

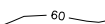
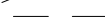











LEGEND:

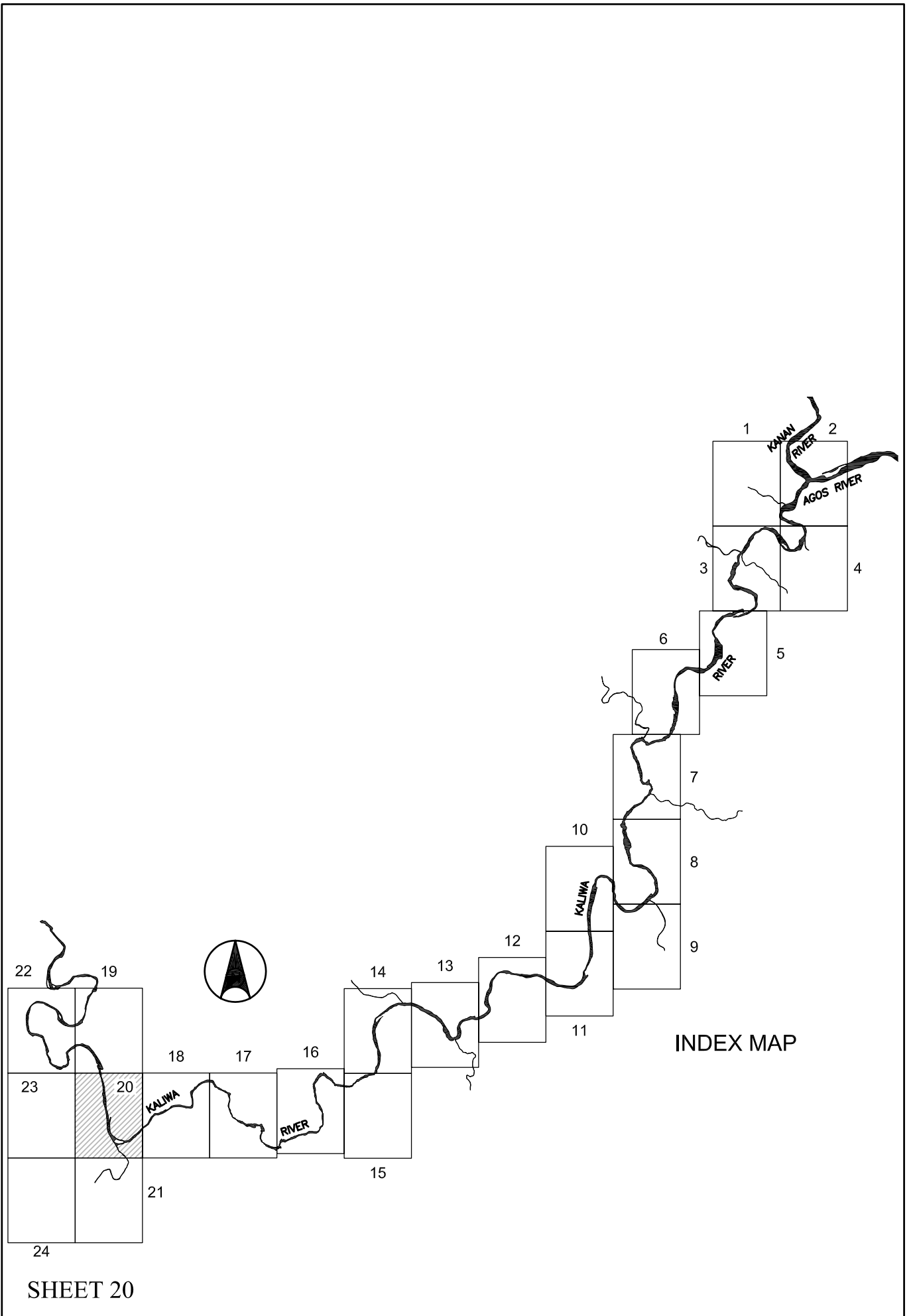
-  STRUCTURES
-  CREEK
-  CONTOUR
-  UNPAVED ROAD

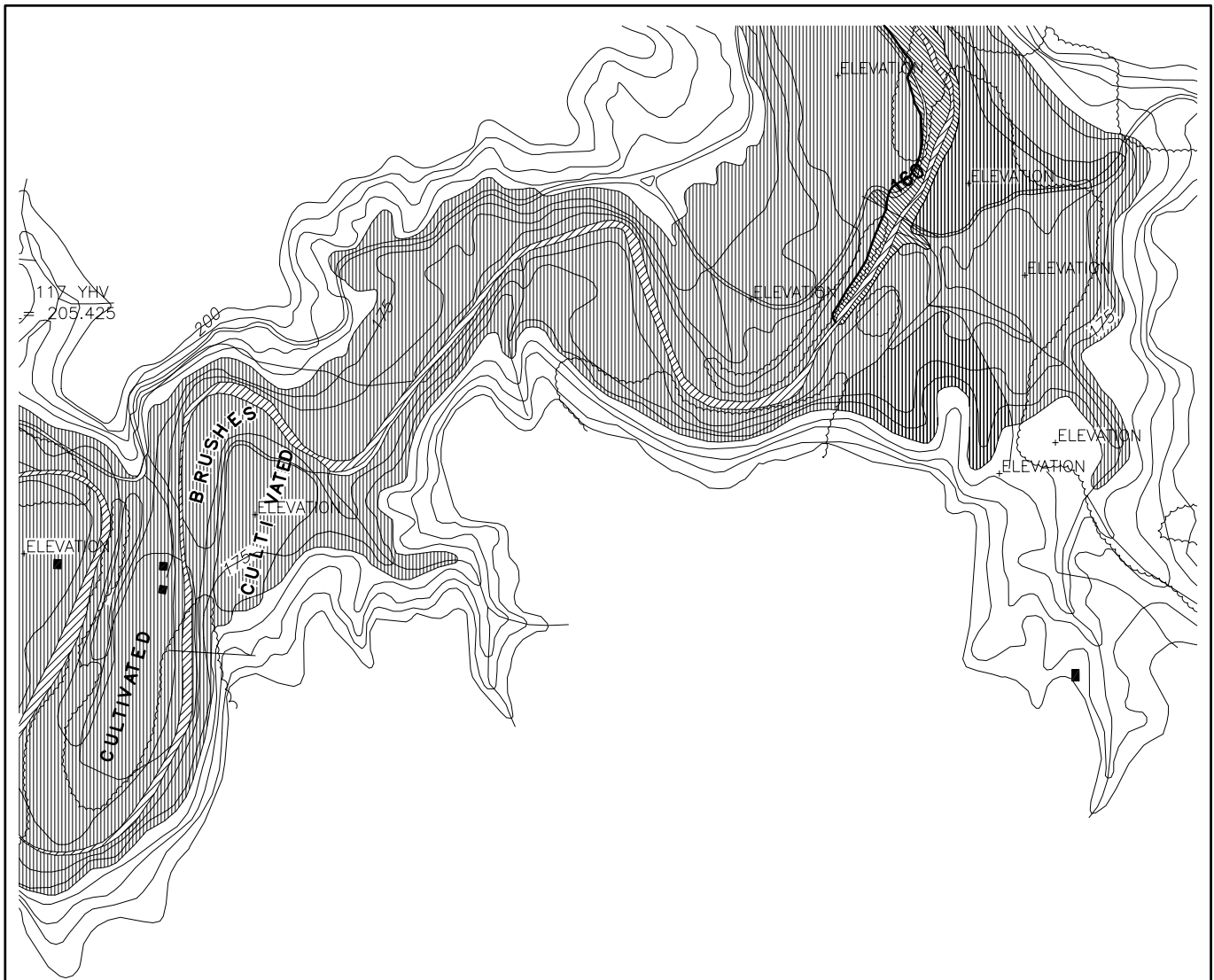
-  RICE PADDY
-  TRAIL
-  SPOT ELEVATION
-  TREES

