

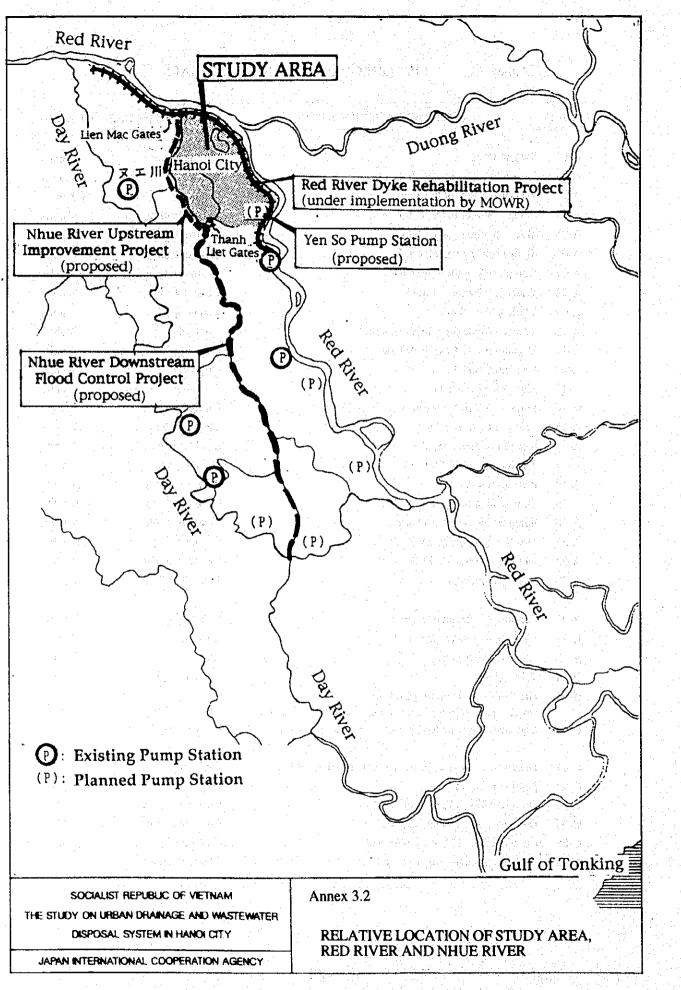
GROUP	EQUIPMENT/SPECIFICATION	PURPOSE OF USE	QUANTITY
A-01	Swampdozer, 7t		2
A-02	Excavator, grab bucket, 0.2 m3	Disposal sites Dredging	2 units
A-03	Working barge for the above	Dredging	2 units
A-04	Sludge hauling barge, 6 m3	Sludge hauling	2 units
A-05	Sludge hauling barge, 2m3	Sludge hauling	4 units
A-06	Sludge settling vessel, 6 m3	Sludge hauling	8 units 2 nos.
A-07	Dump truck, 4 t w/extension	Clean/dredging	2 nos. 12 units
A-08	Water jet cleaner, 4 t truck	Cleaning	
A-09	Water tanker, 4 m3	Cleaning	2 units 5 units
A-10	Vacuum truck, 8 t w/high vacuum	Dredging	2 unit
A-11	Vacuum truck, 4 t w/dehydrator	Cleaning	2 unit
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	2 sets 7 units
A-16	Rough terrain crane, 30 t	Dredging/etc.	1 unit
A-17	Tractor & Trailer, 20 t	Dredging/etc.	l 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

Annex 3.1

LIST OF EQUIPMENT AND MATERIALS

- A1 -

.



