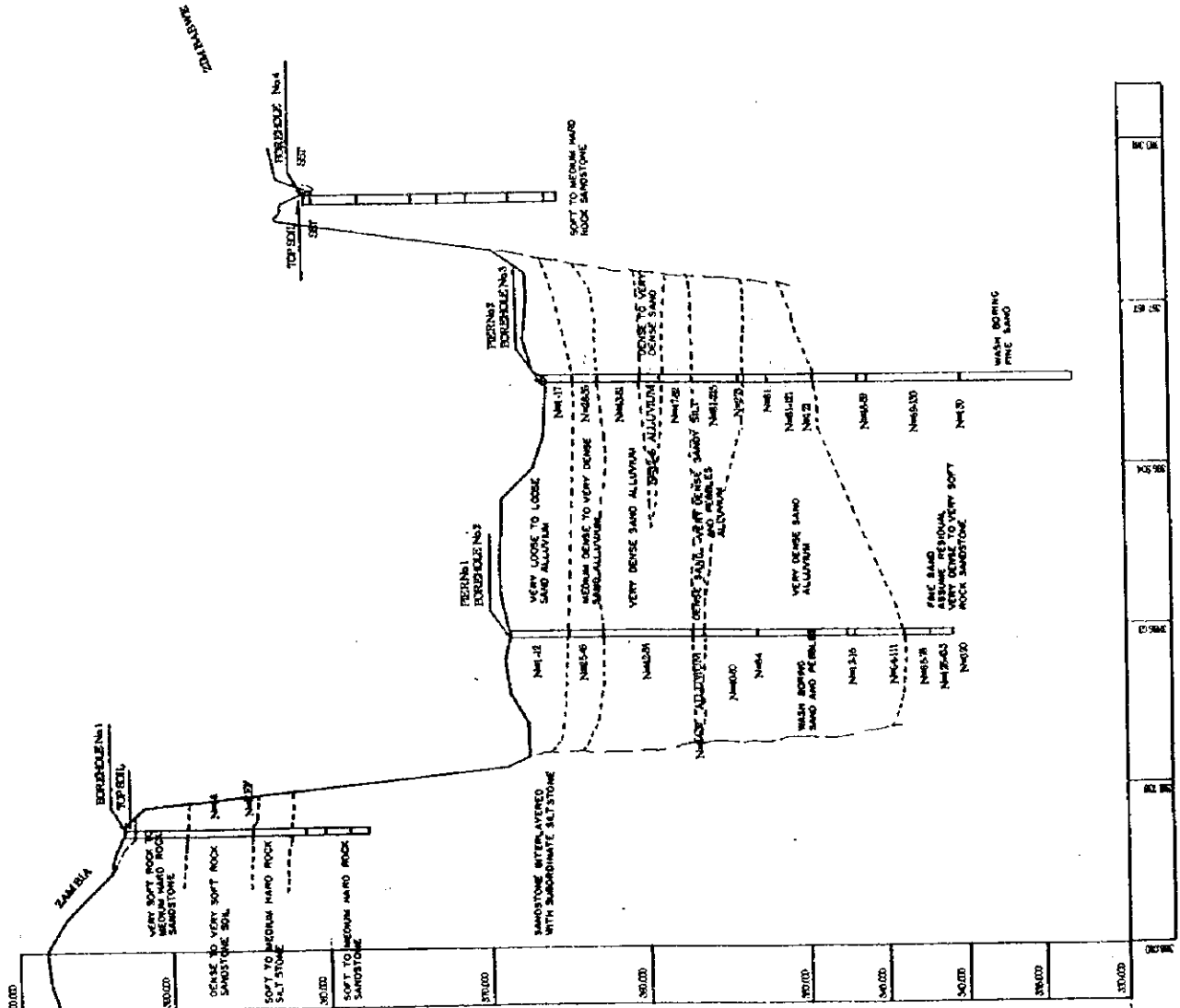


Appendix 2

Geotechnical Survey Results

Geological Section



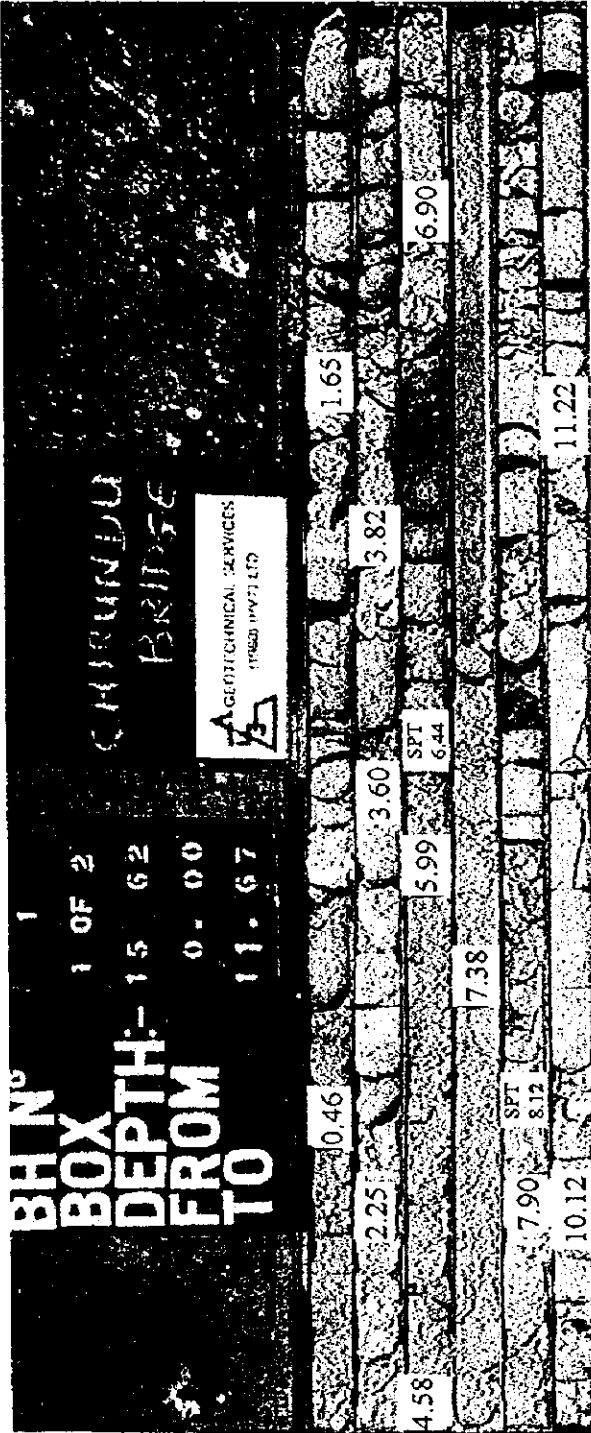
AFRICON		CLIENT : CHODAI LTD		INTERPRETED CORE LOG					WORK No	50462								
DRILLING CONTRACTOR		GEO-TECHNICAL SERVICE		LOCALITY		CHIRUNDU		BOREHOLE No		1								
DRILLER		C. CHIRUNDA		SITE		ABUTMENT ZAMBIA		PAGE		1 OF 3								
DATE STARTED		28/10/97		CORE PHOTOGRAPHED		1/11/97		FABRIC SPACING		8 VERY THINLY								
DATE COMPLETED		22/10/97		ELEVATION		593.80		JOINT SPACING		VC VERY CLOSELY								
DATE LOGGED		29/11/97		INCLINATION		90		WEATHERING		COMPLETELY								
LOGGED BY		A. SCHALJE-VALLBE		DIRECTION		180 - 300°		ROUGHNESS		8 SMOOTH								
X COORD		1779478.4		1		FILTRATED		MIGHTLY		1 ROUGH								
Y COORD		1400000.0		2		CLEANED		MEDIUM		2 VERY ROUGH								
ROCK FABRIC		1 BEDDED		3		SCHISTOSE		SLIGHTLY										
ROCK FABRIC		5 FLOW Banded		6		CHALCISE		VERY WIDELY										
ROCK FABRIC		7 OTHER		8		UNWEATHERED												
DRILLING METHOD & SIZE	DEPTH TO G	RECOVERED MATERIAL	CORE	ROD	FREQUENCY	SAMPLE TEST	DISCONTINUITIES					HYDRO GEOLOGY	WEATHERING	LEGEND	GENERAL DESCRIPTION	REMARKS	DURABILITY	HEIGHT REDUCED
							FABRIC TYPE	INCLINATION	SPACING	NUMBER OF SETS	INCLINATION							
	0.46																	
	1.85																	
	2.25																	
	3.58																	
	3.82																	

continued

DRILLING METHOD & SIZE	DEPTH TO GROUNDWATER (m)	WATER RECOVERY	CORE	ROD	SPECIFIC GRAVITY	SAMPLE / TEST	ROCK FABRIC		DISCONTINUITIES				HYDRO GEOLOGY		DEPTH TO GROUNDWATER (m)	WEATHERING	LEGEND	GENERAL DESCRIPTION REMARKS	CLASSIFICATION	REDUCED WEIGHT (%)
							INCLINATION	SPLITTING	FILL TYPE	SPACING	INCLINATION	SPACING	NUMBER OF SETS	INCLINATION						
TM	3.50	86	86	86	>28	3.9, 4.5 (SPT) N=15	0	0							3.50		ORANGE BROWN MEDIUM DENSE TO DENSE SILTY SAND. RESIDUAL SANDSTONE SOIL.			
	4.50	87	87	87	0										4.50					
	5.50	88	88	88	0										5.50					
	6.44	89	89	89	0										6.44					
	6.50	90	90	90	0										6.50					
	7.30	91	91	91	0										7.30					
	7.50	92	92	92	0										7.50					
	8.12	93	93	93	0										8.12					
	10.12	94	94	94	15										10.12					
	11.22	95	95	95	28										11.22					
12.52	96	96	96										12.52							
12.55	97	97	97										12.55							

continued

DRILLING METHOD & SIZE	DEPTH TO G	F RECOVERY	F CORE	F ROD	FRACTURE FREQUENCY	SAMPLE/TEST	ROCK FABRIC		DISCONTINUITIES					HYDRO GEOLOGY	DEPTH TO G	WEATHERING	LEGEND	GENERAL DESCRIPTION REMARKS	CLASSIFICATION	REDUCED HEIGHT (G)
							INCLINATION	SPACING	NUMBER OF SETS	INCLINATION	SPACING	BOUNDMEN	FILL TYPE							
TM	12.88	100	100	100	5	UCS-28.7 MPa	1	2	45	4	1	1	1	12.88	Diagonal Hatching	LIGHT GREY TO ORANGE CLOSE TO MEDIUM JOINTED HIGHLY TO MODERATELY WEATHERED MEDIUM HARD ROCK SANDSTONE.	3	278.81		
	14.18	100	100	100	18		1	2	45	4	1	1	1	14.18	Diagonal Hatching					
	15.62													15.62	Diagonal Hatching			377.39		

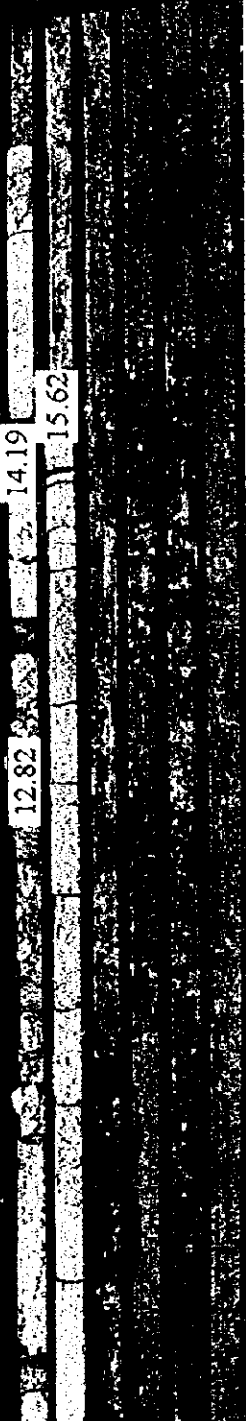
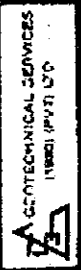


CHIRUNDU BRIDGE

BOREHOLE NO. 1 BOX 1 OF 2

BH N° 1
2 OF 2
DEPTH: 15-62
FROM 11-68
TO 15-62

CHIRUNDU



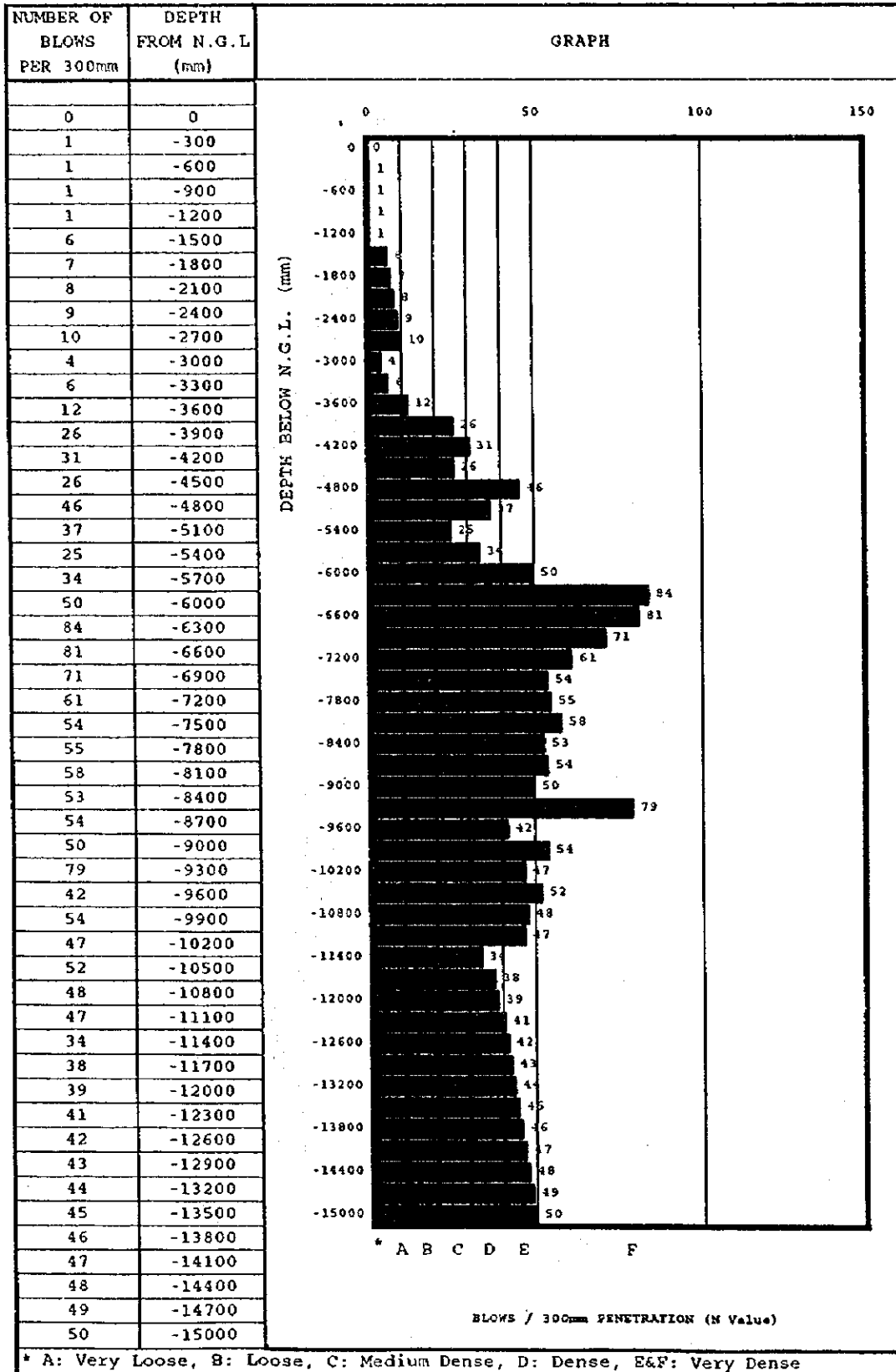
CHIRUNDU BRIDGE

BOREHOLE NO.1 BOX.2 OF 2



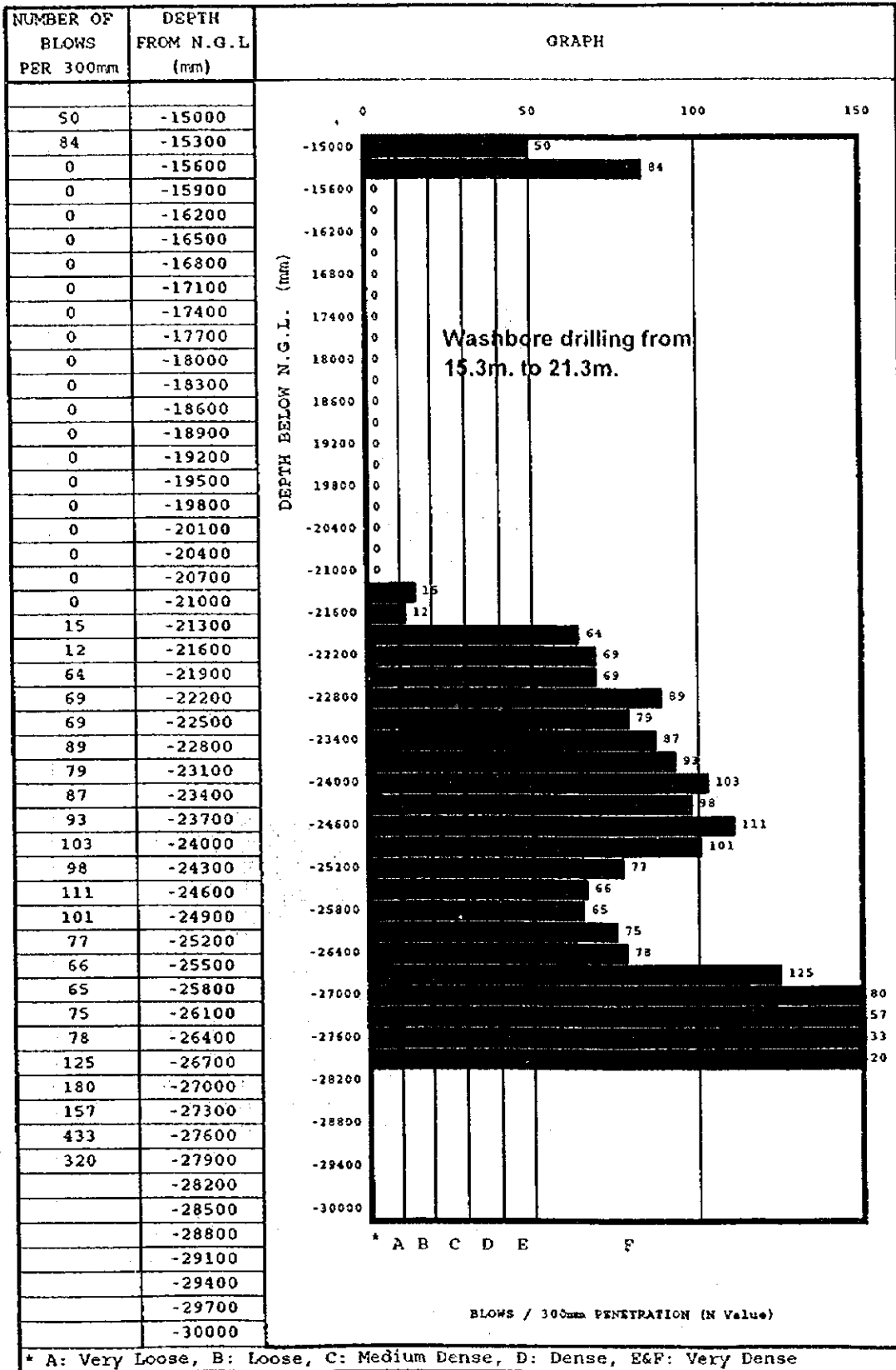
PROJECT	NEW CHIRUNDU BRIDGE	
PROJECT NUMBER	S0462	
TEST LOCALITY	BOREHOLE 2 (PIER 1)	1 OF 2
DATE	Nov-97	

Co-ordinates: X: 177356 Y: 15932.7 Z: 368.4





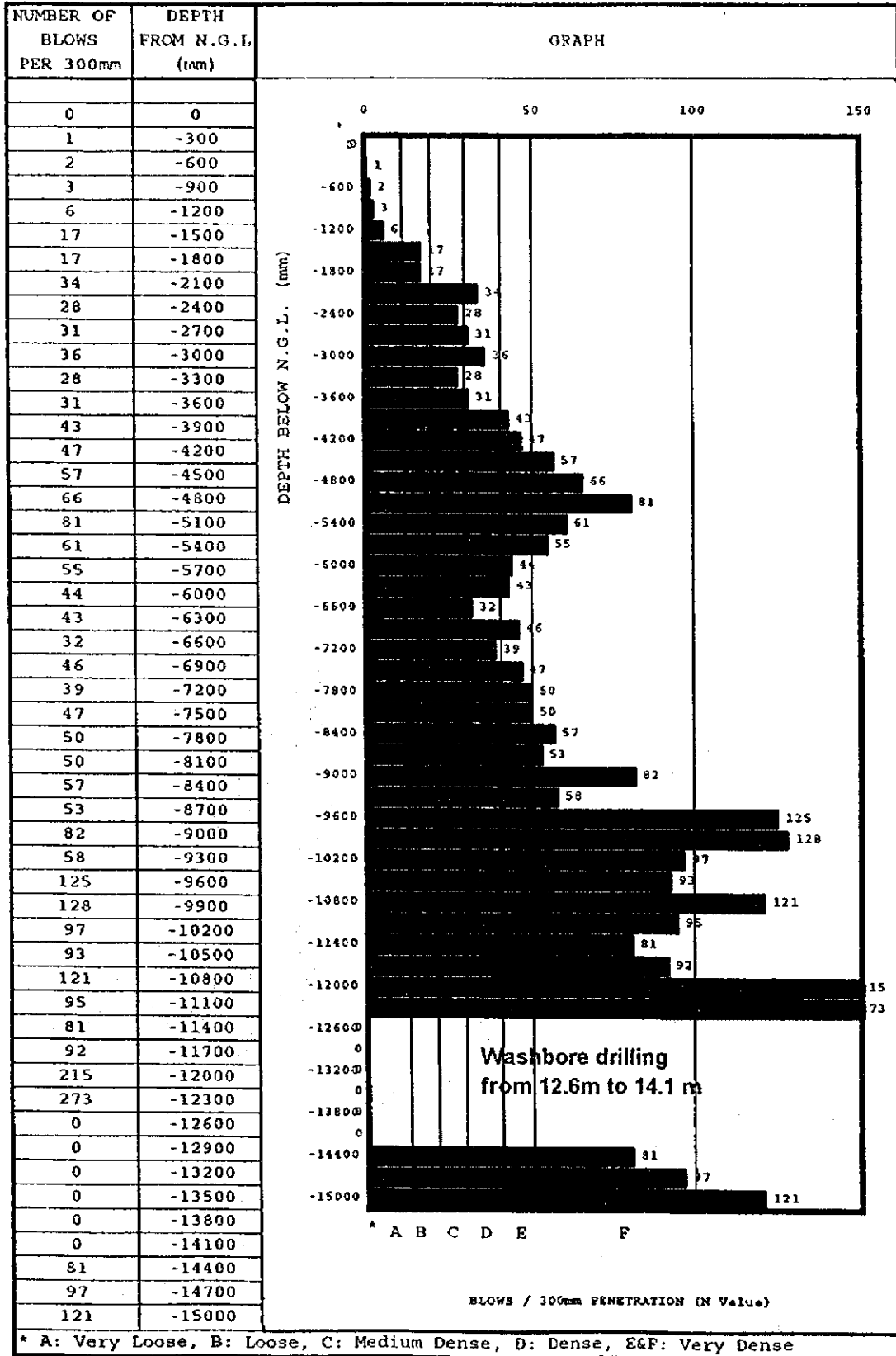
PROJECT	NEW CHIRUNDU BRIDGE	
PROJECT NUMBER	50462	
TEST LOCALITY	BOREHOLE 2 (PIER 1)	2 OF 2
DATE	Nov-97	