-  0-140 ELEV.
-  141-160 ELEV.
-  161-180 ELEV.





SHEET 20




SCALE 1:6,000 MTS








LEGEND:

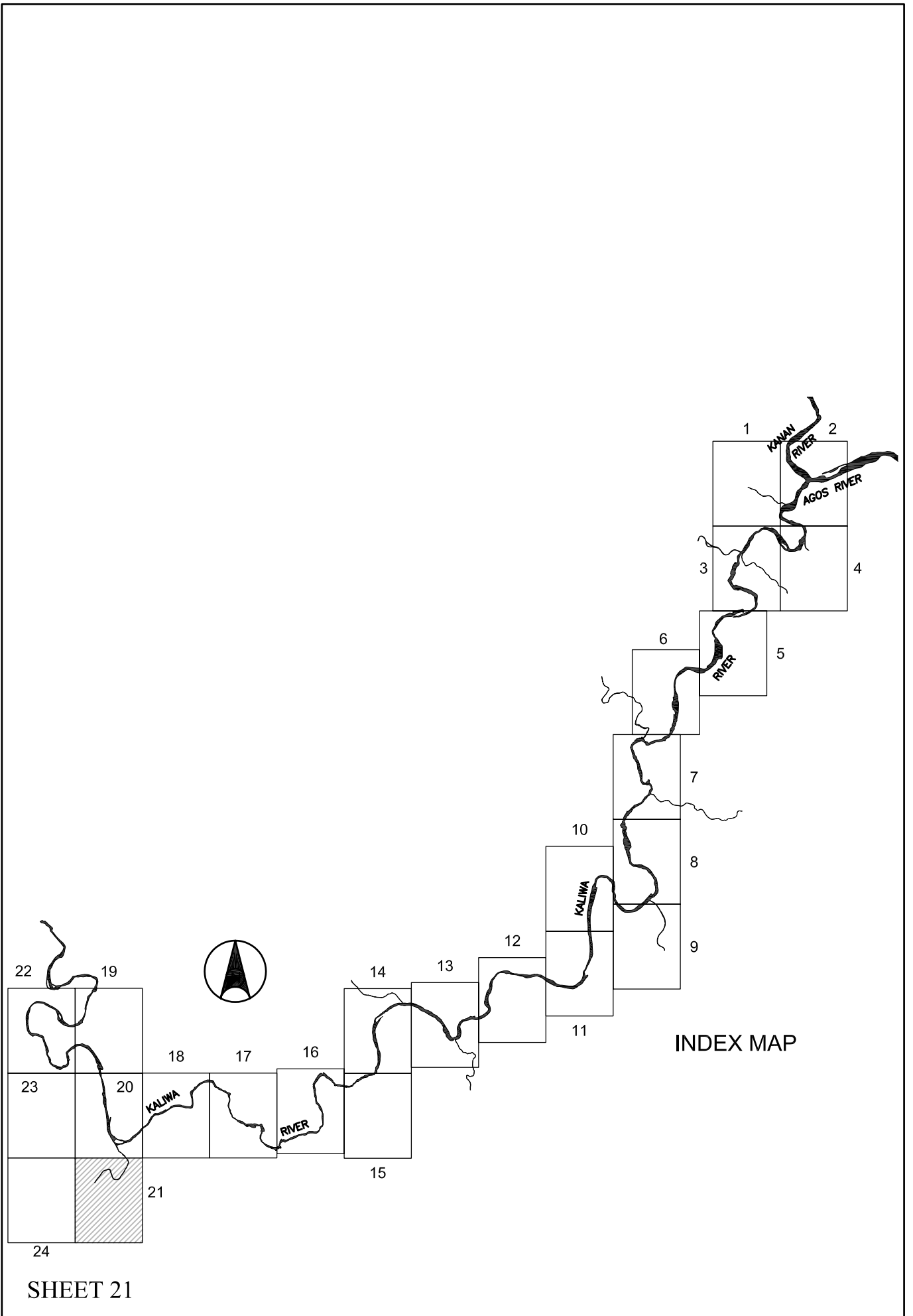
-  STRUCTURES
-  CREEK
-  CONTOUR
-  UNPAVED ROAD

