# SUPPLEMENT - 4.1

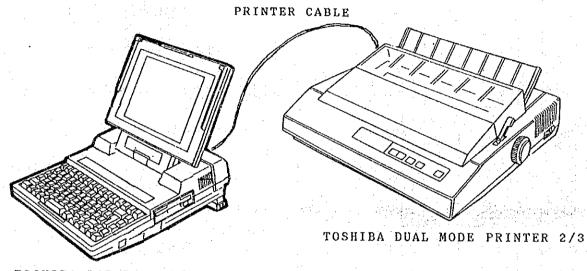
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人名英格兰人姓氏克里特 医电影 医电影 医二氯甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基	A CONTRACTOR OF THE CONTRACTOR

#### <<< BEFORE START >>>

All the hydrologic observation data dealt in this Study will filed and analyzed by using the following instruments.

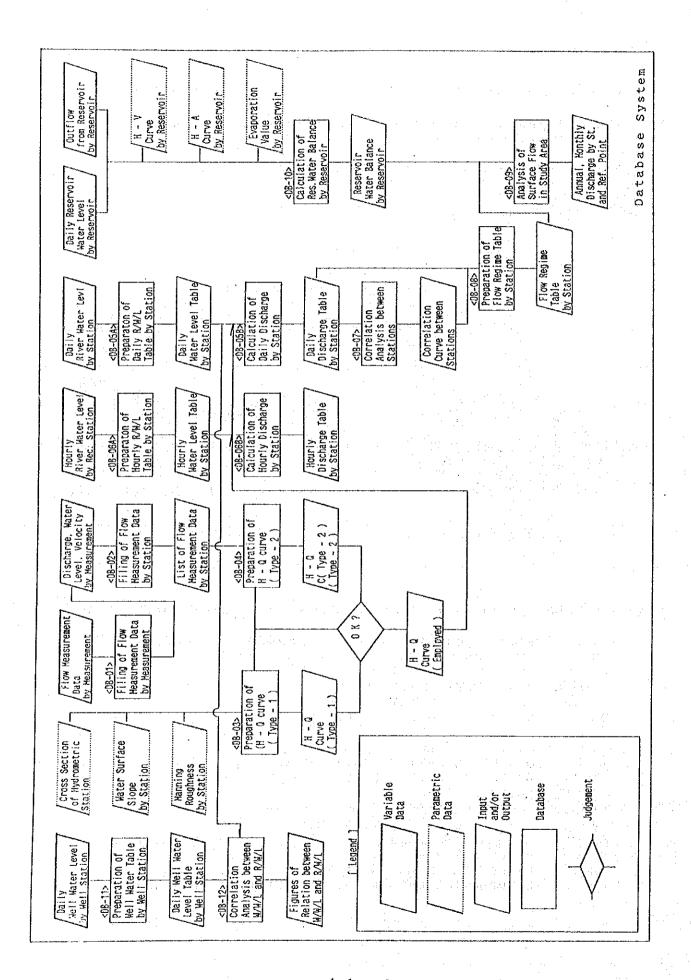
- P/C (TOSHIBA, J-3100 series, IBM compatible)
- Printer (TOSHIBA DUAL MODE PRINTER 2/3)
   MS-DOS (Ver.3.3)
- LOTUS 1-2-3 (Rel.2.0)



TOSHIBA LAP-TOP COMPUTER

This database systems developed in Study are composed of;

- Filing System : consisting of 5 systems 1)
  - DB-01 FLOW MEASUREMENT DATA BY MEASUREMENT
  - DB-02 FLOW MEASUREMENT DATA BY STATION
  - DB-05A DAILY RIVER WATER LEVEL
  - DB-06A HOURLY RIVER WATER LEVEL
  - DB-11 DAILY WELL WATER LEVEL
- Analyzing System : consisting of 9 systems
  - DISCHARGE RATING CURVE METHOD (Type-1) DB-03
  - DB-04 DISCHARGE RATING CURVE METHOD (Type-2)
  - DB-05B DAILY DISCHARGE
  - DB-06B HOURLY DISCHARGE
  - DISCHARGE CORRELATION ANALYSIS DB-07
  - DB-08 FLOW REGIME TABLE
  - RIVER WATER BALANCE DB-09
  - DB-10 RESERVOIR WATER BALANCE
  - DB-12 CORRELATION BETWEEN RIVER AND WELL WATER LEVEL



#### <<< DB-01 >>> FLOW MEASUREMENT DATA BY MEASUREMENT

This filing system is to check a result of flow measurement data by use of computer and draw mean velocity & discharge graph.

To begin this filing, use the following steps to retrieve each station number file.

\*\*\* for example \*\*\*

Diskette No. DB-01 Select /File

Select /Retrieve

Highlight \FM\1-150\1-150.WK1....Zambezi Pump House

Press ENTER to retrieve 1-150.WK1

The following worksheet appears on your screen. This worksheet contains the labels you entered in the previous flow measurement data. You will also notice that the worksheet contains some values. In this system, you will modify to enter new flow measurement data values.

			Start from	LEFT BANK	in the second	
A7:	[W17] 'TOTAL SE/W	IDTH(m)		<del></del>	READY	— Control panel
1	A FLOW MEASUREMENT	B C ST 1-150	D E F ZAMBEZI PUMP HOUSE			
3	ITEMS	№-Г]- №-1	NO-2 NO-3 NO-4	NO-5 NO-6		
9 5 6	WATER DEPTH (m) SE/WIDTH (m)			· ·		
7 8	TOTAL SE/WIDTH(m) VELOCITY.2-1(f/s)	0.00 0.60	1.10 1.00 1.0	0 0.75 0.70		
9 10 11	VELOCITY.2-2(f/s) MEAN VEL.2 (f/s) VELOCITY.8-1(f/s)	0.00 0.55	5 1.13 1.00 1.6	0 0.78 0.70		
12 13	VELOCITY.8-2(f/s) MEAN VEL.8 (f/s)	0.00 0.20	0.80 0.60 0.7 0.80 0.60 0.7	0 0.60 0.50 0 0.60 0.50		
14 15		0.000 0.114	5 0.963 0.800 0.85 6 0.293 0.244 0.25 5 1.888 1.925 1.71	9 0.210 0.183		
16 17 18	L/MEAN WIDTH (m) L/SEC. AREA (m2)	0.00 20.00	10.00 10.00 10.0	0 10.00 10.00	•	
19 20	R/MEAN DEPTH (m) R/MEAN WIDTH (m) Nov-91 10:09 PM	0.000 1.663 0.00 10.00		the state of the s		

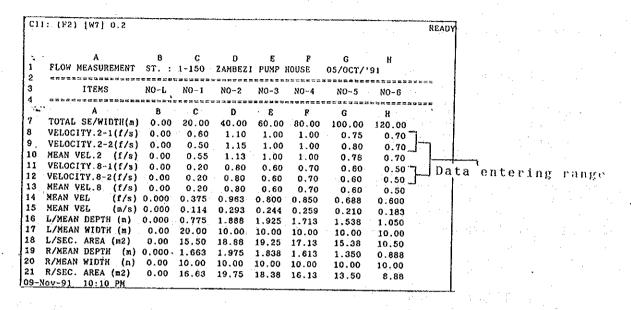
File-and-clock indicator

[ Entering Value ]

To know which section you are entering, select window menu to split the screen horizontally at the row.

Move the cell pointer to A5
Select /Worksheet
Select /Window
Select /Horizontal
Press ENTER

Your worksheet should look like the following screen. Now, you will enter only water depth (m), sectional width (m) and velocity values in the worksheet.



Of course, number of sections by measurement are different, in this case modify the number of section by using COPY, DELETE commands, and enter a formula as follows:

Move	the cell pointer to L19R/mean depth
Туре	+(L5+M5)/2L5 is water depth at last section M5 is water depth at right bank
Press	ENTER to enter the formula in the worksheet
Move	the cell pointer to L20R/mean width
Type	+M6sectional width between last section and right bank edge
Press	ENTER to enter the formula in the worksheet

12	2: [F2] [W14] +K18+K21	l					READY	
		•						
3	TEMS 3	J 8-08	K . NO-9	L NO-10	M NO-R	. 1		
5	WATER DEPTH (m)5	1.50	1.50	0.80	0.00		٠.	
6	SE/WIDTH (m)6	20.00	20.00	20.00		•		
7	TOTAL SE/WIDTH(m)7	160.00	180.00		217.50	f + 1 + 1 + 1		
8	VELOCITY.2-1(f/s)8	0.40	0.10	0.00				
9	VELOCITY.2-2(f/s)9	0.40	0.10					
10	MEAN VEL.2 (f/s)10	0.40	0.10	0.00				
11	VELOCITY.8-1(f/s)11	0.05	0.10	0.10	0.00	. 1.	1.0	
12	VELOCITY.8-2(f/s)12	0.05	0.10	0.05				
13	MEAN VEL.8 (f/s)13	0.05	0.10	0.08	0.00		į,	
14	MEAN VEL (f/s)14	0.225	0.100	0.038	0.000	1.5		
15	MEAN VEL (m/s)15	0.069	0.030	0.011	0.000			
16	L/MEAN DEPTH (m) 16	1.338	1.500	0.975	0.000			
17	L/MEAN WIDTH (m) 17	10.00	10,00	10.00	· .		. 1	
18	L/SEC. AREA (m2) 18	13.38	15.00	9.75	-			
9	R/MEAN DEPTH (m)19	.1.500 ((K5+	L5)/2+K5	(L5+M5)/2	~			
	R/MEAN WIDTH (m)20	10.00 +L6/2		+M6	-			<del></del> ,
	R/SEC. AREA (m2) 21	15.00	13.25	7.00	-		,	hidden formula
	S/AREA (m2)22,	28.38	28.25	16.75	• -			
9-N	ov-91 10:36 PM	···					1	A contract of the contract of

[ Printing the Worksheet ]
Print your worksheet as follows:

Select /Print Select Printer

After selecting /Print Printer, you must specify a print range:

Select Range

Press HOME to move to A1

Press .(period) to anchor the cell pointer

Move the cell pointer to anchor

Press ENTER to accept above printer range

Then do the following:

Select Align

select Go to begin printing

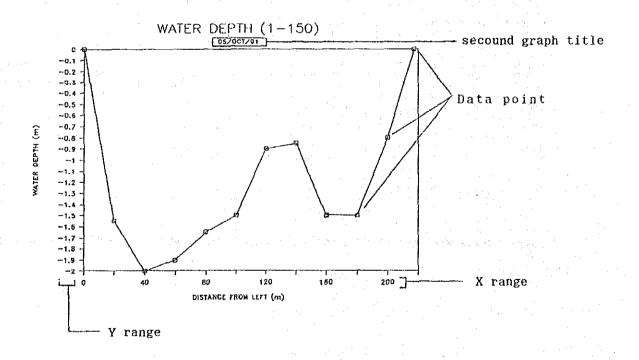
1-2-3 begins printing the range. The printed flow measurement data worksheet should look as follows.

FLOW MEASUREMENT	ST .	1 150	7440671	DUMP II	unce	05 (00%)	01					
FEFFFFFFFFFFFFFFFF			ZANDELI			03700.17	91 					1.0
EKSTI	NO-L	NO-1			NO-4	NO- 5	NO-6	NO7	NO-8	ND-9	N() - 10	NO-R
WATER DEPTH (m)	0.00	1.55	2.00	1 90	1.65	1.50	n on	0.85			****	0.00
SE/WIDTH (m)		20.00	20.00		20.00	20.00	20.00	20.00		20.00		
TOTAL SE/WIDTH(R)		20.00	40.00	60.00	80.00	100.00		140.00			_	
VELOCITY.2-1(f/s)		0.60	1.10	1.00	1.00	0.75	0.70		160.00 0.40	180.00		
VELOCITY. 2-2(f/s)			1.15	1.00	1.00	0.80	0.70	0.60	0.40	0.10 0.10	0.00	0.00
MEAN VEL.2 (f/s)		0.55	1.13	1.00	1.00	0.78	0.70	0.60	0.40			
VELOCITY.8-1(f/s)		0.20	0.80	0.60	0.70		0.50			0.10	0.00	
VELOCITY.8-2(f/s)			0.80	0.60	0.70	0.60	0.50	0.40	0.05	0.10		
MEAN VEL.8 (f/s)			0.80		0.70	0.60		0.40	0.05	0.10		
MEAN VEL (f/s)				0.800	0.850	0.688	0.50	0.40			0.08	
		0.114		0.244	0.259	0.888	0.600	0.500	0.225		0.038	0.000
L/MEAN DEPTH (m)				1.925	1.713	1.538	0.183	0.152	0.069	0.030	0.011	0.000
L/MEAN WIDTH (m)							1.050	0.863	1.338	1.500	0.975	0.000
L/SEC. AREA (m2)	0.00	15 50	10.00		17.13	10.00	10.00	10.00	10.00	10.00	10.00	_
R/MEAN DEPTH (m)						15.38	10.50	8.63	13.38		9.75	
R/HEAN WIDTH (m)				1.838	1,613	1.350	0.888	1.013	1.500	1.325	0.400	
R/SEC. AREA (m2)			19.75		10.00	10.00	10.00	10.00	10.00	10.00	17.50	
S/AREA (m2)		32.13			16.13	13.50		10.13	15.00	13.25	7.00	
TOTAL AREA (m2)						28.88	19.38	18.75	28.38	28.25	16.75	-
		32.1		108.4		170.5	189.9	208.6	237.0	265.3		
S/DISCHARGE(m3/s)	0.00	0.07	11.33	9.17	8.61	6.05	3.54	2.86	1.95	0.86	0.19	
FOTAL DIS. (m3/s)	V.00	3.67	15.00	24.18	32.79	38.84	42.39	45.24	47.19	48.05	48 24	
WATER LEVEL (f) :	1 64		UASCD 1	********* *********		*****	******	******			******	.==2.223
TOTAL DISCHARGE :			WATER I									
OTHE DISCHARGE :	40.05	:	MEAN VE	LUCITY	(m/s) :	0.18						

[ Creating Graph ]
The following illustrations show the relation ship between the data in the flow measurement worksheet and the graph.

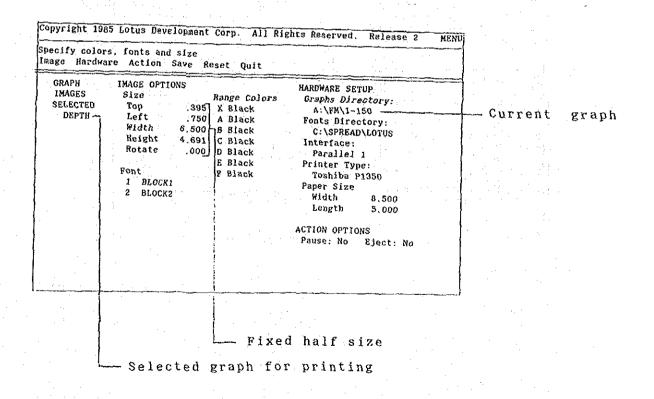
nter graph title, s	econd 1	ine: [05/	OCT/91	]	:	777	. : -	7	secound graph title
FLOW MEASUREMENT	Select Best	- C.	D	PIND 1	sa Par-	0.5 /0CT/!	e se Hassii O i	arada	<b></b>
FLUM MEASUKBMENI	51. :	;====== ;======	raseser:	. FUNE I	iar=uzee		2 = 3 = 4 = = =	25kht	
ITEMS	NO-L	NO-1	NO-2	NO-3	NO-4	NO-5	NO-6		
WATER DEPTH (m	/ 0 00 	. 1.55	2.00	1.90	1.65	1.50	0.90		
SE/WIDTH (E			20.00	20.00	20.00	20.00	20.00	ļ	
TOTAL SE/WIDTH(m	) 0.00	20.00		60.00	80.00	100.00	120.00		X range
COLUMN TO STATE OF THE STATE OF	_								· · · · · · · · · · · ·
高 S/DISCHARGE (m3/s			11.33	9.17	8.61	6.05	3.54		
5 TOTAL DIS. (m3/s	0.00	3.67	15.00	24.18	32.79	38.84	42.39	~~= = =	
WATER LEVEL (f)	. 1.64		WATER	LEVEL	(m) ;	0.50			
TOTAL DISCHARGE					(m/s) :				
037									
				•		100		2000	
251 SMARRANGEMENT FOR	CHADU					1 1			
WATER DEPTH		-1.55	-2.00	~1.90	-1.65	-1.50	-0.90	}	Y range
ESS.	0.00		2.00					4	
9-Nov-91 10:02 PM									* * * * * * * * * * * * * * * * * * * *





[ Printing the Graph ]
After creating both water depth and velocity graph, now you ready
to print them. Be sure that you have saved both graph into a
diskette.

```
Ouit the worksheet
Select
             Printgraph menu
Select
             Setting to define hardware and graph setting
Select
             Hardware to specify hardware setup
Select
             Graph-Directory
             A:\FM\i-150.....where graphs contained
Type
             Enter to select a directory for graphs
Press
Select
             Quit to returned to previous menu
Select
             Image to specify size
Select
             Size to set size of graph
             Half to print on A4 paper
Select
             Ouit to return to previous menu
Select
Select
             Ouit
Select
Select
             Image-Select to select graphs for printing
             Depth.... (next to be velocity)
Highlight
             ENTER to set a graph
Press
Press
             Align to print at the top of page
             Go to begin printing
Press
```



# <<< DB-02 >>> FLOW MEASUREMENT DATA BY STATION

This filing system is to file flow measurement data of each station and output tables by station.

To begin this filing, use the following steps to retrieve each station number file.

\*\*\* for example \*\*\*

Diskette No. DB-02
Select /File
Select /Retrieve

Highlight \1-150.WK1.....Zambezi Pump House

Press ENTER to retrieve 1-150.WK1

The following worksheet appears on your screen. This worksheet contains the labels you entered in the previous flow measurement data by station. In this system, you will enter the result obtained from DB-01 filling system such as date, water depth, discharge, cross sectional area and velocity in both feet and meter.

F12	T OF PLOW M	EASUKEM ======	merannann FUI	ST.:	1-150	ZAMBEZ	I PUMP H	OUSE
			[Peet - Se	cond]		+++++	(Meter -	Second)+
NO	- DATE	H	Q	A T	٧	н	Q	A .
		(f)	(f3/s)	(f2)	(f/s)	(a)	(m3/s)	(m2)
= = =			<b>=====</b>				****	========
_ 1	07-Mar-90	10.10	17,513.96	10,265.87	1.71	3.08	495.94	953.73
2	27-Jun-90	5.71	7,219.38	5,947.21	1.21	1.74	204.43	552.51
3	30-Jul-90	4.04	4,349.71	4,734.97	0.92	1.23	123.17	439.89
4	23-Aug-90	3.22	3,716.87	4,046.08	0.92	0.98	105.25	375.89
5	27-Sep-90	2.00	2,297.57	3,685.79	0.62	0.61	65.06	342.42
6	26-Oct-90	1.80	2,102.64	3,560.46	0.59	0.55		330.78
7	07-Dec-90	3.18	4,546.76	4,470.50		0.97		
8	04-Feb-91	21.46	46,314.13	17,215,30	2.69	6.54		1599.35
9	15-Mar-91	19.29	49,387.91	16,362.43	3.02		1398.51	
10	Contract of		· · · · · · · · · · · · · · · · · · ·					

Data entering range

# <<< DB-05A >>> DAILY RIVER WATER LEVEL

To file the daily river water level observed at the hydrometric stations and output tables showing water level in feet and meter by station.

begin this filing, use the following steps to retrieve station number file.

### \*\*\* for example \*\*\*

Diskette No. DB-05A 1-150 ZAMBEZI PUMP HOUSE

Select /File

Select /Retrieve

Highlight

\11509091.WK1.....Zambezi Pump House 1990/91

Press ENTER to retrieve 11509091.WK1

The following worksheet appears on your screen. In this system, you will enter the monthly gauge readings in feet unit into first table. The metric results are automatically appeared in next table as below.

A1: [W4]	*HF*									
A 1 *HF*} 2 N====	B C ST.: 1-150	D E ZAMBEZI PUMP	у ноиse	G H YEAR :	I 1990/91	J	READY			
3 DAY 4 N=====	OCT NOV	DEC JAN	FEB	MAR APR	MAY	JUN	2≌23			
6 2 7 3 8 4 9 5	2.00 1.79 2.00 1.79 2.06 1.78 2.09 1.78 2.05 1.78		0 21.48	24.70 19.34 24.33 19.25 23.83 19.16	13.57 13.25	7.27 - 7.13 6.98 6.88 6.68				
11 7 12 8 13 9 14 10	2.03 1.77 2.02 1.81 2.01 1.81 2.03 1.81 2.05 1.81 2.06 1.80	3.10 5.4 3.18 5.6 3.23 6.0 3.28 6.8 3.32 7.1 3.41 7.8	6 22.61 7 22.98 3 23.95 4 25.50	22.90 18.91 22.51 18.82 22.10 18.81 21.70 20.13 21.32 20.49	12.45 12.21 11.93 11.70 11.34	6.55 6.44 6.34 6.26 6.18		Data	entering	range
16 12 17 13 18 14 19 15 120 16 1	2.03 1.78 2.01 1.77 1.98 1.74 1.95 1.70 1.93 1.64 05:02 AM	3.56 8.0 3.64 8.1: 3.76 8.3: 3.80 8.60 3.87 9.00	26.78 27.07 27.27 27.48		11.08 10.85 10.53 10.26 10.08 9.85	6.12 5.98 5.90 5.82 5.74 5.67				

[ Printing the Worksheet ]
Print your worksheet as same as previous filing system. The
printed worksheet should look like the followings.

