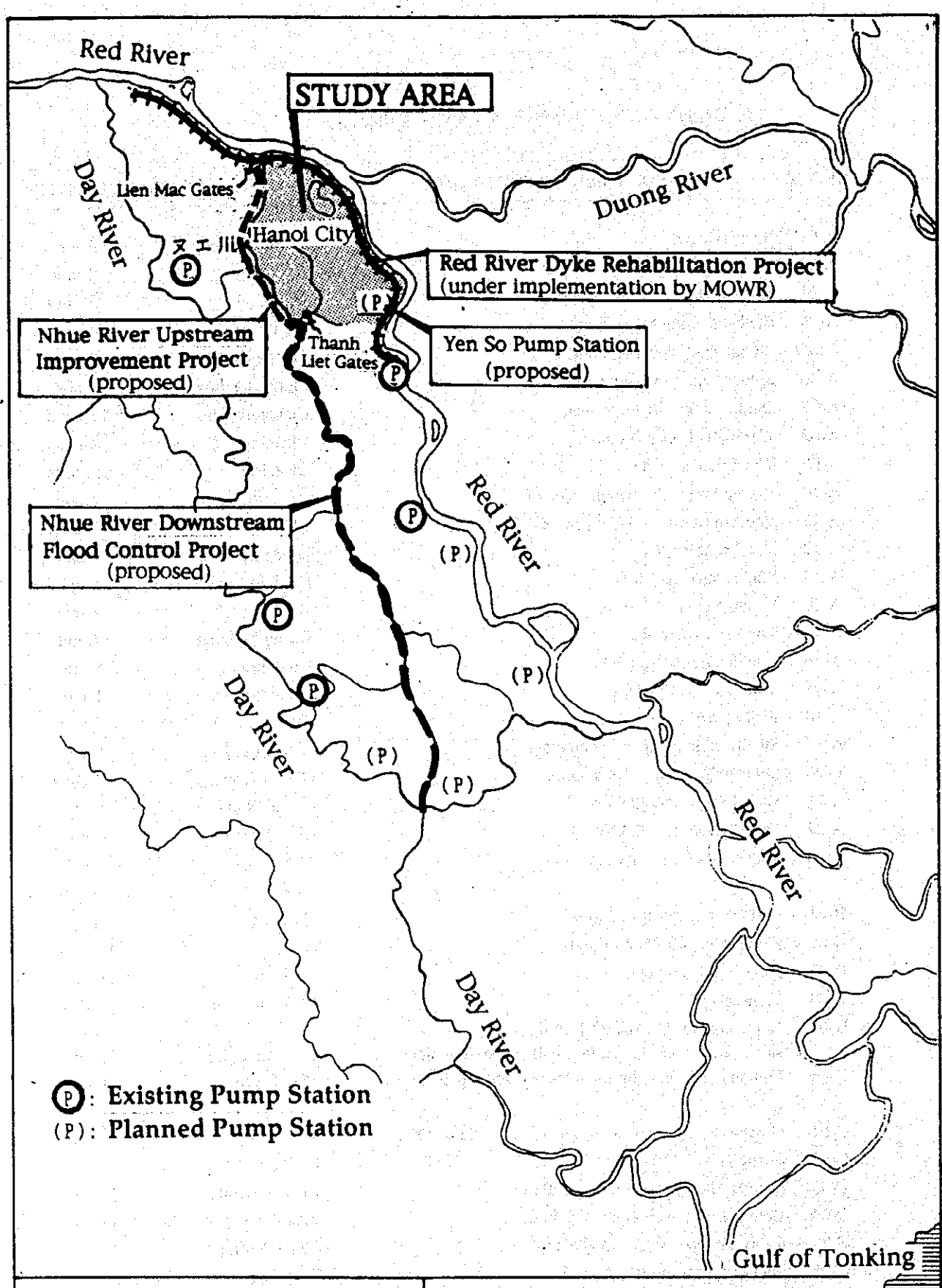
付 属 資 料

付属資料 － 3.1　下水管渠／排水路浚渫用機材リスト

GROUP	EQUIPMENT/SPECIFICATION	PURPOSE OF USE	QUANTITY
A-01	Swampdozer, 7t	Disposal sites	2 units
A-02	Excavator, grab bucket, 0.2 m3	Dredging	2 units
A-03	Working barge for the above	Dredging	2 units
A-04	Sludge hauling barge, 6 m3	Sludge hauling	4 units
A-05	Sludge hauling barge, 2m3	Sludge hauling	8 units
A-06	Sludge settling vessel, 6 m3	Sludge hauling	2 nos.
A-07	Dump truck, 4 t w/extension	Clean/dredging	12 units
A-08	Water jet cleaner, 4 t truck	Cleaning	2 units
A-09	Water tanker, 4 m3	Cleaning	5 units
A-10	Vacuum truck, 8 t w/high vacuum	Dredging	2 unit
A-11	Vacuum truck, 4 t w/dehydrator	Cleaning	2 units
A-12	Vacuum truck, 4 t	Dredging	14 units
A-13	Sludge tank truck 4 t	Dredging	6 units
A-14	Portable winch for sewer	Dredging	2 sets
A-15	Truck, 4 t w/crane 3 t	Clean/dredging	7 units
A-16	Rough terrain crane, 30 t	Dredging/etc.	1 unit
A-17	Tractor & Trailer, 20 t	Dredging/etc.	1 unit
A-18	Pick-up truck, 1 t	SV/F-service	8 units
A-19	Submersible pump, 150 mm dia.	Clean/dredging	6 units
A-20	Submersible pump, 100 mm dia.	Clean/dredging	9 units
A-21	Diesel generator, 30 kVA	Clean/dredging	6 sets
A-22	Diesel generator, 20 kVA	Clean/dredging	4 sets
A-23	Spare parts for the above	15 % of CIF	1 lot
B-01	Portable gas detector, 3 gases	Cleaning	7 nos.
B-02	Floodlight, 300 W, W/tripod	Cleaning	10 sets
B-03	Blower, 300 mm dia.,	Cleaning	11 nos.
B-04	Transceiver	Clean/dredging	7 sets
B-05	Hand tools for Dredging/Cleaning small canal, collector basin, small connection pipes, etc.	Clean/dredging	1 lot
B-06	Equipment & tools for maintenance and repair shop	M & R shop	1 lot
C-01	Dredge suction pipe (steel) set, 150 mm dia. x 200 m	Dredging	3 sets
C-02	Suction hose, 150 mm x 5 m	Dredging	6 pcs
C-03	Delivery hose, 150 mm dia. x 50 m	Clean/dredging	30 sets
C-04	Delivery hose, 100 mm dia. x 50 m	Clean/dredging	45 sets
C-05	Cabtyre cable, 100 m w/cable reel	Clean/dredging	30 sets
C-06	Fuel and lubricant (for 1 year)	Clean/dredging	600 m3



SOCIALIST REPUBLIC OF VIET NAM
THE STUDY ON URBAN DRAINAGE AND WASTEWATER DISPOSAL SYSTEM IN HANOI CITY
JAPAN INTERNATIONAL COOPERATION AGENCY

