

付-5 現地調査で得られた技術関連資料

1. 第一期計画の対象地域内の人口分布図
2. 第一期計画の対象地域内のし尿処理現況図
3. 下水処理場予定地
4. ホーリーTM試験結果(省略, 英文報告書参照)
5. 水質試験結果
 - a) 既存雨水排水路
 - b) 既存下水道施設
 - c) 既存し尿処理施設
 - d) 工場排水

Table 1 第1期計画区域の对象面積と人口(下水道施設)

Name of Sewerage Zone	Priority ⁽¹⁾ for Const'n	Area (ha)	Population	
			1976	2000
Butterworth Zone -- 1	1	367.0	37,900	45,400
Butterworth Zone -- 2	6	182.0	3,600	21,800
Butterworth Zone -- 3	2	457.0	28,300	37,000
Butterworth Zone -- 4	3	444.0	26,300	37,500
Seberang Jaya Zone -- 1	5	438.0	13,700	46,700
Sebrang Jaya Zone -- 2	7	305.0	70	25,200
Bukit Mertajam Zone -- 3	4	927.0	45,500	73,700
Total		3,120.0	155,370	287,300

Note: (1) See Appendix H, "Staging of Construction", Volume II of Master Plan Report.

Table 2 第一期計画区域の雨水排水計画

Drainage Basins	(1) Priority	(2) Names of Drain	Lengths of Drain (m)	Catchment Areas (ha)
B - IV	1	BWA	6,520	300
"	2	BWB	4,710	716
"	3	BWD	1,820	83
"	4	BWE	2,750	100
"	5	BWC	3,860	275
B - II	6	ARA	3,090	353
"	7	BK	1,130	70
Rehabilitation (3)		-	7,500	
Total			31,380	1,897

Note: (1) Determined by NSC's judgement.
 (2) Locations of Drain are shown in Figure 2.
 (3) Rehabilitation should be made throughout the First Stage programme area, and is top priority.

Table 3 第1期計画ロカワ下水施設政府前相合

(In Thousands of M\$)

Name of Sewerage Zone	Sewers	Pump Stations	Treatment Plants	Land Costs	Total
Butterworth Zone-1	7,580	240	2,020	2,630	12,470
Butterworth (1) Zone-2	-	-	-	-	-
Butterworth Zone-3	11,900	840	5,440	3,170*	21,350
Butterworth Zone-4					
Seberang Jaya Zone-1	6,130	-	1,920	2,630	10,680
Seberang Jaya (2) Zone-2	-	-	-	-	-
Bukit Mertajam Zone-3	10,900	680	4,000	3,770	19,350
Sub-Total	36,510	1,760	13,380	12,200	63,850
Contingencies	7,300	350	2,680	-	10,330
Engineerings	4,380	210	1,610	-	6,200
Total	48,190	2,320	17,670	12,200	80,380

Note : Contingencies = Sub-Total x 0.2

Engineerings = (Sub-Total + Contingencies) x 0.1

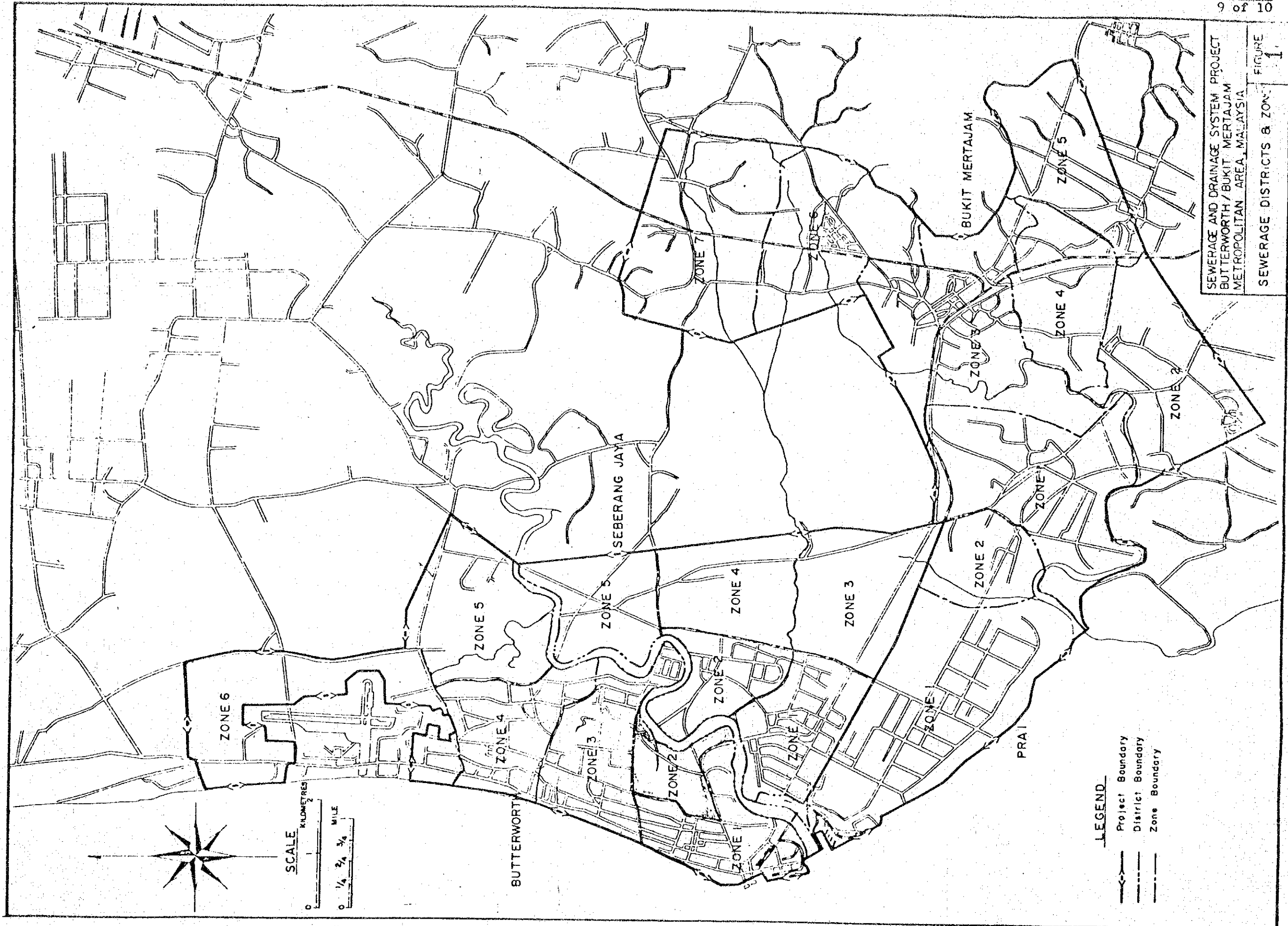
For (1) + (2), while sewerage system is expected to be provided by housing development programmes, engineering discussion will be made in the Feasibility Study.

* State land

Table 4 第一期計劃 排水排水計劃 政府局總局
(In Thousands of MS)

Drainage Basin	Name of Drain	Construction Cost of Drain	Construction Cost of Reservoir	Land Acquisition Cost	Total Cost
	BWA	14,620	-	930	15,510
	BWB	3,170	240	450	3,860
B - IV	BWD	3,510	-	130	3,640
	BWE	2,060	-	80	2,140
	BWC	580	230	520	1,330
B - II	ARA	4,820	-	570	5,390
	BK	1,130	-	100	1,230
	Rehabilitation	720	-	-	720
(1)	Total of Net Cost	30,670	470	2,780	33,920
(2)	Contingencies (20%)	6,130	90	-	6,220
(3)	(1) + (2)	36,800	560	2,780	40,140
(4)	Engineering Fee (10%)	3,674	56	-	3,730
	Grand Total	40,474	616	2,780	43,870

Note: All costs are expressed in 1977 price levels.



SEWERAGE AND DRAINAGE SYSTEM PROJECT
BUTTERWORTH / BUKIT MERTAJAM
METROPOLITAN AREA, MALAYSIA
SEWERAGE DISTRICTS & ZONES
FIGURE 1







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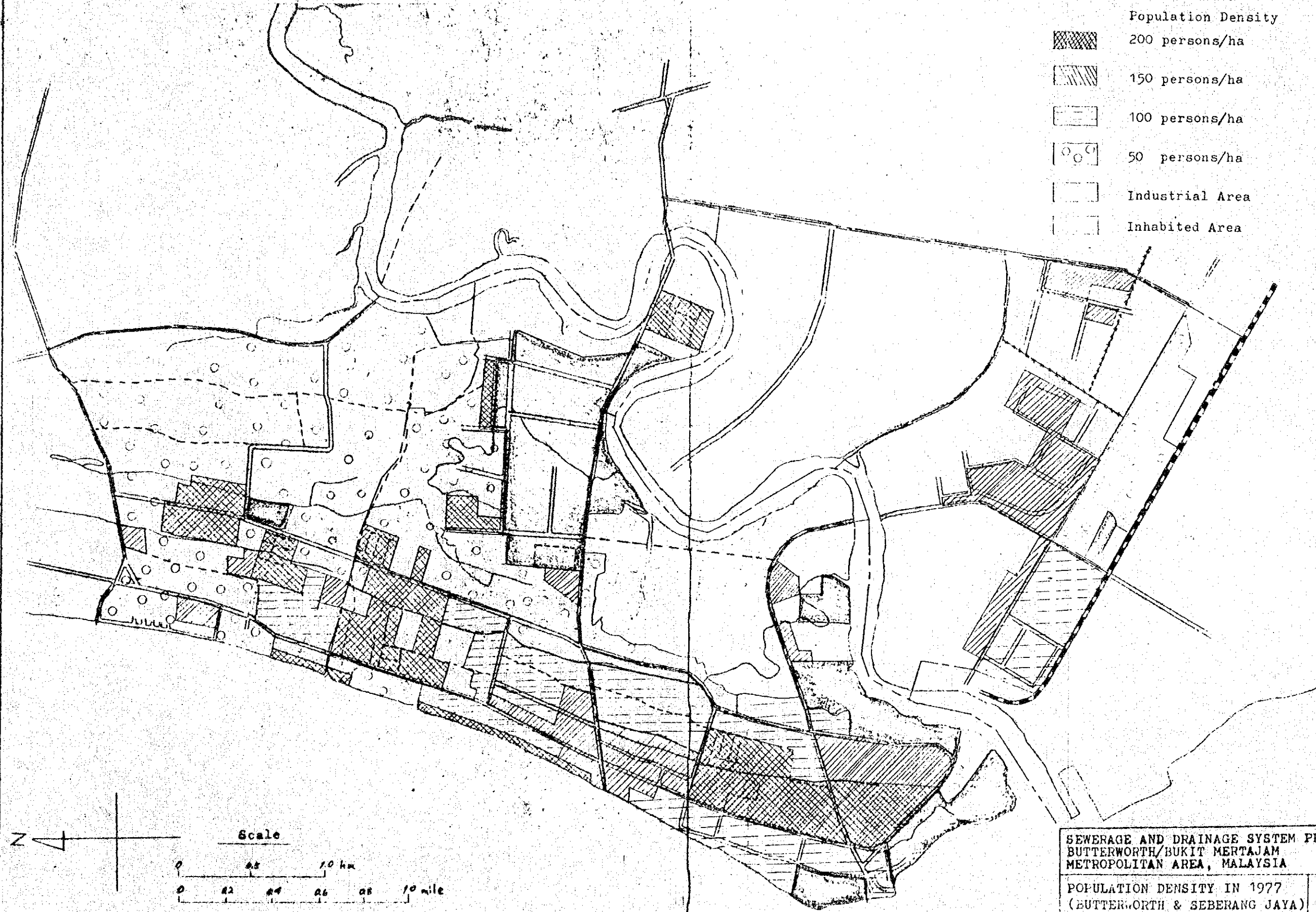
附件四 调查资料

1. 第一期计划区范围内的现状人口分布图.
2. 第一期计划区内的污水处理现状图.
3. 下水处理场号室位置图.
4. 第一期计划区水质检测指标
 - a. 第一期计划区水质检测指标
 - b. 位置图.
5. 水质检测指标
 - a. 现状排水系统
 - b. 现状下水设施
 - c. 污水处理设施
 - d. 工业排水系统

