11.30	10.02	8.89	7.87	6.97	6.19	187.92
1967	60.96	83.44	42.24	17.42	14.49	12.39	11.01	9.75	8.66	7.66	6.79	6.03	280.83
1968	5.49	29.47	7.26	5.73	4.85	4.30	3.80	3.37	3.03	2.65	2.36	2.09	74.40
1969	2.89	1.81	17.30	9.54	18.37	7.72	6.35	5.62	5.00	4.42	3.91	3.48	86.44
1970	3.40	3.94	9.91	23.30	11.70	7.80	6.19	5.49	4.87	4.31	3.84	3.40	88.16
1971	3.08	7.67	59.65	19.49	9.16	8.04	7.07	6.27	5.57	4.93	4.38	3.88	139.19
1972	3.54	8.69	46.20	24.44	13.47	24.13	12.08	10.55	9.33	8.20	7.28	6.91	174.83
1973	31.26	52.06	60.64	35.20	25.93	17.65	15.27	13.53	12.00	10.63	9.43	8.36	291.95
1974	7.42	20.44	13.18	9.31	7.39	6.58	5.81	5.17	4.56	4.04	3.60	3.21	90.73
1975	34.90	83.87	80.24	47.33	19.63	15.45	13.55	12.03	10.65	9.45	8.37	7.45	342.93
1976	38.89	66.90	77.59	66.38	41.22	26.21	19.58	17.17	15.24	13.50	11.98	10.63	405.29
1977	12.86	28.81	46.15	31.70	15.72	13.56	12.03	10.66	9.46	8.38	7.44	6.59	203.35
1978	6.75	12.63	14.65	9.15	6.99	5.78	5.12	4.55	4.02	3.56	3.16	2.81	79.17
1979	2.62	6.53	7.07	4.25	2.62	2.26	1.98	1.77	1.56	1.39	1.22	1.10	34.37
1980	0.99	1.45	7.10	16.74	7.10	3.91	3.46	3.08	2.72	2.41	2.15	1.90	53.02
1981	1.77	22.74	12.21	11.15	6.94	5.21	4.61	4.10	3.63	3.21	2.85	2.54	80.96
1982	2.38	2.15	2.71	1.63	1.42	1.24	1.10	0.96	0.86	1.26	3.84	32.57	52.12
1983	68.83	80.61	91.57	115.45	115.28	96.47	103.49	60.88	49.71	28.82	25.06	22.26	838.45
1984	21.27	78.63	95.43	41.68	23.46	20.11	17.84	15.80	14.02	12.43	11.02	9.99	361.68
1985	9.19	10.74	17.11	17.81	10.18	8.09	7.04	6.24	5.52	4.90	4.35	3.86	105.03
1986	49.01	23.27	11.76	15.32	8.44	7.36	6.54	5.79	5.13	4.55	4.04	3.59	144.80
1987	5.49	72.70	58.44	70.14	36.85	17.13	14.62	13.02	11.48	10.20	9.05	8.01	327.14
1988	7.61	22.00	11.28	19.47	12.08	8.48	7.50	6.64	5.88	5.22	4.64	4.12	114.92
1989	53.65	81.45	65.86	46.47	18.86	14.85	13.15	11.65	10.34	9.16	8.14	7.20	340.80
1990	6.43	6.14	10.04	13.19	5.62	4.92	4.37	3.86	3.42	3.05	2.70	2.38	66.14
1991	2.87	5.15	16.82	6.84	4.29	3.34	2.92	2.60	2.31	2.04	1.81	1.61	52.59
1992	15.91	43.75	109.12	112.70	103.60	44.35	21.37	18.24	16.17	14.36	12.73	11.28	523.57
MAX	68.83	83.87	109.12	115.45	115.28	96.47	103.49	60.88	49.71	28.82	25.06	22.26	838.45
MEAN	17.46	30.91	37.64	30.00	20.72	14.60	12.57	9.87	8.69	7.12	6.39	6.70	202.39
MIN	0.99	1.45	2.71	1.63	1.42	1.24	1.10	0.96	0.86	1.26	3.84	1.10	34.37

