

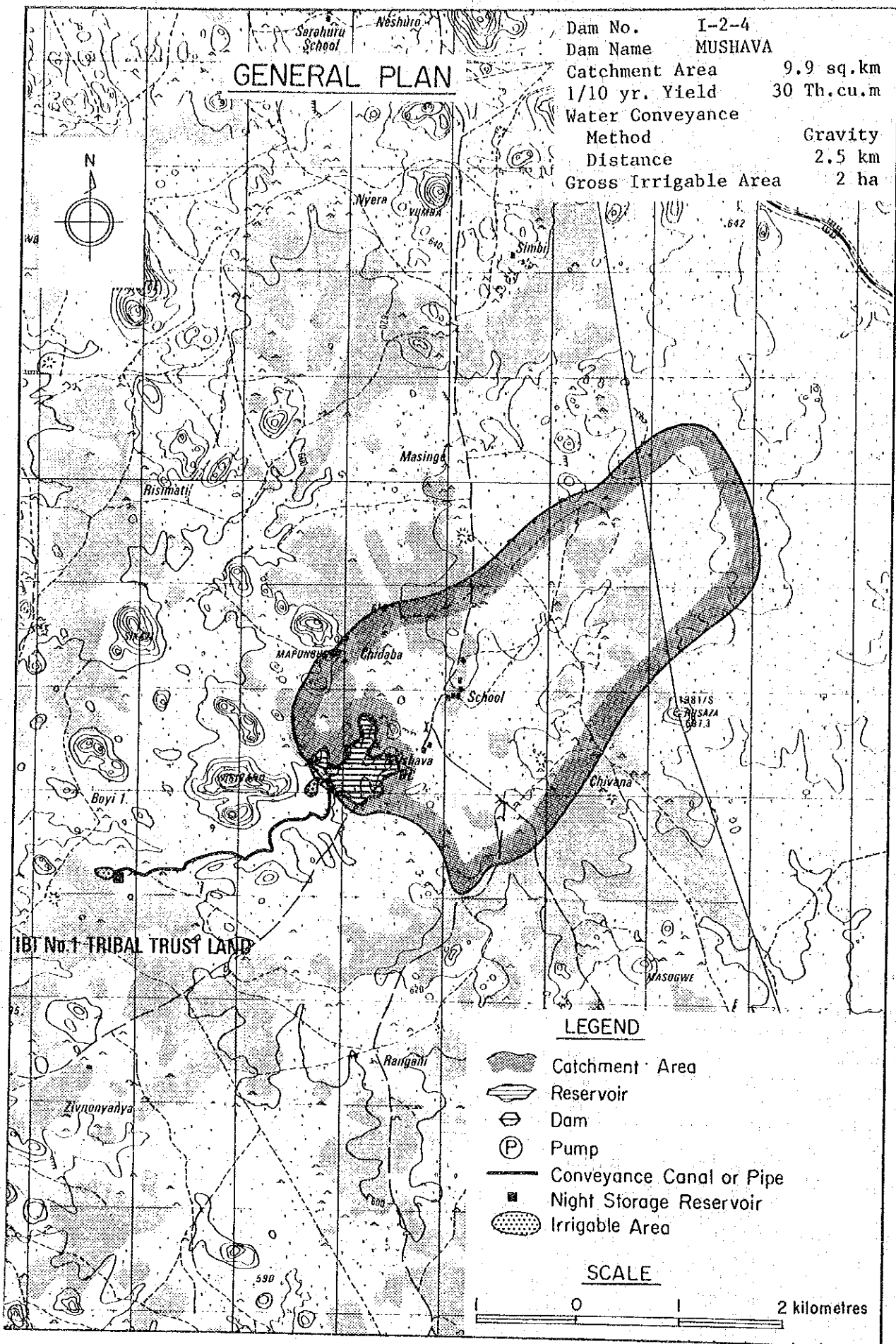
No. I-2-4

Name of Dam Mushava

Location	District	Batanai		Communal Land	Matibi No.1
	Map Ref.	2130B1		Coordinates	TM479671
Geology	Gneiss, highly shearing. Foliated and soft. Surface soil is thin.				
Hydrology	River	(T) Mwanezana		Hydrological Zone	B-N2
	Catchment Area	9.9	sq.km	M.A. Rainfall	600 mm
	M.A. Runoff	38	mm	Sediment	270 tonnes km ² /yr.
Reservoir	Effective Capacity	0.710	MCM	1/10 Yr. Yield	0.030 MCM
	Dead Capacity	0.040	MCM	D.W.S.	601 m
	Total Capacity	0.750	MCM	N.W.S.	604 m
Dam	Height	9	m	Length	500 m
	Embankment Volume	41 000	cu.m	Spillway	67 m
Agriculture	Natural Region	V		Soil	SL-L
	Potential Irrigable Area				80 ha
	Proposed Cropping Pattern	C			
Irrigation	Net Irrigable Area	1.5	ha	Dist. 2.5 km by Gravity	
	Topography	Area	Undulated and complicated		
		Conveyance	Complicated, one river crossing		
Rural Water Supply	Population	1 491	person	30 cu.m/day	
	Livestock	765	unit	34 cu.m/day	
Cost and Benefit	Dam	Z\$ 475 000		Irrigation Facilities	Z\$ 443 000
	Annual Increment Benefit	Z\$ 6 031 /year		Net Present Value	Z\$ 70 000
	Total Cost	Z\$ 918 000		Economic Internal Rate of Return	-
	Class C				
Visit	Dam Engineer	Geologist	Irrigation Engineer	Agronomist	Economist
	Y	Y	Y	Y	Y
Remarks					

Present Condition on the Ward

Ward Name	11		Area	8 250 ha	
Demography	Population Density		49.7	persons/sq.km	
	Family Size		6.7	Persons/household	
Agriculture	Arable Area	3 927	ha	Grazing Area	4 323 ha
	Maize	2.8	ha/household	10	bags/ha
	Sorghum	1.1	ha/household	8	bags/ha
	Livestock	2.1	LSUs/household	15.3	LSUs/sq.km
Rural Water Supply	Borehole	0.08	units/sq.km	585	persons/unit
	Well	0.02	units/sq.km	2 049	persons/unit



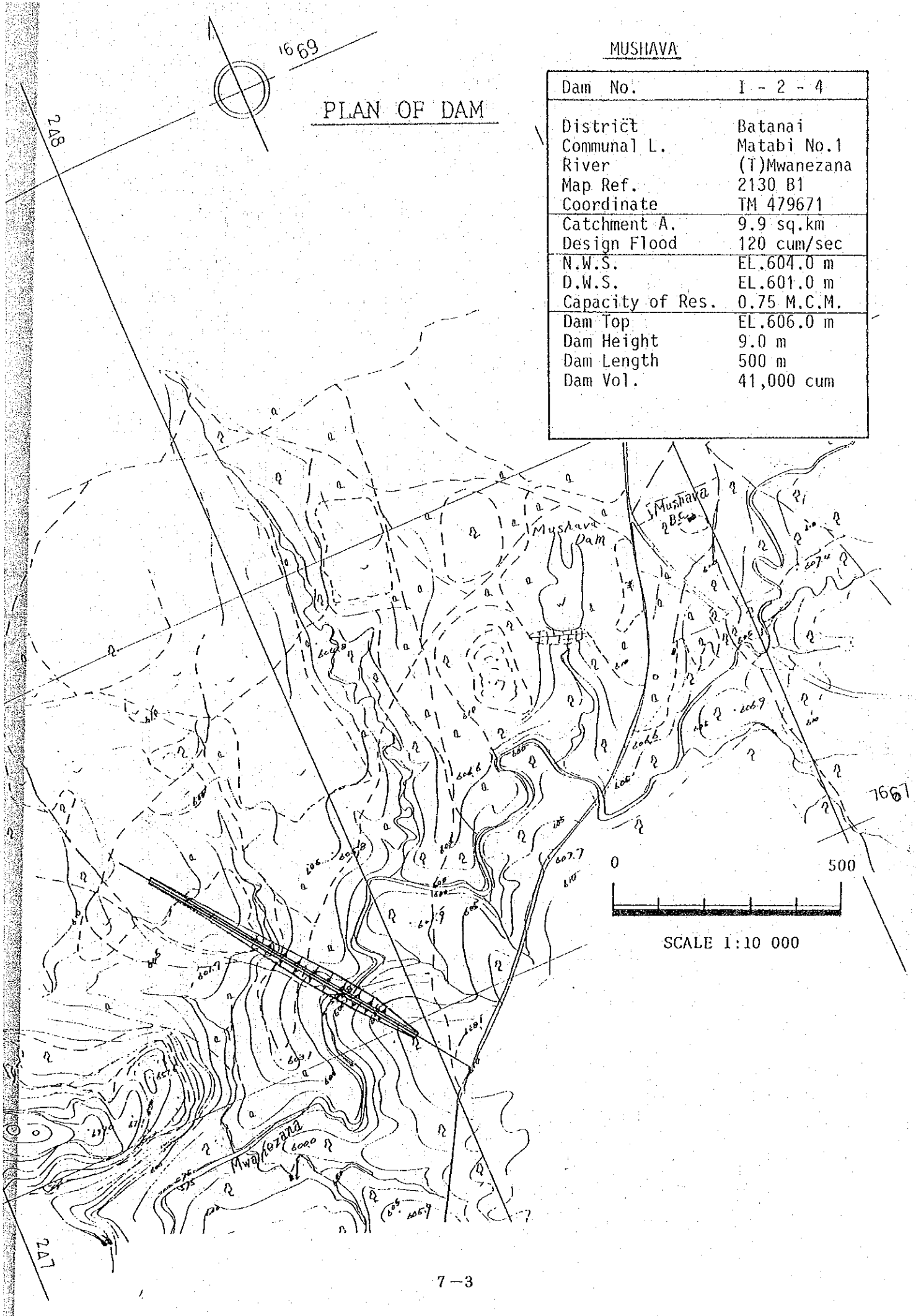
1669



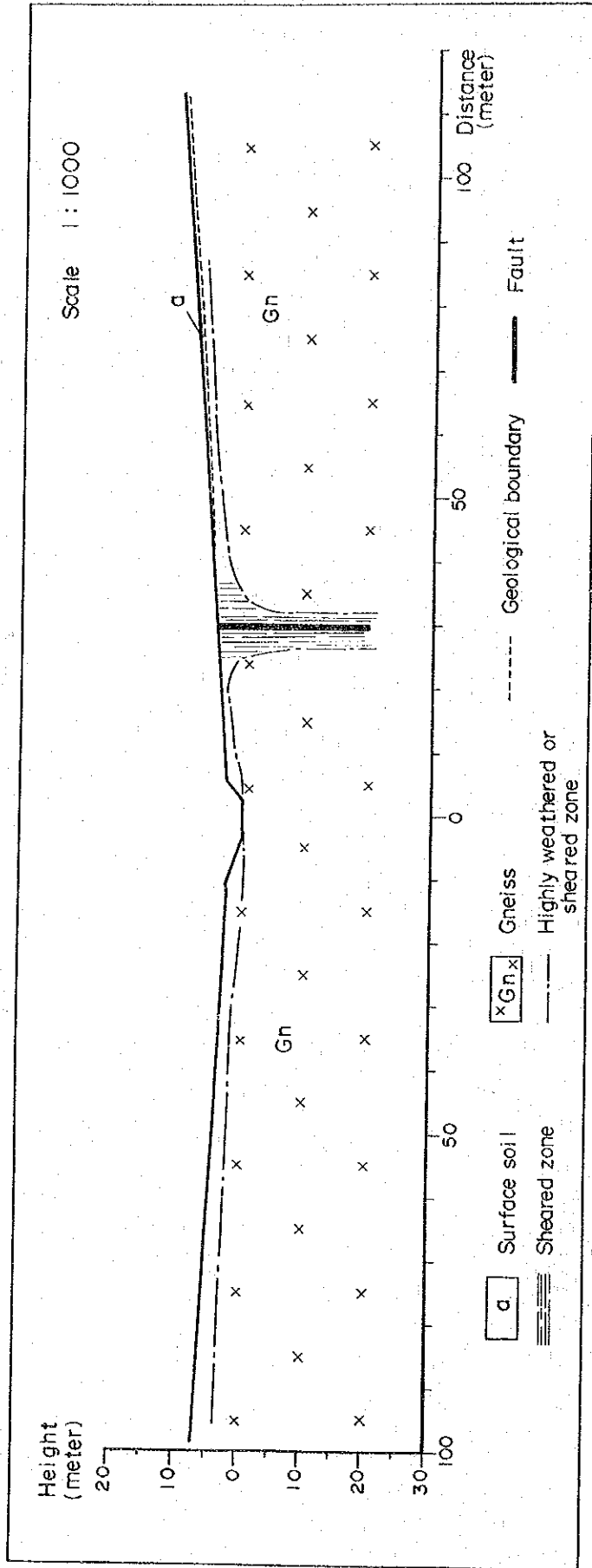
PLAN OF DAM

MUSHAVA

Dam No.	I - 2 - 4
District	Batanai
Communal L.	Matabi No.1
River	(T)Mwanezana
Map Ref.	2130 B1
Coordinate	TM 479671
Catchment A.	9.9 sq.km
Design Flood	120 cum/sec
N.W.S.	EL.604.0 m
D.W.S.	EL.601.0 m
Capacity of Res.	0.75 M.C.M.
Dam Top	EL.606.0 m
Dam Height	9.0 m
Dam Length	500 m
Dam Vol.	41,000 cum



I-2-4 Mushava

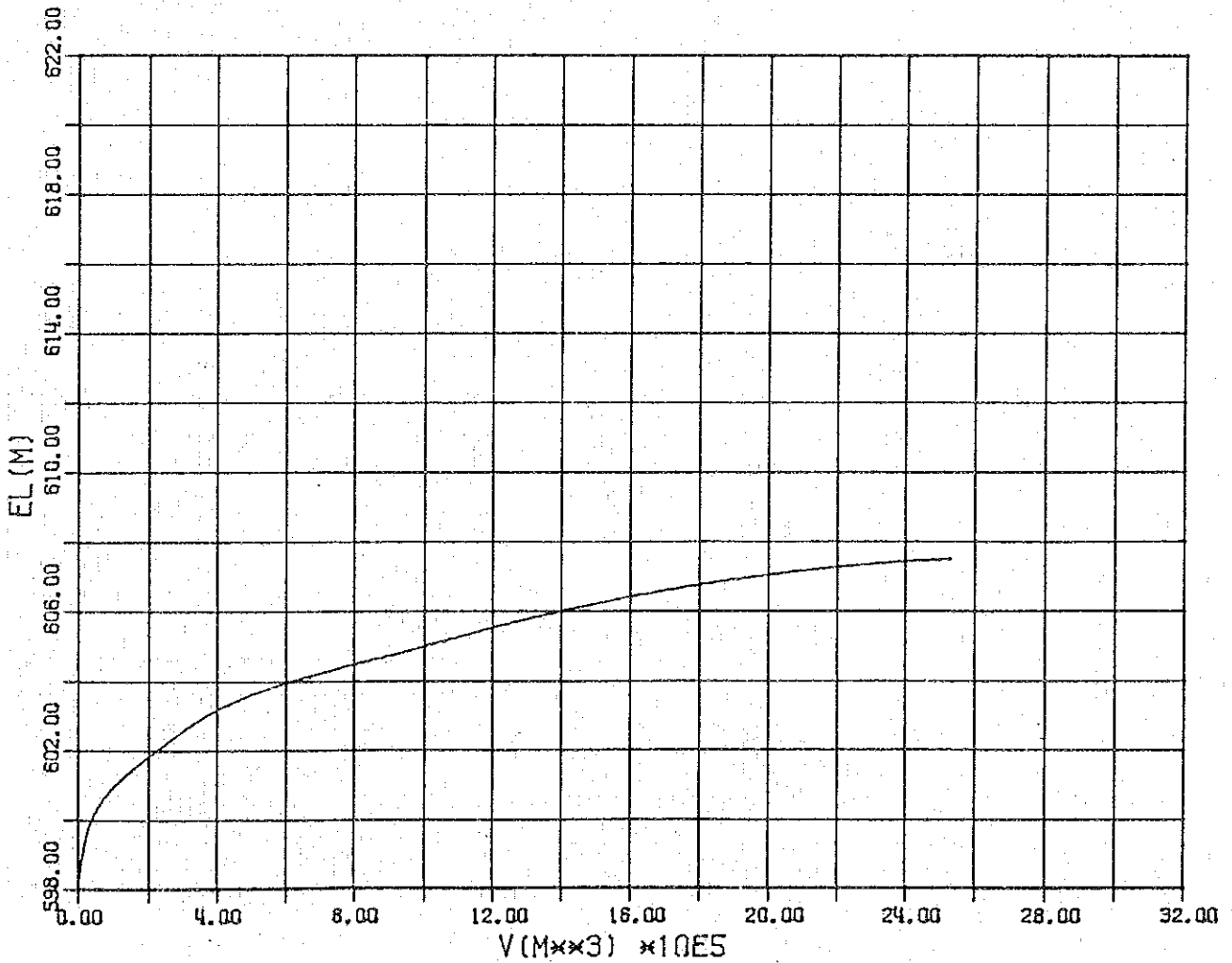


The bedrock consists of gneiss, and it is generally massive and hard. However highly sheared layer is distributed around the damsite, and it has the width of 40 meters and extends N70°E direction. Other several photo-lineaments trending N70°E and N70°W direction are recognized above the damsite. Therefore it seems that leakage through the bedrock is large and bearing strength in the foundation strata is small. The estimated thickness of unconsolidated thickness is less than 2 meters.