1. Maps Showing Present Population Distribution in the First Stage Programme Area.

LEGEND

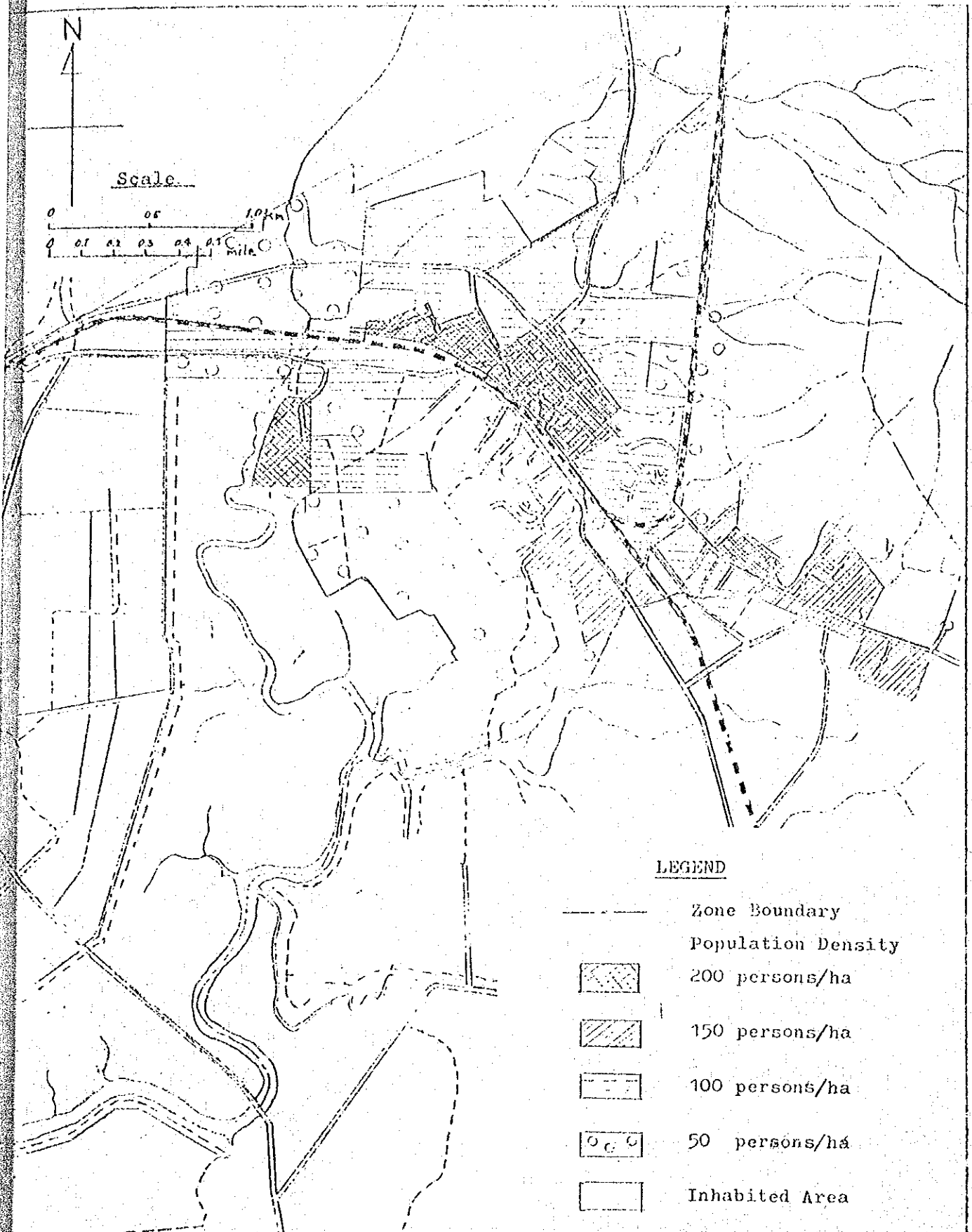
- Zone Boundary
- Population Density
-  200 persons/ha
-  150 persons/ha
-  100 persons/ha
-  50 persons/ha
-  Industrial Area
-  Inhabited Area








SEWERAGE AND DRAINAGE SYSTEM PROJECT
 BUTTERWORTH/BUKIT MERTAJAM
 METROPOLITAN AREA, MALAYSIA

POPULATION DENSITY IN 1977
 (BUTTERWORTH & SEBERANG JAYA)

FIGURE
 1-1



LEGEND

- Zone Boundary
- Population Density
-  200 persons/ha
-  150 persons/ha
-  100 persons/ha
-  50 persons/ha
-  Inhabited Area

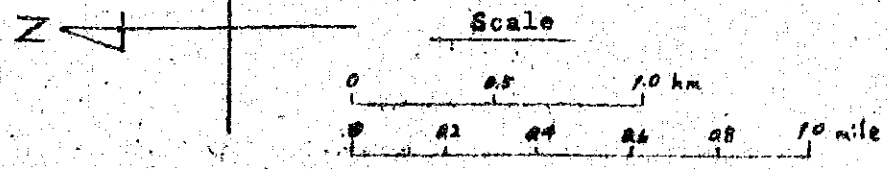
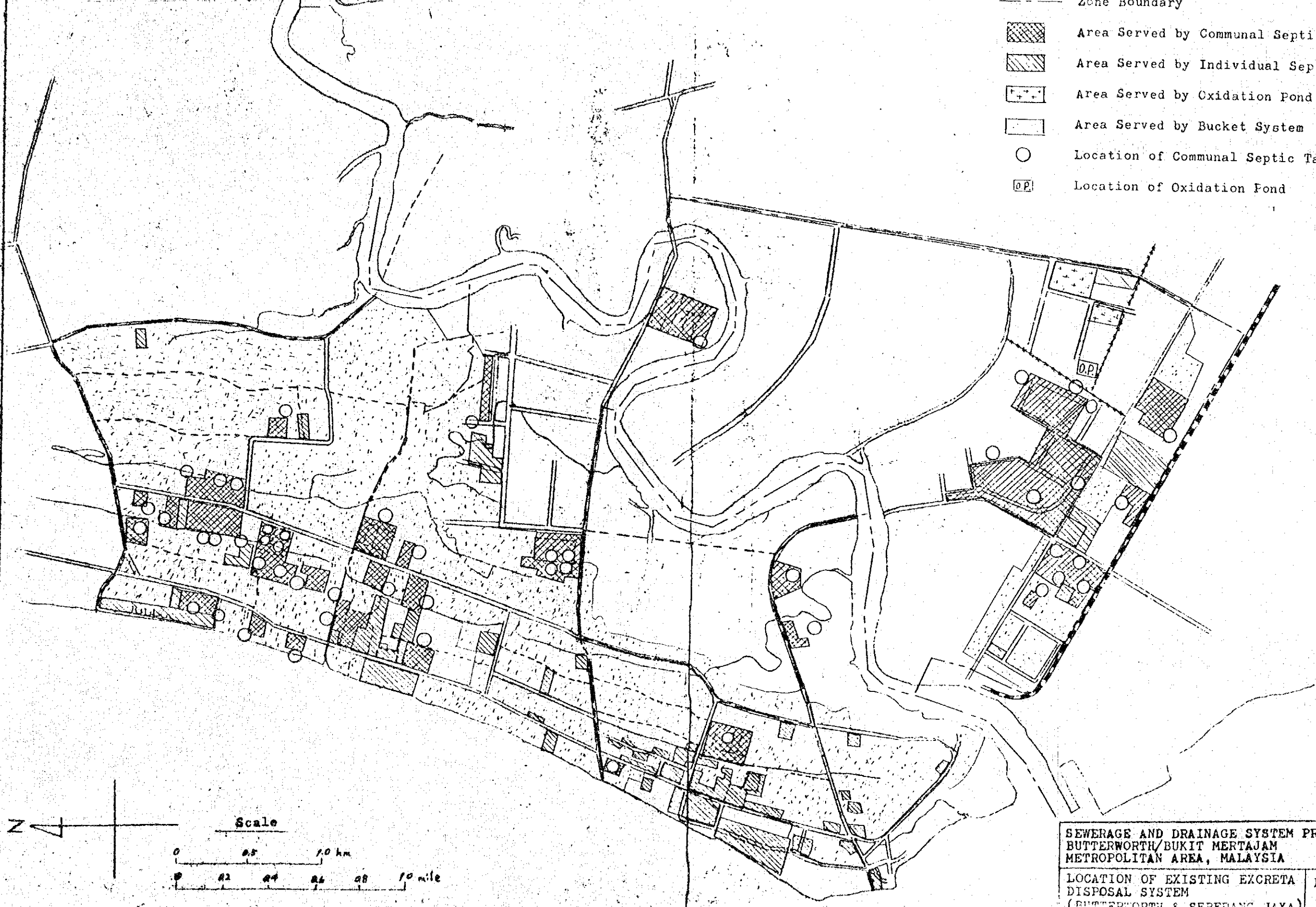
SEWERAGE AND DRAINAGE SYSTEM PROJECT
 BUTTERWORTH/BUKIT MERTAJAM
 METROPOLITAN AREA, MALAYSIA

POPULATION DENSITY IN 1977
 (BUKIT MERTAJAM)

FIGURE
 1-2

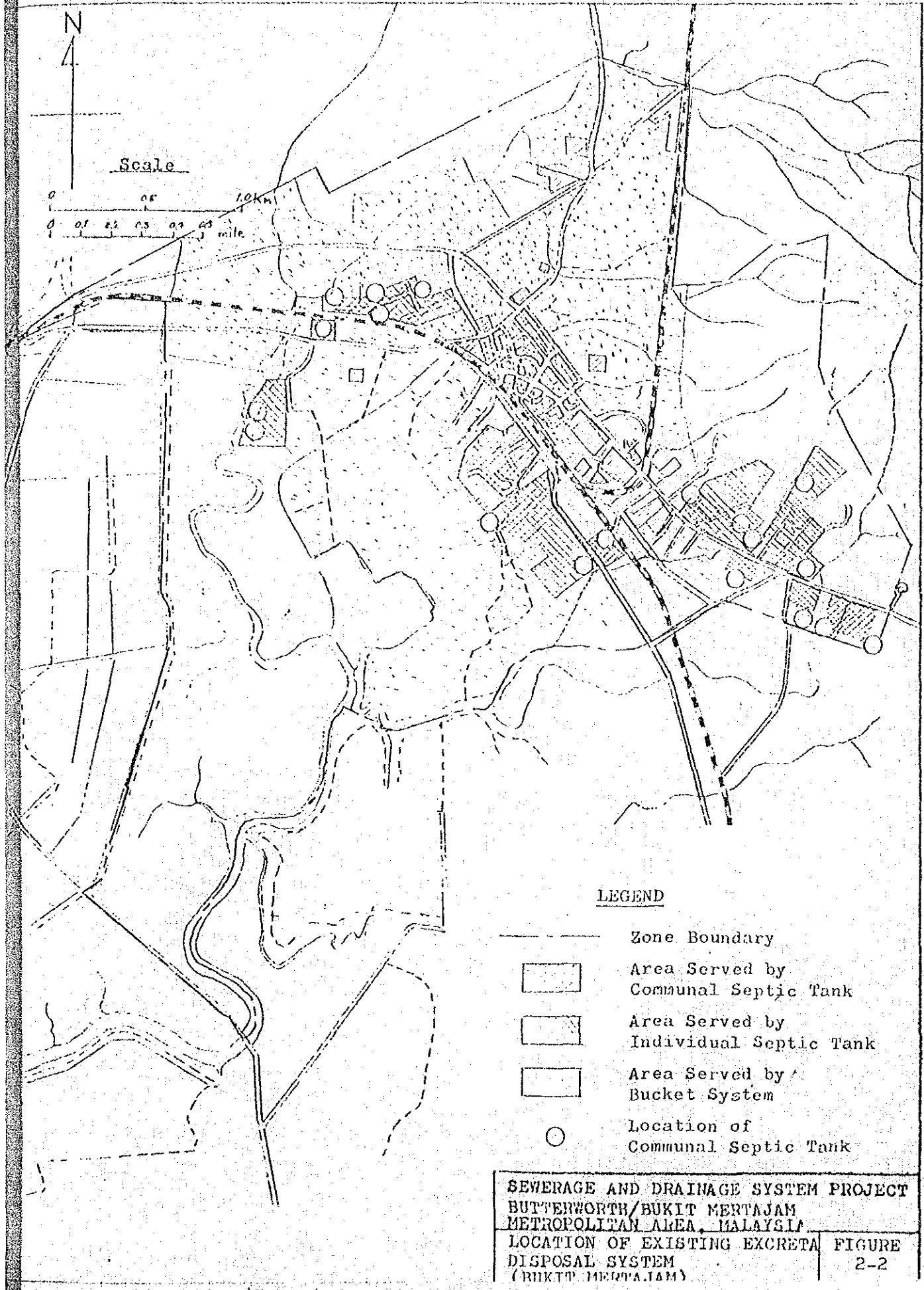
2. Map Showing Existing Excreta Disposal System in the First Stage Programme Area.