Table 3.2.36 Estimated Long-term Runoff in MCM at Estuary of Portoviejo River

(Unit: MCM)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1964	12.48	16.49	63.40	83.02	67.39	55.65	47.06	40.52	35.38	31.15	27.63	24.61	504.79
1965	22.04	20.83	64.95	79.86	82.55	67.42	55.26	46.47	39.84	34.66	30.48	27.00	571.35
1966	55.63	68.41	76.28	69.72	62.46	54.90	48.59	43.20	38.57	34.52	30.92	27.72	610.94
1967	92.97	166.59	157.38	118.38	91.33	72.58	59.51	50.06	42.95	37.36	32.84	29.06	951.01
1968	26.03	47.81	38.30	31.05	25.61	21.62	18.59	16.18	14.26	12.62	11.22	9.99	273.27
1969	10.34	8.98	27.08	34.97	51.43	44.87	38.09	32.89	28.75	25.36	22.50	20.06	345.30
1970	18.45	18.34	26.89	50.41	48.24	40.88	34.58	29.78	26.00	22.90	20.30	18.08	354.85
1971	16.26	22.47	96.26	81.83	62.35	49.25	40.15	33.61	28.72	24.94	21.88	19.34	497.06
1972	17.44	25.23	76.90	77.73	63.83	72.39	61.55	52.84	45.90	40.23	35.56	32.09	601.70
1973	57.21	97.78	137.16	133.88	118.14	97.33	81.10	69.08	59.80	52.36	46.24	41.09	991.17
1974	36.64	49.47	48.99	43.49	37.63	33.00	29.11	25.85	23.04	20.57	18.40	16.50	382.70
1975	56.73	150.16	198.66	185.98	140.11	106.84	84.32	68.78	57.59	49.23	42.74	37.50	1,178.63
1976	75.34	138.96	185.02	193.93	169.06	140.43	113.11	93.40	79.00	68.03	59.36	52.28	1,367.94
1977	50.54	70.37	105.53	104.22	84.56	70.71	60.34	52.28	45.83	40.47	35.95	32.06	752.87
1978	30.11	36.36	45.02	41.34	36.48	31.57	27.61	24.35	21.59	19.23	17.18	15.37	346.22
1979	13.95	18.53	21.37	20.48	17.20	14.49	12.43	10.82	9.51	8.41	7.46	6.67	161.33
1980	6.00	6.11	13.12	28.62	27.94	22.60	18.80	15.99	13.84	12.11	10.68	9.48	185.29
1981	8.57	31.91	38.65	40.98	35.03	29.19	24.88	21.56	18.87	16.69	14.83	13.23	294.39
1982	12.00	10.89	10.90	9.49	8.30	7.26	6.40	5.68	5.05	5.06	7.98	47.73	136.74
1983	126.29	187.34	237.60	294.40	348.83	342.64	346.16	281.18	234.08	181.27	145.13	119.80	2,844.72
1984	102.66	155.95	212.85	180.69	142.04	114.77	95.43	81.10	70.09	61.31	54.07	48.64	1,319.60
1985	43.77	43.18	52.09	57.83	50.41	43.34	37.60	32.97	29.13	25.87	23.07	20.62	459.89
1986	76.01	78.72	66.72	63.32	51.72	43.18	36.83	31.93	27.97	24.72	21.95	19.58	542.66
1987	22.26	103.49	135.07	168.77	152.35	115.89	90.74	73.68	61.38	52.26	45.23	39.61	1,060.73
1988	35.89	53.57	51.51	60.13	55.55	47.46	41.17	36.13	31.93	28.36	25.30	22.63	489.64
1989	73.95	142.71	168.55	160.37	124.06	96.47	77.51	64.15	54.35	46.87	40.93	36.08	1,086.01
1990	32.09	29.22	32.06	36.44	30.59	26.10	22.63	19.82	17.50	15.53	13.84	12.37	288.20
1991	11.81	14.10	28.26	25.66	21.21	17.42	14.60	12.48	10.83	9.51	8.42	7.47	181.78
1992	23.25	62.59	170.61	233.02	250.46	200.72	149.03	114.42	91.16	74.91	63.14	54.24	1,487.56
MAX	126.29	187.34	237.60	294.40	348.83	342.64	346.16	281.18	234.08	181.27	145.13	119.80	2,844.72
MEAN	40.23	64.71	89.21	93.45	84.72	71.76	61.14	51.88	43.55	37.12	32.25	29.69	698.91
MIN	6.00	6.11	10.90	9.49	8.30	7.26	6.40	5.68	5.05	5.06	7.46	6.67	136.74