TABLE STORAGE VOLUME OF RESERVOIR

NO	MAP	GRID	VER	HOR
1-2-4	2130B1	TM	479	671

EL (M)	ΔH (M)	AREA (M ²)	AVE (M ²)	VOL (M ³)	ΣV (1000M ³)	NOTE
598.0	0.0	0	0	0	0.00	
600.0	2.0	38684	19342	38684	38.68	
602.5	2.5	161395	10003	250099	288.78	
605.0	2.5	410778	286087	715216	1004.00	
607.5	2.5	811091	610935	1527336	2531.33	



No. I-2-5

Name of Dam Boyi

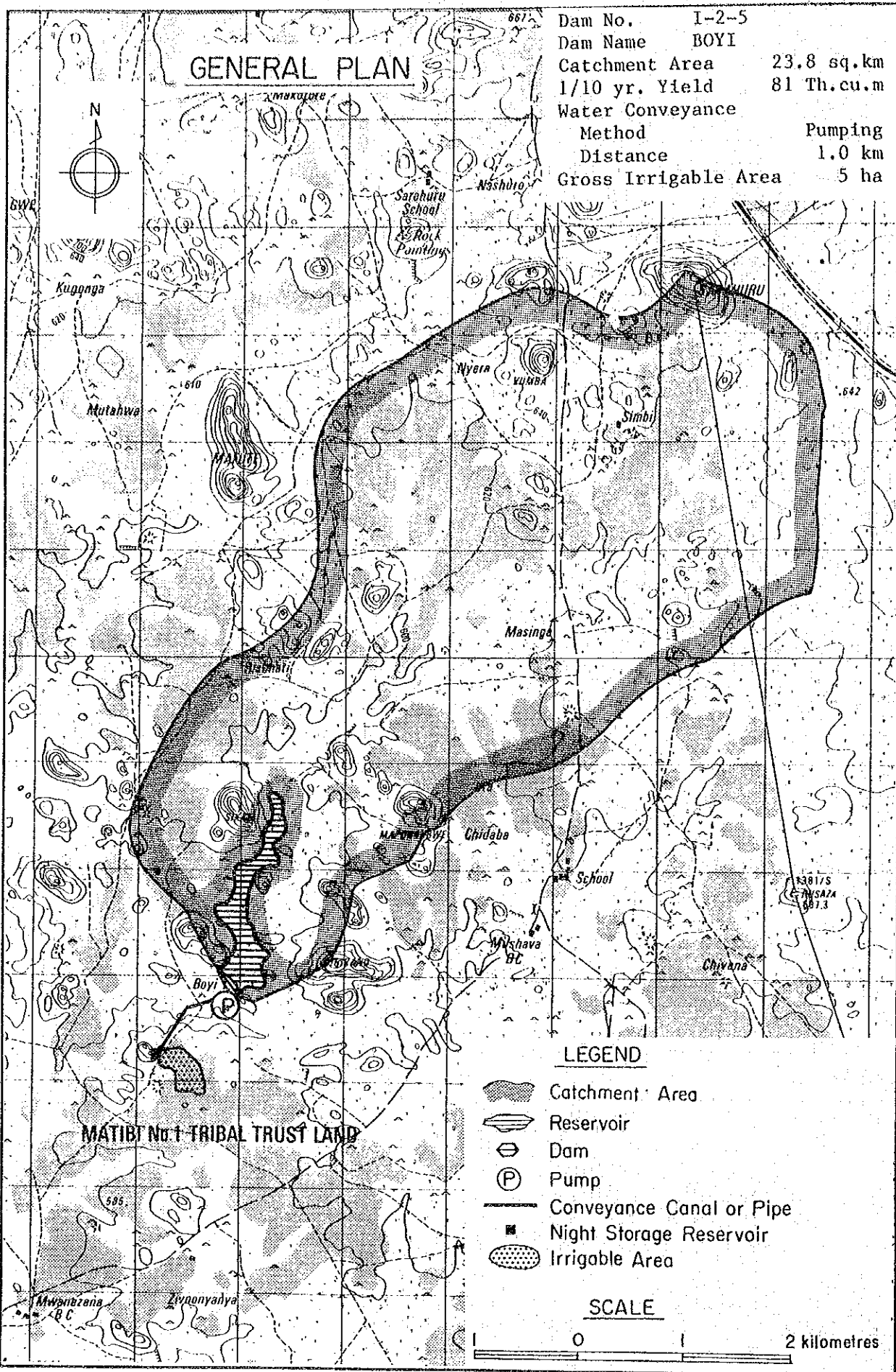
Location	District	Batanai		Communal Land	Matibi No.1
	Map Ref.	2030B1		Coordinates	TM459669
Geology	Gneiss, many photo-lineations are around the damsite, leakage seems to be great.				
Hydrology	River	(T) Mwanezana		Hydrological Zone	B-N2
	Catchment Area	23.8	sq.km	M.A. Rainfall	600 mm
	M.A. Runoff	38	mm	Sediment	270 tonnes km ² /yr.
Reservoir	Effective Capacity	1.710	MCM	1/10 Yr. Yield	0.081 MCM
	Dead Capacity	0.100	MCM	D.W.S.	585 m
	Total Capacity	1.810	MCM	N.W.S.	590 m
Dam	Height	9	m	Length	280 m
	Embankment Volume	29 000	cu.m	Spillway	118 m
Agriculture	Natural Region	V		Soil	SCL-CL
	Potential Irrigable Area	100 ha			
	Proposed Cropping Pattern	C			
Irrigation	Net Irrigable Area 4.1 ha		Dist. 1.0 km by Pump, H=14.0 m		
	Topography	Area	Sloping in one direction		
		Conveyance	Slightly sloping, one river crossing		
Rural Water Supply	Population	1 491 person		30 cu.m/day	
	Livestock	765 unit		34 cu.m/day	
Cost and Benefit	Dam	Irrigation Facilities		Total Cost	Class
	Z\$ 696 000	Z\$ 463 000		Z\$ 1 159 000	
	Annual Increment Benefit	Net Present Value		Economic Internal Rate of Return	C
	Z\$ 15 331 /year	Z\$ 178 000		-	
Visit	Dam Engineer	Geologist	Irrigation Engineer	Agronomist	Economist
	N	N	Y	Y	Y
Remarks					

Present Condition on the Ward








Ward Name	11		Area	8 250 ha
Demography	Population Density		49.7	persons/sq.km
	Family Size		6.7	Persons/household
Agriculture	Arable Area	3 927 ha	Grazing Area	4 323 ha
	Maize	2.8 ha/household	10	bags/ha
	Sorghum	1.1 ha/household	8	bags/ha
	Livestock	2.1 LSUs/household	15.3	LSUs/sq.km
Rural Water Supply	Borehole	0.08 units/sq.km	585	persons/unit
	Well	0.02 units/sq.km	2 049	persons/unit

GENERAL PLAN

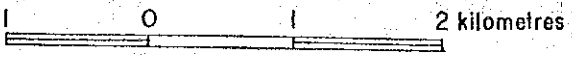
Dam No.	I-2-5
Dam Name	BOYI
Catchment Area	23.8 sq. km
1/10 yr. Yield	81 Th. cu. m
Water Conveyance Method	Pumping
Distance	1.0 km
Gross Irrigable Area	5 ha



LEGEND

-  Catchment Area
-  Reservoir
-  Dam
-  Pump
-  Conveyance Canal or Pipe
-  Night Storage Reservoir
-  Irrigable Area

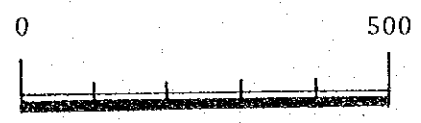
SCALE



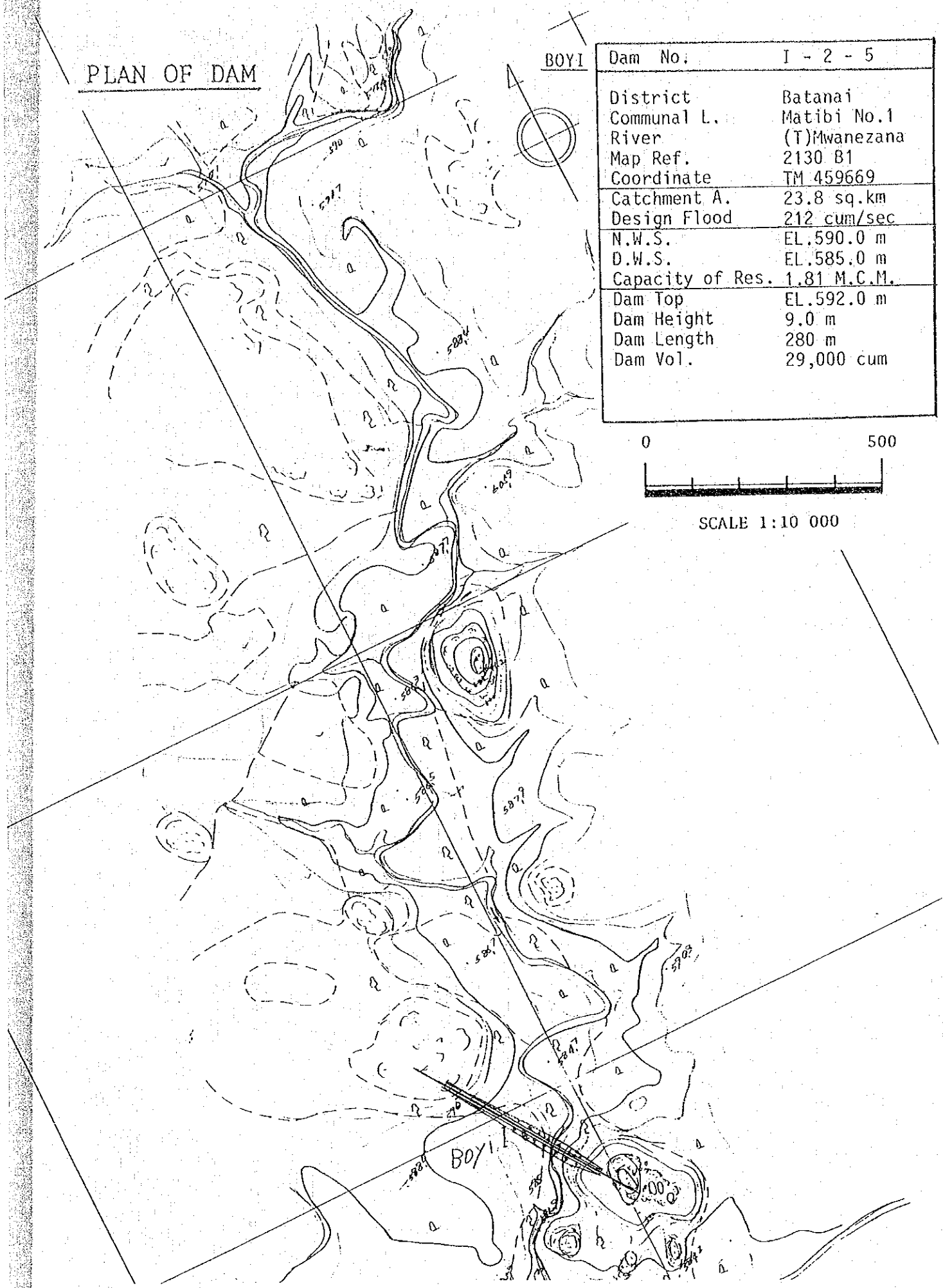
PLAN OF DAM

BOYI

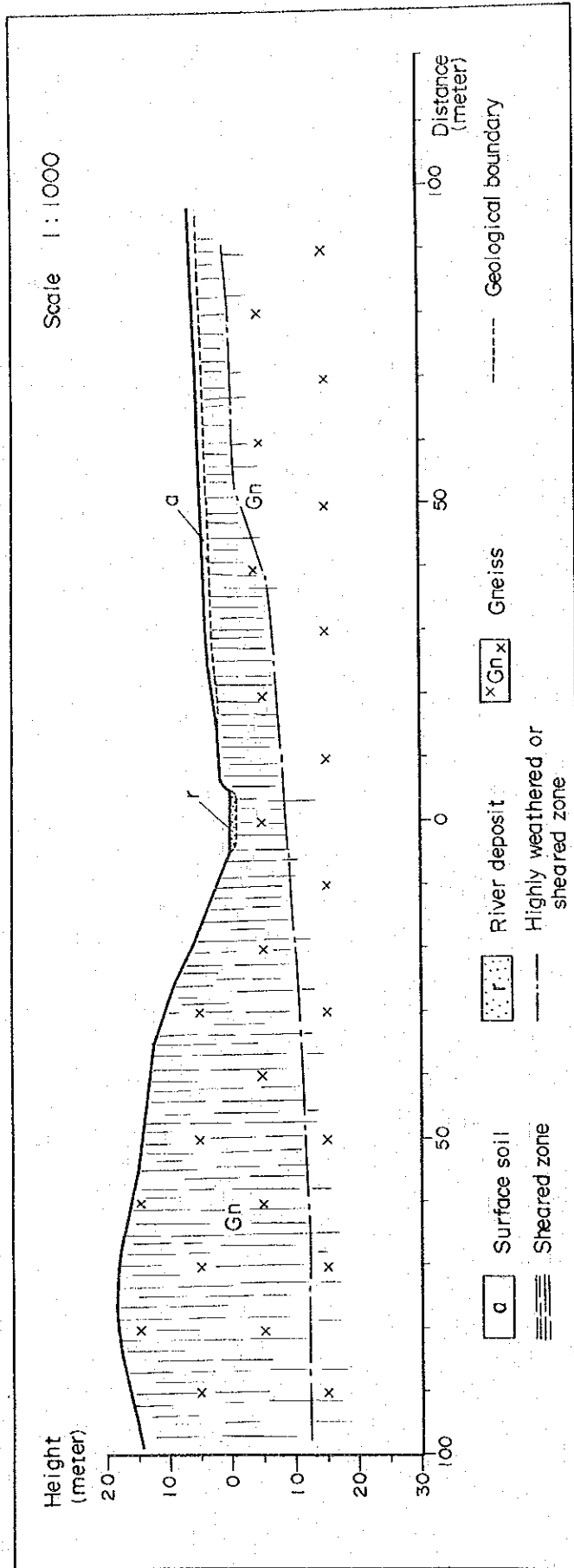
Dam No:	I - 2 - 5
District	Batanai
Communal L.	Matibi No.1
River	(T)Mwanezana
Map Ref.	2130 B1
Coordinate	TM 459669
Catchment A.	23.8 sq.km
Design Flood	212 cum/sec
N.W.S.	EL.590.0 m
D.W.S.	EL.585.0 m
Capacity of Res.	1.81 M.C.M.
Dam Top	EL.592.0 m
Dam Height	9.0 m
Dam Length	280 m
Dam Vol.	29,000 cum



SCALE 1:10 000



I-2-5 Boyi



The ground survey was not carried out in this area, therefore the topographical and the geological conditions were studied from existing data.

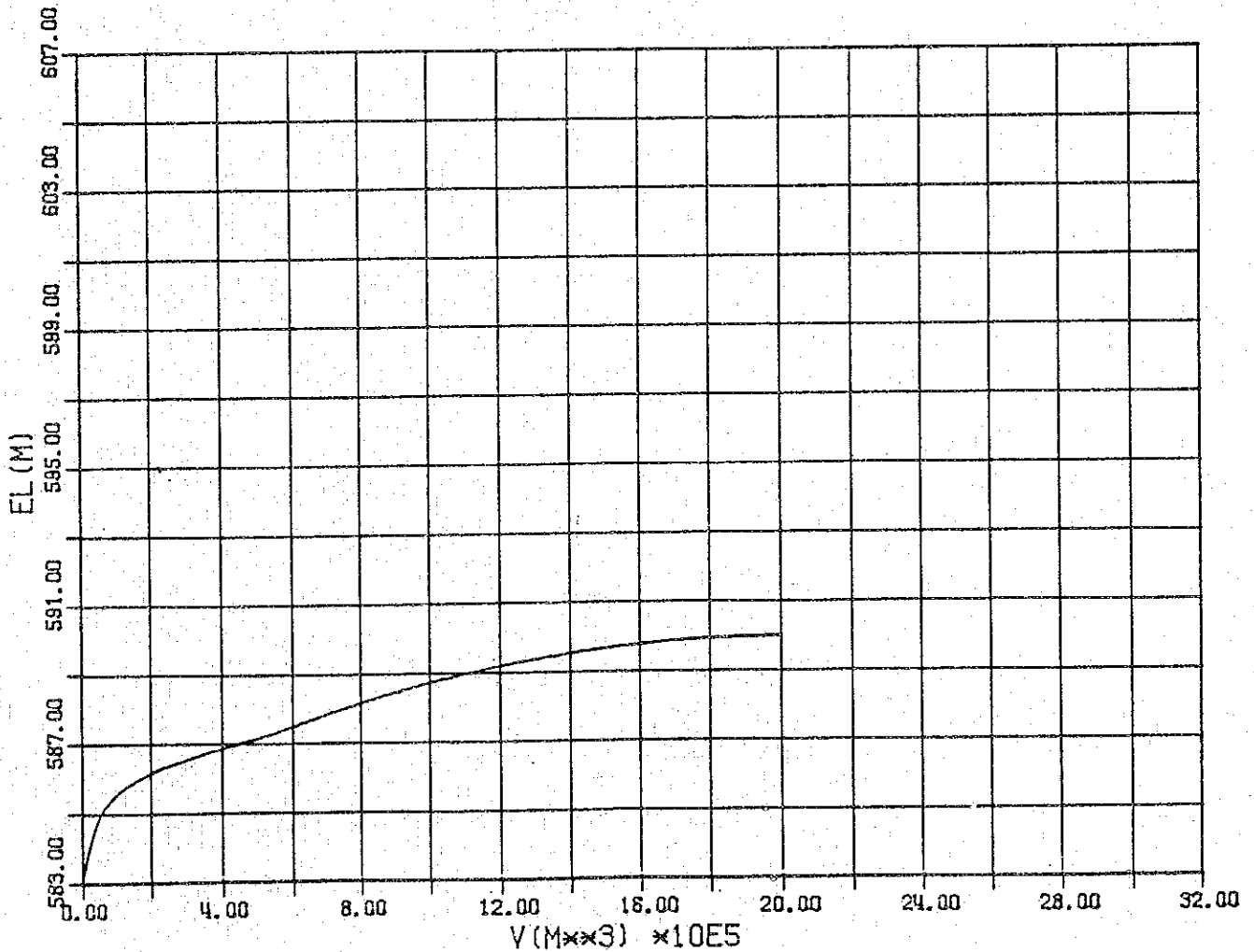
The area is hilly land and the Mwanazawa River forms a narrow and relatively deep valley.