付属資料 － 3.2

調査対象地域と紅河・ヌエ川本流の関係位置図

付属資料 — 3.3　下水道整備計画ー処理区域別特性

Item	ZONE 1		ZONE 2		ZONE 3	ZONE 4	ZONE 5	ZONE 6		ZONE7	Total/Average
	ZONE 1-1	ZONE 1-2	ZONE 2-1	ZONE 2-2				ZONE 6-1	ZONE 6-2		
Area (ha)	930	1,060	990	1,010	1,350	500	2,800	870	2,290	1,740	13,540
Future Population	40,300	46,500	303,800	129,200	299,400	190,300	243,900	114,200	180,100	49,100	1,596,800
Future Population Density (person /ha)	43.3 (111.0)	43.9	306.9	127.9	221.8	380.6	87.1	131.3	78.6	28.2	117.9
Future Wastewater Yield (m3/d)	8,260	7,910	73,370	36,000	70,360	44,720	56,450	29,830	43,220	8,290	378,410
- Domestic	6,539	5,585	54,660	23,026	53,892	34,254	42,063	20,480	31,151	6,330	277,980
- Commercial	1,722	642	16,689	6,951	16,467	10,467	12,147	6,230	9,035	977	81,327
- Industrial	0	1,680	2,016	6,020	0	0	2,240	3,121	3,035	984	19,096
Future Pollutant Load (kg/d)	2,765	3,591	22,455	11,507	21,257	13,511	17,962	9,378	13,827	3,463	119,716
Specific Yield (m3/d/ha)	8.88 (22.75)	7.46	74.11	35.64	52.12	89.44	20.16	34.29	18.87	4.76	27.95
Specific Load (kg/d/ha)	2.97 (7.62)	3.39	22.68	11.39	15.75	27.02	6.42	10.78	6.04	1.99	8.84
Raw Wastewater Quality (BOD & SS :mg/l)	335	454	306	320	302	302	318	314	320	418	316
	301	409	275	288	272	272	286	283	288	376	285
Name of Receiving Water	West Lake	Nhue	Kim Nguu	Kim Nguu	To Lich	Lu	Nhue	To Lich	Nhue	To Lich	
Proposed Removal Efficiency of BOD & SS(%)	80		85	85	85	85	75	75	75	75	
	80		80	80	80	80	80	80	80	80	
Treated Wastewater Quality (BOD:mg/l)			50	50	50	50	80	80	80		
- Domestic	60	50								90	
-Commercial/Industrial	50	50								50	
Proposed Wastewater Disposal System	On-site/ Community	Community	Large Scale Centralized		Medium Scale Centralized	Medium Scale Centralized	Medium Scale Centralized	Medium Scale Centralized		Non-Treatment	
Alternative Wastewater Disposal System	Small Scale Centralized		Medium Scale Centralized		Large Scale Centralized					On-site/ Community	

付属 3

付属資料 — 3.4 (1)　排水計画事業費の算定

Description	Cost ($1,000)
I. TO LICH RIVER BASIN (77.5 km2)	
1st Stage Construction Project	
A. Construction Cost	113,391
1. Site Preparatory Works	723
2. Main Civil Works	85,071
(1) General Installations	8,066
(2) Yen So Pumping Station	13,506
(a) Pumping Station, Civil Work	5,360
(b) Inlet Structure	1,435
(c) Inlet Channel, 1,200 m	1,914
(d) Ordinary Drainage Channel, 1,900 m	834
(e) Outlet Sluiceway, Civil Work	1,158
(f) Outlet Channel, 1,600 m	2,805
(3) Yen So Regulating Reservoir	19,151
(a) Regulating Reservoir, 203 ha	14,923
(b) Yen So Channel, 3,400 m	2,522
(c) Spoil Bank	1,706
(4) Linh Dam Channel, 1,000 m	2,204
(5) Floodgates and Control Gates, Civil Work	4,489
(6) River Improvement	14,427
(a) Lower Kim Nguu, To Lich and Lower Lu Rivers, and Thanh Liet Channel, 22,100 m	8,899
(b) Set and Upper Lu Rivers, and Lu–Set Floodway, 7,500 m	4,299
(c) Upper Kim Nguu River, 3,400 m	1,229
(7) Hygdromechanical Equipment	22,828
(a) Pumping Station, Mechanical/Electrical Work	19,520
(b) Outlet Sluiceway Gates	315

Note : 1994 price, excluding price contingencies

付属資料 — 3.4 (2)　排水計画事業費の算定

Description	Cost ($1,000)
(c) Floodgates and Control Gates, Metal Work	2,993
(8) Installation of Flood Forecasting System	400
3. Drainage Channel Improvement, Reconstruction of Bridges/Culverts	4,548
(1) To Lich and Lower Lu River Basins, and Hoang Liet Drainage Basin, 16,400 m	2,979
(2) Set and Upper Lu River Basins, 3,700 m	397
(3) Kim Nguu River Basin, 10,700 m	1,172
4. Lake Improvement	3,367
(1) Lake Dredging, 4 lakes	3,052
(2) Lake Conservation, Aeration in 2 pilot lakes	315
5. Sewer Rehabilitation and Construction	10,032
(1) West Lake Basin	336
(2) To Lich River Basin	1,660
(3) Set River Basin	1,284
(4) Upper Lu River Basin	2,649
(5) Kim Nguu River Basin	4,103
6. Supply of Dredging Eauipment	9,650
B. Administration Cost	3,402
C. Land Acquisition and Compensation Cost	15,181
1. Land Acquisition	14,030
2. House Evacuation	501
3. Fishery Compensation	650
D. Physical Contingency	11,573

Note : 1994 price, excluding price contingencies

付属資料 — 3.4 (3)　排水計画事業費の算定

Description	Cost ($1,000)
E. Engineering Service Cost	16,925
(Sub-total of 1st Stage Construction Project)	160,472
2nd Stage Construction Project	
A. Construction Cost	101,609
1. Main Civil Works	27,878
(1) General Installations	1,512
(2) Yen So Pumping Station	5,519
(a) Pumping Station, Civil Work	4,384
(b) Outlet Sluiceway, Civil Work	1,135
(3) Linh Dam and Dinh Cong Lakes	4,561
(a) Linh Dam Lake, 107 ha	3,348
(b) Dinh Cong Channel, 400m	429
(c) Dinh Cong Lake, 25 ha	784
(4) Hydromechanical Equipment	16,286
(a) Pumping Station, Mechanical/Electrical Work	15,971
(b) Outlet Sluiceway Gates	315
2. Drainage Channel Improvement	17,723
(1) To Lich and Lower Lu River Basins and Hoang Liet Drainage Basin, 16,400 m	11,684
(2) Set and Upper Lu River Basins, 3,700 m	2,924
(3) Kim Nguu River Basin, 10,700 m	3,115
3. Lake Improvement	7,584
(1) Lake Dredging, 14 lakes	6,240
(2) Lake Conservation, 11 lakes	1,344
4. Sewer Rehabilitaion and Construction	48,424
(1) West Lake Basin	2,412

Note : 1994 price, excluding price contingencies

付属資料 — 3.4 (4)　排水計画事業費の算定

Description	Cost ($1,000)
(2) To Lich River Basin	15,262
(3) Lower Lu River Basin	2,891
(4) Hoang Liet Drainage Basin	5,167
(5) Set River Basin	6,273
(6) Upper Lu River Basin	3,311
(7) Kim Nguu River Basin	12,803
(8) Yen So Drainage Basin	305
B. Administration Cost	3,048
C. Land Acquisition and Compensation Cost	20,049
1. Land Acquisition	18,050
2. House Evacuation	1,339
3. Fishery Compensation	660
D. Physical Contingency	11,656
E. Engineering Service Cost	20,577
(Sub-total of 2nd Stage Construction Project)	156,939
Total of I. TO LICH RIVER BASIN	317,411
II. NHVE RIVER BASIN (57.9 km2)	
Co Nhue Drainage Basin Project (19.7 km2)	
A. Construction Cost	54,787
1. Drainage Improvement	25,801