- LEGEND**
- Zone Boundary
 - [Cross-hatched] Area Served by Communal Septic Tank
 - [Diagonal lines] Area Served by Individual Septic Tank
 - [Dotted] Area Served by Oxidation Pond
 - [White] Area Served by Bucket System
 - Location of Communal Septic Tank
 - [O.P.] Location of Oxidation Pond



SEWERAGE AND DRAINAGE SYSTEM PROJECT
 BUTTERWORTH/BUKIT MERTAJAM
 METROPOLITAN AREA, MALAYSIA
 LOCATION OF EXISTING EXCRETA
 DISPOSAL SYSTEM
 (BUTTERWORTH & SEBERANG JAYA)

FIGURE 2-1

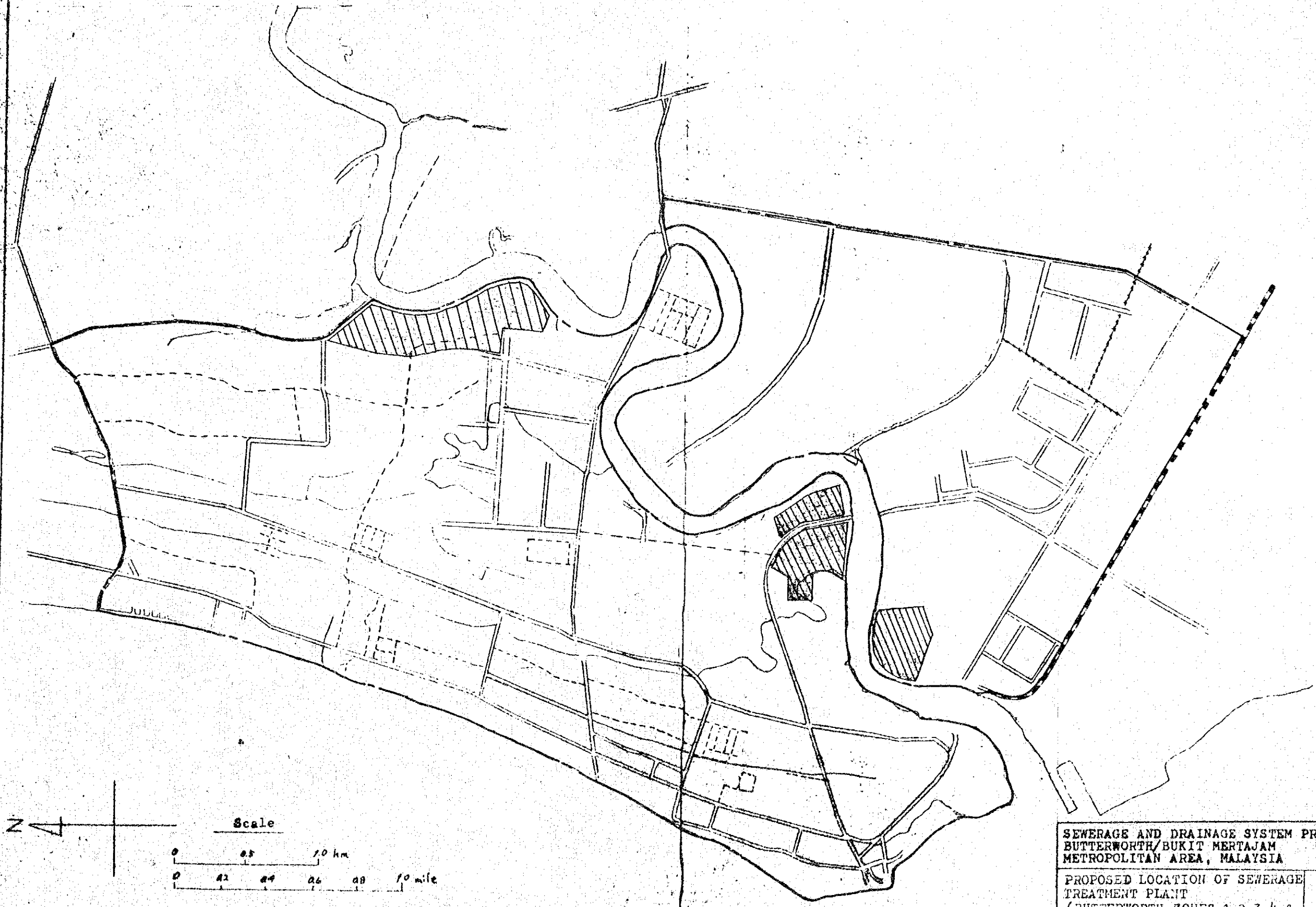


LEGEND

- Zone Boundary
- ▨ Area Served by Communal Septic Tank
- ▤ Area Served by Individual Septic Tank
- ▥ Area Served by Bucket System
- Location of Communal Septic Tank

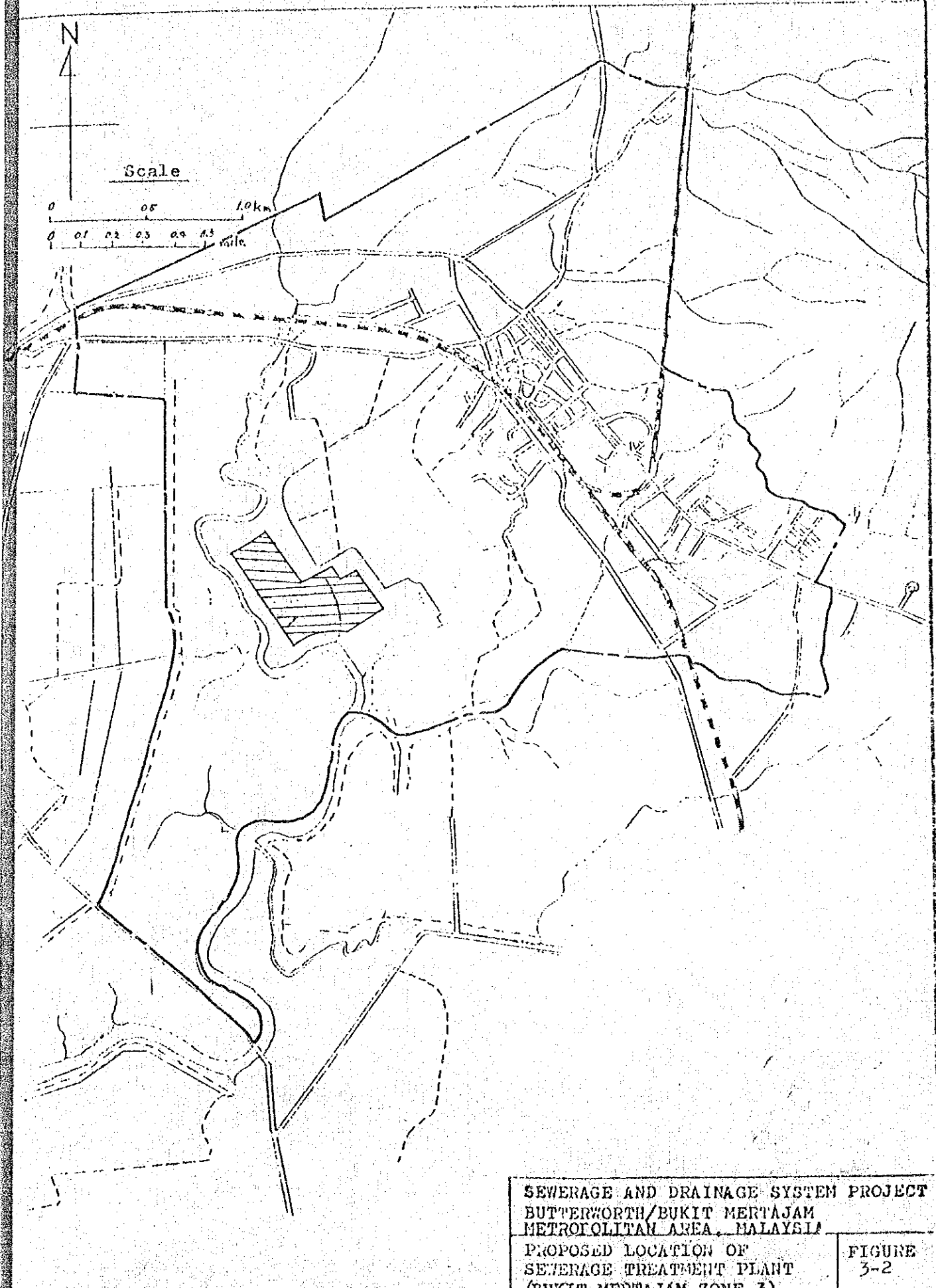
SEWERAGE AND DRAINAGE SYSTEM PROJECT
BUTTERWORTH/BUKIT MERTAJAM
METROPOLITAN AREA, MALAYSIA
LOCATION OF EXISTING EXCRETA DISPOSAL SYSTEM (BUKIT MERTAJAM) FIGURE 2-2

3. Map Showing Proposed Location of Sewerage Treatment Plant.



SEWERAGE AND DRAINAGE SYSTEM PROJECT BUTTERWORTH/BUKIT MERTAJAM METROPOLITAN AREA, MALAYSIA	
PROPOSED LOCATION OF SEWERAGE TREATMENT PLANT (BUTTERWORTH ZONES 1, 2, 3, 4 & SEBERANG JAYA ZONE 1)	FIGURE 3-1

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SEWERAGE AND DRAINAGE SYSTEM PROJECT
BUTTERWORTH/BUKIT MERTAJAM
METROPOLITAN AREA, MALAYSIA
PROPOSED LOCATION OF
SEWERAGE TREATMENT PLANT
(BUKIT MERTAJAM ZONE 3)...

FIGURE
3-2

4. Data for Test Borings.

a. ボーリングの結果

BOREHOLE No. 1

Sheet 1 of BH. 1

Type of boring *PERCUSSION MACHINE*
 Type of rig *U-MEC 200*
 Dia of boring *6.8*
 Casing details

Feature *PONING SEWERAGE AND DRAINAGE PONES*
 Location *CHAM. FERRY RD. 2 WORTH.*
 Ground level:

Date & Time	Depth of boring & casing	Ground Water	Samples & Tests			Strata					
			Depth	Sample	Test	Legend	Depth	Reduced Level	Thickness	Description	
			ft.	ins.			ft.	ins.	ft.	ins.	
23/10/77 6:00 am.	Struck water 4'0"		0'6" - 1'6"	↓ 1	N = 1				2' 6"		Very soft yellowish brown silty SANDY CLAY with gravel
			2'0" - 3'0"	↓ 2	N = 1						
			3'6" - 4'6"	↓ 3	N = 1						
			5'0" - 6'0"	↓ 4	N = 1						
			6'6" - 7'6"	↓ 5	N = 1						
			8'0" - 9'0"	↓ 6	N = 1						
			9'6" - 10'6"	↓ 7	N = 1						
			11'0" - 12'8"	↓ 8	N = 1						
			12'6" - 13'6"	↓ 9	N = 1						
			14'0" - 15'0"	↓ 10	N = 1						
			15'6" - 16'6"	↓ 11	N = 1						
			17'0" - 18'0"	↓ 12	N = 1						
			18'6" - 19'6"	↓ 13	N = 1				18' 6"		
			20'0" - 21'0"	↓ 14	N = 1						
			21'6" - 22'6"	↓ 15	N = 1						
			23'0" - 24'0"	↓ 16	N = 1						
			24'6" - 25'6"	↓ 17	N = 1						
			11:00 am. Before extract casing 5'3"			26'0" - 27'0"	↓ 18	N = 1			27' 0"
After extracted casing 3'3"			END OF BOREHOLE.								