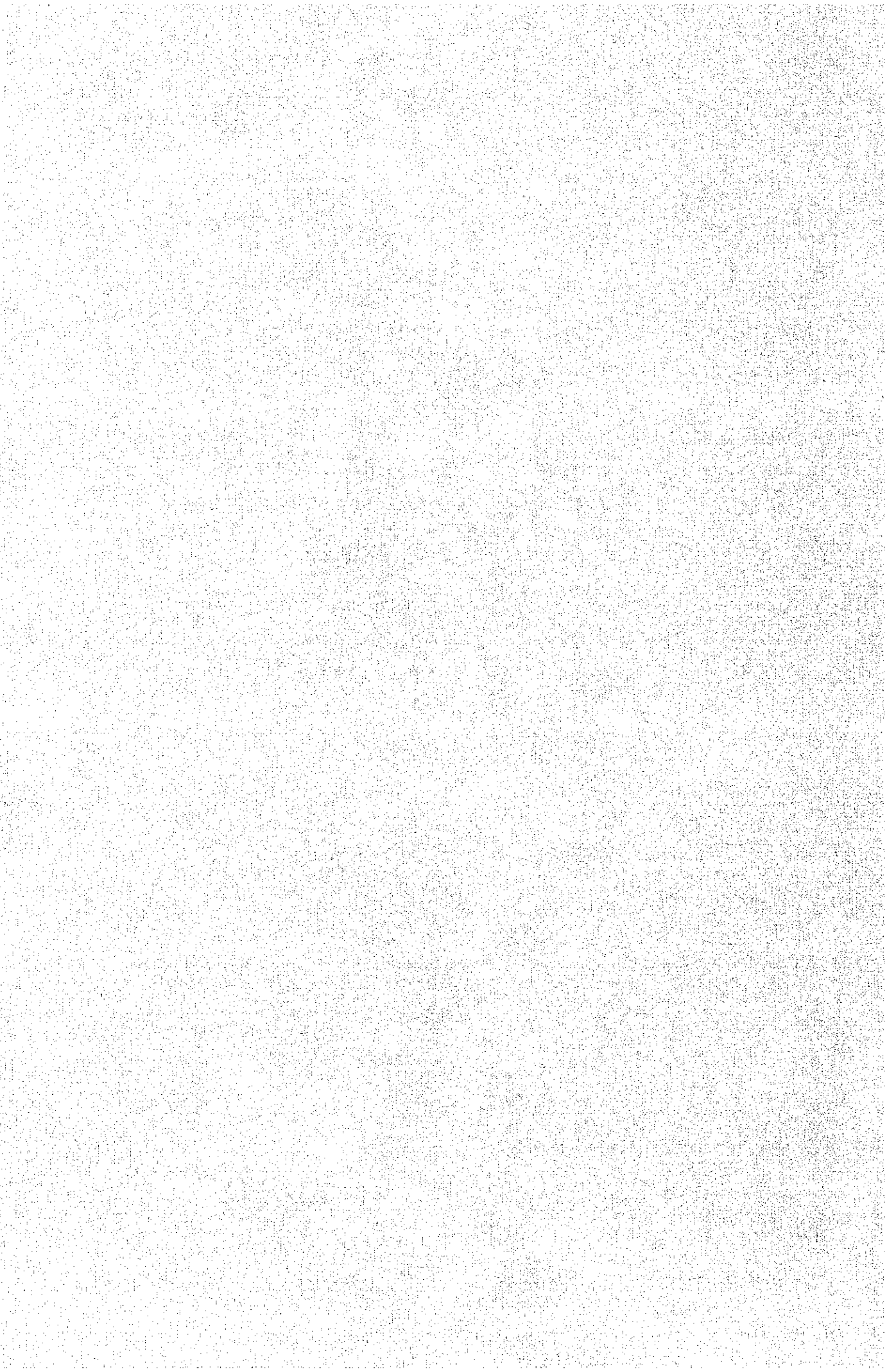
The bedrock consists of gneiss. Because photographic textures and lineations are recognized around the damsite and their structures are large, leakage through the bedrock seems to be great. The bedrock is less suitable for dam foundation from the geological point of view.

TABLE STORAGE VOLUME OF RESERVOIR

NO	MAP	GRID	VER	HØR
I-2-5	2130B1	TM	459	669

EL (M)	ΔH (M)	AREA (M ²)	AVE (M ²)	VOL (M ³)	ΣV (1000M ³)	NOTE
583.0	0.0	0	0	0	0.00	
585.0	2.0	54608	27304	54608	54.61	
587.5	2.5	381396	218002	545005	599.61	
590.0	2.5	733181	557289	1393221	1992.83	





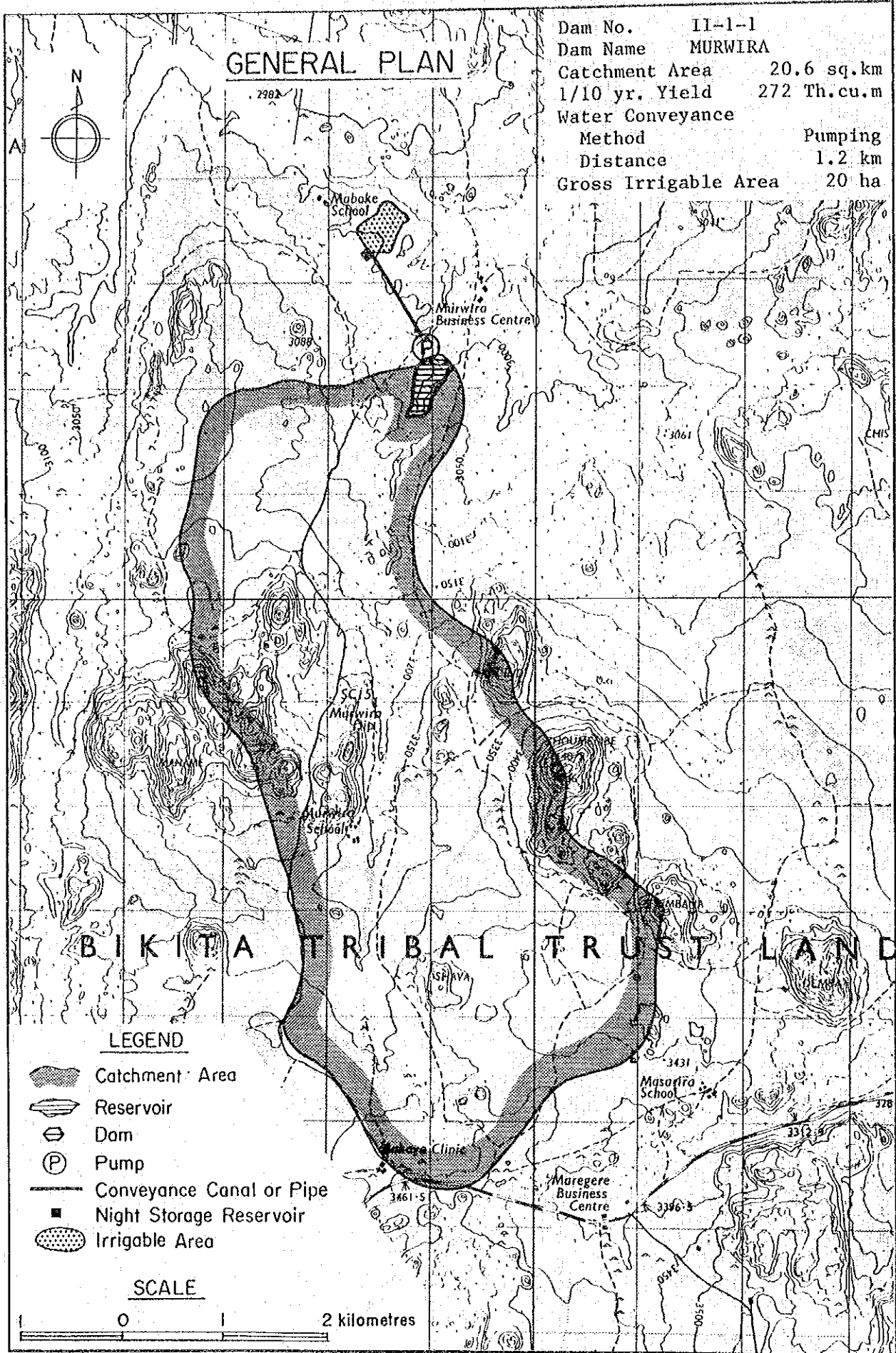
No. II-1-1

Name of Dam Murwira

Location	District Bikita		Communal Land Bikita	
	Map Ref. 1931D3		Coordinates UP591022	
Geology	Granite, surface soil is very thick, highly sheared are there around the damsite.			
Hydrology	River Mutora		Hydrological Zone E-S4	
	Catchment Area 20.6 sq.km		M.A. Rainfall 700 mm	
	M.A. Runoff 66 mm		Sediment 310 tonnes km ² /yr.	
Reservoir	Effective Capacity 0.650 MCM		1/10 Yr. Yield 0.272 MCM	
	Dead Capacity 0.090 MCM		D.W.S. 918 m	
	Total Capacity 0.740 MCM		N.W.S. 925 m	
Dam	Height 17 m		Length 800 m	
	Embankment Volume 145 000 cu.m		Spillway 108 m	
Agriculture	Natural Region IV.		Soil SCL	
	Potential Irrigable Area			50 ha
	Proposed Cropping Pattern A			
Irrigation	Net Irrigable Area 16.0ha		Dist. 1.2 km by Pump, H=2.0 m	
	Topography	Area	Undulated	
		Conveyance	Complicated	
Rural Water Supply	Population 1 418 person		28 cu.m/day	
	Livestock 2 510 unit		113 cu.m/day	
Cost and Benefit	Dam		Irrigation Facilities	Total Cost
	Z\$ 1 884 000		Z\$ 916 000	Z\$ 2 800 000
	Annual Increment Benefit		Net Present Value	Economic Internal Rate of Return
	Z\$ 60 252 /year		Z\$ 1 000	1.8 per cent
Visit	Dam Engineer	Geologist	Irrigation Engineer	Agronomist
	N	N	Y	N
Remarks				

Present Condition on the Ward








Ward Name	19		Area 705 ha	
Demography	Population Density		141.8 persons/sq.km	
	Family Size		5.1 Persons/household	
Agriculture	Arable Area 450 ha		Grazing Area 255 ha	
	Maize 0.5 ha/household		10 bags/ha	
	Sorghum 0.2 ha/household		7 bags/ha	
	Livestock 1.8 LSUs/household		50.2 LSUs/sq.km	
Rural Water Supply	Borehole 0.57 units/sq.km		250 persons/unit	
	Well 1.56 units/sq.km		91 persons/unit	



GENERAL PLAN

Dam No. II-1-1
 Dam Name MURWIRA
 Catchment Area 20.6 sq.km
 1/10 yr. Yield 272 Th.cu.m
 Water Conveyance Method Pumping
 Distance 1.2 km
 Gross Irrigable Area 20 ha

BIKITA TRIBAL TRUST LAND

- LEGEND**
-  Catchment Area
 -  Reservoir
 -  Dam
 -  Pump
 -  Conveyance Canal or Pipe
 -  Night Storage Reservoir
 -  Irrigable Area

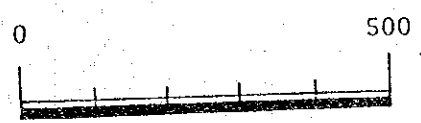
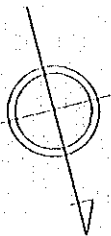
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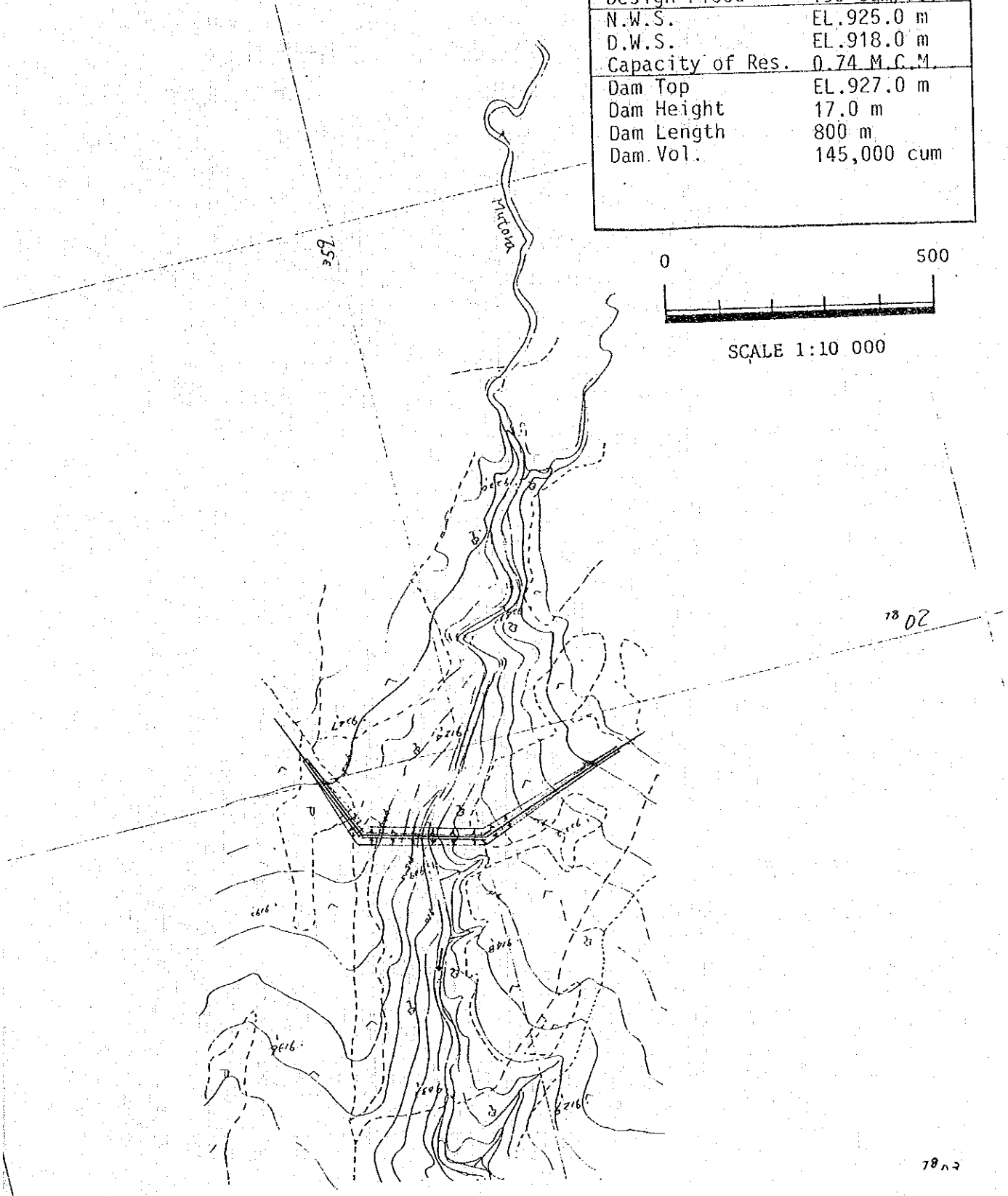
MURHIRA

Dam No.	II- 1 - 1
District	Bikita
Communal L.	Bikita
River	Mutora
Map Ref.	1931 D3
Coordinate	UP 591022
Catchment A.	20.6 sq.km
Design Flood	195 cum/sec
N.W.S.	EL.925.0 m
D.W.S.	EL.918.0 m
Capacity of Res.	0.74 M.C.M
Dam Top	EL.927.0 m
Dam Height	17.0 m
Dam Length	800 m
Dam Vol.	145,000 cum