Note : 1994 price, excluding price contingencies

付属資料 — 3.4 (5)　排水計画事業費の算定

Description	Cost ($1,000)
(1) General Installations	3,365
(2) Pumping Station, 12 m3/S	9,405
(3) Regulating Reservoir, 76 ha	9,808
(4) Drainage Channels, 19,200 m	3,223
2. Nhue River Left Levee, 6,000 m	565
3. Sewer Construction	25,019
4. River/Lake Conservation Works	3,402
B. Administration Cost	1,644
C. Land Acquisition and Compensation Cost	14,478
1. Land Acquisition	14,033
2. House Evacuation	65
3. Fishery Compensation	380
D. Physical Contingency	7,091
E. Engineering Service Cost	8,218
(Sub-total of Co Nhue Drainage Basin Project)	86,218
<u>My Dinh Drainage Basin Project (13.6 km2)</u>	
A. Construction Cost	26,659
1. Drainage Improvement	15,516
(1) General Installations	2,024
(2) Pumping Station, 8m3/S	6,648
(3) Regulating Reservoir, 40 ha	5,124

Note : 1994 price, excluding price contingencies

付属資料 — 3.4 (6)　排水計画事業費の算定

Description	Cost ($1,000)
(4) Drainage Channels, 13,400 m	1,720
2. Nhue River Left Levee, 3,700 m	348
3. Sewer Construction	8,446
4. River/Lake Conservation Works	2,349
B. Administration Cost	800
C. Land Acquisition and Compensation Cost	6,133
1. Land Acquisition	5,894
2. House Evacuation	39
3. Fishery Compensation	200
D. Physical Contingency	3,359
E. Engineering Service Cost	3,999
(Sub-total of My Dinh Drainage Basin Project)	40,950
Me Tri Drainage Basin Project (14.7 km2)	
A. Construction Cost	30,801
1. Drainage Improvement	16,799
(1) General Installations	2,191
(2) Pumping Station, 9m3/S	7,317
(3) Regulating Reservoir, 40 ha	5,222
(4) Drainage Channels, 13,500 m	2,069
2. Nhue River Left Levee, 4,800 m	452
3. Sewer Construction	11,011

Note : 1994 price, excluding price contingencies

付属資料 — 3.4 (7)　排水計画事業費の算定

Description	Cost ($1,000)
4. River/Lake Conservation Works	2,539
B. Administration Cost	924
C. Land Acquisition and Compensation Cost	12,791
1. Land Acquisition	12,500
2. House Evacuation	91
3. Fishery Compensation	200
D. Physical Contingency	4,452
E. Engineering Service Cost	4,620
(Sub-total of Me Tri Drainage Basin Project)	53,588
Ba Xa Drainage Basin Project (9.9 km2)	
A. Construction Cost	18,510
1. Drainage Improvement	10,877
(1) General Installations	1,419
(2) Pumping Station, 6m3/S	5,174
(3) Regulating Reservoir, 27 ha	3,390
(4) Drainage Channels, 8,700 m	894
2. Nhue River Left Levee, 4,100 m	386
3. Sewer Construction	5,537
4. River/Lake Conservation Works	1,710
B. Administration Cost	555

Note : 1994 price, excluding price contingencies

付属資料 — 3.4 (8)　排水計画事業費の算定

Description	Cost ($1,000)
C. Land Acquisition and Compensation Cost	1,995
1. Land Acquisition	1,834
2. House Evacuation	26
3. Fishery Compensation	135
D. Physical Contingency	2,106
E. Engineering Service Cost	2,776
(Sub-total of Ba Xa Drainage Basin Project)	25,942
Total of II. NHUE RIVER BASIN	206,698
III. GRAND TOTAL	524,109

Note : 1994 price, excluding price contingencies

付属資料 — 3.5　下水管渠／排水路浚渫機材調達費用の算定

GROUP	EQUIPMENT/SPECIFICATION	QUANTITY	CIF AT SITE PRICE (US$ 1,000) UNIT	AMOUNT
A-01	Swampdozer, 7t	2 units	9,950	19,900
A-02	Excavator, grab bucket, 0.2 m3	2 units	11,250	22,500
A-03	Working barge for the above	2 units	12,300	24,600
A-04	Sludge hauling barge, 6 m3	4 units	3,800	15,200
A-05	Sludge hauling barge, 2m3	8 units	650	5,200
A-06	Sludge settling vessel, 6 m3	2 nos.	1,200	2,400
A-07	Dump truck, 4 t w/extension	12 units	4,400	52,800
A-08	Water jet cleaner, 4 t truck	2 units	21,600	43,200
A-09	Water tanker, 4 m3	5 units	6,900	34,500
A-10	Vacuum truck, 8 t w/high vacuum	2 unit	27,300	54,600
A-11	Vacuum truck, 4 t w/dehydrator	2 units	33,400	66,800
A-12	Vacuum truck, 4 t	14 units	11,950	167,300
A-13	Sludge tank truck 4 t	6 units	10,900	65,400
A-14	Portable winch for sewer	2 sets	3,450	6,900
A-15	Truck, 4 t w/crane 3 t	7 units	6,850	47,950
A-16	Rough terrain crane, 30 t	1 unit	31,600	31,600
A-17	Tractor & Trailer, 20 t	1 unit	17,900	17,900
A-18	Pick-up truck, 1 t	8 units	2,100	16,800
A-19	Submersible pump, 150 mm dia.	6 units	690	4,140
A-20	Submersible pump, 100 mm dia.	9 units	430	3,870
A-21	Diesel generator, 30 kVA	6 sets	2,600	15,600
A-22	Diesel generator, 20 kVA	4 sets	2,350	9,400
A-23	Spare parts for the above	1 lot		109,284
	Sub-total:			837,844
B-01	Portable gas detector, 3 gases	7 nos.	340	2,380
B-02	Floodlight, 300 W, W/tripod	10 sets	95	950
B-03	Blower, 300 mm dia..	11 nos.	145	1,595
B-04	Transceiver	7 sets	85	595
B-05	Hand tools for Dredging/Cleaning	1 lot	2,300	2,300
B-06	Equip. & tools for maint. and repair shop	1 lot	16,800	16,800
	Sub-total:			24,620
C-01	Dredge suction pipe (steel) set, 150 mm dia.	3 sets	1,550	4,650
C-02	Suction hose, 150 mm x 5 m	6 pcs	150	900
C-03	Delivery hose, 150 mm dia. x 50 m	30 sets	140	4,200
C-04	Delivery hose, 100 mm dia. x 50 m	45 sets	95	4,275
C-05	Cabtyre cable, 100 m w/cable reel	30 sets	284	8,520
C-06	Fuel and lubricant (for 1 year)	600 m3		0
	Sub-total:			22,545
	Total:			885,009

付属資料 － 3.6　下水道整備事業費の算定

(Project Cost)　　(Unit: US$)

Sewerage Zone / Cost Item	ZONE 1-1	ZONE 1-2	ZONE 2-1	ZONE 2-2	ZONE 3	ZONE 4	ZONE 5	ZONE 6-1	ZONE 6-2	ZONE 7	Toatl
A.Direct Cost	15,608,000	17,038,000	57,198,000	35,375,000	62,904,000	38,275,000	77,397,000	30,705,000	61,433,000	13,253,000	295,340,000
1.Treatment Plant	13,800,000	8,444,000	35,499,000	17,418,000	37,383,000	23,663,000	31,466,000	15,721,000	22,778,000	13,253,000	170,785,000
2.Sewer		8,226,000	17,436,000	17,789,000	23,464,000	6,605,000	45,563,000	14,616,000	38,471,000		107,684,000
3.Diversion Chamber	48,000		48,000		38,000	19,000					153,000
4.Relay Pumping Station		368,000	336,000	168,000	184,000	184,000	368,000	368,000	184,000		1,440,000
5.Pilot Treatment Plant (Kim Lien)						5,448,000					5,448,000
6.Lake Water Quality Improvement Works (West lake is not included)	1,760,000		3,879,000		1,835,000	2,356,000					9,830,000
B.Land Acquisition Cost	2,982,000	361,000	2,505,000	1,253,000	15,200,000	11,419,000	2,755,000	718,000	1,040,000	415,000	35,994,000
C.Engineering Services Cost (15 % of A)	2,341,000	2,556,000	8,580,000	5,306,000	9,436,000	5,741,000	11,610,000	4,606,000	9,215,000	1,988,000	44,302,000
D.Administration Cost (5 % of A+B)	930,000	870,000	2,985,000	1,831,000	3,905,000	2,485,000	4,008,000	1,571,000	3,124,000	683,000	16,567,000
E.Physical Contingency (20 % of A to D)	4,372,000	4,165,000	14,254,000	8,753,000	18,289,000	11,584,000	19,154,000	7,520,000	14,962,000	3,268,000	78,441,000
Sub-Total	26,233,000	24,990,000	85,522,000	52,518,000	109,734,000	69,504,000	114,924,000	45,120,000	89,774,000	19,607,000	637,926,000