Table 3.2.37 Estimated Long-term Runoff in MCM for Carrizal River  
(Confluent with Chone River)

(Unit: MCM)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1964	85.55	110.50	271.43	272.26	103.28	47.64	23.19	10.18	4.35	1.87	0.80	0.35	931.41
1965	3.62	30.26	249.41	259.43	227.80	100.03	49.31	24.64	10.68	4.61	1.97	1.82	963.58
1966	133.46	192.21	224.07	161.04	112.84	58.89	33.16	15.75	8.01	3.19	1.35	0.96	944.93
1967	222.23	307.70	214.67	104.20	68.75	35.02	15.96	6.86	3.03	1.26	0.54	0.24	980.47
1968	3.27	119.84	60.83	59.49	28.71	13.58	5.87	2.52	1.53	0.48	0.21	0.08	296.40
1969	7.87	6.29	140.54	130.87	177.74	95.44	49.18	24.88	10.76	4.61	2.07	0.86	651.10
1970	7.47	17.18	66.40	190.10	163.54	71.15	42.27	21.11	9.10	3.91	1.68	0.91	594.81
1971	3.62	70.81	337.53	174.47	69.24	36.42	17.30	7.45	3.40	1.39	0.60	0.29	722.51
1972	2.97	130.22	235.99	190.85	104.06	200.98	126.05	75.56	38.98	17.44	7.49	13.69	1,144.27
1973	181.73	124.49	245.45	192.07	175.73	79.94	42.85	20.97	9.10	3.88	1.68	0.78	1,078.67
1974	0.83	68.51	63.93	61.59	36.61	18.77	8.30	3.56	1.53	0.64	0.31	1.07	265.66
1975	124.25	337.31	407.84	259.69	106.87	52.07	27.59	12.56	5.62	2.76	1.01	4.02	1,341.60
1976	211.83	204.73	279.76	218.12	139.95	81.08	42.96	20.76	9.02	3.86	1.66	0.83	1,214.55
1977	75.83	201.86	309.54	178.30	69.75	34.08	15.48	6.62	2.90	1.21	0.52	0.27	896.35
1978	13.58	87.74	165.55	91.42	92.54	41.71	20.28	8.76	3.76	1.61	0.67	0.29	527.91
1979	14.84	59.37	73.01	93.88	89.35	47.67	24.69	10.82	4.64	1.98	0.86	0.37	421.49
1980	2.22	42.85	108.61	164.80	74.54	36.11	16.82	7.20	3.08	1.34	0.57	0.43	458.57
1981	2.84	144.74	186.82	198.96	67.01	32.22	15.03	6.29	2.72	1.15	0.49	0.35	658.63
1982	2.54	18.58	43.95	64.10	33.02	17.52	7.82	3.35	1.45	7.02	61.30	209.69	470.35
1983	364.24	386.06	472.18	435.02	420.21	357.88	386.47	259.16	176.57	71.35	38.83	27.83	3,395.78
1984	13.26	197.67	278.34	241.55	107.62	49.22	25.28	11.01	4.72	2.04	0.86	2.28	933.83
1985	8.20	49.71	111.05	105.62	46.60	24.13	10.77	4.61	1.97	0.83	0.36	1.34	365.19
1986	89.40	123.04	149.08	203.03	79.49	40.80	19.58	8.49	3.63	1.85	0.67	0.72	719.79
1987	46.74	335.23	414.67	418.58	244.47	106.38	51.83	31.02	15.03	6.54	2.80	2.22	1,695.49
1988	32.46	207.36	132.80	126.70	115.87	57.59	32.33	15.16	6.51	2.87	1.22	0.80	731.66
1989	106.09	239.62	198.01	238.31	108.66	58.50	32.17	14.87	6.56	2.79	1.17	0.88	1,007.63
1990	2.76	21.10	40.42	49.69	25.15	11.90	5.12	2.20	0.93	0.40	0.16	0.08	159.89
1991	3.56	54.67	126.07	92.15	42.75	25.95	11.68	5.01	2.15	0.91	0.39	0.21	365.50
1992	4.98	33.95	169.46	211.74	127.76	62.44	34.47	16.07	6.97	3.00	1.27	0.75	672.87
MAX	364.24	386.06	472.18	435.02	420.21	357.88	386.47	259.16	176.57	71.35	61.30	209.69	3,395.78
MEAN	61.11	135.30	199.22	178.90	113.10	65.35	41.17	22.67	12.57	5.41	4.68	9.46	848.65
MIN	0.83	6.29	40.42	49.69	25.15	11.90	5.12	2.20	0.93	0.40	0.16	0.08	159.89