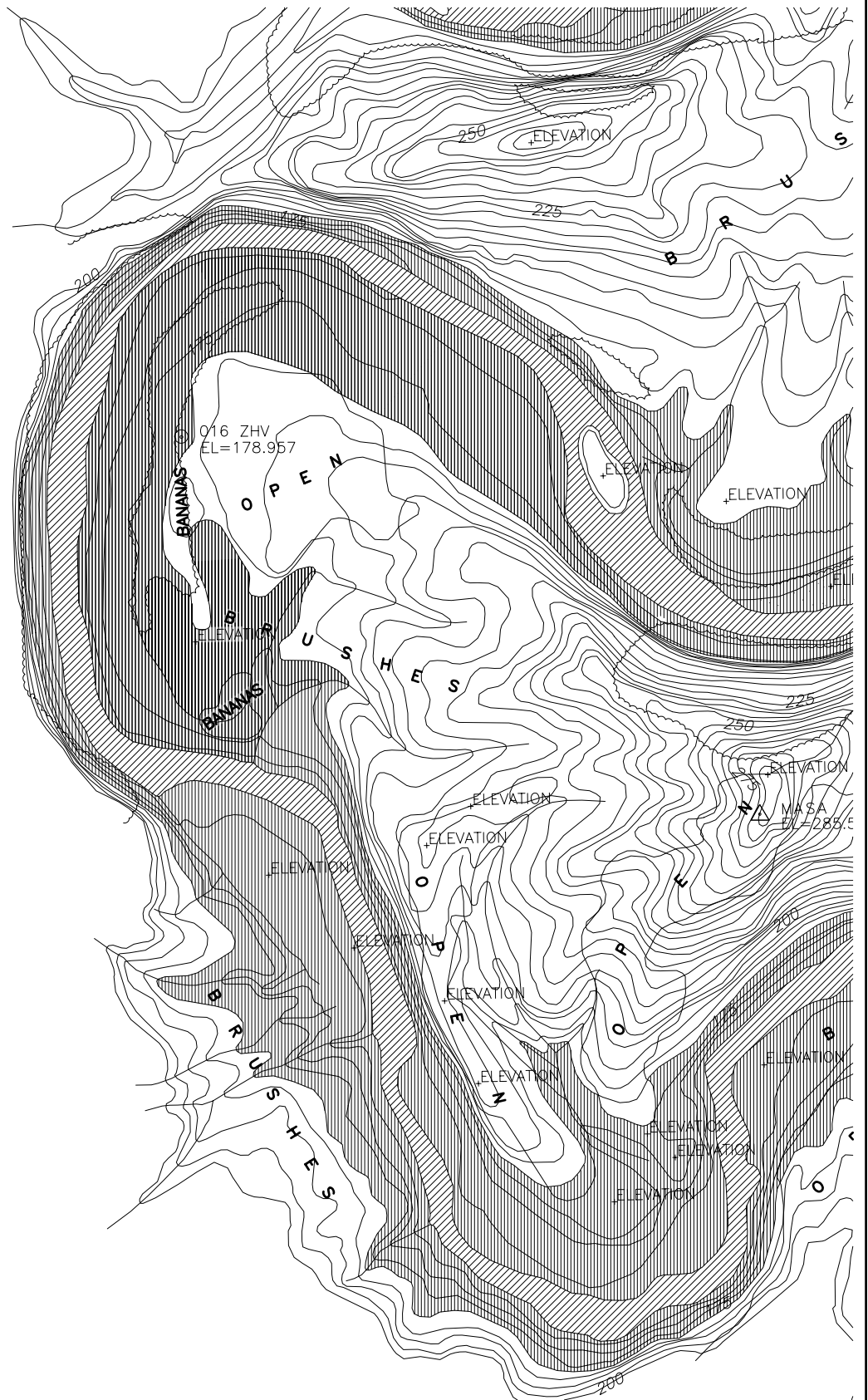
-  RICE PADDY
-  TRAIL
-  SPOT ELEVATION
-  TREES

-  0-140 ELEV.
-  141-160 ELEV.
-  161-180 ELEV.



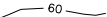

SHEET 21





SCALE 1:6,000 MTS








LEGEND:

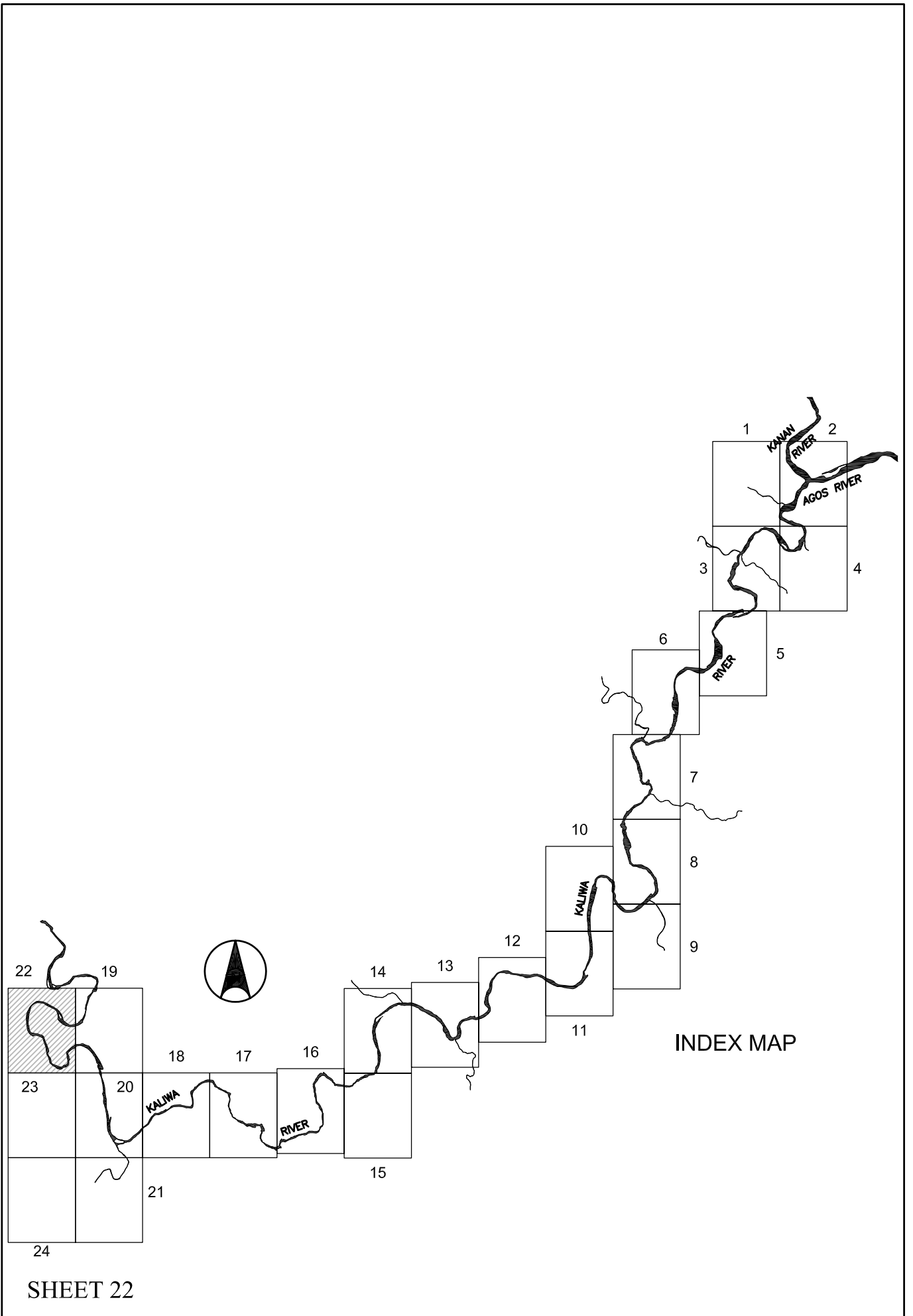
-  STRUCTURES
-  CREEK
-  CONTOUR
-  UNPAVED ROAD