9/1F2 44224	ST.:	1-150	ZAMBEZ	I PUMP	HOUSE	****	YEAR ;	1990/91	*****		(WATER	LEVEL	(f))
DAY	OCT	NOV	ØEC	JAN	FEB	MAR	. APR	YAY:	אטע	1111.	Attic	SED	AMMILIA
1	2.00	1.79	2.49	4.88	20.23	25,20	19.49	13.65	7.27	4.55		2.38	
3	2.00	1.79	2.53	4.91			19.34		7.13	4.48	2,13	2.38	
	2.06	1.78	2.57	4.98	21.08	24.33	19.25	13.25	6.98	4.42	2.10	2.36	
3	2.05	1.78	3.02	5.00	21.48	23.63	19.16	13.05 12.75	5.88	4.35	2.08	2.31	
6	2.03	1.77	3.10	5.46	21.78	23.38	18.94	12.75	6.68	4,29	2.05		
ž	2.02	1.81	3.18		44 61	22 51	20 00	12.45 12.21	6.55	4.24	2.50		
.8	2.01	1.81	3.23	8.07	22.51	22.10	16.82 18.81	11.03	0.44	4.21	2.97		
9	2.03	1.01	3.28	6.83	23.95	21 70	20,13	11.93 11.70	0.34	4.15	2.94	2.25	
10	2.05	1.81			25.50	21.70	20.49			4.09	2.92	2.23	
1,1	2.06	1.80	3,41	7.14	25.55	20.90	20.57		5.12	4,01	2.90	2.22	
12	2.03	1.78	3.56	8.01	25.78	20,41			5.98	4,00	2.85	2.00	
13	2.01	1.77	3.64	8.15	27.07	19.73	20.88			3.93	2.84	2.02	
14.	1.98	1.74	3.76	8.33	. 27.27	19.36	20.73	10.28	5.82	3.92	2.84	2.00	100
15 16	1.95	1.70	3.60	8.60	27.48	19.28	20.40	10.08		3.88	2 70	1.98	
17	1.93	1.64	3.87	9.00	27.58	19.20	19.83	9.85		3.82		1.97	
18	1.87	1.71	3.97 4.09	9.40		19.20	19.00		5.54.	3.16	2.68	1.95	
19	1.83	1.80		9.68	27.63	19.41		9.45	5.46			1.95	
20	1.80	1.83		10.75	27.65 27.93	19.58	17,78	9.25	5.40	3.67	4.03	1.90	
21.	1.80	1.76	4.47	11.45	27.85	19.88	17.35	9.05 8.86	5.39	3.62	2.53	1.90	
22	1.80	1.78	4.57	12.33	27.50	20.07	17.00	8.65	5.32 5.25	3.57	2.52	1.85	
23	1.60	1.83	4.64	13.28	27.23	20.18	15 57	9.49	5 19	J.50	2.50		
24	1.80	2.12	4.70	13.80	25.83		16.30	8,32	5.18 5.07	3.53	2.59	1.84	
25	1.80	2,14	4.70	14.30	26.57	20.34	16.06	8.14	4.99	3.45	2.58	1.85	
26	1.80	2.25	4.70	14.94	26.33	20.28	15.62	8.03	4.93	3 40	2 51	1.80	MAX.
• •	1.80	2.27	4.73	15.80	25.88	20.18	15.14	7.92	4.85	3 36	2.48	1.80	27.93
2.6	1.80 -		4.80	16.37	25.55	20.08	14,81	7.11	4.76	3.33	2.43	1.70	4 3
79 30	1.79	2.43	4.81	17.08		1\$.95	14.43	7.67	4.58	+3.29	2.40	1.17	MIN.
10 11	1.77	2.45	4.83	17.90		19.78	14.12	7 52	4 52	3.25	2.39	1.77	1.64
	1.75		4.85	19.00		19.65		7.38	19 (19)	3.20	2.39		
'AH	1.92	1.89	3.88	10.05	25.35								
١x.	2.09	2.45	4.85	19.00	27.93	25.20	20 80	10.16 13.85		3.83	2.58		3.89
N.	1,77	1.64	2,49	4.88	20.23	19 20			7.27 4.52	4.55	2.97	2.38	27.93
	****	******	I S38MAS	*****		*****	7 2 2 2 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	1990/91			(WATER		m)]
PAY	OÇT	NOV	OEC	NAL NAL	FE8	MAR	APR	MAY			222222	= * = = = = = =	****
PAY Para Para	0ÇT	NOV	DEC ************************************	JAN JAN 4.88	FEB 20.23	MAR 25,20	APR 19,49	MAY	.JUN	JUL JUL Newsca	AUG	SEP	****
) AY 1 2	0CT 0.51 0.61	NOV	DEC ************************************	JAN 970353 4,88 1.50	FEB 20.23 6.28	MAR 25,20 7,53	APR 19,49 5,89	MAY 13.85 4.14	JUN 7.21 2.17	лискана ЈОЕ правити 4.55 1.37	AUG ====================================	SEP SEP ================================	****
3 1 2 2 3	OCT 0.51 0.61 0.63	NOV 1.79 0.55 0.54	0EC 2.49 0.77 0.78	JAN 4.89 1.50 1.51	FEB 20.23 6.28 5.43	MAR 25.20 7.53 7.42	APR 19,49 5,89 5,87	MAY 13.85 4.14 4.04	JUN 7.27 2.17 2.13	личения ЈОЕ причения 4.55 1.37 1.35	AUG ======= 2.17 0.85 0.84	SEP SEP ================================	****
AY 1 2 3 4	OCT 0.51 0.61 0.63 0.64	NOV 1.79 0.55 0.54 0.54	0EC 2.49 0.77 0.78 0.92	JAN 4.89 1.50 1.51	FEB 20.23 6.28 5.43 5.55	MAR 25,20 7,53 7,42 7,26	APR 19,49 5,69 5,87 5,84	MAY 13.85 4.14 4.04 3.98	JUN 7.21 2.17 2.13 2.10	JUL ######## 4.55 1.37 1.35	AUG 2.17 0.85 0.84 0.63	SEP 2.38 0.73 0.72 0.70	****
AY 1 2 3 4 5	OCT 0.51 0.61 0.63 0.64 0.62	NOV 1.79 0.55 0.54 0.54	2.49 0.77 0.78 0.92 0.94	JAN 4.88 1.50 1.51 1.52 1.53	FEB 20.23 6.28 6.43 5.55 6.64	MAR 25.20 7.53 7.42 7.26 7.13	APR 19,49 5,89 5,87 5,84 5,77	MAY 13.85 4.14 4.04 3.99 3.89	7.27 2.17 2.13 2.10 2.04	JUL ************************************	AUG ======== 2.17 0.85 0.84 0.63 0.62	SEP 2.38 0.73 0.72 0.70 0.59	****
PAY 1 2 3 4 5	OCT 0.51 0.61 0.63 0.64 0.62 0.52	NOV 1.79 0.55 0.54 0.54 0.54	0EC 2.49 0.77 0.78 0.92 0.94 0.94	JAN 4.88 1.50 1.51 1.52 1.53	FEB 20.23 6.28 6.43 5.55 6.64 8.75	MAR 25.20 7.53 7.42 7.26 7.13 6.98	APR 19,49 5.89 5.87 5.84 5.77 5.76	MAY 13.85 4.14 4.04 3.99 3.89 3.79	7.27 2.17 2.13 2.10 2.04 2.00	JUL * 55 1.37 1.35 1.33 1.31	AUG 2.17 0.85 0.84 0.63 0.62 0.76	SEP ======== 2.38 0.73 0.72 0.70 0.59 0.69	****
1 2 3 4 5 5 5 7 8	OCT 0.51 0.61 0.63 0.64 0.62	NOV 1.79 0.55 0.54 0.54 0.54	0EC 2.49 0.77 0.78 0.92 0.94 0.94	JAN 4.89 1.50 1.51 1.52 1.53 1.66	FEB 20.23 6.28 6.43 6.55 6.64 8.75	MAR 25,20 7,53 7,42 7,26 7,13 6,98 8,88	APR 19,49 5,89 5,87 5,84 5,77 5,76 5,74	MAY 13.85 4.14 4.04 3.99 3.89 3.79 3.72	7.27 2.17 2.13 2.10 2.04 2.00	JUL * 55 1.37 1.35 1.33 1.31	AUG 2.17 0.85 0.84 0.63 0.62 0.76 0.91	SEP ====================================	****
1 2 3 4 5 5 5 7 8 9	OCT 0.51 0.61 0.63 0.64 0.62 0.62 0.62 0.62	NOV 1.79 0.55 0.54 0.54 0.54 0.54	0EC 2.49 0.77 0.78 0.92 0.94 0.94	JAN 4.88 1.50 1.51 1.52 1.53	FEB 20.23 6.28 6.43 6.55 6.64 8.75 6.89 7.00	MAR 25.20 7.53 7.42 7.26 7.13 6.98 6.74	APR 19,49 5,89 5,87 5,76 5,76 5,74 5,73	MAY 13.85 4.14 4.04 3.99 3.89 3.79 3.72	7.27 2.17 2.13 2.10 2.04 2.00 1.96 1.93	JUL ************************************	AUG 2.17 0.85 0.84 0.63 0.62 0.75 0.91 0.90	SEP ====================================	****
1 2 3 4 5 5 7 8 8 9 0	OCT 0.51 0.61 0.62 0.52 0.62 0.62 0.62 0.62 0.62 0.62	NOV 1.79 0.55 0.54 0.54 0.54 0.55 0.55 0.55	OEC 2.49 0.77 0.78 0.92 0.94 0.94 0.97 0.98 1.00	JAN 4.89 1.50 1.52 1.53 1.66 1.73 1.85 2.18	FEB 20.23 6.28 6.43 6.55 6.64 8.75 6.89 7.00	MAR 25, 20 7, 53 7, 42 7, 13 6, 98 6, 74 6, 61 6	APR 19,49 5,87 5,77 5,76 5,74 5,73 6,14	MAY 13.85 4.14 4.04 3.99 3.89 3.79 3.79 3.64 3.57	7.27 2.17 2.13 2.10 2.04 2.00 1.95 1.93	JUL 4 55 1 37 1 35 1 33 1 31 1 29 1 28 1 25 1 25	AUG 2.17 0.85 0.63 0.62 0.75 0.91 0.89	SEP ====================================	****
1 2 3 4 4 5 5 6 7 7 8 9 9 0 1	OCT 0.51 0.51 0.61 0.63 0.64 0.52 0.62 0.62 0.62 0.62 0.62 0.62	NOV 1.79 0.55 0.54 0.54 0.54 0.55 0.55 0.55	OEC 2.49 0.77 0.78 0.92 0.94 0.97 0.98 1.00	JAN 4.89 1.50 1.51 1.52 1.53 1.66 1.73 1.85 2.08 2.39	FEB 20.23 6.28 5.43 5.55 6.64 8.75 8.89 7.00 7.30 7.37 8.09	MAR 25, 20 7, 53 7, 42 7, 13 6, 98 6, 74 6, 61 6	APR 19,49 5,87 5,77 5,76 5,74 5,73 6,14	MAY 13.85 4.14 4.04 3.99 3.79 3.72 3.64 3.57 3.46	7.27 2.17 2.13 2.10 2.04 2.00 1.96 1.93 1.91	JUL 4.55 1.37 1.35 1.33 1.31 1.29 1.26 1.26	AUG 2.17 0.85 0.84 0.63 0.62 0.75 0.91 0.90 0.89	SEP 2.38 0.73 0.72 0.70 0.59 0.69 0.69 0.68	****
1 2 3 4 4 5 5 6 7 7 8 8 9 0 1 1 1 2 1 2	OCT 0.51 0.51 0.63 0.64 0.52 0.52 0.62 0.62 0.62 0.62 0.62 0.62 0.62 0.6	NOV 1.79 0.55 0.54 0.54 0.54 0.55 0.55 0.55	OEC 2.49 0.77 6.78 0.92 0.94 0.97 0.98 1.00 1.01 1.04	JAN 4.88 1.50 1.51 1.52 1.53 1.66 1.73 1.85 2.08 2.18 2.39 2.44	FEB 20.23 6.28 6.43 6.55 6.64 8.75 7.00 7.30 7.30 7.30 8.16	MAR 25.20 7.53 7.42 7.13 6.98 6.61 6.50 6.57 6.22	APR 19.49 5.89 5.87 5.76 5.74 5.73 6.14 6.25 6.36	MAY 13.85 4.14 4.04 3.99 3.79 3.72 3.64 3.57 3.46	7.27 2.17 2.13 2.10 2.04 2.00 1.96 1.93 1.91	JUL 4.55 1.37 1.35 1.33 1.31 1.29 1.26 1.26	AUG 2.17 0.85 0.84 0.63 0.62 0.75 0.91 0.90 0.89	SEP 2.38 0.73 0.72 0.70 0.59 0.69 0.69 0.68	****
1 2 3 4 5 5 6 7 8 9 1 1 1 2 1 2 1 1 2 1 2 1 2 1 2 1 2	OCT 0.51 0.51 0.53 0.64 0.52 0.62 0.62 0.62 0.62 0.62 0.62	NOV 1.79 0.55 0.54 0.54 0.54 0.55 0.55 0.55 0.55	OEC 2.49 0.77 6.78 0.92 0.94 0.94 0.97 1.00 1.01 1.04 1.09 1.11	JAN 4.88 4.88 1.50 1.51 1.52 1.53 1.66 2.18 2.18 2.34 2.44	FEB 20.23 6.28 6.43 6.54 6.55 6.64 7.30 7.77 8.09 8.15	MAR 25.20 7.53 7.42 7.26 7.13 6.98 6.85 8.74 6.61 6.37	APR 19,49 5,89 5,87 5,76 5,74 5,74 5,73 6,14 6,30	MAY 13.85 4.14 4.04 3.99 3.79 3.72 3.64 3.57 3.46	7.2.17 2.17 2.13 2.10 2.04 2.00 1.95 1.93 1.88 1.87	JUL ************************************	AUG 2.17 0.85 0.84 0.63 0.62 0.75 0.91 0.90 0.89 0.87	SEP 2.38 0.73 0.72 0.70 0.69 0.69 0.69 0.68 0.68	****
AY 3 4 5 5 6 7 8 9 1 1 1 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	OCT 0.51 0.51 0.53 0.64 0.52 0.52 0.62 0.62 0.52 0.52 0.52 0.52 0.52 0.52 0.52 0.5	1.79 0.55 0.54 0.54 0.54 0.55 0.55 0.55 0.55	OEC 2.49 0.77 6.78 0.92 0.94 0.97 0.98 1.00 1.01 1.04 1.09 1.11 1.15	JAN 4.88 1.50 1.51 1.52 1.66 1.73 1.85 2.18 2.39 2.44 2.54	FEB 20.23 6.28 6.43 6.55 6.64 6.76 7.30 7.31 8.09 8.15 8.25 8.31	MAR 25.20 7.53 7.42 7.13 6.98 8.74 6.61 6.37 6.37 6.90	APR	MAY  13.85 4.14 4.04 3.99 3.79 3.72 3.64 3.57 3.46 3.31 3.21 3.13	7.27 2.17 2.13 2.10 2.04 2.00 1.96 1.93 1.91	JUL 4.55 1.37 1.35 1.31 1.25 1.26 1.25 1.25 1.24 1.22 1.22	AUG 2.17 0.85 0.84 0.62 0.75 0.91 0.89 0.89 0.88 0.87 0.87	SEP = 3.38 0.73 0.72 0.70 0.59 0.69 0.69 0.69 0.69 0.69	****
AY	OCT 0.51 0.51 0.53 0.52 0.52 0.52 0.52 0.52 0.52 0.52 0.52	NOV 1.79 0.55 0.54 0.54 0.55 0.55 0.55 0.55 0.55	2.49 0.77 0.78 0.92 0.94 0.94 0.93 1.00 1.01 1.04 1.09 1.11	JAN 4.88 1.50 1.51 1.52 1.53 1.66 1.73 2.08 2.18 2.18 2.44 2.44 2.52	FEB  20.23 6.28 6.43 6.55 6.64 6.76 6.89 7.00 7.30 7.77 8.16 6.25 8.38	MAR 25.20 7.53 7.42 7.26 7.13 6.98 6.85 6.74 6.61 6.50 6.37 5.22 6.01 5.98	APR 19.49 5.89 5.87 5.76 5.74 6.14 6.30 6.36 6.36 6.32 6.22	13.85 4.14 4.04 3.99 3.89 3.79 3.72 3.64 3.37 3.45 3.31 3.21 3.13	JUN	JUL ************************************	AUG 2.17 0.85 0.84 0.62 0.75 0.91 0.89 0.89 0.88 0.87 0.87	SEP = 2.38 0.73 0.72 0.70 0.69 0.69 0.69 0.69 0.61 0.61 0.62 0.61 0.62 0.61	****
AY	OCT 0.51 0.51 0.52 0.52 0.52 0.52 0.52 0.52 0.52 0.52	NOV 1.79 0.55 0.54 0.54 0.55 0.55 0.55 0.55 0.55	OEC 2.49 0.77 6.78 0.92 0.94 0.94 0.94 1.00 1.01 1.04 1.01 1.15 1.15 1.15 1.18	JAN 4.88 1.50 1.51 1.53 1.66 1.73 1.85 2.18 2.34 2.44 2.54 2.54 2.54	FEB  20.23 6.28 6.43 6.55 6.64 6.76 7.30 7.30 7.37 8.09 8.16 9.31 8.41	MAR 25.20 7.53 7.42 7.26 7.13 6.98 6.85 6.74 6.61 6.50 6.37 6.22 6.01 5.90 5.85	APR	MAY 13.85 4.14 4.04 3.89 3.79 3.72 3.64 3.57 3.46 3.31 3.21 3.13 3.07	JUN 7.27 2.17 2.17 2.13 2.04 2.00 1.95 1.97 1.86 1.87 1.80 1.77 1.75	JUL 108 4 . 55 1 . 37 1 . 33 1 . 31 1 . 28 1 . 25 1 . 25 1 . 22 1 . 22 1 . 22 1 . 1 . 1 . 1 . 1	AUG 2.17 0.85 0.63 0.63 0.62 0.75 0.91 0.89 0.88 0.87 0.87 0.87 0.87	SEP = 3.38 0.73 0.72 0.70 0.59 0.69 0.69 0.69 0.69 0.69	****
AY 3 3 4 4 5 5 6 7 8 8 9 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	0.51 9.61 0.64 0.62 0.62 0.62 0.62 0.62 0.62 0.62 0.62	NOV 1.79 0.55 0.55 0.54 0.54 0.55 0.55 0.55 0.55	OEC 2.49 0.77 0.78 0.92 0.94 0.97 0.98 1.00 1.01 1.04 1.09 1.11 1.15 1.16 1.18 1.21	JAN 4.88 1.50 1.51 1.52 1.53 1.66 1.75 2.08 2.39 2.44 2.48 2.52 2.747	FEB  20.23 6.28 6.43 6.55 6.64 6.75 6.89 7.00 7.30 7.30 7.30 7.30 8.15 8.21 8.31 8.41	MAR 25.20 7.52 7.42 7.26 7.13 6.98 6.85 6.61 6.50 6.50 6.50 6.50 6.90 5.89 5.89	APR 19.49 5.89 5.87 5.76 5.74 6.14 6.30 6.36 6.36 6.32 6.22	13.85 4.14 3.99 3.89 3.79 3.72 3.64 3.57 3.46 3.31 3.21 3.21 3.07 3.07	JUN 7.27 2.17 2.17 2.13 2.04 2.00 1.95 1.97 1.86 1.87 1.80 1.77 1.75	JUL 108 4 . 55 1 . 37 1 . 33 1 . 31 1 . 28 1 . 25 1 . 25 1 . 22 1 . 22 1 . 22 1 . 1 . 1 . 1 . 1	AUG 2.17 0.85 0.63 0.62 0.71 0.90 0.89 0.89 0.87 0.87 0.87	SEP 2.38 0.73 0.72 0.70 0.69 0.69 0.69 0.69 0.61 0.61 0.61 0.61 0.62 0.50	****
== x = x = x = x = x = x = x = x = x =	0.51 0.51 0.51 0.54 0.52 0.62 0.62 0.62 0.63 0.63 0.52 0.53 0.59 0.59 0.59 0.59	NOV 1.79 0.55 0.54 0.54 0.55 0.55 0.55 0.55 0.55	OEC 2.49 0.77 0.78 0.92 0.94 0.97 0.98 1.00 1.01 1.04 1.09 1.11 1.16 1.18 1.21 1.25	JAN 4.88 1.50 1.52 1.53 1.66 1.75 2.08 2.18 2.39 2.44 2.48 2.62 2.74 2.95	FEB 20.23 6.28 6.43 6.55 6.64 6.76 6.89 7.00 7.77 8.09 8.16 8.25 8.38 8.41 8.41	MAR 25.20 7.52 7.42 7.26 7.13 6.86 6.74 6.50 6.37 6.01 5.85 5.85 5.85	APR 19 49 5.87 5.84 5.77 5.74 5.74 5.25 6.36 6.36 6.36 6.36 6.36 6.79	HAY 13.85 4.14 4.04 3.99 3.79 3.64 3.57 3.46 3.38 3.21 3.13 3.07 3.00 2.94	JUN 7.27 2.17 2.17 2.17 2.10 2.04 2.00 1.93 1.93 1.87 1.82 1.87 1.75 1.75 1.75 1.75 1.65	JUL 4.55 1.35 1.35 1.29 1.28 1.25 1.22 1.20 1.18 1.16 1.15 1.16 1.15 1.16 1.15	AUG 2.17 0.84 0.63 0.63 0.67 0.91 0.89 0.89 0.87 0.87 0.87 0.87 0.87	2.38 0.73 0.70 0.59 0.69 0.69 0.69 0.69 0.69 0.61 0.61 0.61 0.61 0.61	****
======================================	0.51 0.51 0.53 0.64 0.52 0.62 0.62 0.62 0.62 0.62 0.62 0.63 0.62 0.63 0.55 0.55 0.55	NOV 12.75 0.54 0.54 0.55 0.55 0.55 0.55 0.55 0.5	OEC 2.49 0.77 0.78 0.92 0.94 0.97 0.98 1.00 1.01 1.04 1.09 1.11 1.16 1.18 1.21 1.25	JAN 4.88 1.50 1.52 1.53 1.66 1.75 2.08 2.18 2.39 2.44 2.48 2.62 2.74 2.95	FEB 20.23 6.26 6.43 6.55 6.65 6.76 7.30 7.30 8.15 8.25 8.41 8.41 8.42 8.43	MAR 25.20 7.52 7.42 7.26 7.13 6.85 6.74 6.50 6.37 6.01 5.85 5.85 5.85	APR 19 49 5.87 5.84 5.77 5.74 5.74 5.25 6.36 6.36 6.36 6.36 6.36 6.79	MAY 13.85 4.14 4.04 3.99 3.79 3.64 3.57 3.46 3.38 3.21 3.21 3.07 3.07 2.94 2.88 2.82	JUN 7.27 2.17 2.17 2.19 2.04 2.00 1.96 1.97 1.87 1.87 1.77 1.75 1.75 1.75 1.68	JUL 4.55 1.35 1.35 1.33 1.129 1.28 1.25 1.25 1.20 1.21 1.18 1.15 1.16	AUG 2.17 0.85 0.63 0.63 0.63 0.91 0.90 0.89 0.89 0.87 0.87 0.87 0.87 0.87 0.82	2.38 0.72 0.70 0.69 0.69 0.69 0.61 0.61 0.61 0.60 0.50 0.50	****
EAY 2 3 4 5 5 6 7 7 8 8 9 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	0.51 0.51 0.63 0.64 0.62 0.62 0.62 0.62 0.62 0.62 0.51 0.51 0.55	NOV 1 . 755 0 . 554 0 . 554 0 . 555 0 . 555 0 . 555 0 . 555 0 . 556 0 . 564 0 . 564 0 . 560 0	2.49 0.78 0.92 0.94 0.94 0.94 0.94 1.00 1.01 1.04 1.15 1.16 1.15 1.16 1.21 1.22 1.29 1.32	JAN ************************************	FEB 20.23 6.28 6.43 6.55 6.64 6.76 6.89 7.00 7.77 8.09 8.16 8.25 8.38 8.41 8.41	MAR 25.20 7.52 7.42 7.26 7.13 6.85 6.74 6.50 6.37 6.01 5.85 5.85 5.85	APR 19 49 5.87 5.84 5.77 5.74 5.74 5.25 6.36 6.36 6.36 6.36 6.36 6.79	MAY 13.85 4.14 4.04 3.99 3.89 3.72 3.64 3.57 3.46 3.31 3.21 3.13 3.00 2.94 2.88 2.88 2.82 2.76	7.27 2.17 2.13 2.10 2.04 1.95 1.97 1.86 1.87 1.75 1.75 1.75 1.75 1.75	JUL 4.55 1.37 1.35 1.39 1.28 1.26 1.25 1.26 1.26 1.27 1.20 1.18 1.16 1.16 1.16 1.16 1.16 1.16 1.16	AUG 2.17 0.85 0.63 0.63 0.62 0.76 0.91 0.89 0.87 0.87 0.87 0.87 0.87 0.87 0.85 0.85 0.85	2.38 0.72 0.70 0.69 0.69 0.69 0.68 0.61 0.61 0.61 0.60 0.50 0.50 0.50 0.50	****
= A 7 = E	0.51 0.51 0.51 0.64 0.62 0.62 0.62 0.62 0.62 0.63 0.63 0.53 0.53 0.59 0.59 0.59	NOV 1.79 0.54 0.54 0.55 0.55 0.55 0.55 0.55 0.55	2.49 0.78 0.92 0.94 0.94 0.94 1.01 1.04 1.01 1.15 1.16 1.18 1.25 1.25 1.25 1.32 1.32	JAN ***  4.88 1.50 1.52 1.53 1.66 1.73 1.66 1.73 2.18 2.18 2.44 2.52 2.47 2.59 3.20 3.49 3.76	FEB 20.23 6.26 6.43 6.56 6.64 8.76 6.73 7.00 7.30 7.30 7.30 8.41 8.42 8.41 8.42 8.41 8.42 8.43 8.41 8.42 8.43 8.41 8.42 8.43 8.41 8.42 8.43 8.41 8.42 8.43 8.41 8.42 8.43 8.41 8.42 8.43 8.41 8.42 8.43 8.41 8.42 8.43 8.41 8.42 8.43 8.41 8.42 8.43 8.41 8.42 8.43 8.41 8.42 8.43 8.44 8.44 8.44 8.45 8.45 8.45 8.45 8.45	MAR 25.20 7.52 7.42 7.26 7.13 6.85 6.74 6.50 6.37 6.01 5.85 5.85 5.85	APR. 19.49 5.89 5.87 5.84 5.77 5.76 5.74 6.30 6.36 6.32 6.24 5.79	MAY 13.85 4.14 4.04 3.99 3.89 3.72 3.64 3.57 3.45 3.31 3.21 3.21 3.07 2.94 2.82 2.76	7.27 2.17 2.13 2.10 2.04 1.95 1.93 1.80 1.87 1.80 1.75 1.68 1.65 1.65	JUL 101 105 107 108 108 108 108 108 108 108 108	AUG 217 0.85 0.62 0.76 0.90 0.89 0.87 0.87 0.87 0.87 0.85 0.82 0.82 0.85 0.82 0.85 0.80 0.80 0.80 0.80 0.80 0.80 0.80	2.38 0.72 0.70 0.69 0.69 0.69 0.61 0.61 0.61 0.61 0.50 0.50 0.59 0.59	****
ENAPER 23455578890112211110000000000000000000000000000	0.51 0.51 0.53 0.64 0.65 0.65 0.65 0.65 0.65 0.65 0.65 0.55 0.5	NOV M. 1.79 0.54 0.54 0.55 0.55 0.55 0.55 0.55 0.55	OEC 2.49 0.76 0.92 0.94 0.97 0.98 1.00 1.01 1.01 1.15 1.16 1.15 1.25 1.29 1.36 1.39 1.41	JAN	FEB 20.23 6.28 6.43 6.75 6.64 6.77 8.09 7.30 7.37 8.18 8.25 8.38 8.41 8.41 8.43 9.51 8.38 8.38 8.38 9.51	MAR 25.203 7.42 7.26 7.13 6.98 6.74 6.50 6.50 6.52 26.01 5.88 5.92 5.93 6.06 6.15	19.49 5.89 5.87 5.77 5.74 5.73 6.14 6.25 6.36 6.36 6.36 6.36 6.37 8.22 6.37 8.22 8.22 8.22 8.22 8.22 8.22 8.22 8.2	MAY 13.85 4.14 4.04 3.99 3.89 3.79 3.72 3.64 3.57 3.46 3.37 3.47 3.19 3.00 2.98 2.88 2.82 2.76 2.70	7.27 2.17 2.13 2.10 2.04 1.95 1.97 1.86 1.87 1.75 1.75 1.75 1.75 1.75	JUL 4.55 1.37 1.35 1.35 1.28 1.26 1.26 1.25 1.22 1.20 1.18 1.16 1.16 1.16 1.16 1.16 1.16 1.16 1.10 1	2.17 0.85 0.62 0.76 0.90 0.88 0.37 0.87 0.87 0.87 0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.85	SEP N 2 2 38 0 772 0 70 0 59 0 69 0 68 0 66 1 0 62 0 66 0 0 55 0 0 55 8	****
EAY E E E E E E E E E E E E E E E E E E	OCT 0.51 0.51 0.52 0.62 0.62 0.62 0.62 0.55 0.55 0.55 0.55 0.55 0.55 0.55 0.5	NOV 1.79 0.55 0.54 0.54 0.55 0.55 0.55 0.55 0.55	OEC 2.49 0.77 0.78 0.92 0.94 0.97 0.98 1.00 1.01 1.04 1.09 1.11 1.15 1.16 1.18 1.25 1.25 1.39 1.41 1.41 1.41 1.41 1.41 1.41 1.41 1.4	JAN 4.88 1.50 1.51 1.52 1.53 1.66 1.75 1.75 1.85 2.18 2.34 4.2.52 2.74 7.95 3.26 3.76 4.01	FEB 20.23 6.28 6.43 6.56 6.64 8.75 6.77 7.77 8.09 8.25 8.31 8.41 8.42 8.41 8.41 8.42 8.41 8.42 8.41 8.41 8.42 8.41 8.41 8.42 8.41 8.41 8.41 8.41 8.41 8.41 8.41 8.41	MAR 25.20 7.25 7.26 7.13 6.98 6.65 6.51 6.50 6.37 8.22 6.50 6.50 6.50 6.50 6.50 6.50 6.50 6.50	APR. 19.49 5.87 5.87 5.76 5.74 5.73 6.14 5.73 6.36 6.36 6.36 6.36 6.37 5.79 5.41	MAY 13.85 4.14 4.04 3.99 3.89 3.72 3.64 3.57 3.45 3.31 3.11 3.01 2.94 2.88 2.82 2.76 2.64 2.59	JUN 7.27 2.17 2.17 2.17 2.18 2.10 2.00 1.95 1.87 1.82 1.77 1.73 1.68 1.65 1.65 1.55 1.55 1.58	JUL 1.37 1.37 1.37 1.37 1.37 1.29 1.28 1.26 1.22 1.22 1.22 1.22 1.22 1.22 1.16 1.16 1.16 1.16 1.16 1.16 1.10 1	2.17 0.85 0.84 0.63 0.62 0.781 0.90 0.88 0.87 0.87 0.87 0.87 0.87 0.87 0.8	SEP	****
TAY	OCT	NOV 1.79 0.55 0.54 0.54 0.55 0.55 0.55 0.55 0.55	OEC 2.49 0.78 0.92 0.94 0.97 0.98 1.01 1.01 1.15 1.16 1.15 1.16 1.16 1.25 1.29 1.36 1.36 1.41 1.43	JAN *** 88 1.50 1.551 1.553 1.566 1.75 2.08 2.39 4 2.54 2.54 2.54 2.54 2.54 2.54 2.64 4.26 4.26 4.26	FEB 20.23 6.28 6.43 6.55 6.64 6.76 7.30 7.77 8.16 25 18.38 8.41 8.42 8.43 9.30 8.18 8.10	MAR 25.23 25.23 7.42 7.26 7.13 6.98 6.85 6.61 6.50 6.50 6.50 6.50 6.50 5.88 5.90 5.88 5.90 6.06 6.15 6.15 6.17 6.20	19.49 5.89 5.87 5.77 5.76 5.74 5.73 6.35 6.35 6.35 5.79 5.79 5.79	MAY 13.85 4.14 4.04 3.99 3.89 3.72 3.64 3.57 3.45 3.31 3.13 3.01 2.94 2.88 2.82 2.76 2.70 2.54 2.59 2.54	7.27 2.17 2.13 2.10 2.00 1.96 1.91 1.86 1.87 1.82 1.87 1.77 1.75 1.75 1.75 1.65 1.65	JUL 4 .55 1 .37 1 .33 1 .31 1 .29 1 .28 1 .25 1 .22 1 .22 1 .22 1 .22 1 .16 1 .16 1 .16 1 .16 1 .10 1 .09 1 .09 1 .09 1 .09	2.17 0.85 0.84 0.63 0.62 0.781 0.90 0.88 0.87 0.87 0.87 0.87 0.87 0.87 0.8	SEP	****
EXY =	OCT 0.51 0.51 0.53 0.62 0.62 0.62 0.62 0.62 0.62 0.63 0.63 0.63 0.63 0.59 0.59 0.59 0.59 0.59 0.59 0.55 0.	1.79 0.55 0.54 0.54 0.55 0.55 0.55 0.55 0.55	0EC 0.77 0.78 0.92 0.94 0.94 0.97 0.98 1.00 1.01 1.15 1.16 1.18 1.25 1.29 1.32 1.32 1.43	JAN 4.88 1 1.51 2 1.55 2 1.75 3 1.66 3 1.75 2 2.34 4 4 2 2.52 4 2.52 4 4 .21 6 4 4 .35 5	FEB 20.28 6.28 6.43 6.55 6.64 5.76 6.89 7.30 7.30 7.30 8.15 6.25 9.31 8.41 8.42 8.41 8.42 8.41 8.42 8.43 8.41 8.42 8.43 8.41 8.42 8.43 8.43 8.41 8.42 8.43 8.43 8.43 8.41 8.42 8.43 8.43 8.43 8.43 8.43 8.43 8.43 8.43	MAR 25.20 7.25 27.26 7.13 6.85 8.74 6.61 6.37 5.22 8.5 8.5 8.5 9.7 6.00 6.12 6.15 6.17 6.20 6.18	19 49 5 .87 5 .84 5 .77 5 .74 5 .74 6 .30 6 .35 6 .32 6 .04 5 .79 5 .18 5 .04 5 .79 4 .90 4 .76	MAY 13.85 4.14 4.04 3.99 3.89 3.79 3.72 3.64 3.57 3.38 3.31 3.21 3.19 3.00 2.94 2.88 2.76 2.76 2.76 2.54 2.48 2.48	7.27 2.17 2.13 2.104 2.04 2.04 2.09 1.93 1.86 1.87 1.87 1.75 1.75 1.75 1.65 1.65 1.65 1.55 1.55 1.55	JUL 1.37 1.37 1.37 1.37 1.37 1.29 1.28 1.26 1.22 1.22 1.22 1.22 1.22 1.22 1.16 1.16 1.16 1.16 1.16 1.16 1.10 1	AUG 2. 17 0. 85 0. 62 0. 71 0. 80 0. 87 0. 87 0. 87 0. 87 0. 81 0. 81 0. 81 0. 81 0. 81 0. 81 0. 81 0. 87 0. 8	SEP 2 38 0 77 0 77 0 77 0 77 0 77 0 77 0 77 0	JACUNA JACUNA
EAY = E	OCT	NOV  1.79  0.54  0.54  0.54  0.55  0.55  0.55  0.55  0.55  0.55  0.56  0.50	OEC 2.49 0.78 0.92 0.94 0.94 0.94 1.00 1.01 1.01 1.15 1.15 1.15 1.25 1.29 1.36 1.41 1.43 1.43 1.43 1.43 1.44	JAN 4.89 1.512 1.553 1.673 1.6	FEB 20.28 6.43 6.55 6.64 6.77 77 8.41 8.41 8.42 8.43 9.51 8.49 8.30 8.10 9.70 9.70 9.70 9.70 9.70 9.70 9.70 9.7	MAR 25.20 7.13 6.88 6.86 6.51 6.50 5.90 5.88 5.5.90 6.06 6.15 6.15 6.15 6.15 6.15 6.15 6.15 6.1	APR 89 5.87 5.86 5.74 5.74 8.25 6.36 6.36 6.32 8.29 5.79 5.41 5.79 5.44 9.04 4.76 4.81	MAY 13.85 4.14 4.04 3.99 3.89 3.72 3.64 3.57 3.46 3.31 3.21 3.13 3.00 2.98 2.82 2.76 2.70 2.264 2.59 2.46 2.41	JUN 7.27 2.17 2.13 2.104 2.00 1.93 1.91 1.80 1.77 1.65 1.65 1.65 1.55 1.55 1.55 1.55 1.55	JUL 1.37 1.37 1.33 1.31 1.28 1.28 1.25 1.22 1.22 1.22 1.18 1.18 1.18 1.19 1.18 1.19 1.19 1.10 1	AUG 2.17 0.65 0.63 0.62 0.76 0.91 0.89 0.89 0.87 0.87 0.87 0.87 0.85 0.85 0.85 0.85 0.85 0.85 0.79 0.79	SEP = 2 - 3 - 8	ANNUAL
EAY 2 2 3 4 4 5 5 5 7 8 8 9 9 1 1 1 2 2 1 1 1 1 2 2 2 3 4 4 5 5 5 7 8 8 9 9 1 1 1 2 2 1 1 1 1 1 2 2 2 3 2 3 2 3 2 3	OCT 0.61 0.61 0.62 0.62 0.62 0.62 0.62 0.62 0.55 0.55 0.55 0.55 0.55 0.55 0.55 0.5	NOV 1.79 0.55 0.54 0.54 0.55 0.55 0.55 0.55 0.55	OEC 2.49 0.77 0.78 0.94 0.94 0.97 0.101 1.04 1.11 1.15 1.18 1.25 1.25 1.36 1.39 1.43 1.44 1.45	JAN 4.88 1.512 1.552 1.553 1.673 1.673 2.088 2.39 2.488 2.542 2.542 2.747 2.958 3.248 3.765 4.355 4.355 4.759	FEB 20.28 6.28 6.43 6.55 6.64 5.76 6.89 7.30 7.30 7.30 8.15 6.25 9.31 8.41 8.42 8.41 8.42 8.41 8.42 8.43 8.41 8.42 8.43 8.41 8.42 8.43 8.43 8.41 8.42 8.43 8.43 8.43 8.41 8.42 8.43 8.43 8.43 8.43 8.43 8.43 8.43 8.43	MAR 25.20 7.35 7.425 7.25 7.26 7.13 6.85 6.76 6.37 6.22 9.85 8.85 5.92 7.06 6.12 6.12 6.12 6.12 6.12 6.15 6.12 6.15 6.12	19 49 5 89 5 87 6 5 77 5 74 5 74 6 30 6 36 6 36 6 36 6 36 6 36 6 36 6 3	MAY 13.85 4.14 4.04 3.99 3.89 3.72 3.64 3.57 3.46 3.38 3.31 3.10 3.00 2.94 2.88 2.70 2.64 2.276 2.54 2.45 2.45 2.45	7.27 2.17 2.13 2.104 2.00 1.93 1.80 1.87 1.87 1.75 1.65 1.65 1.65 1.65 1.50 1.50 1.50 1.50 1.50	JUL  101  1 - 37  1 - 37  1 - 33  1 - 31  1 - 29  1 - 28  1 - 25  1 - 25  1 - 20  1 - 19  1 - 16  1 - 16  1 - 16  1 - 16  1 - 16  1 - 10  1 -	AUG 2.17 0.65 0.63 0.62 0.76 0.91 0.89 0.89 0.87 0.87 0.87 0.87 0.85 0.85 0.85 0.85 0.85 0.85 0.79 0.79	SEP 2 38 0 77 0 77 0 77 0 77 0 77 0 77 0 78 0	JACUNA JACUNA
AY	OCT 100CT 10	NOV  1.79  1.79  1.79  0.54  0.54  0.54  0.55  0.55  0.55  0.55  0.55  0.55  0.55  0.56  0.56  0.56  0.56  0.56  0.56  0.57	OEC 2.49 0.97 0.78 0.92 0.94 0.97 1.01 1.01 1.15 1.18 1.25 1.29 1.36 1.41 1.43 1.44 1.45	JAN 4.80 1.51 1.55 1.53 1.63 1.63 1.63 1.63 1.63 1.63 1.63 1.6	FEB 20.28 6.43 6.55 6.64 6.77 77 8.41 8.41 8.42 8.43 9.51 8.49 8.30 8.10 9.70 9.70 9.70 9.70 9.70 9.70 9.70 9.7	MAR 25.20 7.13 6.98 6.61 6.50 7.53 7.42 7.26 6.61 6.50 7.50 7.50 7.50 7.50 7.50 7.50 7.50 7	19.49 5.87 5.87 5.77 5.74 5.74 5.74 6.35 6.36 6.36 6.36 6.37 5.79 5.19 4.90 4.90 4.91 4.51 4.40	MAY 13.85 4.14 4.04 3.99 3.89 3.79 3.72 3.46 3.57 3.46 3.31 3.21 3.19 3.20 2.98 2.82 2.76 2.76 2.59 2.48 2.48 2.41 2.34	JUN 7.27 2.17 2.13 2.04 2.00 1.93 1.86 1.93 1.86 1.77 1.86 1.77 1.55 1.55 1.55 1.55 1.55 1.55 1.48 1.43	JUL 4 .55 1 .37 1 .35 1 .31 1 .29 1 .28 1 .25 1 .22 1 .22 1 .22 1 .22 1 .10 1 .16 1 .16 1 .16 1 .16 1 .10 1 .10 1 .10 1 .05 1 .05 1 .05 1 .05 1 .05	2.17 0.85 0.84 0.62 0.78 0.89 0.89 0.89 0.87 0.87 0.87 0.87 0.87 0.87 0.87 0.87	SEP	ANNUAL
AY 1 2 3 4 4 5 5 6 7 8 8 9 9 11 11 11 11 11 11 11 11 11 11 11 11	OCT 0.61 0.61 0.62 0.62 0.62 0.62 0.62 0.62 0.55 0.55 0.55 0.55 0.55 0.55 0.55 0.5	NOV 1.79 0.55 0.54 0.54 0.55 0.55 0.55 0.55 0.55	OEC 2.49 0.78 0.92 0.94 0.97 0.98 1.00 1.01 1.01 1.15 1.18 1.21 1.25 1.29 1.36 1.41 1.43 1.43 1.43 1.43 1.43 1.43 1.44 1.45 1.47	JAN 4.88 1.512 1.552 1.553 1.673 1.673 2.088 2.39 2.488 2.542 2.542 2.747 2.958 3.248 3.765 4.355 4.355 4.759	FEB 20.28 6.43 6.55 6.64 6.77 77 8.41 8.41 8.42 8.43 9.51 8.49 8.30 8.10 9.70 9.70 9.70 9.70 9.70 9.70 9.70 9.7	MAR 25.20 7.35 7.425 7.25 7.26 7.13 6.85 6.76 6.37 6.22 9.85 8.85 5.92 7.06 6.12 6.12 6.12 6.12 6.12 6.15 6.12 6.15 6.12	19 49 5 89 5 87 6 5 77 5 74 5 74 6 30 6 36 6 36 6 36 6 36 6 36 6 36 6 3	MAY 13.85 4.14 4.04 3.99 3.89 3.79 3.72 3.46 3.57 3.46 3.31 3.21 3.19 3.20 2.98 2.82 2.76 2.76 2.59 2.48 2.48 2.41 2.34	7.27 2.17 2.13 2.104 2.00 1.93 1.80 1.87 1.87 1.75 1.65 1.65 1.65 1.65 1.50 1.50 1.50 1.50 1.50	JUL  101  4.55  1.37  1.33  1.31  1.28  1.26  1.25  1.22  1.22  1.22  1.20  1.18  1.16  1.16  1.16  1.16  1.10  1.10  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00	AUG 2 . 17	SEP	ANNUAL ANNUAL BEAGE ANNUAL BEAGE ANNUAL BEAGE ANNUAL BEAGE ANNUAL
23 4 4 5 5 7 7 8 9 9 0 1 1 1 1 1 2 2 1 1 1 1 1 1 1 1 1 1 1 1	0.61 0.61 0.61 0.63 0.62 0.62 0.62 0.62 0.62 0.62 0.62 0.62 0.62 0.63 0.55	NOV  1.79  0.55  0.54  0.54  0.55  0.55  0.55  0.55  0.55  0.55  0.55  0.56  0.50  0.50  0.50  0.50  0.50  0.79  0.75  0.75	0EC 2.49 0.77 0.78 0.92 0.94 0.97 0.98 1.00 1.01 1.15 1.16 1.18 1.25 1.25 1.32 1.32 1.39 1.43 1.43 1.43 1.43 1.43 1.43 1.43 1.44 1.47 1.48	JAN 4.880 1.51 1.51 1.52 1.53 1.65 1.73 2.18 2.34 2.52 2.44 2.54 2.74 2.95 3.49 3.49 3.49 4.36 4.79 5.47 4.36 5.47 3.18	FEB 20.23 6.28 6.43 6.55 6.64 5.76 6.89 7.00 7.30 7.77 8.21 8.41 8.42 8.41 8.42 8.43 8.41 8.42 8.77 7.79	MAR 25.20 7.42 7.25 7.26 7.13 6.85 6.61 6.37 6.22 6.15 6.90 6.16 6.37 6.00 6.17 6.20 6.18 6.17 6.20 6.18 6.19 6.19 6.19 6.19 6.19 6.19 6.19 6.19	19 49 5.87 5.77 5.84 5.77 6.14 6.35 6.35 6.32 6.04 5.79 5.41 5.29 6.04 5.79 4.90 4.76 4.61 4.40 4.30	MAY 13.85 4.14 4.04 3.99 3.89 3.79 3.72 3.64 3.57 3.38 3.31 3.21 3.19 3.07 3.00 2.94 2.88 2.76 2.76 2.76 2.76 2.59 2.48 2.48 2.48 2.48 2.49 2.34 2.29	7.27 2.17 2.13 2.04 2.00 1.93 1.86 1.87 1.87 1.87 1.69 1.65 1.57 1.75 1.65 1.50 1.50 1.50 1.50 1.50 1.50 1.50 1.5	JUL 4.55 1.37 1.33 1.31 1.29 1.26 1.25 1.22 1.22 1.22 1.22 1.22 1.22 1.20 1.18 1.16 1.17 1.10 1.10 1.00 1	AUG 2. 17 0. 85 0. 62 0. 73 0. 62 0. 91 0. 80 0. 87 0. 65 0. 91 0. 79 0. 79 0. 79 0. 77 0. 77 0. 77 0. 77	SEP 2 38 0 77 2 0 77 2 0 77 2 0 76 9 0 69 0 69 0 69 0 61 0 61 0 61 0 65 0 0 58 0 0 58 0 0 55	MAX.: 25.20 MIN.: 0.5C
AY 2 3 4 4 5 5 5 7 8 9 9 0 1 1 1 1 2 2 1 1 1 1 1 1 1 1 1 1 1 1 1	OCE T TO THE PROPERTY OF THE P	NOV 1.79 1.79 1.79 1.79	OEC 2.49 0.78 0.92 0.94 0.94 0.94 1.00 1.01 1.01 1.15 1.18 1.25 1.29 1.36 1.41 1.45 1.47 1.47 1.47	JAN 4.850 1.551 1.552 1.553 1.673 1.682 2.189 2.448 2.542 2.542 2.542 2.543 3.496 4.216 4.254 4.	FEB 20.28 6.43 6.55 6.64 6.76 8.77 7.77 8.21 8.41 8.42 8.43 9.51 8.43 8.30 8.10 8.30 8.10 8.77 7.79	MAR 25.20 7.25 7.26 7.13 6.88 6.86 6.51 6.50 6.50 5.85 5.90 5.06 6.15 6.15 6.15 6.15 6.15 6.15 6.15 6.1	19.49 5.89 5.87 5.77 5.74 5.74 5.74 6.25 6.36 6.36 6.36 6.36 6.36 6.37 5.79 5.41 5.79 5.41 5.79 5.41 5.79 5.41 5.79 5.41 5.79 6.36 6.32 6.36 6.32 6.36 6.32 6.36 6.32 6.36 6.32 6.36 6.32 6.36 6.36 6.32 6.36 6.36 6.36 6.37 6.36 6.36 6.37 6.36 6.37 6.36 6.37 6.36 6.37 6.36 6.37 6.36 6.37 6.36 6.37 6.36 6.37	MAY 13.85 4.14 4.04 3.99 3.89 3.72 3.67 3.45 3.37 3.13 3.00 2.94 2.76 2.70 2.264 2.59 2.27 2.48 2.41 2.37 2.27 2.29 3.41	7.27 2.17 2.13 2.104 2.004 1.93 1.86 1.82 1.82 1.82 1.82 1.82 1.82 1.82 1.77 1.73 1.69 1.65 1.65 1.52 1.52 1.52 1.52 1.52 1.52 1.52 1.5	JUL 4 .55 1 .37 1 .35 1 .31 1 .25 1 .26 1 .25 1 .22 1 .22 1 .22 1 .22 1 .16 1 .16 1 .16 1 .16 1 .10 1 .00 1 .0	AUG 2. 17 0. 85 0. 62 0. 73 0. 62 0. 91 0. 87 0. 79 0. 79 0. 79 0. 79 0. 79 0. 73 0. 73 0. 73 0. 87	SEP 2 38 0 77 0 77 0 77 0 77 0 77 0 77 0 77 0	MAX.: 25.20 MIN.: 0.50
	00.61 0.61 0.63 0.62 0.62 0.62 0.62 0.62 0.62 0.62 0.62 0.62 0.62 0.55 0.55 0.55 0.55 0.55 0.55 0.55 0.55	NOV  1 .79  0 .54  0 .54  0 .54  0 .55  0 .55  0 .55  0 .55  0 .55  0 .55  0 .56  0 .50  0 .5	0EC 2.49 0.77 0.78 0.92 0.94 0.94 0.97 0.98 1.00 1.01 1.04 1.09 1.11 1.15 1.16 1.25 1.29 1.35 1.35 1.35 1.41 1.47 1.47 1.47 1.47 1.48	JAN 4.880 1.512 1.552 1.553 1.735 1.682 2.189 2.348 2.542 2.542 2.544 2.542 2.544 2.542 2.544 2.542 2.544 2.542 2.543 3.496 3.496 4.295 4.	FEB 20.23 6.28 6.43 6.55 6.64 6.70 7.77 8.15 8.21 8.41 8.42 8.43 8.43 8.41 8.42 8.43 8.43 8.49 8.77 7.79	MAR 25.20 7.42 7.25 7.42 7.26 7.13 6.98 6.85 6.61 6.30 6.30 5.90 5.85 5.90 6.02 6.02 6.02 6.02 6.03 6.02 6.03 6.03 6.03 6.03 6.03 6.03 6.03 6.03	19.49 5.89 5.87 5.75 5.74 5.74 5.74 6.36 6.36 6.36 6.36 6.36 6.36 6.36 6.3	MAY 13.85 4.14 4.04 3.99 3.89 3.72 3.67 3.46 3.38 3.31 3.21 3.13 3.00 2.94 2.82 2.76 2.70 2.264 2.59 2.25 3.41 2.37 2.27 2.29 3.41 3.85	7.27 2.17 2.13 2.104 2.00 1.93 1.86 1.87 1.87 1.87 1.75 1.69 1.65 1.57 1.75 1.65 1.50 1.50 1.50 1.50 1.50 1.45 1.43	JUL  1.00  1.37  1.37  1.33  1.31  1.28  1.28  1.22  1.22  1.22  1.22  1.20  1.18  1.16  1.16  1.16  1.16  1.16  1.10  1.10  1.00  1.00  0.99  1.00  0.99	AUG 2 17 0 85 0 84 0 65 0 91 0 90 0 89 0 89 0 87 0 7 0 7 0 7 0 7 0 7 0 7 0 7 0	SEP = 2 . 38	MAX : 25.20 MIN : 0.50 2.91