Table 3.2.38 Estimated Long-term Runoff in MCM for Chone River  
(Confluent with Carrizal River)

(Unit: MCM)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1964	134.56	98.12	150.79	173.48	39.45	13.63	10.15	8.25	6.74	5.52	4.51	3.70	648.91
1965	4.42	15.39	99.40	137.95	53.09	15.22	5.52	2.84	2.18	1.79	1.45	1.21	340.43
1966	34.87	124.81	141.55	67.13	21.43	7.34	4.53	3.78	3.11	2.52	2.02	1.69	414.77
1967	72.29	169.42	67.07	16.74	9.03	4.25	3.46	2.81	2.33	1.87	1.53	1.26	352.06
1968	2.22	12.60	9.45	6.87	0.64	0.49	0.37	0.29	0.23	0.21	0.16	0.13	33.69
1969	1.77	1.06	36.37	41.60	25.10	27.40	11.22	2.89	2.33	1.90	1.56	1.29	154.49
1970	5.68	7.64	47.17	132.48	45.45	7.41	2.52	1.93	1.58	1.29	1.06	0.88	255.09
1971	1.10	29.80	221.18	67.91	7.26	2.64	1.90	1.55	1.27	1.04	0.86	0.70	337.22
1972	0.67	55.92	105.34	53.85	11.12	88.05	24.56	16.79	4.10	3.24	2.64	9.72	375.81
1973	81.13	51.82	124.49	86.13	52.66	9.12	4.87	3.46	2.83	2.30	1.87	1.55	422.23
1974	1.98	121.78	29.44	41.60	5.22	2.20	1.63	1.34	1.09	0.88	0.73	0.96	208.86
1975	101.97	194.60	255.01	149.97	25.39	8.66	4.37	3.29	2.70	2.20	1.79	1.66	751.60
1976	108.77	129.31	139.46	117.42	67.87	67.29	9.19	4.37	3.55	2.89	2.38	2.04	654.54
1977	73.76	190.03	177.63	87.32	7.93	3.99	2.52	2.06	1.68	1.37	1.11	0.94	550.35
1978	17.09	79.74	80.73	17.50	7.20	2.15	1.74	1.42	1.17	0.96	0.78	0.64	211.12
1979	5.12	54.48	27.43	10.68	1.77	2.13	0.91	0.75	0.62	0.51	0.41	0.35	105.15
1980	3.35	40.09	111.82	78.28	21.80	2.67	1.74	1.42	1.17	0.96	0.78	0.64	264.72
1981	5.89	68.03	83.06	78.46	5.95	2.02	1.66	1.34	1.11	0.88	0.73	0.62	249.75
1982	4.07	3.12	15.83	6.40	1.61	0.29	0.21	0.16	0.13	10.07	40.75	121.09	203.73
1983	226.32	282.49	302.53	212.39	327.03	245.00	190.30	88.63	43.86	7.61	4.98	4.69	1,935.81
1984	3.62	77.45	164.00	118.12	20.70	5.68	3.29	2.65	2.18	1.77	1.45	2.89	403.80
1985	11.01	53.08	49.68	26.15	5.22	2.00	1.55	1.26	1.04	0.86	0.70	0.96	153.51
1986	68.22	35.88	45.96	73.72	9.70	2.72	2.17	1.79	1.45	1.21	0.98	1.18	244.98
1987	26.33	231.57	215.40	239.35	104.97	15.32	4.26	4.31	2.54	2.04	1.66	1.55	849.28
1988	12.64	64.59	18.78	18.09	7.63	2.20	1.39	1.12	0.91	0.75	0.60	0.51	129.22
1989	32.33	142.88	80.86	84.81	20.84	5.37	3.08	2.46	2.02	1.66	1.35	1.12	378.78
1990	3.46	19.79	43.58	59.46	5.04	1.61	1.23	1.02	0.83	0.67	0.54	0.46	137.67
1991	1.61	35.39	27.45	7.98	1.18	0.83	0.64	0.54	0.44	0.35	0.29	0.24	76.94
1992	13.34	41.42	84.53	102.72	67.23	9.72	3.83	2.84	2.31	1.90	1.56	1.26	332.63
MAX	226.32	282.49	302.53	239.35	327.03	245.00	190.30	88.63	43.86	10.07	40.75	121.09	1,935.81
MEAN	34.54	83.87	101.93	79.81	33.78	19.22	10.51	5.77	3.36	2.11	2.80	5.72	385.42
MIN	0.67	1.06	9.45	6.40	0.64	0.29	0.21	0.16	0.13	0.21	0.16	0.13	33.69