- A2 -

Annex 3.3 CHARACTERISTICS OF ZONES

1 ZONE 6-2 1.740 15 70 2.290 1.740 15 80 13,151 6.330 376 80 31,151 6.330 277 80 31,151 6.330 277 21 3,035 984 19 21 3,035 984 19 21 3,035 984 19 21 3,035 984 19 21 3,035 984 19 21 3,035 984 19 21 3,035 984 19 22 3,035 984 19 23 13,827 3,463 116 23 13,827 3,463 119 23 13,827 3,463 119 23 6.04 1.99 376 23 80 80 376 80 80 80 90 90 50 90 50 11 75 75 75 80 80 90 90 90 50 90 50 90 50 90 50 10 76 7	Item	ZONE	IE 1	ZONE	E 2	ZONE 3	ZONE 4	ZONE 5	ZONE	JE 6	ZONE7	Total/Average
173 135 <th></th> <th>ZONE 1-1</th> <th>ZONE 1-2</th> <th>ZONE 2-1</th> <th>ZONE 2-2</th> <th></th> <th></th> <th></th> <th>ZONE 6-1</th> <th>ZONE 6-2</th> <th></th> <th></th>		ZONE 1-1	ZONE 1-2	ZONE 2-1	ZONE 2-2				ZONE 6-1	ZONE 6-2		
Memery 41.3 306 91.27.3 22.1.8 306.6 B7.1 1131.3 78.6 23.2.3 Mo (11.10) 73.70 30.6.9 1127.3 22.1.8 30.6.6 B7.1 1131.3 78.6 2.3.2.3 Mo (11.10) 7.3 7.3 30.6.9 1127.3 2.2.1.8 30.6.9 13.1.3 7.8.6 2.3.2.3 Mo 6.539 5.460 2.3.01 6.4.720 5.4.93 2.4.10 31.3.13 7.8.6 2.3.2.3 Mo 6.539 5.460 2.3.01 15.47 10.407 2.1.47 0.3.3 2.3.6 3.1.5 6.3.93 13.5.1 17.3.6 3.3.3 3.4.5 <t< td=""><td>Area (ha)</td><td>930</td><td></td><td></td><td>1,010</td><td>1,350</td><td>500</td><td></td><td>870</td><td>2,290</td><td></td><td>13,540</td></t<>	Area (ha)	930			1,010	1,350	500		870	2,290		13,540
	Future Population	40,300		30	1 29,200	299,400	1 90,300	- 24	114,200	180,100	4	1,596,800
(111.0) 7.310 7.3.370 36.000 70.360 44.720 56.450 2.3,830 43.220 8.290 373 6,533 5,545 5,545 5,545 5,3482 34,254 42,063 5,335 944 19 73 277 13	Future Population Density	43.3			127.9	221.8	380.6		131.3	78.6	÷.	117.9
B.260 7,910 7.3.30 35.00 70,350 55,450 23,830 43,220 8,290 731 6,330 273 6,330 5,564 31,151 6,330 277 6,330 273 8,204 903 31,151 6,330 277 10 73.51 11,507 21,257 13,511 17,562 3,537 3,837 3,937 933 944 191 2,765 3,591 22,455 11,507 21,257 13,511 17,562 3,537 394 191 2,765 3,591 22,455 11,507 21,257 13,511 17,562 3,537 3463 113 2,765 3,339 22,68 11,39 15,75 27,02 6,42 10,78 6,04 193 3,161 3,152 3,164 32,12 89,44 20,16 31,43 32,0 416 746 74 6 7 6,04 11,99 75 75 75 75 75 75	(person /ha)	(111.0)										
6,539 5,585 54,660 23,026 53,892 34,254 42,063 6,330 31,151 6,330 373 934 19 2,765 3,591 2,2455 16,467 13,511 17,362 3,123 3035 994 19 2,765 3,591 2,2455 11,507 2,1,57 13,511 17,362 3,123 3035 944 19 2,765 3,591 2,2455 11,507 2,1,57 13,511 17,362 3,132 3,033 944 19 2,297 3,33 2,245 11,33 15,75 2,702 6,42 10,97 4,76 2 2,297 3,33 454 306 320 322 2272 2,88 7,5 6,04 1,99 3,35 454 306 2,75 2,86 10,37 3,16 1,99 76 75 6 2 6 2 6 2 6 2 6 2 6	Future Wastewater Yield	8,260		-	36,000	70,360	44,720		29,830	43,220		· .
1,722 5,000 5,11 5,05 5,11 3,05 9,10 5,100 5,100 5,101 5,101 5,101 5,101 3,121 3,035 914 19 2,76 3,591 12,47 12,147 2,106 5,050 15,75 27,02 5,128 914 19 19 19 16 2 4,76 2 <t< td=""><td>(m3/a)</td><td>60.0</td><td></td><td></td><td>30 000</td><td>t3 803</td><td></td><td></td><td></td><td>11 F F G</td><td></td><td></td></t<>	(m3/a)	60.0			30 000	t3 803				11 F F G		
1,722 642 16,693 6,591 16,467 12,147 6,230 9,035 9,71 9,13 10,13 10,12 10,12 10,12 10,12 10,12 10,12 10,12 10,12 10,12 10,12 10,12 10,12 10,12 10,12 <	- Domestic	222,0		. '		22,032				101,10		