Note: Location of the point is shown in Figure 4-1

BOREHOLE No. 4

Sheet 1 of B.H. 4.

Type of boring *PERCUSSION MACHINE*
 Type of rig *H.M.C. 200*
 Dia of boring *6 IN. Ø*
 Casing details

Feature *PENANG SEWERAGE AND DRAINAGE PROJECT*
 Location *LEKING, SENGA, SAT. 4, 2' NORTH*
 Ground level:

Date & Time	Depth of boring & casing	Ground Water	Samples & Tests			Strata					
			Depth	Sample	Test	Legend	Depth	Reduced Level	Thickness	Description	
			ft. ins.				ft. ins.	feet	ft. ins.		
<i>24/10/77</i> <i>11:00 am.</i>		<i>Struck Water</i> <i>3'0"</i>	<i>0'6" - 1'6"</i>	<i>↓ 1</i>	<i>N = 7</i>				<i>4'0"</i>	<i>Firm yellowish brown silty clay with laterite gravels, and mottled yellow.</i>	
			<i>2'0" - 3'6"</i>	<i>↓ 2</i>	<i>N = 5</i>						
<i>12:00</i>	<i>6'6"</i>	<i>2'6"</i>	<i>3'0" - 3'6"</i>	<i>↓ 3</i>	<i>N = 3</i>				<i>4'0"</i>	<i>Very loose greyish green silty sand with little fines sand and organic material.</i>	
<i>13:00</i>		<i>1'6"</i>	<i>5'0" - 6'0"</i>	<i>↓ 4</i>	<i>N = 1</i>						
			<i>6'6" - 7'6"</i>	<i>↓ 5</i>	<i>N = 1</i>				<i>6'6"</i>	<i>Very loose greyish green fine to medium sand with fractured shell fragments.</i>	
			<i>8'0" - 9'0"</i>	<i>↓ 6</i>	<i>N = 3</i>						
			<i>9'6" - 10'6"</i>	<i>↓ 7</i>	<i>N = 3</i>				<i>10'6"</i>	<i>Very loose greyish green fine to medium sand with fractured shell fragments.</i>	
			<i>11'0" - 12'0"</i>	<i>↓ 8</i>	<i>N = 2</i>						
			<i>12'6" - 13'6"</i>	<i>↓ 9</i>	<i>N = 2</i>				<i>6'6"</i>	<i>Very loose greyish green fine to medium sand with fractured shell fragments.</i>	
			<i>14'0" - 15'0"</i>	<i>↓ 10</i>	<i>N = 4</i>						
			<i>15'6" - 16'6"</i>	<i>↓ 11</i>	<i>N = 4</i>				<i>17'0"</i>	<i>Very soft greyish green marine clay with pocket of fine sand and shell fragments.</i>	
			<i>17'0" - 18'0"</i>	<i>↓ 12</i>	<i>N = 1</i>						
			<i>18'6" - 19'6"</i>	<i>↓ 13</i>	<i>N = 1</i>				<i>7'0"</i>	<i>Very soft greyish green marine clay with pocket of fine sand and shell fragments.</i>	
			<i>20'0" - 21'0"</i>	<i>↓ 14</i>	<i>N = 1</i>						
			<i>21'6" - 22'6"</i>	<i>↓ 15</i>	<i>N = 1</i>				<i>24'0"</i>	<i>Very soft greyish green marine clay with pocket of fine sand and shell fragments.</i>	
			<i>23'0" - 24'0"</i>	<i>↓ 16</i>	<i>N = 1</i>						
<i>1625 PM</i>			<i>Before extracted casing = 20'2"</i> <i>After extracted casing = 2'1"</i>								
			<i>END OF BOREHOLE.</i>								

Note: Location of the point is shown in Figure 4-1

BOREHOLE No. 5

Sheet 1 of BH-5

Type of boring *PERCUSSION MACHINE*
 Type of rig *H-MFC 200*
 Dia of boring *6. N.S. φ*
 Casing details

Feature *Penang Sewerage and Drainage Project*
 Location *CHAI LENG PARK, PENANG*
 Ground level:

Date & Time	Depth of boring & casing	Ground Water	Samples & Tests			Strata					
			Depth	Sample	Test	Legend	Depth	Reduced Level	Thickness	Description	
			ft. ins.				ft. ins.	feet	ft. ins.		
<i>22/10/77</i> <i>8:00 am.</i>	<i>struck water out 4' 6"</i>		<i>0' 6" - 1' 6"</i>	<i>↓ 1</i>	<i>N = 4</i>					<i>2' 6"</i>	<i>Soft reddish brown clayey silt with roots.</i>
			<i>2' 0" - 3' 0"</i>	<i>↓ 2</i>	<i>N = 4</i>		<i>2' 6"</i>				
			<i>3' 6" - 4' 6"</i>	<i>↓ 3</i>	<i>N = 1</i>					<i>4' 0"</i>	<i>Very soft greyish green marine clay with organic materials.</i>
			<i>5' 0" - 6' 0"</i>	<i>↓ 4</i>	<i>N = 1</i>						
			<i>6' 6" - 7' 6"</i>	<i>↓ 5</i>	<i>N = 1</i>		<i>6' 6"</i>				
			<i>8' 0" - 9' 0"</i>	<i>↓ 6</i>	<i>N = 1</i>						
			<i>9' 6" - 10' 6"</i>	<i>↓ 7</i>	<i>N = 1</i>						
			<i>11' 0" - 12' 0"</i>	<i>↓ 8</i>	<i>N = 1</i>					<i>8' 6"</i>	<i>Very soft greyish green marine clay with shell fragments and organic clay.</i>
			<i>12' 6" - 13' 6"</i>	<i>↓ 9</i>	<i>N = 1</i>						
			<i>14' 0" - 15' 0"</i>	<i>↓ 10</i>	<i>N = 1</i>						
			<i>16' 0" - 16' 6"</i>	<i>↓ 11</i>	<i>N = 1</i>					<i>15' 0"</i>	
			<i>17' 0" - 18' 0"</i>	<i>↓ 12</i>	<i>N = 1</i>						
			<i>18' 6" - 19' 6"</i>	<i>↓ 13</i>	<i>N = 1</i>						
			<i>20' 0" - 21' 0"</i>	<i>↓ 14</i>	<i>N = 1</i>						
			<i>21' 6" - 22' 6"</i>	<i>↓ 15</i>	<i>N = 1</i>						
			<i>23' 0" - 24' 0"</i>	<i>↓ 16</i>	<i>N = 1</i>					<i>15' 0"</i>	<i>Very soft greyish green marine clayey silt.</i>
			<i>24' 6" - 25' 6"</i>	<i>↓ 17</i>	<i>N = 1</i>						
			<i>26' 0" - 27' 0"</i>	<i>↓ 18</i>	<i>N = 1</i>						
			<i>27' 6" - 28' 0"</i>	<i>↓ 19</i>	<i>N = 1</i>						
			<i>29' 0" - 30' 0"</i>	<i>↓ 20</i>	<i>N = 1</i>					<i>30' 0"</i>	
<i>11:25 am.</i>	<i>WL. 3' 4"</i>	<i>After extracted casing 2 1/2"</i>									
			<i>END OF BOREHOLE.</i>								

Note: Location of the point is shown in Figure 4-1

BOREHOLE No. 6

Sheet 1 of B.H. 6

Type of boring *PERCUSSION MACHINE*
 Type of rig *U-MC 200*
 Dia of boring *6.125" φ*
 Casing details

Feature *PINANGA SEWERAGE AND DRAINAGE PROJECT*
 Location *BUKIT MESTAJAM*

Ground level:

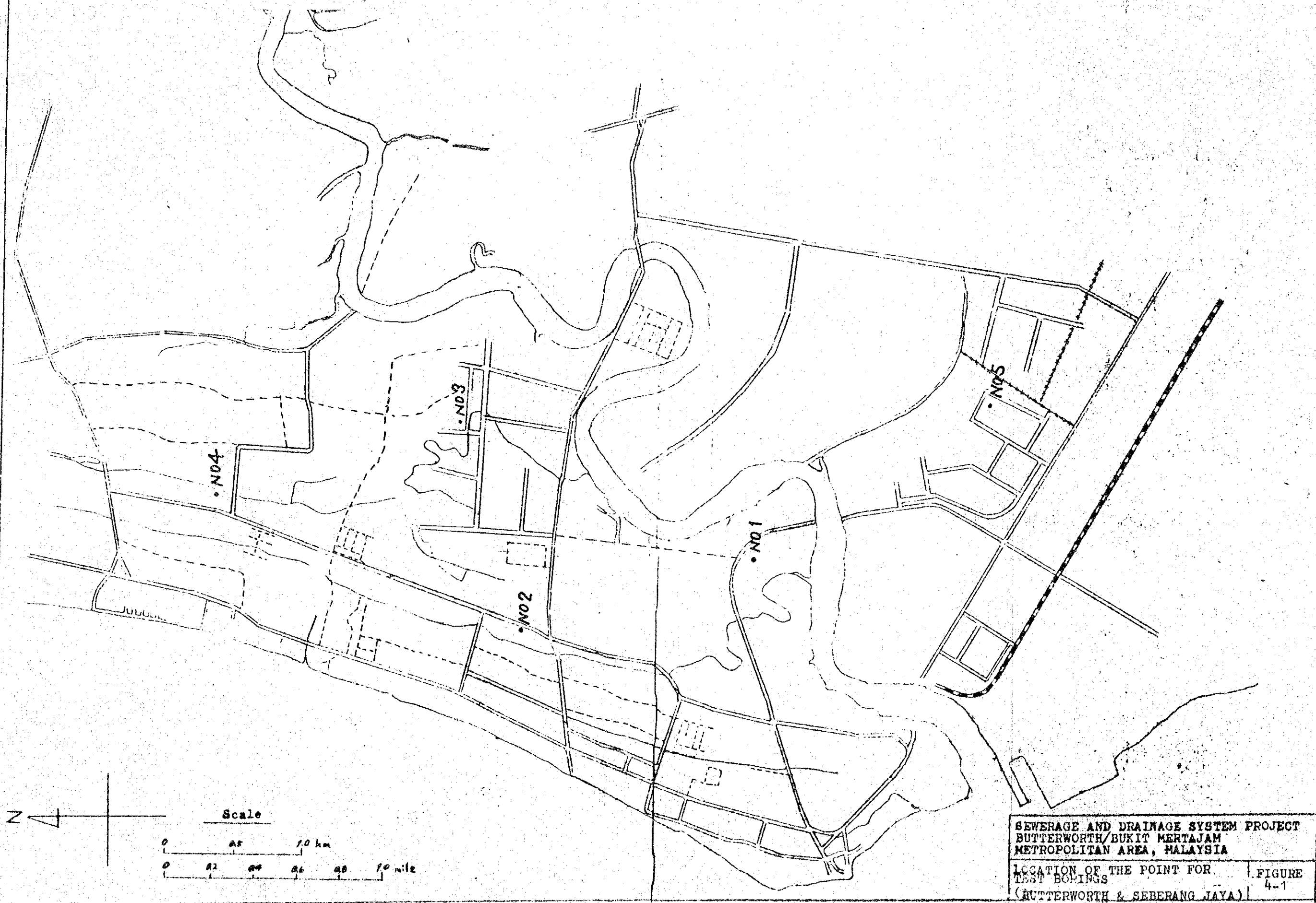
Date & Time	Depth of boring & casing	Ground Water	Samples & Tests			STRATA							
			Depth	Sample	Test	Legend	Depth	Reduced Level	Thickness	Description			
			ft. ins.				ft. ins.	feet	ft. ins.				
19/10/77 10:00 AM 12:00 13:00 15:30 16/10/77 8:00 11:00	5'0"	Struck water at 4'6"	0'6" - 1'6"	↓ 1	N=9		2'0"		2'0"	2'0"	2'0"	Thin brown clayey silty sand with roots.	
			2'0" - 3'0"	↓ 2	N=2				6'0"	Very loose light grey silty sand with yellow patches of clay.			
			3'6" - 4'6"	↓ 3	N=3				8'0"	7'6"	Soft milky grey silty clay with traces of sand.		
			4'6" - 5'0"	↓ 4	N=2								
			6'6" - 7'6"	↓ 5	N=2								
			13'6"	Rain	8'0" - 9'0"				↓ 6	N=4	15'6"	5'6"	Medium stiff milky grey clayey silty sand with patches of clay.
					9'6" - 10'6"				↓ 7	N=4			
					11'0" - 11'0"				↓ 8	N=5			
			21'0"	N.L. 3'6"	13'6" - 13'6"				↓ 9	N=4	21'0"	2'0"	Loose dark brown silty sand with organic material.
					14'8" - 15'8"				↓ 10	N=5			
					15'8" - 16'6"				↓ 11	N=5			
			23'0"	21'6"	17'0" - 18'0"				↓ 12	N=6	23'0"	1'6"	Stiff milky grey sandy silty clay.
					18'6" - 19'6"				↓ 13	N=7			
					20'0" - 21'6"				↓ 14	N=8			
					21'6" - 22'6"				↓ 15	N=6			
		23'0" - 24'0"	↓ 16	N=10									
			END OF BOREHOLE										