PROJECT	NEW CHIRUNDU BRIDGE	Page 1 of 2
PROJECT NUMBER	50462	
TEST LOCALITY	BOREHOLE 3 (PIER 2)	
DATE	Nov-97	

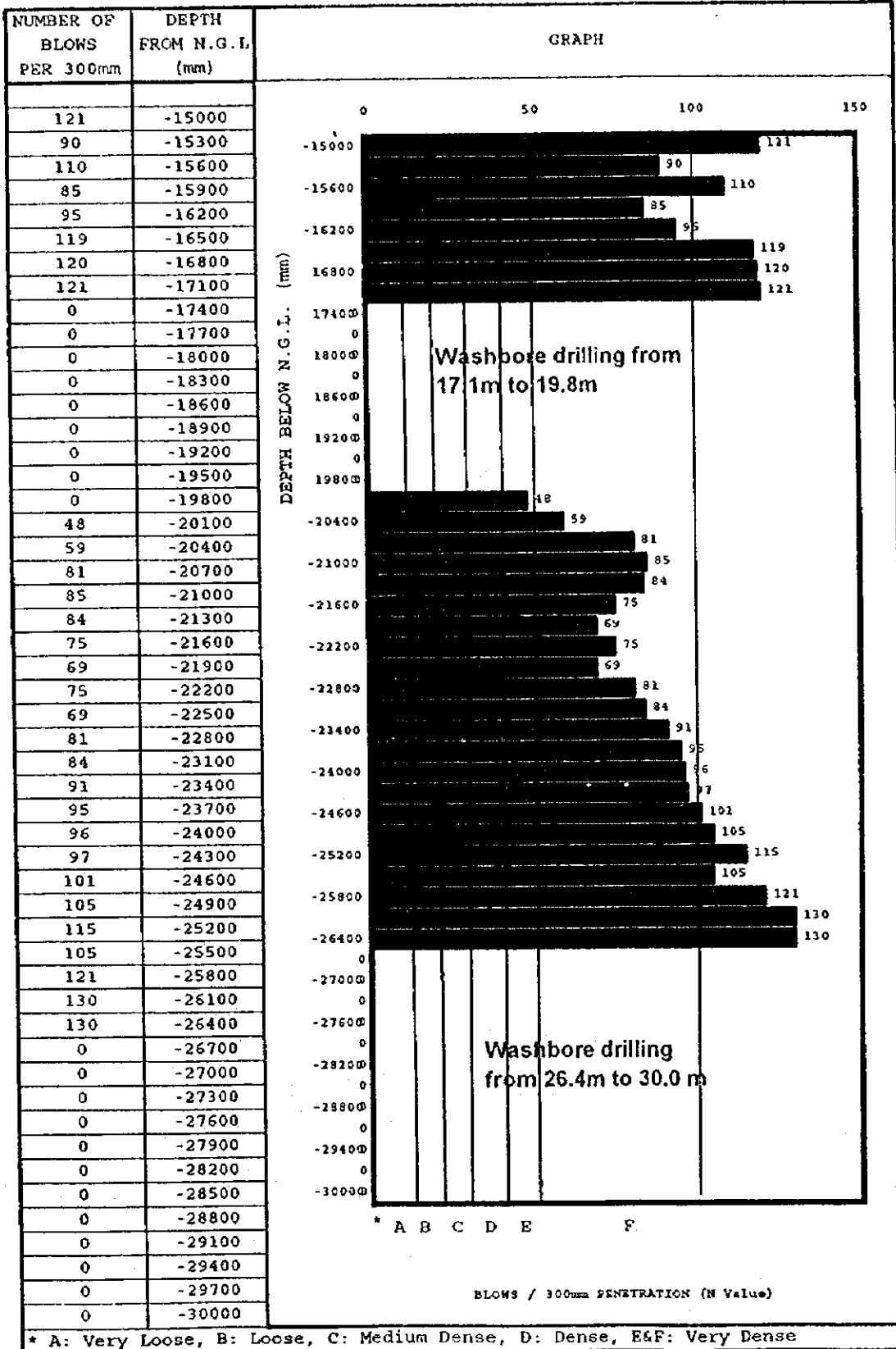
Co-ordinates: X: 1773682.5 Y: 15820.9 Z: 366.37 (Top of sand)





PROJECT	NEW CHIRUNDU BRIDGE	
PROJECT NUMBER	50462	
TEST LOCALITY	BOREHOLE 3 (PIER 2)	Page 2 of 2
DATE	Nov-97	

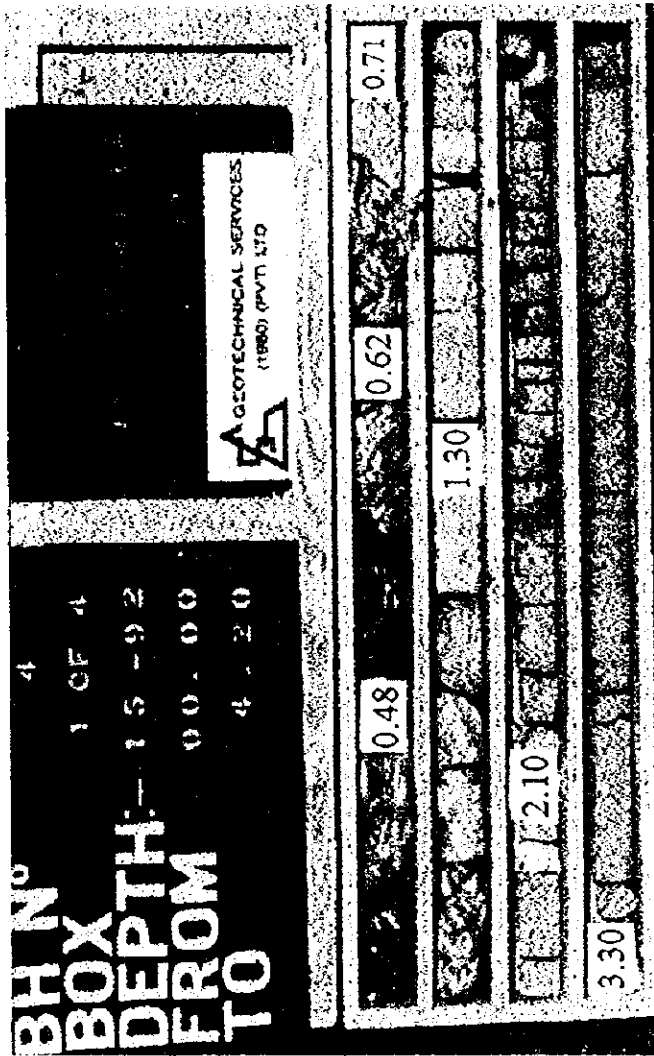
Co-ordinates: X: 1773682.5 Y: 15820.9 Z: 366.37 (Top of sand)



ORILLING METHODE & SIZE	DEPTH TO (S)	1 WATER RECOVERY	1 CORE	1 ROD	FRACTURE FREQUENCY	SAMPLE/ TEST	ROCK FABRIC			DISCONTINUITIES						HYDRO GEOLOGY	DEPTH TO (S)	WEATHERING	LESDO	GENERAL DESCRIPTION REMARKS	CLASSIFICATION	REDUCED HEIGHT (S)
							FABRIC TYPE	INCLINATION	SPECING	NUMBER OF SETS	INCLINATION	SPECING	ROUGHNESS	FILL TYPE	FILL THICKNESS (S)							
	3.38														3.38				Light reddish brown moderately weathered with completely weathered zones medium to widely jointed soft to hard rock SANDSTONE.			
	6.72														6.72							
	8.82														8.82				Light reddish brown highly weathered very loosely jointed medium hard rock SANDSTONE.		372.78	
	18.21														18.21						378.88	

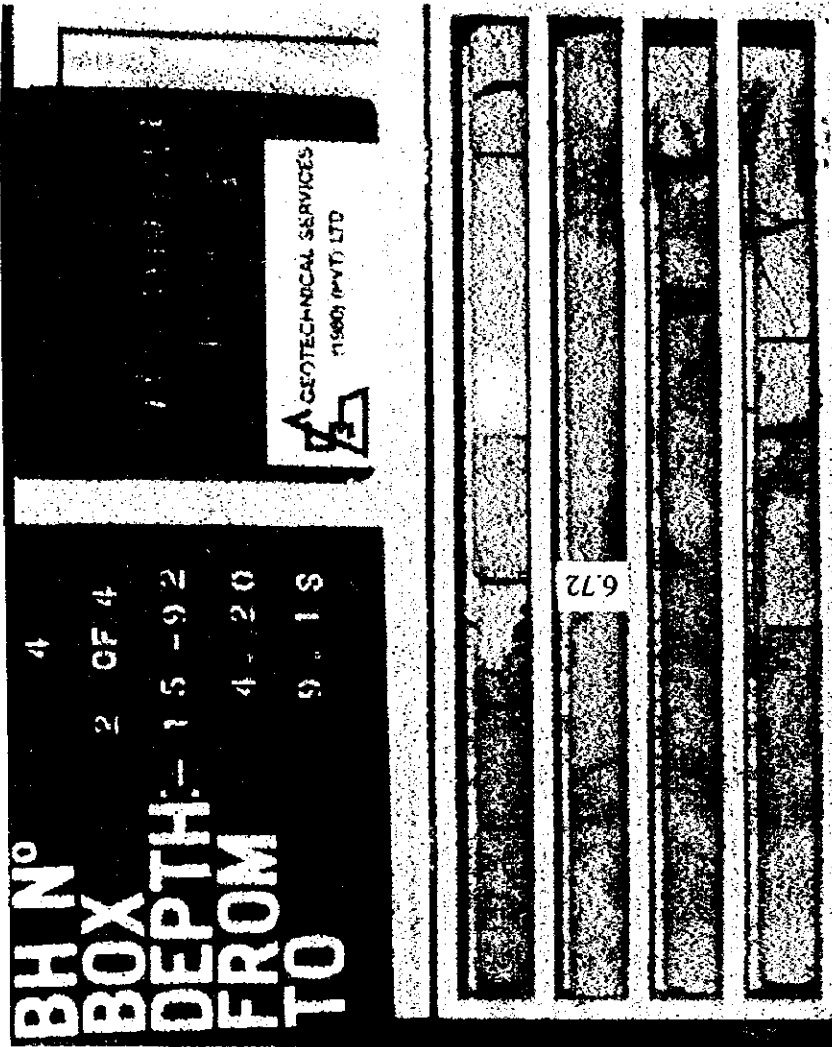
continued

ORILLING METHOD & SIZE	DEPTH TO C	1 METERIAL REDUCTION	1 CORE	1 ROD	FRACTURE FREQUENCY	SAMPLE/TEST	ROCK FABRIC		DISCONTINUITIES					HYDRO GEOLOGY		DEPTH TO C	WEATHERING	GENERAL DESCRIPTION REMARKS	CLASSIFICATION	REDUCED SECTION
							FABRIC TYPE	INCLINATION	SPLITTING	NUMBER OF SETS	INCLINATION	SPLITTING	ROUGHNESS	FILL TYPE	FILL THICKNESS (CM)					
	18.21	100	100	100	2		SPLITTING	3	0 V	1	1	SILT	<1		18.21		Red to light red brown widely jointed moderately weathered with almost narrow completely weathered zones along joints medium hard rock SANDSTONE.		288.28	
	18.85	100	100	100	7		SPLITTING	3	0 V	1	1	SILT	<1		12.82		Light red to pink very closely jointed highly weathered with completely weathered zones along joints soft to medium hard rock SANDSTONE.		365.12	
	14.83	95	95	95	11	UCS-32 MPA	SPLITTING	2	0 H	1	1	SAND	1		15.86		Light red to pink medium jointed moderately weathered medium hard rock SANDSTONE		303.18	
	15.82	95	95	95	18		SPLITTING	2	0 H	1	1	SAND	1		15.82					



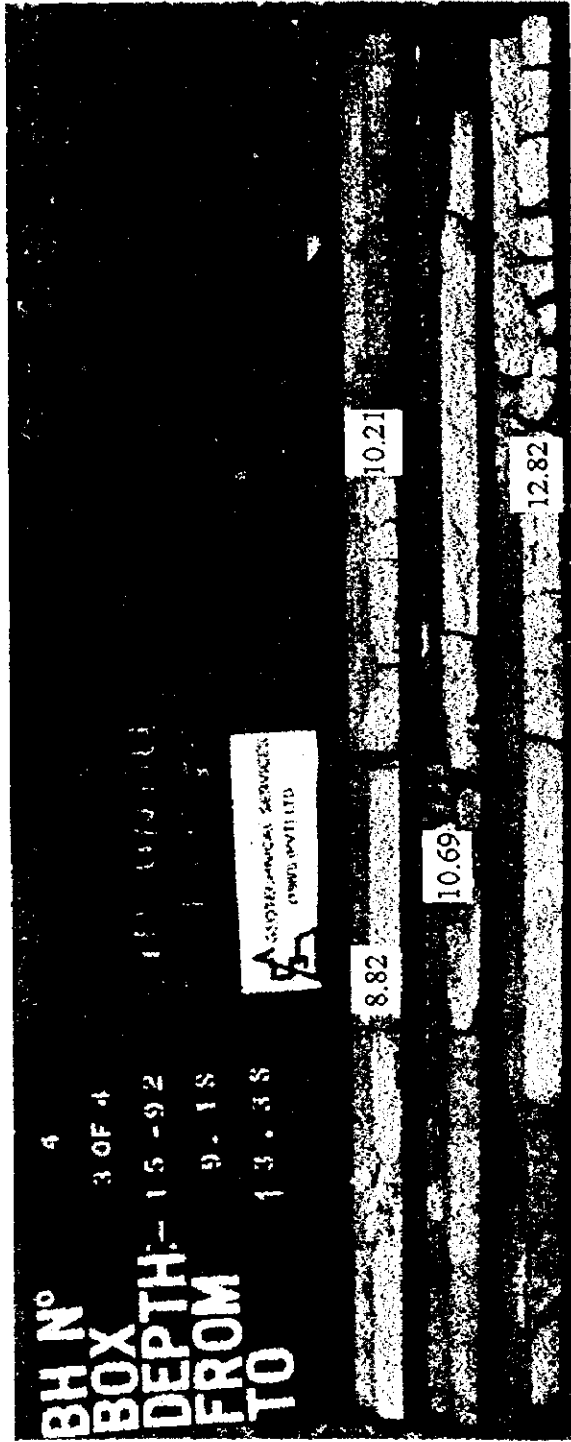
CHIRUNDU BRIDGE

BOREHOLE NO 4 BOX 1 OF 4



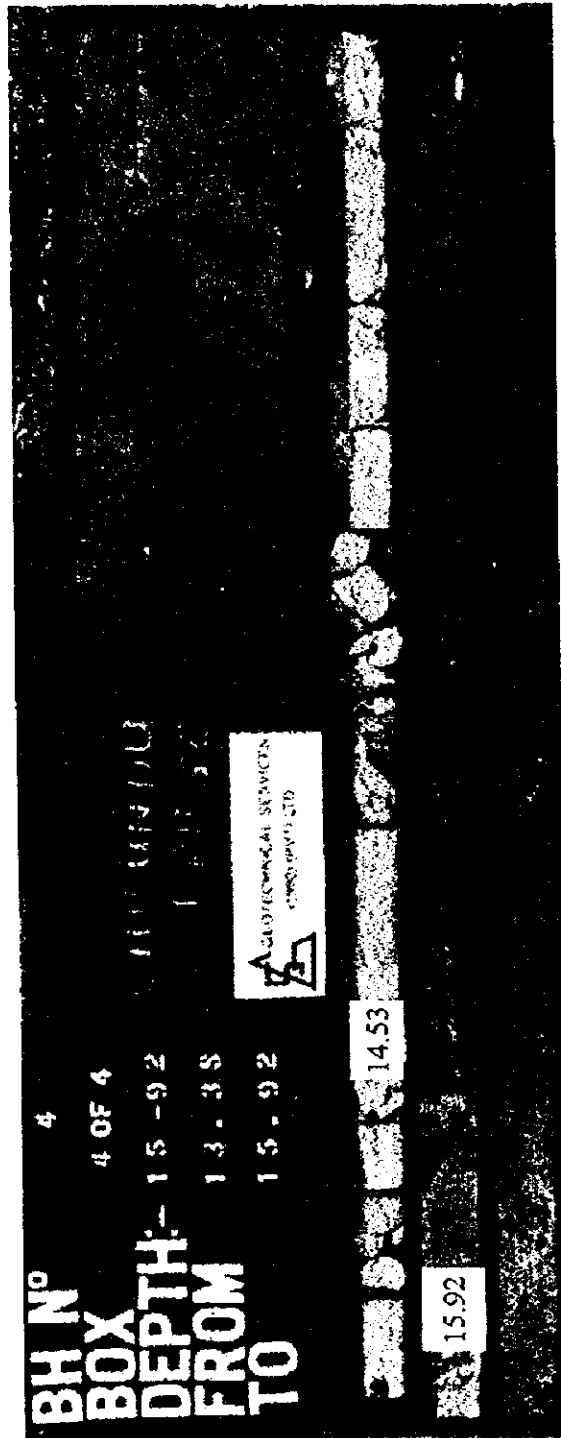
CHIRUNDU BRIDGE

BOREHOLE NO. 4 BOX. 2 OF 4



CHIRUNDU BRIDGE

BOREHOLE NO. 4 BOX. 3 OF 4



CHIRUNDU BRIDGE

BOREHOLE NO. 4 BOX 4 OF 4

Appendix 3

Seismic Data

EARTHQUAKES IN THE LAKE KARIBA/CHIRUNDU AREAS FOR THE PERIOD 1967 - 1997

Sources of Data : Bulawayo, Geological Survey of Zambia and USGS

Explanation for table

dd mm ss : day month year

hh mm ss : hour minute seconds

lat : latitude

lon : longitude } degree.

mag : magnitude

- : undetermined magnitude

DATE			TIME			LOCATION			AREA
dd	mm	yy	hh	mm	ss	lat	lon	mag	
06	01	67	15	10	26	16.5	28.5	2.7	L. Kariba
06	01	67	15	10	59	16.5	28.5	4.2	L. Kariba
12	01	67	05	20	25	16.6	28.3	2.7	L. Kariba
12	01	67	05	21	00	16.6	28.3	3.0	L. Kariba
21	01	67	22	45	21	16.6	28.2	2.9	L. Kariba
03	02	67	11	20	45	14.0	26.0	2.6	Busanga Swamp
10	02	67	22	53	57	14.0	26.0	4.1	Busanga Swamp
10	02	67	22	56	05	14.0	26.0	2.6	Busanga Swamp
06	03	67	09	05	11	16.0	28.0	2.7	L. Kariba
06	01	67	15	40	25	16.8	27.8	2.2	L. Kariba
10	03	67	01	56	22	14.0	25.6	3.2	Busango Swamp
13	03	67	02	36	24	14.0	25.6	2.1	Busango Swamp
13	03	67	02	39	07	14.0	25.0	2.0	Busanga Swamp
14	03	67	12	39	33	15.6	26.8	2.7	Kafue Flats
07	04	67	08	45	07	17.8	27.0	2.6	S. Lake Kariba
13	04	67	06	33	54	17.7	27.0	2.6	S. Lake Kariba
19	04	67	13	25	00	16.6	28.2	4.1	L. Kariba
19	04	67	14	14	55	16.7	28.2	2.7	L. Kariba
19	04	67	15	07	30	16.7	28.2	2.8	L. Kariba
19	04	67	17	08	38	16.7	28.1	2.2	L. Kariba
19	04	67	18	06	42	16.5	28.1	2.0	L. Kariba
20	04	67	02	50	56	16.7	28.2	5.5	L. Kariba
20	04	67	11	15	07	16.7	28.2	2.8	L. Kariba
21	04	67	04	02	14	16.6	28.2	2.4	L. Kariba
21	04	67	07	41	10	16.7	28.2	3.0	L. Kariba
21	04	67	08	26	48	16.6	28.1	2.8	L. Kariba
21	04	67	09	24	42	16.7	28.1	2.2	L. Kariba
22	04	67	14	05	30	16.8	28.1	2.1	L. Kariba
24	04	67	15	18	21	17.1	27.7	2.0	L. Kariba
27	04	67	07	42	17	16.5	28.5	2.1	L. Kariba
27	04	67	14	01	53	14.5	26.0	2.1	Busanga Swamp
06	05	67	02	17	34	16.5	28.4	2.0	L. Kariba
06	05	67	04	09	11	14.7	29.9	2.8	Chipata/Malawi
07	05	67	12	49	26	16.5	28.2	2.3	L. Kariba
15	05	67	03	26	20	16.5	28.5	2.3	L. Kariba
18	05	67	00	59	32	16.3	28.7	2.7	L. Kariba
08	06	67	15	59	13	17.1	27.0	-	L. Kariba area
11	06	67	16	26	09	18.9	26.9	2.7	Dett area Zimbabwe
19	06	67	14	48	18	17.2	27.0	2.2	L. Kariba area
21	06	67	03	58	08	19.5	26.4	2.8	Zimbabwe / Botswana border
21	06	67	16	28	03	17.2	27.0	2.5	L. Kariba
24	06	67	11	01	04	15.0	25.0	2.5	Western Province
28	06	67	16	11	11	17.2	27.0	2.5	L. Kariba area