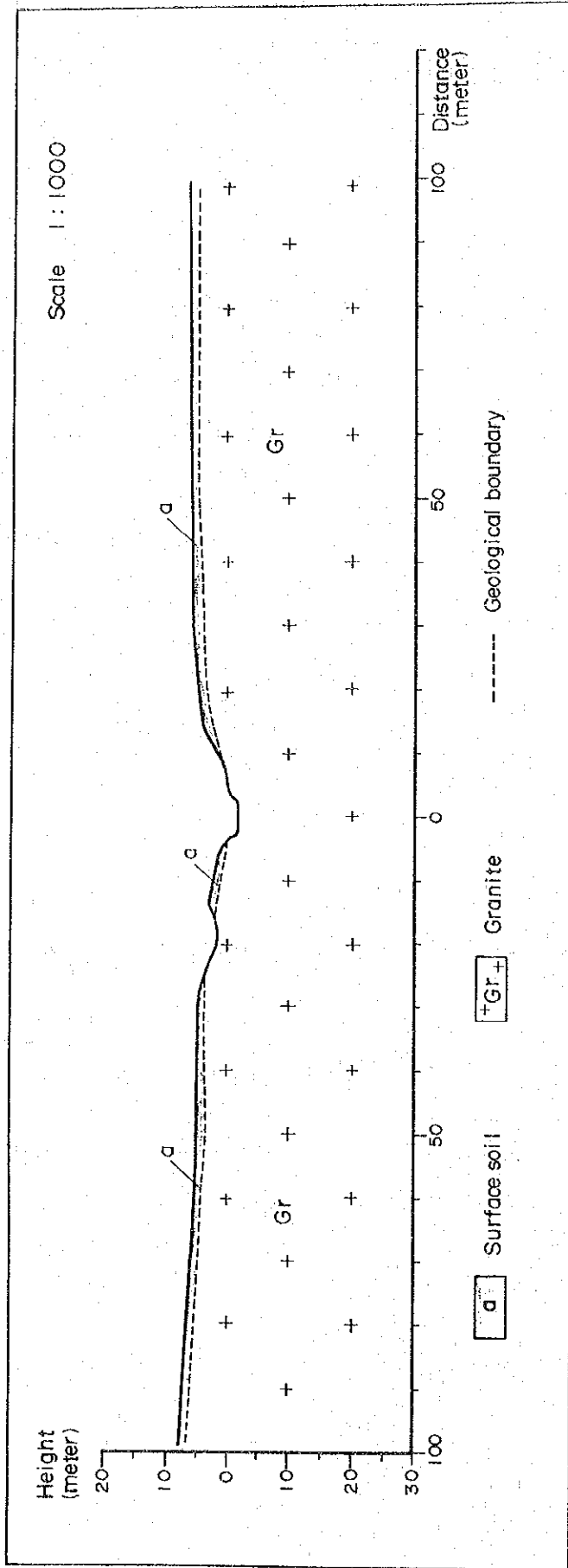
PLAN OF DAM



SCALE 1:10 000



II-1-1 Murwira



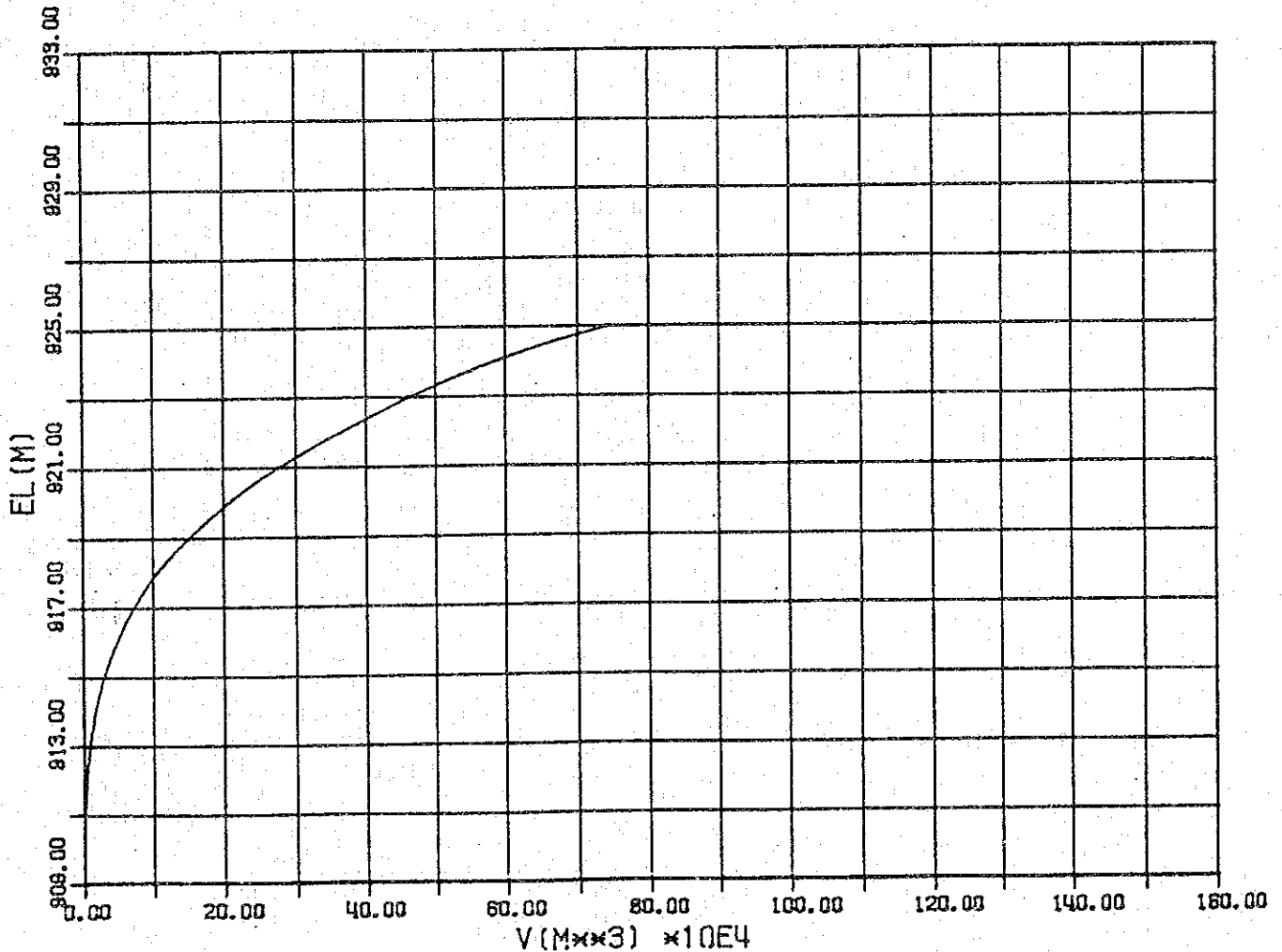
The ground survey was not carried out in this area, therefore the topographical and the geological conditions were studied from existing data.

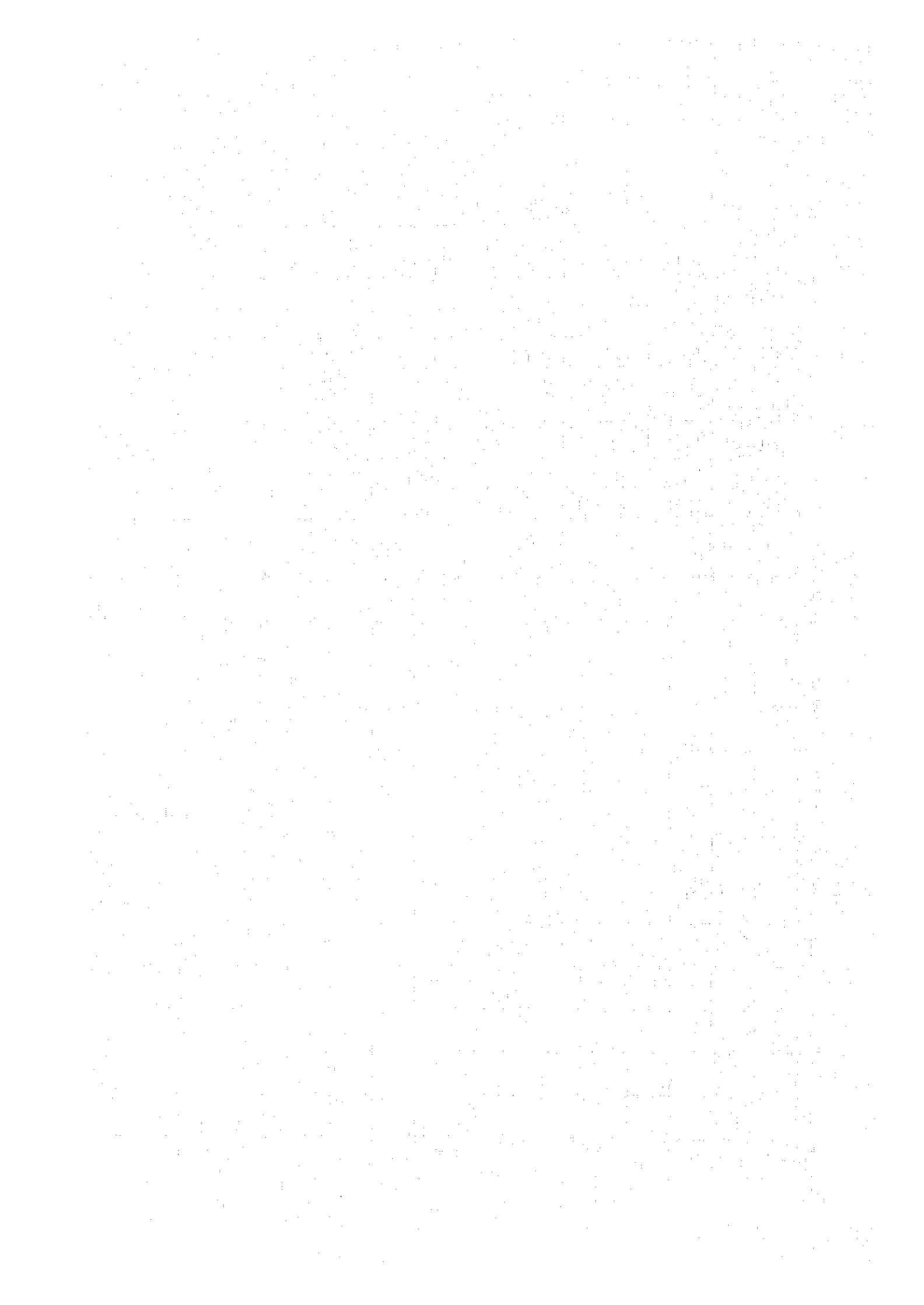
The area is undulated land and slopes gently towards the Mutora River that forms relatively deep and wide valley. The bedrock consists of granite, and the surface soil seems to be thick and outcrops are very few. "Dwalas" and "whale-backs" around the damsite are highly sheared and have been changed into boulders, therefore leakage through the bedrock seems to be large.

TABLE STORAGE VOLUME OF RESERVOIR

NO	MAP	GRID	VER	HOR
II-1-1	193103	UP	591	022

EL (M)	ΔH (M)	AREA (M ²)	AVE (M ²)	VOL (M ³)	ΣV (1000M ³)	NOTE
909.8	0.0	0	0	0	0.00	
910.0	0.2	200	100	20	0.02	
912.5	2.5	4400	2300	5750	5.77	
915.0	2.5	13900	9150	22875	28.64	
917.5	2.5	32800	23350	58375	87.02	
920.0	2.5	62800	47800	119500	206.52	
922.5	2.5	101600	82200	205500	412.02	
925.0	2.5	162400	132000	330000	742.02	





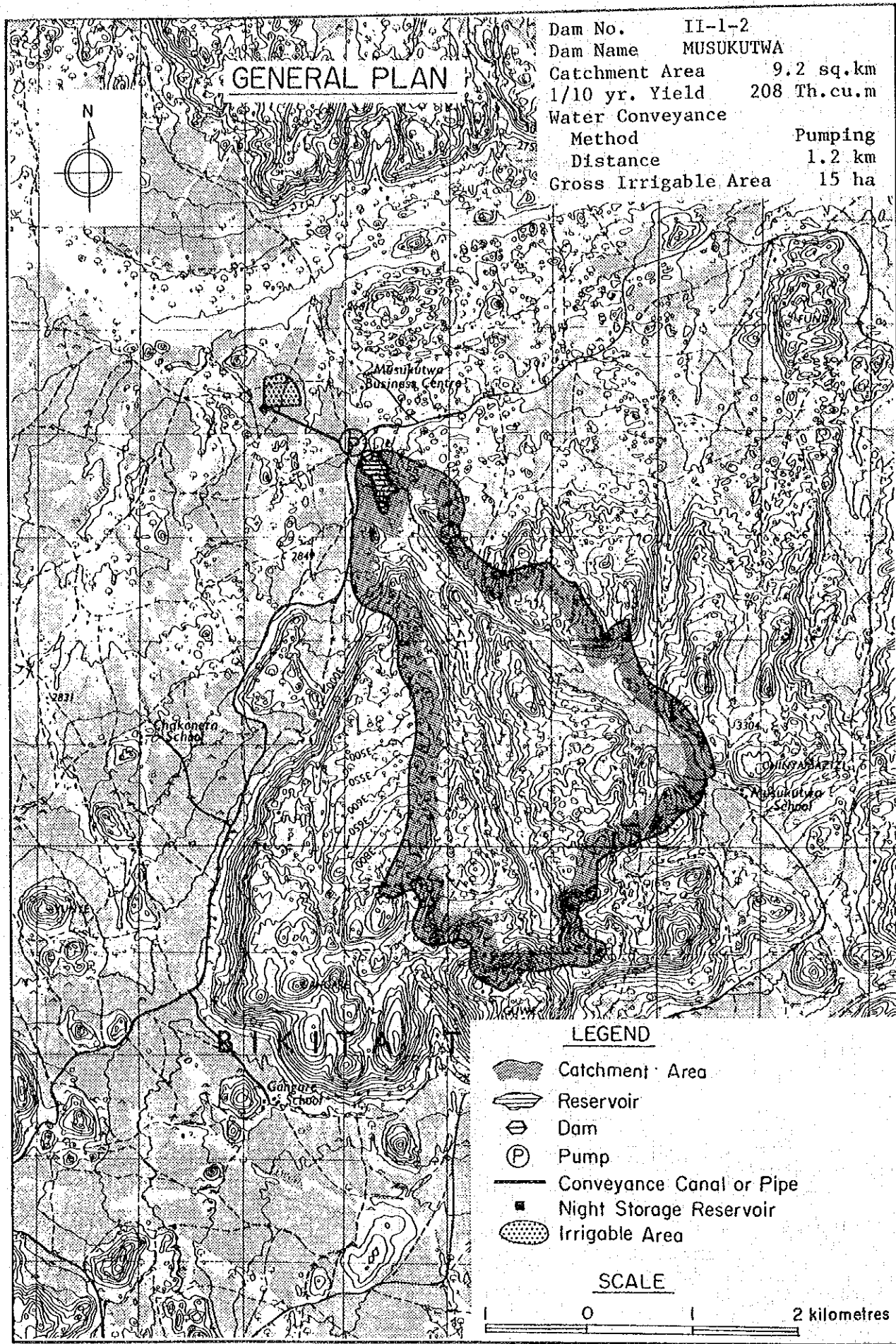
No. II-1-2

Name of Dam Musukutwa

Location	District Bikita		Communal Land Bikita	
	Map Ref. 1931D4		Coordinates UP772038	
Geology	Granite, very flat terrain, outcrops are very few.			
Hydrology	River Mukukuiume		Hydrological Zone E-S4	
	Catchment Area 9.2 sq.km		M.A. Rainfall 800 mm	
	M.A. Runoff 103 mm		Sediment 310 tonnes km ² /yr.	
Reservoir	Effective Capacity 0.510 MCM		1/10 Yr. Yield 0.208 MCM	
	Dead Capacity 0.040 MCM		D.W.S. 838 m	
	Total Capacity 0.550 MCM		N.W.S. 845 m	
Dam	Height 14 m		Length 520 m	
	Embankment Volume 104 000 cu.m		Spillway 62 m	
Agriculture	Natural Region IV		Soil SCL	
	Potential Irrigable Area		40 ha	
	Proposed Cropping Pattern A			
Irrigation	Net Irrigable Area 12.2 ha		Dist. 1.2 km by Pump, H=12.0 m	
	Topography	Area	Undulated and complicated	
		Conveyance	Complicated, one river crossing	
Rural Water Supply	Population 4 023 person		81 cu.m/day	
	Livestock 1 692 unit		76 cu.m/day	
Cost and Benefit	Dam		Irrigation Facilities	
	Z\$ 1 096 000		Z\$ 810 000	
	Annual Increment Benefit		Total Cost	
Z\$55.277 /year		Z\$ 1 906 000		
		Economic Internal Rate of Return		
		2.4 per cent		
Visit	Dam Engineer	Geologist	Irrigation Engineer	Agronomist
	Y	Y	Y	N
Remarks				

Present Condition on the Ward








Ward Name	20		Area 5 146 ha	
Demography	Population Density		134.1 persons/sq.km	
	Family Size		9.9 Persons/household	
Agriculture	Arable Area 4 123 ha		Grazing Area 600 ha	
	Maize 0.1 ha/household		12 bags/ha	
	Sorghum 0. ha/household		10 bags/ha	
	Livestock 6.2 LSUs/household		84.6 LSUs/sq.km	
Rural Water Supply	Borehole 0.12 units/sq.km		1 150 persons/unit	
	Well 0.29 units/sq.km		460 persons/unit	



GENERAL PLAN

Dam No. II-1-2
 Dam Name MUSUKUTWA
 Catchment Area 9.2 sq.km
 1/10 yr. Yield 208 Th.cu.m
 Water Conveyance Method Pumping
 Distance 1.2 km
 Gross Irrigable Area 15 ha



- LEGEND**
-  Catchment Area
 -  Reservoir
 -  Dam
 -  Pump
 -  Conveyance Canal or Pipe
 -  Night Storage Reservoir
 -  Irrigable Area

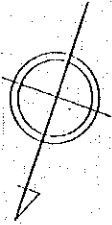
SCALE

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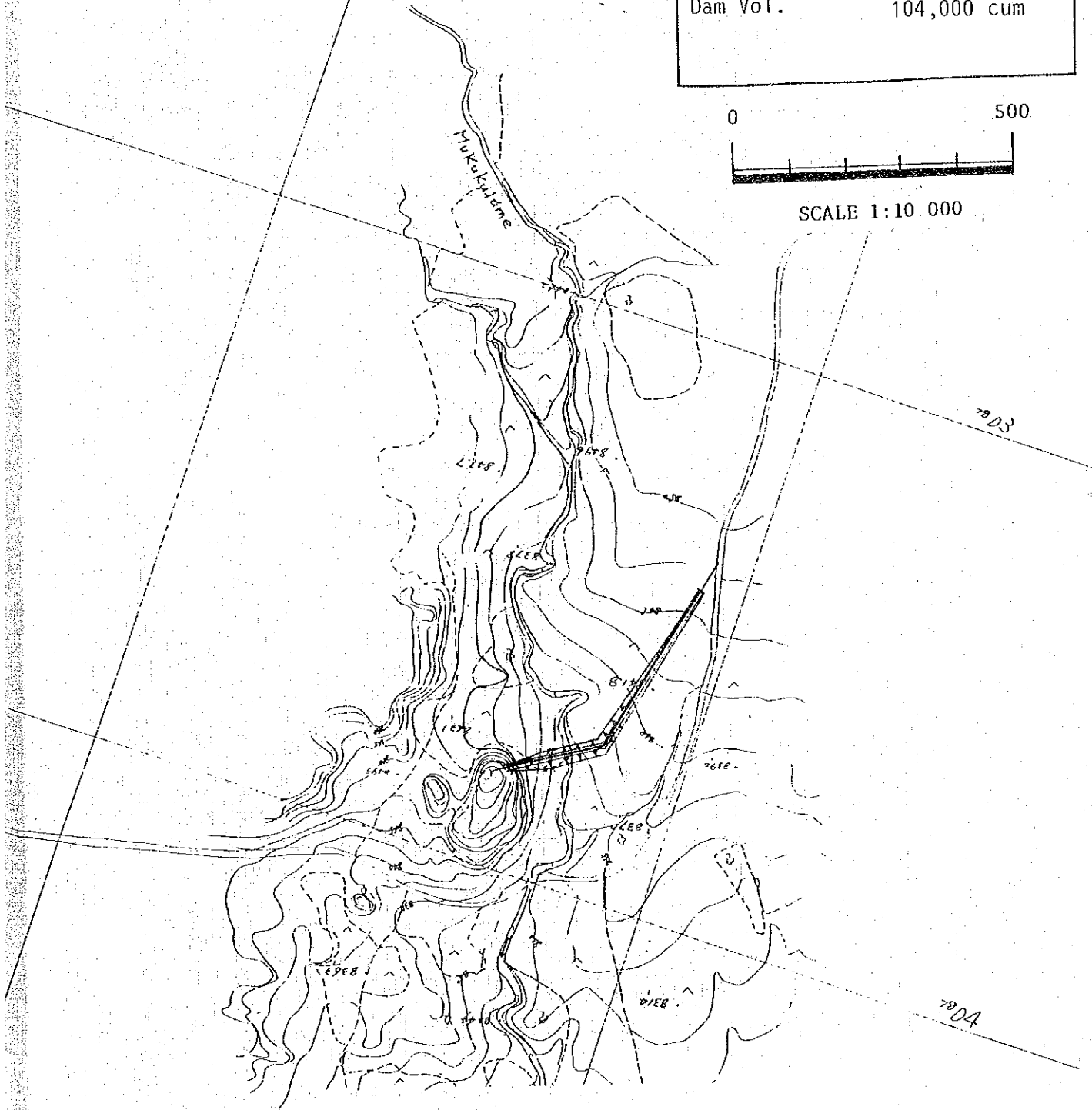
MUSUKUTWA