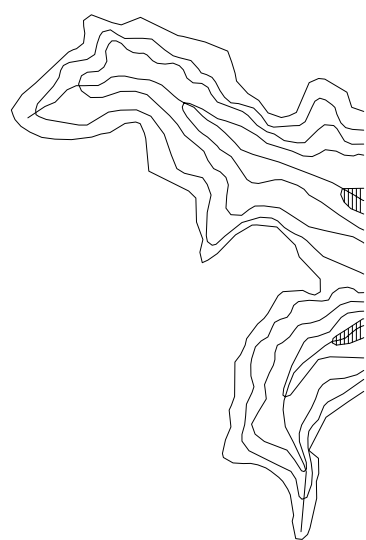
-  RICE PADDY
-  TRAIL
-  SPOT ELEVATION
-  TREES

-  0-140 ELEV.
-  141-160 ELEV.
-  161-180 ELEV.



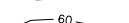

SHEET 22




SCALE 1:6,000 MTS








LEGEND:

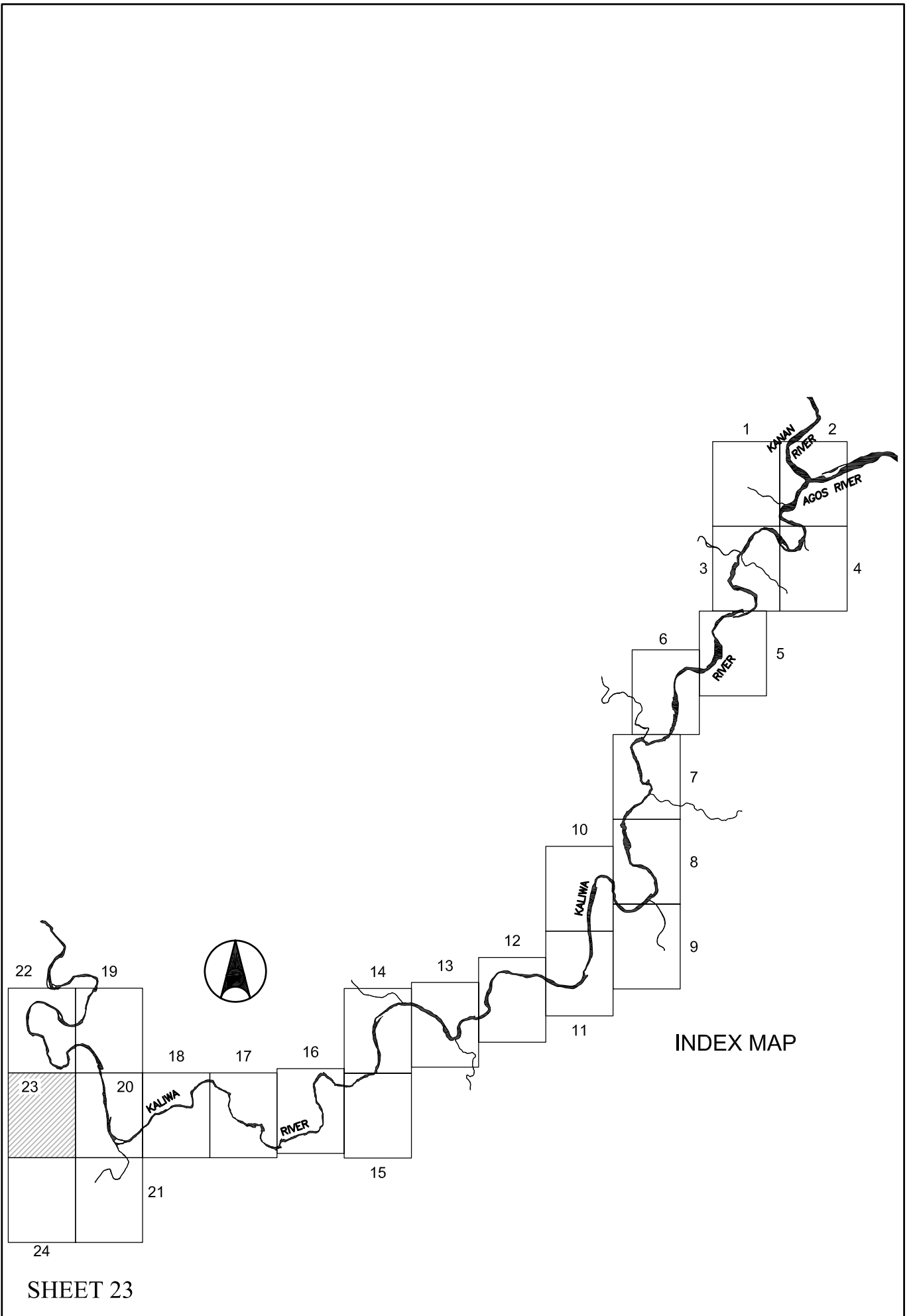
-  STRUCTURES
-  CREEK
-  CONTOUR
-  UNPAVED ROAD

-  RICE PADDY
-  TRAIL
-  SPOT ELEVATION
-  TREES

-  0-140 ELEV.
-  141-160 ELEV.
-  161-180 ELEV.