#### <<< DB-06A >>> HOURLY RIVER WATER LEVEL

To file the hourly water level recorded at the hydrometric stations and output tables in feet and meter by station.

To begin this filing, use the following steps to retrieve each station number file.

#### \*\*\* for example \*\*\*

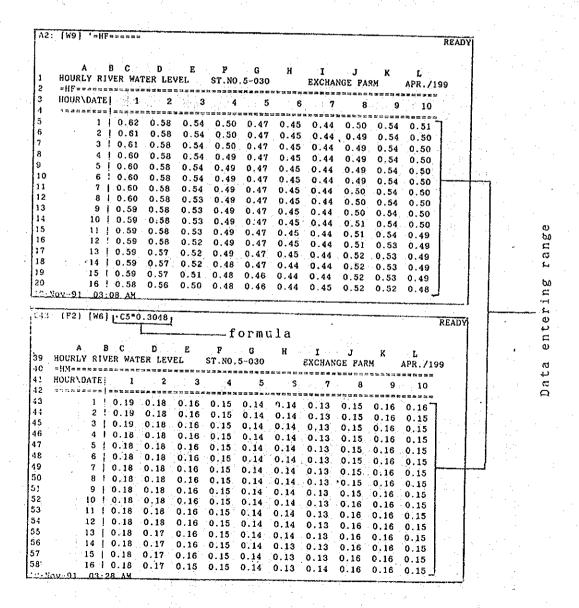
Diskette No. DB-06A 5-030 EXCHANGE FARM

Select /File Select /Retrieve

Highlight \1991\APR.WK1.....Exchange Farm Apr.1991

Press ENTER to retrieve APR.WK1

The following worksheet appears on your screen. Before enter the hourly water level, a technician should convert from chart line into values by use of a special scale.



#### <<< DB-11 >>> DAILY WELL WATER LEVEL

To file daily well water level observed at the observation well, calculate water level elevation in meter and output tables by station.

To begin this system, use the following steps to retrieve each station number file.

#### \*\*\* for example \*\*\*

Diskette No. DB-11 Well No.1 Kanyilaba

Select /File Select /Retrieve

Highlight \9091.WK1......Year of 1990/1991

Press ENTER to retrieve 9091.WK1

This filing system contains 5 (five) difference tables in a worksheet to prevent human error. The first table defines the characters of a well station, now appears on your screen as follows;

(01)	Well No		
(02)	Well Name	Kanvilaba	
(03)	Height of Observation Point>	0.43 m	
(04)	Elevation of Ground Level (m)>	1068.55	
(05)	Diameter of Well>	1.30 m	1 1
(80)	Depth of Well>	11.77 m	
(07)	Zero Reading of Tape>	20.00 m	
(80)	Distance from Hydrometric St>	8.5 km	
(09)	Hydrometric St. No>	1-150	
(10)	Hydrometric St. Name>	Zambezi	
(11)	R/B/H of Hydrometric St. (m)>	1040.55	1 .
(12)	Zero Height of Staff Gauge (m)>	1026.65	
		1	

823	s: (,2	?) [W7]	29.04				1				READY	
	Α	. В	· c	D	E	P	G	н	Í	. <b></b>		
19 20		m*	Well No							Morning		
20 21 22		OCT	NOV	DEC	JAN			APR	MAY	JUN		
23	1	29.04	29.48	.29.80	30.13	27.57	25.40	25.19	25 69	26.25		
24	2	29.05	29.49	29.82	30.07	27.51	25.37	25.22	25.68			*
25	3	29.05		29.82	30.10	27.48	25.37	25,22	25.66	26.31		
26	4	29.08	29.53	29.84	30.13	27.49	25.38	25.24	25.72	26.29		
7	5	29.07	29.52	29.86	30.10	27.45	25.38	25.25	25.75	26.32		
89	6	29.07	29.51	29.84	30.15	27.28	25.38	25.24	25.79	26.36		
29	7	29.10	29.52	29.88	30.11	26.98	25.39	25.26	25.75			
0	8	29.09	29.54	29.89	30.09	26.76	25.40	25.22	25.80			
31	9	29.18	29.56	29.90	30.02	26.51	25.42	25.24	25.81	26.39		
2	10	29.15	29.55	29.90	29.91	26.43	25.41	25.25		26.41		
3	11	29.16	29.62	29.90	29.91	26,28	25.41	25.30	25.84	26.39		
4	12	29.18	29.64	29.94	29.94	26.21	25.44	25.30	25.87	26.37	* - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	
5	13	29.18	29.84	29.93	29,92	26.10	25.43	25.35	25.88	26.43		
6	14	29.21	29.63	29.95	29.95	25.99	25.45	25.36	25.91	26.50		
7	-15	29.21	29.60	29.96	29.92	25.74	25.47	25,37	25.93	26.52		
38	16	29.23	29.65	29.99	29.97	25.60	25.45	25,39	25.93	26.55		
Q = N	lov-91	05:0	7 AM								- 1	

The third table is for entering well water level data in the evening. Be sure that unit should be metric.

	A	₿	C	D	E	F	G	H	1	J	
61 62	*MWL N==N	e* *****	Well No	1	Kanyila	ıba			1990/91	Evening	
63		OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	
64	2222		2==0====	******	*****			*******			
65	1	29,42		30.26	30.29	27.93	25.51	25.36	25.88	26.51	
66	2	29,39	30.00	30.30	30.23	27.72	25.42	25.38	25.82	26.58	
67	3	29.66	29.91	30.28	30.30	27.74	25.55	25.39	25.95	26.55	
68	4	29.49	29.97	30.29	30.25	27.64	25.50	25.42	25.94	26.56	
69	5	29.09	30.08		30.19	27.56	25.48	25.31	25.92	26.60	
70	6	29.52	30.01		30.29	27.42	25.47	25.44	26.01	26.58	
71	7	29,56	30.02		30.26	27.03	25.52	25.46	26.00	26.64	
72	.8	29.30	29.99		30.23	26.80	25.49	25.47	25.98	26.62	
73	9	29.43	29.98		30.21	26.68	25.53	25.46	26.02	26.75	
74	10	29.40	30.07		30.16	26.46	25.50	25.44	26.00	26.78	11 /
75	11,	29.45	30.08		30.19	26.44	25.61	25.44	26.04	26.76	
76	12	29.61	30.12		30.30	26.28	25.55	25.45	26.08	26.78	
77	13	29.59	30.08		30.21	26.16	25.61	25.50	26.04	26.81	+ +
78	14	29.68	30.10		30.16	26.00	25.57	25.49	26.02	26.80	
79 :	15	29.67	30.07		30.18	25.74	25.63	25.55	26.09	26.75	
BO 🤄	. 16	29.68	30.05		30.25	25.56	25.62	25.54	26.13	26.82	100

The Forth table describes the actual well water level in the morning by hidden formula as follows;

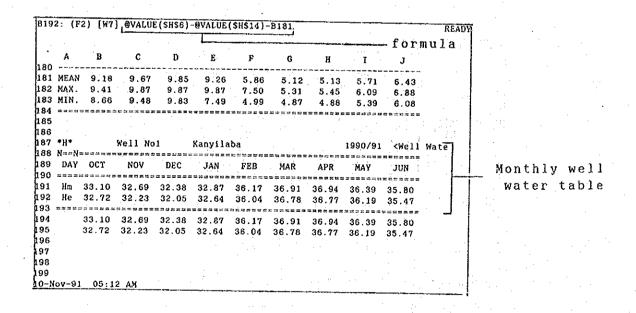
3107	7: (,2	) [W7	) +B23-\$H	\$5-\$H\$	<u> </u>			- for	mula		READ
103	A *WWLm		C Well No1	מ	E Kanyilab	P.	G	н	I	J Morning	
05	N==N= DAY	OCT	NOV	DEC	JAN	PEB	MAR	APR	MAY	JUN	
06 07	1	8.61		9.37	9.70	7.14	4.97	4.76	5.26	5.82	
08 09	2 3	8.62 8.62	9.06	9.39	9.64 9.67	7.08	4.94 4.94	4.79	5.25 5.23	5.86 5.88	
10	4 5	8.65 8.64	9.10 9.09	9.41	9.70 9.87	7.06	4.95 4.95	4.81	5.29 5.32	5.86 5.89	
12	6	8.64	9.08	9.41	9.72	6.85	4.95	4.81	5.36	5.93	**
13 14	8	8.67	9.09 9.11	9.45	9.68 9.66	6.55	4.96 4.97	4.83 4.79	5.32 5.37	5.95 5.94	
15 16	9 10	8.75 8.72	9.13 9.12	9.47	9.59	6.08	4.99 4.98	4.81 4.82	5.38 5.41	5.96 5.98	
17	11	8.73	9.19	9.47	9.48	5.85	4 98	4.87	5.41	5.96	
18 19	12 13	8.75 8.75	9.21	9.51 9.50	9.51 9.49	5.78 5.67	5.01 5.00	4.87 4.92	5.44 5.45	5.94 6.00	
20 21	14 15	8.78 8.78	9.20	9.52 9.53	9.52	5.56 5.31	5.02 5.04	4.93	5.48 5.50	6.07 6.09	
22	16 lov-91	8.80	9.22 9.80	9.56	9.54	5.17	5.02	4.96	5.50	6.12	

Result of formula

The Fifth table describes the actual well water level in the evening by hidden formula as follows;

B14:	9: (,2	(W7	] +B65-\$!	H\$5-\$H	\$9					
			1		~~~~			- for	mula	
	A	В	, C	. D	E	F	G	H	1	j
145			Well No:	1	Kanyila	ba		. :	1990/91	Evening
					異なこされたつち	######################################	# E # # # # #		==x=====	->=====
147	DAY	oct	NOV	DEC	JAN	FEB	MAR	APR	MAY	JÚN
148		2=242.	********	======		======	=======	***		
149	. 1	8.99		9.83	9.86	7.50	5.08	4.93	5.45	6.08
150	2	8.96	9.57	9.87	9.80	7.29	4.99	4.95	5.39	6.15
151	3	9.23	9.48	9.85	9.87	7.31	5.12	4.96	5.52	6.12
152	. 4	9.06	9.54	9.86	9.82	7.21	5.07	4.99	5.51	6.13
153	- 5	8.66	9.65		9.76	7.13	5.05	4.88	5.49	6.17
154	6	9.09	9.58		9.86	6.99	5.04	5.01	5.58	6.15
155	7	9.13	9.59		9.83	6.60	5.09	5.03	5.57	6.21
156	8	8.87	9.56		9.80	6.37	5.06	5.04	5.55	6.19
157	9	9.00	9.55		9.78	6.25	5.10	5.03	5.59	6.32
158	10	8.97	9.64		9.73	6.03	5.07	5.01	5.57	6.35
159	11	9.02	9.65		9.76	6.01	5.18	5.01	5.61	6.33
160	12	9.18	9.69		9.87	5.85	5.12	5.02	5,65	6.35
61	13	9.16	9.65		9.78	5.73	5.18	5.07	5.61	6.38
162	14	9.25	9.67		9.73	5.57	5.14	5.06	5.59	6.37
63	15	9.24	9.64		9.75	5.31	5.20	5.12	5.66	6.32
164	. 16	9.25	9.62		9.82	5.13	5.19	5.11	5.70	6.39
0-N	lov-91	05:1	O AM					1		

The sixth table summarizes the monthly well water level by hidden formula as follows;



In case that flow measurement data is few, this system prepares discharge rating curve using Manning's Formula. (parametric data : cross section, water surface slope and roughness)

St.4-941 Kaleya Dam Site is a good sample to explain this analyzing system. To begin this system, be sure that cross sectional survey results is required. In DB-03 diskette of each stations contains as the following files:

#### 

Now, retrieve RC1.WK1 file on your computer. The following work-sheet appears in the screen. This file is for calculating cross sectional area (=A), velocity (=V) and discharge (=Q) substituting water surface slope (=i) and roughness coefficient (=n) into the data entering range as shown below;

	CS.WK1				RC1.WK1	•		_ Da	ta en	terin	g rang	e →	
•					4-941 KALE	YA DAM	SITE	}	V - Q	į			
:	4-941 KALEYA CROSS SECTION					====== = d = d	1249.72]- 430.46		0.04000	1	0.00040		•
	GAUGE PLATE 2	ERO (0)	ELEVATION 1242.73			S = R =	199.81 2.15	h MIN=	1,242.57	1 1 1 1 1 1	1,252.25		mula
	x		H		V =(1/n)*R^Q	(2/3)*] = A*V	(1/2)=C*R	(2/3) =	0.83 359.0	(m/sec) (m3/s)	: Velocity : Discharg	e	٠.
	(120.00) (100.00)	1251.79 1250.75	8.016		h(m) 1,249.72	7.00	A(m2) 430,46	S(m) 199.81	R(m) 2.15	V(m/s) 0.83	Q(m3/s) 359.01		. o
•		1249.30 1248.45 1248.02	6.566 5.716 5.286	Copy		Y	<b>j</b> r.	(b)	Al	A21	A22	AREA	
•	(24.50)	1246.84 1246.89	4.106 4.156		(120.00)1, (100.00)1, (72.00)1,	250.75	0.00 0.00 0.42	20.00 0.00 32.00	0.00 0.00 13.44	0.00 1.70 0.00		0.00 1.70	
:	(17.80)	1246.28 1245.60 1244.97	3.526 2.866	1 1 2	(40.00)1, (26.50)1,	248.45	1.27	13.50	17.14 3.40	0.00	0.00	13.44 17.14 3.40	Resu
,	(17.00)	1242.85 1242.76	2,236 0,116 0,026	B 1 2	(24.50)1.3 (19.50)1,3	46.89	2.88 2.83	5.00 1.50	14.40 4.24	0.00 0.00	0.00	14.40 4.24	
i	(14.00)	1242.62 1242.57	(0.114) (0.164)		(18.00)1,3 (17.80)1,3 (17.00)1,3	45.60	3.46 4.12 4.75	0.20 0.80 0.00	0.69 3.30 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.69 3.30	
	(11.50)	1243.12 1244.16 1244.57	0.386 1.426 1.836		(17.00)1,3 (16.00)1,3	42.85 42.76	6.87 6.96	1.00	6.87	0.00	0.00	0.00 6.87 6.96	
1	(9.00)	1245.95 1246.33	3,216 3,596		(15.00)1,2	42.57	7.10	1.00	7.10 7.15	0.00	0.00	7.10 7.15	
	0.00	1247.10 1247.22	4.366 4.486		(13.00)1,2 (11.50)1,2 (10.00)1,2	44.16	6.60 5.56 5.15	1.50 1.50 1.00	9.90 8.34 5.15	0.00 0.00 0.00	0.00 0.00 0.00	9.90 8.34 5.15	
1	40.00	1247.32 1246.89 1246.76	4.586 4.156 4.026		(9.00)1,2 (8.00)1,2	45.95	3.77 3.39	1.00 4.50	3.77 15.26	0.00	0.00	3.77 15.26	
:	93.00 112.00	1247.48 1249.42	4.746 6.686		(3.50)1,2 0.00 1,2 18.00 1,2	47.22	2.62 2.50 2.40	3.50 18.00 22.00	9.17 45.00	0.00	0.00 0.00	9.17 45.00	
1		1251.19	8.456 9.516	* * * *	40.00 1,2 80.00 1,2	46.89	2.83 2.96	40.00 13.00	52.80 113.20 38.48	0.00 0.00 0.00	0.00 0.00 0.00	52.80 113.20 38.48	
					93.00 1,2 112.00 1,2	49.42	.2.24 0.30	19.00 0.00	42.56 0.00	0.00	0.00	42.56 0.43	
٠					129,00 1,2 150.00 1,2 150.00 1,2	52.25	0.00	21.00	0.00 0.00	0.00 0.00	0.00	0.00 0.00	
				•			•					4	
			St	ırvey	Result				Cal	culat	ion ra	nge -	1

After entering data in the first table, the following table should summarize in the same file.

. 4-541	KALEYA DAM	SHE					RE
A.4-941	KALEYA DAM	SITE	. D <<< H - /	=B., \	CALCULA'	G: TION >>>	H. a 3
i.	h = Area =	1249.72 430.46	n = C =	0.04000	1 =	0.00040	-
	· R =	199.81 2.15	h MIN=	1,242.57			1
∦V =(1/r	$R^{*}(2/3)*i$ Q = A*V	(1/2)=C*R	^(2/3) = =	0.83 359.0	(m/sec) (m3/s)	: Velocity : Discharge	
h(n) \$1,249.7	H(m) 72 7.00	A(p2) 430.46	S(a) 199.81	R(m) 2 15	V(m/s)	Q(m3/s)	. m J m <b>H</b> = <b>X</b>

4-941	KALEYA DAM	SITE	<<< H ~ /	- V - 0	CALCULA	TION >>>	
			113		0.03500		1/2500
h(m)	H(m)	A(m2)	S(n)	R(m)	V(m/s)	Q(m3/s)	REMARKS
1,243.0	0.28	0.94	4 06	0.23	0.22	0.20	0.45
1,244.0	00 1.28	5.76	6.85	0.84	0.51	2.93	1.71
1,245.0	0 2.28	13.35	10.24	1.30	0.68	9.10	3.02
1,246.0	0 3.28	22.06	12.94	1.70	0.82	17.99	
1,247.5	0 4.78	91.30	123,35	0.74	0.47	42.69	6.53
1,248.0	0 5.28	. 152.14	129.26	1.18	0.64	96.92	
1,248.5		215.20	149.61	1.44	0.73	156.70	12.52
1,249.0	0 6.28	293.57	173.36	1.69	0.81	238.33	
1,249.7	2 7.00	430.46	199.81	2.15	0.95	410.29	20.26
	2+			200			: 1277
	* *			n =		1 = 1	1/2500
h(n)	######################################						
	H(M) =========	A(m2)	S(m)	R(n)	V(m/s)	Q(m3/s)	REMARKS
1,243.0	0 0.28	0.94	4.06	0.23	0.25	0.24	The second of the second of
1,244.0	0 1.28	5.76	6.85	0.84	0.59	3.42	1.85
1,245.0	0 2.28	13.35	10.24	1.30	0.80	10.62	
1,246.0		22.06	12.94	1.70		20.99	4.58
1,247.5		91.30	123.35	0.74	0.55	49.80	7.06
1,248.00		152.14	129.26	1.18		113.07	10.63
1.248.5		215.20	149.61		0.85		13.52
249.00		293.57	173.36	1.69		278.05	15.52
1,249.7		430.46	199.81	2.15	1.11	478.68	21.88
						310.00	. 21.00
:		**		n =		i = 1	
h(n)	H(m)	A(m2)	S(m)	R(m):	V(m/s)	Q(m3/s)	REMARKS
.243.00		0.94	4.06		0.19	0.18	0.42
,244,00		5.76	6.85	0.84	0.15	2.56	1.60
,245.00		13.35	10.24	1.30	0.60	7.97	2.82
,246.00	3.28	22.06	12.94	1.70	0.71	15.74	3.97
,247.50		91.30	123.35	0.74	0.41	37.35	6.11
,248.00		152.14	129.26	1.18	0.56	84.80	9.21
,248.50		215.20	149.61	1.44		137.11	11.71
,249.00	-,	293.57	173.36	1.69	0.71	208.54	14.44
,249.72		430.46	199.81	2.15	0.83	359.01 j	
					V.00	JJ.	. 10.53
التحجيد					ر عبي شاهيات		

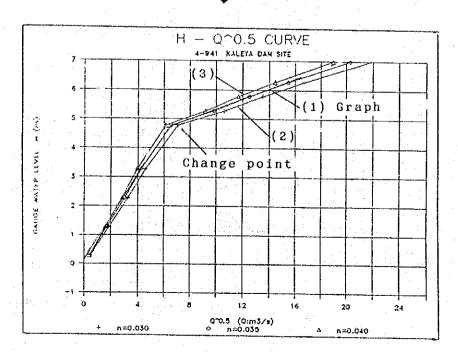
Copy result of fo

In order to select the most appropriate curve among three alternative results, water level (H) - square root discharge (Q^0.5) graph should be prepared as follows. In this case, n=0.035 curve is the most appropriate curve.