0 1,680 2,016 6,020 0 2,740 3,121 3,033 984 19 2,765 3,531 22,445 11,507 21,257 13,511 17,962 9378 13,827 3,463 119 2,275 3,531 22,445 11,507 21,257 13,511 17,962 9378 13,827 3,463 199 2,297 3,339 22,68 11,39 15,75 27,02 6,42 10,78 6,04 1,99 2,297 335 454 306 320 320 320 318 34,59 13,827 3,468 1 4,76 2 4,76 2 4,76 2 4,76 2 4 4 4 4 4 4 4 4 4 4 4 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 <t< td=""><td>- Commercial</td><td>1,722</td><td></td><td></td><td></td><td>16,467</td><td></td><td>_</td><td>6,230</td><td>9,035</td><td></td><td>81,3</td></t<>	- Commercial	1,722				16,467		_	6,230	9,035		81,3
2.765 3.591 22.455 11,507 21,257 13,511 17,962 9,378 13,827 3,463 119 8.88 7.46 74,11 35.64 52.12 89.44 20.16 34.29 18.87 4.76 2 (22.75) 3.39 22.68 11.39 15.75 27.02 6.42 10.78 6.04 1.99 (22.75) 3.39 27.6 31.39 15.75 27.02 6.42 10.78 6.04 1.99 (2.275) 3.39 27.5 27.02 6.42 10.78 6.04 1.99 301 409 275 320 302 302 302 314 320 416 301 409 85 85 85 75 75 75 75 75 80 80 80 80 80 80 80 80 80 80 80 50 50 50 50 50 50 <td< td=""><td>- Industrial</td><td>0</td><td></td><td></td><td></td><td>0</td><td>0</td><td>2,240</td><td>3,121</td><td>3,035</td><td></td><td>19,0</td></td<>	- Industrial	0				0	0	2,240	3,121	3,035		19,0
8.86 7.46 74.11 35.64 52.12 89.44 20.16 34.29 16.87 4.76 2 2.97 3.39 22.68 11.39 15.75 27.02 6.42 10.78 6.04 1.99 2.297 3.39 22.68 11.39 15.75 27.02 6.42 10.78 6.04 1.99 335 454 306 320 322 302 302 314 320 418 335 454 20 80 80 80 80 81 81 81 81 81 81 81 81 81 81 81 81 81 80 <t< td=""><td>Future Pollutant Load</td><td>2,765</td><td></td><td>22,455</td><td>•</td><td>21,257</td><td>13,511</td><td>17,962</td><td>9,378</td><td>13,827</td><td></td><td>119,716</td></t<>	Future Pollutant Load	2,765		22,455	•	21,257	13,511	17,962	9,378	13,827		119,716
8.88 7.46 7.41 35.64 52.12 89.44 20.16 $7.4.76$ $7.4.76$ $7.4.76$ $7.4.76$ $7.4.76$ $7.4.76$ $7.4.76$ $7.4.76$ $7.4.76$ $7.4.76$ $7.4.76$ $7.4.76$ $7.4.76$ $7.6.76$ $1.0.78$ $1.0.78$ 6.04 $1.1.99$ $7.4.76$ 2.72 2.813 2.72 2.813 2.72 2.813 2.72 2.813 2.72 2.813 2.72 2.813 2.72 2.813 2.75 2.816 2.75 2.816 2.75 2.816 2.75 2.86 2.75 2.86 2.75 2.86 2.75 2.86 2.75 2.86 2.75 2.86 2.75 2.86 2.75 2.86 2.75 2.86 2.75 2.86 2.75 2.86 2.75 2.86 2.75 2.86 2.75 2.86 2.75 2.86 2.75 2.86 2.75 2.86 2.75 2.75 2.7	(kg/d)											•
(22.75) 339 22.68 11.39 15.75 27.02 6.42 10.78 6.04 1.99 7.62) 7.62) 7.62) 330 320 320 320 320 320 320 321 320 418 7.62) 7.62) 7.62 288 372 302 318 314 320 418 301 409 275 288 305 302 272 272 272 286 376 376 West Lake Nhue Kim Nguu Kim Nguu To Lich Lu Nhue To Lich 10.78 80 85 85 85 85 85 85 85 85 75 75 75 75 80 80 80 80 80 80 80 80 80 80 80 80 75 75 75 80 50 50 50 80 80 80 8	Specific Yield	8.88			35.64	52.12	89.44		34.29	18.87	4.76	27.95
	(m3/d/ha)	(22.75)										
(7.62) 54 306 320 302 302 302 314 320 418 335 454 306 320 302 302 313 320 418 305 305 288 302 275 286 288 376 80 85 85 85 85 85 85 75 75 75 80 50 50 <t< td=""><td>Specific Load</td><td>2.97</td><td>3.39</td><td></td><td>11.39</td><td>1S.75</td><td>27.02</td><td></td><td>10.78</td><td>6.04</td><td></td><td>8</td></t<>	Specific Load	2.97	3.39		11.39	1S.75	27.02		10.78	6.04		8