SHEET 23





SCALE 1:6,000 MTS








LEGEND:

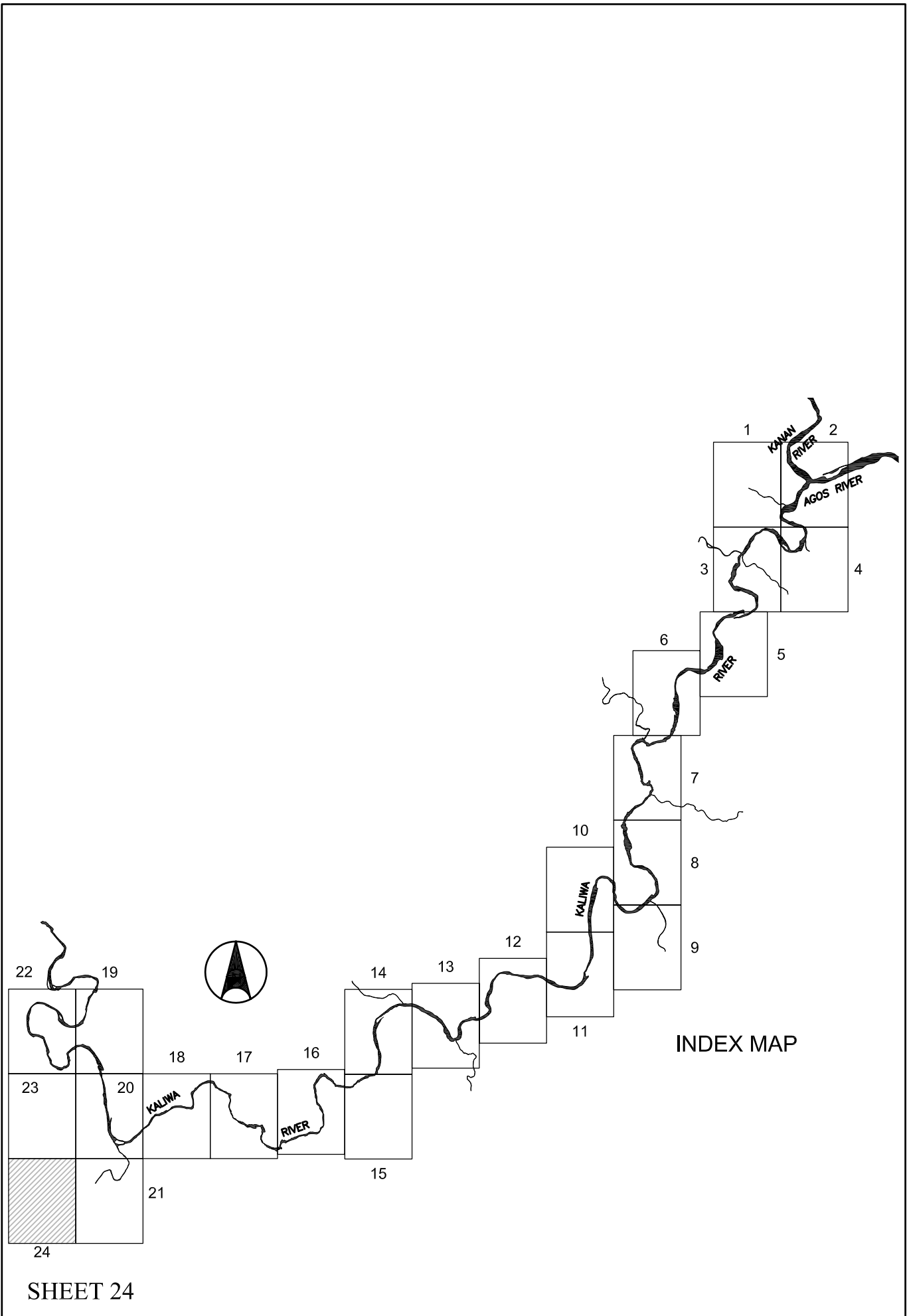
-  STRUCTURES
-  CREEK
-  CONTOUR
-  UNPAVED ROAD

-  RICE PADDY
-  TRAIL
-  SPOT ELEVATION
-  TREES

-  0-140 ELEV.
-  141-160 ELEV.
-  161-180 ELEV.

SHEET 24

SCALE 1:6,000 MTS



*The Study on Water Resources Development for
Metro Manila in the Republic of the Philippines
Final Report
Data Book*

***Water Supply
Questionnaire
Sheet***

Questionnaire Sheets

Maynilad Water Services Inc. (MWSI)

Business Area :

SOUTH

Municipality/city covered: Muntinlupa, Paranaque, Las Pinas, Pasay and Makati

IMUS SECTOR

I. Summary Data on the Business Area

No.	Item	Unit	Calendar Year				
			1997	1998	1999	2000	2001
(1-1)	Area Covered by the Business Area Office	(km ²)					
(1-2)	Total Population	(x 1000 persons)					
(1-3)	Total Number of Households	(x 1000 Nos.)					
(1-4)	Total Number of Households Connected with Piped Water	(x 1000 Nos.)	29.098	38.490	46.837	58.124	61.514
(1-5)	Number of Households by Extent of Fulfillment of Water Supply						
	- 24-hours (or complete) water supply a day	(x 1000 Nos.)					
	- 12 to 23-hours water supply a day	(x 1000 Nos.)					
	- Water supply of less than 12-hours a day	(x 1000 Nos.)					
(1-5)	Total Number of Customers Waiting for Pipe Connections	(x 1000 Nos.)					
(1-6)	Length of Distribution Pipes,	Main					
		Secondary					

II. Summary of Records of Water Supply by Source in the Business Area

No.	Water Source	Unit	Calendar Year				
			1997	1998	1999	2000	2001
(2-1)	Surface Water	MLD		46.14	87.169	138.239	176.238
(2-2)	Groundwater	MLD		29.5	25.9	23.3	22
(2-3)	Supplied from Other Concessionaire	MLD		26.0	22.0	28.0	-
	Total	MLD	66.745	101.640	135.009	179.539	198.238

III. Summary of Records of Water Supply by Sector in the Business Area

No.	Water Source	Unit	Calendar Year				
			1997	1998	1999	2000	2001
(3-1)	Domestic water supply	MLD	25.471	38.117	47.144	63.629	70.066
(3-2)	Semi-business water supply	MLD			2.957	3.984	4.076
(3-3)	Industrial water supply	MLD	1.102	2.215	3.632	4.305	4.004
(3-4)	Commercial water supply	MLD	0.128	0.196	0.281	0.337	0.248
(3-5)	Non-revenue water	MLD	20.067	61.112	81.005	107.724	118.941
	Total	MLD	66.745	101.640	135.009	179.539	198.238

IV. Current Non-Revenue Water Ratio in the Business Area

Has the Business Area Office performed the survey to clarify the situation of non-revenue water?
If yes, please reply to the following questionnaires.