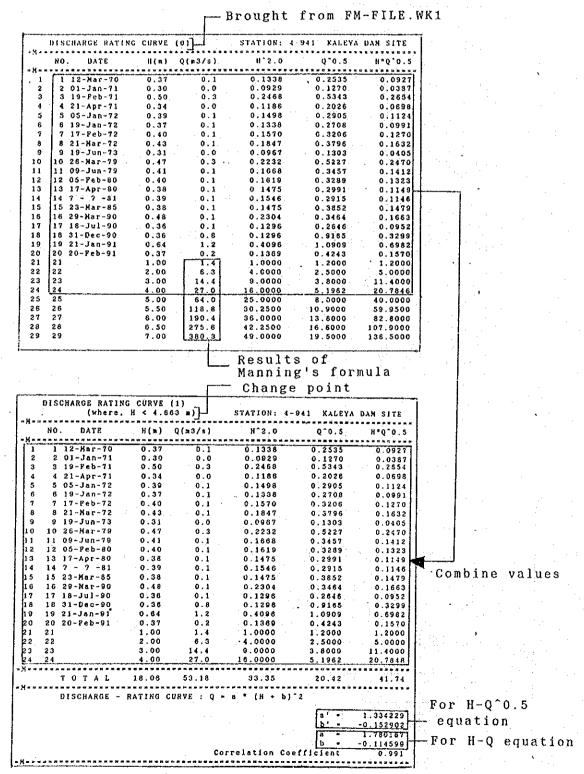
							7	
				1.		r	ough	ness coefficient
4-941 KA	CEYA DAN	SITE	<<< H - A	- V - Q	CALCULA 0.03500	TION >>>	1/2500]	water surface sl
h(n)	X(n)	A(n2)	\$(a)	R(n)	V(n/s)	Q(=3/s)	REMARKS	
1,243.00	0.28	0.94	4.08	0.23	0.22	0.20	0.45	· ·
1.244.00	1.28	5.76	6.85	0.84	0.51	2.93	1.71	
1,245,00	2.28	13.35	10.24	1.30	0.68	9.10	3.02	
1,246.00	3.28	22.06	12.94	1.70	0.82	17.99	4.24	
1,247.50	4.78	91.30	123.35	0.74	0.47	42.69	6.53	
1,248.00	5.28	. 152.14	129.26	1.18	0.64	98.92	9.84	<b>1</b>
1,248.50	5.78	215.20	149.81	1.44	0.73	156.70	12.52	
1.249.00	8.28	293.57	173.36	1.69	0.81	238.33	15:44	Y data range
1.249.72	7.00	430.46	199.81	2.15	0.95	410.29	20.26	•
<del></del>		. :						for (1)
l <b></b>				Ü =	0.03000	1 -	1/2500	( _ /
h(m)	H(m)	A(22)						
		A(BC)	S(m)	R(=)	V(R/s)	Q(m3/s)	REMARKS	
1,243.00	0.28	0.94	4.08	0.23	*********	********	*******	a transfer of the second second
1,244.00	1.28	5.78	8.85		0.25	0.24	0.49	•
1.245.00	2.28	13.35	10.24	0.84	0.59	3.42	1.85	
1.245.00	3.28	22.06	12.94	1.70	0.80	10.62		The second secon
1,247.50	4.78	91.30	123.35	0.74	0.95 0.55	20.99	4.58	i .
1,248,00	5.28	152.14	129.28	1.18	0.74	49.80	7.06	
1,249.50	5.78	215,20	149.61	1.44	0.14	113.07	10.63	
1.249.00	6.28	293.57	173.36	1.69	0.95	182.82	13.52	
1,249.72	7,00	430.48	199.81	2.15	1.11	278.05	18.67	
			4	2.10	. 4.11	478.68	21.88	for (2)
				n =	0.04000	4	1/2500	\ _ /
*********							1/2300	
p(a)	H(m)	A(D2)	8(2)	Ŕ( <b>д</b> )	V(n/s)	Q(=3/s)	REMARKS	
1,243.00	0.28	0.94	4.08	0.23	0.19	0.18	0.42	le de la companya de
1.244.00	1.28	5.76	6,85	0.84	0.45	2.58	1.60	
1,245.00	2.28	13.35	10.24	1.30	0.60	7.97	2.82	
1.246.00	3.26	22.06	12.94	1.70	0.71	15.74	3.97	
1.247.50	4.78	91.30	123.35	0.74	0.41	37.35	6.11	
1,248.00	5.28	152.14	129.26	1.18	0.56	84.80	9.21	
	5.78	215.20	149.61	1.44	0.64	137.11	11.71	
1,248.50								
	8.28	293.57 430.48	173.38 199.81	1.69	0.71	208.54	14.44	

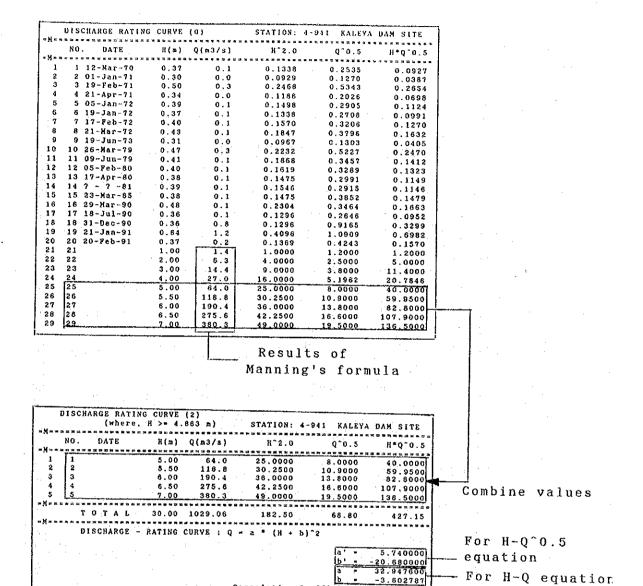
X data range



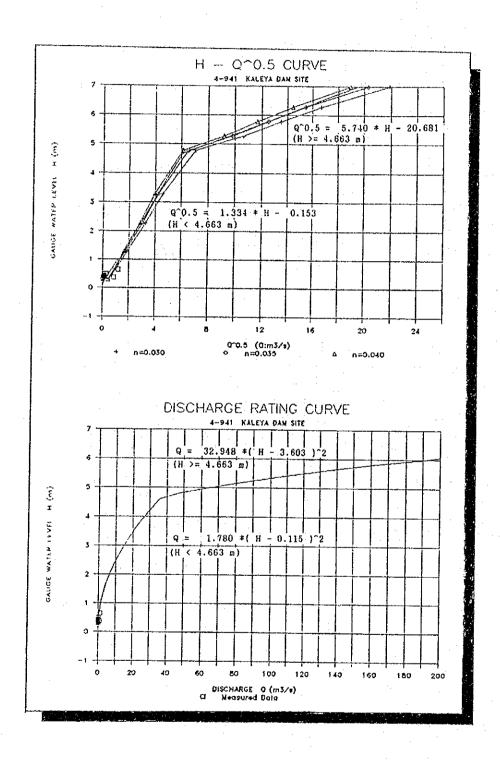


retrieve RC.WK1 file. This file is for preparing the H-0 curve, there are two type of H-Q curves in this station according of H-Q^0.5 curve. From FM-FILE.WK1 result (DB-02), actual is only available at the range of measured data between water zero and water level 0.70 m. Therefore, substitute these the discharge rating curve data into (1)table substitute result of Manning's formula into the discharge curve (2).





By using these calculation results, both H-Q^0.5 curve and H-Q curve can appear as follows;



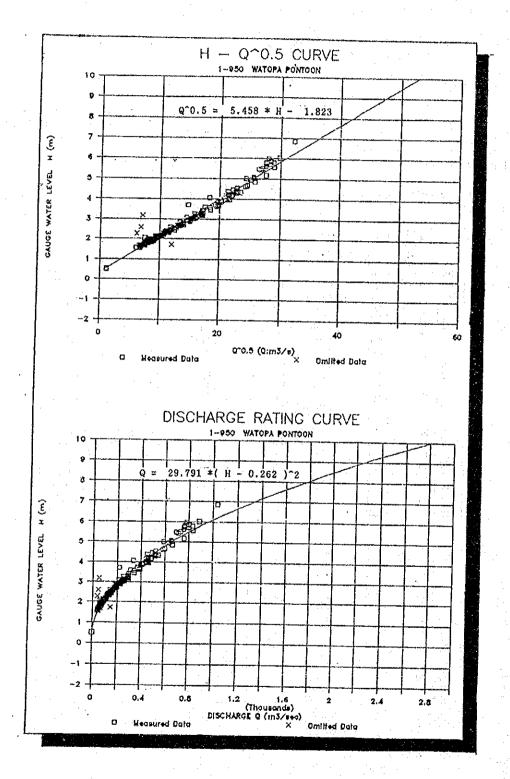
In case that many flow measurement data is available, this system prepares discharge rating curve using the data filed in DB-02.

In DB-04 diskette (same diskette as DB-03) of each stations contains as the following files;

At first, retrieve RC.WK1 file on your computer. The following worksheet appears in the screen. This file is for calculating discharge rating curve. From second column to fifth column should be copied from FM-LIST.WK1 file.

.WK1		-14-	===:		======	====	=======	: STATION:		A PONTOON				
		1	NO.	DATE		H(⊵)	Q(m3/s)	H^2.0	Q^0.5	H*Q^0.5				
	14	1	1	58/ 5/2	6	1.98	84.1	3.9252	9.1707	18.1689				
(A)		2	. 2	8/		1.80	66.8	3.2340	8.1714	14.6947				
ILE	1.4	3	3	9/1		1.68	58.0	2.8308	7.6134	12.8096	1			
F-1		4	. 4	11/		1.83	73.7	3.3445	8.5870	15.7040				
FM-F		5	5	11/2		2.00	79.3	4.0102	8.9059	17.8344				
≥.	/	6	6	59/ 1/		2.88	227:5	8.2965	15.0830	43.4445	-			
ĮΞ.	1.0	7	7	.1/		3.16	. 295.5	10.0098	17.1889	54.3826				
			8	2/1		3.66	394.4	13.4227	19.8601	72.7615				
		7	. 9	2/1		3.96	448.5	15.6523	21.1787	83.7895	1			
		10	10	2/2		4.31	515.1	18.5750	22.6961	97.8172	l'			
	1.5	11	11	3/2		1.34	525.1	18.8651	22.9152	99.5300	1			
		12	12	3/20		1.15	479.2	17.2592	21.8908	90.9436				
		13	13	3/2		.07	464.8	16.5574	21.5584	87.7228	:			
		14	14	4/11		3.27	293.8	10.6962	17.1394	56.0545	f .			
		15	15	4/16		3.11	263.4	9.6467	16.2306	50.4107	1			
		16	16	4/18		3.02	246.8	9,1054	15.7102	47,4058	<b>!</b> .			
		17	17	5/14		2.33	133.7	5.4085	11.5609	26.8864	} ·			
	- P. 17	18	18	5/30		.09	95.4	4.3592	9.7658	20.3898				
	1.0	19	19	6/19	1	.94	82.7	3.7816	9.0931	17.6827	•			
							(							
	:						2		45.5					
	, 14	170	174	89/10/ e		.51	1.3	0 0000		1.2				
		171	175	90/2/9		.03	257.3	0.2622	1.1396	0.5835				
~		172	176	3/8		. 26		9.1809	16.0406	48.6029				
Ð			177	5/8		.03	251.3 257.3	10.6276	15.8531	51.6810				
ρū			178	6/26		. 13		9.1809	16.0406	48.6029				
ange			79	7/29		.01	87.0	4.5369	9.3247	19.8616	3			
5-4	- 1		180	8/22		.92	65.6	4.0401	8.1019	16.2847				
~	: 1	177	81	9/26			55.3	3.6864	7.4351	14.2753				
9-4			82	10/25		.71	46.0	2.9241	6.7853	11.6028				
0		179		12/ 6	_	.70	49.9	2.8900	7.0626	12.0064				
	100			91/ 1/12		.88	66.9	3.5344	8.1786	15.3758	٠.			
=		181	25	2/4		.08	211.7	9.4864	14.5509	44.8169				
o u t		OKIT	57. 1	9/11/12		. 29	514.1	18.4041	22.6740	97.2714	-			
<b>-</b>	14.5	በሃተተ	58 8	0/ 5/23		. 27	37.9	5.1564	6.1553	13.9773				
		ודואף	69	6/7		18	50.0	10.1064	7.0696	22.4747				
a ta		оміті		4/9		.59	46.4	6.7122	6.8084	17.6393				
(C)	['					. 73	145.0	2.9973	12.0420	20.8479				
ਹ	- 4		1.5	ОТА	540	07				========		:		
		=#i===	====	======	548.	. 97	46401	1895.2297	2666.2666	9343,3469	-			
e d	[		n	LSCHARGE	7 DATI	MO - M		*********	#55522432455 	*=======	٠.			
it t	1						LRVE : Q :	= a * (H + b	)^2			Eq	uati	o n
r-			(	where,	OMIT :	Omit	ted data)	•	a' =	5.458147		or	H - Q	^0.5
E O	•								b' =	-1.823601			4	V. 0
٠.									a =	29.791368		e	77	
	·							•	b =	-0.261824		or	H - Q	
	. 1.						Co	rrelation C	oefficient	0.991				
	ب	M===:	222	HARRANDE.	2022222	=====			=======================================	0.001			•	

[Printing the Graph]
By using these calculation results, both H-Q^0.5 curve and H-Q curve can appear as follows;



#### <<< DB-05B >>> DAILY DISCHARGE

Using the discharge rating curve prepared by DB-03 or DB-04, this system convert the daily river water level filed in DB-05A to daily discharge, and output daily discharge tables.

To begin this filing, use the following steps to retrieve each station number file.

\*\*\* for example \*\*\*

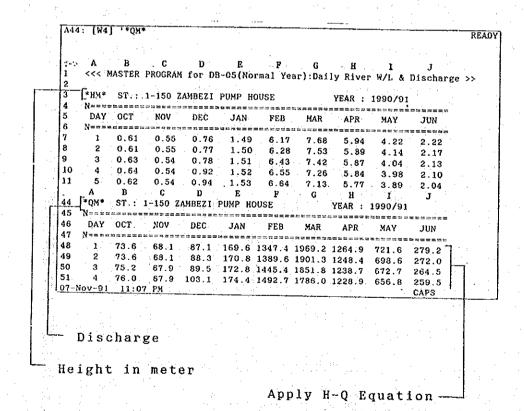
Diskette No. DB-05B 1-150 ZAMBEZI PUMP HOUSE

Select /File Select /Retrieve

Highlight \9091\9091.WK1....Zambezi Pump House 1990/91

Press ENTER to retrieve 9091.WK1

The following worksheet appears on your screen. In this system, you will copy the daily water level from DB-05A diskette in meter unit (second table in DB-05A diskette) into first table. The daily discharge results are automatically appeared in next table as below. Be sure that each cell in discharge table has a discharge rating equation prepared by either DB-03 or DB-04.



[ Printing the Worksheet ]
Print your worksheet as same as previous filing system. The printed worksheet should look like the followings.