(Annual O&M Cost)

Sewerage Zone / Cost Item	ZONE 1-1	ZONE 1-2	ZONE 2-1	ZONE 2-2	ZONE 3	ZONE 4	ZONE 5	ZONE 6-1	ZONE 6-2	ZONE 7	Toatl
(US$/year)											
A.Treatment Plant	414,000	253,000	1,065,000	523,000	1,121,000	873,000	944,000	472,000	683,000	1,136,000	7,484,000
B.Collection Sewer System	5,000	26,000	65,000	54,000	77,000	27,000	138,000	45,000	116,000		553,000
Total	419,000	279,000	1,130,000	577,000	1,198,000	900,000	1,082,000	517,000	799,000	1,136,000	8,037,000

(Replacement cost)

25years after Construction	ZONE 1-1	ZONE 1-2	ZONE 2-1	ZONE 2-2	ZONE 3	ZONE 4	ZONE 5	ZONE 6-1	ZONE 6-2	ZONE 7	Toatl
(US$)	9,200,000	4,550,000	25,699,000	12,613,000	25,736,000	18,441,000	21,606,000	11,227,000	15,917,000	12,076,384	157,065,384

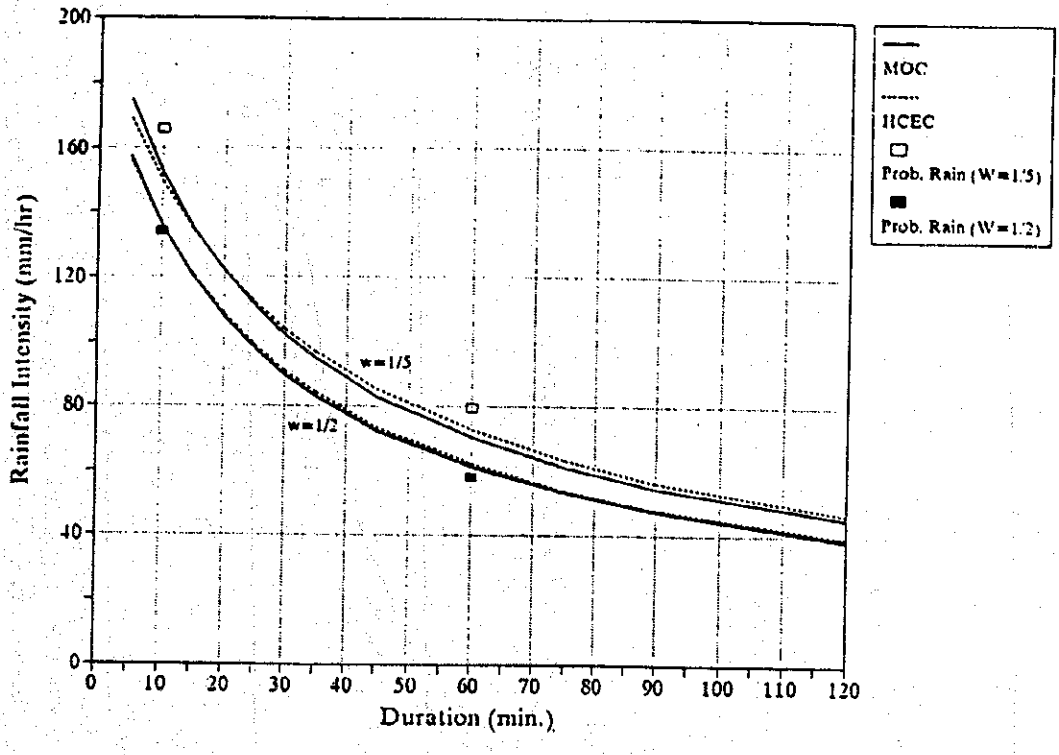
付属 13

付属資料 3.7 — 事業実施所要賃金の年度別フロー

(US$1,000)

		1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
I. Urban Drainage Plan	524,107	8,150	29,866	42,762	47,235	27,568	15,780	22,439	57,422	53,534	25,217	21,962	31,806	28,285	27,845	22,023	20,611	18,023	5,629	6,166	5,447						
1 To Lich River	317,409	8,150	29,866	42,762	47,235	27,568	15,780	22,439	57,422	46,841	19,346																
1st Stage	160,470	8,150	29,866	42,762	47,235	27,568	4,889																				
2nd Stage	156,939						10,891	22,439	57,422	46,841	19,346																
2 Nhue River	206,698									6,693	5,871	21,962	31,806	28,285	27,845	22,023	20,611	18,023	5,629	6,166	5,447						
Co Nhue	86,218									6,693	5,871	21,962	23,458	20,892	7,342												
My Dinh	40,950												3,000	2,556	8,916	9,645	8,937	7,896									
Me Tri	53,588												5,348	4,837	11,587	12,378	10,338	9,100									
Ba Xa	25,942																1,336	1,027	5,629	6,166	5,447						
II. Wastewater Disposal Plan	637,926		3,991	5,038	5,933	5,968	7,093	23,553	34,022	36,350	14,181	20,668	31,891	16,809	33,015	32,663	45,970	29,222	35,567	30,720	23,268	42,666	30,382	52,308	39,722	23,019	13,907
(1) 2 – 1	85,522		1,134	1,134	1,870	3,373	2,638	21,415	21,415	23,743	8,800																
(2) Zone 4	69,504		2,857	3,845	3,848	741	249	249	8,358	8,358	3,275	17,473	17,473	2,778													
(3) Zone 3	109,734					360	1,619	360	2,720	2,720	360	1,619	10,739	9,480	23,678	23,678	23,678	8,723									
(4) Zone 2 – 2	52,518													314	2,339	1,066	13,942	13,942	13,942	6,973							
(5) Zone 6 – 1	45,120												189	189	189	1,110	1,541	619	11,893	11,893	11,893	5,604					
(6) Zone 5	114,924																	601	2,923	4,576	2,254	29,289	29,289	29,289	16,703		
(7) Zone 6 – 2	89,774																			469	2,312	2,936	1,093	23,019	23,019	23,019	13,907
(8) Zone 1 – 1	26,233			59	215	1,494	2,587	1,474	1,474	1,474	1,474	1,474	1,474	1,474	1,474	1,474	1,474	1,474	1,474	1,474	1,474	1,242					
(9) Zone 1 – 2	24,990												104	662	3,423	3,423	3,423	1,951	3,423	3,423	3,423	1,735					
(10) Zone 7	19,607							55	55	55	272	102	1,912	1,912	1,912	1,912	1,912	1,912	1,912	1,912	1,912	1,860					
III. Grand Total	1,162,033	8,150	33,857	47,800	53,168	33,536	22,873	45,992	91,444	89,884	39,398	42,630	63,697	45,094	60,860	54,686	66,581	47,245	41,196	36,886	28,715	42,666	30,382	52,308	39,722	23,019	13,907