PLAN OF DAM

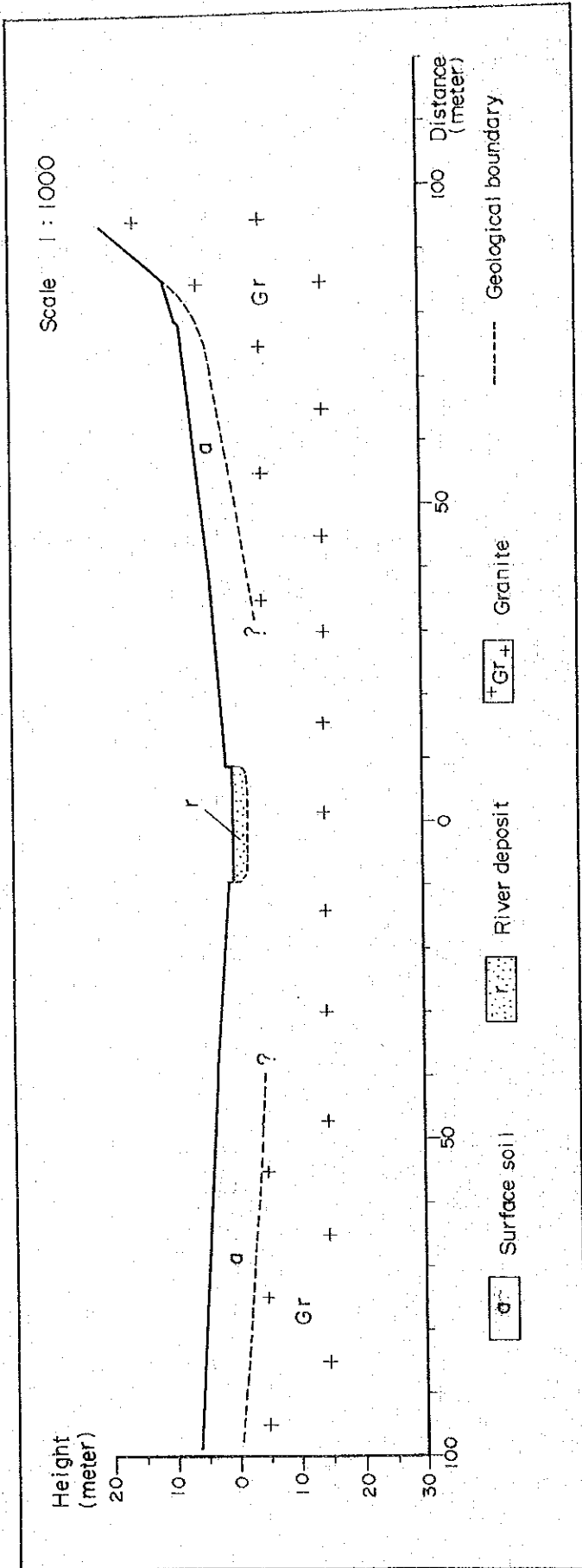
Dam No.	II- 1 - 2
District	Bikita
Communal L.	Bikita
River	Mukukuume
Map Ref.	1931 D4
Coordinate	UP 772038
Catchment A.	9.2 sq.km
Design Flood	112 cum/sec
N.W.S.	EL.845.0 m
D.W.S.	EL.838.0 m
Capacity of Res.	0.55 M.C.M.
Dam Top	EL.847.0 m
Dam Height	14.0 m
Dam Length	520 m
Dam Vol.	104,000 cum



SCALE 1:10 000



II-1-2 Musukutwa

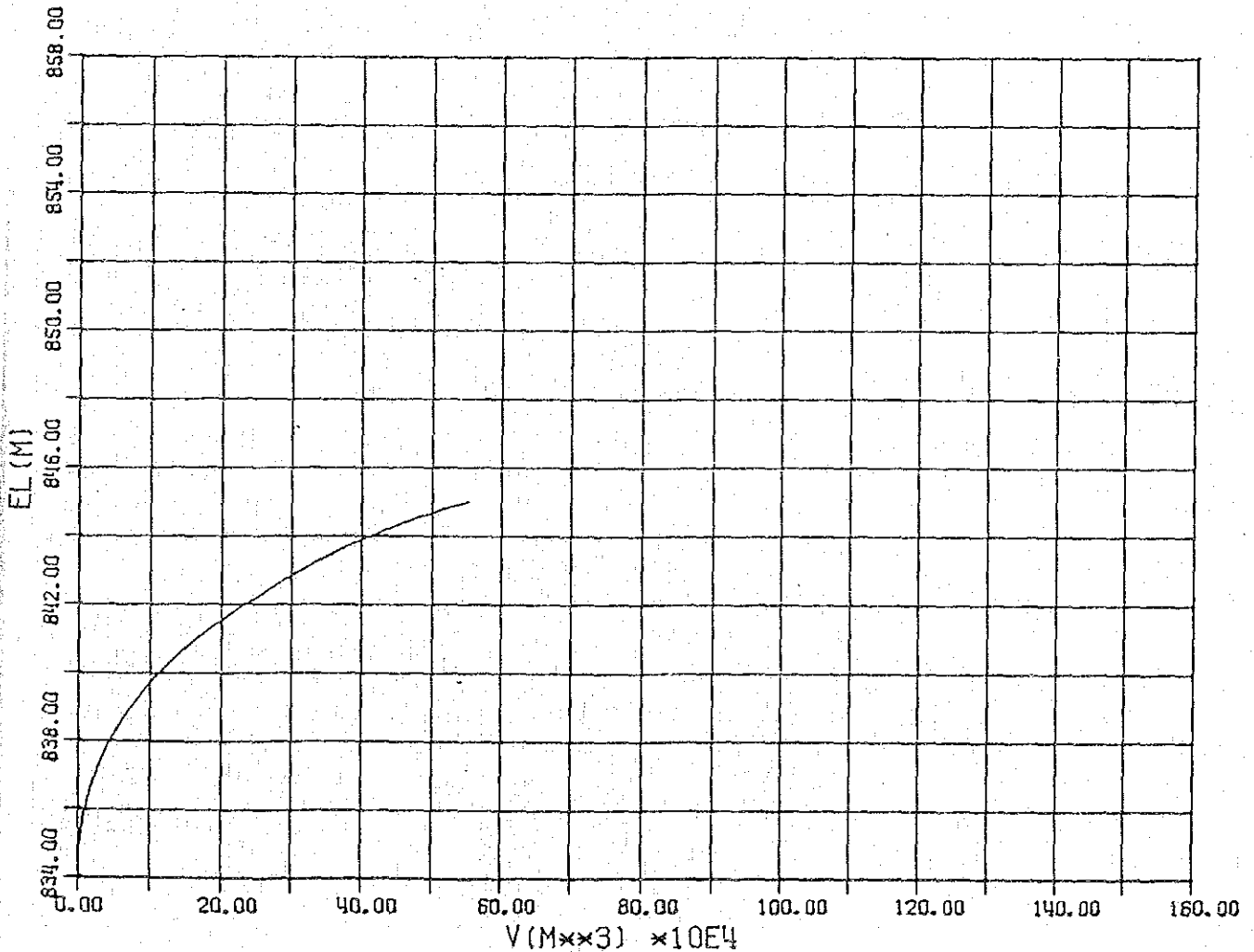


The area is very flat land that small "dwalas" are sporadically exposed. Outcrops are very few in this area, therefore it is very difficult to find a damsite. The bedrock consists of granite, and it is very soft and highly weathered layer is considerably deep. The thickness of unconsolidated deposits seems to be considerably deep.

TABLE STORAGE VOLUME OF RESERVOIR

NO	MAP	GRID	VER	HØR
II-1-2	193104	UP	772	038

EL (M)	ΔH (M)	AREA (M ²)	AVE (M ²)	VØL (M ³)	ΣV (1000M ³)	NOTE
834.0	0.0	0	0	0	0.00	
835.0	1.0	3500	1750	1750	1.75	
837.5	2.5	20300	11900	29750	31.50	
840.0	2.5	43800	32050	80125	111.62	
842.5	2.5	83400	63600	159000	270.62	
845.0	2.5	139700	111550	278875	549.50	










No. II-1-3

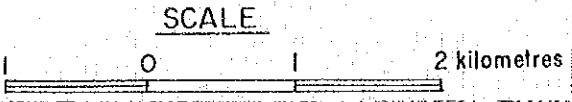
Name of Dam Mutsinzwa

Location	District Bikita		Communal Land Bikita		
	Map Ref. 1931D4		Coordinates UN872960		
Geology	Granite and the dyke of dolerite. have been changed into boulders.		The dyke and surrounding granite		
Hydrology	River Mushamba		Hydrological Zone E-S4		
	Catchment Area 23.2 sq.km		M.A. Rainfall 750 mm		
	M.A. Runoff 83 mm		Sediment 310 tonnes km ² /yr.		
Reservoir	Effective Capacity 0.660 MCM		1/10 Yr. Yield 0.347 MCM		
	Dead Capacity 0.110 MCM		D.W.S. 768 m		
	Total Capacity 0.770 MCM		N.W.S. 775 m		
Dam	Height 16 m		Length 600 m		
	Embankment Volume 120 000 cu.m		Spillway 115 m		
Agriculture	Natural Region IV		Soil SL		
	Potential Irrigable Area		50 ha		
	Proposed Cropping Pattern		B		
Irrigation	Net Irrigable Area 20.4ha		Dist. 0.5 km by Pump, H=7.0 m.		
	Topography	Area	Undulated		
		Conveyance	Slightly sloping, one river crossing		
Rural Water Supply	Population 1 651 person		33 cu.m/day		
	Livestock 1 252 unit		56 cu.m/day		
Cost and Benefit	Dam		Irrigation Facilities	Total Cost	Class
	Z\$ 1 971 000		Z\$ 766 000	Z\$ 2 737 000	B
	Annual Increment Benefit		Net Present Value	Economic Internal Rate of Return	
	Z\$ 41 094 /year		Z\$ 478 000	0.2 per cent	
Visit	Dam Engineer	Geologist	Irrigation Engineer	Agronomist	Economist
	Y	Y	Y	Y	Y
Remarks					

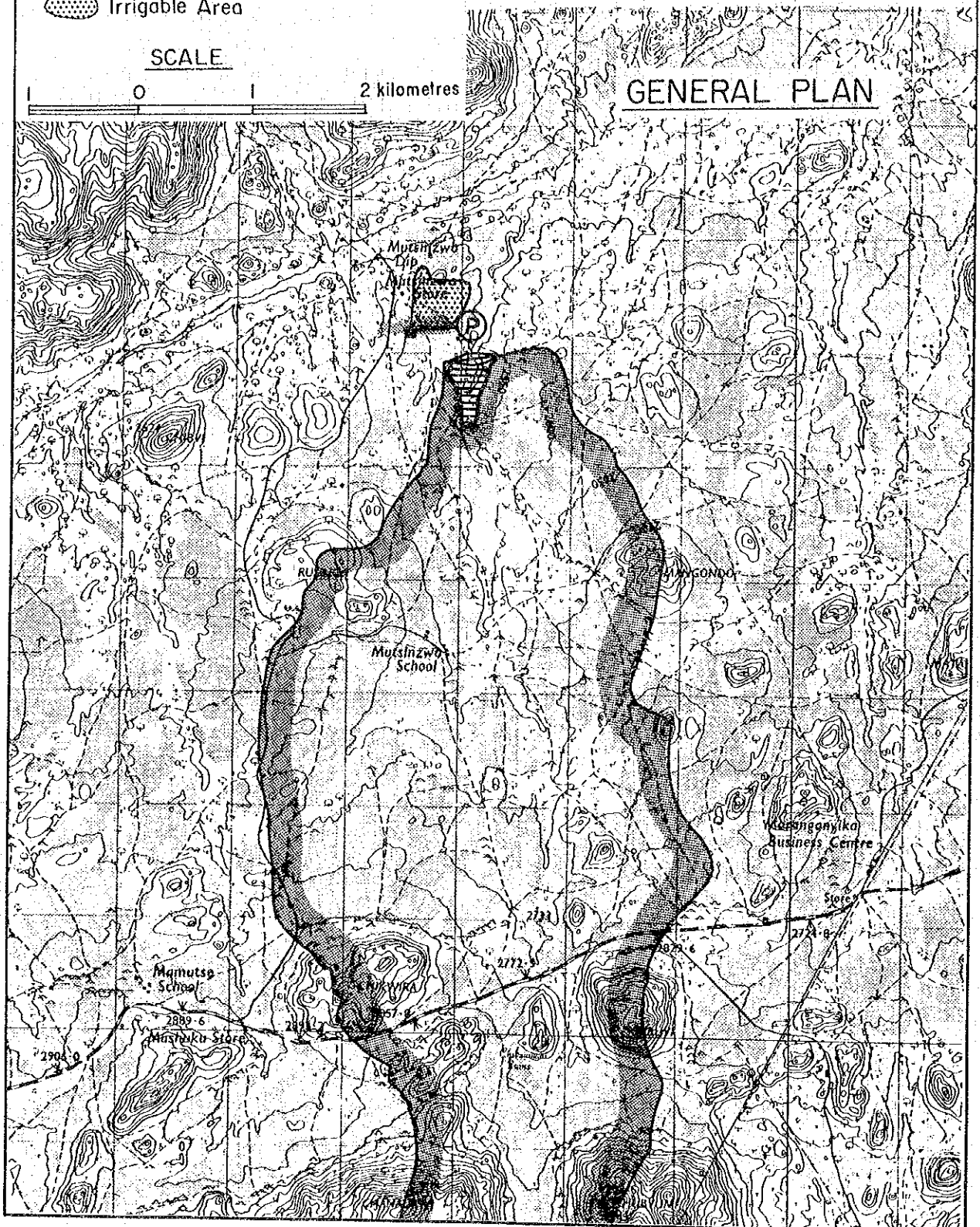
Present Condition on the Ward

Ward Name	18		Area 3 675 ha	
Demography	Population Density		165.4 persons/sq.km	
	Family Size		8.8 Persons/household	
Agriculture	Arable Area 3 122 ha		Grazing Area 400 ha	
	Maize 0.2 ha/household		18 bags/ha	
	Sorghum 0. ha/household		10 bags/ha	
	Livestock 3.3 LSUs/household		62.6 LSUs/sq.km	
Rural Water Supply	Borehole 0.19 units/sq.km		869 persons/unit	
	Well 1.09 units/sq.km		152 persons/unit	

LEGEND		Dam No.	II-1-3
	Catchment Area	Dam Name	MUTSINZWA
	Reservoir	Catchment Area	23.2 sq.km
	Dam	1/10 yr. Yield	347 Th.cu.m
	Pump	Water Conveyance	
	Conveyance Canal or Pipe	Method	Pumping
	Night Storage Reservoir	Distance	0.5 km
	Irrigable Area	Gross Irrigable Area	25 ha



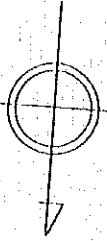
GENERAL PLAN



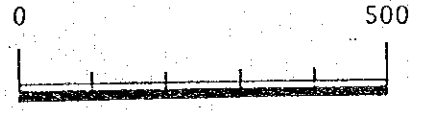
PLAN OF DAM

MUTSINZWA

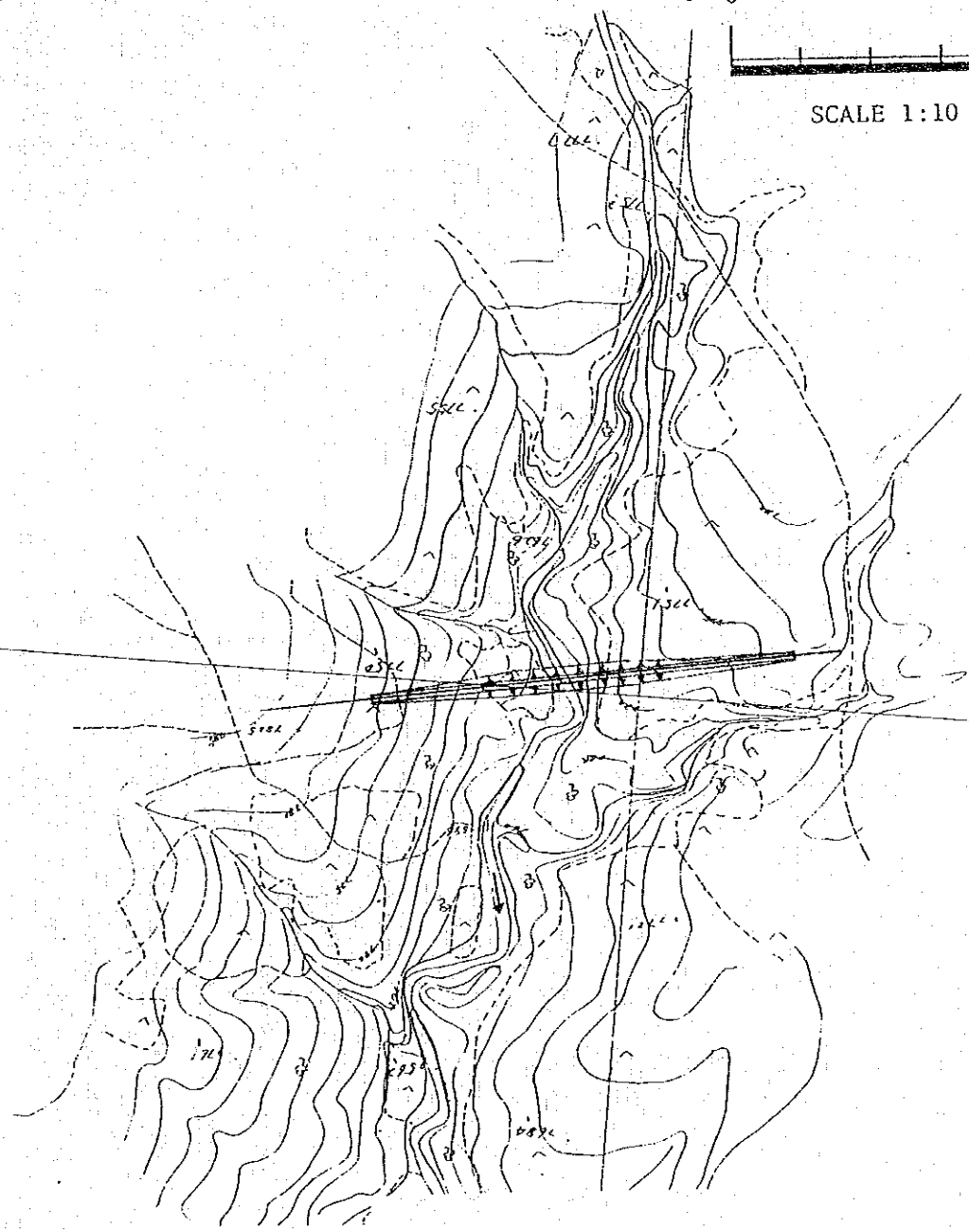
Dam No.	II- 1 - 3
District	Bikita
Communal L.	Bikita
River	Mushamba
Map Ref.	1931 D4
Coordinate	UN 872960
Catchment A.	23.2 sq.km
Design Flood	207 cum/sec.
N.W.S.	EL.775.0 m
D.W.S.	EL.768.0 m
Capacity of Res.	0.77 M.C.M.
Dam Top	EL.777.0 m
Dam Height	16.0 m
Dam Length	600 m
Dam Vol.	120,000 cum