15222	ST.	******	****	は日本の日子に	*******	******	*****	5×5×2=40	CHESEX:	******	*****		tase
YAC	OCT	NOV	DEC	JAN	FE6	MAR	APR	MAY	JUN	JUL	ALIG	SEP	ANNUAL
1	0.51	0.55	0.76	1.49	6.17	7.68	5.94	4.22		1.39			
3	0.61	0.55	0.77		6.28	7.53				1.37		0.7	3 -
ă	0.54	0.54		1.5				3.98	2.13		0.54		
5	0.62	0.54	0.94	1.53						1.31	0.63 0.62		
6	0.62	0.54	0.94	1.5					2.00			0.5	
?	0.62	0.55	0.97	1,7,					1.95	1.28	0.91	0.6	9 ·
	0.61	0.55	0.98	1.85					1.93	1.26	0.90		
10	0.62		1.01	2.18	1.77	6.51	6.14	3:45	1.91	1 25	0.89	0.6	
11	0.63	0.55	1.04	2.3%	8.09	6.37	.6.30	3.38	1.97	1.22	0.87	0.5	
12	0.62	0.54	1.09			6.22	6.36	3.31	1.82	1.22	0.87	0.6	1
13	0.61	0.53	1.11	2.48	8.25		6.35	3.21	1.80	1.20	0.87		
15		0.52	1,15	2.62	8.38	5.88	5.32 6.22		1.77	1.19	0.87		1 n
16	0.59	0.56		2.74	8,41	5.85	6.04	3.00	1.73	1.16	0.85	0.6	ŏ
17	0.59	6.50			8.41	5.88	5.79		1,69	1.15	0.82	0.5	
19	0.56	0.55	1,25	2.95		5.92 5.97		2.88	1.55		0.81	0.59	9
20	0.55	0.56			8.51		5.41	2.76	1.63	1.12 1.10	0.81	0.5	5 G
21	0.55	0.54	1.36	3.49	8.49	6.08	5 20	. 3 70	1 6 2				
55 .	0.55	0.54	1.39	3.75	8.38	6.12	5.18	2.54	1.50	1.09	0.79	0.5	5
23 : 24	0.55 0.55	0.56 0.65	1.41		8.30	0.10	3.04	2.39	1.58				
	0.55	0.65	1 49	4 38	8.18	6 30	4.97	2.54	1.55	1.06	0.79	0.56	2
2 ŧ.	0.55	0.69	1.43	4.55	8.03	8.18	4.76	2.45	1.50	1.05	0.77	0.5	•
	0.55	0.59	1.44	4.75	7.89	6.15	4.61	2.41	1.48	1.02	0.75		
	0.55	0.73	1.46	4.99	7.79	6.12		2.37	1.45	1.01	0.74		
31. 38	0.55 .: 54	0.74	1.47	5.21 5.46			4.40		1.43	1.00		0.54	
31	0.54	0.75	1.48			6.03 5.99		2.29 2.25	1.41	0.99		0.5	12.
	0.58	0.58	1.18		7.73	6,39	5.56	3.10 4.22 2.25	1.76	1.37	0.79	0.52	2.67
in.	0.64	0.75	1.48	5.79	8.51	7.68 5.85	6.36	4.22	2.22	1.39	0.91	0.73	
		*****	U. /G	 	0,17	5.85	4.30	2.25	1.41	0.98	0.62	0.54	0.50
)M* :===: DAY	ST.; OCT	1-150 Z	AMBEZI DEC	PUMP H	OUSE PER	annunus MAR	YEAR :	1990/91 =======	JUN	(OISCHA	RGE (mi	3/sec)]	ANNUAL
)M* :===: DAY	ST.; OCT	1-150 Z	AMBEZI DEC	PUMP H	OUSE PER	annunus MAR	YEAR :	1990/91 =======	JUN	(OISCHA	RGE (mi	3/sec)]	ANNUAL
)M* :===: DAY	ST.; OCT	1-150 Z	AMBEZI DEC	PUMP H	OUSE PER	annunus MAR	YEAR :	1990/91 =======	JUN	(OISCHA	RGE (mi	3/sec)]	ANNUAL
)M* :===: DAY	ST.; OCT	1-150 Z	AMBEZI DEC	PUMP H	OUSE PER	annunus MAR	YEAR :	1990/91 =======	JUN	(OISCHA	RGE (mi	3/sec)]	ANNUAL
)M* :===: DAY	ST.; OCT	1-150 Z	AMBEZI DEC	PUMP H	OUSE PER	annunus MAR	YEAR :	1990/91 =======	JUN	(OISCHA	RGE (mi	3/sec)]	ANNUAL
)M* :===: DAY	ST. 7 OCT 73.6 73.6 75.2 76.0 74.9 74.4	1-150 Z NOV SERVE 88.1 68.1 67.9 67.9 67.9	AMBEZI DEC 97.1 88.3 89.5 103.0 105.0	PUMP H 169.5 170.8 172.8 174.4 175.7 193.7	FEB 1347.4 1349.6 1445.4 1492.7 1528.7	MAR 1969.2 1901.3 1851.9 1785.0 1727.8 1666.8	YEAR:  APR 1254.9 1240.4 1238.7 1226.9 1205.2	1990/91 MAY 721.6 698.6 672.7 556.8 633.3	JUN 279.2 272.0 264.5 259.5 259.5	OISCHA SEE SEE JUL 156.6 153.9 151.6 148.9	RGE (mi AUG 78.2 77.1 76.3 75.7	3/sec)] SEP 84.0 84.0 83.4 82.0	ANNUAL
)M* :===: )AY	ST. 7 OCT 73.6 73.6 75.2 76.0 74.9 74.4	1-150 Z NOV SERVE 88.1 68.1 67.9 67.9 67.9	AMBEZI DEC 97.1 88.3 89.5 103.0 105.0	PUMP H 169.5 170.8 172.8 174.4 175.7 193.7	FEB 1347.4 1349.6 1445.4 1492.7 1528.7	MAR 1969.2 1901.3 1851.9 1785.0 1727.8 1666.8	YEAR:  APR 1254.9 1240.4 1238.7 1226.9 1205.2	1990/91 MAY 721.6 698.6 672.7 556.8 633.3	JUN 279.2 272.0 264.5 259.5 259.5	OISCHA SEE SEE JUL 156.6 153.9 151.6 148.9	RGE (mi AUG 78.2 77.1 76.3 75.7	3/sec)] SEP 84.0 84.0 83.4 82.0	ANNUAL
)M* :==: OAY :==: 1 2 3 4 5 6 7 9	ST. 7 OCT 73.6 73.6 75.2 76.0 74.9 74.4	1-150 Z NOV SERVE 88.1 68.1 67.9 67.9 67.9	AMBEZI DEC 97.1 88.3 89.5 103.0 105.0	PUMP H 169.5 170.8 172.8 174.4 175.7 193.7	FEB 1347.4 1349.6 1445.4 1492.7 1528.7	MAR 1969.2 1901.3 1851.9 1785.0 1727.8 1666.8	YEAR:  APR 1254.9 1240.4 1238.7 1226.9 1205.2	1990/91 MAY 721.6 698.6 672.7 556.8 633.3	JUN 279.2 272.0 264.5 259.5 259.5	OISCHA SEE SEE JUL 156.6 153.9 151.6 148.9	RGE (mi AUG 78.2 77.1 76.3 75.7	3/sec)] SEP 84.0 84.0 83.4 82.0	ANNUAL
)M* 2 3 4 5 6 7 3 9	ST. 7 OCT 73.6 73.6 75.2 76.0 74.9 74.4	1-150 Z NOV SERVE 88.1 68.1 67.9 67.9 67.9	AMBEZI DEC 97.1 88.3 89.5 103.0 105.0	PUMP H 169.5 170.8 172.8 174.4 175.7 193.7	FEB 1347.4 1349.6 1445.4 1492.7 1528.7	MAR 1969.2 1901.3 1851.9 1785.0 1727.8 1666.8	YEAR:  APR 1254.9 1240.4 1238.7 1226.9 1205.2	1990/91 MAY 721.6 698.6 672.7 556.8 633.3	JUN 279.2 272.0 264.5 259.5 259.5	OISCHA SEE SEE JUL 156.6 153.9 151.6 148.9	RGE (mi AUG 78.2 77.1 76.3 75.7	3/sec)] SEP 84.0 84.0 83.4 82.0	ANNUAL
)M* 2 3 4 5 6 7 3 9	ST. 7 OCT 73.6 73.6 75.2 76.0 74.9 74.4	1-150 Z NOV SERVE 88.1 68.1 67.9 67.9 67.9	AMBEZI DEC 97.1 88.3 89.5 103.0 105.0	PUMP H 169.5 170.8 172.8 174.4 175.7 193.7	FEB 1347.4 1349.6 1445.4 1492.7 1528.7	MAR 1969.2 1901.3 1851.9 1785.0 1727.8 1666.8	YEAR:  APR 1254.9 1240.4 1238.7 1226.9 1205.2	1990/91 MAY 721.6 698.6 672.7 556.8 633.3	JUN 279.2 272.0 264.5 259.5 259.5	OISCHA SEE SEE JUL 156.6 153.9 151.6 148.9	RGE (mi AUG 78.2 77.1 76.3 75.7	3/sec)] SEP 84.0 84.0 83.4 82.0	ANNUAL
OAY 2 3 4 5 6 7 9 0	ST. 7 OCT 73.6 73.6 75.2 76.0 74.9 74.4	1-150 Z NOV SERVE 88.1 68.1 67.9 67.9 67.9	AMBEZI DEC 97.1 88.3 89.5 103.0 105.0	PUMP H 169.5 170.8 172.8 174.4 175.7 193.7	FEB 1347.4 1349.6 1445.4 1492.7 1528.7	MAR 1969.2 1901.3 1851.9 1785.0 1727.8 1666.8	YEAR:  APR 1254.9 1240.4 1238.7 1226.9 1205.2	1990/91 MAY 721.6 698.6 672.7 556.8 633.3	JUN 279.2 272.0 264.5 259.5 259.5	OISCHA SEE SEE JUL 156.6 153.9 151.6 148.9	RGE (mi AUG 78.2 77.1 76.3 75.7	3/sec)] SEP 84.0 84.0 83.4 82.0	ANNUAL
)M* DAY 1 2 3 4 5 6 7 8 9 0 1 2 3 4	ST. 7 OCT 73.6 73.6 75.2 76.0 74.9 74.4	1-150 Z NOV SERVE 88.1 68.1 67.9 67.9 67.9	AMBEZI DEC 97.1 88.3 89.5 103.0 105.0	PUMP H 	FEB 1347.4 1349.6 1445.4 1492.7 1528.7	MAR 1969.2 1901.3 1851.9 1785.0 1727.8 1666.8	YEAR:  APR 1254.9 1240.4 1238.7 1226.9 1205.2	1990/91 MAY 721.6 698.6 672.7 556.8 633.3	JUN 279.2 272.0 264.5 259.5 259.5	OISCHA SEE SEE JUL 156.6 153.9 151.6 148.9	RGE (mi AUG 78.2 77.1 76.3 75.7	3/sec)] SEP 84.0 84.0 83.4 82.0	ANNUAL
M*************************************	ST. 7 OCT 73.6 73.6 75.2 76.0 74.9 74.4	1-150 Z NOV SERVE 88.1 68.1 67.9 67.9 67.9	AMBEZI DEC 97.1 88.3 89.5 103.0 105.0	PUMP H 	FEB 1347.4 1349.6 1445.4 1492.7 1528.7	MAR 1969.2 1901.3 1851.9 1785.0 1727.8 1666.8	YEAR:  APR 1254.9 1240.4 1238.7 1226.9 1205.2	1990/91 MAY 721.6 698.6 672.7 556.8 633.3	JUN 279.2 272.0 264.5 259.5 259.5	OISCHA SEE SEE JUL 156.6 153.9 151.6 148.9	RGE (mi AUG 78.2 77.1 76.3 75.7	3/sec)] SEP 84.0 84.0 83.4 82.0	ANNUAL
)M+ 10AY 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6	ST. 7 OCT 73.6 73.6 75.2 76.0 74.9 74.4	NOV = 58.1 66.1 67.9 67.9 67.6 68.6 68.6 68.6 68.6 68.5 68.4 67.9 65.9 65.9	AM8EZI DEC 87.1 88.3 89.5 103.1 105.0 105.6 109.8 111.4 112.7 115.6 120.7 123.4 127.5 129.0	PUMP H  JAN  169 6 170 8 172 8 174 4 175 7 193 7 202 4 200 8 257 0 272 6 308 8 318 7 326 4 336 6 6 352 0 375 5	OUSE FEB 1347.4 1389.6 1445.4 1492.7 1528.7 1570.3 1801.7 2010.5 2158.4 2191.5 2262.8 2293.8 5 2262.8	1969.2 1901.3 1851.9 1785.0 1727.8 1666.8 1618.0 1567.5 1519.0 1473.7 1424.3 1367.8 1291.3 1250.6	YEAR:  APR  1264.9 1240.4 1238.7 1205.2 1202.0 1192.4 1191.3 1336.1 1377.0 1397.7 1420.8 1420.8 14420.6 1366.7	1990/91  MAY  721.6 699.6 619.7 656.8 633.3 610.2 551.2 551.2 554.4 528.5 510.2 494.3 472.6 494.3 472.6	JUN 279.2 272.0 279.5 249.5 249.3 229.8 225.8 22	(OISCHA	RGE (m: AUG 78.2 2 77.1 76.3 75.7 74.9 87.4 100.5 100.0 99.4 97.8 97.5 96.0	3/sec)] SEP 84.0 84.0 83.4 82.0	ANNUAL
DAY 1 2 3 4 5 5 6 7 7 5 6 6 7	ST. 7 OCT 73.6 73.6 75.2 76.0 74.9 74.4	1-150 Z NOV  58.1 67.9 67.9 67.9 67.9 67.9 67.9 67.9 67.9	M8EZI DEC 87.1 88.3 89.5 103.1 105.0 105.6 109.1 112.7 112.7 122.4 127.5 129.0 131.4	PUMP H*  JAN  169-5  170-8  172-8  172-8  172-8  202-4  220-8  257-0  272-5  308-8  318-7  326-4  352-0  375-5  399-5	OUSE 1347.4 1389.6 1445.4 1492.7 1577.3 1630.5 1676.9 1801.7 2010.5 2158.4 2191.8 2293.8 2293.8 2308.6	1969.2 1901.3 1851.8 1785.0 1727.8 1666.8 1618.0 1567.5 1473.7 1424.3 1291.3 1291.3 1250.5 1241.9 1233.2	YEAR:  APR  1264.9 1264.9 127.7 127.9 127.9 127.7 127.9 127.7 127.7 127.7 127.7 127.7 127.7 127.7 127.7 127.7 127.7 127.7 127.7 127.7 127.7 127.7 127.7 127.7 127.7 127.7	1990/91  MAY  721.5 699.6 692.7 655.8 633.3 610.2 552.0 571.2 554.4 5528.5 510.2 494.3 472.6 454.7 442.9 428.1	JUN 279.2 279.2 279.2 259.5 259.5 249.5 249.3 229.6 225.0 225.0 225.0 216.7 213.0 209.5 205.9 202.8	(OISCHA WESSER JUL = 155.6 155.9 1146.7 144.8 139.6 135.4 139.6 135.4 133.5 139.8 129.7	RGE (m: AUG 78.2 77.1 76.3 75.7 74.9 87.4 101.5 100.0 99.3 98.4 97.5 97.5 97.5 97.5	3/sec)]  SEP  84.0 83.4 82.0 81.2 80.4 79.8 79.5 74.1 73.6 73.1 72.8	ANNUAL
0M1 0AY 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9	ST.7 OCT 73.6 73.6 75.2 76.0 74.9 74.4 74.9 75.2 74.9 75.2 74.9 75.2 76.4 77.7	NOV \$88.1 67.9 67.9 67.9 67.9 67.6 68.6 68.6 68.6 68.6 68.6 68.6 68.6	AMBEZI DEC 87.1 88.3 89.5 103.1 105.0 109.8 111.4 112.7 123.4 127.5 129.0 131.4 135.0 139.3	PUMP H  JAN  169 5 170 8 172 8 174 4 175 7 202 4 257 0 272 5 308 8 318 7 326 4 336 6 375 5 391 9	OUSE ####################################	1969.2 1901.3 1851.9 1785.0 1785.0 1786.8 1666.8 1667.5 1519.0 1473.7 1424.3 1291.3 1250.6 1241.9 1241.9 1241.9	YEAR:  APR 1254-9 1240-4 1238-7 1228-9 1202-0 1192-4 1191-3 1336-1 1420-8 1422-0 1404-6 1366-7 1306-7 1321-7	1990/91  MAY  721.5 699.6 692.7 655.8 633.3 610.2 5524.5 571.2 494.3 472.6 454.7 428.1 415.4 402.9	JUN = 279.2 272.0 264.5 5 249.5 2230.1 233.3 6 225.8 223.1 213.0 209.5 200.8 197.7 193.7	(OISCHA JUL = 156.6 153.9 1146.7 144.8 139.6 135.4 139.5 133.2 131.8 129.7 126.5	RGE (mm. AUG 78.2 2 77.1 76.3 75.7 74.9 8.100.6 100.0 99.3 99.4 97.5 97.5 96.0 95.7 92.7 92.7	3/sec)]  SEP  84.0 84.0 81.2 81.2 80.4 79.8 73.6 74.1 73.6 72.8	ANNUAL
DAY 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0	ST. 7  OCT  73.6  73.6  75.2  74.9  74.4  74.9  75.2  74.4  77.7  71.2  70.2  69.2  69.4	NOV \$88.1 67.9 67.9 67.9 67.9 67.6 68.6 68.6 68.6 68.6 68.6 68.6 68.6	AMBEZI DEC 87.1 88.3 89.5 103.1 105.0 109.8 111.4 112.7 123.4 127.5 129.0 131.4 135.0 139.3	PUMP H  JAN  169 5 170 8 172 8 174 4 175 7 202 4 257 0 272 5 308 8 318 7 326 4 336 6 375 5 391 9	OUSE ####################################	1969.2 1901.3 1851.9 1785.0 1785.0 1786.8 1666.8 1667.5 1519.0 1473.7 1424.3 1291.3 1250.6 1241.9 1241.9 1241.9	YEAR:  APR 1254-9 1240-4 1238-7 1228-9 1202-0 1192-4 1191-3 1336-1 1420-8 1422-0 1404-6 1366-7 1306-7 1321-7	1990/91  MAY  721.5 699.6 692.7 655.8 633.3 610.2 5524.5 571.2 494.3 472.6 454.7 428.1 415.4 402.9	JUN = 279.2 272.0 264.5 5 249.5 2230.1 233.3 6 225.8 223.1 213.0 209.5 200.8 197.7 193.7	(OISCHA JUL = 156.6 153.9 1146.7 144.8 139.6 135.4 139.5 133.2 131.8 129.7 126.5	RGE (mm. AUG 78.2 2 77.1 76.3 75.7 74.9 8.100.6 100.0 99.3 99.4 97.5 97.5 96.0 95.7 92.7 92.7	3/sec)]  SEP  84.0 84.0 81.2 81.2 80.4 79.8 73.6 74.1 73.6 72.8	ANNUAL
OM	SY. 7 OCT 73.6 73.6 73.6 74.9 74.1 73.9 74.9 74.9 74.7 74.9 74.7 74.9 74.9 74	1-150 Z  NOV  S8.1  67.9  67.9  67.6  68.6  68.6  68.6  68.6  68.6  68.6  68.7  65.9  67.9  65.9  67.9	AMBEZI DEC 87.1 88.3 89.5 103.1 105.0 105.6 109.8 111.4 112.7 120.7 129.0 131.4 135.0 139.3 144.8 148.5 153.5	PUMP H	OUSE 1347.4 1389.6 1445.4 1492.7 1577.3 1576.9 1510.5 2233.5 2293.8 2293.8 2293.8 2293.8 2311.5 2316.0 2318.0 2318.0 2318.0 2318.0 2318.0 2318.0 2318.0	MAR ## 1969 .7 1969 .7 1961 .3 1851 .9 1767 .0 1567 .5 1519 .0 1567 .5 1241 .9 1256 .1 1241 .9 1256 .1 1241 .9 1256 .1 1298 .5	YEAR:  ***********************************	1990/91 MAY 721.5 699.6 612.7 656.8 633.3 610.2 592.0 571.2 554.4 528.5 510.2 494.3 472.6 442.9 442.9 448.9 415.4 402.9 378.5 378.5	JUN 279.2 272.0 5 249.5 249.3 229.6 229.6 7 215.7 209.5 202.8 197.1 199.7 199.7 199.7	(OISCHA 156.6 157.9 146.7 144.5 144.5 139.3 138.5 133.2 131.8 129.7 128.3 126.5 1	AUG T8.2 77.1 74.9 37.4 101.5 100.0 99.3 96.4 97.5 97.5 97.5 97.5 97.5 97.5 97.5 97.5	3/sec)] ====================================	ANNUAL
0M1 = == 0 A S b 7 3 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	SY. 7  OCT  73.6  73.6  73.6  73.6  74.4  74.4  74.4  75.4  77.7  71.7  71.2  58.4  68.4	1-150 Z NOV	AMSEZI BT. 1 86.3 89.5 103.1 105.0 105.6 109.8 111.4 112.7 115.6 120.7 123.4 127.5 129.0 131.4 135.0 139.3 144.8 148.8 153.5 153.5	PUMP H ************************************	OUSE 1347.4 1389.6 1445.4 1492.7 1577.3 1630.5 1676.8 1801.7 22158.4 2233.5 2262.8 2308.6 2318.9 2318.9 2348.8 7248.8 7248.8	1969.2 1901.3 1851.9 1785.0 1785.0 1785.0 1787.3 1666.8 1567.5 1519.0 1473.7 1424.3 1250.6 1241.9 1241.9 1241.9 1241.9 1241.9 1241.9 1241.9 1241.9 1241.9 1241.9 1241.9 1241.9 1241.9	YEAR: ""###################################	1990/91  MAY  721.5 699.6 699.6 639.3 610.2 5592.0 571.2 554.4 5528.5 510.2 494.3 472.6 442.9 428.1 415.4 402.9 391.3 378.5	JUN 279.2 272.0 5 249.5 249.5 249.3 229.6 223.1 213.0 209.5 200.8 197.7 191.7 191.7 191.7 187.7	(OISCHA A VUL - 156.6 153.9 146.9 144.8 143.7 144.8 133.5 133.2 133.2 133.2 128.3 129.7 129.3 129.7 129.3 129.7 129.3 129.7 129.3 129.7 129.3 129.7 129.3 129.7 129.3 129.7 129.3 129.7 12	AUG 78.2 78.2 77.1 76.3 75.7 74.9 87.4 101.5 100.0 99.3 99.3 99.4 97.5 97.5 96.0 95.7 92.7 92.7	3/sec)] ====================================	ANNUAL
OM************************************	SY. 7 OCT 73.6 73.6 73.6 74.9 74.1 73.9 74.9 74.9 74.7 74.9 74.7 74.9 74.9 74	1-150 Z NOV	AMSEZI BT. 1 86.3 89.5 103.1 105.0 105.6 109.8 111.4 112.7 115.6 120.7 123.4 127.5 129.0 131.4 135.0 139.3 144.8 148.8 153.5 153.5	PUMP H ************************************	OUSE 1347.4 1389.6 1445.4 1492.7 1577.3 1630.5 1676.8 1801.7 22158.4 2233.5 2262.8 2308.6 2318.9 2318.9 2348.8 7248.8 7248.8	1969.2 1901.3 1851.9 1785.0 1785.0 1785.0 1787.3 1666.8 1567.5 1519.0 1473.7 1424.3 1250.6 1241.9 1241.9 1241.9 1241.9 1241.9 1241.9 1241.9 1241.9 1241.9 1241.9 1241.9 1241.9 1241.9	YEAR: ""###################################	1990/91  MAY  721.5 699.6 699.6 639.3 610.2 5592.0 571.2 554.4 5528.5 510.2 494.3 472.6 442.9 428.1 415.4 402.9 391.3 378.5	JUN 279.2 272.0 5 249.5 249.5 249.3 229.6 223.1 213.0 209.5 200.8 197.7 191.7 191.7 191.7 187.7	(OISCHA A VUL - 156.6 153.9 146.9 144.8 143.7 144.8 133.5 133.2 133.2 133.2 128.3 129.7 129.3 129.7 129.3 129.7 129.3 129.7 129.3 129.7 129.3 129.7 129.3 129.7 129.3 129.7 129.3 129.7 12	AUG 78.2 78.2 77.1 76.3 75.7 74.9 87.4 101.5 100.0 99.3 99.3 99.4 97.5 97.5 96.0 95.7 92.7 92.7	3/sec)] ====================================	ANNUAL
0M************************************	ST. 7 ====================================	1-150 Z NOV	AMSEZI BT. 1 86.3 89.5 103.1 105.0 105.6 109.8 111.4 112.7 115.6 120.7 123.4 127.5 129.0 131.4 135.0 139.3 144.8 148.8 153.5 153.5	PUMP H ************************************	OUSE 1347.4 1389.6 1445.4 1492.7 1577.3 1630.5 1676.8 1801.7 22158.4 2233.5 2262.8 2308.6 2318.9 2318.9 2348.8 7248.8 7248.8	1969.2 1901.3 1851.9 1785.0 1785.0 1785.0 1787.3 1666.8 1567.5 1519.0 1473.7 1424.3 1250.6 1241.9 1241.9 1241.9 1241.9 1241.9 1241.9 1241.9 1241.9 1241.9 1241.9 1241.9 1241.9 1241.9	YEAR: ""###################################	1990/91  MAY  721.5 699.6 699.6 639.3 610.2 5592.0 571.2 554.4 5528.5 510.2 494.3 472.6 442.9 428.1 415.4 402.9 391.3 378.5	JUN 279.2 272.0 5 249.5 249.5 249.3 229.6 223.1 213.0 209.5 200.8 197.7 191.7 191.7 191.7 187.7	(OISCHA A VUL - 156.6 153.9 146.9 144.8 143.7 144.8 133.5 133.2 133.2 133.2 128.3 129.7 129.3 129.7 129.3 129.7 129.3 129.7 129.3 129.7 129.3 129.7 129.3 129.7 129.3 129.7 129.3 129.7 12	AUG 78.2 78.2 77.1 76.3 75.7 74.9 87.4 101.5 100.0 99.3 99.3 99.4 97.5 97.5 96.0 95.7 92.7 92.7	3/sec)] ====================================	ANNUAL
DATE 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 2 2 3 4 5 6	ST. 7  OCT  73.6  73.6  75.2  74.9  74.1  74.4  74.4  75.2  74.9  74.1  75.2  76.0  76.0  76.0  76.0  76.0  76.0  76.0  76.0  76.0  76.0  76.0  76.0  76.0  76.0  76.0  76.0  76.0  76.0  76.0	1-150 Z  NOV  S8.1  68.1  67.9  67.6  68.6  68.6  68.6  68.6  68.6  68.6  68.7  67.9  67.9  67.9  67.9  67.9  67.9  67.9  67.9	AM8EZI DEC 97.1 88.3 89.5 103.1 105.0 105.6 109.8 111.4 112.7 129.4 112.7 129.4 112.7 129.0 139.3 148.8 135.0 139.3 148.8 148.5 157.9 160.1 162.4 162.4	PUMP H	OUSE  1347.4 1389.6 1445.4 1492.7 1577.3 1577.3 1676.9 1801.7 2010.5 2233.5 2233.5 2233.5 2236.0 2311.5 2318.9 2360.7 2318.9 2360.7 2318.9 2360.7 2318.9 2360.7 2318.9 2360.7 2318.9 2360.7 2318.9 2360.7 2318.9 2360.7 2318.9 2360.7 2318.9 2360.7 2318.9 2360.7 2318.9 2360.7 2318.9 2360.7 2318.9 2360.7 2318.9 2360.7 2318.9 2360.7 2318.9 2360.7 2318.9 2360.7 2318.9 2360.7 2318.9 2318.9 2360.7 2318.9 231	MAR ## 1969 .7 1969 .7 1961 .3 1851 .9 1767 .8 1666 .8 1851 .9 1767 .5 1519 .0 1473 .7 1424 .3 1291 .3	YEAR:  """""""""""""""""""""""""""""""""""	1990/91  MAY  721.5 699.6 672.7 656.8 633.3 610.2 551.2 554.4 528.5 510.2 442.3 472.6 442.9 445.4 402.9 378.5 391.3 378.5 395.7 325.9 345.7	JUN 279.2 272.0 264.5 249.5 249.3 223.3 223.3 223.3 225.8 223.1 7213.0 209.5 205.8 157.1 190.7 184.8 101.3 174.6	(OISCHA A VUL - 156.6 153.9 146.9 144.8 143.7 144.8 133.5 133.2 133.2 133.2 128.3 129.7 129.3 129.7 129.3 129.7 129.3 129.7 129.3 129.7 129.3 129.7 129.3 129.7 129.3 129.7 129.3 129.7 12	AUG 78.2 78.2 77.1 76.3 75.7 74.9 87.4 101.5 100.0 99.3 99.3 99.4 97.5 97.5 96.0 95.7 92.7 92.7	3/sec)] ====================================	ANNUAL
DAY 23 A S 6 7 8 9 0 1 2 3 A S 6 7 8 9 0 1 2 3 A S 6 6 7	ST.: 73.6 75.2 74.9 74.4 74.9 75.2 774.4 74.9 75.2 76.9 76.9 77.7 76.9 77.7 76.9 77.7 77.9 77.7 77.9 77.7 77.9 77.9	1-150 Z NOV S===== 68.1 68.1 67.9 67.9 67.6 68.6 68.6 68.6 68.7 67.6 68.7 67.6 68.7 67.8 67.9 67.8 67.9 67.8 68.8 68.8 68.8 68.9 67.8	AMSEZI DEC 87.1 88.3 89.5 103.1 105.0 105.6 111.4 112.7 115.6 120.7 123.4 127.5 129.0 131.4 131.4 127.5 131.4 127.5 131.4 131.4 144.8 153.5 160.1 162.4 162.4 162.4	PUMP H	OUSE  1347.4 1389.6 1445.4 1492.7 1577.3 1630.5 1676.9 1801.7 2010.5 2158.4 2293.8 2308.6 2293.8 2308.6 2293.8 2308.6 2293.8 2308.6 2293.8 2308.6 230	MAR 1969.2 1969.2 1985.0 1785.0 1787.5 1519.0 1473.7 1424.3 1291.3 1256.1 1224.9 1256.1 1285.8 1308.0 1359.3 1341.7 1359.9 1359.0 1359.	YEAR: "************************************	1990/91  MAY  721.5 656.8 6672.7 656.8 633.3 610.2 5524.5 5520.5 510.2 4494.3 472.6 428.1 4402.9 428.1 402.9 3378.5 367.2 3354.9 345.7 325.9 319.8 313.7	JUN 279.2 272.0 264.5 249.5 249.3 2239.3 2225.8 223.1 2293.7 219.7 219.7 1190.7 1187.7 1184.8 187.8 1774.0 1774.0 1774.0	(OISCHA DUL 156.6 153.9 148.7 144.8 143.7 141.5 139.5 139.6 139.6 139.7 120.7 121.0 120.7 121.0 120.7 121.0 121.0 120.7 121.0 120.7 121.0 120.7 121.0 120.7 121.0 120.7 121.0 120.7 121.0 120.7 121.0 120.7 121.0 120.7 121.0 120.7 121.0 120.7 121.0 120.7 121.0 120.7 121.0 120.7 121.0 120.7 121.0 120.7 121.0 120.7 121.0 120.7 121.0 120.7 121.0 120.7 120.7 121.0 120.7 120	RGE (m° 78.2 776.3 75.7 74.9 87.4 101.5 100.6 100.0 99.3 96.4 97.5 97.5 97.5 97.5 96.0 95.7 92.7 92.7 92.7 92.7 92.7 92.7 93.7 92.7 93.7 89.7 89.7 89.7 89.7 89.7 86.8	3/sec)] ====== 84.0 84.0 81.2 80.4 79.8 74.6 73.5 74.6 73.7 72.8 71.0 69.4 69.4 69.4 69.4	ANNUAL
DM************************************	ST. 7  OCT  73.6  73.6  75.2  74.9  74.1  74.4  74.4  75.2  74.9  74.1  75.2  76.0  76.0  76.0  76.0  76.0  76.0  76.0  76.0  76.0  76.0  76.0  76.0  76.0  76.0  76.0  76.0  76.0  76.0  76.0	1-150 Z  NOV  S8.1  68.1  67.9  67.9  67.6  68.6  68.6  68.6  68.6  68.6  68.6  67.9  67.9  67.9  67.9  67.9  68.6	AM8EZI DEC 97.1 88.3 89.5 103.1 105.0 109.8 111.4 112.7 115.6 120.7 129.0 131.4 135.0 134.8 144.8 144.8 153.6 160.1 162.4 162.4 163.4 163.6	PUMP H 1 170	OUSE 1347.4 1389.6 1445.4 157.3 157.3 1630.5 1676.9 2158.4 2191.5 2233.5 2233.5 2233.6 2316.0 2318.9 2360.7 2318.9 2360.7 2318.9 2360.7 2198.7 2126.3 2126.3 2126.3 22126.3	MAR WHEN THE TOTAL TO THE TOTAL THE	YEAR : "***********************************	1990/91  MAY  721.5 699.6 672.7 6558.8 610.2 5592.0 571.2 554.4 528.5 494.3 472.6 442.9 428.1 415.4 402.9 428.1 415.4 402.9 354.9 336.7 336.0 325.9 313.7 336.0 325.9 313.7	JUN 279.2054.5 249.5 249.5 249.3 229.8 225.1 205.9 202.8 197.7 191.7 194.8 177.3 174.6 168.8 177.3	(OISCHA JUL 156.6 153.9 144.9 144.8 143.7 144.8 133.5 133.2 133.2 129.7 128.3 124.4 125.7 121.0 120.7 121.3 124.4 121.0 120.7 121.3	RGE (m: AUG 78.2 77.1 76.3 75.7 74.9 87.4 101.5 100.5 100.0 99.3 98.4 977.5 96.0 95.7 92.7 92.7 92.7 92.7 92.7 92.7 92.7 92	3/sec)] ====================================	ANNUAL
DM = = = = = = = = = = = = = = = = = = =	ST.: 73.6 73.6 75.2 774.9 74.4 74.9 75.2 771.2 3 771.7 1.2 58.4 68.4 68.4 68.4 68.4 68.4 68.4 68.4 6	1-150 Z	AMSEZI DEC 87.1 88.3 89.5 103.1 105.0 105.6 111.4 112.7 115.6 120.7 123.4 127.5 129.0 131.4 131.4 127.5 131.4 127.5 131.4 131.4 144.8 153.5 160.1 162.4 162.4 162.4	PUMP H	OUSE  1347.4 1389.6 1445.4 1492.7 1577.3 1630.5 1676.9 1801.7 2010.5 2233.5 2233.5 2233.5 2248.8 2293.8 229	MAR 1969.2 1969.2 1985.0 1785.0 1787.5 1519.0 1473.7 1424.3 1291.3 1256.1 1224.9 1256.1 1285.8 1308.0 1359.3 1341.7 1359.9 1359.0 1359.	YEAR:  """""""""""""""""""""""""""""""""""	1990/91  MAY  721.5 659.6 672.7 656.8 633.3 610.2 551.2 554.4 528.5 510.2 472.6 442.9 472.6 442.9 472.6 442.9 378.5 378.5 354.9 378.5 355.7 335.7 335.7 305.6	JUN 279.2 272.0 2549.5 2239.3 2239.3 2239.3 2223.1 233.3 2225.8 2233.1 2131.7 190.7 1931.7 1931.7 1931.7 1931.7 1931.7 1931.7 184.6 165.8 4 164.8 1664.8 1664.8 1661.8	(OISCHA JUL 156.6 153.9 151.6 144.7 144.7 144.8 144.7 141.5 138.6 138.4 139.3 126.7 128.7 128.7 128.7 128.7 128.7 129.7 119.7 179.7 119.7	RGE (m: 78.2 78.2 78.7 74.9 87.4 101.5 100.6 100.0 99.3 99.4 997.5 99.2 1 99.9 90.9 90.7 89.7 89.7 89.7 89.7 89.7 89.7 89.7 89	3/sec)] ====================================	ANNUAL
OM************************************	ST.:	1-150 Z	AMSEZI DEC 97.1 88.3 89.5 103-1 105.6 108.1 109.8 111.4 112.7 115.6 120.7 123.4 112.7 123.4 120.7 123.4 135.0 139.3 148.5 157.3 160.4 162.4 162.4 162.4 162.4 162.4 162.4 162.4 162.4 163.5 166.8	PUMP H	OUSE  1347.4 1389.6 1445.4 1492.7 1577.3 1630.5 1676.9 1801.7 2010.5 2158.4 2262.8 2293.8 2308.6 2293.8 2308.6 2318.9 2316.0 2318.9 2360.7 2348.8 2273.8	MAR ## 1969. 2 1969. 2 1785. 0 1785. 0 1785. 0 1785. 0 1785. 0 1787. 1 1727. 8 1688. 0 1589. 0 1473. 7 1424. 3 1291. 3 1250. 5 1241. 9 1255. 1 1255. 1 1255. 0 1329. 3 1341. 7 1339. 0 1341. 7 1339. 0 1341. 7 1339. 4 1353. 0	YEAR:  """""""""""""""""""""""""""""""""""	1990/91  MAY  721.5 659.6 672.7 656.8 633.3 610.2 551.2 554.4 528.5 510.2 472.6 442.9 472.6 442.9 472.6 442.9 378.5 378.5 354.9 378.5 355.7 335.7 335.7 305.6	JUN 279.2054.5 249.5 249.5 249.3 229.8 225.1 205.9 202.8 197.7 191.7 194.8 177.3 174.6 168.8 177.3	(OISCHA JUL 156.6 153.9 144.9 144.8 143.7 144.8 133.5 133.2 133.2 129.7 128.3 124.4 125.7 121.0 120.7 121.3 121.0 120.7 120.7 121.0 120.7 120.7 120.7 120.1 120.7	RGE (m: AUG 78.2 77.1 76.3 75.7 74.9 87.4 101.5 100.5 100.0 99.3 98.4 977.5 96.0 95.7 92.7 92.7 92.7 92.7 92.7 92.7 92.7 92	3/sec)] ====================================	ANNUAL
DMY 1234567390123456789022345667	ST.:  73.6 75.2 774.9 74.4 74.9 75.2 775.2 770.2 76.9 771.2 770.2 76.9 770.2 770.2 770.2 770.2 770.2 770.2 770.2 770.2 770.2 770.2 770.2 770.2 770.2 770.2 770.2	1-150 Z NOV SSENT SENT SENT SENT SENT SENT SENT SENT	AMSEZI BOC 87.1 88.3 89.5 103.1 105.0 105.6 108.1 109.8 111.4 112.7 115.6 127.5 123.4 127.5 123.4 127.5 129.0 131.4 131.4 131.4 131.4 144.8 153.5 162.4 162.4 162.4 162.4 163.6 163.6 165.4 165.4 165.4	PUMP H	OUSE  1347.4 1389.6 1445.4 1492.7 1577.3 1630.5 1676.9 1801.7 2010.5 2158.4 2262.8 2293.8 2308.6 2293.8 2308.6 2318.9 2316.0 2318.9 2360.7 2348.8 2273.8 2308.6 2316.0 2318.9 2300.7 248.8 2308.6 2316.0 2318.9 2300.7 248.8 20017.4	MAR 1969.2 1901.3 1851.0 1785.0 1785.0 1785.0 1787.5 1519.0 1473.7 1424.3 1250.6 1241.9 1256.1 1274.8 1291.3 1250.1 1274.9 1255.1 1274.9 1255.1 1274.9 1255.1	YEAR: """"""""""""""""""""""""""""""""""""	1990/91  MAY  721.6 659.6 699.6 692.7 655.8 633.3 610.2 5528.5 510.2 494.3 472.6 454.7 307.8 378.5 367.2 336.7 3354.9 345.7 3354.9 345.7 3356.7 3356.9 319.8 319.8 319.8 319.8 319.8 319.8 319.8 319.8 325.9 325.9 326.6	JUN 279.2 272.0 264.5 249.5 249.3 2239.1 239.3 2225.8 223.1 239.7 219.7 219.7 219.7 1190.7 1191.7 1191.7 1191.7 1191.7 1191.7 1191.7 1191.7 1191.7 1191.7 1191.7 1191.8 11	[OISCHAM JUL   156.6   143.7   144.8   143.7   144.5   139.5   135.4   139.5   135.4   137.7   141.5   137.7   141.7   137.7   141.7   137.7   141.7   137.7   141.7	RGE (m. 78.2 77.3 78.7 74.9 87.4 101.5 100.6 100.0 99.3 98.4 97.5 97.5 97.5 97.5 96.0 95.7 92.1 89.7 87.7 82.1 84.6 84.3 84.3	3/sec)] ====================================	ANNUAL
OM************************************	ST. 7 73.6 73.6 75.2 74.9 774.9 774.9 774.1 773.9 774.4 775.2 74.4 68.4 68.4 68.4 68.4 68.4 68.4 68.4 6	1-150 Z  NOV  S8.1  68.1  67.9  67.6  68.6  68.6  68.6  68.6  68.6  68.7  67.9  67.9  67.9  67.9  67.9  67.9  67.9  67.9  67.9  68.6	AM8EZI DEC 97.1 88.3 89.5 103.1 105.0 105.6 109.8 111.4 112.7 129.4 112.7 129.4 112.7 129.4 135.0 139.3 144.8 135.0 139.3 148.5 157.9 166.4 162.4 162.4 163.6 166.8 157.6	PUMP H	OUSE  1347.4 1389.6 1445.4 1492.7 1577.3 1576.9 1801.7 2010.5 2233.5 2233.5 2233.5 2236.0 2311.5 2318.9 2360.7 2318.9 2360.7 2318.9 2360.7 2318.9 2360.7 2318.9 2360.7 2318.9 2360.7 2318.9 2360.7 2318.9 2360.7 2318.9 2360.7 2318.9 2360.7 2318.9 2360.7 2318.9 2360.7 2318.9 2360.7 2318.9 2360.7 2318.9 2360.7 2318.9 2360.7 2318.9 2360.7 2318.9 2360.7 236	MAR ## 1969 .7 1901 .3 1851 .9 1727 .8 1666 .8 1851 .9 1727 .8 1666 .8 1851 .9 1727 .2 1241 .9 1256 .1	YEAR:  """""""""""""""""""""""""""""""""""	1990/91  MAY  721.5 659.6 672.7 656.8 633.3 610.2 551.2 554.4 528.5 510.2 4428.1 442.9 4428.1 445.4 402.9 378.5 391.3 378.5 395.7 335.7 305.6 325.9 313.7 305.6 224.9	JUN 279.2 272.0 264.5 2239.3 2239.3 2239.3 2223.1 2239.3 2223.1 213.0 2209.5 216.7 1191.1 190.7 184.8 181.8 174.0 168.4 161.8 151.9 3	[OISCHA JUL 156.6 153.9 151.6 144.7 144.7 144.8 144.7 141.5 139.6 136.4 136.4 137.7 141.5 138.6 138.4 122.7 121.0 126.7 119.7 170.1 119.7 170.4 122.7 119.7 170.4 122.7 110.4 122.7 122.7 122.7 122.7 110.4 122.7	RGE (mm 78.2 78.2 78.7 74.9 87.4 101.5 100.6 100.0 99.3 99.4 997.5 99.2 7 92.1 99.3 90.3 90.3 90.3 90.3 90.3 89.7 89.7 89.7 89.7 89.7 89.7 89.7 89.7	3/sec)] ======= 84.0 84.0 81.2 80.4 79.8 73.6 73.6 72.8 72.5 71.0 71.0 75.7 69.4 68.4 68.4 68.4 67.6	ANNUAL
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#### <<< DB-06B >>> HOURLY DISCHARGE

Using the discharge rating curve prepared by DB-03 or DB-04, this system convert the hourly river water level filed in DB-06A to hourly discharge, an output hourly discharge tables.