	(kg/d/ha)	(7.62)										2
301 409 275 288 272 286 283 376 West Lake Mhue Kim Mguu To Lich Lu Nhue To Lich Mhue To Lich Nhue To Lich No So	Raw Wastewater Quality	335			320	302	302		314	320		
West LakeNhueKim NguuKim NguuTo LichNhueTo LichNhue808085858585857575757580808080808080808080808050505050508080808080806050505050505080808080806050505050505080808080800n-site/ 50505050505080808080800n-site/ 50505050CentralizedCentralizedCentralizedCentralized011Medium ScaleLarge ScaleMedium ScaleCentralizedCentralized0050505050505050808080808010-site/ 50CentralizedCentralizedCentralizedCentralized00150505050505050808080808050505050CentralizedCentralizedCentralized0505050505050505050505080808080505050	(BOD & SS :mg/l)	301	409		288	272	272		283	288		
80 85 85 85 85 85 75 75 75 75 75 75 75 75 75 75 75 75 75 75 75 75 75 80<	Name of Receiving Water	West Lake	Nhue	Kim Nguu	Kim Nguu	ToLich	Lu	Nhue	To Lich	Nhue	To Lich	
80 80<	Proposed Removal	80		85	85	85	85	75	75	75	75	
60505050508080615050505080808050505050808080805050506080808080605050605080808060505080Medium ScaleMedium ScaleMedium ScaleMedium Scale60606060606060606060606060608080806060608080808060606080808080606060808080806060606080808060606060808080606060608080606060608080606060608080606060608080606060608080606060608060606060806060606080606060608060606060806060606080606060	Efficiency of BOD & SS(%)	80		80	80	80	80:	80	80	80	80	
60 50 <th< td=""><td>Treated Wastewater</td><td></td><td></td><td>50</td><td>50</td><td>50</td><td>50</td><td>80</td><td>80</td><td>80</td><td></td><td></td></th<>	Treated Wastewater			50	50	50	50	80	80	80		
60 50 <th< td=""><td>Quality (BOD:mg/l)</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></th<>	Quality (BOD:mg/l)											
50 50 50 50 60 60 60 60 60 60 60 60 60 60 60 60 60 70 <th70< th=""> 70 70 <th7< td=""><td>- Domestic</td><td>60</td><td>50</td><td></td><td></td><td></td><td>÷.,</td><td>• .</td><td></td><td></td><td>06</td><td>···</td></th7<></th70<>	- Domestic	60	50				÷.,	• .			06	···
water On-site/ Community Large Scale Medium Scale Medium Scale Medium Scale Community Community Centralized Centralized Centralized Centralized Rwater Small Scale Medium Scale Centralized Centralized Centralized Centralized Centralized Centralized Centralized Centralized Centralized Centralized Centralized Centralized	-Commercial/Industrial	50	50								50	
Community Centralized Centralized Centralized iewater Small Scale Medium Scale Centralized Centralized Centralized Centralized Centralized Centralized Centralized	Proposed Wastewater	On-site/	Community	Large 5	Scale	Medium Scale	Medium Scale		Mediun	n Scale	-uoN	
Small Scale Medium Scale Large Scale Centralized Centralized Centralized	Disposal System	Community		Centra	fized	Centralized	Centralized	Centralized	Centra	alized	Treatment	
Centralized Centralized	Alternative Wastewater	Small Scale		Medium	Scale	Large :	Scale				On-sile/	
	Disposal System	Centralized		Centra	lized	Centra	lized				Community	
							•					
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Annex 3.4	÷.	PRUJEUI	LOSI FUR	DRAINAGE MASTER PLAN (1/8)