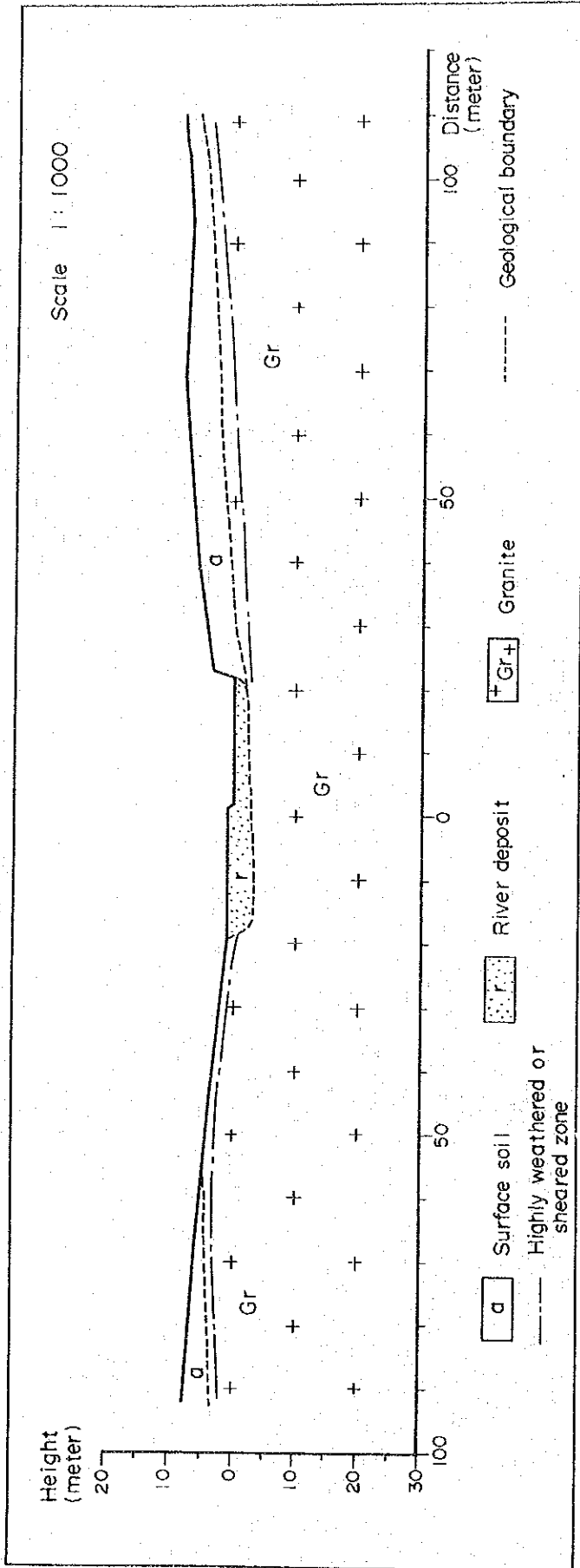
328



SCALE 1:10 000



II - 1 - 3 Mutsinzwa



The Mushamba River forms relatively wide flood plane and meanders shortly.

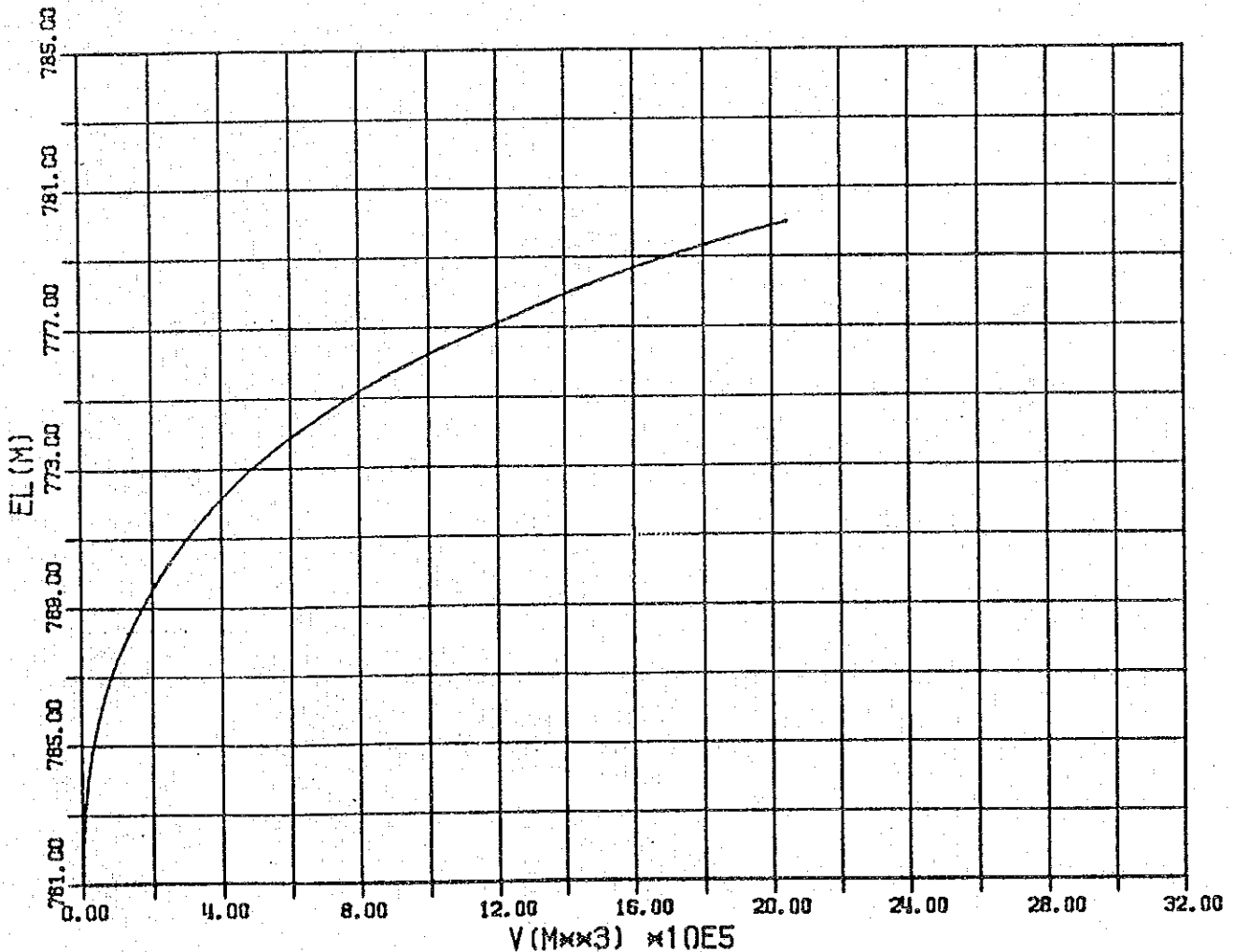
The bedrock consists of granite and dolerite dykes. The former is mostly massive and hard. However surrounding rocks of the dykes have been changed into boulders and quartz rich soils by highly weathering or shearing. The latter are 20 to 5 meters wide and trend N70°E direction. Leakage through the bedrock seems to be large, therefore foundation treatment against leakage seems to be necessary.

The thickness of unconsolidated deposits is maximum 4 meters in the riverbed and maximum 3 meters at the both banks of the damsite.

TABLE STORAGE VOLUME OF RESERVOIR

NO	MAP	GRID	VER	HOR
II-1-3	1931D4	UN	872	960

EL (M)	ΔH (M)	AREA (M ²)	AVE (M ²)	VOL (M ³)	ΣV (1000M ³)	NOTE
761.0	0.0	0	0	0	0.00	
762.5	1.5	5400	2700	4050	4.05	
765.0	2.5	18100	11750	29375	33.42	
767.5	2.5	37000	27550	68875	102.30	
770.0	2.5	63000	50000	125000	227.30	
772.5	2.5	102000	82500	206250	433.55	
775.0	2.5	165000	133500	333750	767.30	
777.5	2.5	250000	207500	518750	1286.05	
780.0	2.5	356000	303000	757500	2043.55	



No. II-1-4








Name of Dam Maranganyika

Location	District Bikita		Communal Land Bikita		
	Map Ref. 1931D4		Coordinates UN907926		
Geology	Granite, mostly massive and hard, however several faults are there, and soft, and foliated surrounding them.				
Hydrology	River Nyamakondo		Hydrological Zone E-S4		
	Catchment Area 15.9 sq.km		M.A. Rainfall 700 mm		
	M.A. Runoff 69 mm		Sediment 310 tonnes km ² /yr.		
Reservoir	Effective Capacity 0.520 MCM		1/10 Yr. Yield 0.208 MCM		
	Dead Capacity 0.070 MCM		D.W.S. 801 m		
	Total Capacity 0.059 MCM		N.W.S. 808 m		
Dam	Height 17 m		Length 310 m		
	Embankment Volume 81 000 cu.m		Spillway 91 m		
Agriculture	Natural Region IV		Soil SL		
	Potential Irrigable Area			40 ha	
	Proposed Cropping Pattern B				
Irrigation	Net Irrigable Area 12.2 ha		Dist. 3.0 km by Pump, H=22.0 m		
	Topography	Area Very complicated			
		Conveyance Complicated, one river crossing			
Rural Water Supply	Population 4 023 person		81 cu.m/day		
	Livestock 1 692 unit		76 cu.m/day		
Cost and Benefit	Dam		Irrigation Facilities	Total Cost	Class
	Z\$ 937 000		Z\$ 1 349 000	Z\$ 2 286 000	
	Annual Increment Benefit		Net Present Value	Economic Internal Rate of Return	C
	Z\$ 25 063 /year		Z\$ 291 000	-	
Visit	Dam Engineer	Geologist	Irrigation Engineer	Agronomist	Economist
	Y	Y	Y	Y	Y
Remarks					

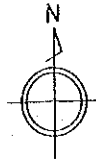
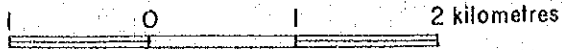
Present Condition on the Ward

Ward Name	20		Area 5 146 ha	
Demography	Population Density		134.1 persons/sq.km	
	Family Size		9.9 Persons/household	
Agriculture	Arable Area 4 123 ha		Grazing Area 600 ha	
	Maize 0.1 ha/household		12 bags/ha	
	Sorghum 0 ha/household		10 bags/ha	
	Livestock 6.2 LSUs/household		84.6 LSUs/sq.km	
Rural Water Supply	Borehole 0.12 units/sq.km		1 150. persons/unit	
	Well 0.29 units/sq.km		460 persons/unit	

LEGEND

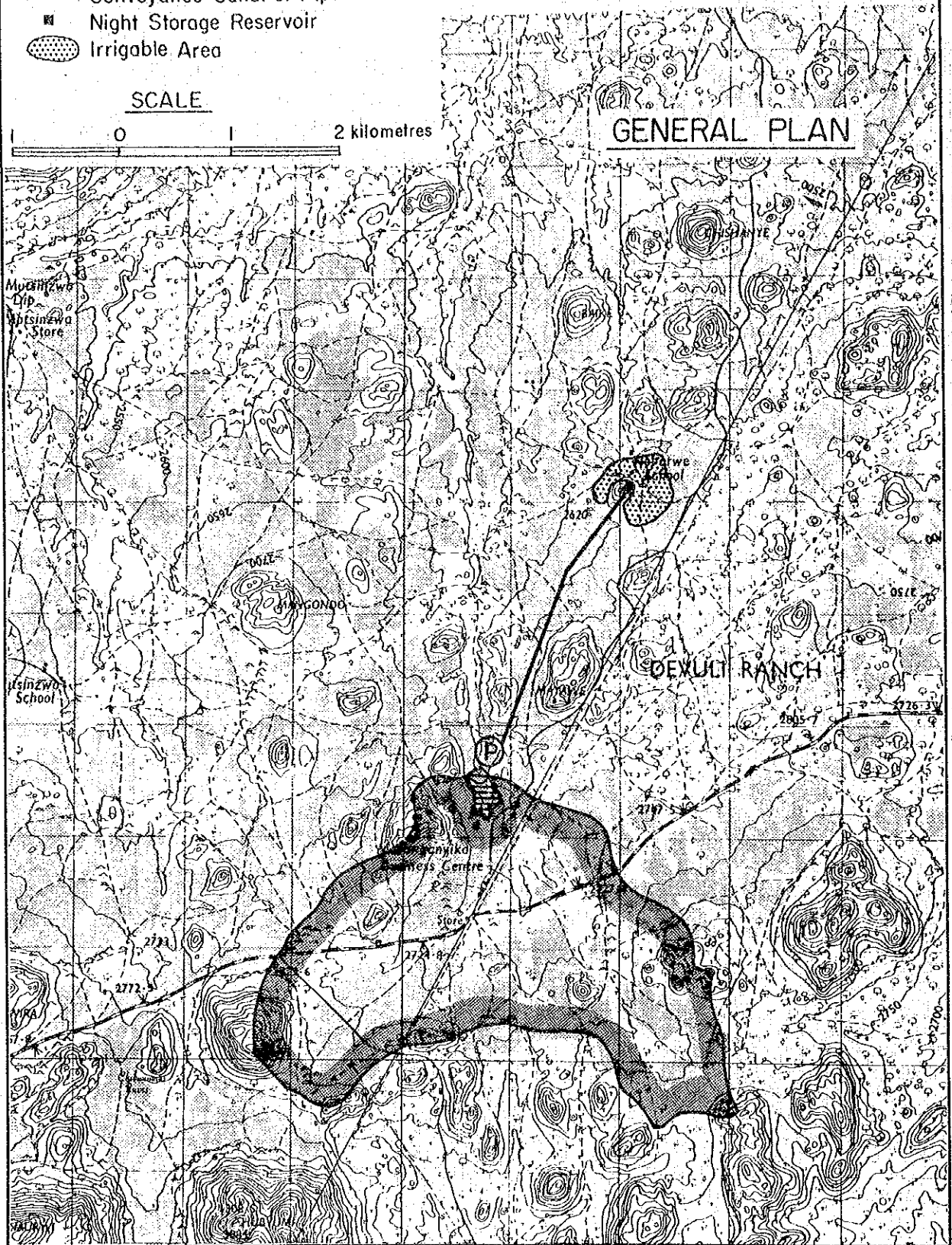
-  Catchment Area
-  Reservoir
-  Dam
-  Pump
-  Conveyance Canal or Pipe
-  Night Storage Reservoir
-  Irrigable Area

SCALE



Dam No. II-1-4
 Dam Name MARANGANYIKA
 Catchment Area 15.9 sq.km
 1/10 yr. Yield 208 Th.cu.m
 Water Conveyance Method Pumping
 Distance 3.0 km
 Gross Irrigable Area 15 ha

GENERAL PLAN



PLAN OF DAM

MARANGANYIKA

Dam No.	II- 1 - 4
District	Bikita
Communal L.	Bikita
River	Nyamakondo
Map Ref.	1931 D4
Coordinate	UN 907926
Catchment A.	15.9 sq.km
Design Flood	163 cum/sec
N.W.S.	EL.808.0 m
D.W.S.	EL.801.0 m
Capacity of Res.	0.59 M.C.M.
Dam Top	EL.810.0 m
Dam Height	17.0 m
Dam Length	310 m
Dam Vol.	81,000 cum