07	07	67	16	07	41	17.1	26.9	-	L. Kariba
12	07	67	16	11	03	17.0	27.2	2.2	L. Kariba area
16	07	67	16	51	16	15.6	31.6	2.6	Tete Province, Mozambique
20	07	67	16	04	57	17.1	26.9	2.7	L. Kariba area
15	08	67	14	37	43	16.6	28.3	3.3	L. Kariba
16	08	67	13	43	48	14.0	26.0	2.3	Busango Swamp
16	08	67	18	19	59	16.4	28.3	2.2	L. Kariba
17	08	67	03	46	07	16.7	28.1	2.5	L. Kariba
20	08	67	22	19	55	14.5	27.0	2.4	Lukanga Swamp area, Zambia
23	08	67	13	21	08	16.9	28.0	2.9	L. Kariba
30	08	67	10	44	56	16.6	28.2	2.0	L. Kariba
08	09	67	12	32	38	16.7	28.8	2.2	L. Kariba
21	09	67	16	20	21	16.6	28.6	2.2	L. Kariba
02	10	67	18	25	03	16.4	28.5	2.5	L. Kariba
10	10	67	23	00	30	14.8	26.6	2.5	Kafue Hook area
11	10	67	15	16	38	17.1	27.0	2.2	L. Kariba area
17	10	67	11	12	01	17.5	27.3	2.2	L. Kariba
26	10	67	12	42	30	16.6	28.4	3.9	L. Kariba
01	11	67	19	15	09	15.6	27.4	2.2	Kafue Flats
05	11	67	00	33	33	16.6	28.6	2.0	L. Kariba
08	11	67	17	35	03	16.6	28.5	2.1	L. Kariba
13	11	67	01	50	56	16.6	28.5	2.3	L. Kariba
18	11	67	15	46	40	16.9	27.3	2.3	L. Kariba
20	11	67	01	58	56	16.6	28.6	2.2	L. Kariba
03	12	67	13	24	53	15.9	28.0	2.5	Kafue gorge
04	12	67	12	04	03	15.8	28.1	2.0	Kafue gorge
16	12	67	20	58	46	14.3	25.1	3.1	Busanga Swamp
18	12	67	05	21	57	16.7	28.6	2.6	L. Kariba
20	12	67	07	38	01	16.7	28.6	2.2	L. Kariba
21	12	67	02	12	59	15.4	27.4	2.1	Kafue Flats
24	12	67	15	38	04	16.7	28.6	2.3	L. Kariba
25	12	67	15	32	16	17.3	27.1	2.6	Choma area
26	12	67	02	47	00	16.7	28.5	2.1	L. Kariba
27	12	67	22	00	52	16.6	28.3	2.2	L. Kariba
30	12	67	02	00	52	19.9	26.5	2.3	N.E Makarikari depression
14	02	68	13	14	45	16.5	28.6	2.0	L. Kariba
16	02	68	00	56	12	16.6	28.3	2.2	L. Kariba
19	03	68	13	49	54	17.6	27.2	2.2	L. Kariba
20	03	68	17	36	07	17.5	27.4	2.5	L. Kariba
26	03	68	08	33	43	16.6	28.2	2.6	L. Kariba
02	04	68	20	27	01	16.5	28.3	3.2	L. Kariba
12	04	68	01	51	16	16.4	27.0	2.2	Choma
23	04	68	22	04	01	15.4	29.9	2.4	Zambezi-Luangwa confluence
27	04	68	00	49	37	16.6	28.4	2.6	L. Kariba
30	04	68	00	53	18	15.1	26.8	3.3	Mumbwa
06	05	68	11	25	56	14.2	27.0	2.5	Lukanga Swamp
07	05	68	19	05	36	17.5	27.2	2.2	L. Kariba
16	05	68	23	26	16	15.7	25.9	3.1	Namwala
17	05	68	01	20	03	15.9	26.1	2.6	Namwala
17	05	68	03	23	03	15.9	26.1	2.9	Namwala
17	05	68	07	00	39	15.8	26.0	3.0	Namwala
24	05	68	22	33	48	16.7	28.4	2.5	L. Kariba
26	05	68	05	13	44	16.7	28.4	3.1	L. Kariba
02	06	68	03	43	42	15.0	29.1	3.0	Lunsemfwa Valley
05	06	68	04	15	26	16.6	28.4	3.4	L. Kariba
21	06	68	08	32	55	15.9	26.0	3.1	Namwala
24	06	68	10	40	45	16.5	28.6	2.2	L. Kariba
27	06	68	01	25	16	15.9	26.0	3.2	Namwala

17	07	68	20	47	05	16.6	28.4	2.0	L. Kariba
26	07	68	19	16	37	17.5	27.4	2.8	Kandabwe, Zambia
12	08	68	15	13	21	14.7	26.4	2.5	Kafue Hook
21	08	68	18	35	21	14.1	26.2	2.6	Busanga Swamp
25	08	68	08	31	16	17.0	28.0	2.6	L. Kariba
31	08	68	12	33	37	16.6	28.4	2.4	L. Kariba
26	09	68	14	08	18	16.3	26.6	2.3	Kafue Valley
05	10	68	22	24	01	16.7	28.3	2.2	L. Kariba
08	10	68	08	37	26	14.6	26.3	2.9	Kafue Valley
11	10	68	19	49	32	14.4	29.7	2.3	Muchinga Escarpment
12	10	68	13	58	39	18.4	26.4	2.8	Wankie Coal Fields, Zimbabwe
16	10	68	17	40	31	14.2	26.3	4.1	Busanga Swamp
22	10	68	04	46	54	16.7	28.5	3.5	L. Kariba
30	10	68	00	56	16	16.6	28.6	2.0	L. Kariba
04	11	68	07	02	05	16.6	28.6	2.0	L. Kariba
04	11	68	07	03	12	16.6	28.6	2.4	L. Kariba
05	11	68	02	53	34	16.6	28.5	2.2	L. Kariba
15	11	68	01	22	52	16.6	28.7	2.3	L. Kariba
08	12	68	07	26	53	15.6	29.0	2.2	Kafue area
16	12	68	13	21	31	16.7	28.6	2.4	L. Kariba
16	12	68	19	45	28	16.3	28.8	2.4	L. Kariba
20	12	68	19	37	55	16.0	25.8	3.1	Namwala
15	01	69	16	52	02	16.7	28.6	2.1	L. Kariba
22	01	69	20	07	06	14.9	27.1	2.8	Mumbwa
23	01	69	09	50	34	14.9	27.1	2.2	Mumbwa
18	03	69	23	36	12	19.5	27.5	2.2	W. Zimbabwe
18	03	69	23	40	02	19.5	27.5	2.8	W. Zimbabwe
27	03	69	03	40	12	16.6	28.4	2.5	L. Kariba
06	04	69	13	03	02	16.7	28.2	2.4	L. Kariba
07	04	69	01	00	55	14.7	28.4	2.1	Kabwe
10	04	69	09	03	52	17.5	27.1	2.4	Kandabwe
10	04	69	09	52	30	17.6	27.2	2.7	Kandabwe
10	04	69	20	10	07	17.6	27.2	2.1	Kandabwe
10	04	69	21	35	16	17.6	27.2	2.0	Kandabwe
27	04	69	01	41	04	16.5	28.5	2.2	L. Kariba
28	04	69	00	25	45	15.3	29.8	2.3	Kafue Valley
29	04	69	18	18	45	16.7	28.4	3.1	L. Kariba
03	05	69	07	38	12	18.2	26.3	2.3	Wankie, Zimbabwe
05	05	69	04	27	20	15.4	26.8	2.1	Kafue Flats
10	05	69	01	20	06	17.0	28.1	2.3	L. Kariba
20	05	69	17	10	29	14.9	27.3	2.5	S. Lukanga Swamp
23	05	69	16	33	37	14.8	26.6	2.9	Kafue Flats
30	05	69	00	23	32	17.1	27.4	3.9	Kandabwe
01	06	69	02	09	16	14.8	27.1	2.2	S. Lukanga Swamp
05	06	69	23	22	08	15.3	29.9	2.2	Lower Luangwa Valley
08	06	69	17	25	53	16.5	28.5	2.0	L. Kariba
23	06	69	15	36	18	16.0	30.7	2.7	Zambezi Valley
27	06	69	17	57	03	16.5	28.6	2.6	L. Kariba
29	06	69	08	53	48	16.5	28.6	2.0	L. Kariba
03	07	69	11	52	24	16.5	28.6	2.5	L. Kariba
04	07	69	23	25	38	16.5	28.7	2.0	L. Kariba
05	07	69	06	18	31	16.5	28.6	2.1	L. Kariba
14	07	69	12	00	09	16.5	28.4	2.4	L. Kariba
16	07	69	11	24	24	15.2	30.4	2.8	Lower Luangwa valley
19	07	69	05	43	16	15.5	29.9	3.0	Lower Luangwa valley
05	08	69	23	01	26	17.9	26.7	2.6	Deka fault, Zambezi river
06	08	69	23	21	44	17.1	28.1	2.3	L. Kariba
14	08	69	14	23	00	19.6	26.1	3.0	Zimbabwe - Botswana border

20	08	69	23	16	51	16.6	28.5	2.2	L. Kariba
21	08	69	14	41	26	16.5	28.5	3.3	L. Kariba
21	08	69	22	08	30	17.0	28.0	2.3	L. Kariba
25	08	69	20	31	10	16.6	28.0	2.1	L. Kariba
27	08	69	12	11	54	16.9	28.2	2.4	L. Kariba
02	09	69	22	16	51	15.7	29.6	2.7	Zambezi Valley
04	09	69	22	13	00	16.8	28.2	2.3	L. Kariba
09	09	69	12	25	49	16.6	28.4	2.3	L. Kariba
12	09	69	01	52	20	15.8	29.5	2.7	Zambezi Valley
18	09	69	22	42	48	16.5	28.5	2.2	L. Kariba
20	09	69	08	00	28	16.6	28.5	2.6	L. Kariba
04	10	69	22	55	52	17.0	27.9	2.4	L. Kariba
06	10	69	13	33	58	17.2	27.0	2.3	Kandabwe area
27	10	69	07	30	58	16.7	28.8	2.5	L. Kariba
30	10	69	23	45	11	16.6	28.4	2.5	L. Kariba
02	11	69	03	56	07	16.6	28.4	2.3	L. Kariba
03	11	69	01	38	16	16.8	28.8	2.9	L. Kariba
06	11	69	16	09	56	16.6	28.5	2.1	L. Kariba
15	11	69	21	43	01	16.6	28.5	2.5	L. Kariba
20	11	69	20	47	21	17.1	28.1	2.6	L. Kariba
07	12	69	10	35	55	16.6	28.5	2.7	L. Kariba
14	12	69	12	21	01	16.6	28.8	2.5	L. Kariba
14	12	69	23	26	34	16.7	28.8	2.6	L. Kariba
16	12	69	23	40	22	16.5	28.3	3.3	L. Kariba
18	12	69	21	41	20	16.5	28.1	2.5	L. Kariba
15	01	70	17	03	43	16.6	28.4	2.6	L. Kariba
31	01	70	15	28	12	16.6	28.8	3.3	L. Kariba
31	01	70	20	05	22	16.6	28.8	2.5	L. Kariba
01	02	70	03	31	00	16.6	28.8	2.9	L. Kariba
01	02	70	10	52	06	16.4	28.9	2.2	L. Kariba
01	02	70	17	15	45	16.5	28.8	3.0	L. Kariba
02	02	70	04	34	36	16.5	28.9	2.1	L. Kariba
02	02	70	06	00	24	16.4	28.9	2.7	L. Kariba
02	02	70	10	01	04	16.5	28.9	2.2	L. Kariba
02	02	70	16	32	11	16.5	28.9	2.2	L. Kariba
02	02	70	19	41	43	16.4	28.8	2.3	L. Kariba
02	02	70	19	42	18	16.5	28.8	2.3	L. Kariba
03	02	70	09	03	37	16.3	28.9	3.1	L. Kariba
04	02	70	17	40	53	16.5	28.9	2.4	L. Kariba
04	02	70	21	43	00	16.6	27.9	2.5	L. Kariba
04	02	70	22	51	56	16.5	28.9	2.2	L. Kariba
05	02	70	01	32	32	16.3	28.8	2.8	L. Kariba
05	02	70	20	35	06	16.7	27.9	2.6	L. Kariba
05	02	70	23	55	18	16.5	28.8	3.0	L. Kariba
07	02	70	10	47	44	16.5	28.8	2.2	L. Kariba
13	02	70	14	54	43	16.4	28.8	3.0	L. Kariba
13	02	70	22	36	03	16.5	28.0	2.2	L. Kariba
14	02	70	05	56	00	16.5	28.0	2.1	L. Kariba
14	02	70	07	55	56	16.4	27.4	3.2	L. Kariba
28	02	70	19	05	46	16.5	28.8	2.2	L. Kariba
07	03	70	15	18	26	16.5	28.7	2.6	L. Kariba
12	03	70	23	53	54	16.4	28.7	2.3	L. Kariba
18	03	70	23	56	35	16.6	28.5	2.6	L. Kariba
30	03	70	12	44	24	16.7	28.6	2.3	L. Kariba
25	03	70	02	38	09	15.3	30.2	2.5	Luangwa Valley, Zambia
25	03	70	04	09	02	15.3	30.1	2.0	Luangwa Valley, Zambia
25	03	70	17	50	16	16.7	28.0	2.8	L. Kariba
25	03	70	19	45	13	15.3	30.1	2.2	Luangwa Valley, Zambia

27	03	70	01	05	58	16.7	27.8	2.6	L. Kariba
28	03	70	01	57	23	16.7	27.8	2.4	L. Kariba
28	03	70	20	07	53	16.7	27.9	2.1	L. Kariba
28	03	70	21	40	13	16.6	27.9	2.4	L. Kariba
29	03	70	00	08	14	16.6	27.8	2.1	L. Kariba
08	04	70	13	56	51	15.3	26.6	2.5	Kafue Flats
09	04	70	07	06	24	16.6	28.8	2.2	L. Kariba
15	04	70	04	14	34	16.6	27.8	2.2	L. Kariba
16	04	70	08	54	45	16.6	27.8	2.7	L. Kariba
18	04	70	07	08	19	16.6	27.8	2.2	L. Kariba
20	04	70	09	01	51	16.5	28.9	2.1	L. Kariba
29	04	70	11	52	40	16.9	27.8	2.0	L. Kariba
01	05	70	05	09	21	16.7	27.7	2.8	L. Kariba
28	05	70	22	02	45	16.7	28.6	2.5	L. Kariba
28	05	70	22	03	07	16.7	28.6	2.5	L. Kariba
28	05	70	22	52	11	16.7	28.6	2.4	L. Kariba
09	06	70	07	07	33	16.6	27.9	2.5	L. Kariba
09	06	70	17	31	46	16.6	28.0	2.0	L. Kariba
09	06	70	17	42	18	16.7	27.8	2.6	L. Kariba
10	06	70	01	28	19	16.7	27.8	2.7	L. Kariba
10	06	70	03	15	16	16.7	27.8	3.2	L. Kariba
10	06	70	12	03	57	16.7	28.6	2.0	L. Kariba
11	06	70	08	23	59	16.6	28.0	2.5	L. Kariba
12	06	70	06	00	23	16.5	28.5	2.6	L. Kariba
17	06	70	02	42	11	14.2	25.9	2.4	Busanga Swamp
17	06	70	08	54	12	16.6	27.7	2.3	L. Kariba
18	06	70	05	23	56	16.6	27.9	2.0	L. Kariba
22	06	70	06	19	44	16.7	28.7	3.0	L. Kariba
04	07	70	08	34	11	15.3	30.2	2.5	Tete Province, Mozambique
09	07	70	20	44	04	17.7	27.5	2.0	L. Kariba
09	07	70	20	45	44	17.7	27.7	2.7	L. Kariba
17	07	70	09	56	50	14.9	29.5	2.4	Central Province, Zambia
17	07	70	09	58	58	17.4	27.1	2.0	L. Kariba
27	07	70	05	22	09	16.4	29.2	2.5	L. Kariba
02	08	70	20	43	34	16.6	28.4	2.5	L. Kariba
07	08	70	05	30	22	14.3	31.4	3.1	Eastern Province, Zambia
12	08	70	07	07	29	17.9	27.3	2.0	L. Kariba
16	08	70	01	05	48	16.6	31.8	3.7	North Eastern Zimbabwe
03	09	70	21	22	04	18.4	26.2	4.3	Wankie, Zimbabwe
16	09	70	15	46	10	14.6	25.5	2.6	Central province, zambia
19	09	70	01	15	10	14.5	29.7	2.7	Central Province, Zambia
24	09	70	17	16	42	14.4	27.2	2.6	Central Province, Zambia
29	09	70	14	48	47	14.5	30.5	3.4	Eastern Province, Zambia
13	10	70	05	42	22	14.7	29.5	2.6	Central Province, Zambia
19	10	70	05	45	20	15.2	29.8	2.6	Central Province, Zambia
21	10	70	11	51	51	16.7	28.6	2.2	L. Kariba
04	11	70	20	24	39	16.6	28.4	2.8	L. Kariba
04	11	70	20	41	18	16.6	28.5	2.4	L. Kariba
08	11	70	01	50	01	15.9	31.7	3.0	Tete Province, Mozambique
26	11	70	23	10	16	16.2	26.1	2.1	South West Zambia
28	11	70	01	36	18	16.6	28.4	2.3	L. Kariba
03	12	70	19	50	56	15.6	30.6	2.5	Tete Province, Mozambique
30	12	70	19	23	11	14.4	24.8	2.9	Western Province, Zambia
30	12	70	22	13	34	15.2	30.0	2.1	Central Province, Zambia
17	01	71	22	22	15	17.1	27.9	2.5	L. Kariba
01	02	71	02	28	06	16.6	28.7	2.8	L. Kariba
22	02	71	19	15	18	18.4	26.5	2.8	West of Zimbabwe
01	03	71	03	21	17	16.8	28.7	3.1	L. Kariba

01	03	71	03	28	40	16.6	28.5	2.5	L. Kariba
01	03	71	03	29	26	16.6	28.5	2.5	L. Kariba
07	03	71	00	48	28	15.0	28.7	3.0	Central Province, Zambia
09	03	71	01	03	01	18.5	26.3	2.4	North-Western Zimbabwe
14	03	71	06	49	53	16.6	28.6	2.8	L. Kariba
21	03	71	10	33	34	16.7	27.7	2.6	L. Kariba
25	03	71	02	53	34	14.6	30.4	2.7	Eastern Province, Zambia
26	03	71	17	38	32	14.0	30.7	3.5	Eastern Province, Zambia
14	04	71	12	14	46	16.6	27.8	3.9	L. Kariba
16	04	71	18	37	13	17.3	27.3	2.7	L. Kariba
22	04	71	02	55	06	16.7	28.3	2.5	L. Kariba
13	06	71	16	54	06	16.0	31.3	2.7	Tete Province, Mozambique
15	06	71	19	15	03	14.9	31.3	3.4	Tete Province, Mozambique
30	06	71	15	25	49	16.4	28.6	2.7	L. Kariba
21	08	71	02	14	16	16.6	28.8	2.6	L. Kariba
24	08	71	00	10	54	16.0	32.0	3.0	Tete Province, Mozambique
29	08	71	19	25	29	14.6	31.0	3.0	Eastern Province, Zambia
04	09	71	02	41	48	16.6	28.6	2.5	L. Kariba
04	09	71	05	01	34	16.6	28.6	2.6	L. Kariba
04	09	71	07	47	02	16.6	28.6	3.0	L. Kariba
04	09	71	10	15	46	16.6	28.6	2.6	L. Kariba
12	09	71	10	48	56	16.6	28.6	2.9	L. Kariba
12	09	71	12	16	10	16.6	28.6	2.6	L. Kariba
12	09	71	12	17	22	16.6	28.6	2.5	L. Kariba
12	09	71	14	48	18	16.6	28.6	2.5	L. Kariba
12	09	71	15	45	49	16.6	28.6	2.6	L. Kariba
12	09	71	17	39	47	16.6	28.6	2.5	L. Kariba
12	09	71	22	14	17	16.6	28.6	3.0	L. Kariba
13	09	71	00	26	53	16.6	28.6	2.5	L. Kariba
13	09	71	00	30	04	16.6	28.6	2.6	L. Kariba
13	09	71	00	32	34	16.6	28.6	2.8	L. Kariba
13	09	71	02	47	03	16.6	28.6	2.5	L. Kariba
13	09	71	05	52	51	16.6	28.6	2.5	L. Kariba
13	09	71	20	07	52	16.6	28.6	2.5	L. Kariba
13	09	71	22	43	03	16.6	28.6	3.6	L. Kariba
14	09	71	01	42	03	16.6	28.6	3.4	L. Kariba
14	09	71	02	37	29	16.6	28.6	2.9	L. Kariba
14	09	71	16	41	41	16.6	28.5	2.7	L. Kariba
14	09	71	17	38	52	16.6	28.6	2.5	L. Kariba
15	09	71	03	48	55	16.6	28.5	2.5	L. Kariba
15	09	71	09	41	13	16.6	28.7	2.5	L. Kariba
15	09	71	14	05	15	16.6	28.7	2.8	L. Kariba
16	09	71	18	14	17	14.2	28.1	4.2	Central Province, Zambia
20	09	71	10	03	40	14.3	28.1	3.3	Central Province, Zambia
22	09	71	21	29	00	16.6	28.7	2.8	L. Kariba
25	09	71	06	33	32	16.6	28.7	2.6	L. Kariba
25	09	71	07	02	14	16.6	28.6	2.5	L. Kariba
26	09	71	19	51	10	14.2	28.3	3.5	Central Province, Zambia
20	10	71	13	58	25	16.7	28.7	3.4	L. Kariba
22	10	71	00	38	56	14.3	28.2	2.6	Central Province, Zambia
30	10	71	00	05	18	16.7	28.7	3.7	L. Kariba
30	10	71	01	01	33	16.7	28.7	3.1	L. Kariba
30	10	71	01	03	59	16.7	28.7	3.2	L. Kariba
30	10	71	03	28	44	16.7	28.7	2.8	L. Kariba
30	10	71	04	37	28	16.6	28.7	2.5	L. Kariba
30	10	71	04	37	16	16.6	28.7	2.8	L. Kariba
30	10	71	05	45	56	16.7	28.7	2.8	L. Kariba
30	10	71	05	50	37	16.6	28.7	3.0	L. Kariba