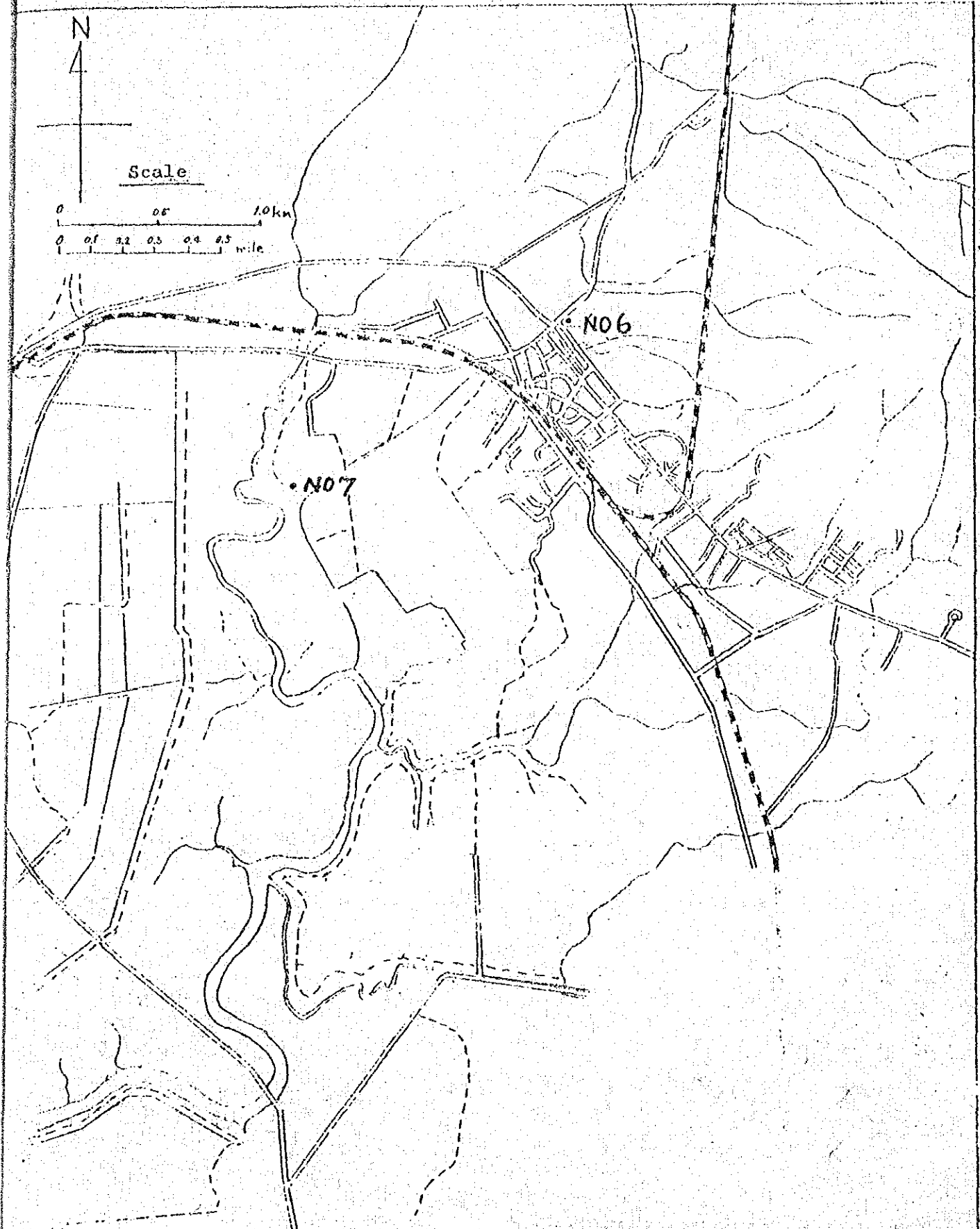
Note: Location of the point is shown in Figure 4-2

BOREHOLE No. 7																										
Type of boring <i>PERCUSSION MACHINE</i>					Sheet 1 of BH-7.																					
Type of rig <i>H.M.C. 200</i>					Feature <i>PENANG SEWERAGE AND DRAINAGE PROJECT</i>																					
Dia of boring <i>4.125"</i>					Location <i>BUKIT MEKATAM</i>																					
Casing details					Ground level:																					
Date & (Time)	Depth of boring & (casing)	Ground Water	Samples & Tests			Legend	Strata																			
			Depth	Sample	Test		Depth	Reduced Level	Thickness	Description																
			ft. Ins.				ft. Ins.	feet	ft. Ins.																	
21/10/77 8:00 am		Struck Water 2' 2"	0' 6" - 1' 6"	↓ 1	N = 7		3' 0"		3' 0"	Firm reddish brown silty clay with traces of sand and roots.																
			2' 0" - 3' 0"	↓ 2	N = 6					5' 0"	Very soft dark brown highly organic silt.															
			3' 6" - 4' 6"	↓ 3	N = 1						6' 0"	7' 0"	Very soft greyish brown silty clay with decaying organic material.													
			5' 0" - 6' 0"	↓ 4	N = 1									15' 0"	2' 0"	Yellowish brown - dilute -										
			6' 6" - 7' 6"	↓ 5	N = 1												17' 0"	6' 0"	Soft to med. stiff light grey clay with yellow and red patches.							
			8' 0" - 9' 0"	↓ 6	N = 1															23' 0"	1' 0"	Loose light grey silty med. to fine sand.				
			9' 6" - 10' 6"	↓ 7	N = 1																		24' 0"			
			11' 0" - 12' 0"	↓ 8	N = 1																					
			12' 6" - 13' 6"	↓ 9	N = 1																					
			14' 0" - 15' 0"	↓ 10	N = 1																					
			15' 6" - 16' 6"	↓ 11	N = 2																					
			17' 0" - 18' 0"	↓ 12	N = 2																					
			18' 6" - 19' 6"	↓ 13	N = 4																					
			20' 0" - 21' 0"	↓ 14	N = 4																					
			21' 6" - 22' 6"	↓ 15	N = 5																					
			23' 0" - 24' 0"	↓ 16	N = 7																					
11:30 am	24' 0"	W.L. 4' 8"	After extracted casing 2' 0"																							
END OF BOREHOLE.																										

Note: Location of the point is shown in Figure 4-2

b. Location of the Point for Test Borings.





SEWERAGE AND DRAINAGE SYSTEM PROJECT
BUTTERWORTH/BUKIT MERTAJAM
METROPOLITAN AREA, MALAYSIA
LOCATION OF THE POINT FOR
TEST BORINGS
(BUKIT MERTAJAM)

FIGURE
4-2

a. Existing Drainage System

TABLE 1

水路系統河川の水質分析結果

Sampling Points	DO (mg/l)	BOD ₃ (mg/l)	COD _{Mn} (mg/l)	SS (mg/l)	Cl ⁻ (mg/l)	Coliforms (N/ml)	Remarks
a-1	0.0	27.4	39.0	24	49	146,000	Gate open
a-2	0.4	53.5	53.7	62	16	9,500	
a-3	0.3	18.2	35.3	26	51	26,000	Kampong Drain
a-4	0.0	120.9	73.1	102	10	221,000	Residential
a-5	0.0	24.0	42.4	24	50	42,000	
a-6	0.0	65.4	71.9	54	77	300,000	Jln.Chain Ferry
b-1	0.4	11.2	23.4	18	72	45,000	Gate open
b-2	0.4	13.1	31.7	8	42	20,400	
b-3	0.3	19.9	26.7	16	33	29,000	bucket station
c-1	0.9	5.9	38.9	18	105	3,000	Swampy
c-2	0.1	23.0	41.4	10	51	83,000	Receiving residential sewage
c-3	-	20.2	36.4	18	54	141,000	New housing
c-4	-	16.5	36.1	14	45	154,000	New housing
d-1	0.0	22.8	64.0	30	2,975	148,000	Tide water
d-2	0.0	26.2	162.5	48	4,300	80,000	Mak Mandin
A	0.4	1.8	19.2	16	83	4	Gate closed
D	1.6	2.9	12.5	26	23	1	Irrigation water
F	1.5	7.1	10.1	32	31	15,000	Kampong
G	0.6	33.9	46.3	94	93	61,000	Receiving residential sewage
H-1	0.6	25.1	33.3	86	51	32,000	Sg.Rambai
H-2	0.0	40.0	50.5	116	78	84,000	B/N Town Drain
H-3	1.0	4.8	18.2	56	50	25,000	
I	7.1	3.0	3.3	14	8	100	unhabitation
J	2.1	5.4	9.5	26	17	1,200	
K	2.8	4.9	10.8	26	48	3,400	
L	1.6	7.8	33.0	100	28	500	irrigation water
M	6.2	0.9	9.1	18	5	9,000	"

Note: Sampling Stations are shown in Figures 5-1 and 5-2

b. Existing Sewerage System

TABLE 2 ストラクチャー浄化池へ流入水量から流入BOD濃度の変化

Time	Flow Rate (m ³ /day)			BOD ₃ (mg/l)	BOD Load		Remarks
	Pump A	Pump B	Total		kg/day	kg/ha.day	
20/10 PM							
12:00	241.7	162.2	403.9	-	-	-	rain
13:00	225.6	112.1	337.7	209.6	70.8	235.8	13:30
14:00	265.0	165.6	430.6	-	-	-	to
15:00	419.8	310.3	730.1	144.0	105.1	350.0	15:10
16:00	236.2	117.1	353.3	-	-	-	
17:00	207.6	111.1	318.7	-	-	-	
18:00	246.7	147.1	393.8	58.0	30.7	102.2	
19:00	296.4	156.7	353.1	-	-	-	
20:00	256.8	169.4	426.2	142.5	60.7	202.1	
21:00	210.5	97.7	308.2	-	-	-	
22:00	184.6	106.6	291.2	91.6	26.7	88.9	
23:00	139.0	70.6	209.6	-	-	-	
24:00	90.2	50.4	140.6	171.5	24.1	80.3	
21/10 AM							
1:00	90.2	40.8	131.0	-	-	-	
2:00	46.6	34.6	81.2	-	-	-	
3:00	46.6	34.6	81.2	-	-	-	
4:00	46.6	34.6	81.2	139.8	11.4	38.0	
5:00	46.6	32.9	79.5	-	-	-	
6:00	114.0	152.6	146.9	123.0	18.1	60.3	
7:00	215.5	166.6	358.1	-	-	-	
8:00	321.4	165.4	488.0	139.8	68.2	227.1	
9:00	244.6	165.4	410.0	(198.4)	81.3	270.7	
10:00	262.6	176.2	438.8	165.6	72.7	242.1	
11:00			(421.4)	(96.8)	82.9	276.1	
Average			304.5		54.4	181.1	