Table 3.2.39 Estimated Long-term Runoff in MCM at Estuary of Chone River

(Unit: MCM)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1964	184.17	227.93	372.14	432.06	264.92	151.37	89.03	54.18	34.89	24.05	17.68	13.69	1,866.11
1965	14.33	40.30	254.18	367.36	315.25	197.72	116.62	67.84	38.93	22.87	14.10	9.91	1,459.42
1966	109.33	247.27	360.06	285.92	197.29	123.66	77.81	48.00	30.27	19.28	12.91	9.43	1,521.23
1967	189.87	404.03	327.33	206.56	137.48	82.68	49.50	29.70	18.61	12.29	8.66	6.48	1,473.20
1968	8.17	109.52	84.53	77.19	49.23	30.40	17.73	10.34	6.51	4.07	2.72	1.96	402.37
1969	7.23	7.84	119.32	159.36	189.07	151.66	100.07	60.24	35.12	20.68	12.75	8.33	871.66
1970	14.95	23.22	90.64	281.96	235.08	139.48	86.38	52.07	30.46	18.00	11.12	7.45	990.79
1971	7.45	74.20	403.55	298.37	166.86	94.04	52.44	29.27	16.95	10.31	6.71	4.74	1,164.90
1972	5.38	126.26	281.12	265.94	174.04	258.50	195.20	138.50	86.85	51.88	30.95	30.08	1,644.40
1973	190.65	204.20	328.18	308.50	268.91	164.41	100.60	60.56	36.24	22.31	14.52	10.12	1,709.21
1974	8.52	143.00	113.40	111.84	71.43	44.14	26.28	15.72	9.80	6.45	4.59	4.23	559.41
1975	173.27	458.83	636.31	508.91	276.12	151.24	84.91	48.00	28.10	17.52	11.51	10.37	2,405.06
1976	220.19	300.15	383.20	365.50	277.48	204.77	118.71	67.98	39.42	23.84	15.34	10.77	2,027.34
1977	100.81	309.00	442.15	343.57	182.43	103.73	55.44	30.91	18.20	11.46	7.70	5.62	1,611.03
1978	26.70	125.85	205.46	147.02	121.97	78.95	48.40	28.55	16.98	10.55	6.92	4.87	822.23
1979	15.99	97.54	97.31	103.21	98.48	72.65	47.65	28.82	17.06	10.29	6.51	4.39	599.90
1980	6.35	57.58	174.74	214.18	146.32	84.11	47.65	26.73	15.34	9.27	6.01	4.29	792.56
1981	9.64	145.85	239.77	268.01	149.43	83.59	46.50	25.79	15.03	9.00	5.88	4.23	1,002.74
1982	7.18	16.79	51.85	62.75	46.87	31.08	18.75	10.85	6.32	13.74	69.83	229.99	566.01
1983	474.10	617.48	782.74	765.29	830.20	712.62	668.48	478.28	332.14	185.85	108.09	69.42	6,024.68
1984	46.44	219.24	377.57	375.87	230.37	130.69	74.94	43.04	25.51	15.99	10.70	9.88	1,560.25
1985	21.61	90.02	158.05	150.78	91.92	55.34	32.52	19.15	11.72	7.58	5.24	4.85	648.77
1986	97.90	136.56	174.69	238.85	152.56	91.01	53.06	30.51	17.91	11.22	7.36	5.65	1,017.28
1987	57.00	408.46	589.97	653.21	496.34	271.30	146.86	84.88	49.17	28.74	17.47	12.24	2,805.64
1988	36.48	187.52	179.64	163.66	142.17	96.91	63.21	38.78	23.15	14.06	8.92	6.19	960.69
1989	88.28	272.96	289.70	315.08	206.64	125.53	75.96	44.92	26.65	16.31	10.55	7.55	1,480.12
1990	9.24	33.17	70.50	95.90	57.80	33.20	18.88	11.01	6.77	4.45	3.14	2.38	346.43
1991	5.44	60.96	123.85	111.40	72.13	47.04	28.20	16.34	9.54	5.76	3.73	2.60	487.00
1992	16.18	71.36	207.52	281.23	230.15	138.80	82.52	48.16	28.18	17.03	10.91	7.66	1,119.71
MAX	474.10	617.48	782.74	765.29	830.20	712.62	668.48	478.28	332.14	185.85	108.09	229.99	6,024.68
MEAN	74.24	179.90	273.89	274.46	202.38	136.23	90.49	56.87	35.57	21.55	15.60	17.56	1,377.94
MIN	5.38	7.84	51.85	62.75	46.87	30.40	17.73	10.34	6.32	4.07	2.72	1.96	346.43