10	11	71	22	42	09	16.7	28.5	2.8	L. Kariba
12	11	71	15	37	07	16.7	28.7	2.5	L. Kariba
13	11	71	09	36	50	16.7	28.7	2.6	L. Kariba
14	11	71	07	18	54	16.7	28.7	3.6	L. Kariba
14	11	71	08	40	21	16.7	28.7	3.1	L. Kariba
14	11	71	15	00	58	16.7	28.7	2.9	L. Kariba
15	11	71	11	06	43	16.7	28.7	3.0	L. Kariba
15	11	71	11	08	13	16.7	28.7	2.8	L. Kariba
15	11	71	14	48	51	16.7	28.7	2.8	L. Kariba
16	11	71	04	07	22	16.7	28.7	2.6	L. Kariba
16	11	71	05	43	32	16.7	28.7	3.0	L. Kariba
16	11	71	05	45	23	16.7	28.7	2.9	L. Kariba
16	11	71	06	00	31	16.7	28.7	3.0	L. Kariba
16	11	71	09	05	13	16.7	28.7	3.3	L. Kariba
16	11	71	09	13	17	16.7	28.7	2.5	L. Kariba
16	11	71	11	56	02	16.7	28.7	3.0	L. Kariba
16	11	71	12	34	14	16.7	28.7	2.5	L. Kariba
16	11	71	12	38	53	16.7	28.7	2.8	L. Kariba
16	11	71	13	44	28	16.7	28.7	2.9	L. Kariba
16	11	71	13	45	02	16.7	28.7	2.9	L. Kariba
16	11	71	13	59	55	16.7	28.7	2.7	L. Kariba
16	11	71	19	32	24	16.7	28.7	2.9	L. Kariba
16	11	71	21	40	55	16.7	28.7	2.8	L. Kariba
16	11	71	22	29	18	16.8	28.8	3.3	L. Kariba
16	11	71	22	39	41	16.7	28.7	2.6	L. Kariba
17	11	71	06	48	41	16.7	28.7	2.5	L. Kariba
17	11	71	06	52	02	16.7	28.7	2.6	L. Kariba
17	11	71	09	58	15	16.7	28.7	2.6	L. Kariba
18	11	71	03	51	45	16.7	28.7	2.7	L. Kariba
18	11	71	06	51	47	16.7	28.7	2.5	L. Kariba
18	11	71	09	15	51	16.7	28.7	2.7	L. Kariba
18	11	71	13	57	08	14.3	25.6	3.1	Western Province, Zambia
19	11	71	20	46	23	16.7	28.7	2.8	L. Kariba
20	11	71	05	52	22	16.7	28.6	2.7	L. Kariba
24	11	71	05	46	26	16.7	28.7	2.8	L. Kariba
24	11	71	07	02	32	16.7	28.7	2.7	L. Kariba
24	11	71	13	53	12	16.7	28.7	3.2	L. Kariba
24	11	71	13	55	57	16.8	28.8	3.0	L. Kariba
24	11	71	14	04	05	16.8	28.8	3.0	L. Kariba
24	11	71	14	06	03	16.8	28.8	2.6	L. Kariba
24	11	71	14	13	57	16.7	28.7	2.8	L. Kariba
24	11	71	16	48	43	16.7	28.7	3.5	L. Kariba
24	11	71	16	54	29	16.8	28.8	3.0	L. Kariba
24	11	71	17	15	32	16.7	28.7	2.9	L. Kariba
25	11	71	02	30	42	16.8	28.8	3.3	L. Kariba
25	11	71	06	39	47	16.8	28.8	3.6	L. Kariba
25	11	71	07	43	44	16.8	28.7	2.7	L. Kariba
25	11	71	15	32	51	16.7	28.7	3.0	L. Kariba
27	11	71	13	52	45	16.7	28.7	2.6	L. Kariba
04	12	71	17	34	31	16.7	28.8	2.6	L. Kariba
07	12	71	10	24	30	16.8	28.5	3.2	L. Kariba
12	12	71	13	52	22	19.5	25.5	2.7	North Western Botswana
23	01	72	02	18	00	16.3	28.8	3.1	L. Kariba
29	01	72	14	48	41	16.6	28.7	3.2	L. Kariba
07	02	72	15	33	11	16.6	28.6	2.6	L. Kariba
05	03	72	15	20	38	16.7	28.5	3.4	L. Kariba
06	03	72	01	47	18	16.5	28.6	2.7	L. Kariba
06	03	72	02	40	48	16.6	28.6	3.2	L. Kariba

03	03	72	07	32	56	16.6	28.8	2.6	L. Kariba
06	03	72	10	49	14	16.8	28.7	3.6	L. Kariba
06	03	72	14	22	46	16.7	28.6	2.7	L. Kariba
07	03	72	00	38	55	16.7	28.7	3.4	L. Kariba
07	03	72	07	16	40	16.8	28.8	3.2	L. Kariba
15	03	72	01	42	09	16.9	28.7	3.8	L. Kariba
24	03	72	13	17	56	16.9	27.9	2.8	L. Kariba
09	05	72	17	12	55	16.7	28.6	3.4	L. Kariba
09	05	72	19	39	54	16.7	28.7	2.9	L. Kariba
09	05	72	19	53	42	16.7	28.7	2.5	L. Kariba
15	05	72	01	51	05	17.6	27.2	3.8	L. Kariba
21	05	72	04	58	07	17.6	27.3	3.1	L. Kariba
31	05	72	23	34	35	17.7	27.3	2.9	L. Kariba
06	06	72	02	04	02	18.0	27.4	2.7	L. Kariba
07	06	72	18	25	21	17.6	27.5	2.8	L. Kariba
10	06	72	21	25	15	17.7	27.5	2.6	L. Kariba
29	06	72	17	54	20	14.8	26.3	3.1	Western Province, Zambia
01	07	72	12	13	02	16.7	28.9	2.7	L. Kariba
03	07	72	03	29	05	17.7	27.3	3.1	L. Kariba
08	07	72	06	29	43	16.0	27.3	2.6	Central Province, Zambia
14	07	72	18	22	44	17.1	27.9	2.7	L. Kariba
13	08	72	23	39	12	15.7	26.3	2.6	Southern Province, Zambia
24	09	72	07	34	00	17.7	27.2	3.3	L. Kariba
26	09	72	09	16	55	14.0	24.0	3.8	Western Province, Zambia
05	10	72	13	22	27	16.5	28.8	3.0	L. Kariba
15	10	72	21	42	06	14.6	26.9	3.6	Western Province, Zambia
28	10	72	11	39	12	16.5	28.8	2.9	L. Kariba
01	11	72	11	41	19	17.3	27.2	2.5	L. Kariba
27	11	72	16	31	04	16.7	28.2	3.7	L. Kariba
27	11	72	16	45	10	16.7	28.2	3.4	L. Kariba
27	11	72	17	04	03	16.7	28.3	2.9	L. Kariba
27	11	72	17	05	27	16.7	28.3	2.7	L. Kariba
27	11	72	19	40	11	16.7	28.2	3.3	L. Kariba
28	11	72	09	51	02	16.8	28.2	2.9	L. Kariba
29	11	72	00	28	18	16.8	28.3	3.1	L. Kariba
30	11	72	10	08	45	16.8	28.2	2.9	L. Kariba
01	12	72	12	33	15	16.7	28.3	3.0	L. Kariba
12	12	72	03	18	47	16.7	28.1	5.0	L. Kariba
12	12	72	03	24	05	16.6	28.1	4.0	L. Kariba
12	12	72	03	28	31	16.7	28.1	3.3	L. Kariba
12	12	72	04	33	03	16.7	28.1	2.5	L. Kariba
12	12	72	04	38	25	16.6	28.0	2.5	L. Kariba
12	12	72	05	10	48	16.6	28.1	2.7	L. Kariba
12	12	72	05	13	55	16.6	28.1	3.1	L. Kariba
12	12	72	06	37	53	16.7	28.2	3.2	L. Kariba
12	12	72	23	21	25	16.8	28.2	3.8	L. Kariba
13	12	72	01	42	44	16.6	28.1	2.7	L. Kariba
13	12	72	06	54	40	16.7	28.1	3.6	L. Kariba
13	12	72	06	55	13	16.7	28.1	3.2	L. Kariba
13	12	72	11	25	37	16.6	28.1	3.2	L. Kariba
13	12	72	15	51	00	16.8	28.1	3.0	L. Kariba
14	12	72	01	59	46	16.7	28.2	3.4	L. Kariba
14	12	72	03	06	37	16.7	28.2	3.3	L. Kariba
14	12	72	05	01	01	16.7	28.2	3.7	L. Kariba
14	12	72	07	05	27	16.7	28.1	3.2	L. Kariba
14	12	72	22	08	49	16.7	28.1	2.7	L. Kariba
14	12	72	23	05	01	16.8	28.1	2.6	L. Kariba
14	12	72	23	41	38	16.7	28.2	3.5	L. Kariba

15	12	72	00	51	11	16.7	28.2	2.9	L. Kariba
15	12	72	04	29	15	16.7	28.1	3.1	L. Kariba
15	12	72	11	23	06	16.7	28.1	2.8	L. Kariba
16	12	72	08	45	36	16.7	28.2	2.6	L. Kariba
16	12	72	08	49	49	16.6	28.2	3.4	L. Kariba
16	12	72	10	46	15	16.7	28.2	2.6	L. Kariba
16	12	72	13	33	56	16.6	28.1	2.6	L. Kariba
16	12	72	20	02	12	16.7	28.2	2.5	L. Kariba
17	12	72	00	36	00	16.6	28.1	2.5	L. Kariba
17	12	72	12	15	04	16.6	28.1	2.7	L. Kariba
18	12	72	01	18	54	16.6	28.1	5.2	L. Kariba
18	12	72	01	18	56	16.6	28.1	5.4	L. Kariba
18	12	72	01	28	31	16.7	28.2	3.2	L. Kariba
18	12	72	01	33	27	16.7	28.2	2.7	L. Kariba
18	12	72	01	46	30	16.6	28.1	3.5	L. Kariba
18	12	72	02	36	17	16.6	28.1	3.8	L. Kariba
18	12	72	02	51	06	16.7	28.1	3.0	L. Kariba
18	12	72	03	25	49	16.6	28.1	2.8	L. Kariba
18	12	72	03	36	57	16.6	28.1	2.7	L. Kariba
18	12	72	06	34	49	16.7	28.2	2.8	L. Kariba
18	12	72	06	39	25	16.7	28.2	3.0	L. Kariba
18	12	72	07	31	13	16.7	28.2	2.7	L. Kariba
18	12	72	07	37	22	16.7	28.2	3.0	L. Kariba
18	12	72	07	54	57	16.6	28.1	2.5	L. Kariba
18	12	72	18	14	59	16.7	28.1	2.6	L. Kariba
18	12	72	09	01	27	16.7	28.1	3.1	L. Kariba
18	12	72	10	55	11	16.7	28.1	2.5	L. Kariba
18	12	72	11	26	41	16.7	28.1	3.0	L. Kariba
18	12	72	12	03	24	16.7	28.2	3.3	L. Kariba
18	12	72	12	35	45	16.6	28.1	2.8	L. Kariba
18	12	72	13	31	07	16.7	28.2	3.0	L. Kariba
18	12	72	14	58	12	16.7	28.2	2.7	L. Kariba
18	12	72	15	50	44	16.7	28.1	3.5	L. Kariba
18	12	72	18	07	33	16.6	28.1	3.0	L. Kariba
18	12	72	18	11	25	16.7	28.1	3.5	L. Kariba
18	12	72	18	24	41	16.6	28.1	3.3	L. Kariba
18	12	72	21	45	20	16.7	28.2	2.6	L. Kariba
19	12	72	07	52	28	16.7	28.1	3.1	L. Kariba
19	12	72	08	21	32	16.6	28.1	2.6	L. Kariba
19	12	72	08	25	30	16.6	28.1	2.6	L. Kariba
19	12	72	09	27	21	16.6	28.2	2.9	L. Kariba
19	12	72	15	41	10	16.7	28.1	3.1	L. Kariba
19	12	72	17	26	09	16.6	28.1	2.7	L. Kariba
19	12	72	23	25	25	16.6	28.1	2.7	L. Kariba
20	12	72	05	33	31	16.7	28.1	2.8	L. Kariba
20	12	72	14	30	57	16.7	28.2	3.4	L. Kariba
20	12	72	14	36	35	16.7	28.2	2.7	L. Kariba
20	12	72	15	02	13	16.6	28.1	3.6	L. Kariba
20	12	72	16	15	44	16.7	28.1	3.7	L. Kariba
20	12	72	17	01	00	16.7	28.1	3.1	L. Kariba
21	12	72	07	25	35	16.6	28.1	2.6	L. Kariba
21	12	72	22	29	55	16.6	28.1	2.6	L. Kariba
22	12	72	08	13	35	16.7	28.1	2.7	L. Kariba
22	12	72	15	12	28	16.7	28.1	2.6	L. Kariba
23	12	72	00	15	02	16.6	28.1	2.8	L. Kariba
24	12	72	01	41	28	16.7	28.2	2.6	L. Kariba
24	12	72	10	16	17	16.6	28.1	2.9	L. Kariba
25	12	72	00	29	57	16.7	28.2	2.9	L. Kariba

25	12	72	07	07	10	16.7	28.1	3.4	L. Kariba
25	12	72	10	11	25	16.6	28.1	2.9	L. Kariba
25	12	72	14	47	58	16.6	28.1	3.0	L. Kariba
25	12	72	18	39	12	16.6	28.1	2.9	L. Kariba
26	12	72	09	32	19	16.7	28.1	2.8	L. Kariba
26	12	72	12	25	15	16.8	28.2	3.0	L. Kariba
27	12	72	12	19	06	16.7	28.1	2.9	L. Kariba
27	12	72	15	29	37	16.7	28.1	4.6	L. Kariba
27	12	72	15	52	30	16.8	28.2	3.2	L. Kariba
28	12	72	15	11	23	16.6	28.1	2.8	L. Kariba
29	12	72	18	53	22	16.7	28.2	2.5	L. Kariba
30	12	72	09	52	30	16.7	28.1	2.6	L. Kariba
30	12	72	14	40	33	16.7	28.1	2.5	L. Kariba
01	01	73	08	16	39	16.7	28.1	3.0	L. Kariba
01	01	73	13	20	52	16.7	28.1	3.2	L. Kariba
01	01	73	16	54	33	16.7	28.1	3.0	L. Kariba
01	01	73	17	43	35	16.7	28.1	3.1	L. Kariba
01	01	73	18	26	18	16.7	28.1	3.0	L. Kariba
01	01	73	23	28	45	16.6	28.1	3.0	L. Kariba
03	01	73	00	13	18	16.7	28.1	3.9	L. Kariba
03	01	73	00	25	14	16.6	28.1	3.4	L. Kariba
03	01	73	14	08	22	16.6	28.1	4.0	L. Kariba
04	01	73	08	06	24	16.5	28.1	3.1	L. Kariba
07	01	73	02	23	30	16.5	28.1	3.0	L. Kariba
08	01	73	09	02	30	16.5	28.1	3.2	L. Kariba
09	01	73	02	05	46	16.5	28.1	3.1	L. Kariba
13	01	73	04	23	33	16.5	28.1	3.4	L. Kariba
13	01	73	06	05	36	16.6	28.1	4.9	L. Kariba
13	01	73	06	55	30	16.5	28.1	3.8	L. Kariba
13	01	73	06	57	16	16.5	28.1	3.8	L. Kariba
13	01	73	08	13	33	16.5	28.1	3.2	L. Kariba
14	01	73	06	18	12	16.5	28.1	3.1	L. Kariba
15	01	73	15	04	57	16.6	28.6	3.2	L. Kariba
15	01	73	21	42	25	16.5	28.1	3.1	L. Kariba
17	01	73	18	26	57	16.5	28.1	3.0	L. Kariba
18	01	73	16	32	22	16.5	28.1	3.1	L. Kariba
19	01	73	03	14	13	16.5	28.2	3.5	L. Kariba
20	01	73	12	41	40	16.5	28.1	2.9	L. Kariba
20	01	73	12	45	50	16.5	28.1	3.1	L. Kariba
20	01	73	13	00	15	16.5	28.1	3.1	L. Kariba
22	01	73	13	02	03	16.5	28.2	3.4	L. Kariba
27	01	73	21	28	19	16.5	28.1	2.9	L. Kariba
27	01	73	21	28	46	16.5	28.1	2.9	L. Kariba
28	01	73	10	05	19	16.5	28.1	3.2	L. Kariba
30	01	73	01	46	07	16.5	28.1	3.2	L. Kariba
02	02	73	13	38	37	16.6	28.1	2.8	L. Kariba
03	02	73	04	27	19	16.6	28.1	2.9	L. Kariba
03	02	73	18	22	54	16.5	28.8	2.8	L. Kariba
06	02	73	20	47	34	16.7	28.1	3.6	L. Kariba
06	02	73	21	31	35	16.7	28.1	2.9	L. Kariba
08	02	73	16	39	55	19.9	28.1	2.9	South Western Zimbabwe
10	02	73	10	19	59	16.6	28.1	3.4	L. Kariba
10	02	73	19	24	46	18.0	27.0	3.0	Western Zimbabwe
11	02	73	22	44	25	16.7	28.1	3.8	L. Kariba
12	02	73	09	08	33	16.7	28.2	3.5	L. Kariba
18	02	73	23	28	37	16.7	28.2	3.1	L. Kariba
19	02	73	00	28	25	16.7	28.2	2.9	L. Kariba
20	02	73	15	17	54	16.7	28.1	4.3	L. Kariba

21	02	73	01	19	52	16.7	28.2	2.8	L. Kariba
21	02	73	11	28	24	17.3	27.3	2.9	L. Kariba
22	02	73	18	54	24	16.7	28.2	3.6	L. Kariba
24	02	73	14	00	39	17.3	27.3	3.0	L. Kariba
28	02	73	16	19	01	16.7	28.7	3.1	L. Kariba
28	02	73	16	19	12	16.8	28.9	3.1	L. Kariba
01	03	73	10	43	51	16.6	28.2	3.0	L. Kariba
03	03	73	05	15	53	16.6	28.1	2.9	L. Kariba
05	03	73	03	06	39	16.6	28.1	3.3	L. Kariba
05	03	73	05	09	05	16.6	28.1	3.0	L. Kariba
06	03	73	13	07	00	16.6	28.1	2.9	L. Kariba
08	03	73	10	23	30	16.6	28.2	3.9	L. Kariba
09	03	73	16	31	40	16.6	28.2	3.2	L. Kariba
11	03	73	10	40	07	16.7	28.1	4.1	L. Kariba
11	03	73	18	49	55	16.7	28.2	3.9	L. Kariba
13	03	73	03	34	33	16.6	28.7	3.4	L. Kariba
16	03	73	03	56	53	16.7	28.7	3.8	L. Kariba
20	03	73	12	05	15	16.6	28.1	3.0	L. Kariba
22	03	73	13	45	46	16.6	28.6	3.1	L. Kariba
22	03	73	14	25	29	16.5	28.1	3.8	L. Kariba
28	03	73	06	31	56	16.7	28.1	3.2	L. Kariba
31	03	73	13	20	19	16.7	28.2	3.3	L. Kariba
31	03	73	20	22	14	16.7	28.2	3.1	L. Kariba
02	04	73	01	34	43	18.3	26.8	2.9	Western Zimbabwe
03	04	73	18	55	06	15.2	28.3	3.6	Central Province, Zambia
05	04	73	02	56	50	16.7	28.2	4.3	L. Kariba
05	04	73	02	58	12	16.7	28.2	3.6	L. Kariba
05	04	73	03	36	33	16.6	28.2	3.3	L. Kariba
05	04	73	04	50	02	16.6	28.2	3.2	L. Kariba
07	04	73	12	44	17	16.7	28.2	3.1	L. Kariba
13	04	73	12	35	12	16.7	28.2	2.8	L. Kariba
19	04	73	02	12	11	16.7	28.2	3.9	L. Kariba
22	04	73	06	59	17	16.3	28.7	3.1	L. Kariba
22	04	73	18	41	33	16.6	28.2	2.8	L. Kariba
24	04	73	16	48	32	16.7	28.0	3.3	L. Kariba
02	01	75	16	26	19	14.2	26.0	3.0	Western Province, Zambia
03	01	75	13	08	27	15.7	27.1	3.5	Central Province, Zambia
20	08	75	19	52	23	16.7	29.0	3.8	L. Kariba
21	08	75	00	26	52	16.6	28.9	2.9	L. Kariba
23	08	75	00	18	45	16.6	29.0	3.3	L. Kariba
07	12	75	14	04	37	16.6	28.2	3.4	L. Kariba
28	01	76	04	41	44	16.5	29.1	3.4	L. Kariba
31	01	76	21	02	42	16.8	28.8	3.4	L. Kariba
03	04	76	08	29	54	19.3	27.4	3.8	Western Zimbabwe
18	04	76	06	51	02	16.3	32.0	3.4	North Eastern Zimbabwe
08	05	76	00	35	43	17.4	27.7	3.8	L. Kariba
13	05	76	07	22	24	16.8	28.8	3.5	L. Kariba
15	05	76	11	10	24	19.0	27.0	2.9	Western Zimbabwe
21	05	76	10	15	10	18.6	26.3	2.8	Western Zimbabwe
23	05	76	11	09	23	16.8	28.9	2.8	L. Kariba
28	05	76	12	29	35	16.8	30.2	2.9	Nothern Zimbabwe
28	05	76	23	15	32	18.6	26.4	3.2	Western Zimbabwe
31	05	76	07	16	45	16.3	28.8	2.8	L. Kariba
12	06	76	20	46	02	17.4	30.7	3.0	Nothern Zimbabwe
12	06	76	22	59	22	19.0	27.3	2.9	Western Zimbabwe
15	06	76	11	38	03	16.2	31.3	2.8	Nothern Zimbabwe
01	07	76	17	18	51	16.6	28.2	3.3	L. Kariba
02	07	76	05	43	27	16.5	28.7	3.0	L. Kariba