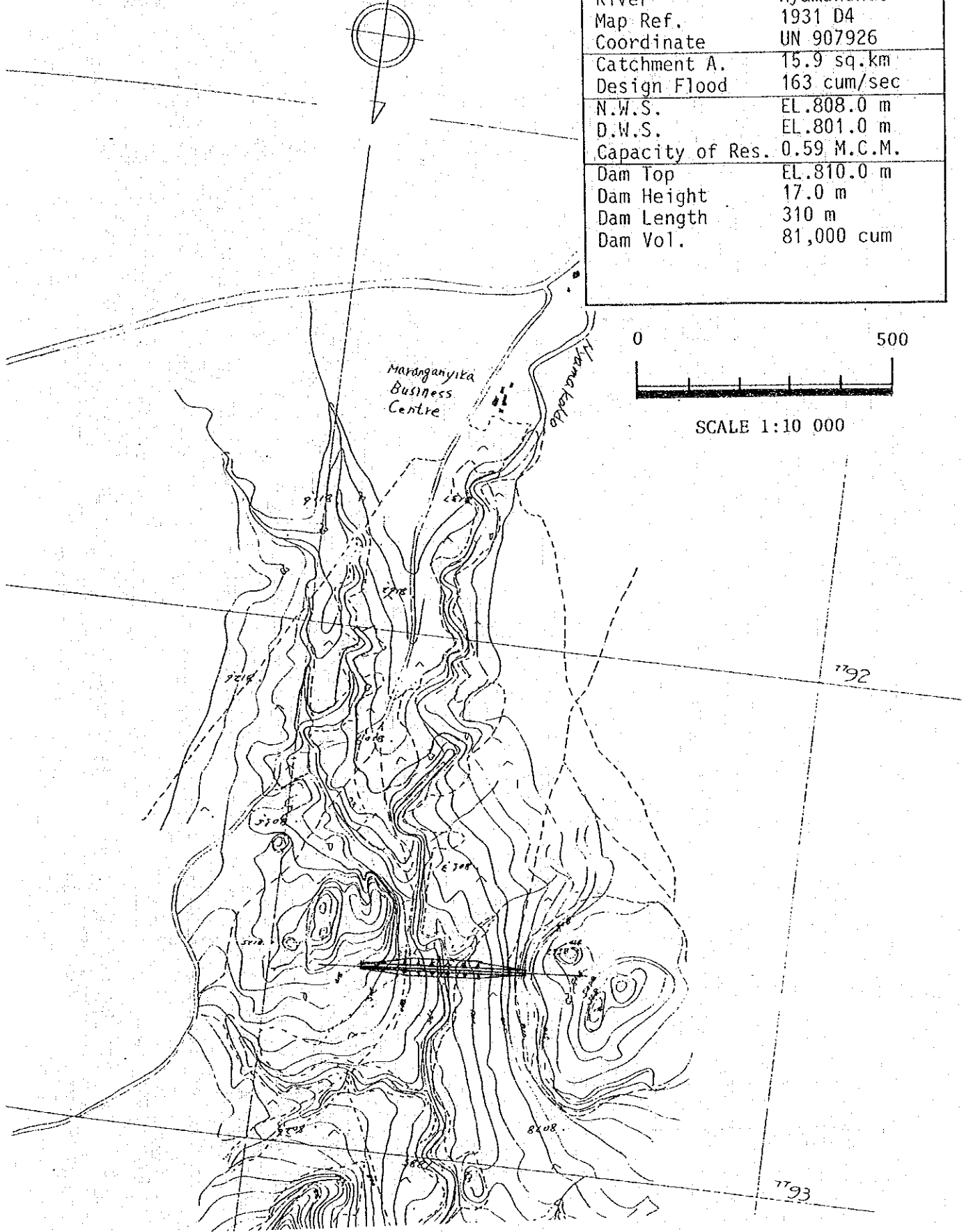
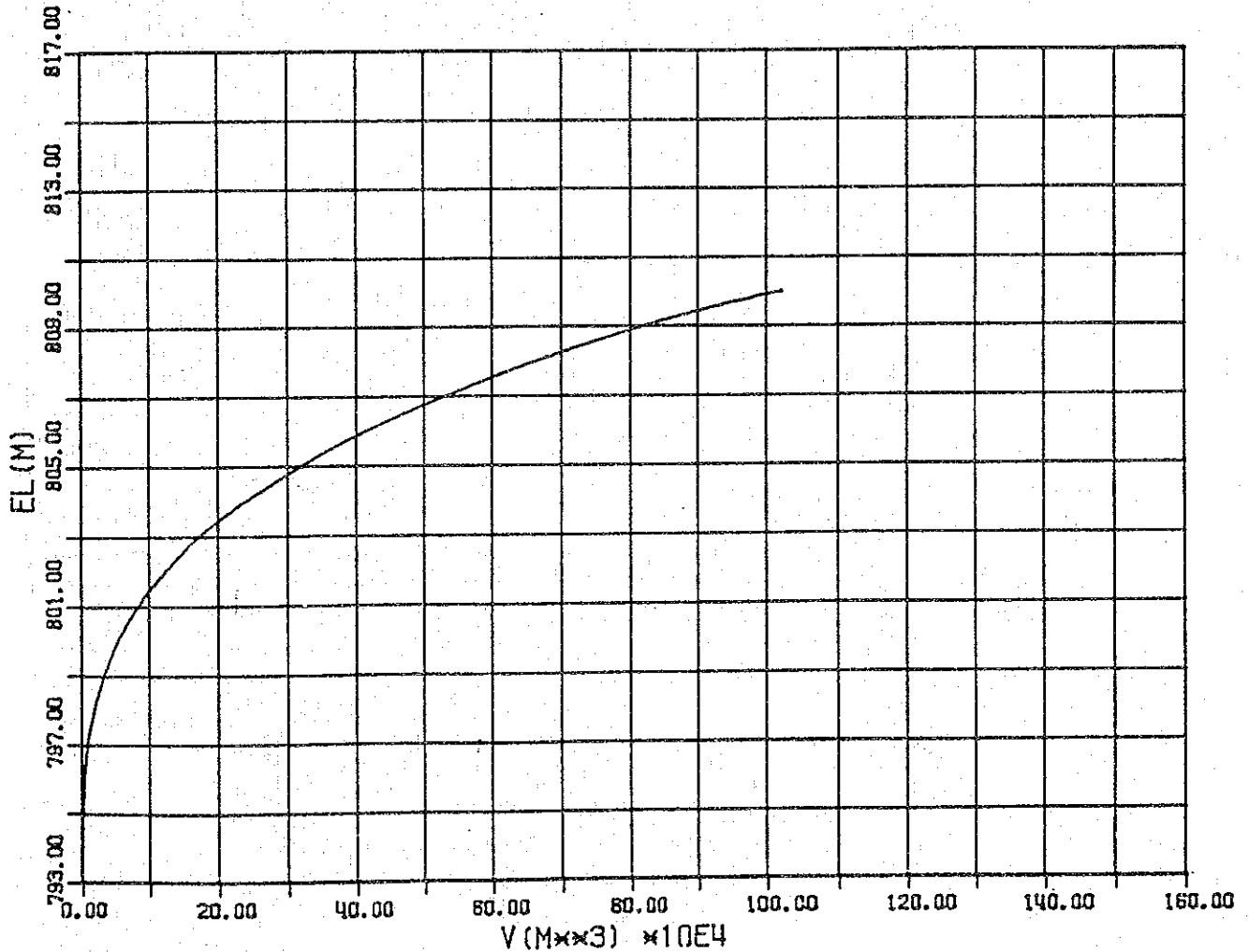


TABLE STORAGE VOLUME OF RESERVOIR

NO	MAP	GRID	VER	HØR
II-1-4	193104	UN	907	926

EL (M)	ΔH (M)	AREA (M ²)	AVE (M ²)	VOL (M ³)	ΣV (1000M ³)	NOTE
793.2	0.0	0	0	0	0.00	
795.0	1.8	1300	650	1170	1.17	
797.5	2.5	7600	4450	11125	12.30	
800.0	2.5	24800	16200	40500	52.80	
802.5	2.5	49100	36950	92375	145.17	
805.0	2.5	88800	68950	172375	317.54	
807.5	2.5	131700	110250	275625	593.17	
810.0	2.5	210400	171050	427625	1020.79	



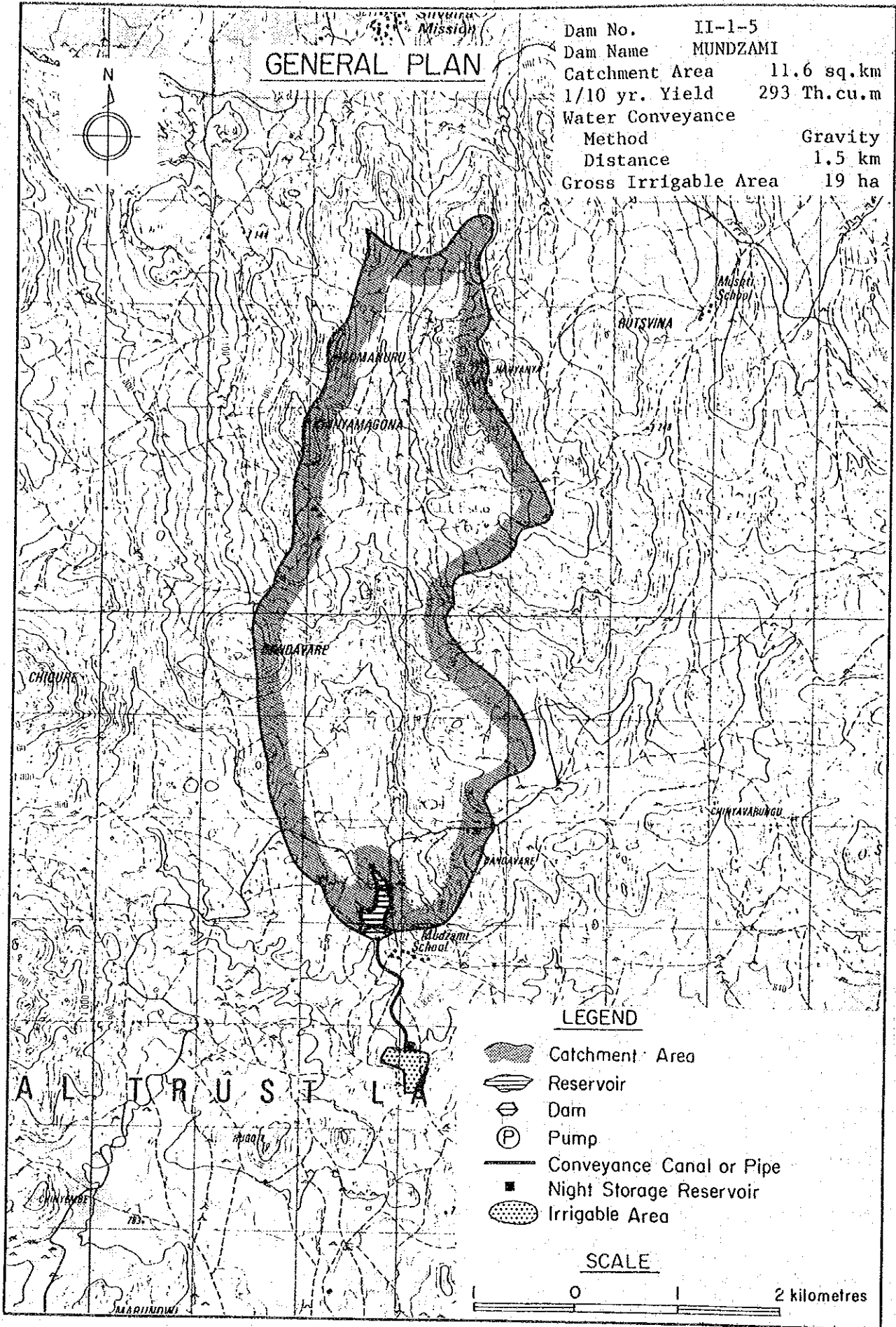
No. II-1-5

Name of Dam Mundzami

Location	District Bikita		Communal Land Bikita		
	Map Ref. 2031B1		Coordinates UN628769		
Geology	Granite, many photo-lineations are recognized around the damsite, well jointed, and leakage is great.				
Hydrology	River (T) Mujiche		Hydrological Zone E-S3		
	Catchment Area 11.6 sq.km		M.A. Rainfall 980 mm		
	M.A. Runoff 194 mm		Sediment 310 tonnes km ² /yr.		
Reservoir	Effective Capacity 0.380 MCM		1/10 Yr. Yield 0.294 MCM		
	Dead Capacity 0.050 MCM		D.W.S. 809 m		
	Total Capacity 0.430 MCM		N.W.S. 818 m		
Dam	Height 18 m		Length 300 m		
	Embankment Volume 93 000 cu.m		Spillway 75 m		
Agriculture	Natural Region III		Soil SL		
	Potential Irrigable Area		20 ha		
	Proposed Cropping Pattern B				
Irrigation	Net Irrigable Area 15.4 ha		Dist. 1.5 km by Gravity		
	Topography	Area		Complicated	
		Conveyance		Complicated	
Rural Water Supply	Population 811 person		16 cu.m/day		
	Livestock 5 405 unit		243 cu.m/day		
Cost and Benefit	Dam	Irrigation Facilities	Total Cost	Class	
	Z\$ 1 675 000	Z\$ 404 000	Z\$ 2 079 000	B	
	Annual Increment Benefit	Net Present Value	Economic Internal Rate of Return		
Z\$ 33 809/year	Z\$ 393 000	0.9 per cent			
Visit	Dam Engineer	Geologist	Irrigation Engineer	Agronomist	Economist
	N	N	Y	N	N
Remarks	Water right ----- 0.3 km (No.13192)				

Present Condition on the Ward

Ward Name	14		Area 3 700 ha	
Demography	Population Density		81.1 persons/sq.km	
	Family Size		5.0 Persons/household	
Agriculture	Arable Area 2 100 ha		Grazing Area 1 600 ha	
	Maize	3.0 ha/household	18	bags/ha
	Sorghum	0.7 ha/household	20	bags/ha
	Livestock	6.7 LSUs/household	108.1	LSUs/sq.km
Rural Water Supply	Borehole	0.11 units/sq.km	750	persons/unit
	Well	0.22 units/sq.km	375	persons/unit

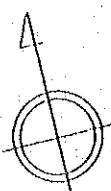


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PLAN OF DAM

MUNDZAMI

Dam No.	II- 1 - 5
District	Bikita
Communal L.	Bikita
River	(T)Mujiche
Map Ref.	2031 B1
Coordinate	UN 628769
Catchment A.	11.6 sq.km
Design Flood	135 cum/sec
N.W.S.	EL.818.0 m
D.W.S.	EL.809.0 m
Capacity of Res.	0.43 M.C.M.
Dam Top	EL.820.0 m
Dam Height	18.0 m
Dam Length	300 m
Dam Vol.	93,000 cum