**Table 3.4.1 Conversion from GPS to Ecuadorian Geographical System**

Number	Latitude	Longitude	North	East	Zone	EL
CP23	0 48 0.4370 S 79 57	31.9810 W	9911546.828	615849.941	17	154.849
CP24	0 48 15.0100 S 79 56	3.1640 W	9911098.607	618595.442	17	472.943
CP25	0 50 38.2960 S 79 55	32.0370 W	9906698.240	619556.494	17	124.092
CP26	0 50 51.5550 S 79 55	38.7010 W	9906291.131	619350.377	17	134.829
CP27	0 50 24.2590 S 79 53	8.4400 W	9907128.053	623995.671	17	298.496
CP28	0 49 16.2050 S 79 52	7.8970 W	9909217.400	625867.871	17	141.503
CP29	0 49 24.8730 S 79 51	49.6230 W	9908951.052	626432.715	17	195.281
CP30	0 55 25.7870 S 79 44	59.3780 W	9897863.387	639111.549	17	84.034
CP31	0 55 48.5760 S 79 47	25.2410 W	9897165.095	634602.086	17	66.881
CP32	0 56 31.4870 S 79 51	21.2980 W	9895849.759	627304.321	17	129.824
CP33	0 57 48.1540 S 79 54	35.2990 W	9893497.330	621306.483	17	279.552
CP34	0 58 38.6400 S 79 57	13.5190 W	9891948.521	616415.107	17	137.726
CP35	0 58 24.4910 S 79 59	48.4850 W	9892384.469	611625.015	17	42.740
CP36	0 58 26.1930 S 80 1	23.2860 W	9892333.065	608694.593	17	205.467
CP37	0 58 16.5910 S 80 1	57.6210 W	9892628.226	607633.350	17	106.788
CP38	0 59 44.5790 S 80 3	12.3670 W	9889926.995	605322.121	17	158.262
CP39	1 0 32.7380 S 80 3	54.6050 W	9888448.533	604016.102	17	291.362
CP40	1 3 12.2080 S 80 6	21.9600 W	9883552.970	599459.965	17	437.711
CP41	1 3 52.2540 S 80 6	22.6810 W	9882323.285	599437.324	17	433.499
CP42	1 5 33.9660 S 80 7	20.7500 W	9879200.544	597641.549	17	148.732
CP43	1 6 17.6310 S 80 11	2.7970 W	9877861.685	590777.990	17	108.143
CP44	1 6 42.7760 S 80 12	9.9210 W	9877090.140	588703.093	17	112.052
CP45	1 3 59.2360 S 80 11	50.6330 W	9882111.681	589300.587	17	124.726
CP46	1 3 38.5960 S 80 12	15.7670 W	9882745.659	588523.893	17	93.748