To begin this filing, use the same diskette as DB-06A, in each file contains hourly river water level in feet, hourly river water level in meter and hourly river water discharge table.

```
*** for example ***

Diskette No. DB-06B (DB-06A) 5-030 EXCHANGE FARM

Select /File

Select /Retrieve

Highlight \1991\APR.WK1.....Exchange Farm Apr.1991

Press ENTER to retrieve APR.WK1
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The following worksheet appears on your screen. Be sure that in third table (discharge table) contains a discharge rating formula prepared by either DB-03 or DB-04.

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[ Printing the Worksheet ] Print your worksheet as same as previous filing system. The printed worksheet should look like the followings.

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					100

# <<< DB-07 >>> DISCHARGE CORRELATION ANALYSIS

This system prepares the correlation curve(s) between two stations' discharge. The curve(s) will be used to fill the missing or not-available discharge data in the table output from DB-05B. The equation of the lines are;

$$y = aX + b$$

where, a is the regression coefficient of y versus x, b the regression constant of x versus y.

The correlation coefficient (:f) is used statistical parameters for measuring the degree of association of two linearly dependent variables. It is determined as;

$$f = \frac{\sum xi \cdot yi - (\sum xi)(\sum yi)/N}{\sqrt{\{\sum x^2i - (\sum xi)^2/N\} \cdot \{\sum y^2i - (\sum yi)^2/N\}}}$$

To begin this filing, use the following steps;

\*\*\* for example \*\*\*

Diskette No. DB-07 /File Select

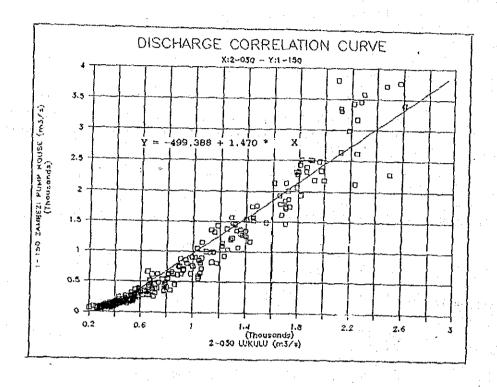
/Retrieve Select

\0401.WK1......st.No.2-030-st.No.1-150 Highlight

ENTER to retrieve 0401.WK1 Press

	MUNITHLY DISCHARGE CORELATION BETWEEN X: NO.04 2-030 LUKULU			•
	Y: NO.01 1-150 ZAMBEZI PUMP HOUSE	(DISCHARGE U	NIT: m3/s)	
rge	NO YEAR-MONTH ST:X ST:Y	X*Y X^2	Y^2	
ischar	2 11 280.9 72.1 12 349.4 120.8	15865.25 67644.73 20251.81 78896.42 42210.26 122096.21	5198.41 14592.64	
ly D		193774.43 344798.27 092582.24 1203343.44 -		
다.				
n Mon		19611.58 77603.26 34536.66 109645.81 77591.11 178016.61	10878.49 33819.21	
Mean	312 2 1.135.3 1.354.5 1 313 8 403.9 168.1	423993.65 475764.76 537739.77 1288865.72 67887.20 163094.90 39715.97 119063.79	1834670.25 28257.61	
	***************************************	39715.97 119063.79 ====================================	#=# <b>#</b>	
-	y - a + b*X x = a' + b'*Y (a'=-a/b, b'		1.47001	Equation
	Core	a'= b'= lation Coefficient c=	0.68027	 

According to result of correlation, Zambezi Pump House can be correlated by using equation Y = -499.388 + 1.470 \* X. And the correlation curve will draw as follows;



#### <<< DB-08 >>> FLOW REGIME TABLE

This system prepares the flow regime of each year by stations under the following condition,

The risk level of design flow is set as 1/10 year probability. Therefore, the year which has the 3rd-small drought discharge (Q355day: discharge exceeding 355day in a year) among 30 years, is decided as design year in this Study.

To begin this filing, use the following diskette same as DB-05B.

#### \*\*\* for example \*\*\*

Diskette No. DB-05B 1-150 ZAMBEZI PUMP HOUSE

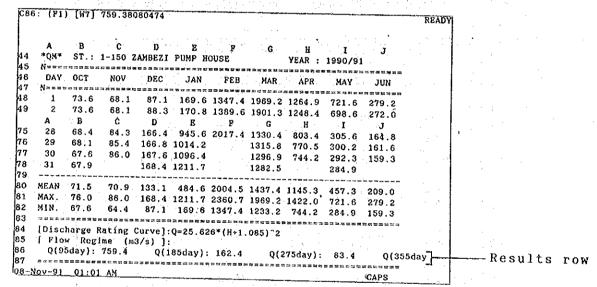
Select /File

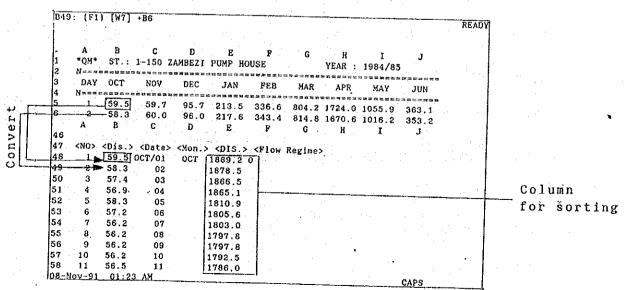
Select /Retrieve

Highlight \9091\9091.WK1.....Zambezi Pump House 1990/91

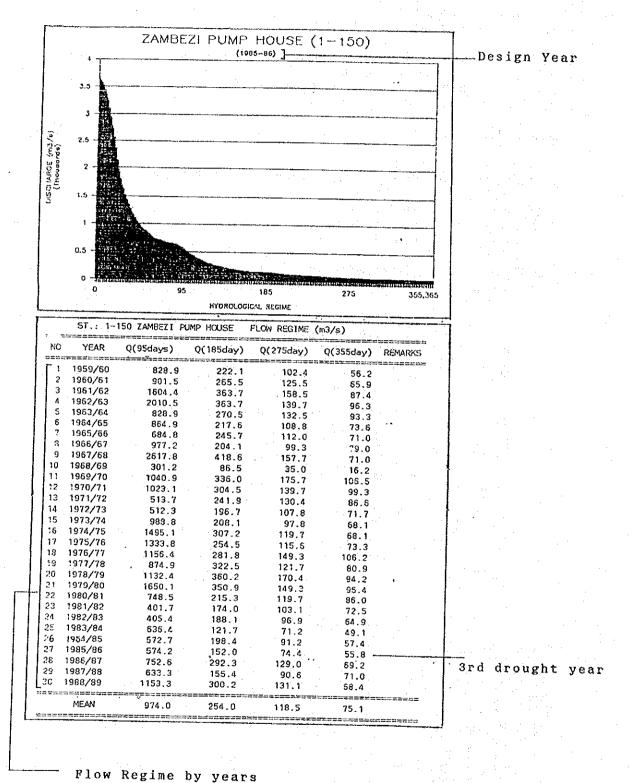
Press ENTER to retrieve 9091.WK1

#### The following worksheet appears on your screen.





After calculating the flow regime of each year, summarize those results into the following table.



#### <<< DB-09 >>> RIVER WATER ANALYSIS

This system prepares the annual and monthly tables of river flow, using the data obtained from DB-05B and DB-10.

\*\*\* for example \*\*\*

Diskette No. DB-09 (3) Select /File

Select /Retrieve

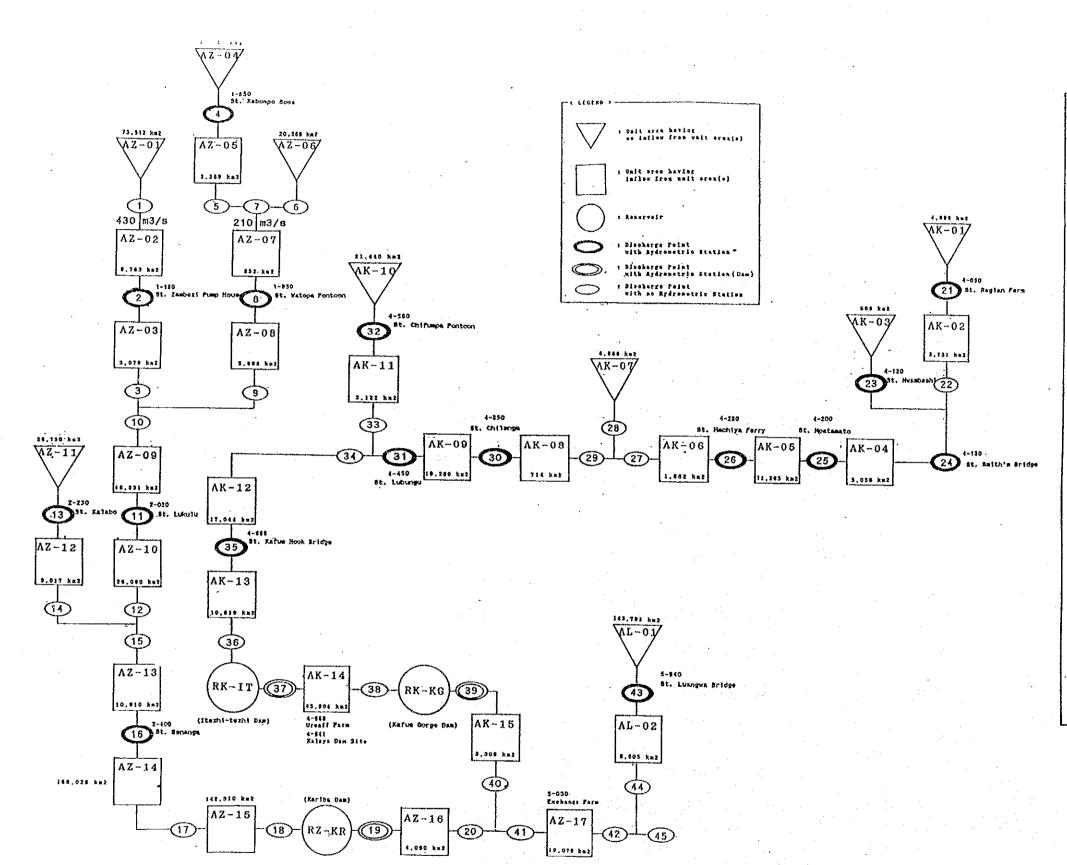
Highlight \30Y\DB09.WK1.....Water Balance for 30Y

Press ENTER to retrieve DB09.WK1

The flow pattern of main river can be described as the following. The discharge point exists 45 points and each discharge can be estimated by the formula after substituting actual mean monthly discharge into DB-09 table.

The following table shows period of between 1979/80 and 1988/89.

=	0.011	<del></del>	- <del></del>	AA100 A 2717TA1 1117	10011-43	20/05	00.604	04/64	61 601	20101	OA JOF	or for	se /o=	07.600	80 /0/	MEAN	
ASS AS	BAS!NS	No.	ST.	POINT & STATION NAME	MEA(ka2)	19/80	80/81	81/82	82/83	83/8 <del>4</del>	\$4/63	83/85 	65/87 	¥1/88	88/83	/ICAN	
UPPE	ZAMBEZI			Cholose	73,512	749	183	285	237	395	382	413	. 481	370	688	575	
l :	•		1-150	St. Zaabezi Rump House		830	573	338 350	281 291	469 485	453 489	490 508	571 591	446 455	816 845	E83 701	
Ι.	:	(3)		Zaobezi R. Portion	90,353 42,740	921 293	593 240	109	201	124	153	181	243	208	153	223 —	
,		(5)	1-650	St. Kabospo Bona Kabospo R. Portion	45,029	235	247	118	201	125	157	184	241	207	155	221	
		(6)		Danaxe R. Portion	20,568	28	82	74	1	15	35	26	-17	-6	20	41	
] .		(7)		Confluence	85,597	325	309	191	201	141	192	210	224	201	175	258	
	•		1-950		65,449	326	312	191	201	142	193	211	223	201	177	270 —	
1 .	٠	(9)		Kabango R. Portion	72,347	334	329	215	201	148	203	218	218	199	182	282	
1 .	•	(10)		Confilience	162,700	1255	922	568	192	632	\$73	728	810	854	1028	989	
1 .	•	(11)	2-030	St. ໄໝ່ນໃນ	205,531	1003	795	578	537	594	825	628	768	671	871	822	<del> </del>
١.	,	(12)		Zaobezi R. Portion	228,G75	1031	833	623	545	639	100	674	780	722	828	884	1
1.		(13)	2-250	St. Kalabo	34,521	75	78	32	10	38	51	47	38	85	175	75 —	<del>                                     </del>
	•	(11)		Luanginua R. Portion	41,233	85	89	48	43	51	73	6 İ	61	80	183	<b>9</b> 5	1
1.	•	(15)		Confluence	269,309	1115	355	677	883	691	773	135	840	802	1080	\$\$0	1
1.	•			St. Senanga	278,298	1127	\$38	699	592	709	804	754	670			1005	<del> </del>
'	XARUE		4-050		4,393	57	35	21	29	21	30	43	37	26	28	38 -	<u> </u>
1 '	•	(22)		Kafue R. Portion	7,130	85		46	64	50	75	98	75	56	69	72	
Ι.	•			St. Marbashi	859	8	10	5	6	4	9	13	?	6	5	8 -	<del> </del>
Ι.				St. Smith's Bridge	8,559	101		51	70	54	85	111	82		75	80	
1:	•			St. Mpatamato	11,655	123	109	58	76	80 79	121 178	176 195	80 117	-		180 148	1
1:	•		4-289	St. Machiya Ferry	22,920	198	174 183	90 95	103 107	. 83	185	203	120			155	1
1.		(27)		Kefue R. Portion	24,592 8,866	207 58		35 25	20	. 03 20	34	38	21			37	İ
١.		(28) (29)		Lussishi R. Portion Confluence	33,448	265		121	127	103	219	241	161			192	
1.			4 250		34,152	270		123	129	104	222	211	143				
١.				St. Chilenga St. Lubungu	54,42	279		128	125	111	212	237	148			206 -	
١.				St. Chifuspa Postcon	21,445	145		56	44	51	269	274	74	*		112 -	<u> </u>
١.		(33)	4 300	lunga R. Portion	24.418	147		62	48	55	243	245	72			114	
		(34)		Confluence	18,858	428		190	173	186	455	482	220	231	235	320	ĺ
				St. Kafue Hook Bridge	95,053	440		221	193	190	310	324	209			329 -	ļ
LOVE	R ZAMBEZ I			Trivingstone	455,324	1486	1325	791	818	916	898	899	977	935	1458	1041	
•		(18)		In (Kariba Can)	508,634	1772	1972	814	902	915	1312	1240	1053	1233	1828	1308	1
1.	•	(188	)	Everoration		285	303	331	305	294	282	247	278	252	260	285	
1.	•	(185		Storage		14	. 13		-434	-312	57	82	-61			~40	i
	. •	(19)	+ 7	Out (Kariba Dam)		1473			1031	957	972		839				
1 *	.*	(20)		Zambezi R. Portion	612,724	1481			1033	910	136	921	.641			1071	1
1.	KAPUE	(38)		In (Itezhi-tezhi Dan)	105,672	488			171	!\$8	323						İ
Ι.		(388		Evaporation	<del></del> .	18	,		17	H	15		19			17	1.
		(355		Storage		3			-24	-48	79		-20				.
1:	•	(31)		Out (Itezhi-tezhi Con)		444			178	193	238		201			264	
1.		(38)		In (Kafue Gorge Dag)	151,576	520			182								
Ι.		(385		Evaporation	. —	31			19	12		39	38				1
1:		(383	•	Storage		. 18		-10		2		•					
1.	•	(39)		Out (Kafue Gorge Dan)		471			159	164	158					• • • •	1
		(40)		Kafue R. Portion	154,892	474			173	159							İ
	IAMEZI			Confluence	167,605	1955				1133	,						ļ
1:	********	(42)		Zarbezi R. Portion	788,686												1
1:	LUANGRA				143,781 150,585	722 758											T
1	144821	(4)		Luangea R. Portion Confluence	139,360	2719					1918						1



```
HETHOD TO OBTAIN DISCHARGE Q(x)
 Q( 1) " Q( 2) x (73,512/82,275) " Q( 2) x 0.893
 Q(2): Calculated with water level & rating curve
 Q(3) = Q(2) \times (85.353/82.275) = Q(2) \times 1.037
 Q(4): Obtained from water level & rating curve
 Q(5) = Q(4) + \{Q(8) - Q(4)\} \times \{2.287/23.707\}

Q(6) = \{Q(8) - Q(4)\} \times (20.568/23.707)

Q(7) = Q(5) + Q(6)

Q(8) : Calculated with water level A rating curve <math>Q(9) = Q(8) + \{Q(8) - Q(4)\} \times (5.898/23.707)
 Q(10) = Q(3) + Q(9)
 Q(11): Calculated with water level & rating curve
 Q(12) = Q(11) + (Q(16) - Q(11) - Q(13)) \times (26,090/45,017)
 Q(13): Calculated With water level & rating curve Q(14) = Q(13) + \{Q(16) - Q(11) - Q(13)\} \times \{8,017/45,017\}
Q(15) = Q(12) + Q(14)
 Q(16) : Calculated with water level & rating curve
 Q(17) = Q(16) + (Q(18) - Q(16)) \times (188,026/202,326)
 Q(18): Obtained from res. water level & H-V curve
 Q(18E): Water Use for Irrigation and Drinking
 Q(185): Variation of Reservoir Water Level
 Q(19) : Obtained from dam gate operation data
 Q(20) = Q(19) + 4.090 \times C
Q(21): Calculated with water level & rating curve Q(22) = Q(24) - Q(21) - Q(23)

Q(23): Calculated with water level & rating curve
 Q(24) : Calculated with water level & rating curve
 Q(25) : Calculated with water level & rating curve
 Q(26) : Calculated with water level & rating curve
Q(27) = Q(26) + \{Q(30) - Q(26)\} \times \{1.662/11.242\}

Q(28) = \{Q(30) - Q(26)\} \times \{8.866/11.242\}

Q(29) = Q(27) + Q(28)
 Q(30) : Calculated with water level & rating curve
 Q(31) : Calculated with water level & rating curve
 Q(32) : Calculated with water level & rating curve
Q(33) = Q(32) + \{Q(35) - Q(31) - Q(32)\} \times \{3,122/39,446\}
Q(34) = Q(31) + Q(33)
'Q(35) : Calculated with water level & rating curve
Q(36): Obtained from res. water level & H-V curve
 Q(36E): Water Use for Irrigation and Drinking
Q(365): Mariation of Reservoir Mater Level,
Q(37): Obtained from dam gate operation data
 Q(38): Obtained from res. water level & N-V curve
 Q(38E): Water Use for Irrigation and Drinking
 Q(38S): Variation of Reservoir Water Level
 Q(39) : Obtained from dam gate operation data
Q(40) = Q(39) + 3.306 \times C

Q(41) = Q(20) + Q(40)