RAINFALL INTENSITY CURVES IN HANOI



Rainfall Intensities proposed by MOC

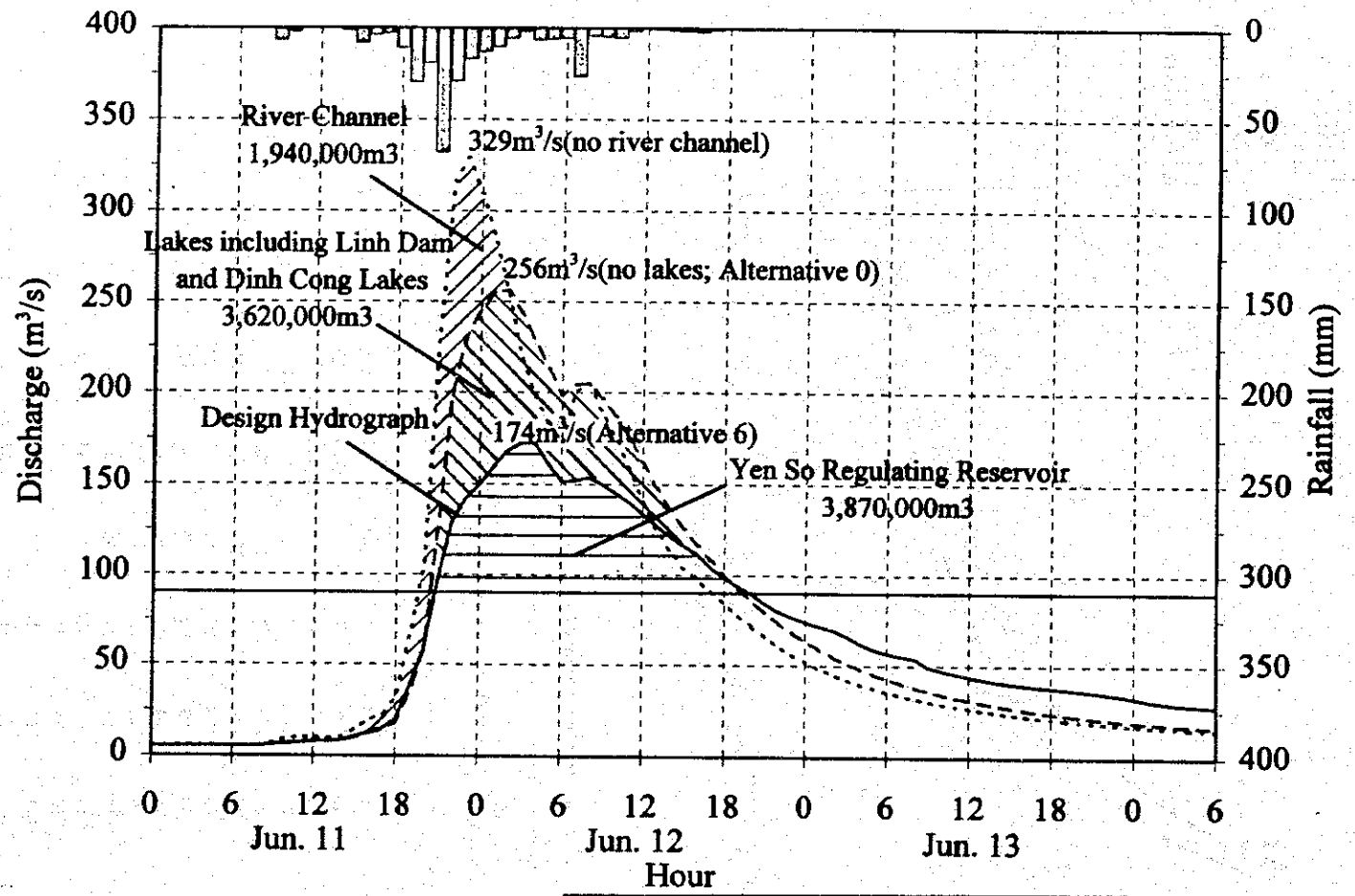
unit : mm/hr

Duration (min.)	Return Period (year)						
	50	20	10	5	3	2	1
5	219	202	188	175	165	157	144
10	194	177	165	152	143	136	123
15	174	158	147	135	127	120	108
20	157	143	132	122	114	107	97
25	144	131	121	111	103	98	88
30	133	121	111	102	95	90	80
35	124	112	103	95	88	83	74
45	109	99	91	83	77	72	64
60	93	84	77	70	65	61	54
75	82	74	68	61	57	53	47
90	73	66	60	55	51	47	42
120	61	55	50	45	42	39	34
180	47	42	38	34	31	29	25
240	38	34	31	28	25	24	20
360	29	25	23	21	19	17	15
480	23	21	19	17	15	14	12

SOCIALIST REPUBLIC OF VIET NAM
THE STUDY ON URBAN DRAINAGE AND WASTEWATER DISPOSAL SYSTEM IN HANOI CITY
JAPAN INTERNATIONAL COOPERATION AGENCY

付属資料 － 4.1
ハノイ市の雨量強度

Hydrographs of Alternatives at the Yen So Site
Jun. 12 '89 Flood Type (10-year)



SOCIALIST REPUBLIC OF VIET NAM THE STUDY ON URBAN DRAINAGE AND WASTEWATER DISPOSAL SYSTEM IN HANOI CITY	付属資料 — 4.2 計画洪水ハイドログラフ
JAPAN INTERNATIONAL COOPERATION AGENCY	

付属資料 — 4.3　水門工の計画概要

Name	Location	Purpose	Design Discharge (m3/s)	Dimensions	Gate Type
1. Thanh Liet Floodgate	T 0.4 K	To prevent backwater from the Nhue River and to secure natural drainage to the river.	45	12 m wide x 7 m high x 2 gates	Steel roller gate
2. Hoa Binh Floodgate	K 1.1 K	To prevent backwater through the Hoa Binh channel, and to secure irrigation water to the channel.	—	5 m wide x 3 m high	- do -
3. Van Dien Floodgate	K 3.7 K	To prevent backwater through the Old To Lich River, and to secure irrigation water to the river.	—	5 m wide x 3 m high	- do -
4. West Lake Control Gate (A)	T 14.6 K	To contain floodwater from the basin, and to release the water after the flood.	12	4 m wide x 3 m high x 2 gates	- do -
5. West Lake Control Gate (B)	West bank of West Lake	To contain floodwater from the basin, and to secure irrigation water to the downstream reaches.	—	3 m wide x 3 m high	- do -
6. Lu River Control Gate	L 3.2 K	To divert floodwaters toward the Lu-Set floodway, and to release maintenance water to the Lower Lu River when necessary.	—	3 m wide x 3 m high	- do -
7. Nghia Do Control Gate	T3.A Drainage Channel 1.6 K	To prevent backwater from the Nhue River basin, and to intake irrigation water from the basin.	—	3 m wide x 3 m high	- do -