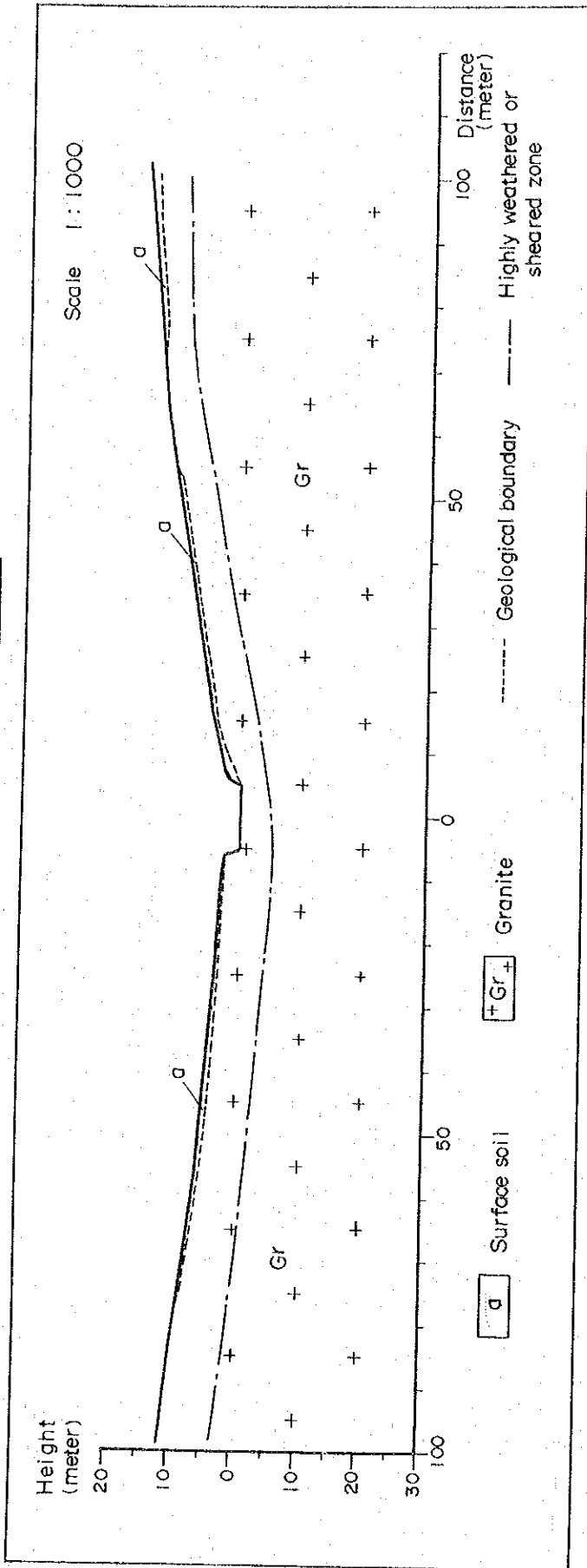
SCALE 1:10 000



7719
364

362

II-1-5 Mundzami

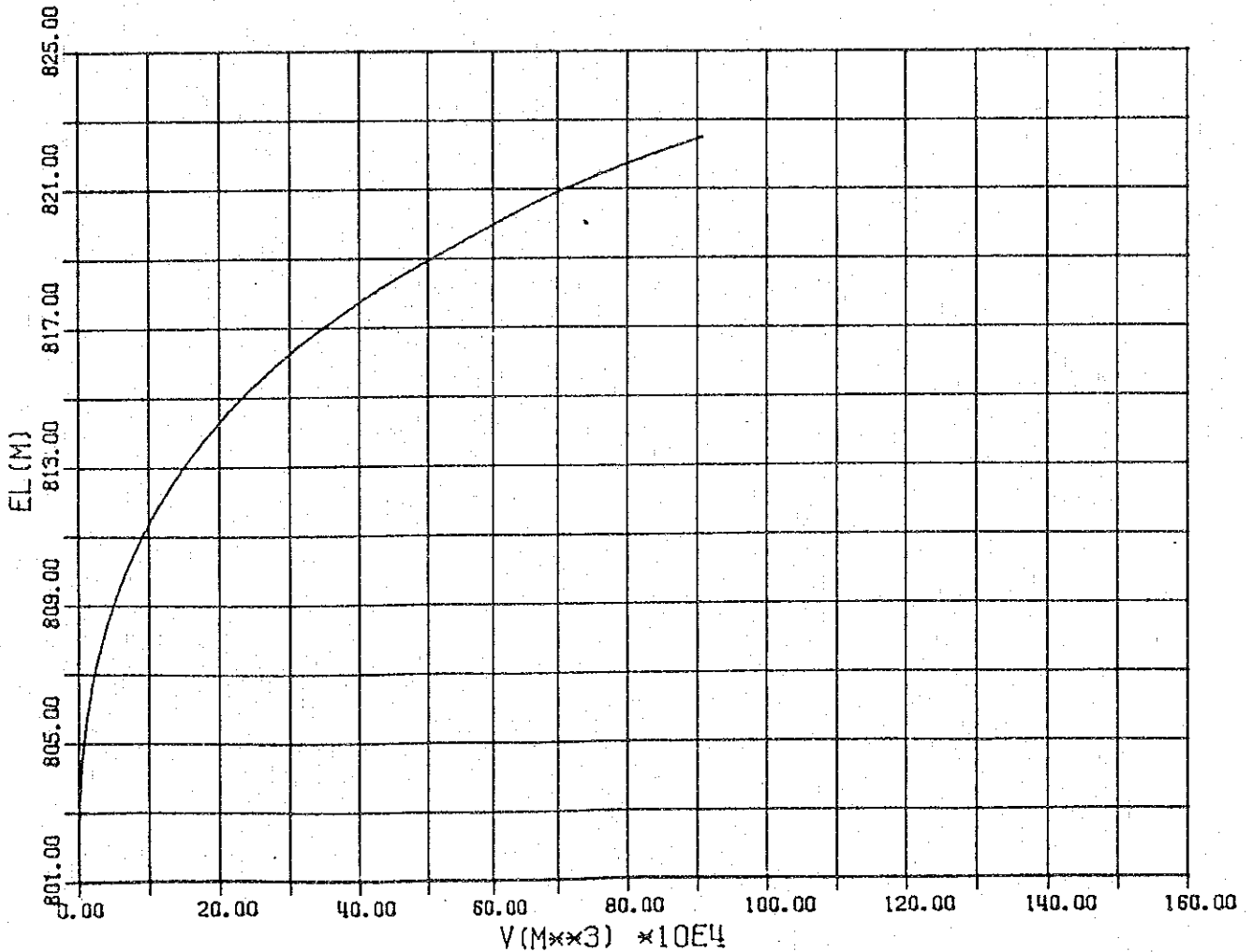


The ground survey was not carried out in this area, therefore the topographical and the geological conditions were studied from existing data. The area is hilly land and the Mujiche River forms shallow and narrow valley. The bedrock consists of granite. Because many photographic textures and lineations are recognized, it seems that the bedrock is well jointed and the leakage is great.

TABLE STORAGE VOLUME OF RESERVOIR

NO	MAP	GRID	VER	HOR
II-1-5	2031B1	UN	628	769

EL (M)	ΔH (M)	AREA (M ²)	AVE (M ²)	VOL (M ³)	ΣV (1000M ³)	NOTE
801.5	0.0	0	0	0	0.00	
802.5	1.0	900	450	450	0.45	
805.0	2.5	5200	3050	7625	8.07	
807.5	2.5	11300	8250	20625	28.70	
810.0	2.5	20700	16000	40000	68.70	
812.5	2.5	30800	25750	64375	133.07	
815.0	2.5	48200	39500	98750	231.82	
817.5	2.5	72200	60200	150500	382.32	
820.0	2.5	103500	87850	219625	601.95	
822.5	2.5	141200	122350	305875	907.82	



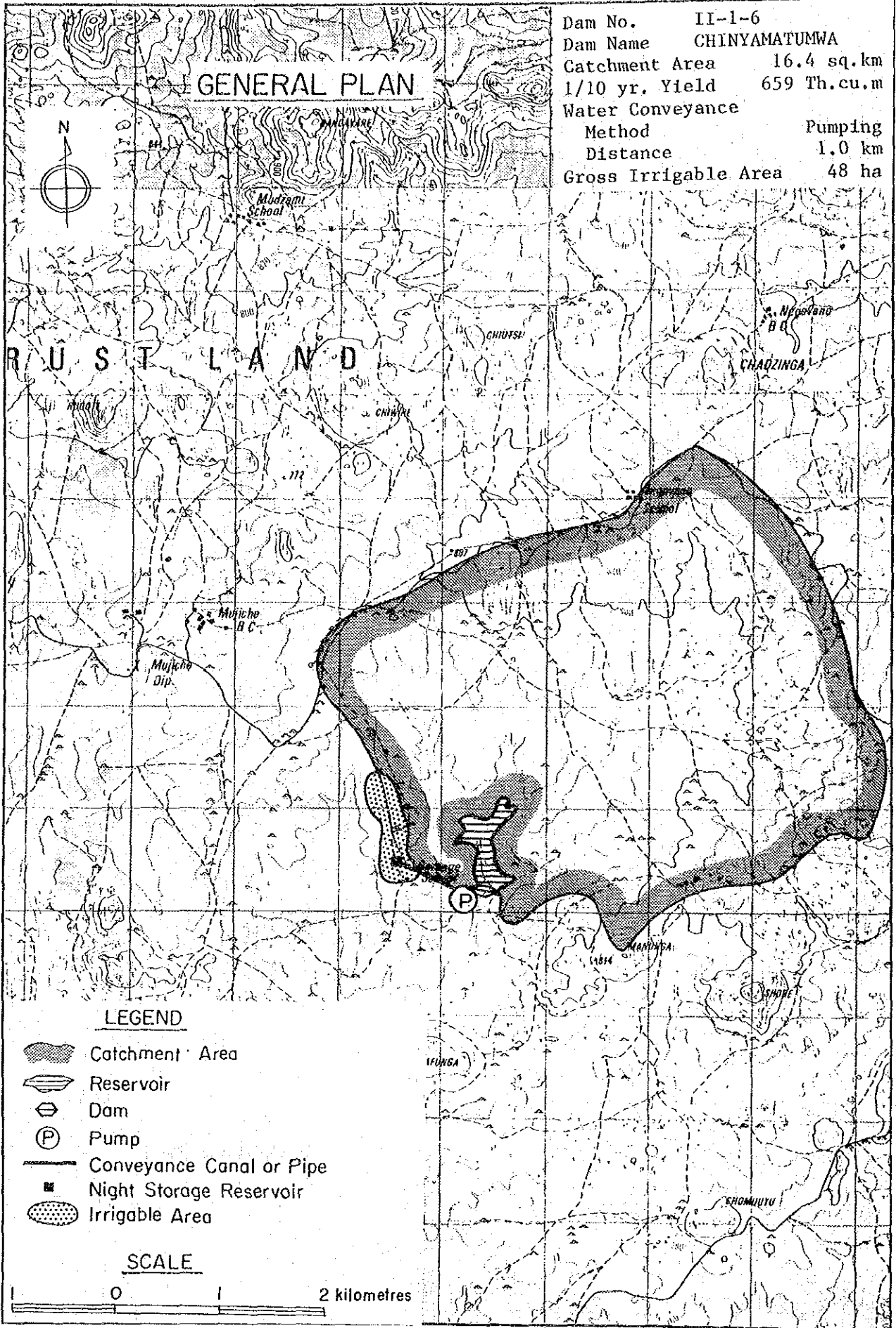
No. II-1-6

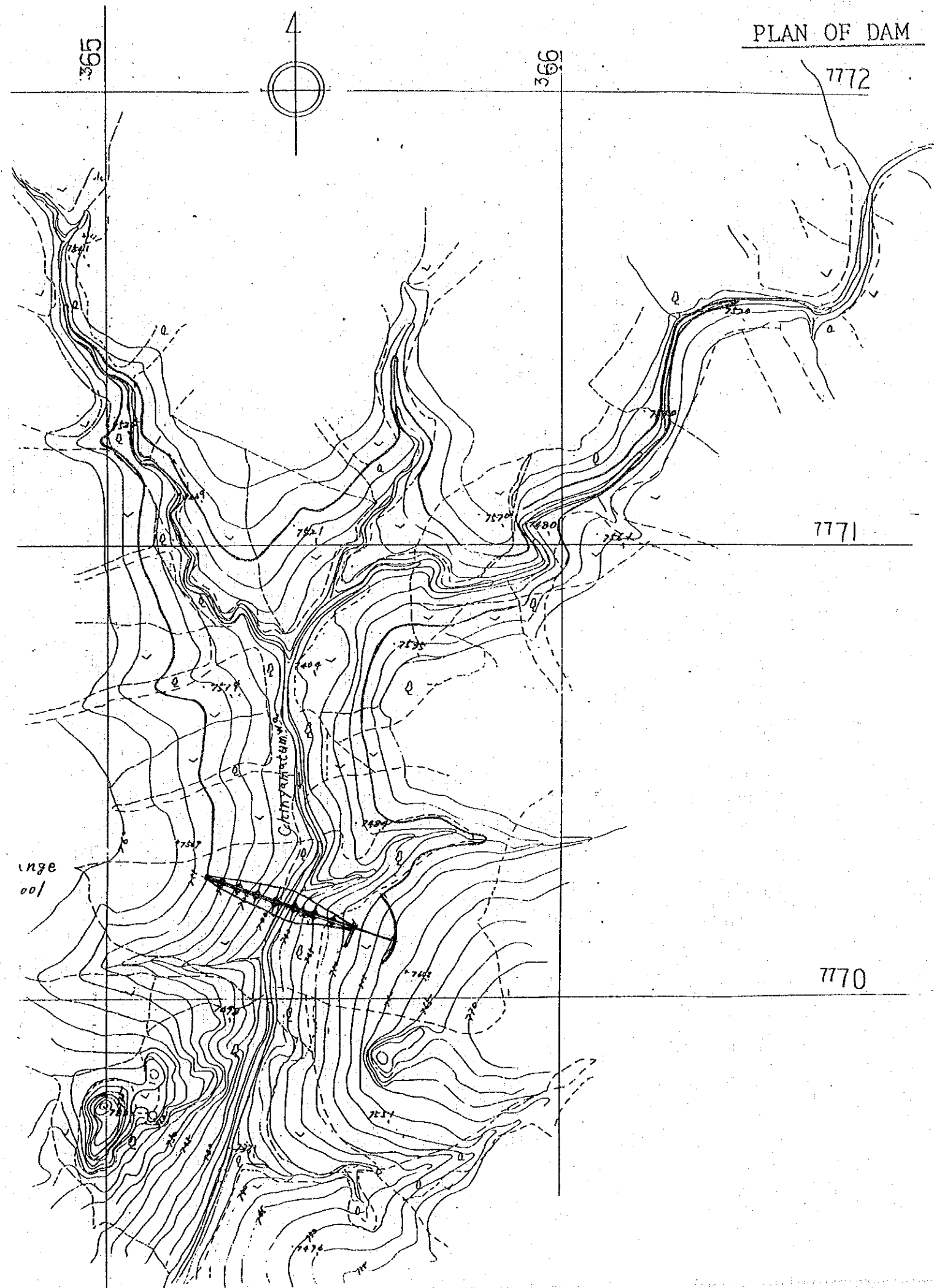
Name of Dam Chinyamatumwa

Location	District Bikita		Communal Land Bikita		
	Map Ref. 2031B1		Coordinates UN654702		
Geology	Granite, highly weathering, changed into boulders.				
Hydrology	River Chinyamatumwa		Hydrological Zone E-S3		
	Catchment Area 16.4 sq.km		M.A. Rainfall 800 mm		
	M.A. Runoff 103 mm		Sediment 310 tonnes km ² /yr.		
Reservoir	Effective Capacity 2.370 MCM		1/10 Yr. Yield 0.659 MCM		
	Dead Capacity 0.080 MCM		D.W.S. 742 m		
	Total Capacity 2.450 MCM		N.W.S. 754 m		
Dam	Height 18 m		Length 400 m		
	Embankment Volume 115 000 cu.m		Spillway 91 m		
Agriculture	Natural Region III		Soil SL-L		
	Potential Irrigable Area		200 ha		
	Proposed Cropping Pattern A				
Irrigation	Net Irrigable Area 38.8ha		Dist. 1.0 km by Pump, H=28.0 m		
	Topography	Area		Steep slope	
		Conveyance		Slightly sloping	
Rural Water Supply	Population 811 person		16 cu.m/day		
	Livestock 5 405 unit		243 cu.m/day		
Cost and Benefit	Dam	Irrigation Facilities	Total Cost	Class	
	Z\$ 1 275 000	Z\$ 1 378 000	Z\$ 2 653 000	A	
	Annual Increment Benefit	Net Present Value	Economic Internal Rate of Return		
	Z\$ 144 354/year	Z\$ 1 678 000	8.9 per cent		
Visit	Dam Engineer	Geologist	Irrigation Engineer	Agronomist	Economist
	Y	Y	Y	Y	Y
Remarks					

Present Condition on the Ward

Ward Name	14		Area 3 700 ha	
Demography	Population Density		81.1 persons/sq.km	
	Family Size		5.0 Persons/household	
Agriculture	Arable Area 2 100 ha		Grazing Area 1 600 ha	
	Maize 3.0 ha/household		18 bags/ha	
	Sorghum 0.7 ha/household		20 bags/ha	
	Livestock 6.7 LSUs/household		108.1 LSUs/sq.km	
Rural Water Supply	Borehole 0.11 units/sq.km		750 persons/unit	
	Well 0.22 units/sq.km		375 persons/unit	





PLAN OF DAM

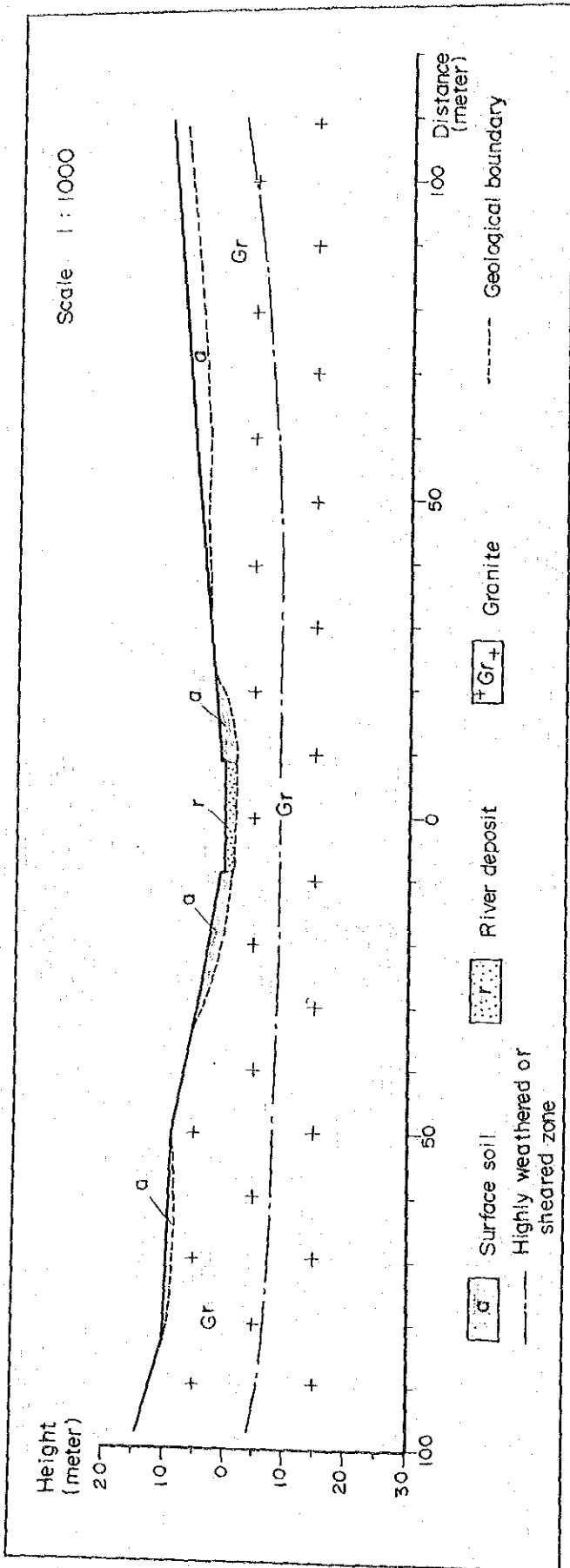
CHINYAMATUMWA

Dam No.	II- 1 - 6
District	Bikita
Communal L.	Bikita
River	Chinyamatumwa
Map Ref.	2031 B1
Coordinate	UN 654702
Catchment A.	16.4 sq.km
Design Flood	163 cum/sec
N.W.S.	EL.752.0 m
D.W.S.	EL.742.0 m
Capacity of Res.	3.38 M.C.M.
Dam Top	EL.754.0 m
Dam Height	18.0 m
Dam Length	400 m
Dam Vol.	115,000 cum



SCALE 1:10 000

II-1-6 Chinyamatumwa



The Chinyamatumwa River meanders among "dwalas" and "whale-backs", and the banks around the damsite slopes gently.

The bedrock consists of very soft porphyritic granite, and it is usually well jointed, and partly it has been changed into boulders by highly weathering. It seems that the thickness of the highly weathered layer is more than 10 meters, and leakage through the layer is very large.

The estimated thickness of unconsolidated deposits seems to be maximum 3 meters.

TABLE STORAGE VOLUME OF RESERVOIR

NO	MAP	GRID	VER	HØR
II-1-6	2031B1	UN	654	702

EL (M)	ΔH (M)	AREA (M ²)	AVE (M ²)	VØL (M ³)	ΣV (1000M ³)	NOTE
736.0	0.0	0	0	0	0.00	
737.5	1.5	2600	1300	1950	1.95	
740.0	2.5	14800	8700	21750	23.70	
742.5	2.5	56300	35550	88875	112.57	
745.0	2.5	132500	94400	236000	348.57	
747.5	2.5	240600	186550	466375	814.95	
750.0	2.5	359600	300100	750250	1565.20	
752.5	2.5	523900	441750	1104375	2669.57	
755.0	2.5	741700	632800	1582000	4251.57	
757.5	2.5	1010700	876200	219049	6442.07	