Q(42) = Q(40) + 19.079 \times C
Q(43) : Calculated with water level & rating curve
Q(44) = Q(43) + 6.805 \times C
Q(45) = Q(42) + Q(44)
 Q(46) : Calculated with water level & rating curve
Q(47): Calculated with water level & rating curve Q(48): Calculated with water level & rating curve
```

#### <<< DB-10 >>> RESERVOIR WATER BALANCE

This system calculate the monthly reservoir water balance as the following manner.

Generally, dam and reservoir balance is expressed as the following equation.

$$Qo = Qi + dV + R - E + Qgi - Qgo$$

where,

Qo : Outflow to reservoir
Qi : Inflow from reservoir
dV : Change of storage volume

R : Rainfall to reservoir  $R = r \times (A1 + A2)/2$ 

E : Evaporation from reservoir  $E = Eo \times (A1 + A2)/2$ 

Qgi: Groundwater inflow to reservoir

Qgo: Leakage from reservoir

A1 : Starting reservoir area of calculation period A2 : Ending reservoir area of calculation period

: Rainfall height

Eo: Potential free water evaporation height

Above two factors: Qgi and Ggo are neglected as these parameters do not much affect the balance and data are not available, and inflow (Qi) is calculated on monthly base as an unknown variable. The above equation can be rewritten as follow:

$$Qi = Qo - dV - R + E$$

To begin this filing, use the following steps,

\*\*\* for example \*\*\*

Diskette No. DB-10 Select /File

Select /File Select /Retrieve

Highlight \ITEZHI\9091.WK1.....Itezhi-Tezhi Dam 1990/91

Press ENTER to retrieve 9091.WK1

	990/91	Year:1	7	ZHI-TEZHI	DAM: ITE				(12)	ERATION ]	AIOIR	
•				A.Evap. O E(m3/*) Qo					R.Ares A(Xm2)	Volume V(mcm)	V/Lev B(=	0/91 cotb
*		## ## ## ## ## ## ## ## ## ## ##		M & M & M W W W W W W W W			,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		315	4797	1025.	SEP
<sup>-</sup>	-9.0	19.0	173.0	23.8	10.0	-186.8	210		292	1297	1024.	007
`	-22.8	12.0	152.0	15.2	-10.8	-178.0	140	87	271	3835	1022,	NOV
1	~3.4	32.0	152.0	13.7	28.6	-137.1	140	197	253	3468	1021.	Dec
·	-110.7	254.0	113.0	11.3	123.3	-1.0	120	225	253	3466	1021.	HAL
	-53.8	512.0	106.0	11.3	458.2	341.0	100	42	292	4290	1024.	PEB
٠	35.5	514.0	110.0	15.8	549.5	122.9	140	91	342	5423	1027.	HAR
`   .	179.2	417.0	208.0	17.9	398.2	280.2	150	۰	372	5150	1029.	APR
	19.2	209.0	201.0	10.7	228.2	10.5	120		373	6178	1029,	YAK
	38.4	101.0	162.0	12.9	159,4	-35.5	90	0	370	5086	1029.	JUK
`   '	5.3	69.0	156.0	16.3	74.3	-98.1	120	٥	359	5823	1028.	105
·	7.7	33.0	157.0	18.4	80.7	-114.7	140	ō	346	5516	1027.	AUG
· [	-91.3	38.0	231.0	21.6	-53.3	-305.0	170	و ا	312	4723	1025.	589
'	-0.3	181.9 5737	167.6 5286	18.3 515	181.6 5727	-2.4 -74	135 1820	53 640			6 h & h .	

# <<< DB-12 >>> CORRELATION BETWEEN RIVER AND WELL WATER LEVEL

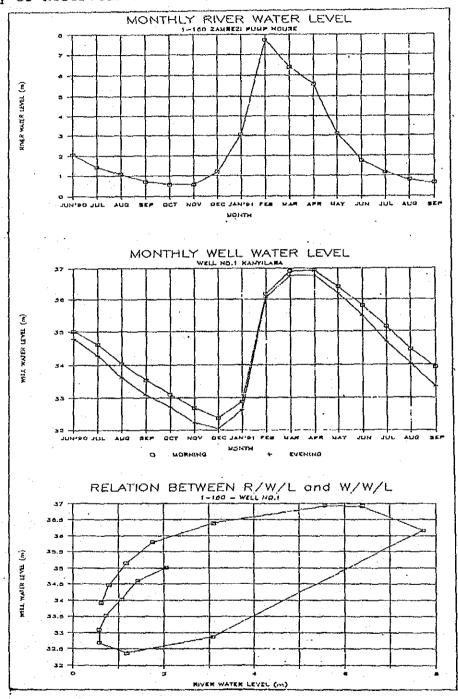
This system analyzed the relationship between the mean monthly river water level and mean monthly well water level.

In DB-11 (Dairy Well Water Level) for each station, the table of the system are existing.

Now, retrieve the same file as DB-11, it appears the following worksheet in your computer.

1197	2: (F	2) [W7	@VALUE	(SHS6)	-9VALUE	(SH\$14)	-8181		يد بي	-for		EADY		-		
•	A	B	c	D	E	F	G	Н	1	- 101°		a				
82 83	MEAN MAX. MIN.	9.18 9.41 8.66		9.85 9.87 9.83	9.26 9.87 7.49	5.86 7.50 4.99	5.12 5.31 4.87	5.13 5.45 4.88	6.09	6.43 6.88 6.08		: " - ;		: :		
	*#*		Well No	1	Kanyila	ıba	********		1990/91	<well< td=""><td>Wate</td><td>7</td><td></td><td></td><td></td><td></td></well<>	Wate	7				
89	N==N- DAY	oct	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN				Mor	thl	y well
90 91 92	Hm He	33.10 32.72	32.69 32.23	32.38 32.05	32.87 32.64	36.17 36.04	36.91 36.78	36.94 36.77	36.39 36.19	35.80 35.47				,wa	ter	table
3 4 5	=== <b>=</b> =	33.10 32.72	32.69 32.23		32.87 32.84	36.17 36.04	36.91 36.78	36.94 36.77	36.39 36.19	35.80 35.47	•	j				
16 17 18											. 1 :	٠	:	٠.		
9	ov-91	05:1	2 AM					,							• •	

[ Creating Graph ]
The following three type of graphs will be required for the system such as monthly river water level and monthly well water levels and relation between R/W/L and W/W/L in this system.
Summary of Reservoir Water Balance

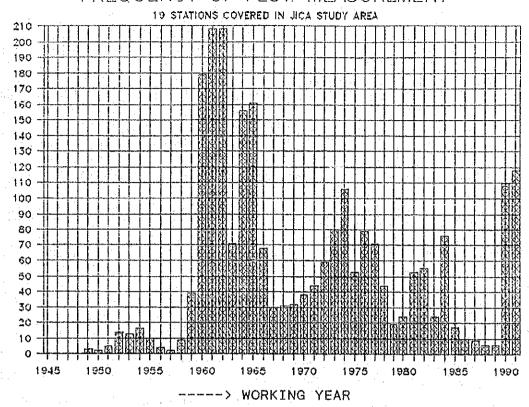


rent in the english was a reason of the complete the first the engineering of the engineering of the engineerin The complete in the engineering of the engineering of the engineering of the engineering of the engineering of	
SUPPLEMENT - 4.2	
SUFFERENT - 4.2	
이 흥미하다 그런 어린 얼굴하는 아무렇게 하는 것은 이 이 얼마로 하는데	
DISCHARGE RATING CURVE BY STATION	ika Parang
그리는 사람들이 많은 사람들이 가를 내려면 하는 것이 나는 살아들이 되었다.	
그 문화로 하루를 하게 되었다. 그는 사람들이 되었다. 그 그 사람이 없는 것 같다.	
LIST OF DISCHARGE RATING CURVE	4 2- 1
LIST OF FLOW MEASUREMENT FREQUENCY	A 0_
<pre><frequency flow="" measurement="" of=""></frequency></pre>	
1_160 7AMPETT DIME HOHER	4.2- 3
1-150 ZAMBEZI PUMP HOUSE	4.2-4
1-650 KABOMPO BOMA	4.2-4
1-950 WATOPA PONTOON	4.2- 5
2-030 LUKULU	A 9_ 6
2-250 KALABO	4.2- 6
2-400 SENANGA	4.2- 6
4-050 RAGLAM FARM	4.2- 7
- 4-120 MWAMBASHIYA AREA AREA AREA AREA AREA AREA AREA AR	4 2 7
4-130 SMITH'S BRIDGE	4 2- 9
4-200 MPATAMATO	* · Z - O
4-280 MACHIYA FERRY	4 2 0
A-95A CUTTENCA	7
4-450 LUBUNGU	4.2- 9
4 500 OUTEHADA DOMINOOM	4.2-10
47000 Unitumpa Punitum	4 0 40
4-009 KAPUE HOOK BRIDGE	4 2-11
4-944 KALEYA DAM SITE	A 9-11
4-958 URUAFF FARM. 5-030 EXCHANGE FARM	4.2-12
5-030 EXCHANGE FARM	4.2-12
5-940 LUANGWA BRIDGE	4.2-13
ZDTCCUADCE DATTNC CHOURS	
1-150 ZAMBEZI PUMP HOUSE	4.2-14
1-650 KABOMPO BOMA	4 2-16
THUSO WATORA PONTOON	4 5 6 5
2-030 LUKULU	4 2-20
2-250 KALABO	4.2-20
2-400 SENANGA	4.2-22
A-DEO DACTAM DADM	4.2-24
4-050 RAGLAM FARM	4.2-26
4-120 MWAMDASHI	4.2-28
4-130 SMITH'S BRIDGE	4.2-30
4-200 MPATAMATO	4.2-32
4-280 MACHIYA FERRY	4.2-34
PA-350 CHILLENGA	4.2-36
4-450 CURINGU	4 6 6
$\Delta - \Omega \Omega \cap \Omega \cap \Omega \cap \Omega \cap \Omega \cap \Omega \cap \Omega \cap \Omega \cap \Omega \cap$	
AMAKY KARIK HOOK URIDER	
4-941 KALEYA DAM SITE	4 9-44
4-941 KALEYA DAM SITE. 4-958 URUAFF FARM. 5-030 EXCHANGE FARM. 5-940 LUANGWA BRIDGE.	7 6 4 6 1 0 40
5-030 EXCHANGE FARM	4.2-40
5-940 THANGWA BRIDGE	4.2~48
CALCULATION OF DISCHARGE RATING CURVE>	4.2-50
	A 950

#### DISCHARGE RATING CURVE

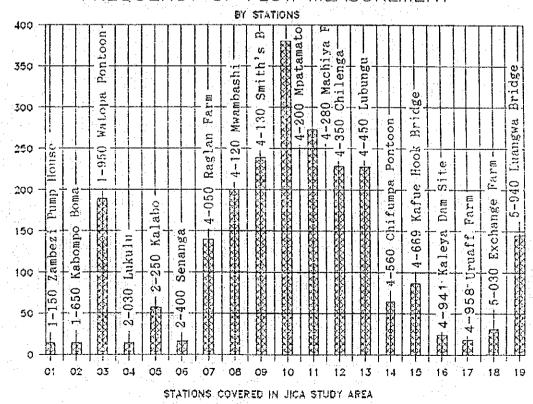
	DISCHARGE RATING CORVE	·
No. Hydrometric St.	Rating Curve	Range
	e Q = 25.626 *(H + 1.085 )^2	
2 1-650 Kabompo Boma	$Q = 66.342 * (H - 0.715)^2$	
3 1-950 Watopa Pontoon	$Q = 29.791 * (H - 0.262)^2$	
4 2-030 Lukulu	$Q = 28.448 * (H + 2.567)^2$	
5 2-250 Kalabo	$Q = 7.404 * (H + 0.654)^2$ $Q = 132.763 * (H - 2.270)^2$	
6 2-400 Senanga	$Q = 50.805 * (H + 1.747)^2$	777 - 77 100 100 100 100 100 100 100 100 100
7 4-050 Raglam Farm	$Q = 5.677 * (H + 0.167)^2$	
8 4-120 Mwambashi	Q = 6.058 *(H - 1.262 )^2 Q = 1.989 *(H - 0.019 )^2	H < 2.920 m H >= 2.920 m