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TO LICH RIVER BASIN (77.5 km2) <u>1st Stage Construction Project</u> A. Construction Cost	113,391
1st Stage Construction Project	113 291
	113 391
	113 391
A. Construction Cost	113 301
A. Construction Cost	113 301
그 물을 물 건강물 것이 집안을 것을 못했다. 것 아버지 못했다는 것 같아요?	110,071
· · · · · · · · · · · · · · · · · ·	
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 (4) Linh Dom Channel 1 000 m	1,706
(4) Linh Dam Channel, 1,000 m(5) Floodgates and Control Gates, Civil Work	2,204 4,489
(6) River Improvement	4,489
(a) Lower Kim Nguu, To Lich and Lower Lu Rivers,	8,899
and Thanh Liet Channel, 22,100 m	0,077
(b) Set and Upper Lu Rivers, and Lu-Set Floodway,	4,299
7,500 m	م. مرسو . T
(c) Upper Kim Nguu River, 3,400 m	1,229
(7) Hygdromechanical Equipment	22,828
(a) Pumping Station, Mechanical/Electrical Work	19,520

Note : 1994 price, excluding price contingencies

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Annex 3.4 PROJECT COST FOR DRAINAGE MASTER PLAN (2/8)

Description	Cost (\$1,000)
(b) a subsequence of the second state of th	
(c) Floodgates and Control Gates, Metal Work	2,993
(8) Installation of Flood Forecasting System	400
3. Drainage Channel Improvement, Reconstruction of	4,548
Bridges/Culverts	
(1) To Lich and Lower Lu River Basins, and Hoang Lie	et 2,979
Drainage Basin, 16,400 m	e ja terretaki in
(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
(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
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1. Land Acquisition	14,030
2. House Evacuation	501
3. Fishery Compensation	650
D. Physical Contingency	11,573
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Note : 1994 price, excluding price contingencies

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	11,684
Drainage Basin, 16,400 m	
(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

- A6 -

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Annex 3.4 PROJECT COST FOR DRAINAGE MASTER PLAN (3/8)

Description	Cost (\$1,000)	-
	15.0(0	
(2) To Lich River Basin (3) Lower Lu River Basin	15,262 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)	1	
A. Construction Cost	54,787	
1. Drainage Improvement	25,801	an an Marina

Annex 3.4 PROJECT COST FOR DRAINAGE MASTER PLAN (4/8)

Note : 1994 price, excluding price contingencies

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Description	Cost (\$1,000)
(1) General Installations	3,365
(2) Pumping Station, 12 m3/S	9,405
(3) Regulating Reservoir, 76 ha	
(4) Drainage Channels, 19,200 m	3,223
2. Nhue River Left Levee, 6,000 m	
3. Sewer Construction	25,019
4. River/Lake Conservation Works	
n de la companya de la companya de la companya (Nada de Companya). A companya de la compa	
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
My Dinh Drainage Basin Project (13.6 km2)	
My Dhar Diamage Dash (10jeet (13.0 km/2)	
A. Construction Cost	26,659
1. Drainage Improvement	15,516
(1) General Installations (2) Dumping Station 9m2/S	2,024
(2) Pumping Station, 8m3/S(3) Regulating Reservoir, 40 ha	6,648 5,124