Note: Surface Area of 1st Pond: 0.3 ha (Seberang Jaya Pond)

TABLE 3 スタンダヤ守尾化沈の水質

Time	BOD ₃ mg/l	COD _{Mn.} mg/l	SS mg/l	Cl- mg/l	Coliform N/ml	Remarks
<u>Influent</u>						
20/10						
AM						
9:00	198.4	86	260	170	483,000	
11:00	196.8	116	364	160		
13:00	209.6	66	204	122	678,000	rain 13:30 to 15:10
15:00	144.0	35	136	133		
18:00	78.0	33	106	71		
20:00	142.5	42	96	171		
22:00	91.6	27	64	150		
24:00	171.5	42	128	210	210,000	
21/10						
AM						
4:00	139.8	41	58	260		
6:00	123.0	43	156	354		
8:00	139.8	64	176	307	294,000	
10:00	165.6	75	176	111		
<u>1st Pond</u>						
20/10						
AM						
9:00	464	33	98	154	25,800	
11:00		29	94	148		
13:00	29.3	28	72	156	16,700	rain 13:30 to 15:10
15:00		40	63	148		
<u>2nd Pond</u>						
20/10						
AM						
9:00	18.5	23	66	144	190	
11:00		25	70	135		
13:00		28	76	135	280	rain 13:00 to 15:10
15:00		26	72	133		

to be continued

TABLE 3 (continue)

Time	BOD ₃ mg/l	COD _{Mn} mg/l	SS mg/l	Cl- mg/l	Coliform N/ml	Remarks
<u>Effluent</u>						
20/10						
AM						
9:00	24.0	27	56	138	250	
11:00		24	62	140		
13:00	20.6	27	58	138	260	rain
14:00		26	60	137		13:30 to
15:00		26	58	140		15:10
22:00		28	52	138		
24:00		27	50	136	370	
21/10						
AM						
2:00	24.3	32	58	136		
8:00		34	66	140	290	
10:00		28	61	136	140	

TABLE 4 スプランクタン等総化水素の DO 垂直分布と日中変化

28 Oct. 77

Depth (m)	1st Pond(DO mg/l)			2nd Pond(DO mg/l)		
	Time 7:00	10:00	12:30	Time 7:00	10:30	13:15
0	0.0	7.9	33.6	0.0	5.5	10.2
0.15	0.0	3.6	24.0	0.0	4.2	6.7
0.30	0.0	3.6	4.0	0.0	1.5	5.5
0.60	0.0	0.0	0.0	0.0	0.0	0.8
1.00	0.0	0.0	0.0	0.0	0.0	0.0

21 Nov. 77

2nd Pond (DO mg/l)

Depth (m)	Time 10:00	12:00	14:00	16:00	18:00
0	14.7	27.7	29.3	25.0	20.6
0.15	13.5	26.9	17.1	21.5	16.6
0.30	0.5	3.0	14.7	14.6	16.4
0.45	0.4	0.3	0.6	8.2	9.5
0.60	0.3	0.2	0.3	0.1	0.2
0.75	0.2	0.1	0.4	0.0	0.0
0.90	0.1	0.1	0.2	0.0	0.1

TABLE 5 池田川の DO 生産量

1st Pond		Dissolved Oxygen (mg/l)				
Depth (m)	Time 6:50	8:50	10:50	12:50	14:50	16:50
0.05	0.0	0.0	27.4	56.5	63.9	70.9
0.20	0.0	0.0	2.7	5.1	9.2	8.8
0.35	0.0	0.0	0.0	0.0	0.3	0.0
0.50	0.0	0.0	0.0	0.0	0.0	0.0
0.65	0.0	0.0	0.0	0.0	0.0	0.0
0.80	0.0	0.0	0.0	0.0	0.0	0.0
0.95	0.0	0.0	0.0	0.0	0.0	0.0

2nd Pond		Dissolved Oxygen (mg/l)				
Depth (m)	Time 7:20	9:20	11:20	13:20	15:20	17:20
0.05	0.0	13.1	28.9	47.2	55.6	53.9
0.20	0.0	1.0	4.3	3.9	10.4	27.4
0.35	0.0	0.3	0.3	0.4	1.7	0.3
0.50	0.0	0.0	0.0	0.1	0.1	0.3
0.65	0.0	0.0	0.0	0.0	0.0	0.1
0.80	0.0	0.0	0.0	0.0	0.0	0.0
0.95	0.0	0.0	0.0	0.0	0.0	0.0

TABLE 6 ステンレス鋼管化処理の DO 測定値

1st Pond		2nd Pond	
Time (hr)	DO (mg/l)	Time (hr)	DO (mg/l)
0	7.18	0	3.88
0.25	5.73	0.25	3.40
0.5	4.55	0.5	2.60
1.0	2.14	1.0	1.78
1.5	0.13	1.5	1.52
2.0	0.00	2.0	1.23
		3.0	0.82

Remarks.

Initial BOD₃ of the samples

1st Pond 59.5 mg/l

2nd Pond 19.0 mg/l

c. Existing Excreta Disposal System

TABLE 7

1/10/87 3/11/87 2/11/87 1/11/87 1/11/87 1/11/87

No. Of Septic Tank	Sampling Point	BOD ₃ mg/l	COD _{Mn} mg/l	SS mg/l	Cl- mg/l	Coliform N/ml	Remarks
(U)-2	BF		42	32	136		
	EF		33	57	137	2,900	
(U)-3	RS		135	404	118	26,000	No F/B
	EF		81	42	112	5,500	
(U)-7	BF		73	112	44		
	EF	68	46	82	52		
(U)-12	EF	120	1360*	364	190	4,800	
(U)-13	BF	410	485*	52	148	6,300	
	EF	273	390*	59	140	4,000	
(U)-14	RS		93	296	128	31,000	
	EF		59	28	115	1,100	
(U)-28	BF		72	21	107	1,400	
	EF		63	110	131	2,500	
(U)-30	BF	35	32	38	57		
	EF		26	28	72		
(U)-31	EF		45	36	36		No F/B
(U)-32	BF	93	68	38	81		
	EF	51	55	56	53		
(U)-33	RS	126	123	200	140	140,000	
	BF	47	80	90	133	40,000	
	EF	35	79	162	132	39,100	
(T)-1	BF	193	345	1512	134		
	EF	83	173	596	127		
(T)-5	RS	222	105	266	45		pump spoiled
	BF	36	45	56	36		
(T)-6	BF	104	101	154	44		
	EF	58	51	64	44		
(T)-5	RS	179	122	188	54	480,000	pump spoiled

NOTES: RS --- Raw Sewage, BF --- Before Filter, EF --- Effluent

* --- COD Cr

d. Industrial Wastewater

TABLE 8

工場調査の対応工場リスト

Ref.No.	Names	Addresses	Products	Remarks
1*	Federal Cables, Wire & Metal Mfg. Sdn. Bhd.	P.O. Box 70 B/W	Elect. Cables	interviewed plating 6-2
2	Swee Hin & Company	3899 Jln. Ptg. Pauh B/W	Tyre Retreading	interviewed 4-2
3	Hup Soon Engineering Works	4863 Jln. Ptg. Pauh B/W	Metal Container	interviewed 6-1
4*	Lingham & Son	4870 Kawasan MEL E/M	Chilly Sauce	interviewed 1-3
5*	Sam Guan Frozean Sdn. Bhd.	5059 Mak Mandin B/W	Frozen Foods	interviewed 1-1
6*	Johnson Patterson Footwear Sdn. bhd.	5647 Mak Mandin B/W	Footwear	closed
7	Syarikat Ban Hin	5074-D Mak Mandin B/W	-	closed
8*	Acme Canning Sdn.	P.O. Box 54 B B/W	Foods	interviewed 1-3
9*	Ghee Hin Chang Chilly Sauce Factory	4139 Jln. Ptg. Pauh B/W	Sauce	interviewed 1-3
10	Lee Seng Hwa	133 Jln. Ptg. Pauh B/W	Sauce	closed
11	Chop Soon Cheong	402 Jln. Ptg. Pauh B/W	Sauce	outside
12	Khong Guan Sauce & Food Mfg. Co.	232 Bagan Ajam B/W	Sauce	outside
13	Hockston Corporation Sdn. Bhd.	6512 Mak Mandin B/W	Seafoods	closed
14*	Tong Ah Garment	6506 Mak Mandin B/W	Garment	interviewed 2-2
15*	Syarikat Poly Insulation Form	6500 Mak Mandin B/W	Synthetic Foams	interviewed 3-2
16*	Asia Pharmaceutical Products Sdn. bhd.	Mak Mandin B/W	Medicine	interviewed 3-3

to be continued

TABLE 8 (continue)

Ref.No.	Names	Addresses	Products	Remarks
17*	Barkath Mfg.Sdn.Bhd.	5127 Jln. Ptg. Pauh B/W	Foods	interviewed 1-3
18*	Johnson Shoes Sdn. Bhd.	5651 Mak Mandin B/W.	Shoes	interviewed 4-2
19*	A.K.Seenivasagam & Brothers	P.O.Box 3 B/W		interviewed 1-3
20*	United Malayan Flour Mills Bhd.	P.O.Box 28 B/W	Flour	1-3
21*	Allied Malayan Tex- tile Bhd.	4828 Mak Mandin B/W	Textiles	interviewed 2-2
22*	Aik Joo Can Factory Bhd.	4829 Mak Mandin B/W	Cans	interviewed 6-1
23	Pama Food Process- ing Sdn.Bhd.	4608 Jln. Ptg. Pauh B/W	Seafoods	interviewed 1-1
24	Tong Teik Rubber Factory	4072 Jln. Raja Uda B/W	N.Rubber	interviewed 4-1
25*	Solex Oil Bhd.	4826 Jln. Ptg. Pauh B/W	Veg.Oil	interviewed 1-2
26	Kah Motor Co.Boon Siew Motor	4449 Jln. Ptg. Pauh B/W	Motor Assembly	interviewed 8-1
27*	Fraser & Neave(M) Sdn.Bhd.	3724, Jln. Sg. Nyior B/W	Soft-drinks	interviewed 1-4
28	Eastern Industries Sdn.Bhd.	5652 Mak Mandin B/W		storage 9-2
29	Eastern Shoes Mfg.	5064 Mak Mandin B/W	Shoes	under repairing
30*	Seng Huat Motor & Fuel Injection Ser.	5647 Mak Mandin B/W	Ironworks	interviewed 6-1
31	Khian Guan Biscuit Factory	3738 Jln. Siram B/W	Biscuit	interviewed 1-3
32*	Steel Pipe Industry (M) Sdn.Bhd.	4457 Jln. Chain Ferry B/W	Steel pipe	interviewed 6-2

to be continued

TABLE 8 (continue)