20	08	76	15	08	09	16.0	29.0	3.0	L. Kariba
20	08	76	19	52	23	16.7	29.0	3.8	L. Kariba
22	08	76	00	26	52	16.6	28.9	2.9	L. Kariba
23	08	76	00	18	45	16.6	29.0	3.3	L. Kariba
28	08	76	19	48	57	15.9	30.3	2.8	Tete Province, Mozambique
02	09	76	06	08	46	17.2	28.6	2.9	L. Kariba
05	09	76	18	26	13	16.7	28.8	3.1	L. Kariba
02	10	76	21	08	05	16.4	30.7	3.1	Nothern Zimbabwe
05	10	76	15	25	14	16.6	28.3	2.9	L. Kariba
07	10	76	00	23	14	17.0	24.5	3.2	Southern Province, Zambia
09	10	76	08	20	40	15.6	27.4	3.2	Central Province, Zambia
15	10	76	08	21	40	17.6	27.3	3.0	L. Kariba
15	10	76	16	06	11	17.4	27.3	3.0	L. Kariba
17	10	76	03	38	42	17.6	27.4	2.9	L. Kariba
26	10	76	07	26	26	15.6	29.6	3.0	Central Province, Zambia
05	11	76	09	15	14	19.7	28.3	3.9	South Western Zimbabwe
07	11	76	02	15	19	16.6	28.8	3.1	L. Kariba
14	11	76	04	34	49	16.7	28.6	3.3	L. Kariba
12	12	76	05	42	39	17.7	27.1	3.2	L. Kariba
15	12	76	06	23	53	17.6	27.3	3.0	L. Kariba
11	01	77	02	54	01	16.8	28.0	2.9	L. Kariba
19	01	77	11	03	31	18.2	26.8	3.0	North Western Zimbabwe
19	01	77	14	39	20	18.3	26.7	2.9	North Western Zimbabwe
19	01	77	17	37	29	17.6	27.2	2.8	L. Kariba
20	01	77	13	04	31	15.9	29.4	3.0	Central Province, Zambia
21	01	77	22	02	01	17.3	27.7	2.8	L. Kariba
31	01	77	17	13	45	16.5	28.6	3.0	L. Kariba
24	02	77	09	08	47	16.3	28.4	3.2	L. Kariba
10	03	77	05	13	12	16.5	28.1	3.7	L. Kariba
14	03	77	21	08	46	16.6	27.8	3.1	L. Kariba
25	03	77	02	44	23	16.5	28.2	3.0	L. Kariba
28	03	77	20	18	38	17.4	27.7	3.0	K. Kariba
06	04	77	03	56	11	17.3	26.5	3.7	Southern Province, Zambia
17	06	77	08	27	22	16.7	29.1	2.8	Northern Zimbabwe
18	07	77	03	07	49	16.7	28.7	2.9	L. Kariba
27	07	77	20	25	25	15.8	32.0	3.1	L. Cabora Bassa
28	07	77	04	07	12	18.4	26.3	3.0	Western Zimbabwe
30	07	77	09	01	32	15.5	32.0	3.0	L. Cabora Bassa
30	07	77	13	08	43	18.2	26.2	3.1	Western Zimbabwe
05	08	77	18	01	31	16.3	28.6	3.0	L. Kariba
08	09	77	17	03	43	18.7	26.7	2.8	Western Zimbabwe
10	09	77	17	20	37	16.0	29.2	4.6	Northern Zimbabwe
12	09	77	20	03	32	15.8	32.0	3.0	L. Cabora Bassa
23	09	77	10	26	36	15.6	32.0	2.8	L. Cabora Bassa
24	09	77	06	34	14	15.0	29.3	3.4	Central Province, Zambia
02	10	77	17	02	50	14.7	31.6	3.3	Eastern Province, Zambia
03	10	77	06	27	08	19.2	28.1	3.2	Western Zimbabwe
04	10	77	07	27	44	15.2	31.7	3.2	L. Cabora Bassa
28	10	77	00	22	18	19.1	26.2	3.6	North Western Zimbabwe
31	10	77	08	32	50	14.0	30.7	3.5	Eastern Province, Zambia
04	11	77	04	12	38	19.0	26.3	3.3	Western Zimbabwe
10	11	77	12	59	55	16.6	28.5	3.0	L. Kariba
22	11	77	22	32	31	16.4	28.0	2.9	L. Kariba
25	11	77	21	04	33	16.7	28.0	2.9	L. Kariba
27	01	78	02	24	00	16.7	28.1	4.0	L. Kariba
03	01	79	02	09	21	17.5	27.9	2.9	L. Kariba
26	02	79	06	18	42	15.6	30.2	3.9	West of L. Cabora Bassa
24	03	79	04	41	38	16.7	28.7	3.0	L. Kariba

31	03	79	12	32	23	16.7	28.1	2.9	L. Kariba
14	04	79	23	49	32	16.6	28.5	2.8	L. Kariba
15	04	79	20	47	40	17.2	27.5	3.0	L. Kariba
19	04	79	12	33	55	15.4	30.8	2.8	L. Cabora Bassa
19	04	79	14	04	58	17.3	27.7	2.8	L. Kariba
20	04	79	07	56	58	16.8	28.8	3.8	L. Kariba
21	04	79	23	14	37	17.3	27.6	3.2	L. Kariba
29	04	79	14	55	44	17.4	27.7	3.3	L. Kariba
29	04	79	17	01	41	17.3	27.7	3.3	L. Kariba
01	05	79	10	14	44	17.3	27.4	3.1	L. Kariba
02	05	79	16	43	19	17.3	27.3	2.8	L. Kariba
03	05	79	12	43	59	17.3	27.3	3.6	L. Kariba
05	05	79	16	09	43	17.3	27.6	3.3	L. Kariba
08	05	79	16	40	05	17.3	27.4	2.9	L. Kariba
08	05	79	18	18	10	17.1	27.3	2.8	L. Kariba
11	05	79	05	59	20	17.6	27.2	2.8	L. Kariba
13	05	79	21	03	24	17.3	27.4	4.2	L. Kariba
14	05	79	04	57	15	17.3	27.4	4.2	L. Kariba
16	05	79	03	53	47	15.9	29.1	2.8	Central Province, Zambia
17	05	79	09	38	39	15.9	26.2	3.4	Southern Province, Zambia
17	05	79	11	25	11	17.4	27.5	3.2	L. Kariba
18	05	79	11	30	50	17.4	27.7	2.9	L. Kariba
20	05	79	22	36	57	16.6	28.0	2.8	L. Kariba
29	05	79	06	46	14	17.3	27.4	3.0	L. Kariba
09	06	79	18	06	24	17.3	27.5	3.1	L. Kariba
09	06	79	20	57	41	17.2	27.5	2.8	L. Kariba
11	06	79	08	34	41	18.6	25.3	3.1	Northern Botswana
11	06	79	12	43	31	17.7	27.8	2.8	L. Kariba
12	06	79	02	26	58	15.2	31.3	2.9	L. Cabora Bassa
12	06	79	02	27	07	15.2	31.3	2.9	L. Cabora Bassa
12	06	79	13	55	36	17.3	27.7	2.9	L. Kariba
12	06	79	14	49	59	17.4	27.4	2.8	L. Kariba
16	06	79	02	43	19	17.4	27.8	2.8	L. Kariba
27	.6	79	19	06	27	17.4	27.7	2.9	L. Kariba
27	06	79	19	22	00	17.3	27.6	2.8	L. Kariba
02	07	79	17	58	54	17.2	27.6	2.8	L. Kariba
04	07	79	06	36	56	17.4	27.7	3.0	L. Kariba
06	07	79	17	59	31	17.2	28.2	2.8	L. Kariba
20	07	79	05	50	05	17.4	27.6	2.9	L. Kariba
31	07	79	07	03	26	17.5	27.6	3.4	L. Kariba
31	07	79	08	54	43	17.4	27.7	3.9	L. Kariba
31	07	79	16	34	15	17.3	27.6	3.0	L. Kariba
07	08	79	16	37	18	17.3	27.4	2.9	L. Kariba
07	08	79	22	08	52	14.8	28.5	3.5	Central Province, Zambia
09	08	79	17	39	37	17.2	27.4	2.9	L. Kariba
10	08	79	10	04	05	17.4	27.7	3.8	L. Kariba
11	08	79	10	32	40	17.3	27.6	3.2	L. Kariba
11	08	79	19	31	35	17.3	27.5	3.1	L. Kariba
13	08	79	05	30	00	17.3	27.4	3.5	L. Kariba
13	08	79	10	09	42	17.1	27.3	3.1	L. Kariba
13	08	79	21	25	36	17.6	27.2	2.9	L. Kariba
16	08	79	10	31	55	17.5	27.2	2.8	L. Kariba
16	08	79	13	09	50	17.3	27.2	3.1	L. Kariba
16	08	79	15	47	30	16.8	28.5	3.3	L. Kariba
17	08	79	19	47	14	17.5	27.2	3.1	L. Kariba
25	08	79	03	17	45	16.5	28.4	3.3	L. Kariba
26	08	79	18	29	50	17.3	27.6	2.9	L. Kariba
27	08	79	23	06	07	17.3	27.5	2.9	L. Kariba

29	08	79	19	16	46	17.3	27.4	2.9	L. Kariba
31	08	79	04	06	11	17.2	27.4	3.2	L. Kariba
31	08	79	06	38	12	17.3	27.4	3.5	L. Kariba
02	09	79	20	38	48	17.4	27.5	3.5	L. Kariba
02	09	79	20	57	44	17.4	27.5	3.0	L. Kariba
04	09	79	07	49	04	17.3	27.4	3.1	L. Kariba
05	09	79	00	51	39	16.6	28.2	3.1	L. Kariba
05	09	79	10	44	13	17.2	27.4	3.2	L. Kariba
07	09	79	18	52	24	16.5	28.7	3.3	L. Kariba
07	09	79	19	39	51	17.1	27.3	3.3	L. Kariba
09	09	79	08	56	25	17.2	27.4	3.4	L. Kariba
09	09	79	10	37	07	17.3	27.4	3.5	L. Kariba
11	09	79	10	14	30	17.1	27.4	3.1	L. Kariba
12	09	79	08	58	28	17.2	27.4	2.9	L. Kariba
14	09	79	06	47	35	17.1	27.4	3.0	L. Kariba
17	09	79	02	59	01	15.6	29.9	3.2	Central Province, Zambia
27	09	79	18	25	42	17.2	27.4	3.6	L. Kariba
28	09	79	04	21	06	17.3	27.4	3.8	L. Kariba
28	09	79	06	59	11	17.2	27.3	3.4	L. Kariba
07	10	79	10	50	57	17.2	27.4	3.0	L. Kariba
10	10	79	15	39	49	16.6	28.7	3.2	L. Kariba
12	10	79	02	24	26	17.4	27.2	3.1	L. Kariba
13	10	79	18	51	45	16.5	28.0	3.1	L. Kariba
15	10	79	03	20	31	14.1	30.6	3.3	Eastern Province, Zambia
15	10	79	21	00	39	17.0	27.3	3.0	L. Kariba
17	10	79	21	19	01	17.1	27.4	3.0	L. Kariba
19	10	79	08	40	20	17.1	27.3	3.1	L. Kariba
20	10	79	02	51	02	17.1	27.3	3.0	L. Kariba
20	10	79	15	58	56	17.2	27.2	3.0	L. Kariba
21	10	79	01	57	54	17.3	27.4	3.8	L. Kariba
21	10	79	22	58	52	17.2	27.3	3.0	L. Kariba
22	10	79	20	48	01	17.2	27.4	3.1	L. Kariba
23	10	79	04	48	02	17.3	27.3	3.2	L. Kariba
23	10	79	10	03	24	17.4	27.4	3.0	L. Kariba
23	10	79	10	58	54	17.3	27.4	3.1	L. Kariba
24	10	79	22	02	39	17.3	27.3	3.0	L. Kariba
25	10	79	02	35	46	17.3	27.3	3.1	L. Kariba
25	10	79	12	52	44	17.2	27.3	3.1	L. Kariba
04	11	79	01	26	00	14.5	31.6	2.8	Eastern Province, Zambia
30	12	79	09	09	38	16.8	28.6	3.6	L. Kariba
01	01	80	11	18	20	15.9	26.1	3.8	Southern Province, Zambia
01	01	80	15	05	40	17.2	27.1	2.9	L. Kariba
01	01	80	15	55	56	15.5	26.1	3.8	Southern Province, Zambia
02	01	80	00	43	21	15.4	25.8	3.0	Southern Province, Zambia
03	01	80	12	04	57	15.5	26.1	3.2	Southern Province, Zambia
09	01	80	22	51	49	18.2	26.5	3.2	Western Zimbabwe
15	01	80	00	47	53	16.6	29.0	3.1	L. Kariba
29	01	80	13	06	01	16.6	28.2	2.8	L. Kariba
05	02	80	14	26	45	18.6	26.3	2.8	North Western Zimbabwe
08	02	80	08	06	26	16.6	29.0	3.3	L. Kariba
22	02	80	19	54	44	17.2	27.3	2.9	L. Kariba
04	04	80	18	34	40	16.6	28.1	3.7	L. Kariba
22	06	80	12	07	26	16.4	29.0	3.0	L. Kariba
30	06	80	06	03	10	17.7	25.4	3.9	Southern Province, Zambia
30	06	80	06	10	32	18.3	27.0	3.4	North Western Zimbabwe
05	07	80	11	41	42	17.3	27.3	2.8	L. Kariba
18	07	80	00	37	55	18.2	26.6	3.1	Western Zimbabwe
01	08	80	02	36	55	14.3	24.2	3.0	Western Province, Zambia

06	08	80	17	27	19	14.2	26.8	3.1	Western Province, Zambia
22	09	80	07	28	00	16.6	28.2	4.5	L. Kariba
07	11	80	01	39	45	16.7	28.1	3.1	L. Kariba
12	11	80	22	40	54	18.0	24.0	3.3	Northern Botswana
13	11	80	11	07	05	17.2	27.2	2.9	L. Kariba
28	11	80	08	22	28	16.7	28.2	3.1	L. Kariba
08	12	80	13	52	52	18.5	26.4	2.8	L. Kariba
11	12	80	05	50	42	17.9	27.4	2.9	L. Kariba
03	03	81	22	50	55	18.0	27.0	2.8	L. Kariba
10	03	81	11	41	49	17.2	27.2	3.0	L. Kariba
22	03	81	02	33	22	18.0	27.1	3.1	L. Kariba
22	03	81	02	56	38	18.0	27.1	3.5	L. Kariba
22	03	81	07	21	36	18.0	27.1	3.6	L. Kariba
23	03	81	03	56	36	18.0	27.1	3.1	L. Kariba
24	03	81	02	35	49	16.6	28.4	3.4	L. Kariba
25	03	81	18	39	22	16.4	28.8	2.8	L. Kariba
30	03	81	06	25	24	16.7	28.8	3.3	L. Kariba
16	04	81	10	57	26	16.8	28.1	2.8	L. Kariba
13	05	81	14	53	51	17.9	27.1	3.8	L. Kariba
20	05	81	02	22	42	18.0	27.0	3.4	L. Kariba
20	05	81	02	35	07	18.0	27.0	3.5	L. Kariba
23	05	81	18	23	48	18.0	27.0	3.8	L. Kariba
30	05	81	20	35	28	18.0	27.0	3.6	L. Kariba
30	05	81	21	23	07	18.0	27.0	3.2	L. Kariba
01	06	81	06	23	44	18.0	27.1	3.1	L. Kariba
01	06	81	16	49	44	18.0	27.1	3.4	L. Kariba
02	06	81	16	27	43	17.0	28.0	3.8	L. Kariba
02	06	81	16	58	03	18.0	27.1	3.2	L. Kariba
12	06	81	08	17	15	18.0	27.1	3.3	L. Kariba
12	06	81	10	19	05	18.0	27.0	2.9	L. Kariba
14	06	81	03	37	12	17.9	27.1	3.9	L. Kariba
14	06	81	04	24	23	18.0	27.1	3.7	L. Kariba
14	06	81	05	02	44	18.0	27.1	3.4	L. Kariba
15	06	81	02	54	30	18.0	27.1	3.2	L. Kariba
20	06	81	03	48	01	16.6	27.9	2.8	L. Kariba
28	06	81	14	29	26	16.6	29.0	3.2	L. Kariba
06	07	81	17	58	07	18.0	27.2	3.7	L. Kariba
07	07	81	08	54	16	18.0	27.1	3.1	L. Kariba
12	07	81	09	12	21	16.6	28.9	4.2	L. Kariba
13	07	81	08	20	39	18.0	27.1	3.6	L. Kariba
14	07	81	12	53	57	16.5	29.0	3.0	L. Kariba
15	07	81	20	43	20	18.0	27.3	3.2	L. Kariba
18	07	81	16	39	39	17.9	27.1	3.5	L. Kariba
20	07	81	01	21	12	18.0	27.1	3.1	L. Kariba
23	07	81	14	04	37	16.4	29.0	3.2	L. Kariba
06	08	81	03	09	47	16.5	29.0	3.1	L. Kariba
07	08	81	23	41	06	17.9	27.1	3.1	L. Kariba
29	08	81	09	19	29	17.9	27.2	2.9	L. Kariba
01	09	81	05	08	21	16.6	29.0	3.1	L. Kariba
01	09	81	10	32	53	17.4	28.0	3.0	L. Kariba
03	09	81	01	02	57	16.6	29.0	3.2	L. Kariba
09	09	81	14	36	25	16.6	28.4	2.9	L. Kariba
13	09	81	01	42	24	16.5	28.7	3.1	L. Kariba
18	09	81	00	58	06	16.5	28.8	3.7	L. Kariba
18	09	81	18	19	34	16.4	28.7	3.2	L. Kariba
19	09	81	14	30	22	17.9	27.0	3.4	L. Kariba
03	10	81	05	00	03	16.5	28.5	3.3	L. Kariba
03	10	81	22	12	29	16.5	28.5	4.1	L. Kariba

17	10	81	02	18	53	17.3	27.4	2.9	L. Kariba
24	10	81	00	53	26	16.5	28.5	4.3	L. Kariba
02	11	81	04	54	29	17.8	27.1	3.4	L. Kariba
03	11	81	06	30	22	16.6	28.3	3.0	L. Kariba
11	11	81	14	05	35	16.4	28.5	3.1	L. Kariba
22	12	81	03	48	48	17.2	27.4	3.4	L. Kariba
04	02	82	06	35	20	16.3	28.0	3.7	L. Kariba
05	02	82	17	20	10	17.2	27.1	3.2	L. Kariba
06	02	82	20	47	05	16.7	29.1	3.2	North Western Zimbabwe
06	02	82	20	55	58	16.6	29.1	3.1	North Western Zimbabwe
08	02	82	08	07	54	15.3	27.2	3.4	South West of Central Province, Zambia
08	02	82	14	04	30	17.4	27.4	2.9	South West of L. Kariba
02	03	82	20	53	02	16.6	26.5	3.0	L. Kariba
24	03	82	05	50	04	15.9	29.1	3.2	Central Province, Zambia
24	03	82	06	04	08	15.9	29.1	3.0	Central Province, Zambia
29	03	82	02	07	15	16.8	28.2	4.1	L. Kariba
31	03	82	16	53	29	16.9	28.0	3.4	L. Kariba
02	04	82	02	54	10	16.9	28.2	3.5	L. Kariba
05	04	82	05	55	06	16.8	27.7	3.4	L. Kariba
05	04	82	09	20	53	16.1	31.4	3.7	Northern Zimbabwe
09	04	82	02	34	00	18.1	27.2	4.1	North Western Zimbabwe
13	04	82	23	43	22	18.0	27.5	3.2	North Western Zimbabwe
14	04	82	09	54	36	16.8	28.1	2.9	L. Kariba
14	04	82	22	34	45	16.8	28.1	3.3	L. Kariba
15	04	82	14	41	11	16.8	28.1	3.2	L. Kariba
29	04	82	00	59	50	17.2	27.9	3.4	L. Kariba
20	05	82	09	15	44	16.6	29.1	3.1	North Western Zimbabwe
23	05	82	09	03	27	16.6	28.0	2.9	L. Kariba
26	05	82	10	18	23	17.2	27.3	2.9	L. Kariba
28	05	82	11	09	49	17.8	27.2	3.0	L. Kariba
01	06	82	23	39	50	15.5	31.9	3.6	L. Cabora Bassa
02	06	82	13	06	47	16.9	28.4	2.9	L. Kariba
09	06	82	21	06	32	14.6	29.9	3.1	Central Province, Zambia
10	06	82	10	08	03	16.8	28.2	3.1	L. Kariba
14	06	82	07	37	05	16.7	28.1	3.5	L. Kariba
16	06	82	16	11	14	17.5	26.8	3.3	Southern Province, Zambia
11	07	82	07	40	38	16.7	27.9	3.2	L. Kariba
06	08	82	21	43	25	15.6	26.0	4.1	Southern Province, Zambia
06	08	82	23	32	32	15.6	26.0	3.1	Southern Province, Zambia
18	08	82	11	55	02	17.2	27.7	3.2	L. Kariba
21	08	82	05	46	00	15.6	26.0	4.3	Southern Province, Zambia
21	08	82	05	52	12	15.6	26.0	3.8	Southern Province, Zambia
22	08	82	00	16	59	15.6	26.0	3.2	Southern Province, Zambia
22	08	82	01	18	32	15.6	26.0	3.0	Southern Province, Zambia
22	08	82	12	19	22	16.7	28.7	3.9	L. Kariba
23	08	82	16	57	05	16.6	28.1	3.0	L. Kariba
26	08	82	15	59	22	15.7	26.1	3.0	Southern Province, Zambia
28	08	82	10	43	19	16.6	28.9	3.5	L. Kariba
01	09	82	16	44	20	15.8	26.1	3.2	Southern Province, Zambia
03	09	82	09	59	14	16.2	28.8	3.0	L. Kariba
07	09	82	09	58	38	16.6	28.9	3.1	L. Kariba
14	09	82	13	54	55	17.2	27.2	3.0	Southern Province, Zambia
02	10	82	00	54	25	16.6	28.8	3.3	L. Kariba
19	11	82	20	07	26	17.6	27.4	3.5	L. Kariba
21	11	82	01	53	28	16.6	28.1	3.6	L. Kariba