Lake No.	Lake Name	Area (ha)	Perimeter (km)	Low Water Level in Rainy Season EL (m) Present	Low Water Level in Rainy Season EL (m) Proposed	Ground Level EL (m)	Dimensions of Dredging Depth *1 (m)	Dimensions of Dredging Volume (1,000 m3)	Proposed Type of Improv-ment *2	Characteristics Flood Control Effect	Characteristics Quality of Environment Surrounding	Characteristics Accessability	Recent Dredging by HPC
T 7	Giang Vo	8.4	1.1	5.5	3.5	6.2	2.0	168	A	Large	High	Easy	
T 8	Ngoc Khanh	4.5	0.9	5.1	3.5	5.9	1.6	72	B	Medium	Medium	Easy in future	X
T 9	Thanh Cong	6.5	1.2	4.9	3.5	6.0	1.4	91	A	Medium	High	Easy	X
T10	Hao Nam	2.8	0.5	5.2	3.5	5.8	1.7	48	B	Small	Low	Easy	
T13	Dong Da	18.6	1.8	4.7	3.5	5.6	1.2	223	B	Large	High	Possible	
T16	Nghia Do 1	5.2	0.8	5.0	3.5	6.2	1.5	78	A	Medium	High	Easy	X
L 3	Van Chuong	4.1	0.8	5.2	3.5	5.7	1.7	70	B	Medium	Low	Easy	
L 4	Tho Quang	1.5	0.6	5.3	3.5	5.6	1.8	27	B	Small	Low	Hard	
L 6	Trung Tu	5.1	0.9	4.9	3.5	5.9	1.4	71	B	Medium	High *3	Easy	
L11	Phuong Liet 1	5.6	1.2	4.5	3.5	5.3	1.0	56	C	Medium	Medium	Hard	
L12	Phuong Liet 2	1.9	0.6	4.5	3.5	5.2	1.0	19	C	Small	Low	Easy	
S 2	Bay Mau	23.1	2.0	5.0	3.5	5.9	1.5	347	A	Large	High	Easy	X
S 4	Trai Ca	4.7	1.1	4.2	3.5	5.4	0.7	33	C	Medium	Low	Hard	
S 5	Lang Tam	1.9	0.9	4.5	3.5	5.4	1.0	19	C	Small	Low	Hard	
S 7	Thanh Liet	13.2	1.4	4.3	3.5	5.0	0.8	106	C	Large	Low	Hard	
S 8	Dam Set	3.6	0.6	4.0	3.5	5.0	0.5	18	C	Small	Low	Hard	
K 3	Thanh Nhan 1	8.5	1.2	4.7	3.5	6.2	1.2	102	A	Large	Medium	Easy	
K 4	Thanh Nhan 2	4.0	0.8	4.7	3.5	6.2	1.2	48	B	Medium	Medium	Easy	
Total		123.2	18.4	—	—	—	—	1,596	—	—	—	—	4

*1 Dredging will be done by the depth corresponding to the balance between the present and proposed normal water levels that aims to conserve the present lake use and environments.

*2 Refer to Fig. D4.11.

*3 The lake is separated from the drainage channel whose water quality is badly polluted, so that connection between them for flood control purpose is not recommended at present.

付属資料 － 4.5　トーリック流域排水プロジェクト事業費

Unit: US $ 1,000 equivalent

Item	First Stage Construction			Second Stage Construction			Total		
	F.C.	L.C.	Total	F.C.	L.C.	Total	F.C.	L.C.	Total
1 Construction Works	88,771	24,616	113,387	69,906	31,702	101,608	158,677	56,318	214,995
A. Construction Works	80,021	23,716	103,737	69,906	31,702	101,608	149,927	55,418	205,345
B. Procurement of Equipment & Materials	8,750	900	9,650	0	0	0	8,750	900	9,650
2 Administration Cost	0	3,401	3,401	0	3,048	3,048	0	6,449	6,449
3 Land Acquisition and Compensation Cost	0	15,180	15,180	0	20,050	20,050	0	35,230	35,230
4 Import Tax	0	3,980	3,980	0	3,282	3,282	0	7,262	7,262
5 Engineering Service	10,728	4,660	15,388	12,160	6,547	18,707	22,888	11,207	34,095
6 Price Escalation	9,140	4,356	13,496	18,945	14,273	33,218	28,085	18,629	46,714
7 Physical Contigency	9,296	5,537	14,833	9,290	7,888	17,178	18,586	13,425	32,011
Grand Total	117,935	61,730	179,665	110,301	86,790	197,091	228,236	148,520	376,756

付属資料 －4.6 (1) 第1期・第2期別工事内容内訳

Item	First Stage Project	Second Stage Project
1- Yen So Pumping Station		
(1) Pumping Station	Q = 45 m3/s	Q = 45 m3/s
(2) Inlet Structure	B = 200 m	--
(3) Inlet Channel	L = 1,200 m	--
(4) Ordinary Drainage Channel	L = 1,900 m	--
(5) Outlet Sluiceway	A = 30 m2	A = 30 m2
(6) Outlet Channel	L = 1,600 m	--
2- Yen So Regulating Reservoir		
(1) Regulating Reservoir	A = 203ha (130ha)	--
(2) Yen So Channel	L = 3,400 m	--
(3) Spoil Bank	A = 40 ha	--
3- Linh Dam and Dinh Cong Lakes		
(1) Linh Dam Channel	L = 1,000 m	--
(2) Linh Dam Lake	--	A = 107 ha
(3) Dinh Cong Channel	--	L = 400 m
(4) Dinh Cong Lake	--	A = 25 ha
4- Floodgates and Control Gates	7 places	--
5- River Improvement		
(1) To Lich and Lower Lu River System	L = 22.1 km (Lower Lu = 3.2km)	--
(2) Set and Upper Lu River System	L = 7.5 km (Upper Lu = 3.1km)	--
(3) Kim Nguu River System	L = 3.4 km	--
6- Drainage Channel Improvement		
(1) To Lich and Lower Lu River Basin	Bridges/Box Culverts (21 places)	Channel Works (L = 16.4 km) and Bridge/Box Culverts (24 places)
(2) Set and Upper Lu River Basin	Bridges/Box Culverts (13 places)	Channel Works (L = 3.7 km) and Bridge/Box Culverts (2 places)
(3) Kim Nguu River Basin	Bridges/Box Culverts (20 places)	Channel Works (L = 10.7 km) and Bridge/Box Culverts (1 places)

付属資料 － 4.6 （2）第 1 期・第 2 期別工事内容内訳

Item	First Stage Project	Second Stage Project
7- Lake Improvement		
(1) Lake Dredging	4 lakes	14 lakes
(2) Lake Conservation	Aeration in 2 lakes as a pilot project	Overall environmental measures for 11 lakes
8- Sewer Rehabilitation and Construction		
(1) West Lake Basin	Rehabilitation	New construction
(2) To Lich River Basin	Rehabilitation	Rehabilitation/ New construction
(3) Lower Lu River Basin	—	New construction
(4) Hoang Liet Drainage Basin	—	New construction
(5) Set River Basin	Rehabilitation	New construction
(6) Upper Lu River Basin	Rehabilitation/ New construction	New construction
(7) Kim Nguu River Basin	Rehabilitation/ New construction	New construction
(8) Yen So Drainage Basin	—	New construction
9- Equipment Supply for Cleanup of Drainage Channels and Sewers	Grab bucket excavator, water jet cleaner, etc.	— —