(4-1) When was the survey performed?

Year- 2001

Walk the block @ Las Pinas City

(4-2) Please show the break-down of the non-revenue water estimated based on the survey and/or other survey.

Classification of non-revenue water	Ratio (%)
a) Illegal connections	15
b) Pilferage of meter reading	5
c) Insufficient installation of water meters	10
d) Water leakage from distribution pipes	2
e) Water leakage from service pipes	40
f) Other causes	5
Total	100 (%)

IMW SECTION

V. Measures to Reduce the Non-Revenue Water Ratio and Future Targets for Reduction of Non-Revenue Water Ratio in the Business Area

(5-1) Did the Business Area Office implement the measures to reduce non-revenue water? *No*
 If yes, please explain what sort of measures were practiced and when they were practiced.

Only NRW Reduction thru leak repair and inactive closing by illegal and abandoned WSCs. There is no concrete plans and objectives to reduce NRW.

(5-2) Please Explain the Improvement Plans of the Non-revenue Water Ratio in the future

a) Target non-revenue water ratio	<i>30%</i>	(%)
b) Target year	<i>2002-2005</i>	

c) Please explain the measures to attain the target non-revenue water ratio

*1. There should be specific goal & thrust for NRW
 2. Create a separate sector unit for NRW reduction activities
 3. Support the unit w/ logistics, manpower & resources.*

(5-3) Please Explain the Improvement Plans of the Water Leakage Ratio for Distribution Pipes, if any.

a) Target water leakage ratio	<i>1 liter per 5km² per day</i>	(%)
b) Target year	<i>2002-2005</i>	
c) Total length of distribution pipes to be replaced		(km)
d) Estimated total budget for the pipe replacement		(Pesos)

(5-4) Are there any community-based faucet systems for very low-income people (squatter areas), or is the Business Area Office planning to introduce such a water tariff collection system in the Future to improve the non-revenue water ratios? If yes, please explain what sort of measures were practiced and when they were practiced.

a) Presently adopted such faucet systems in the very low-income communities, if any

- Number of very low-income communities served by the system	(Nos.)	
- Number of households served by the system	(Nos.)	
- Number of people served by the system (Approximately)	(persons)	
- Annual water supplied in the year 2000	(mld)	
- Water tariff imposed	(pesos/m ³)	

b) Please explain the expansion plan of the system for very low-income people in the future.

VI. Industrial development Plans in the Business Area

(6-1) Are There Large-Scale Industrial Developments in the Business Area, which Increase Its Water Demands in the Future? If yes, please explain them by Sector

VII. Future Expansion Plan of the Business Area

(7-1) Please Explain the Future Expansion Plan of the Business Area, if Any

VIII. Other Data and Information to be Collected

- (1) Maps showing the Business Area and municipalities involved therein, and alignments of distribution facilities
- (2) Data useful for the water demand projection for the Business Area as well as each of the municipalities such as the results of previous projection of population, GRDP, non-revenue water ratios, etc.
- (3) Data on structures of water tariff
- (4) Other data and information

Questionnaire Sheets

Maynilad Water Services Inc. (MWSI)

Business Area :

SOUTH

Municipality/city covered: Muntinlupa, Paranaque, Las Pinas, Pasay and Makati

I. Summary Data on the Business Area

PASAY / MAKATI SECTOR

No.	Item	Unit	Calendar Year				
			1997	1998	1999	2000	2001
(1-1)	Area Covered by the Business Area Office	(km ²)					
(1-2)	Total Population	(x 1000 persons)				408	
(1-3)	Total Number of Households	(x 1000 Nos.)				26	
(1-4)	Total Number of Households Connected with Piped Water	(x 1000 Nos.)				A	B
(1-5)	Number of Households by Extent of Fulfillment of Water Supply						
	- 24-hours (or complete) water supply a day	(x 1000 Nos.)				20% A	83% B
	- 12 to 23-hours water supply a day	(x 1000 Nos.)				17% A	15% B
	- Water supply of less than 12-hours a day	(x 1000 Nos.)				3% A	2% B
(1-5)	Total Number of Customers Waiting for Pipe Connections	(x 1000 Nos.)					
(1-6)	Length of Distribution Pipes,	Main				29.6	29.6
		Secondary				260.6	260.6

II. Summary of Records of Water Supply by Source in the Business Area

No.	Water Source	Unit	Calendar Year				
			1997	1998	1999	2000	2001
(2-1)	Surface Water	MLD				405.60	447.08
(2-2)	Groundwater	MLD				2.40	1.73
(2-3)	Supplied from Other Concessionaire	MLD				-	-
	Total	MLD				409.00	448.81

III. Summary of Records of Water Supply by Sector in the Business Area

No.	Water Source	Unit	Calendar Year				
			1997	1998	1999	2000	2001
(3-1)	Domestic water supply	MLD					
(3-2)	Semi-business water supply	MLD					
(3-3)	Industrial water supply	MLD					
(3-4)	Commercial water supply	MLD					
(3-5)	Non-revenue water	MLD					
	Total	MLD					

IV. Current Non-Revenue Water Ratio in the Business Area

Has the Business Area Office performed the survey to clarify the situation of non-revenue water? **NO**
 If yes, please reply to the following questionnaires.

(4-1) When was the survey performed?

Year- N.A.

(4-2) Please show the break-down of the non-revenue water estimated based on the survey and/or other survey.

Classification of non-revenue water	Ratio (%)
a) Illegal connections	
b) Pilferage of meter reading	
c) Insufficient installation of water meters	
d) Water leakage from distribution pipes	
e) Water leakage from service pipes	
f) Other causes	
Total	100 (%)

} N.A.