02	10	82	00	54	25	16.6	28.8	3.3	L. Kariba
19	11	82	20	07	26	17.6	27.4	3.5	L. Kariba
21	11	82	01	53	28	16.6	28.1	3.6	L. Kariba
30	11	82	23	31	16	18.0	27.4	3.5	North Western, zimbabwe
01	12	82	15	37	45	18.1	27.0	3.5	North Western, zimbabwe
02	12	82	00	16	48	18.1	27.1	3.9	North Western, zimbabwe
03	12	82	02	53	02	18.1	27.1	3.2	North Western, Zimbabwe
05	12	82	05	23	44	17.7	27.1	3.3	South West of L. Kariba
05	12	82	05	29	10	17.6	27.2	3.2	South West of L. Kariba
06	12	82	07	42	51	17.6	27.2	3.2	South West of L. Kariba
07	12	82	10	22	44	17.6	27.2	3.1	L. Kariba
11	12	82	13	24	17	17.6	32.0	4.0	North Eastern, Zimbabwe
18	12	82	04	16	31	16.7	28.2	3.9	L. Kariba
23	12	82	23	27	28	19.7	28.1	3.1	Western Zimbabwe
23	01	83	14	49	00	14.5	29.4	3.1	Central Province, Zambia
11	02	83	15	44	12	16.6	28.6	3.1	L. Kariba
13	02	83	23	15	18	16.4	28.6	3.0	L. Kariba
20	02	83	13	34	10	16.7	28.3	3.1	L. Kariba
26	02	83	19	17	06	17.4	27.5	2.9	L. Kariba
19	03	83	18	45	43	15.3	31.3	3.2	L. Cabora Bassa
21	03	83	19	56	27	16.0	30.6	3.1	Northern Zimbabwe
06	04	83	19	16	49	15.4	30.4	2.8	L. Kariba
07	04	83	01	40	08	17.6	25.5	3.4	Southern Province, Zambia
08	04	83	18	24	19	14.9	28.2	2.8	Central Province, Zambia
09	04	83	20	20	47	15.5	31.2	2.9	L. Cabora Bassa
11	04	83	07	40	47	14.0	26.4	4.0	Western Province, Zambia
11	04	83	09	34	54	16.6	29.0	2.9	L. Kariba
12	04	83	08	01	00	16.7	28.6	2.8	L. Kariba
19	04	83	01	24	27	15.4	29.6	3.2	Central Province, Zambia
21	04	83	06	06	49	14.5	27.5	3.2	Central Province, Zambia
27	04	83	11	00	15	19.5	28.1	3.3	Western Zimbabwe
28	04	83	13	01	22	14.7	30.6	3.7	Eastern Province, Zambia
28	04	83	20	02	42	16.1	28.7	3.1	L. Kariba
01	05	83	16	51	38	15.4	31.3	3.8	L. Cabora Bassa
05	05	83	14	49	07	15.4	31.3	3.0	L. Cabora Bassa
12	05	83	15	20	37	15.3	29.2	3.0	Central Province, Zambia
01	06	83	04	19	21	16.5	28.3	3.4	L. Kariba
08	06	83	17	18	44	17.0	27.0	2.8	L. Kariba
12	07	83	04	37	33	16.6	28.1	3.4	L. Kariba
29	08	83	19	56	40	16.8	28.6	3.4	L. Kariba
07	09	83	11	26	31	17.5	27.6	3.1	L. Kariba
27	09	83	00	23	09	17.4	27.6	3.1	L. Kariba
29	09	83	08	42	31	17.4	27.5	2.9	L. Kariba
04	10	83	09	31	41	16.4	28.4	3.4	L. Kariba
09	10	83	03	46	46	17.4	27.4	3.0	L. Kariba
17	10	83	11	47	31	18.5	26.1	3.0	North Western Zimbabwe
19	10	83	17	15	39	14.4	27.4	3.4	Central Province, Zambia
26	10	83	12	29	27	17.7	27.1	3.0	L. Kariba
28	10	83	02	42	02	16.7	28.5	3.2	L. Kariba
26	11	83	13	56	52	17.1	28.4	3.0	L. Kariba
28	11	83	07	15	42	17.0	28.4	3.1	L. Kariba
01	12	83	06	35	25	18.5	27.6	3.0	North Western Zimbabwe
23	01	84	04	22	31	17.1	25.2	3.3	Southern Province, Zambia
27	01	84	14	55	12	16.6	27.7	3.0	L. Kariba
18	02	84	09	52	08	17.7	27.3	3.5	L. Kariba
25	02	84	06	57	15	16.7	28.8	2.8	L. Kariba
17	03	84	09	21	15	16.6	28.6	2.9	L. Kariba
17	03	84	14	54	12	16.7	28.7	2.9	L. Kariba

20	03	84	00	17	49	18.3	26.4	4.3	North Western Zimbabwe
30	03	84	14	50	06	17.5	27.6	3.1	L. Kariba
20	06	84	04	32	15	16.6	31.7	3.1	Northern Zimbabwe
20	06	84	07	30	06	17.8	28.6	2.8	L. Kariba
28	06	84	14	51	22	17.5	27.6	2.8	L. Kariba
09	08	84	15	15	34	16.4	29.0	3.8	L. Kariba
10	08	84	23	01	00	16.4	28.7	2.8	L. Kariba
11	08	84	08	57	36	16.4	28.6	2.9	L. Kariba
12	08	84	12	29	56	16.4	28.8	2.9	L. Kariba
13	08	84	11	05	42	16.4	28.7	2.9	L. Kariba
25	08	84	03	03	58	16.4	28.7	2.8	L. Kariba
28	08	84	03	11	58	15.2	28.0	3.3	Central Province, Zambia
12	09	84	12	42	48	17.2	27.3	2.9	L. Kariba
18	09	84	03	11	52	16.2	28.7	2.8	L. Kariba
22	09	84	07	11	26	16.2	29.0	2.7	L. Kariba
02	10	84	22	21	16	16.2	28.8	2.8	L. Kariba
06	10	84	13	01	04	14.4	27.2	3.5	L. Kariba
07	10	84	06	10	31	16.2	28.9	3.0	L. Kariba
07	10	84	14	50	49	16.2	29.0	3.9	L. Kariba
13	10	84	16	02	15	16.2	28.9	2.7	L. Kariba
13	10	84	18	22	13	16.2	28.9	3.9	L. Kariba
20	10	84	06	42	56	14.3	29.2	3.4	Central Province, Zambia
22	10	84	17	56	43	16.2	28.8	2.9	L. Kariba
26	10	84	07	44	34	16.5	28.9	5.0	L. Kariba
26	10	84	08	01	47	16.5	28.9	3.2	L. Kariba
26	10	84	08	22	21	16.2	28.8	2.8	L. Kariba
26	10	84	08	27	45	16.3	28.9	3.3	L. Kariba
26	10	84	08	58	29	16.3	28.9	2.9	L. Kariba
26	10	84	09	44	57	16.3	28.9	2.7	L. Kariba
26	10	84	10	37	08	16.3	28.9	2.8	L. Kariba
27	10	84	00	37	04	15.2	28.3	2.8	Central Province, Zambia
27	10	84	05	02	09	16.2	28.8	3.3	L. Kariba
27	10	84	07	26	41	16.5	28.9	2.9	L. Kariba
27	10	84	16	38	05	16.3	28.9	2.7	L. Kariba
27	10	84	21	06	30	16.3	28.9	3.2	L. Kariba
27	10	84	23	54	52	16.3	28.9	3.3	L. Kariba
28	10	84	01	27	19	16.3	28.9	3.2	L. Kariba
29	10	84	13	11	53	16.5	28.8	2.7	L. Kariba
31	10	84	02	58	49	16.3	28.9	2.7	L. Kariba
31	10	84	06	22	56	16.3	28.9	2.8	L. Kariba
31	10	84	17	19	09	16.3	28.9	2.9	L. Kariba
31	10	84	17	26	50	16.3	28.9	3.2	L. Kariba
04	11	84	04	18	45	16.3	28.7	3.4	L. Kariba
04	11	84	15	04	44	16.3	28.7	3.0	L. Kariba
05	11	84	06	59	50	16.3	28.7	2.9	L. Kariba
07	11	84	08	22	10	16.1	28.6	2.9	L. Kariba
08	11	84	21	17	04	16.3	28.9	3.7	L. Kariba
10	11	84	20	19	43	16.2	28.9	3.4	L. Kariba
11	11	84	22	50	48	16.2	28.9	3.0	L. Kariba
13	11	84	12	11	51	16.2	28.9	3.4	L. Kariba
13	11	84	18	49	54	16.2	28.9	3.1	L. Kariba
14	11	84	22	34	38	16.2	28.9	2.9	L. Kariba
21	11	84	08	49	38	16.2	28.9	3.2	L. Kariba
24	11	84	07	27	47	16.3	28.7	2.9	L. Kariba
05	12	84	19	58	35	16.7	29.0	3.3	L. Kariba
05	12	84	23	37	56	16.4	28.7	2.9	L. Kariba
06	12	84	01	17	22	16.4	28.7	2.9	L. Kariba
07	12	84	08	38	03	16.4	28.7	3.8	L. Kariba

07	12	84	08	38	03	16.4	28.7	3.8	L. Kariba
12	12	84	18	40	20	16.6	28.7	2.9	L. Kariba
18	12	84	16	23	41	16.4	28.7	3.2	L. Kariba
18	12	84	21	43	35	16.5	28.9	3.1	L. Kariba
22	12	84	02	15	35	16.6	28.6	2.9	L. Kariba
26	12	84	05	04	27	17.0	27.9	2.8	L. Kariba
01	02	85	06	58	57	16.6	28.6	2.8	L. Kariba
01	02	85	10	41	11	16.9	28.7	2.9	L. Kariba
13	02	85	07	22	28	16.2	28.9	3.3	L. Kariba
16	02	85	22	45	30	17.8	27.6	3.1	L. Kariba
22	02	85	16	07	04	16.3	28.8	3.1	L. Kariba
23	10	85	09	55	50	16.3	28.9	3.2	L. Kariba
25	02	85	20	18	39	16.6	28.2	2.8	North Western Zimbabwe
25	02	85	20	37	14	16.6	28.2	2.8	North Western Zimbabwe
27	02	85	01	22	33	16.2	28.9	2.8	L. Kariba
13	03	85	07	42	58	16.6	28.6	2.8	L. Kariba
19	03	85	01	35	08	16.6	29.3	3.6	Northern Zimbabwe
22	03	85	06	41	34	18.2	26.8	2.8	Western Zimbabwe
22	03	85	19	35	12	16.6	29.4	3.8	Northern Zimbabwe
01	05	85	05	55	35	16.4	28.9	3.3	L. Kariba
08	05	85	01	44	30	16.2	28.8	2.9	L. Kariba
19	05	85	14	02	59	16.2	28.8	2.8	L. Kariba
24	05	85	17	26	09	17.6	27.3	3.0	L. Kariba
29	05	85	02	31	37	16.6	29.1	3.0	Northern Zimbabwe
02	06	85	19	41	57	18.7	26.6	3.1	North Western Zimbabwe
02	06	85	20	25	03	18.2	26.6	2.8	Northern Zimbabwe
03	06	85	04	32	05	17.0	28.6	2.9	L. Kariba
04	06	85	15	45	34	16.9	28.6	3.9	L. Kariba
20	06	85	08	54	29	16.4	28.6	2.8	L. Kariba
03	08	85	13	31	00	16.8	29.0	3.9	L. Kariba
06	08	85	06	10	50	17.0	29.3	2.9	L. Kariba
14	08	85	15	24	40	17.5	27.6	2.8	L. Kariba
18	09	85	19	28	16	17.8	27.6	2.8	L. Kariba
03	10	85	03	24	51	16.7	29.0	3.4	L. Kariba
12	10	85	05	52	37	14.4	25.6	3.6	Western Province, Zambia
21	10	85	17	15	58	16.1	31.6	3.4	Northern Zimbabwe
21	10	85	18	39	54	16.1	31.6	3.1	Northern Zimbabwe
28	10	85	22	49	37	15.6	31.8	3.6	Cabora Bassa
01	12	85	12	39	07	16.0	32.0	3.1	L. Cabora Bassa
04	12	85	08	43	48	16.5	29.0	3.0	L. Kariba
04	12	85	13	43	48	16.4	31.9	2.6	Northern Zimbabwe
09	12	85	03	16	12	15.6	32.0	2.8	L. Cabora Bassa
19	12	85	21	02	32	17.1	29.3	3.0	Northern Zimbabwe
20	01	86	07	19	31	14.4	24.9	4.2	Western Province, Zambia
22	01	86	03	21	44	14.2	24.9	4.0	Western Province, Zambia
22	01	86	23	40	25	15.3	28.5	3.2	Central Province, Zambia
01	02	86	18	40	19	16.5	28.8	2.8	L. Kariba
02	03	86	14	34	35	16.5	28.8	2.7	L. Kariba
03	03	86	21	59	37	16.5	28.8	2.7	L. Kariba
28	03	86	02	11	17	16.5	28.8	2.8	L. Kariba
29	03	86	06	25	34	18.2	26.5	3.6	Western Zimbabwe
11	04	86	07	58	03	18.3	27.6	2.8	Western Zimbabwe
04	05	86	00	08	37	17.7	27.6	3.3	L. Kariba
07	05	86	02	43	15	17.7	27.6	3.6	L. Kariba
07	05	86	02	47	08	17.7	27.6	3.3	L. Kariba
07	05	86	04	20	58	17.7	27.6	3.2	L. Kariba
10	05	86	00	20	20	17.8	28.1	3.1	L. Kariba area
10	05	86	21	40	39	18.1	28.3	3.5	L. Kariba area

10	05	86	22	36	56	17.7	28.1	2.9	L. Kariba area
11	05	86	04	36	22	17.7	27.7	3.0	L. Kariba area
11	05	86	05	31	40	18.0	28.2	2.9	L. Kariba area
19	05	86	08	19	54	17.8	28.1	2.9	L. Kariba area
19	05	86	12	39	56	17.9	28.0	3.2	L. Kariba area
21	05	86	09	39	26	16.7	27.7	2.8	L. Kariba area
27	06	86	06	17	17	16.6	28.4	3.0	L. Kariba
30	06	86	23	25	36	16.3	30.5	3.2	Northern Zimbabwe
18	07	86	15	07	53	16.4	28.4	5.2	L. Kariba
18	07	86	15	27	28	16.4	28.4	3.1	L. Kariba
18	07	86	15	30	52	16.4	28.4	3.0	L. Kariba
18	07	86	22	48	47	16.4	28.4	3.0	L. Kariba
20	07	86	14	10	18	16.4	28.6	2.9	L. Kariba
22	07	86	04	34	35	16.4	28.6	2.8	L. Kariba
26	07	86	02	28	36	16.4	28.5	2.8	L. Kariba
29	07	86	19	31	10	16.3	28.6	2.8	L. Kariba
10	08	86	02	27	43	16.6	28.5	3.3	L. Kariba
24	09	86	23	36	45	16.4	28.6	3.2	L. Kariba
27	09	86	11	29	16	16.4	28.6	3.4	L. Kariba
28	09	86	04	36	59	16.6	28.4	3.0	L. Kariba
01	10	86	15	50	57	16.3	28.7	3.0	L. Kariba
05	10	86	17	14	23	14.8	27.2	3.4	Central Province, Zambia
08	10	86	17	03	32	17.9	24.8	3.3	Southern Province, Zambia
08	10	86	17	03	26	17.5	24.4	3.3	Western Province, Zambia
09	10	86	03	04	16	17.4	24.4	3.2	Western Province, Zambia
25	10	86	07	49	52	18.5	26.6	2.9	Hwange, Zimbabwe
10	11	86	03	11	18	19.2	29.2	3.2	Zimbabwe
13	11	86	15	42	40	18.5	32.0	3.4	Eastern Zimbabwe
19	11	86	10	57	51	18.6	26.3	3.0	North Western Zimbabwe
24	11	86	16	23	37	16.8	28.6	3.0	L. Kariba
11	12	86	03	22	23	16.6	30.8	3.6	Northern Zimbabwe
18	12	86	23	32	15	18.6	26.5	3.5	Western Zimbabwe
28	12	86	04	48	14	16.6	28.4	3.1	L. Kariba
09	01	87	08	18	34	18.4	26.4	2.8	Hwange, Zimbabwe
03	02	87	12	32	50	17.6	28.9	2.9	L. Kariba
17	02	87	11	00	25	17.2	25.1	4.5	Southern Province, Zambia
17	02	87	11	20	03	17.1	25.2	4.3	Southern Province, Zambia
18	02	87	04	57	36	17.2	25.2	3.3	Southern Province, Zambia
21	02	87	01	59	56	17.2	28.6	3.3	L. Kariba
22	02	87	04	05	53	16.4	28.5	3.0	L. Kariba
11	03	87	04	05	40	17.1	28.1	3.0	L. Kariba
16	03	87	18	01	06	17.6	27.8	2.8	L. Kariba
13	05	87	10	06	51	16.8	28.6	2.9	L. Kariba
02	06	87	14	30	20	19.4	26.5	3.4	Western Zimbabwe
03	06	87	07	45	25	17.2	27.3	3.0	L. Kariba
06	06	87	13	00	00	14.2	24.9	3.5	Western Province, Zambia
17	06	87	10	02	04	15.0	29.4	3.1	Central Province, Zambia
24	06	87	18	02	42	16.0	28.8	4.2	L. Kariba
19	07	87	16	41	04	14.3	27.0	2.9	Central province, Zambia
26	07	87	13	54	14	15.7	29.0	3.4	Central province, Zambia
27	07	87	16	06	21	14.5	26.2	3.3	Western Province, Zambia
07	08	87	17	01	22	16.1	28.7	2.9	L. Kariba
07	08	87	20	06	51	15.4	27.6	2.8	Central Province, Zambia
20	08	87	19	58	10	16.7	28.7	2.9	L. Kariba
23	08	87	12	21	32	15.2	27.3	3.1	Central Province, Zambia
27	08	87	15	14	46	16.5	28.6	2.8	L. Kariba
18	09	87	02	04	56	17.4	24.9	3.8	Southern Province, Zambia
26	09	87	18	17	06	17.5	27.6	2.9	L. Kariba

06	10	87	04	42	13	18.6	28.2	2.8	Zimbabwe
29	10	87	23	04	02	16.1	28.9	2.9	L. Kariba
11	11	87	11	09	40	16.4	28.7	3.2	L. Kariba
21	11	87	21	43	53	16.2	28.8	2.8	L. Kariba
21	11	87	21	44	20	16.2	28.8	3.4	L. Kariba
21	11	87	21	45	24	16.2	28.8	3.0	L. Kariba
13	12	87	04	58	15	16.5	28.4	2.9	L. Kariba
05	01	88	07	43	29	18.4	27.2	2.8	Western Zimbabwe
07	01	88	16	41	51	18.2	27.6	3.1	Western Zimbabwe
21	01	88	12	41	30	16.1	28.9	2.9	L. Kariba
03	02	88	09	21	08	16.1	28.9	2.9	L. Kariba
24	02	88	18	37	24	18.1	27.1	3.5	North Western Zimbabwe
17	03	88	00	20	40	16.6	28.9	3.4	L. Kariba
06	04	88	00	20	11	16.7	28.8	3.4	L. Kariba
17	05	88	00	17	54	16.8	28.7	3.3	L. Kariba
19	05	88	00	22	33	16.7	28.7	2.8	L. Kariba
23	05	88	02	14	36	16.6	28.2	3.0	L. Kariba
09	10	88	13	52	56	16.6	28.7	4.2	L. Kariba
10	10	88	18	20	53	16.7	28.9	3.6	L. Kariba
26	10	88	18	54	00	16.7	28.6	2.8	L. Kariba
23	11	88	02	33	36	17.9	28.3	2.9	L. Kariba
13	01	89	00	00	17	14.1	27.8	-	L. Itezhi-Tezhi
14	01	89	08	35	26	17.6	28.9	-	Ganderowe Falls, Mashonaland, Zimbabwe
14	01	89	08	37	40	16.3	28.3	-	Siavonga area
15	01	89	19	02	15	14.1	27.9	-	Central Province, Zambia
19	01	89	04	07	33	15.8	29.5	-	Lusaka Province, near Mozambique border
20	01	89	00	00	00	14.8	29.8	-	Border of Central and Lusaka Provinces, Zambia
23	01	89	08	20	42	16.3	28.4	-	L. Kariba
23	01	89	08	26	49	15.9	28.5	-	L. Kariba
26	01	89	12	49	50	14.1	27.1	-	West of Kabwe, Zambia
27	01	89	12	56	25	18.0	26.6	-	Botswana near border with Zambia
28	01	89	18	03	59	16.5	26.0	2.0	L. Itezhi-Tezhi, Zambia
29	01	89	13	21	05	14.0	27.6	2.0	L. Itezhi-Tezhi, Zambia
06	02	89	09	44	09	15.7	26.3	-	Itezhi-Tezhi, Zambia
07	02	89	17	07	05	17.8	27.9	3.3	Caprivi-Strip, Botswana
16	02	89	12	54	47	17.4	15.4	-	Western Province, Zambia
23	02	89	12	56	03	16.3	25.0	-	Western Province, Zambia
24	02	89	07	18	29	14.6	30.8	-	Central Province, Zambia
25	02	89	21	52	33	18.0	32.0	-	Manicaland, Zimbabwe
26	02	89	12	47	58	15.6	25.1	-	Western Province, Zambia
27	02	89	16	54	49	17.3	25.1	-	Caprivi-Strip, Botswana
28	02	89	00	26	16	15.0	24.1	-	Western Province, Zambia
28	02	89	00	41	43	17.2	25.5	-	Mulobezi, Zambia
28	02	89	01	33	09	15.5	24.1	-	Western Province, Zambia
28	02	89	03	55	49	15.9	26.1	-	Itezhi-Tezhi, Zambia
28	02	89	06	56	56	17.5	27.4	-	L. Kariba
20	03	89	19	43	56	14.3	27.5	3.2	Central Province, Zambia
13	04	89	13	19	16	14.6	26.0	3.2	Kafue National Park, Zambia
15	04	89	12	56	08	17.2	24.2	3.0	Katima Mulilo - Zambia / Namibia border
15	04	89	23	02	54	16.2	28.2	-	L. Kariba
17	04	89	17	15	08	17.5	25.3	3.2	Kazungula area - Zambia / Namibia border
28	04	89	00	22	00	16.4	28.4	2.9	Kafue dam, Zambia