付属資料 — 4.7　下水管渠増設計画

Work Item	Unit	STAGE 1 Work Quantity	STAGE 2 Work Quantity
1. West Lake Basin (930 ha)		(W1:80 ha)	(W2:850 ha)
1.1 Rehabilitation of Existing Combined System			
(1) Pipe			
D 1000	m	360	0
D 800	m	480	0
D 600	m	1,200	0
(2) Box Culvert			
1.3*1.2 m	m3	400	0
1.2 Sewer Converted from Open Channel			0
1.3 Newly Installed Separate Sewer			
(1) Trunk Sewer			
D 1000	m	0	1,900
D 1200	m	0	930
(2) Secondary Sewer			
D 900	m	0	700
D 800	m	0	1,000
D 700	m	0	1,300
D 600	m	0	1,700
D 500	m	0	2,000
(3) Box Culvert			
1.3*1.2 m	m3	0	900
1.5*1.2 m	m3	0	3,760
2. To Lich River Basin (2000 ha)		(T1:130 ha &T5a:194 ha)	(T2,T3,T4,T5b, T6,T7,T8 & T9)
2.1 Rehabilitation of Existing Combined System			
(1) Pipe			
D 1200	m	630	1,300
D 1000	m	420	740
D 800	m	4,720	8,280
D 600	m	3,130	5,520
(2) Box Culvert			
1.5*1.30 m	m3	1,470	2,580
2.8*1.05	m3	350	620
2.2 Sewer Converted from Open Channel			
1.60*1.2 m	m3	0	7,780
1.45*1.0 m	m3	0	2,570
2.3 Newly Installed Separate Sewer			
(1) Trunk Sewer			
D 1000	m	0	7,800
D 1200	m	0	5,344
(2) Secondary Sewer			
D 900	m	0	2,700
D 800	m	0	4,100
D 700	m	0	5,400
D 600	m	0	6,900
D 500	m	0	8,200
(3) Box Culvert			
1.5*1.2 m	m3	0	3,449
1.8*1.2 m	m3	0	15,215
3. Upper Lu River Basin (587 ha)		(L1:215 ha)	(L2, L3 & L4)
3.1 Rehabilitation of Existing Combined System			
(1) Pipe			
D 1200	m	720	0
D 1000	m	480	0
D 800	m	3,180	0
D 600	m	2,130	0
(2) Box Culvert			
1.3*1.2 m	m3	1,660	0
1.3*1.1 m	m3	410	0
3.2 Sewer Converted from Open Channel			
1.8*1.4 m	m3	4,180	0
1.5*1.4 m	m3	1,670	0
3.3 Newly Installed Separate Sewer			
(1) Trunk Sewer			
D 1000	m	0	2,250
D 1200	m	0	1,520
(2) Secondary Sewer			
D 900	m	0	900
D 800	m	0	1,400
D 700	m	0	1,900
D 600	m	0	2,300
D 500	m	0	2,800
(3) Box Culvert			
1.5*1.5 m	m3	0	1,260
2.0*2.0 m	m3	0	5,290
4. Lower Lu River Basin (433 ha)			
4.1 Rehabilitation of Existing Combined System			
4.2 Sewer Converted from Open Channel			
4.3 Newly Installed Separate Sewer			
(1) Trunk Sewer			
D 1000	m	0	2,600
D 1200	m	0	1,672
(2) Secondary Sewer			
D 900	m	0	1,100
D 800	m	0	1,600
D 700	m	0	2,100
D 600	m	0	2,700
D 500	m	0	3,200
(3) Box Culvert			
1.2*1.2 m	m3	0	3,976

Work Item	Unit	STAGE 1 Work Quantity	STAGE 2 Work Quantity
5. Int River Basin (710 ha)		(I1:217 ha)	(I2,I3 & I4)
5.1 Rehabilitation of Existing Combined System			
(1) Pipe			
D 1200	m	620	0
D 1000	m	420	0
D 800	m	2,750	0
D 600	m	1,830	0
(2) Box Culvert			
1.8*1.4 m	m3	2,080	0
5.2 Sewer Converted from Open Channel			
1.80*1.40 m	m3	0	3,600
1.60*1.25 m	m3	0	1,880
1.25*1.15 m			
5.3 Newly Installed Separate Sewer			
(1) Trunk Sewer			
D 1000	m	0	3,500
D 1200	m	0	2,250
(2) Secondary Sewer			
D 900	m	0	1,400
D 800	m	0	2,300
D 700	m	0	2,900
D 600	m	0	3,600
D 500	m	0	4,300
(3) Box Culvert			
1.4*1.2 m	m3	0	1,944
2.20*1.35 m	m3	0	8,064
6. Kim Ngau River Basin (K1:347 ha)		(K1:347 ha)	(K2,K3, K4 & K5)
6.1 Rehabilitation of Existing Combined System			
(1) Pipe			
D 1200	m	2,390	0
D 1000	m	1,600	0
D 800	m	4,790	0
D 600	m	3,190	0
(2) Box Culvert			
1.8*1.4 m	m3	7,980	0
1.5*1.5 m	m3	0	0
6.2 Sewer Converted from Open Channel			
1.9*1.4 m	m3	480	2,400
1.8*1.4 m	m3	540	660
1.4*1.2 m	m3	1,000	0
6.3 Newly Installed Separate Sewer			
(1) Trunk Sewer			
D 1000	m	0	8,400
D 1200	m	0	5,550
(2) Secondary Sewer			
D 900	m	0	3,500
D 800	m	0	5,280
D 700	m	0	7,000
D 600	m	0	8,700
D 500	m	0	10,500
(3) Box Culvert			
1.5*1.5 m	m3	0	6,210
2.0*2.0 m	m3	0	16,800
7. Heung Liet Drainage Basin			
7.1 Rehabilitation of Existing Combined System			
7.2 Sewer Converted from Open Channel			
7.3 Newly Installed Separate Sewer			
(1) Trunk Sewer			
D 1000	m	0	4,700
D 1200	m	0	3,060
(2) Secondary Sewer			
D 900	m	0	1,900
D 800	m	0	2,900
D 700	m	0	3,900
D 600	m	0	4,900
D 500	m	0	4,900
(3) Box Culvert			
1.2*1.2 m	m3	0	5,990
8. Yen So Drainage Basin			
8.1 Rehabilitation of Existing Combined System			
8.2 Sewer Converted from Open Channel			
8.3 Newly Installed Separate Sewer			
(1) Trunk Sewer			
D 1000	m	0	300
D 1200	m	0	160
(2) Secondary Sewer			
D 900	m	0	100
D 800	m	0	200
D 700	m	0	300
D 600	m	0	300
D 500	m	0	300
(3) Box Culvert			
1.2*1.2 m	m3	0	330

付属資料 －4.8（1） 事業費・便益のキャッシュフロー
（トーリック、第一期）

(US$1,000)

No.	Year	Const. Cost	O&M Cost	Cost Total	Benefit Total	B-C
1	1995	5,994		5,994	0	-5,994
2	1996	23,867		23,867	0	-23,867
3	1997	38,330		38,330	0	-38,330
4	1998	46,161		46,161	0	-46,161
5	1999	27,568	342	27,910	3,321	-24,589
6	2000	4,889	572	5,461	5,979	518
7	2001	0	1,143	1,143	12,917	11,774
8	2002	0	1,143	1,143	13,950	12,807
9	2003	0	1,143	1,143	15,066	13,923
10	2004	0	1,143	1,143	16,272	15,129
11	2005	0	1,143	1,143	17,573	16,430
12	2006	0	1,143	1,143	18,979	17,836
13	2007	0	1,143	1,143	20,498	19,355
14	2008	0	1,143	1,143	22,137	20,994
15	2009	0	1,143	1,143	23,908	22,765
16	2010	0	1,143	1,143	25,821	24,678
17	2011	0	1,143	1,143	27,887	26,744
18	2012	0	1,143	1,143	30,118	28,975
19	2013	0	1,143	1,143	32,527	31,384
20	2014	0	1,143	1,143	35,129	33,986
21	2015	0	1,143	1,143	37,940	36,797
22	2016	0	1,143	1,143	37,940	36,797
23	2017	0	1,143	1,143	37,940	36,797
24	2018	0	1,143	1,143	37,940	36,797
25	2019	0	1,143	1,143	37,940	36,797
26	2020	0	1,143	1,143	37,940	36,797
27	2021	0	1,143	1,143	37,940	36,797
28	2022	0	1,143	1,143	37,940	36,797
29	2023	0	1,143	1,143	37,940	36,797
30	2024	0	1,143	1,143	37,940	36,797
31	2025	32,478	1,143	33,621	37,940	4,319
32	2026	0	1,143	1,143	37,940	36,797
33	2027	0	1,143	1,143	37,940	36,797
34	2028	0	1,143	1,143	37,940	36,797
35	2029	0	1,143	1,143	37,940	36,797
36	2030	0	1,143	1,143	37,940	36,797
37	2031	0	1,143	1,143	37,940	36,797
38	2032	0	1,143	1,143	37,940	36,797
39	2033	0	1,143	1,143	37,940	36,797
40	2034	0	1,143	1,143	37,940	36,797
41	2035	0	1,143	1,143	37,940	36,797
42	2036	0	1,143	1,143	37,940	36,797
43	2037	0	1,143	1,143	37,940	36,797
44	2038	0	1,143	1,143	37,940	36,797
45	2039	0	1,143	1,143	37,940	36,797
46	2040	0	1,143	1,143	37,940	36,797
47	2041	0	1,143	1,143	37,940	36,797
48	2042	0	1,143	1,143	37,940	36,797
49	2043	0	1,143	1,143	37,940	36,797
50	2044	0	1,143	1,143	37,940	36,797
	Total	179,287	51,206	230,493	1,460,276	1,229,783