9 4-130 Smith's Bridge	$Q = 6.078 * (H + 0.184)^2$	
10 4-200 Mpatamato	$Q = 7.269 * (H + 0.676)^2$	
11 4-280 Machiya Ferry	$Q = 10.964 * (H - 1.012)^2$	
12 4-350 Chilenga	$Q = 8.771 * (H + 0.439)^2$ $Q = 40.036 * (H - 2.525)^2$	H < 5.134 m H >= 5.134 m
13 4-450 Lubungu	$Q = 31.695 * (H - 0.476)^2$	
14 4-560 Chifumpa pontoon	$Q = 25.326 * (H + 0.562)^2$	
15 4-669 Kafue Hook Bridge	$Q = 110.511 * (H - 0.937)^2$	
16 4-941 Kaleya Dam Site	$Q = 1.780 * (H - 0.115)^2$ $Q = 32.948 * (H - 3.603)^2$	H < 4.663 m H >= 4.663 m
17 4-958 Uruaff Farm	$Q = 8.421 * (H - 0.009)^2$	
18 5-030 Exchange Farm	$Q = 1.684 *(H + 0.084)^2$ $Q = 9.681 *(H - 0.386)^2$ $Q = 21.059 *(H - 0.729)^2$	H < 0.720 m 0.720m <= H < 1.640m H >= 1.640 m
19 5-940 Luangwa Bridge	Q = 60.157 *(H - 1.003 )^2	

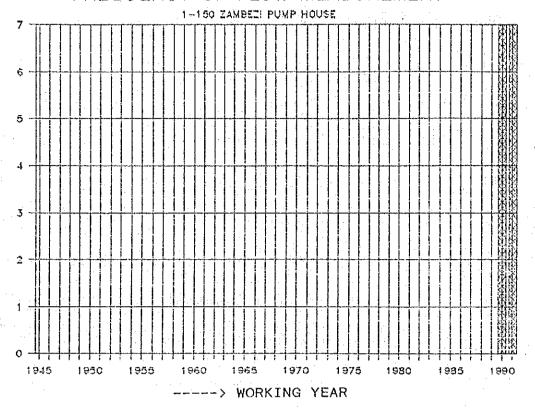
83	YEAR	1-1	50 1-	-650	1-950	2-030		2-400		4-120	4-130	4-200	4-280	4-350	4-450	4~560	4-669	4-941	4~958	5-030	19  5-940	
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76       10       1       3       15       18       5       10       3       3       8       3       79         77       9       4       12       13       8       9       6       7       2       1       71         78       3       1       2       3       7       2       3       1       9       1       44         79       1       1       2       3       7       2       3       1       19       1       44         79       1       1       1       2       3       3       1       15       3       2       19       1       44       44       41       11       2       2       1       13       5       53       33       2       1       1       3       5       53       33       5       53       53       53       55       76       6       6       1       1       1       1       1       1       1       3       1       13       55       76       76       76       76       76       76       76       76       76       76       76       76       76 <td>71 72 73</td> <td></td> <td></td> <td></td> <td>7 5 9</td> <td>   </td> <td></td> <td></td> <td>15</td> <td>13</td> <td>7 [ 19</td> <td>2</td> <td>  12   11   7</td> <td>  6   8   7</td> <td>4</td> <td></td> <td>  3</td> <td>] 3   4   1</td> <td>3</td> <td>4</td> <td></td> <td>44 59 80</td>	71 72 73				7 5 9	 			15	13	7 [ 19	2	12   11   7	6   8   7	4		3	] 3   4   1	3	4		44 59 80
31     <	76 77 78				10 9 3		1		3	15	18	5 8	10	6	3 7 3		8 2 19	2	3	2		79 71 44
85   2   1   1   1   1   3   2   10 87           1   1   2   2   1     1   3   3   3   5   110 86	31 82 83				3				2	3	11 3 9	4 2 1	3	2	2 1 1	   	2 	] 2   1 		•	5   33   2	53 55 24
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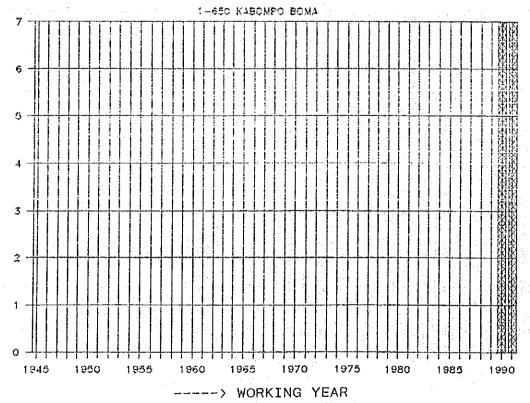


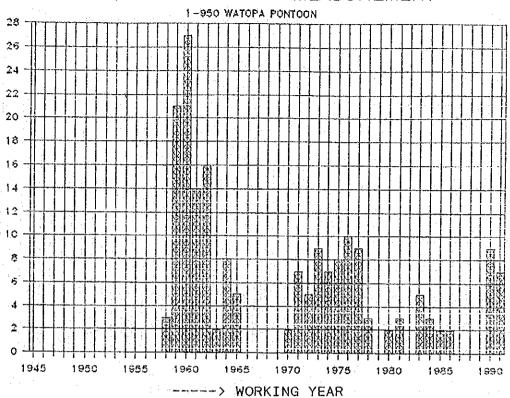
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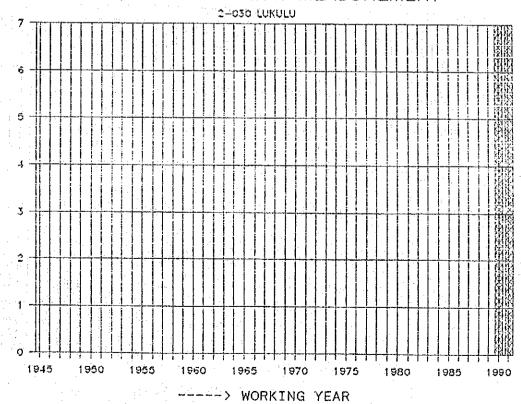


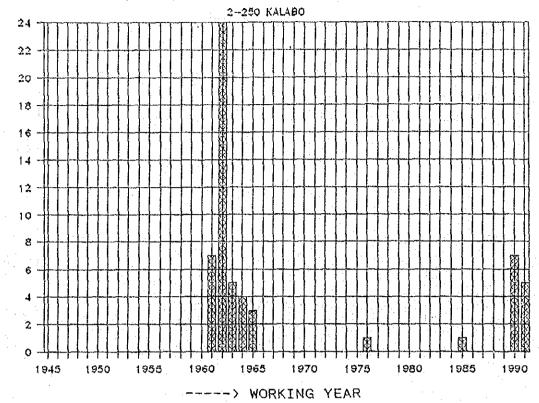




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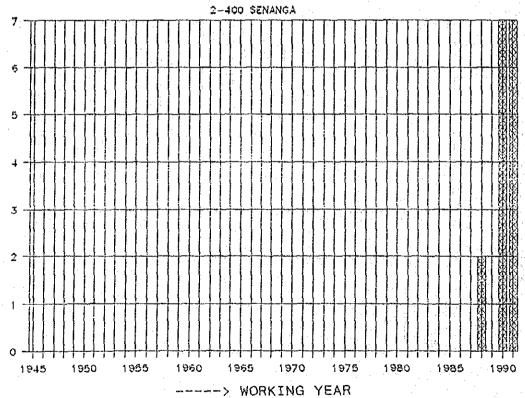
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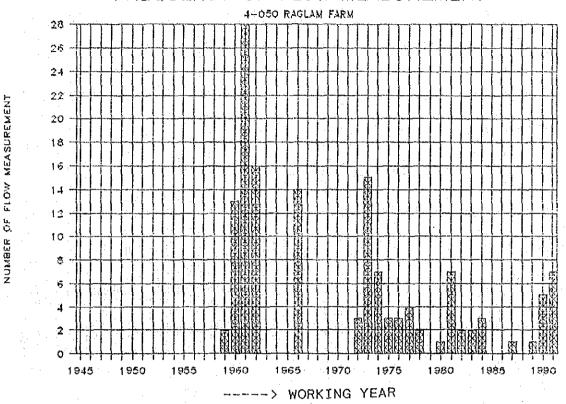


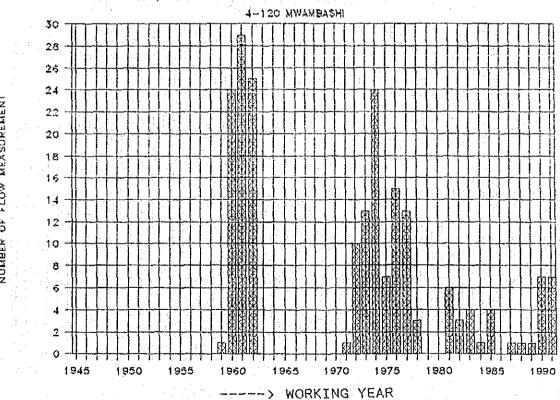


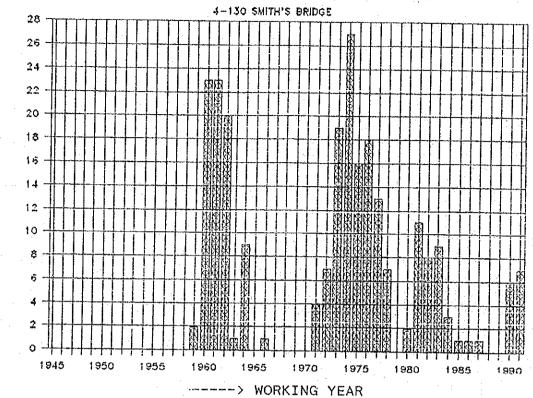
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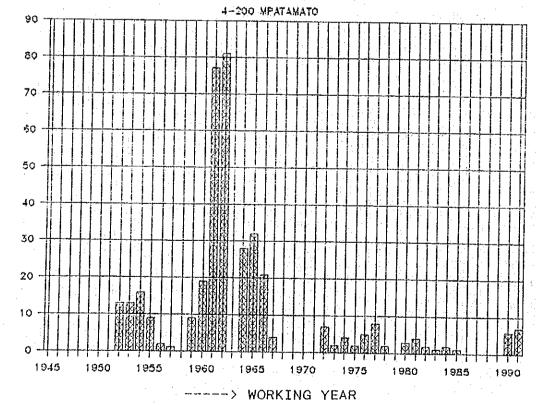


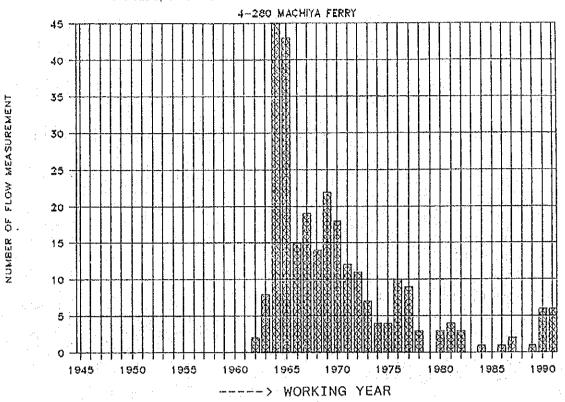




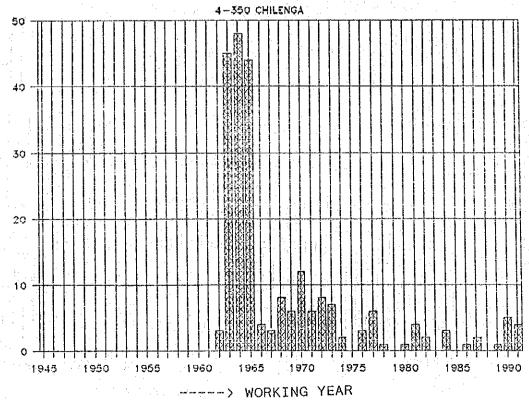
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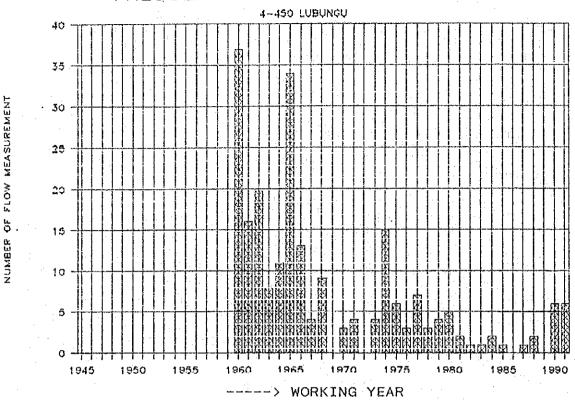




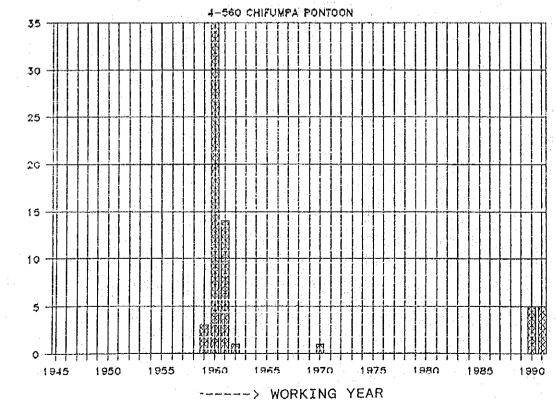


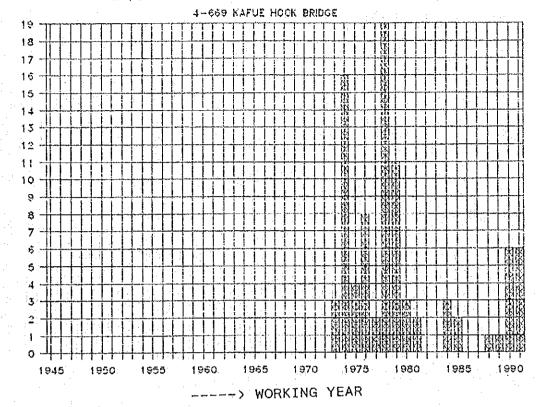






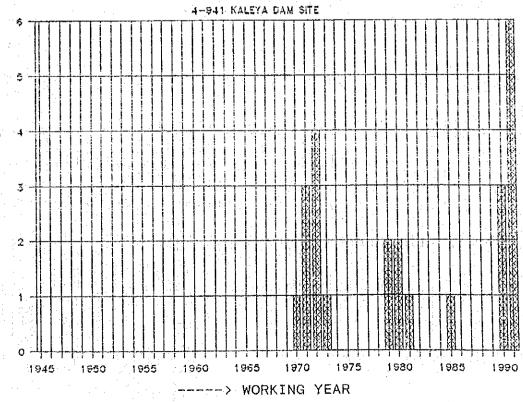
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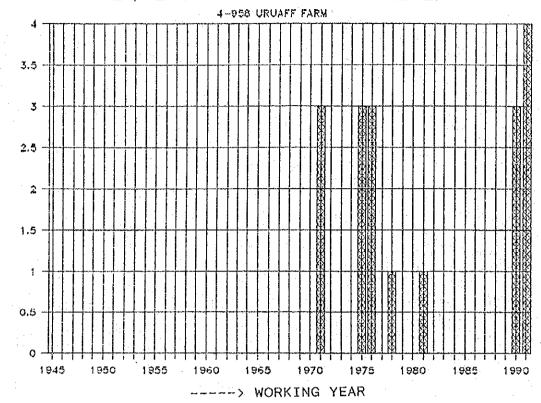




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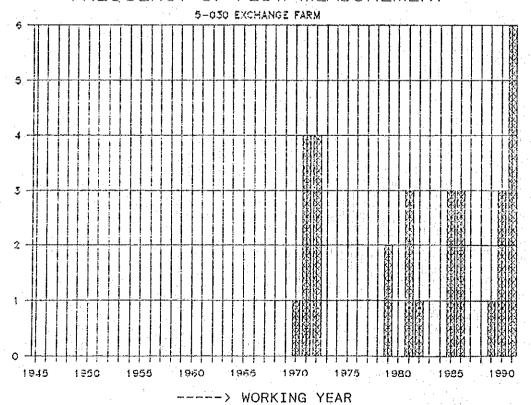
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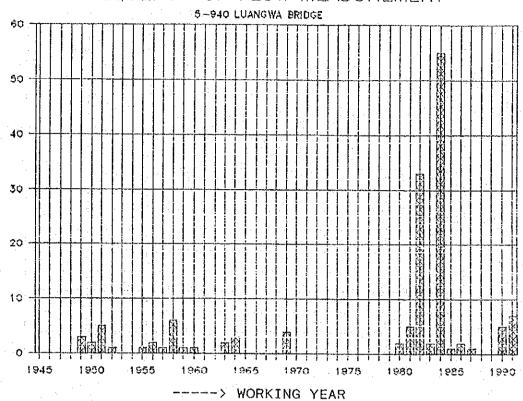


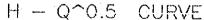


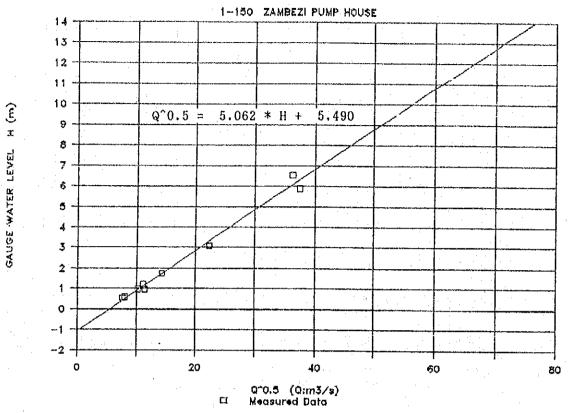
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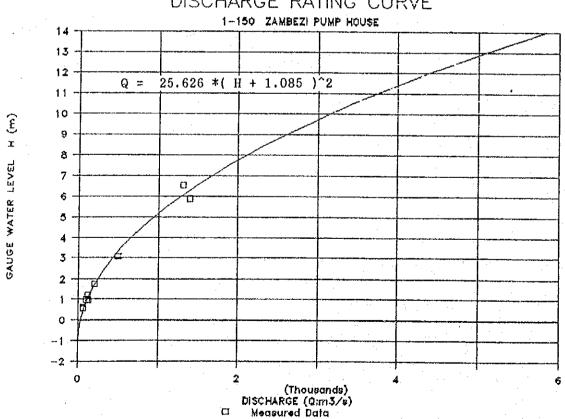


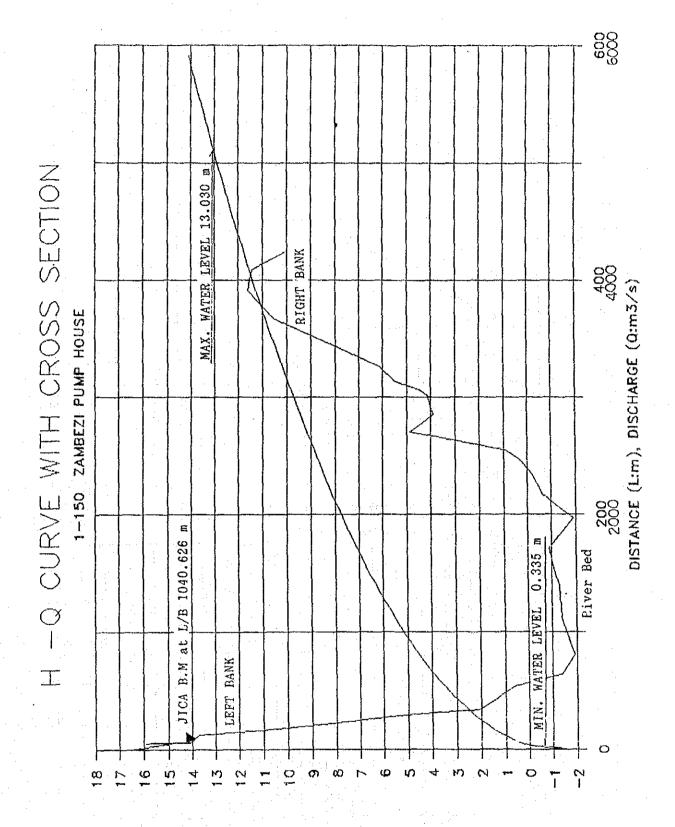




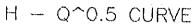


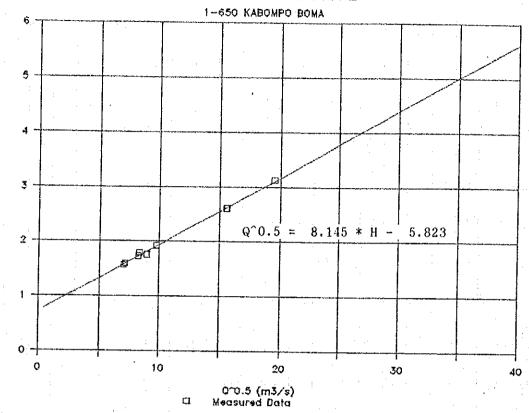






SAUGE WATER LEVEL H (m)



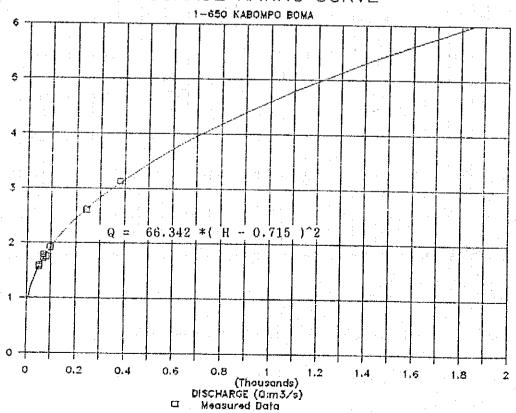


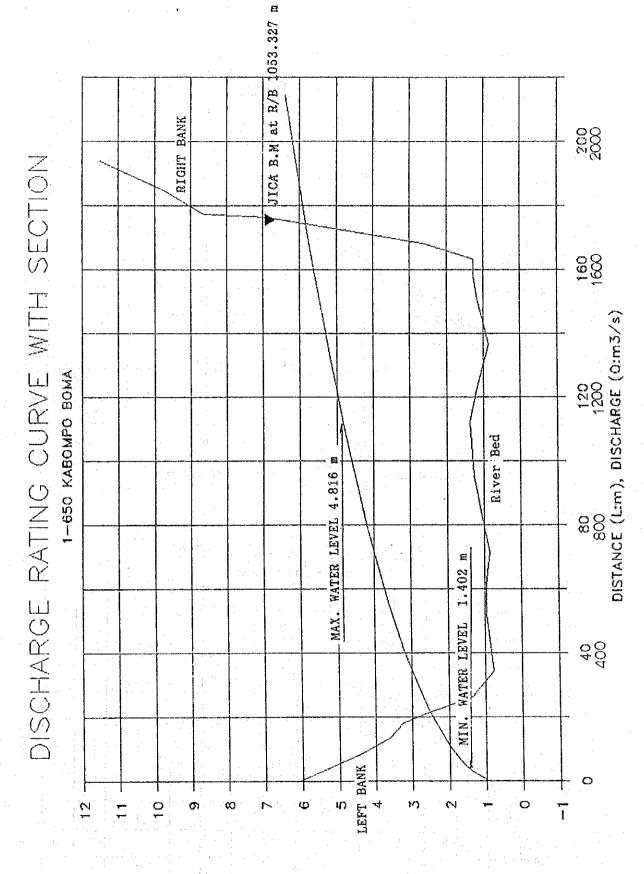
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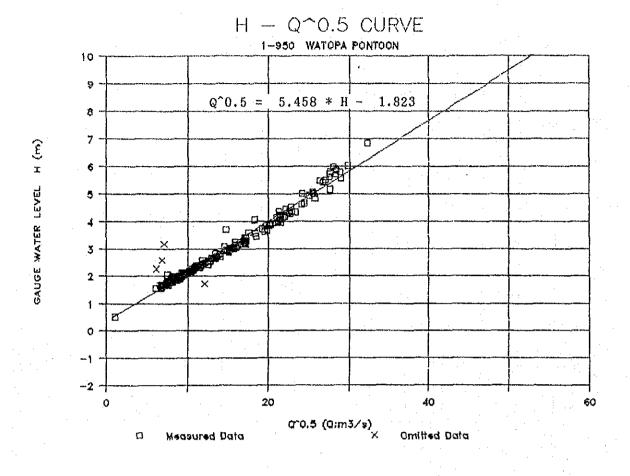
GAUGE WATER LEVEL

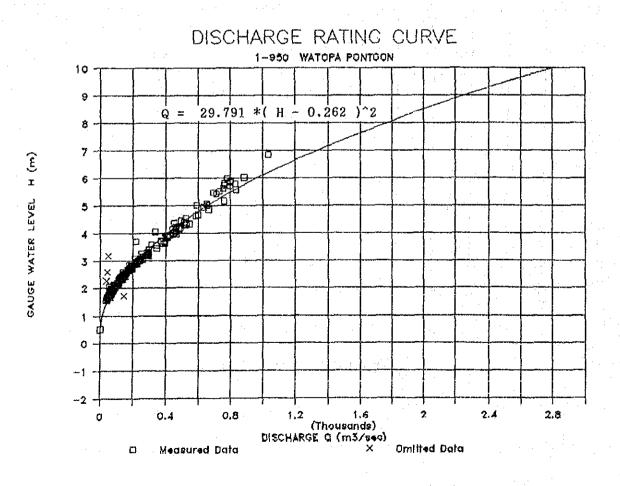


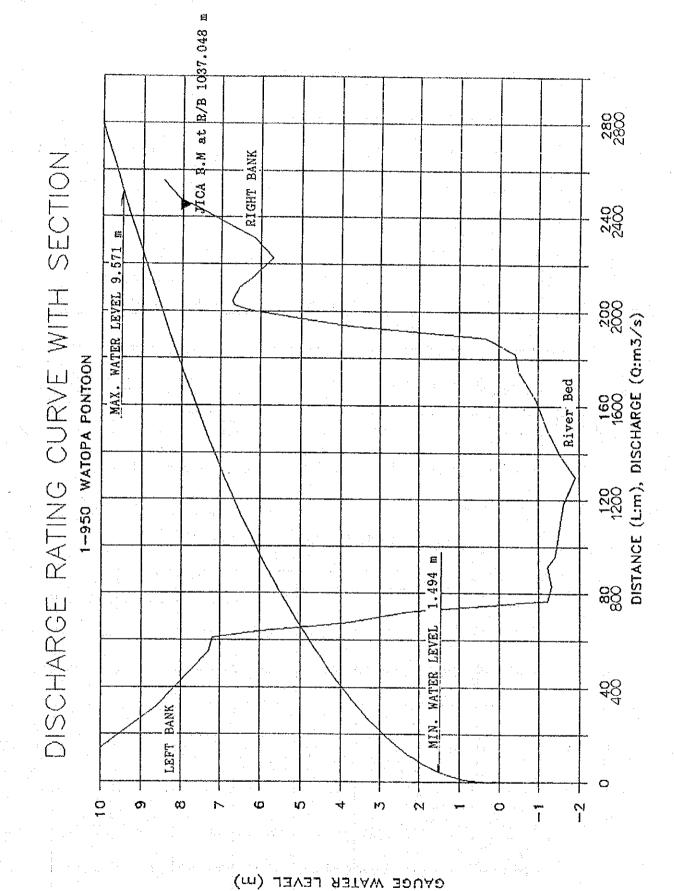


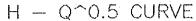


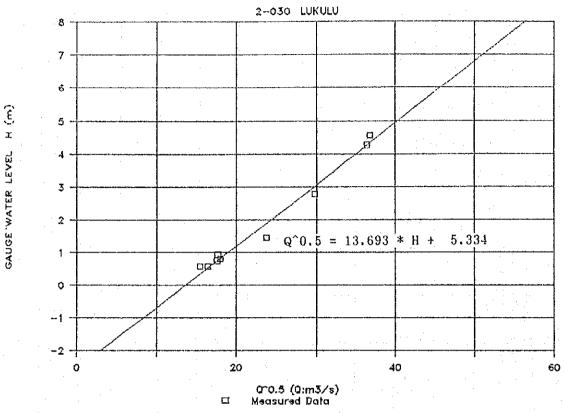
GAUGE WATER LEVEL (m)



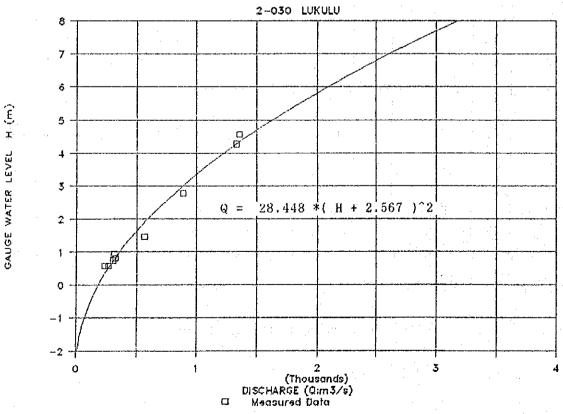


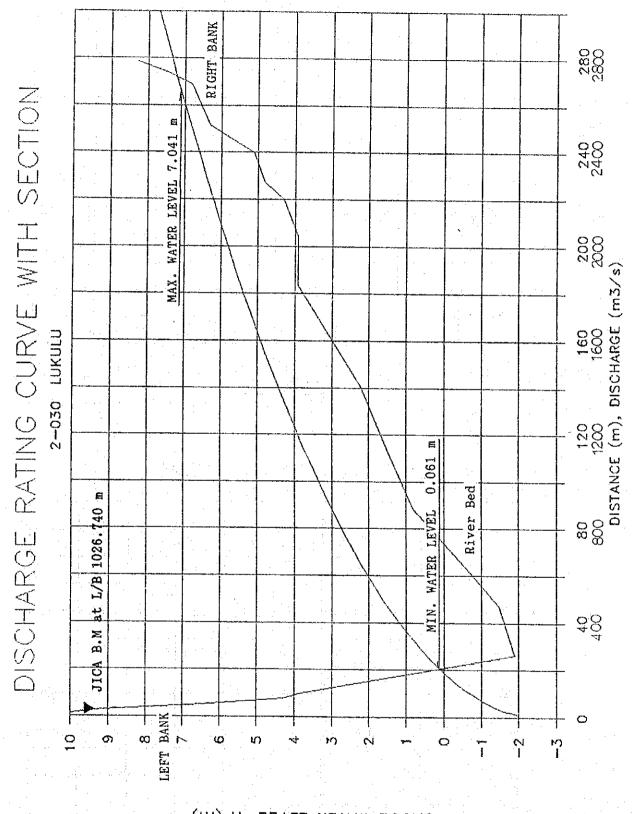




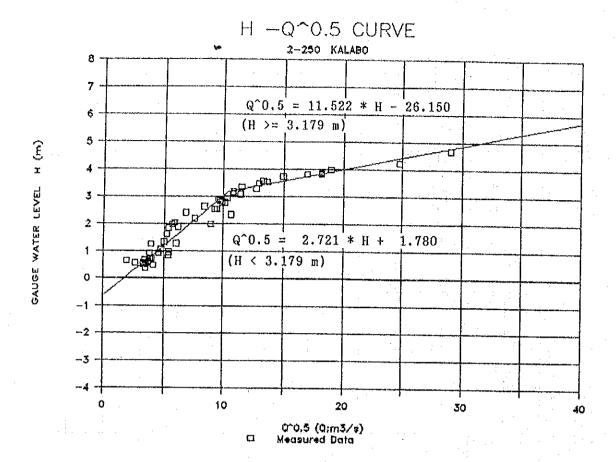


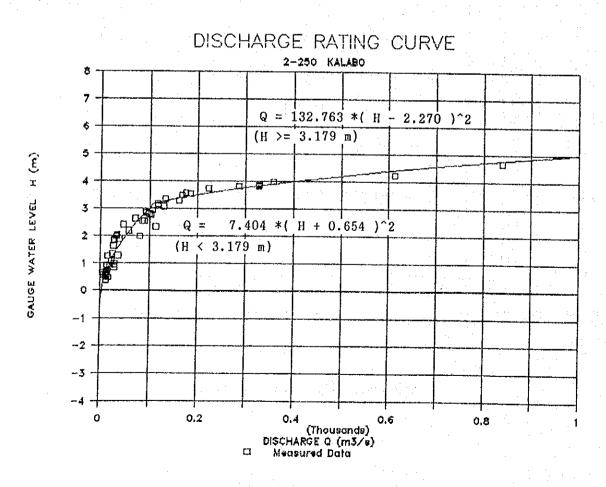


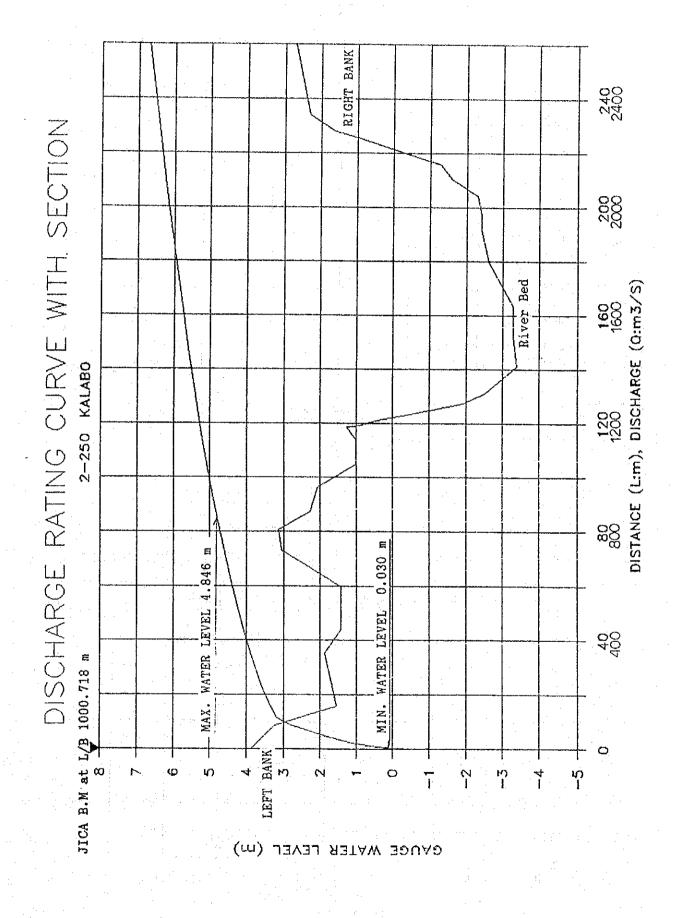


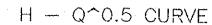


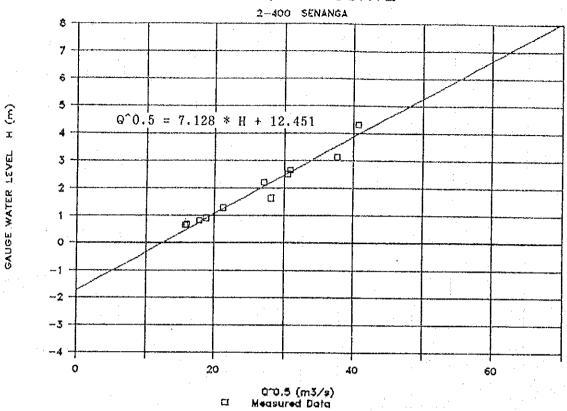
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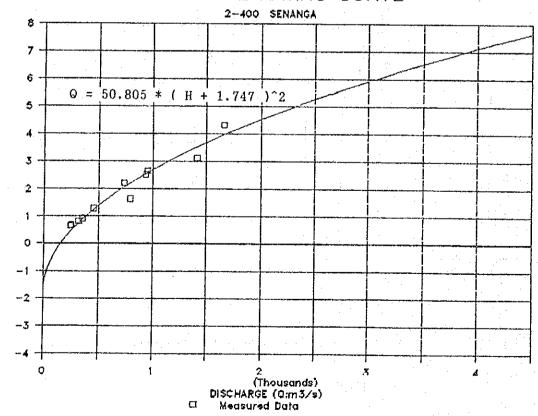






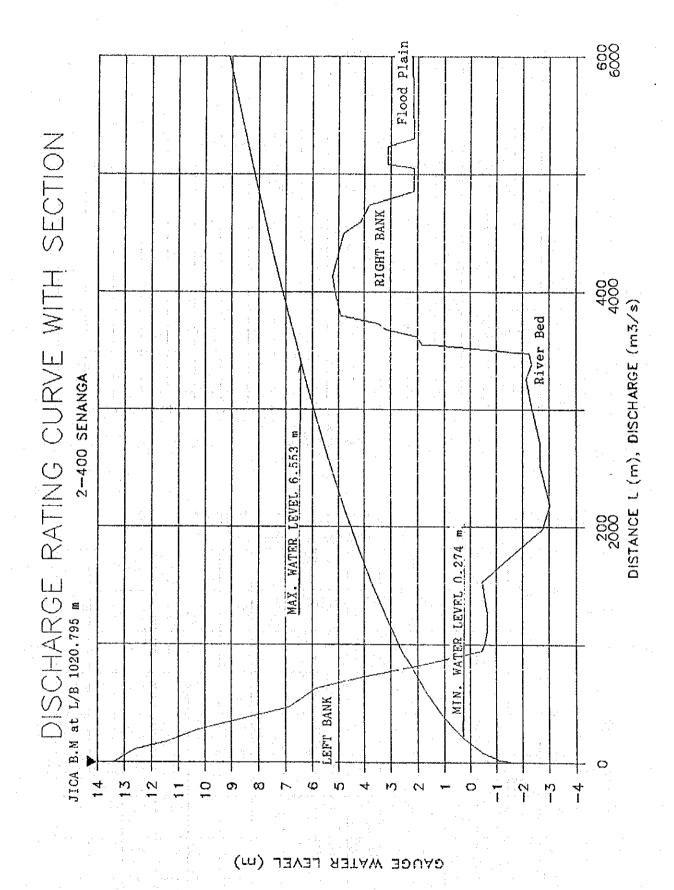


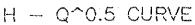
# DISCHARGE RATING CURVE

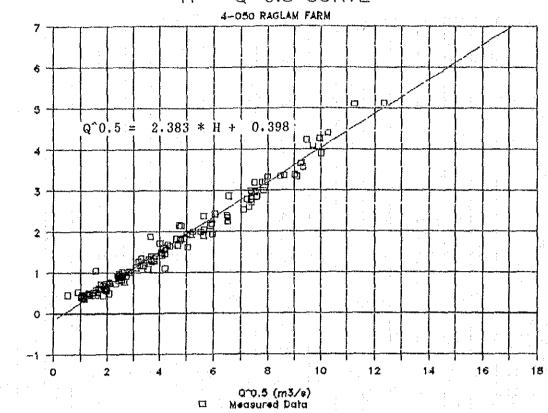


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GAUGE WATER LEVEL





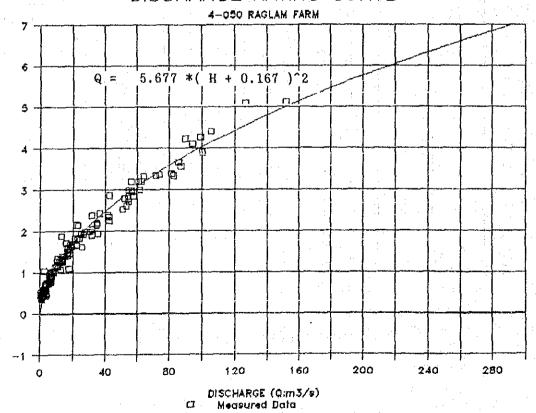


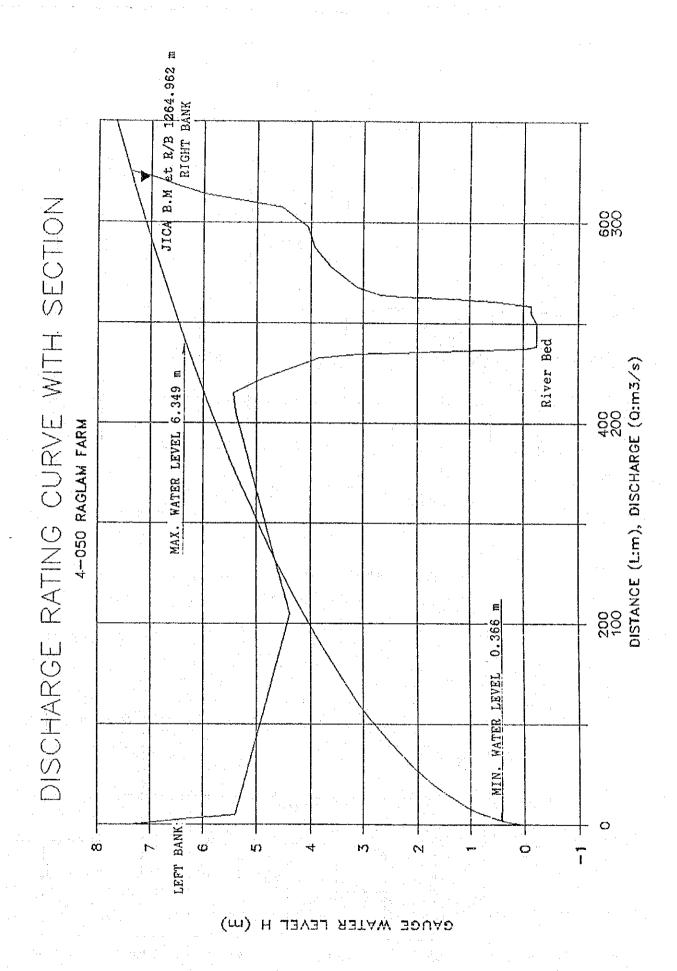
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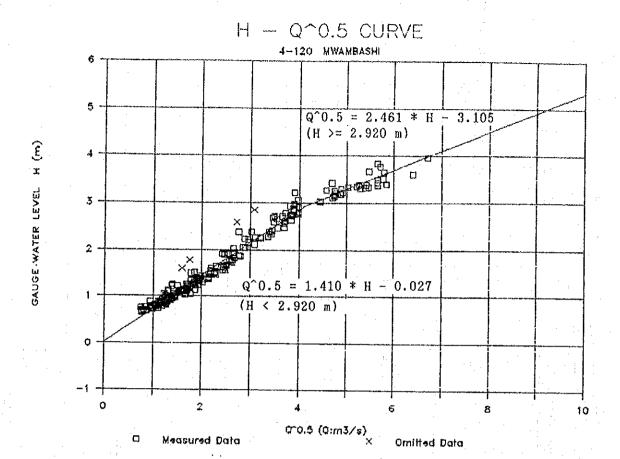
GAUGE WATER LEVEL

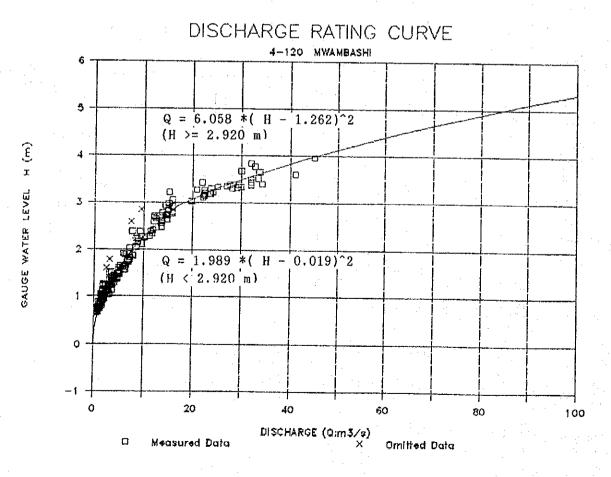
GAUGE WATER LEVEL H (m)

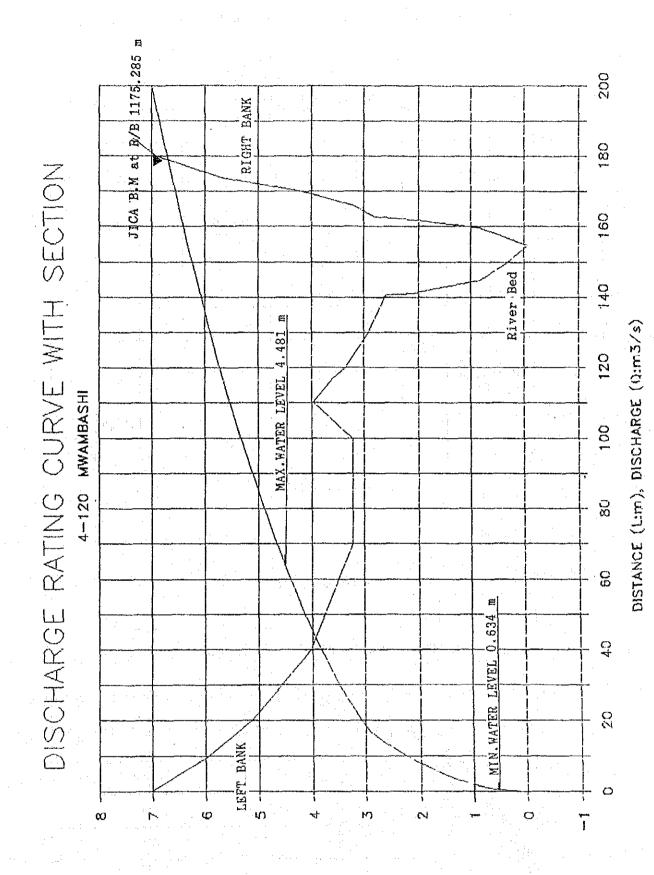
## DISCHARCE RATING CURVE



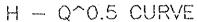


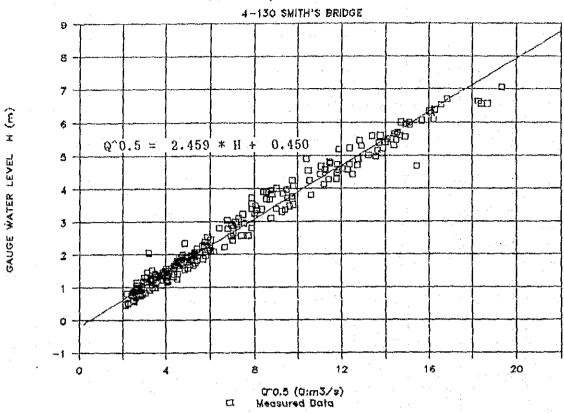




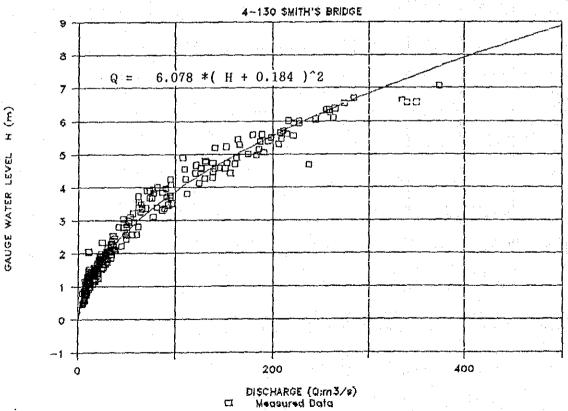


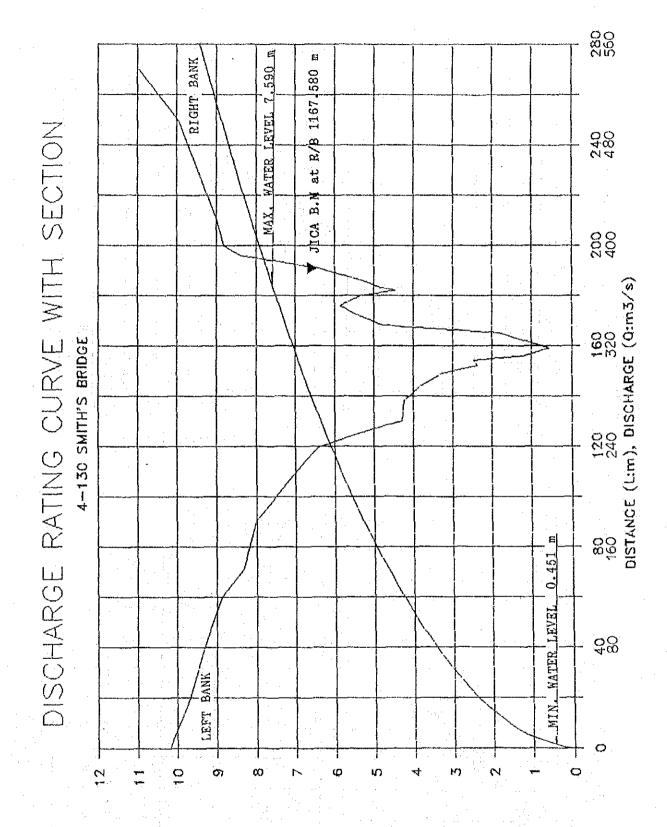
OPOGE WATER LEVEL H (in).





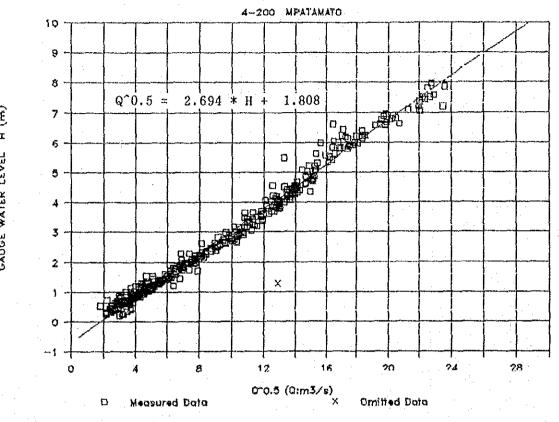


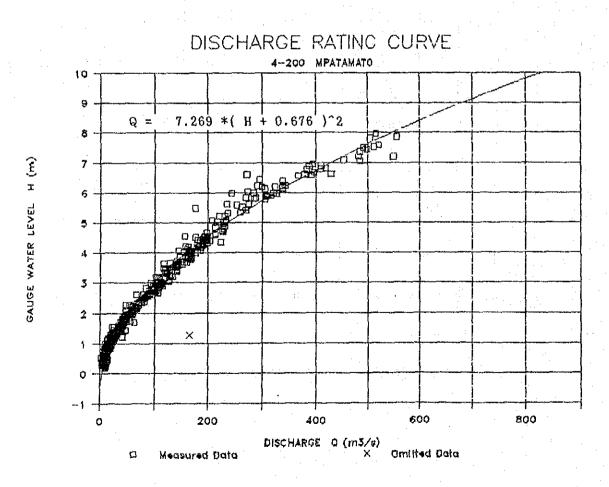


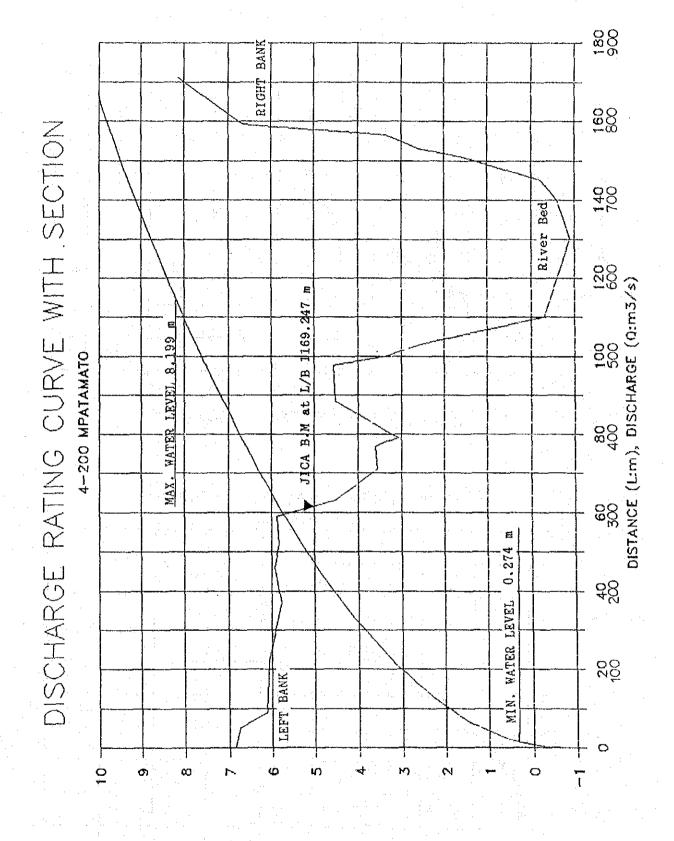


CAUGE WATER LEVEL H (m)

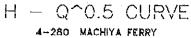


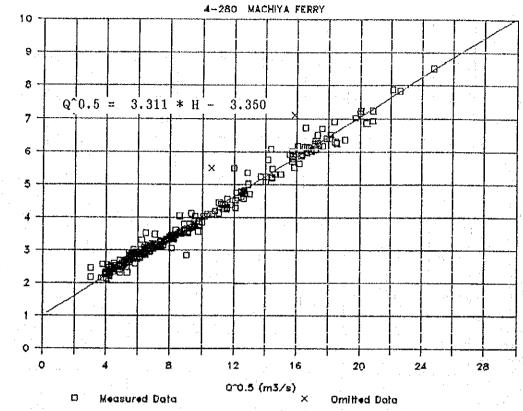






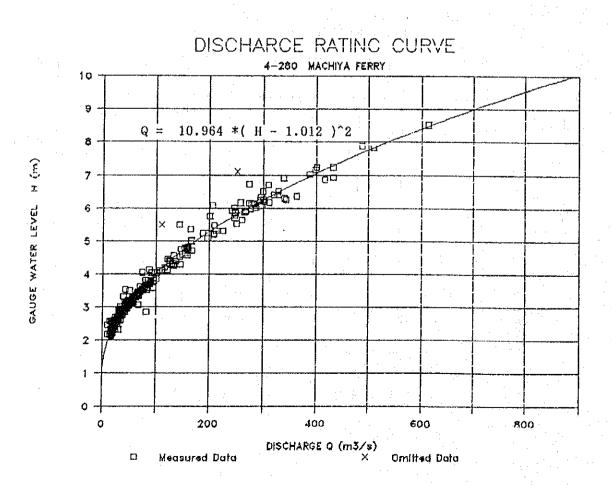
GAUGE WATER LEVEL H (m)

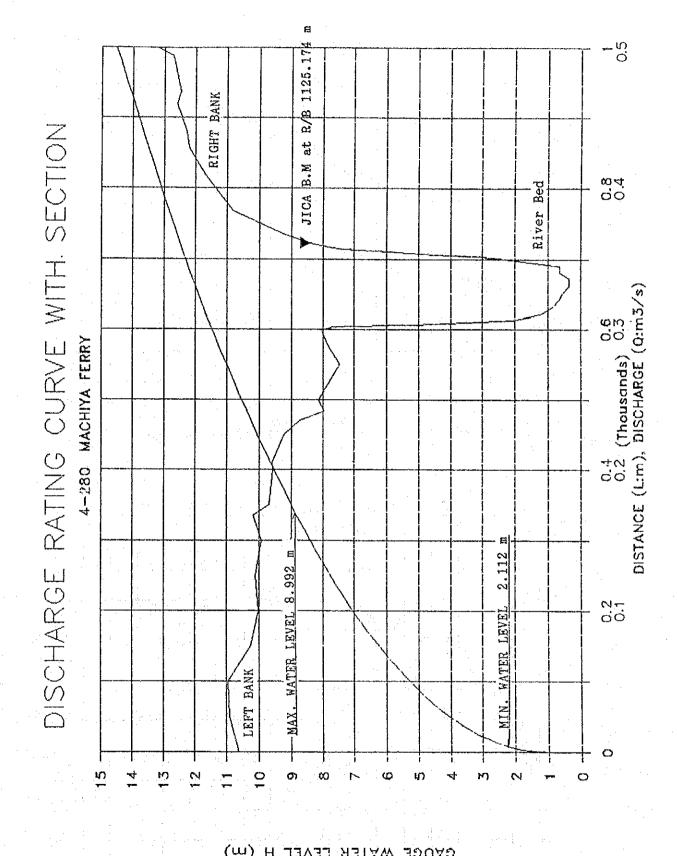


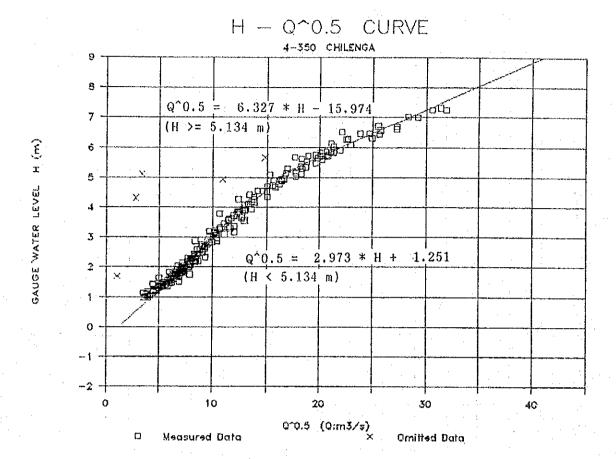


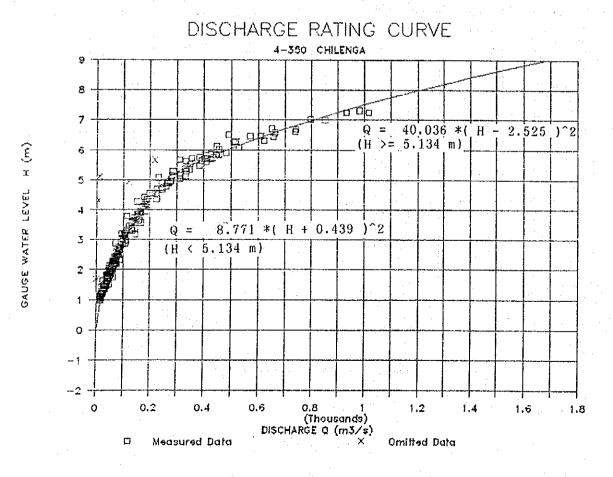
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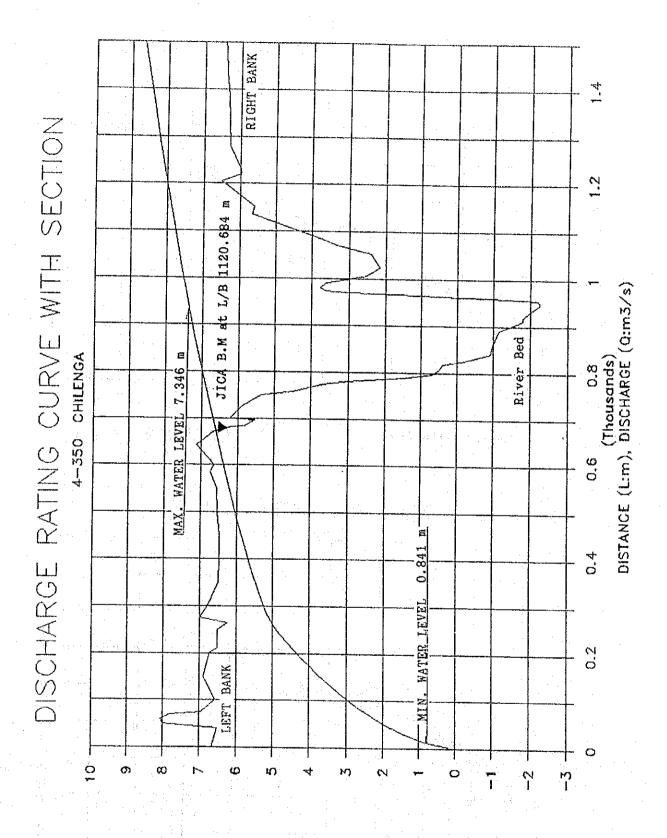
GAUGE WATER LEVEL



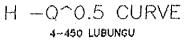


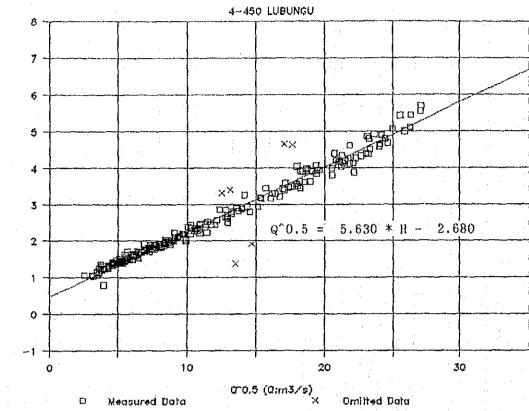






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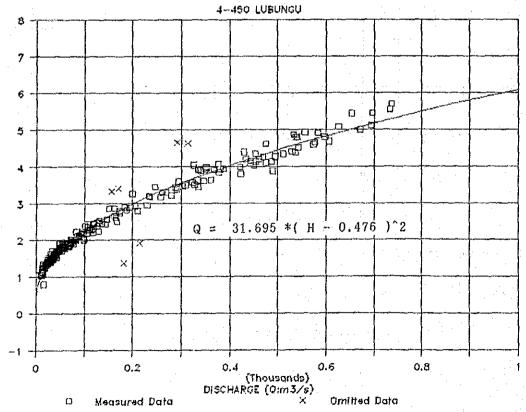


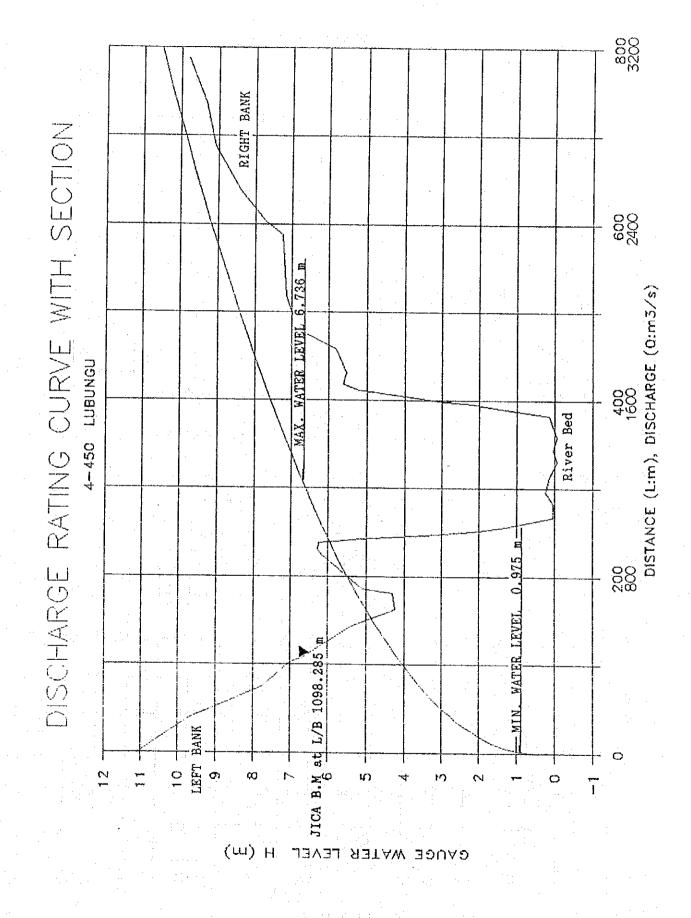


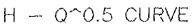
GAUGE WATER LEVEL

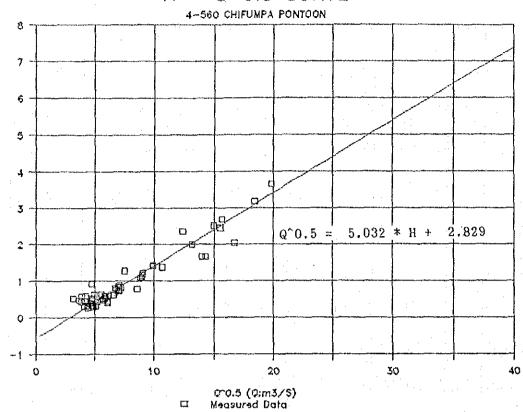
GAUGE WATER LEVEL











GAUGE WATER LEVEL H (m)

# DISCHARGE RATING CURVE