28	04	89	12	45	35	18.0	29.6	3.0	Gatoma area, Zimbabwe
01	05	89	08	54	47	17.0	29.2	3.5	Kariba area, Zimbabwe
17	05	89	03	01	54	14.7	28.2	3.1	Southern Province, Zambia
17	05	89	23	14	59	14.9	25.2	2.9	Western Province, Zambia
25	05	89	03	03	17	16.1	28.3	2.7	Southern Province, Zambia
29	05	89	22	36	39	16.0	28.7	3.6	Chirundu
02	06	89	00	14	13	17.1	27.4	3.0	L. Kariba
25	09	89	14	36	09	15.5	30.0	3.4	Rufunsa area, Zambia
30	09	89	20	30	12	17.6	27.1	2.8	L. Kariba
06	10	89	06	25	14	15.1	24.9	3.4	Southern Province, Zambia
16	04	91	01	28	42	14.3	26.2	-	Zambia
10	05	91	01	12	42	17.3	25.3	-	Southern Province, Zambia
28	05	91	04	04	48	15.4	30.3	2.9	L. Cabora Bassa, Mozambique
07	06	91	16	52	21	17.8	27.5	2.7	L. Kariba
21	06	91	22	51	10	16.2	27.0	1.9	Southern Province, Zambia
27	06	91	02	27	43	15.8	25.9	2.8	Southern Province, Zambia
12	07	91	08	04	22	16.6	28.9	2.8	L. Kariba
12	07	91	22	00	33	15.9	31.4	2.8	L. Cabora Bassa
31	07	91	15	59	05	16.1	25.4	3.2	Southern Province, Zambia
23	08	91	14	05	59	16.3	27.0	3.2	Western Zimbabwe
05	09	91	06	10	05	16.3	30.8	3.4	Northern Zimbabwe
12	01	92	23	53	01	15.6	28.6	2.1	L. Kariba
15	01	92	05	37	12	18.2	28.0	2.0	L. Kariba
03	05	92	15	13	27	15.5	32.0	2.7	L. Cabora Bassa
12	05	92	13	20	30	17.4	28.3	2.6	L. Kariba
13	07	92	15	09	42	14.5	26.4	3.0	Western Province, Zambia
03	09	92	07	30	31	18.0	26.6	2.7	Western Zimbabwe
13	09	92	08	48	48	16.9	28.0	2.3	L. Kariba
14	09	92	10	39	13	18.8	26.4	2.1	Western Zimbabwe
16	09	92	15	04	39	17.3	26.1	2.6	Southern Province, Zambia
30	09	92	23	13	55	16.8	28.4	2.8	L. Kariba
02	10	92	11	11	50	18.3	27.3	2.2	Western Zimbabwe
10	10	92	09	36	17	17.6	27.5	1.9	L. Kariba
22	10	92	07	06	37	18.4	27.1	2.3	Western Zimbabwe
01	11	92	08	58	58	18.1	26.3	2.8	Western Zimbabwe
02	11	92	11	57	46	18.3	26.5	2.4	Western Zimbabwe
16	11	92	13	36	10	17.2	27.2	2.2	L. Kariba
30	11	92	08	30	38	16.8	28.6	4.5	L. Kariba
26	12	92	09	13	38	18.2	28.1	2.3	Western Zimbabwe
06	02	93	10	52	06	17.1	28.8	2.9	L. Kariba
17	02	93	11	33	07	17.7	27.7	2.8	L. Kariba
17	03	93	09	01	47	19.4	26.6	2.1	Western Zimbabwe
02	06	93	18	41	28	16.8	28.1	2.9	L. Kariba
16	08	93	16	36	22	17.1	29.2	3.0	L. Kariba
08	09	93	03	57	45	17.6	29.3	2.4	Lomagundi - Sebukwe border, Zimbabwe
10	09	93	11	32	33	18.2	26.4	2.3	Hwange, Zimbabwe
12	09	93	11	15	34	14.4	31.6	2.6	Eastern Province, Zambia
30	09	93	20	40	37	14.8	30.7	3.7	Cabora Bassa dam area
02	10	93	21	31	08	17.4	28.8	2.6	L. Kariba
05	10	93	15	34	25	19.2	26.1	2.5	Western Zimbabwe
06	10	93	14	27	57	19.0	26.7	2.2	Western Zimbabwe
08	10	93	08	57	15	18.9	28.3	1.9	Western Zimbabwe
08	10	93	11	03	42	18.9	28.3	2.2	Western Zimbabwe
08	10	93	14	30	23	18.4	26.4	2.3	Western Zimbabwe
08	10	93	15	23	24	18.2	26.2	2.3	Western Zimbabwe
09	10	93	07	23	23	18.1	26.6	2.0	Western Zimbabwe
09	10	93	14	46	12	18.3	26.2	2.3	Western Zimbabwe

10	10	93	07	55	04	16.2	28.6	2.3	L. Kariba
11	10	93	14	28	32	18.5	28.5	1.6	Western Zimbabwe
11	10	93	15	08	39	18.3	27.1	2.1	Western Zimbabwe
12	10	93	14	08	50	16.8	28.5	2.5	L. Kariba
13	10	93	12	19	51	18.3	26.9	2.0	Western Zimbabwe
14	10	93	10	54	37	18.4	27.0	1.9	Western Zimbabwe
15	10	93	11	28	12	18.4	26.8	2.0	Western Zimbabwe
16	10	93	11	19	35	18.3	26.5	2.1	Western Zimbabwe
21	10	93	10	01	47	16.0	31.1	2.1	L. Cabora Bassa
23	10	93	19	51	05	17.9	27.1	2.2	L. Kariba
24	10	93	15	20	12	17.3	30.2	2.2	Zimbabwe
01	11	93	11	42	03	18.9	26.6	2.2	Western Zimbabwe
02	11	93	14	33	30	18.4	26.2	2.2	Western Zimbabwe
03	11	93	09	07	44	17.7	30.1	2.5	Western Zimbabwe
07	11	93	10	31	53	19.9	25.7	2.4	Western Zimbabwe
08	11	93	03	16	52	17.0	28.2	2.3	L. Kariba
22	11	93	07	20	48	17.4	28.5	2.5	L. Kariba
22	11	93	11	21	30	20.4	26.0	2.3	South Western Zimbabwe
22	11	93	23	22	26	17.1	28.4	2.1	L. Kariba
03	12	93	12	59	02	15.8	26.0	2.6	L. Kariba
05	12	93	10	32	49	17.3	27.8	2.0	L. Kariba
06	12	93	11	46	40	19.0	27.3	1.8	Western Zimbabwe
08	12	93	13	40	38	17.3	29.4	2.6	L. Kariba
28	02	94	18	39	08	14.3	25.7	3.7	Western Province, Zambia
13	06	94	21	58	58	18.0	26.7	1.0	
13	06	94	21	59	59	18.0	27.8	-	
29	08	94	20	22	26	20.0	30.6	-	
29	08	94	20	23	27	19.1	26.9	3.5	Hwange, Zimbabwe
29	08	94	20	23	29	18.5	27.0	-	
08	03	97	23	27	30	18.0	25.0	3.2	
18	03	97	03	05	49	16.0	26.1	1.6	
19	03	97	01	42	15	14.1	24.0	1.7	
19	03	97	08	09	05	16.1	23.6	2.7	
25	03	97	02	46	10	15.8	26.1	2.4	
26	03	97	17	00	46	15.7	26.0	1.3	
26	03	97	20	25	15	15.9	26.2	1.6	
27	03	97	20	46	18	17.6	24.6	2.9	
28	03	97	15	15	27	17.6	25.1	2.4	
29	03	97	05	21	40	18.0	24.1	2.5	
02	04	97	15	00	20	15.6	25.8	2.3	
02	04	97	17	40	23	14.3	26.6	2.0	
02	04	97	17	45	46	14.1	25.8	1.1	
04	04	97	21	46	14	16.5	29.1	2.5	
04	04	97	22	18	31	15.6	26.3	2.4	
06	04	97	05	20	19	15.6	26.0	1.4	
09	04	97	11	32	29	15.8	26.2	2.1	
10	04	97	13	01	07	15.0	26.4	1.5	
14	04	97	04	03	46	15.8	26.0	0.9	
16	04	97	14	39	24	18.4	26.8	2.6	
05	05	97	15	28	43	17.9	26.9	3.3	
07	05	97	19	41	27	15.0	27.1	3.0	
07	05	97	21	46	18	18.5	26.2	3.3	
07	05	97	21	46	31	17.8	26.1	3.0	
08	05	97	15	40	22	18.0	26.4	3.4	
08	05	97	17	30	17	17.9	26.0	3.4	
09	05	97	13	21	53	18.0	26.5	3.3	
13	05	97	11	55	20	17.9	27.5	2.3	
14	05	97	11	46	15	18.0	27.0	1.2	

Appendix 4

Water Quality Results

Comments on Raw Water Quality

These comments relate to two sets of data:

Chirundu sample analysis results collected 14/July/97 and 15/Oct/97
1996 water quality results for the Zambezi River

1 Samples on 14.07.97 and 15.10.97

1.1 Turbidity

The results show that the raw water turbidity is low at all nine sampling points from the river on 15/Oct/97. On 14/July/97 the turbidity was higher but still low. However, the turbidity at sampling point 10 is significantly higher than the other samples. The reason for this high value is not apparent.

1.2 Iron

Generally, the concentration is low. However, the concentration at sample point 10 is high. Given that the pH is neutral to alkaline and the dissolved oxygen concentration is high, the iron will be in the insoluble state and will account for some of the turbidity at this point. The reason for the high iron is not clear but corrosion of an iron main could be an explanation. More data is required if this point is to be clarified.

1.3 Dissolved Oxygen

The water is obviously well aerated. Indeed, the samples taken on 14/July/97 indicate the water may be supersaturated with air.

1.4 Alkalinity

The alkalinity of the water is consistent at all sampling points and on both dates; being in the range 55 to 73 mg/l as CaCO₃. The alkalinity is low to moderate and offers some buffering capacity.

1.5 Manganese

Values are generally low but some results are above the World Health Organisation Guideline Value of 0.1 mg/l (this is a value based on aesthetic quality, it does not constitute a health risk).

1.6 Conductivity and TDS

There is not a specific relationship between conductivity and total dissolved solids (TDS). However, the value for TDS in mg/l is generally between 0.55 and 0.7 times the value for conductivity in µS/cm.

These results show a very different relationship, indicating the reported conductivity is high by a factor of 10. This should be checked during any future water quality monitoring.

1.7 Bacteria

The presumptive coliforms and E Coli indicate a degree of faecal contamination. However, the values are not unusually high for a surface water

1.8 Other

Copper, nitrate, nitrite and phosphate are at acceptable levels for drinking water.

COD shows inexplicably high values at sample point 9 and 10 in samples taken on 14/July/97

2 1996 Zambezi River Samples

2.1 Turbidity

Generally low with values normally less than 5 NTU.

2.2 Dissolved Oxygen

Concentration in the range normally in the range 4 to 7 mg/l but with one low value (2.48 mg/l) and one high value (10.23 mg/l). These results show the water to be well aerated at between 50 and 100% saturation. The percentage saturation figures given in the final column are suspicious; 6.73 mg/l is 93% saturation and 10.23 mg/l is 91% saturation.

2.3 pH

The pH values are variable ranging from 7.7 to 9.9. The high results, > 8, may indicate algal activity between late September and early January.

2.4 Conductivity and TDS

Conductivity is an order of magnitude lower than the Chirundu samples. The TDS is suspiciously consistent but the relationship between conductivity and TDS is believable.

2.5 Phosphate and Nitrate

Phosphate concentrations are considerable higher by a factor of 10 to 100 times the concentrations quoted for the Chirundu samples.

Conversely, the nitrate concentrations are considerably lower.

This certainly raises a question about the reliability of the raw water quality data.

3 Impact of Bridge Construction Activity

Construction activity will disturb the water and the sediments. This will result in an increase in turbidity. The reported turbidity is not high so the impact of construction activity will be relatively high. This may or may not adversely affect the operation of the water works and depends on the treatment processes. On the Zambian side a new water treatment works may be built before the bridge works are undertaken, and no details are currently available. On the Zimbabwe side the existing water treatment works which has floc blanket clarifiers should be able to reduce turbidity prior to filtration and disinfection through chlorination, thus the impact will be reduced to a minimum.

With respect to disinfection, turbidity interferes with the process because the particles shield the bacteria from the effects of the disinfectant. Although the WHO Guideline Value for turbidity is 5 NTU, they add the remark that turbidity should preferably be less than 1 NTU for disinfection efficiency.

Increased turbidity may also adversely affect the flora and fauna in the river. For example many game fish are visual feeders, and therefore may be affected by reduced visibility in the river caused by an increase in suspended solids.

However, solid loads will increase as river flows increase in the rainy season. Such a natural increase may be far greater than any increase caused by building work. Certainly this needs to be kept in perspective when considering the impact of the environment and on the water works. It is strongly recommended that additional water samples be taken during the rainy season to determine water quality during high flows.

Cement is alkaline and any discharge to the river will increase the pH. The water does not have a high buffering capacity. Thus, quantities of spill and dilution (flow in the river is important) will be major factors in any impact.

Increasing water pH may have an adverse effect on the water treatment work – again more information is needed concerning the water treatment process.

Increasing pH may also adversely affect the flora and fauna in the river.

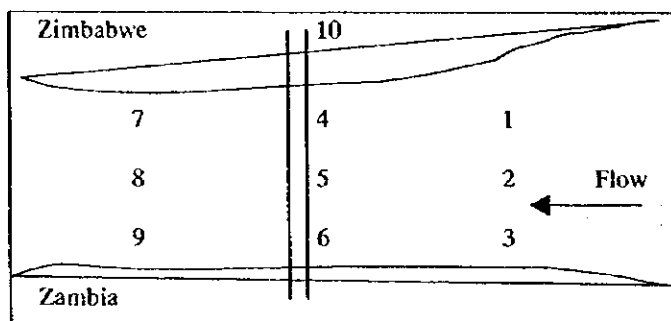
Water Quality Results for Samples taken on 14/July/97 at Chirundu

Sample Number	1	2	3	4	5	6	7	8	9	10	WHO Maximum Levels for drinking water
Laboratory Reference	294	295	296	297	298	299	300	301	302	303	
Parameter											
PH	6.8	6.8	6.92	6.98	6.95	7.09	7.17	7.06	7.15	7.16	6.5-8.5
Conductivity uS/cm	1007	934	1045	1065	1012	1065	1012	1001	1041	1324	
TDS mg/l	60	75	42	32	40	56	70	60	94	91	1000
Alkalinity mg/l CaCO ₃	55	56	65	59	61	65	58	63	73	52	
BOD mg/l O ₂	3	2.6	1.6	2.3	2.8	3.42	2.4	2.9	3.3	2.8	
Phosphate mg/l	0.07	0.04	0.07	0.03	0.025	0.11	0.011	0.08	0.09	0.06	
Nitrate N mg/l	-	2.2	1.0	0.4	1.6	1.6	1.3	1.0	2.6	0.2	10
Iron mg/l	0.09	0.11	0.11	0.08	0.06	0.09	0.04	0.06	0.10	0.79	0.3
Manganese mg/l	0.1	<0.1	0.1	0.1	<0.1	0.2	<0.1	<0.1	<0.1	0.1	0.1
Copper mg/l	0.04	0.12	0.04	0.05	0.05	0.04	0.07	0.10	0.08	0.01	1.0
Dissolved oxygen mg/l	11.4	10.9	10.4	10.8	10.7	11.7	10.7	11.3	11.7	11.3	
Turbidity (NTU)	2.9	3.24	7.11	4.26	3.01	4.81	6.38	5.06	7.67	19.8	5
Permanganate value mg/l O ₂	<0.10	1.9	0.1	2.4	3.0	-	0.7	2.3	2.2	0.5	
COD mg/l O ₂	10	9	8	10	7	6	7	12	75	45	
E Coli	290	140	60	400	100	139	665	140	62	-	0
Total Coliforms	500	280	250	1080	255	280	1030	280	1250	-	0

Water Quality Results for Samples taken on 15/Oct/97

Sample Number	1	2	3	4	5	6	7	8	9	10	WHO Maximum Levels for drinking water
Laboratory Reference	367	368	369	370	371	372	373	374	375		
Parameter											
PH	7.72	7.74	7.75	7.72	7.72	7.64	7.61	7.65	7.25		6.5-8.5
Conductivity uS/cm	937	933	941	901	895	941	930	939	885		
TDS mg/l	102	89	88	75	90	109	102	97	110		1000
Alkalinity mg/l CaCO ₃	61	63	61	67	56	60	58	70	62		
BOD mg/l O ₂	1.2	2.3	1.6	1.1	1.3	0.6	0.7	0.5	1.3		
Phosphate mg/l	0.12	0.24	0.13	0.31	0.09	0.1	0.2	0.11	0.11		
Nitrate N mg/l	2.9	0.1	1.2	0.8	1.3	0.8	0.6	0.9	0.7		10
Iron mg/l	0.02	0.02	0.01	<0.01	0.15	0.03	<0.01	0.02	0.05		0.3
Manganese mg/l	-	-	-	-	-	-	-	-	-		0.1
Copper mg/l	0.1	0.03	<0.01	0.11	0.1	0.06	0.08	0.12	0.06		1.0
Dissolved oxygen mg/l	5.6	6.9	6.3	5.7	5.8	5.3	5.5	5.6	5.8		
Turbidity (NTU)	1.01	1.28	1.5	1.6	1.96	1.16	1.01	1.13	1.74		5
Permanganate value mg/l O ₂	0.6	1.9	1.6	1.1	0.9	1.3	0.7	0.5	0.7		
COD mg/l O ₂	2	<0.01	3	2.5	11	<0.01	7.5	14	4		
E Coli	44	38	74	48	26	35	57	22	85		0
Total Coliforms	80	72	126	101	67	68	87	27	137		0

Sample Locations – Water samples were taken from nine locations in the river, as shown in the diagram below and from the water treatment works in Zimbabwe. The main flow of the river was located towards the Zambian shore, with fast flowing deep water.





ZAMBEZI RIVER AUTHORITY

HEAD OFFICE:

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LUSAKA

Please reply to Office

Reference 186/9

August 1, 1997

JICA Study Team
C/o Ministry of Transport & Energy
Department of Roads
Kaguvi Buliding
P.O. Box CY 95
Causeway
Harare
ZIMBABWE

ATTENTION: Ms Annabelle Cleeve

Dear Madam,

RE: 1996 WATER QUALITY RESULTS FOR THE ZAMBEZI RIVER

We acknowledge receipt of your fax dated 21 July 1997.

We tried to contact you, but found that you had already checked out of the hotel.

Enclosed are water quality results for the year 1996. However, we have not yet disting long term trends between wet and dry seasons' results. Please note that the current san points below the Kariba Dam are;

- a) Dam wall downstream, this point is immediately downstream of the wa the south bank tailrace.
- b) Kafue river at Chiawa pontoon
- c) Luangwa/Kanyemba
- d) Luangwa at Luangwa

JICA Study Team
C/o Ministry of Transport & Energy
Department of Roads
Kagivi Buliding
P.O. Box CY 95
Causeway
Harare
ZIMBABWE

We hope this data will be of some use to you.

Yours faithfully,



S.N. Mukono
RESOURCES & WATER RIGHTS ENGINEER
for/Chief Executive

Encl.