PASAY SECTOR

V. Measures to Reduce the Non-Revenue Water Ratio and Future Targets for Reduction of Non-Revenue Water Ratio in the Business Area

(5-1) Did the Business Area Office implement the measures to reduce non-revenue water? If yes, please explain what sort of measures were practiced and when they were practiced.

Yes. Leak repair, decommissioning of old/abandoned lines, pipe replacement, closing of illegal abandoned WSC, massive metering (collective), looping/interconnection to improve supply & revenue. Implemented from start of MWSI to the present depending on availability of resources.

(5-2) Please Explain the Improvement Plans of the Non-revenue Water Ratio in the future

a) Target non-revenue water ratio		(%)
b) Target year		

c) Please explain the measures to attain the target non-revenue water ratio

All new works are being undertaken in view of the current financial problem of MWSI. Prioritization is given to projects of high revenue impact & less cost. Concentration is on looping/interconnection to improve supply & revenue.

(5-3) Please Explain the Improvement Plans of the Water Leakage Ratio for Distribution Pipes, if any.

a) Target water leakage ratio		(%)
b) Target year		
c) Total length of distribution pipes to be replaced		(km)
d) Estimated total budget for the pipe replacement		(Pesos)

(5-4) Are there any community-based faucet systems for very low-income people (squatter areas), or is the Business Area Office planning to introduce such a water tariff collection system in the Future to improve the non-revenue water? If yes, please explain what sort of measures were practiced and when they were practiced.

a) Presently adopted such faucet systems in the very low-income communities, if any

- Number of very low-income communities served by the system	(Nos.)	
- Number of households served by the system	(Nos.)	
- Number of people served by the system (Approximately)	(persons)	
- Annual water supplied in the year 2000	(mld)	
- Water tariff imposed	(pesos/m ³)	

b) Please explain the expansion plan of the system for very low-income people in the future.

Bayan-Tubig Program - provision of limited machine extension with multiple-user service connection (3-4 households/connection).

VI. Industrial development Plans in the Business Area

(6-1) Are There Large-Scale Industrial Developments in the Business Area, which Increase Its Water Demands in the Future? If yes, please explain them by Sector

VII. Future Expansion Plan of the Business Area

(7-1) Please Explain the Future Expansion Plan of The Business Area, if Any

VIII. Other Data and Information to be Collected

- (1) Maps showing the Business Area and municipalities involved therein, and alignments of distribution facilities
- (2) Data useful for the water demand projection for the Business Area as well as each of the municipalities such as the results of previous projection of population, GRDP, non-revenue water ratios, etc.
- (3) Data on structures of water tariff
- (4) Other data and information

Maynilad Water Services, Inc.

Imus/Bacoor Branch

South Business Area

A. Number of Active Water Service Connections

Cavite Province	Year	1997	1998	1999	2000	May-01
	Bacoor					
	Residential	3,758*	3,681*	4,187	4,865	5,084
	Semi-Business			258	295	322
	Business Group I	130	143	230	275	306
	Business Group II	6	12	12	14	15
	Cavite City					
	Residential	8,397*	8,434*	7,868	7,810	7,942
	Semi-Business			495	505	520
	Business Group I	402	416	420	443	463
	Business Group II	29	26	27	29	28
	Imus					
	Residential	1,147*	1,085*	960	1,058	1,084
	Semi-Business			38	63	65
	Business Group I	62	56	56	68	70
	Business Group II	3	3	3	3	3
	Kawit					
	Residential	4,793*	4,596*	4,818	4,639	4,631
	Semi-Business			215	237	257
	Business Group I	158	172	186	228	233
	Business Group II	10	10	12	14	15
	Noveleta					
	Residential	704*	758*	868	958	963
	Semi-Business			33	39	42
	Business Group I	9	15	20	30	33
	Business Group II	0	0	0	0	0
	Rosario					
	Residential	1,830*	1,826*	1,806	1,802	1,812
	Semi-Business			80	87	87
	Business Group I	67	70	75	80	82
	Business Group II	2	2	2	2	2

South	Muntinlupa					
	Residential	2,006*	1,764*	1,561	1,843	1,778
	Semi-Business			98	108	114
	Business Group I	14	15	18	24	28
	Business Group II	2	2	2	1	1
	Paranaque					
	Residential	4,493*	11,586*	14,439	21,299	22,634
	Semi-Business			950	1,026	1,182
	Business Group I	326	1,108	1,892	2,037	2,183
	Business Group II	81	121	169	183	182
	Las Pinas					
	Residential	633*	2,414*	4,380	7,268	8,427
	Semi-Business			398	460	573
	Business Group I	33	105	244	299	329
	Business Group II	3	10	17	22	24

* Residential and Semi-Business Combined

B. Water Consumption (MLD)

Municipality	1997	1998	1999	2000	May-01
Bacoor	3.393	3.089	4.571	5.522	6.706
Cavite City	6.953	7.668	8.152	6.936	8.023
Imus	0.701	0.736	0.726	0.824	0.99
Kawit	3.075	3.033	4.333	3.703	3.662
Noveleta	0.358	0.522	0.742	0.585	0.602
Rosario	1.836	1.859	2.272	2.041	2.088
Muntinlupa	1.45	0.9	1.189	1.375	1.599
Paranaque	8.441	20.536	28.863	42.599	46.267
Las Pinas	0.491	2.185	3.156	8.23	9.357

MAYNILAD WATER SERVICES INC. (MWSI) - West zone

A. Number of Water Service Connections

(ACTIVE)

SOUTH		1997	1998	1999	2000	2001
	Muntinlupa					
	Residential					
	Semi-Business					
	Business Group I					
	Business Group II					
	Raw Water					
	Water District					
	Unknown Type					
	Paranaque					
	Residential					
	Semi-Business					
	Business Group I					
	Business Group II					
	Raw Water					
	Water District					
	Unknown Type					
	Las Pinas					
	Residential					
	Semi-Business					
	Business Group I					
	Business Group II					
	Raw Water					
	Water District					
	Unknown Type					
	Pasay		27 229	29 420	31 330	
	Residential					
	Semi-Business					
	Business Group I					
	Business Group II					
	Raw Water					
	Water District					
	Unknown Type					
	Makati		9 210	9 340	9 347	
	Residential					
	Semi-Business					
	Business Group I					
	Business Group II					
	Raw Water					
	Water District					
	Unknown Type					