Ref.No.	Names	Addresses	Products	Remarks
33*	NGK Plug (M) Bhd.	4586 Jln. Ptg. Pauh B/W	Spark Plug	interviewed 6-1
34*	Great Eastern Knitting Factory Sdn.Bhd.	5060 Jln. Ptg. Pauh B/W	Textiles	interviewed dyeing 2-1
35*	Butterworth Ice Works Sdn.Bhd.	4402 Jln. Chain Ferry B/W	Ice	interviewed 1-1
36*	ESSO Standard (M) Ltd.	Jln. Pantai B/W	Fuel Oil	interviewed storage 9-2
37*	Chahaya Paints Factory Sdn.Bhd.	4547 Jln. Ptg. Pauh B/W	Paints	interviewed 9-1
38	Syarikat Wah Bee Sdn.Bhd.	4868 Jln. Ptg. Pauh B/W	Art Material	under construction
39*	Heng Yip Machinery Industry Sdn.Bhd.	260 Jln. Ptg. Pauh B/W	Ironworks	interviewed 6-1
40	Shanghai Siang Mee Co.	4864 Mak Mandin B/W	Tiles	interviewed 5-1
41	Mobil Oil(M) Ltd.	Jln. Ptg. Pauh	Fuel Oil	9-2
42	Teik Tatt Company	5068 Mak Mandin B/W	Synthetic Material	not factory 9-2
43*	Silver Bell Co.	5495 Mak Mandin B/W.	Ironworks	interviewed plating 6-2
44*	Syarikat Cold Storage(M)Sdn.Bhd.	5496 Mak Mandin B/W	Soft-drinks	interviewed 1-4
45	Lam Hoe Company	6531 Mak Mandin B/W	Printings	interviewed 9-2
46	Shell Malaysia Trading Sdn.Bhd.	Jln. Pantai B/W	Fuel Oil	interviewed storage 9-2
47	Kau Ting Heong	4822 Mak Mandin B/W	Joss Stick	interviewed 9-1
48*	Syarikat Sett Mfg. Sdn. Bhd	Mak Mandin B/W.	Cosmetics	interviewed 9-1
49	Hock Heng Co.Ltd.	5094 Mak Mandin B/W	Rubber	interviewed packing, trading 9-2

to be continued

TABLE 8 (continue)

Ref.No.	Names	Addresses	Products	Remarks
50*	Khong Guan Oil Refinery	4825 Mak Mandin B/W.	Veg. Oil	interviewed 1-2
51*	Malaysia Aica Sdn.Bhd.	5100 Mak Mandin	Plastic Sheets	interviewed 3-2
52	Syarikat Chip Seng Trading Sdn.Bhd.	5888 Mak Mandin B/W	Printing Papers	interviewed 9-1
53	M/S Sin Chuan Bee Feather Works	5499 Mak Mandin B/W	Feather Process	interviewed not factory 9-2
54	Aik Hin Plastic Co.	116 Mk.14 Mak Mandin B/W	Plastics	interviewed 4-2
55	Playing Cards (M) Sdn.Bhd.	5886 Mak Mandin B/W	Cards	interviewed 9-1
56*	India Malaysia Textiles	P.O.Box 85 B/W	Textiles	interviewed dyeing 2-1
57*	Penang Pewter & Metal Arts Sdn.Bhd.	P.O.Box 51 B/W	Metal Work	interviewed 6-1
58*	Pan Asia Paper Product Mfg.Sdn. Bhd.	170 Mak Mandin B/W	Paper	outside
59*	Malaysia Agricultural Oil Sdn.Bhd.	171-3 Mak Mandin B/W	Veg.Oil	interviewed 1-2
60*	Reown Wire Netting Industry Sdn.Bhd.	265 Mak Mandin B/W	Metal Work	interviewed 6-2
61	Hollywood Comestic Factory	139 Mak Mandin B/W	Plastic Cycle parts	interviewed 4-2
62*	Chop Guan Seng	6422 Jln. Ptg. Pauh B/W	Fruit Process	interviewed 1-3
63*	Ting Tai Metal Ware Factory	4821 Mak Mandin B/W	Metal Work	interviewed 6-1
64	Chop Tai Hin	6424 Jln. Ptg. Pauh B/W	Tyre Retreading	interviewed 4-2
65	Kim Seah Foundry	4860 Mak Mandin B/W	Metal work	interviewed 6-1

to be continued

TABLE 8 (continue)

Ref.No.	Names	Addresses	Products	Remarks
66	Sin Heng Chan(M)	Jln. Ptg. Pauh B/W	Animal Food	interviewed storage 9-2
67	Shroffs(M) Ltd.	4364 Jln. Heng Choon Thian B/W	Machine parts	not factory 9-2
68	Rex Canning	5099 Mak Mandin B/W	Food	interviewed 1-3
69	Calsberg Brewery (M) Bhd.	3854 Jln. Ptg. Pauh B/W	Beer	interviewed storage 9-2
70	Tat & Co.	4053 Jln. Ptg. Pauh B/W	Bicycle parts	interviewed 6-2
71	Ban Seong Co.	3896 Jln. Ptg. Pauh B/W	Bicycle parts	interviewed 6-1
72	Somitomo	4548 Mak Mandin B/W	Dye Stuff	closed
73	Shanghai Sin Kee	3895 Jln. Ptg.	Dry Cleaning	not factory 9-2
74	Union Carbide	4551 Jln. Ptg. Pauh B/W	Battery	not factory 9-2
75	Butterworth Seafoods	1590 Jln. Ptg. Pauh B/W	Seafood	interviewed 1-1
76	Kim Guan Choong	4047-8 Jln. Ptg. Pauh, 851, Jln. Ptg. Pauh B/W	Vegetable	interviewed storage 9-2
77	Europe & Asia Industry	4055 Jln. Ptg. Pauh B/W	Biscuit	interviewed 1-3
78*	K.Cheong Sauce Factory	4137 Jln. Ptg. Pauh B/W	Sauce	interviewed 1-3
79	Leow's Farming Development	4546 Jln. Ptg. Pauh B/W	Agri. Products	interviewed shop 9-2
80	Syarikat Lee Samsu	4541 Jln. Ptg. Pauh B/W	Liquor	interviewed shop 9-2
81	Asian Food Products Sdn.Bhd.	5069 Mak Mandin B/W	Bakery	interviewed 1-3

to be continued

TABLE 8 (continue)

Ref.No.	Names	Addresses	Products	Remarks
82*	Jin Cola	4540 Jln. Ptg. Pauh B/W	Soft-drinks	interviewed 1-4
83*	Hong Leong Lurssen Ship- yard Bhd.	4567 Jln. Chain Ferry B/W	Shipyards	interviewed 9-1
84	Allied Malayan Development	Mak Mandin B/W	Textile	interviewed dyeing 2-1
85	Public Textile	Jln. Ptg. Pauh B/W	Textile	interviewed dyeing 2-1
86	Continental Seafood	Jln. Ptg. Pauh B/W	Seafood	interviewed 1-1
87	Sitt Tatt	Jln. Ptg. Pauh B/W	Gas	interviewed 9-1
88*	Syarikat Strait Trading Co.	Jln. Pantai B/W	Tin	interviewed 6-3
89	Kok Electric Plating	Jln. Assumption B/W	Metal work	interviewed plating 6-2
90*	G.A.M. Cigar Factory	436 Jln. Sungai Rambai B.H.	Cigar	interviewed 9-1
91*	Tai Chong Press Ltd.	103 Jln. Besar B.H.	Printing	interviewed 9-1
92	Eastern Printers	6 & 7 Jln. Murthy B.H.	Printing	interviewed 9-1
93.	Southern Press & Company	499 Jln. Sungai Rambai B.H.	Printing	interviewed 9-1
94*	Province Wellesley Icework Co. Sdn.Bhd.	237 Jln. Sungai Rambai B.M.	Ice	1-3
95	Teck Aun Medical Mill	488 Jln. Sungai Rambai B.M.	Medicine	interviewed 3-3
96*	Chocolate Pro- ducts(M)Sdn.Bhd.	Mak Mandin B/W	Chocolate	surveyed in 1976 1-3

to be continued

TABLE 8 (continue)

Ref.No.	Names	Addresses	Products	Remarks
97*	Hack Malaysia Sdn.	Mak Mandin B/W	Biscuit	Surveyed in 1976 1-3
98*	Zuelling Feed-mills(M) Sdn. Bhd.	Mak Mandin B/W	Animal Food	" 1-3
99*	Coco Industry Sdn.Bhd.	Mak Mandin B/W	Coco Fibre	" 2-2
100*	Blood Protection (M) Sdn. Bhd.	Mak Mandin B/W	Mosquito-Coil	" 3-3
101*	Syarikat Eastern Powder Sdn.Bhd.	Mak Mandin B/W	Apparel	" 2-2
102*	North Malaya Engineering	Mak Mandin B/W		" 6-2
103*	Malaysia Foods Bhd.	Seberang Jaya Industrial Est.	Food Stuff	" 1-3
104*	United Chemical Industries.	Seberang Jaya Industrial Est.	Plastics	" 3-2

* Questionnaire Collected

TABLE 9

工場の汚水と排水の特性

Type of Industry		Number of Factories	Wastewater Characteristics
Category	Sub-Division		
1. Food Stuffs	1-1 Seafoods	5	high BOD & SS
	1-2 Vegetables Oils	3	high oily floatables
	1-3 Other Foods	17	high or low pH, high BOD
	1-4 Soft Drinks	3	high pH
2. Textiles	2-1 Dyeing	4	high BOD & colour much water consumption heavy metals
	2-2 Spinning, Weaving/ Apparel	4	low water consumption
3. Chemicals	3-1 Chemical Synthesis	0	-
	3-2 Processing	3	low water consumption
	3-3 Medicine	3	" " "
4. Rubber	4-1 Natural Rubber	1	much water consumption high BOD & SS
	4-2 Processing (including synthetics)	5	low water consumption
5. Glass, Clay/ Stones	5-1 Tile	1	high SS, low BOD
6. Metals	6-1 Manufacturing	9	low water consumption grease & oil leakage
	6-2 Plating/ Galvanization	17	low pH, heavy metals
	6-3 Other Metal Works	1	low water consumption
7. - 9 others	7-1 - 9-2	28	low water consumption

TABLE 10 工場排水の分析結果 (I)

Sample	WT oC	pH	BOD ₅ mg/l	COD _{Cr} mg/l	SS mg/l	Oil & Grease mg/l
(1)	17.5	8.2	1720	2,145	1,100	74
(2)	40.5	1.9	730	8,775	2,485	9,580
(3)	32.6	9.4	750	146,940	1,825	58,310
(4)	61.7	4.3	170	325	380	10
(5)	50.0	10.1	100	410	20	5
(6)	34.1	10.8	50	295	20	10
(7)	32.6	8.4	50	200	25	4
(8)	-	10.4	215	1,735	-	-
(9)	-	12.2	1,000	6,665	-	-
(10)	-	10.4	65	2,525	-	-
(11)	-	12.6	280	10,910	-	-
(12)	-	7.8	55	165	435	6

- (1) : Seafoods (Washing Water)
 (2),(3),(4) : Vegetable Oil (After Oil Trap)
 (5),(6) : Soft Drinks (Total Waste Effluent)
 (7) : Dyeing Textile (Total Waste Effluent)
 (8),(9),(10)& : Dyeing Textile (Primary Dyeing Effluent
 (11) before Washing)
 (12) : Rubber (Washing Water after Solid Traps.)