DATE	ORIGIN	610nm PO4 mg/l	PO4X.32 P mg/l	NO3-N mg/l 500 nm	NO3X4.4 NO3mg/l	Cond us	Formazin Turbidity	Temp. C	pH	DO mg/l
03-Jan-96	Dam Wall Gauge Plates	1.4	0.4564	0.07	0.308	50	1.38	30	10.2	7.99
03-Jan-96	Dam Wall Downstream	2	0.652	0.1	0.44	50	100	0.96	29.5	9.6
03-Jan-96	Andora Harbour	1.2	0.3912	0.05	0.22	50	108	2.52	35.4	10.1
03-Jan-96	Manchinchil bay	2.6	0.8476	0.06	0.264	50	102	0.77	30.8	10.2
09-Jan-96	Dam Wall Downstream	4.3	1.4018	0.08	0.352	50	103	0.73	30.7	9.4
09-Jan-96	Manchinchil bay	1.7	0.5542	0.08	0.32	50	108	1.46	31	10.1
09-Jan-96	Andora Harbour	3.4	1.1084	0.06	0.264	50	108	3.2	32.5	10
09-Jan-96	Charara Harbour	10.6	3.4556	0.06	0.264	60	110	4.7	33.5	10
09-Jan-96	Dam Wall Gauge Plates	4.9	1.5974	0.05	0.22	50	108	1.16	31.2	10.2
15-Jan-96	Chavuma Gauging Station	7.3	2.3798	0.01	0.044	10	20	3.96	27	7.8
16-Jan-96	Manchinchil bay	NR	0	NR	0	NR	NR	NR	27.1	7.88
17-Jan-96	Nyaodza Bay	NR	0	NR	0	NR	NR	NR	28	7.7
17-Jan-96	Gatchegatche Bay	NR	0	NR	0	NR	NR	NR	30	7.5
17-Jan-96	Watopa Gauging Station	5.6	1.8256	0.04	0.176	80	175	81.6	25	7.9
18-Jan-96	Lukulu Gauging Station	2.5	0.815	0.02	0.088	70	110	14.1	24	7.9
19-Jan-96	Dam Wall Downstream	NR	0	NR	0	NR	NR	NR	21.2	8.3
19-Jan-96	Andora Harbour	NR	0	NR	0	NR	NR	NR	26.2	8.25
19-Jan-96	Dam Wall Gauge Plates	NR	0	NR	0	NR	NR	NR	20.9	8.2
19-Jan-96	Manchinchil bay	NR	0	NR	0	NR	NR	NR	27.1	7.8
19-Jan-96	Charara Harbour	NR	0	NR	0	NR	NR	NR	27	7.99
23-Jan-96	Charara Harbour	7.7	2.5102	0.02	0.088	50	116.9	15	32.4	8.5
23-Jan-96	Andora Harbour	1.3	0.4238	0.11	0.484	50	115.3	2.25	28.2	8.1
23-Jan-96	Dam Wall Downstream	5.5	1.793	0.01	0.044	50	103.6	5.58	26.5	7.96
23-Jan-96	Dam Wall Gauge Plates	5.6	1.8256	0.04	0.176	50	107.3	2.28	27	8.03
23-Jan-96	Manchinchil bay	1.3	0.4238	0.09	0.396	50	100	1.93	27.2	8.1
26-Jan-96	Dam Wall Gauge Plates	1.2	0.3912	0.01	0.044	50	104.8	2.32	27.7	8.15
26-Jan-96	Dam Wall Downstream	10	3.26	0.1	0.44	50	108.9	3.37	28.6	7.9
26-Jan-96	Manchinchil bay	1.7	0.5542	0.1	0.44	50	107.9	1.48	27.3	8.1
27-Jan-96	Andora Harbour	1.5	0.489	0.1	0.44	50	113.6	3.2	28	8.4
27-Jan-96	Charara Harbour	3.2	1.0432	0.05	0.22	60	117.6	12.5	30.4	8.2
21-Jan-96	Dam Wall Gauge Plates	2.2	0.7172	0.11	0.484	50	104	1.69	27.1	8
21-Jan-96	Andora Harbour	6.2	2.0212	0.3	1.32	60	119.5	2.67	26.8	7.9
21-Jan-96	Charara Harbour	2	0.652	0.04	0.176	60	116	9.99	30.4	8.6
21-Jan-96	Dam Wall Downstream	3.9	1.2714	0.09	0.396	50	102.8	1.75	27.2	7.7

DATE	ORIGIN	PO4X.326		NO3X4.4		Formazin		Temp. C	pH	DO mg/l	% Sat	Sulphide	NO2
		PO4 mg/l	P mg/l	NO3-N mg/l	NO3	Cond us	Turbidity						
April 1996	02-Apr-96 Manchini Bay	5.6	1.8256	0.03	0.132	50	109.2	2.21	27.8	8.6	5.76	69.9	
	02-Apr-96 Dam Wall Gauge plates	2.7	0.8802	0.04	0.176	50	105.2	2.96	28.3	8.5	5.8	76	
	02-Apr-96 Dam wall Downstream	4.1	1.3666	0.05	0.22	50	105.3	4.32	28.4	8.3	4.6	57.8	
	02-Apr-96 Andora Harbour	1.7	0.5542	0.1	0.44	50	110.9	7.09	28.5	8.4	6.17	73.8	
	02-Apr-96 Charara Bay	2.4	0.7824	0.07	0.308	60	115.4	5.6	30.3	8.2	5.6	70.3	
	11-Apr-96 Matongo Platform (under platform)	2.6	0.8476	0.03	0.132	40	90	2.28	28.2	7.2	3.12	39.2	
	11-Apr-96 Matongo Platform (main flowing stream)	1.7	0.542	0.09	0.396	30	72.9	2.64	26.4	7.2	4.2	42.3	
	11-Apr-96 Senanga Hydrometric station	3.3	1.0758	0.08	0.352	40	60	3.28	30	7.2	3.33	41.4	
	12-Apr-96 Sesheke DWA offices	1.7	0.5542	0.07	0.044	30	66.9	8.05	28.2	7.9	5.8	76.2	
	13-Apr-96 Kazungula Pontoon (B/Post)	2.6	0.8476	0.07	0.308	30	62	3.08	25	7.6	3.48	41.3	
	13-Apr-96 Nana's Farm Hydrometric Station	1.8	0.5968	0.06	0.284	30	69.1	5.75	25.5	7.9	5.75	64	
	13-Apr-96 Livingstone Punphouse Hydro. station	4.6	1.4996	0.05	0.22	30	69.2	5	25.1	8	5.38	72	
	14-Apr-96 Maamba at izuma stream Bridge (M/Road)	3.7	1.2062	0.24	1.056	710	1440	1.85	28.7	8.5	7.85	99.8	
	15-Apr-96 Chipepo Harbour	2.1	0.6946	0.01	0.044	50	120	8.45	27.8	8.2	6.54	81.9	
	25-Apr-96 Luangwa / Kanyemba (Zambezi river)	5.8	1.8908	NR*	0	60	139.5	13.3	25.2	8.6	7.2	87.7	
	25-Apr-96 Luangwa / Zumbo (Luangwa river)	4.9	1.5974	NT	0	60	118.4	704	26.5	8.6	7.4	89.7	
				NR* Not read because of high turbidity									
				NT Not traced									
May 1996	07-May-96 Kalue River at Chiawa Potoon	14.8	4.8248	0.05	0.22	120	254	5.08	24.5	8.6	8.73	101.5	
	07-May-96 Zambezi River at Zambezi Kayla Lodge	0.8	0.2608	0.05	0.22	70	141.5	5.85	27.1	8.6	8.29	101.3	
	17-May-96 Manchini Bay	9.4	3.0644	0.11	0.484	50	107.9	1.28	26.1	8.5	7.5	97.5	
	17-May-96 DamWallGaugeplates	3.1	1.0106	0.09	0.396	50	106.4	1.34	26	8.5	7.12	89.3	
	17-May-96 Dam Wall Downstream	4.8	1.5648	0.23	1.012	50	102.7	1.82	26.1	8.5	6.14	68.1	
	17-May-96 Andora Harbour	2	0.652	0.08	0.352	50	109.3	1.36	27	8	5.56	69.6	
	17-May-96 Charara Harbour	4.7	1.5322	0.02	0.088	50	114	13.8	27.8	8.4	6.99	87.9	
	21-May-96 Nyaoza	13.3	4.3358	0.16	0.704	50	114.4	5.26	24.1	8	4.02	47.8	
	21-May-96 Gatchegatche Bay	1.9	0.6194	0.11	0.484	50	103.3	2.71	24.9	7.6	1.58	18.9	
	21-May-96 Sanyati Gorge	14.1	4.5966	0.06	0.264	70	135.4	9.45	25	8.3	0.29	3.8	
	23-May-96 Sanyati Hydrological Station	14.4	4.6944	0.04	0.176	110	235	250	22.8	8.3	4.3	46.2	51 0.01
	24-May-96 Bumi Hillis Hotel Harbour	8.8	2.8688	0.06	0.264	50	114.8	3	25.5	8.7	6.47	75.2	NR
	25-May-96 Kuluzwe Hotel Binga Harbour	12.2	3.9772	0.14	0.616	50	105.9	14	25	8.3	8.62	102.5	0.051 0.2
	26-May-96 Binga DDF Harbour	3.7	1.2062	0.09	0.396	50	101.4	16	25.8	8.7	7.06	81.4	0.051 0.06
	26-May-96 Milibi Harbour	3.2	1.0432	NT	0	60	112.9	9	26	8.2	4.4	55.4	0.091 0.03
	27-May-96 Deka Mouth at Tiger Mile Resort	2.7	0.8802	0.03	0.132	30	66.3	5.57	22.4	8.2	7.5	83.5	0.2 0.01
June 1996	18-Jun-96 Manchini Bay	2.4	0.7824	0.04	0.176	50	106.8	1.35	24.7	8.5	6.45	77.2	
	18-Jun-96 Dam Wall Gaugeplates	4.4	1.4344	0.07	0.308	50	106.5	1.05	24.7	8.5	5.96	73	
	18-Jun-96 DamWall Downstream	4.1	1.3666	0.04	0.176	50	110.6	1.35	25	8.6	6.3	75	
	18-Jun-96 Andora Harbour	1.4	0.4564	0.07	0.308	50	109.3	5.4	26	8.2	4.6	45.3	
	18-Jun-96 Charara Harbour	16.3	5.3138	0.04	0.176	50	110.6	16.2	24.9	8.5	6.88	83.9	
	20-Jun-96 Manchini Bay	1.8	0.5968	0.03	0.132	50	109	1.35	24.3	8.3	5.96	72	
	20-Jun-96 Dam Wall Gaugeplates	2.67	0.87042	0.08	0.352	50	108.9	1.89	24.5	8.3	6.1	73.5	
	20-Jun-96 DamWall Downstream	2.56	0.83456	0.06	0.264	50	110	2.2	26	8.5	5.89	70	
	20-Jun-96 Andora Harbour	1.7	0.5542	0.02	0.088	50	112.5	3.5	27	8.4	4.87	60.3	
	20-Jun-96 Charara Harbour	1.6	0.5216	0.06	0.264	50	112	10.5	25	8.2	6.25	80.4	
	25-Jun-96 Manchini Bay	2.6	0.8476	0.07	0.308	50	110.1	1.52	25.3	8.2	6.23	75	
	25-Jun-96 Dam Wall Gaugeplates	3.7	1.2062	0.08	0.352	50	113	1.45	25.5	8.2	6.45	76.5	
	25-Jun-96 DamWall Downstream	3.3	1.0758	0.08	0.352	50	110.5	2.2	26	8.2	6.35	75	
	25-Jun-96 Andora Harbour	4.5	1.467	0.06	0.264	50	112	5	26	8.5	5.2	63	
	25-Jun-96 Charara Harbour	8.6	2.8036	0.08	0.352	50	118	9.8	28	8.6	5.67	68.8	
	27-Jun-96 Manchini Bay	3.2	1.0432	0.02	0.088	50	110.3	1.25	23.5	7.9	6.65	82.3	
	27-Jun-96 Dam Wall Gaugeplates	3.2	1.0432	0.03	0.132	50	113.2	1.9	23.5	8.2	5.54	70.2	
	27-Jun-96 DamWall Downstream	2.5	0.815	0.07	0.308	50	112.5	2.6	24.3	8.5	6.2	78.3	
	27-Jun-96 Andora Harbour	3.2	1.0432	0.04	0.176	50	117	3.5	25.5	8.3	4.5	55.2	
	27-Jun-96 Charara Harbour	5.7	1.8582	0.06	0.264	50	114.3	11.4	26.8	8.6	5.67	69.2	
	28-Jun-96 Nyaoza Bay	5.4	1.7604	0.08	0.352	50	115	3.1	22.9	8	5.75	66.4	
	28-Jun-96 Gatchegatche Bay	3.8	1.2388	0.07	0.308	50	116.3	1.23	23.1	7.9	3.94	45.6	
	28-Jun-96 Sanyati Gorge	11.7	3.8142	0.22	0.958	50	112.2	20.6	24.5	7.7	3.21	40.5	

DATE	ORIGIN	PO4 mg/l	P mg/l	NO3-N mg/l	NO3	TDS mg/l	Cond uS	Turbidity	Temp. C	pH	DO mg/l	DO%Sat
25-Sep-96	Dam Wall Downstream	1.9	0.6194	0.03	0.132	50	104.6	0.8	26.1	9	7.78	82.6
25-Sep-96	Andora Harbour	1.4	0.4564	0.06	0.264	50	109.2	3.2	27.6	9.1	6.15	78.6
25-Sep-96	Charara Harbour	1.9	0.6194	0.01	0.044	50	108.6	18.1	25.5	9.1	7.74	94.5
27-Sep-96	Manchinchi Bay	1.2	0.3912	0.06	0.264	50	103.6	0.8	27.6	9.7	8.17	100.3
27-Sep-96	Dam wall Gaugeplates	1.1	0.3586	0.05	0.22	50	102.3	0.77	26.9	9.1	8.73	106.3
27-Sep-96	Dam Wall Downstream	1.5	0.489	0.04	0.176	50	105.3	1.04	25.5	9.2	7.92	95.6
27-Sep-96	Andora Harbour	1.4	0.4564	0.04	0.176	50	110.2	4.61	28.2	9.6	8.3	103.5
27-Sep-96	Charara Harbour	1.1	0.3586	0.07	0.308	50	109.5	5.49	26.6	9	7.28	91.3
01-Oct-96	Manchinchi Bay	1.7	0.5542	0.03	0.132	50	104.3	1.08	27.7	9.4	6.64	115.3
01-Oct-96	Dam Wall Gaugeplates	1.5	0.489	0.03	0.132	50	102.3	1.03	26.8	9.2	8.68	110.2
01-Oct-96	Dam Wall Downstream	1.7	0.5542	0.05	0.22	50	103.8	1.6	26.6	9.3	6.73	93
01-Oct-96	Andora Harbour	1.9	0.6194	0.07	0.308	50	110.3	3.6	27.8	9.6	5.83	63.4
01-Oct-96	Charara Harbour	1.3	0.4238	0.04	0.176	50	114.2	5.68	30.2	9.3	8.6	109.8
04-Oct-96	Chavuma Telemetry Hut	1.6	0.5216	0.05	0.22	10	35.5	1.09	25.1	8.6	8.59	93.4
04-Oct-96	Chavuma Falls	1.7	0.5542	0.03	0.132	10	34.9	1	25.4	8.9	8.63	103.1
05-Oct-96	Watopa Hydro. Station	0.7	0.2282	0.03	0.132	150	317	1.4	26.5	9.6	6.42	77.4
05-Oct-96	Lukulu Hydro. Station	3.2	1.0432	0.03	0.132	80	175.5	1.4	26.4	9.8	6.13	73.7
06-Oct-96	Matongo Platform (Mongu)	2.2	0.7172	0.09	0.396	40	90.7	6	25.1	9.1	7.61	91.7
06-Oct-96	Senanga Hydrostation	2.1	0.6846	0.03	0.132	40	85.3	5.8	26.6	9.3	9.5	115.3
07-Oct-96	Sesheke DWA Offices	6.1	1.9836	0.08	0.352	40	82.8	4.7	27.1	9.4	7.6	94
08-Oct-96	Kazungula Pontoon (Border Post)	1.5	0.489	0.07	0.308	50	87.8	1.8	25.3	9.2	6.73	93
08-Oct-96	Nana's Fam Hydro/Telem. Station	14.7	4.7922	0.02	0.088	40	88.4	2.2	26.1	9.4	7.02	109.2
08-Oct-96	Livingstone Pump House Hydro Station	0.8	0.2608	0.01	0.044	40	87.7	2.1	27.2	9.3	10.9	119.2
08-Oct-96	Vic. Falls, U/Stone Boiling Pot	10.8	3.5208	0.03	0.132	40	81.7	2.3	26.3	9.4	10.3	122.3
09-Oct-96	Ranting Point 18 (Batoka road)	1.9	0.6194	0.01	0.044	40	83.6	3.5	30	9.5	8.36	96.2
09-Oct-96	Batoka Gorge (ZRA)	13.7	4.4662	0.01	0.044	50	86.6	2.1	26.5	9.6	10.1	110.3
09-Oct-96	ZESA pump house / intakes, Deka	2.6	0.8476	0.04	0.176	50	86.3	3.3	26.3	10.2	8.64	96
15-Oct-96	Manchinchi Bay	2.7	0.8802	0.07	0.308	50	108.4	1	28.8	9.9	11.84	127
15-Oct-96	Dam Wall Gaugeplates	0.7	0.2282	0.03	0.132	50	103.9	1.2	27.4	9.5	7.9	96.7
15-Oct-96	Dam Wall Downstream	2.2	0.7172	0.05	0.22	50	100.9	0.7	26.8	9.3	7.39	85.7
15-Oct-96	Andora Harbour	4.9	1.5974	0.03	0.132	50	114.3	2.3	27.6	9.2	6.43	85
15-Oct-96	Charara Harbour	0.01	0.00328	0.06	0.264	50	100.7	6.7	27.8	9.5	8.44	97.6
17-Oct-96	Manchinchi Bay	1.8	0.5888	0.04	0.176	50	103.2	0.9	28.4	9.3	9.37	115
17-Oct-96	Dam Wall Gaugeplates	1.4	0.4564	0.04	0.176	50	110.1	1.2	25.5	9.3	8.05	94
17-Oct-96	Dam Wall Downstream	1.1	0.3586	0.02	0.088	50	107	0.98	26.2	9.2	7.2	83
17-Oct-96	Andora Harbour	1.1	0.3586	0.02	0.088	50	103.3	1.9	28.9	9.9	8.51	86
17-Oct-96	Charara Harbour	1.1	0.3586	0.04	0.176	50	108.5	3.9	27.5	9.3	6.93	80
22-Oct-96	Manchinchi Bay	0.8	0.2608	0.04	0.176	50	104.2	0.8	29.1	9.9	4.46	117
22-Oct-96	Dam Wall Gaugeplates	1.6	0.5216	0.02	0.088	50	104.2	0.7	27.1	9.7	6.74	79
22-Oct-96	Dam Wall Downstream	7	2.282	0.09	0.396	40	101.1	0.8	27.5	9.6	10.23	91
22-Oct-96	Andora Harbour	10.3	3.3578	0.07	0.308	50	102.8	2.7	29.2	10.3	6.05	77
22-Oct-96	Charara Harbour	0.9	0.2934	0.09	0.396	50	111.1	3.5	26.1	9.4	9.5	66

DATE	ORIGIN	PO4 mg/l	P mg/l	NO3-N mg/l	NO3	TDS mg/l	Cond uS	Turbidity	Temp. C	pH	DO mg/l	DO%Sat	
November 1996													
01-Nov-96	Nyaodza	1.3	0.4238	0.01	0.044	50	110.3	2.5	28.8	9.3	6.32		
01-Nov-96	Gatchegaitche Bay	1.5	0.489	0.04	0.176	60	132.2	1.1	31	9.4	6.47		
01-Nov-96	Sanyati Gorge	1.3	0.4238	0.02	0.088	60	124.3	7.3	30.1	9.6	6.5		
05-Nov-96	Manchinchi Bay	4.1	1.3366	0.05	0.22	50	103.1	0.8	29	10.5	3.89		
05-Nov-96	Dam Wall Gaugeplates	1.2	0.3912	0.03	0.132	50	106.4	0.7	30.1	10.5	3.8		
05-Nov-96	Dam Wall Downstream	1.3	0.4238	0.04	0.176	50	103.2	0.6	27.8	9.9	3.79		
05-Nov-96	Andora	0.8	0.2608	0.05	0.22	50	114	2	30.9	9.9	3.53		
05-Nov-96	Charara	1.1	0.3586	0.03	0.132	60	113.1	2.6	32	10.5	2.9		
14-Nov-96	Manchinchi Bay	2.7	0.8802	0.07	0.308	50	110.2	0.7	30.4	10.3	6.48		
14-Nov-96	Dam Wall Gaugeplates	1.8	0.5868	0.03	0.132	50	104	1	29.5	10.3	6.95		
14-Nov-96	Dam Wall Downstream	3	0.978	0.05	0.22	50	101	0.6	28	9.8	5.93		
14-Nov-96	Andora	1.2	0.3912	0.06	0.264	50	110.8	3.4	30.1	9.6	4.6		
14-Nov-96	Charara	1.5	0.489	0.02	0.088	60	104.5	2.4	28.5	9.9	5.91		
19-Nov-96	Manchinchi Bay	2.1	0.6846	0.04	0.176	50	113.2	1.3	29	9.3	7.13		
19-Nov-96	Dam Wall Gaugeplates	1.6	0.5216	0.03	0.132	50	116.1	1.6	29.5	9	6.98		
19-Nov-96	Dam Wall Downstream	1.1	0.3586	0.03	0.132	50	110.6	1.2	28	9.2	6.6		
19-Nov-96	Andora	3.5	1.141	0.07	0.308	50	117.3	3	28	9.6	6.66		
19-Nov-96	Charara	1.4	0.4584	0.06	0.264	60	124.3	7.2	28.4	10	3.99		
21-Nov-96	Manchinchi Bay	2.1	0.6846	0.05	0.22	50	109.6	1.2	27.3	9	7.8		
21-Nov-96	Dam Wall Gaugeplates	1.3	0.4238	0.04	0.176	50	110.7	1.6	28.9	9.2	6.3		
21-Nov-96	Dam Wall Downstream	1.1	0.3586	0.03	0.132	50	110.5	1.3	28.2	9.3	7.23		
21-Nov-96	Andora	3.5	1.141	0.04	0.176	60	117.3	6.5	30	9.6	6.7		
21-Nov-96	Charara	2.1	0.6846	0.04	0.176	60	113.2	13.5	30.2	9	7.5		
December 1996													
03-Dec-96	Manchinchi Bay	1.3	0.4238	0.05	0.22	50	109.3	1.4	31.4	10.2	6.89		
03-Dec-96	Dam Wall Gauge Plates	1.1	0.3586	0.07	0.308	50	116.1	1.2	29	10.2	6.8	84.6	
03-Dec-96	Dam Wall Down Stream	1.1	0.3586	0.05	0.264	50	110	1	28.5	10	6.98	85.9	
03-Dec-96	Andora Harbour	2.1	0.6846	0.04	0.176	60	115.3	6.6	30.1	9.9	7.5	92.9	
03-Dec-96	Charara Harbour	2.2	0.7172	0.01	0.044	60	117.5	12.8	31	9.5	6.3	82.7	
03-Dec-96	Manchinchi Bay	1.1	0.3586	0.02	0.088	50	110.3	1.2	28.4	9.3	6.9	85.2	
05-Dec-96	Dam Wall Gauge Plates	1	0.326	0.03	0.132	50	109.1	1	28	9.4	5.66	68.9	
05-Dec-96	Dam Wall Down Stream	1.2	0.3912	0.01	0.044	50	106.5	0.6	29	9.2	7.13	89.4	
05-Dec-96	Andora Harbour	1.3	0.4238	0.08	0.352	60	115.3	6.2	29	9.8	3.99	50.2	
05-Dec-96	Charara Harbour	0.8	0.2608	0.07	0.308	60	110.5	9.5	29.8	9.6	6.9	85	
10-Dec-96	Manchinchi Bay	NR	NR	0	0.03	0.132	50	110.4	0.7	30.6	10.4	7.3	97.8
10-Dec-96	Dam Wall Gauge Plates	NR	NR	0	0.05	0.22	50	109.8	0.8	30.1	10.4	7.39	98.6
10-Dec-96	Dam Wall Down Stream	NR	NR	0	0.03	0.132	50	109.8	0.6	29	9.9	5.94	76.3
10-Dec-96	Andora Harbour	NR	NR	0	0.11	0.484	50	114	2.4	28.9	10.3	5.96	64.5
10-Dec-96	Charara Harbour	NR	NR	0	0.07	0.308	50	119	4.1	32.2	10.2	7.05	91.6
10-Dec-96	Manchinchi Bay	NR	NR	0	0.02	0.088	50	106	0.9	30	9.5	6.7	81
19-Dec-96	Dam Wall Gauge Plates	NR	NR	0	0.01	0.044	50	106.2	1.2	30	9.5	5.26	66.6
19-Dec-96	Dam Wall Down Stream	NR	NR	0	0.02	0.088	50	109.3	1.1	29	9.2	5.5	67.2
19-Dec-96	Andora Harbour	NR	NR	0	0.04	0.176	60	113	3.6	31	9.6	4.5	58
19-Dec-96	Charara Harbour	NR	NR	0	0.03	0.132	60	117	15.4	30	9.8	5.6	67.9
		NR - not read											