* NOTE: ACTIVE SERVICES ONLY

MAYNILAD WATER SERVICES, INC. (MWSI)
Central Business Area
Portion of Manila City

I. Summary Data on the Business Area

No.	Item	Unit	Calendar Year				
			1997	1998	1999	2000	2001
(1-1)	Area Covered by the Business Area Office	sq.km.					
(1-2)	Total Population	(x 1000 persons)					
(1-3)	Total Number of Households	(x 1000)					
(1-4)	Total Number of Households connected with Pipe Water *	(x 1000)		106	110	116	119
(1-5)	Number of Households by Extent of Fulfillment of Water Supply						
	- 24-hrs. (or complete) water supply a day	(x 1000)					
	- 12 to 23-hrs. water supply a day	(x 1000)					
	- Water supply of less than 12-hrs a day	(x 1000)					
(1-5)	Total Number of Customers Waiting for Pipe Connections **	(x 1000)			3616	894	532
(1-6)	Length of Distribution Pipes, Main	km.					
	Secondary	km.					

Note: * - Domestic & semi-business accounts although some households are also categorized as commercial accounts
 ** - Backlog of installation at year end and EO April for 2001

II. Summary of Records of Water Supply by Source in the Business Area

No.	Water Source	Unit	Calendar Year				
			1997	1998	1999	2000	2001
(2-1)	Surface Water	MLD					
(2-2)	Groundwater	MLD		0	0	0	0
(2-3)	Supplied from Other Concessionaire	MLD		300	300	250	160
	TOTAL	MLD			630	620	631

III. Summary of Records of Water Supply by Sector in the Business Area

No.	Water Source	Unit	Calendar Year				
			1997	1998	1999	2000	2001
(3-1)	Domestic water supply	MLD					
(3-2)	Semi-business water supply	MLD					
(3-3)	Industrial water supply	MLD					
(3-4)	Commercial water supply	MLD					
(3-5)	Non-revenue water	MLD					
	TOTAL	MLD					

No data on water supplied to each customer category. Supply to each customer category is not measured.

IV. Current Non-Revenue Water Ration in the Business Area

Has the Business Area Office performed the survey to clarify the situation of non-revenue water?
 If yes, please reply to the following questionnaires.

(4-1) When was the survey performed? Year -

(4-2) Please show the break-down of the non-revenue water estimated based on the survey and/or other survey.

Classification of non-revenue water	Ratio (%)
a) Illegal connections	
b) Pilferage of meter reading	
c) Insufficient installation of water meters	
d) Water leakage from distribution pipes	
e) Water leakage from service pipes	
Total	

V. Measures to Reduce the Non-Revenue Water Ration and Future Targets for Reduction of Non-Revenue Water Ratio in the Business Area.

(5-1) Did the Business Area Office implement the measures to reduce non-revenue water? Yes
 If yes, please explain what sort of measures were practiced and when they were practiced
 leak repair, old GI service pipes & mainline replacements, massive metering as well as decommissioning of old lines, abandoned service pipes, spaghetti connections, illegal connections.

(5-2) Please explain the Improvement Plans of the Non-revenue Water Ratio in the future

a) Target non-revenue water ration		%
b) Target year		
c) Please explain the measures to attain the target non-revenue water ratio		
implemented zone/block measurement/monitoring then effect physical works (Item No. 5-1) to reduce losses.		

(5-3) Please explain the Improvement Plans of the Water Leakage Ratio for Distribution Pipes, if any.

a) Target water leakage ration		%
b) Target year		
c) Total length of distribution pipes to be replaced		km
d) Estimated total budget for the pipe replacement		

(5-4) Are there any community-based faucet systems for very low-income people (squatter areas), or is the Business Area Office planning to introduce such a water tariff collection system in the future to improve the non-revenue water ratios?
 If yes, please explain what sort of measures were practical and when they were practiced.

a) Presently adopted such faucet systems in the very low-income communities, if any

- Number of very low-income communities served by the system	Number	
- Number of households served by the system	Number	
- Number of people served by the system (approx.)	persons	
- Annual water supplied in the year 2000	mld	
- Water tariff imposed	pesos/cu.m.	

b) Please explain the expansion plan of the system for very low-income people in the future.
 Our community-based systems for low income groups are the Bayan Tubig projects which replaced the public faucets. The first was implemented in February 1999 and as of Dec 2000 we were able to install 19,387 water service connections for the beneficiaries.

VI. Industrial development Plans in the Business Area

(6-1) Are there large-scale Industrial Dev'ts in the Business Area, which increases its Water Demands in the future?
 If yes, please explain them by Sector.

no

VII. Future Expansion Plan of the Business Area

(7-1) Please Explain the Future Expansion Plan of the Business Area, if any.



VIII. Other Data and Information to be Collected

- 1) Maps showing the Business Area and municipalities involved therein and alignments of distribution facilities.
- 2) Data useful for the water demand projection for the Business Area as well as each of the municipalities such as the results of the previous projection of population, GRDP, non-revenue water ratios, etc.
- 3) Data on structures of water tariff.
- 4) Other data and information.

MAYNILAD WATER SERVICES, INC. (MWSI) - West Zone

A. Number of Water Service Connections

Branch	City/Municipality	1997	1998	1999	2000	2001*
CENTRAL	Manila (portion) **					
	Residential		103,226	101,690	107,074	109,882
	Semi-Business		2,975	8,024	8,981	9,133
	Business Group I		9,355	15,125	15,612	15,502
	Business Group II		634	1,669	2,296	2,300
	Raw Water		-	-	-	-
	Water District		-	-	-	-
	Sea Transport		9	10	4	4
	Unknown		-	-	-	-

Notes:

* - April 2001 billing summary data

** - Numbers represent active accounts only.

B. Water Consumption (MLD)

Branch	City/Municipality	1997	1998	1999	2000	2001*
CENTRAL	Manila (portion)					
	Residential		99.0	107.4	107.4	103.7
	Semi-Business		3.1	8.0	9.0	9.6
	Business Group I		48.8	65.7	65.7	58.3
	Business Group II		4.1	6.3	7.9	9.5
	Raw Water		-	-	-	-
	Water District		-	-	-	-
	Sea Transport		1.5	2.3	2.7	3.1
	Unknown		-	-	-	-

Note:

* - April 2001 billing summary data