TABLE 11

工場排水の分析例 (Ⅱ)

Sample	Chromium mg/l	Cadmium mg/l	Mercury mg/l	Lead mg/l	Zinc mg/l	Nickel mg/l	Arsenic mg/l
(1)	0.049	0.002	Nil	0.41	3.09	0.13	Nil
(2)	0.072	0.006	Nil	0.55	5.58	0.15	Nil
(3)	0.020	Nil	Nil	0.06	1.29	0.02	Nil
(4)	261	0.006	Nil	1.82	3.34	24.9	Nil
(5)	190	0.009	Nil	0.11	3.18	180	Nil
(6)	0.080	0.060	Nil	0.23	0.07	0.44	Nil
(7)	0.030	0.018	Nil	0.16	0.74	0.10	Nil
(8)	0.058	0.041	Nil	0.16	0.11	0.26	Nil
(9)	0.064	0.032	Nil	0.76	0.23	0.17	Nil

- (1), (2) : Galvanizing (Acid Washing Wastes)
 (3) : Assembling (Total Waste Effluent)
 (4), (5) : Electroplating (Washing Wastes)
 (6), (7), (8), (9) : Dyeing (Primary Dyeing Effluent before Washing)

安定化池内の光合成作用と及び有機態五酸化砷水の
影響実験結果

TABLE 12

Dilution	Photosynthetic OXYSen Production (mg/hr)												
	Blank1	Black1	Brown	Pink	Blank2	Green	Blue-I	Purple	Blue-II	Black-II	Blank3	Orange	Red
10	13.5	0.0	0.0	7.0	13.3	0.0	6.1	0.0	2.4	0.0	17.2	2.7	0.0
100	14.5	0.0	11.2	12.8	13.8	3.5	14.0	9.1	9.8	0.0	18.2	17.9	12.0
1,000	14.3	11.3	13.6	13.2	10.6	13.3	12.7	10.2	12.5	9.9	18.9	20.8	19.0
10,000	15.2	13.0	14.1	14.3	14.5	13.8	12.5	11.7	13.5	11.9	19.2	21.1	19.5
100,000	-	13.7	14.3	14.3	12.6	13.0	12.4	13.1	13.1	11.7	18.9	21.6	20.3
1,000,000	-	-	-	-	-	-	-	-	-	12.9	-	-	21.0

* The samples collected are primary dyeing effluents before diluted by water.
The pH values are shown as follows:

Orange	10.40	Green	12.70
Red	12.15	Blue-I	6.10**
Black	12.60	Blue-II	12.55
Brown	11.95	Purple	10.44
Pink	10.35		

** Blue-I is washing effluent from an apparel factory.

TABLE 13

工場排水の有機成分の分解速度に関する実験結果

Exp. I

I - a *

Time hr.	Temp °C	DO mg/l.
0	29	6.49
0.5	30	6.22
1.0	30.5	5.99
2.0	30.5	5.59
4.0	30	5.14
6.0	29	4.62
20.0	28	1.92
30.0	28	0.57

I - b **

Time hr.	Temp °C	DO mg/l.
0	29	6.72
0.5	30	5.62
1.0	30	5.02
2.0	30	4.45
4.0	30.5	3.83
6.0	30	3.57
20.0	27.5	0.76
30.0	29	0.09

Exp. II

II - a ***

Time hr.	Temp °C	DO mg/l.
0	29	7.06
0.5	29	5.04
1.0	29	1.87
2.0	30	0.29
3.0	30	0.00
4.0	29	0.00

II - b ***

Time hr.	Temp °C	DO mg/l.
0	30	6.22
0.5	29	6.08
1.0	30	5.79
2.0	29	4.71
4.0	30.5	1.98
6.0	30	0.00
20.0	27	0.00

Remarks.

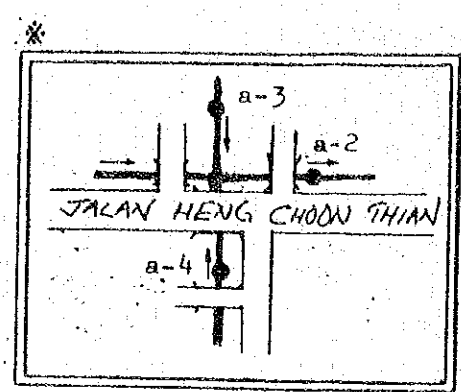
- * I-a : Mixture of 500 ml Rubber Fact. Wastes, 2800 ml Distilled Water and 5 ml Sewage
- ** I-b : Mixture of 500 ml Rubber Fact. Wastes, 2500 ml Distil Water (without Sewage)
- *** II-a : Mixture of 200 ml Seafood Fact. Wastes, 2500 ml Distill Water and 5 ml Sewage
- *** II-b : Mixture of 500 ml Seafood Fact. Wastes, 2500 ml Distill Water and 5 ml Sewage

TABLE 13 (contine)

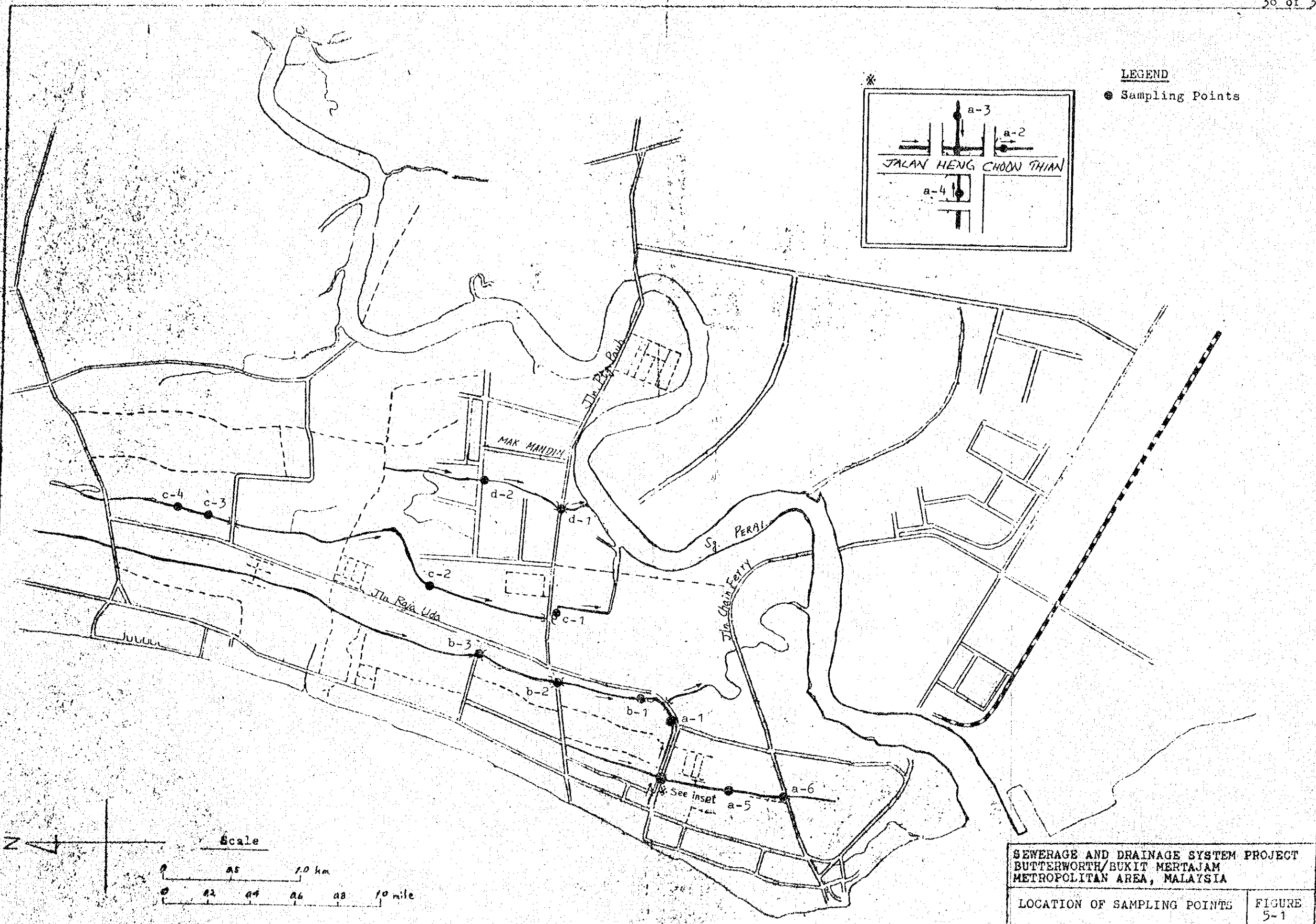
Exp. III	III *	Exp. IV	IV *		
Time hr.	Temp °C	DO mg/l	Time hr.	Temp °C	DO mg/l
0	28	6.79	0	29	6.71
0.5	28	6.60	0.5	29.5	6.69
1.0	29	6.95	1.0	30	6.82
2.0	29.5	6.80	2.0	30	6.88
4.0	30	6.84	4.0	29	6.68
26.0	30	6.85	6.0	29	6.51
33.5	29.5	0.00	9.0	29	5.34
47.0	28.5	0.00	24.0	30	2.66
			32.0	29.5	1.07
			45.0	28.5	0.38
			53.0	29.5	0.05

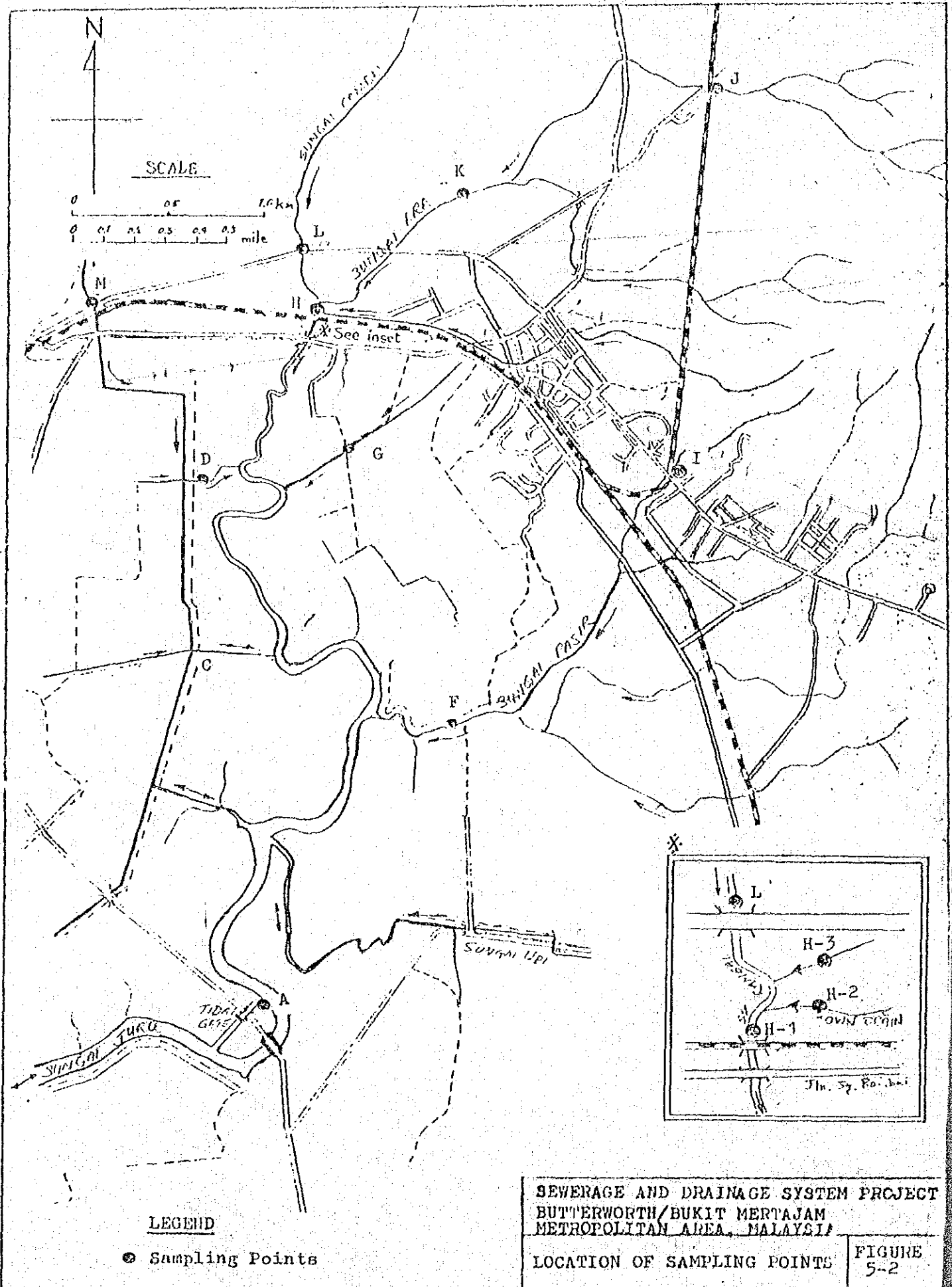
Remarks.

- * III : Mixture of 1 l Soft Drink Bottling Wastes,
2 l Distill Water and 5 ml Sewage
- * IV : Mixture of 200 ml Oil Mill Wastes,
2800 ml Distil Water and 5 ml Sewage



LEGEND
 ● Sampling Points





SEWERAGE AND DRAINAGE SYSTEM PROJECT
BUTTERWORTH/BUKIT MERTAJAM
METROPOLITAN AREA, MALAYSIA
LOCATION OF SAMPLING POINTS
FIGURE 5-2