EIRR = 11.7%

付属資料 － 4.8 （2） 事業費・便益のキャッシュフロー
（トーリック、第二期）

(US$1,000)

No.	Year	Const. Cost	O&M Cost	Cost Total	Benefit Total	B-C
1	1995	0		0		0
2	1996	0		0		0
3	1997	0		0		0
4	1998	0		0		0
5	1999	0		0		0
6	2000	7,282		7,282		-7,282
7	2001	15,221		15,221		-15,221
8	2002	50,204	0	50,204	0	-50,204
9	2003	46,841	174	47,015	3,014	-44,001
10	2004	19,346	289	19,635	5,425	-14,210
11	2005	0	579	579	11,716	11,137
12	2006	0	579	579	12,653	12,074
13	2007	0	579	579	13,666	13,087
14	2008	0	579	579	14,759	14,180
15	2009	0	579	579	15,939	15,360
16	2010	0	579	579	17,215	16,636
17	2011	0	579	579	18,592	18,013
18	2012	0	579	579	20,079	19,500
19	2013	0	579	579	21,685	21,106
20	2014	0	579	579	23,420	22,841
21	2015	0	579	579	25,294	24,715
22	2016	0	579	579	25,294	24,715
23	2017	0	579	579	25,294	24,715
24	2018	0	579	579	25,294	24,715
25	2019	0	579	579	25,294	24,715
26	2020	0	579	579	25,294	24,715
27	2021	0	579	579	25,294	24,715
28	2022	0	579	579	25,294	24,715
29	2023	0	579	579	25,294	24,715
30	2024	0	579	579	25,294	24,715
31	2025	0	579	579	25,294	24,715
32	2026	0	579	579	25,294	24,715
33	2027	0	579	579	25,294	24,715
34	2028	0	579	579	25,294	24,715
35	2029	16,285	579	16,864	25,294	8,430
36	2030	0	579	579	25,294	24,715
37	2031	0	579	579	25,294	24,715
38	2032	0	579	579	25,294	24,715
39	2033	0	579	579	25,294	24,715
40	2034	0	579	579	25,294	24,715
41	2035	0	579	579	25,294	24,715
42	2036	0	579	579	25,294	24,715
43	2037	0	579	579	25,294	24,715
44	2038	0	579	579	25,294	24,715
45	2039	0	579	579	25,294	24,715
46	2040	0	579	579	25,294	24,715
47	2041	0	579	579	25,294	24,715
48	2042	0	579	579	25,294	24,715
49	2043	0	579	579	25,294	24,715
50	2044	0	579	579	25,294	24,715
	Total	155,179	23,623	178,802	936,984	758,182

EIRR = 11.4%

付属資料 －4.8 （3） 事業費・便益のキャッシュフロー

（トーリック川全流域）

(US$1,000)

No.	Year	Const. Cost		O&M Cost	Cost	Benefit			B-C
		1st Stage	2nd Stage		Total	1st Stage	2nd Stage	Total	
1	1995	5,994			5,994	0	0	0	-5,994
2	1996	23,867			23,867	0	0	0	-23,867
3	1997	38,330			38,330	0	0	0	-38,330
4	1998	46,161		0	46,161	0	0	0	-46,161
5	1999	27,568		342	27,910	3,321	0	3,321	-24,589
6	2000	4,889	7,282	572	12,743	5,979	0	5,979	-6,764
7	2001	0	15,221	1,143	16,364	12,917	0	12,917	-3,447
8	2002	0	50,204	1,143	51,347	13,950	0	13,950	-37,397
9	2003	0	46,841	1,317	48,158	15,066	3,012	18,078	-30,080
10	2004	0	19,346	1,432	20,778	16,272	5,425	21,697	919
11	2005	0	0	1,722	1,722	17,573	11,716	29,289	27,567
12	2006	0	0	1,722	1,722	18,979	12,653	31,633	29,911
13	2007	0	0	1,722	1,722	20,498	13,666	34,163	32,441
14	2008	0	0	1,722	1,722	22,137	14,759	36,896	35,174
15	2009	0	0	1,722	1,722	23,908	15,939	39,848	38,126
16	2010	0	0	1,722	1,722	25,821	17,215	43,036	41,314
17	2011	0	0	1,722	1,722	27,887	18,592	46,479	44,757
18	2012	0	0	1,722	1,722	30,118	20,079	50,197	48,475
19	2013	0	0	1,722	1,722	32,527	21,685	54,213	52,491
20	2014	0	0	1,722	1,722	35,129	23,420	58,550	56,828
21	2015	0	0	1,722	1,722	37,940	25,294	63,234	61,512
22	2016	0	0	1,722	1,722	37,940	25,294	63,234	61,512
23	2017	0	0	1,722	1,722	37,940	25,294	63,234	61,512
24	2018	0	0	1,722	1,722	37,940	25,294	63,234	61,512
25	2019	0	0	1,722	1,722	37,940	25,294	63,234	61,512
26	2020	0	0	1,722	1,722	37,940	25,294	63,234	61,512
27	2021	0	0	1,722	1,722	37,940	25,294	63,234	61,512
28	2022	0	0	1,722	1,722	37,940	25,294	63,234	61,512
29	2023	0	0	1,722	1,722	37,940	25,294	63,234	61,512
30	2024	0	0	1,722	1,722	37,940	25,294	63,234	61,512
31	2025	32,478	0	1,722	34,200	37,940	25,294	63,234	29,034
32	2026	0	0	1,722	1,722	37,940	25,294	63,234	61,512
33	2027	0	0	1,722	1,722	37,940	25,294	63,234	61,512
34	2028	0	0	1,722	1,722	37,940	25,294	63,234	61,512
35	2029	0	16,285	1,722	18,007	37,940	25,294	63,234	45,227
36	2030	0	0	1,722	1,722	37,940	25,294	63,234	61,512
37	2031	0	0	1,722	1,722	37,940	25,294	63,234	61,512
38	2032	0	0	1,722	1,722	37,940	25,294	63,234	61,512
39	2033	0	0	1,722	1,722	37,940	25,294	63,234	61,512
40	2034	0	0	1,722	1,722	37,940	25,294	63,234	61,512
41	2035	0	0	1,722	1,722	37,940	25,294	63,234	61,512
42	2036	0	0	1,722	1,722	37,940	25,294	63,234	61,512
43	2037	0	0	1,722	1,722	37,940	25,294	63,234	61,512
44	2038	0	0	1,722	1,722	37,940	25,294	63,234	61,512
45	2039	0	0	1,722	1,722	37,940	25,294	63,234	61,512
46	2040	0	0	1,722	1,722	37,940	25,294	63,234	61,512
47	2041	0	0	1,722	1,722	37,940	25,294	63,234	61,512
48	2042	0	0	1,722	1,722	37,940	25,294	63,234	61,512
49	2043	0	0	1,722	1,722	37,940	25,294	63,234	61,512
50	2044	0	0	1,722	1,722	37,940	25,294	63,234	61,512
	Total	179,287	155,179	74,829	409,295	1,460,276	936,981	2,397,257	1,987,962

EIRR = 11.6%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