**Table 3.42 Accuracy of Control Points**

Accuracies (m):		D. LAT	D. LON.
CP39	CP14	0.026	0.035
CP39	CP38	0.023	0.033
CP38	CP14	0.028	0.037
CP38	CP36	0.026	0.035
CP38	CP37	0.026	0.035
CP36	CP37	0.020	0.031
CP40	CP14	0.030	0.037
CP40	CP41	0.021	0.032
CP41	CP14	0.030	0.038
CP42	CP41	0.031	0.039
CP42	CP43	0.044	0.049
CP41	CP43	0.046	0.053
CP43	CP44	0.021	0.031
CP46	CP45	0.022	0.036
CP45	CP44	0.041	0.049
MINA	CP46	0.092	0.096
CP24	CP23	0.029	0.040
CP24	CP25	0.038	0.047
ALAJ	CP30	0.023	0.036
CP34	CP35	0.034	0.041
CP32	CP33	0.044	0.050
CP32	CP31	0.055	0.061
CP30	CP29	0.108	0.112
CP35	CP36	0.027	0.036
CP34	CP33	0.038	0.045
CP32	CP34	0.050	0.057
CP34	CP36	0.037	0.045
TABL	CP23	0.100	0.103
CP23	TANQ	0.107	0.111
CP27	CP25	0.029	0.037
CP27	CP26	0.029	0.037
CP26	CP25	0.020	0.031
CP29	CP27	0.023	0.032
CP29	CP28	0.019	0.030
CP27	CP28	0.023	0.032
ALAJ	CP31	0.038	0.047

Table 3.4.3 Accuracy of Leveling

From	Up to	DIST. ACCUR.		TOLERANCE
		(Km)	(m)	II ORDER (m)
VIII-B-BA (Q-M-1, BM-1, QM-2, B-2B-3, QM-3,4,5,6,7,8,9)	CP.26	23.61	+0.0356	0.0486
Q-M-9	CP.25	0.14	-0.0007	0.0037
Q-M-9 (Q-M-10, Q-MP-11, 12)	CP.27	5.73	-0.0054	0.0239
Q-M-P-12 (Q-MP-13, 14, 15, BM-M1)	CP.29	8.05	+0.0011	0.0284
CP-29 (BM-M2)	CP.28	1.08	-0.0041	0.0104
QMP-11 (M-B-C-1, 2, 3)	CP.24	7.81	+0.0063	0.0279
CP-24 (M-B-C-4, 5)	CP.23	4.04	-0.0023	0.0201
CP-23 (BMC-6)	BMC-4	3.08	+0.0023	0.0175
CP-04 (BM-10J, 11J, 12J, 13J)	CP.35	9.11	+0.0019	0.0302
BM-11J (BM-14J, 15J)	CP.37	2.40	+0.0028	0.0155
BM-12J	CP.36	2.18	+0.0079	0.0148
BM-15J (BM-16J, 17J, 18J)	CP.38	3.24	+0.0093	0.0180
BM-12J (CP-36)	BM16-J	3.16	+0.0079	0.0178
CP-04 (BM-M3, 4, 5, 6, 7, 8, 9, BM-10MJ, 11MJ, BM-M12)	CP.33	17.68	+0.0084	0.0420
M-Q-97 (D-A-1, 2, 3, 4, 5, 6, 7, 8, BM-1J, 2J)	CP.31	18.21	+0.0136	0.0027
D-A-7 (BM-3J)	CP.30	3.36	+0.0061	0.0183
M-Q-91 (BM-4J, 5J, 6J, 7J, 8J, 9J)	CP.32	13.64	+0.0025	0.0369
M-Q-48	CP.46	0.08	-0.0002	0.0028
M-Q-49	CP.45	0.38	-0.0033	0.0062
M-Q-59-AJ	CP.40	0.07	+0.0008	0.0026
M-Q-59-AJ	CP.41	2.03	+0.0087	0.0142
XIII-B-17	CP.44	0.36	-0.0016	0.0060
CP-44 (BM-V-2)	CP.43	3.46	+0.0047	0.0186
CP-43 (BM-V-5, V-4, V-3)	CP.42	8.98	+0.0150	0.0300
M-Q-64A (BM-V-1)	CP.39	1.69	+0.0090	0.0130
PE-15639Y	CP.34	0.11	-0.0009	0.0033
VIII-B-8A(BM-T1,BM-T2,BM-T3,BM-T4,BM-T5.)	CP.4	10.79	+0.0564	0.0328
CP 38 (BM.1)	MQ64-A	1.5	-0.289	0.012
MQ64A	MQ62AJ	3.0	+0.027	0.017
MQ62AJ	MQ59AJ	3.5	+0.040	0.019
MQ59AJ	PV-7	2.3	+0.022	0.015
PV-7 (BM2.BM3)	MQ-49	11.0	-0.164	0.033
CP-41 (BM4.BM5.BM6.SR93.5)	CP-42	6.0	-0.205	0.024

Note: The ones between parenthesis are intermediate points

TOLERANCE II ORDER  $10\text{mm}\sqrt{S}$