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Annex 3.4 PROJECT COST FOR DRAINAGE MASTER PLAN (5/8)

Note : 1994 price, excluding price contingencies

Description	Cost (\$1,000)
(4) Drainage Channels, 13,400 m	
2. Nhue River Left Levee, 3,700 m	348
3. Sewer Construction	sule in the the base of the 8,446
4. River/Lake Conservation Works	2,349
	e di su ta Mary segle se El Mari Di Liker. L
B. Administration Cost	800
C. Land Acquisition and Compensation Cost	1 a. 1965, 1977, 1976, 1976, 1976, 1976, 1987, 1976, 1987, 1976, 1976, 1977, 1977, 1977, 1977, 1977, 1977, 197
	let en apresidente por el composition de la composition de la composition de la composition de la composition d
1. Land Acquisition	5,894
2. House Evacuation	
3. Fishery Compensation	200
	$\mathcal{A}^{\mathrm{exp}}(x,y) = \mathcal{A}_{\mathrm{exp}}(y) \mathcal{A}_{\mathrm{exp}}(y) \mathcal{A}_{\mathrm{exp}}(y) \mathcal{A}_{\mathrm{exp}}(y)$
D. Physical Contingency	3,359
E. Engineering Service Cost	3,999
(Sub-total of My Dinh Drainage Basin Projec	t)
Me Tri Drainage Basin Project (14.7 km2)	
	30,801
A. Construction Cost	30,801
A. Construction Cost	
A. Construction Cost 1. Drainage Improvement	16,799
A. Construction Cost 1. Drainage Improvement	16,799 2,191
 A. Construction Cost 1. Drainage Improvement (1) General Installations 	16,799 2,191 7,317
 A. Construction Cost 1. Drainage Improvement (1) General Installations (2) Pumping Station, 9m3/S 	16,799 2,191 7,317 5,222
 A. Construction Cost 1. Drainage Improvement (1) General Installations (2) Pumping Station, 9m3/S (3) Regulating Reservoir, 40 ha 	16,799 2,191 7,317 5,222

Annex 3.4 PROJECT COST FOR DRAINAGE MASTER PLAN (6/8)

escription	Cost (\$1,000)
4. River/Lake Conservation Works	0.520
4. River/Lake Conservation Works	2,539
B. Administration Cost	
	Sentra de la 724 El 2016 - El 2017 - El 2 724 Sentra Sentra de
C. Land Acquisition and Compensation Cost	12,791
C. Land requisition and compensation Cost	12,191 18 18 12,191
1. Land Acquisition	12,500
2. House Evacuation	91
3. Fishery Compensation	200
	200
D. Physical Contingency	4,452
	· · · · · · · · · · · · · · · · · · ·
E. Engineering Service Cost	4,620
(Sub-total of Me Tri Drainage Basin Project)	53,588
	an a
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
	894
(4) Drainage Channels, 8,700 m	
 (4) Drainage Channels, 8,700 m 2. Nhue River Left Levee, 4,100 m 	
	386
2. Nhue River Left Levee, 4,100 m	386 5,537

Annex 3.4 PROJECT COST FOR DRAINAGE MASTER PLAN (7/8)

Note : 1994 price, excluding price contingencies

 $[n^{-1}]$

Annex 3.4 PROJECT COST FOR DRAINAGE MASTER PLAN (8/8)

	scription	Cost (\$1,000)
1. Land Acquisition1,8342. House Evacuation263. Fishery Compensation135D. Physical Contingency2,106E. Engineering Service Cost2,776		
2. House Evacuation263. Fishery Compensation135D. Physical Contingency2,106E. Engineering Service Cost2,776	C. Land Acquisition and Com	pensation Cost 1,995
 2. House Evacuation 3. Fishery Compensation D. Physical Contingency 2,106 E. Engineering Service Cost 2,776 		
3. Fishery Compensation135D. Physical Contingency2,106E. Engineering Service Cost2,776		
 D. Physical Contingency 2,106 E. Engineering Service Cost 2,776 	2. House Evacuation	26
E. Engineering Service Cost 2,776	3. Fishery Compensation	135
E. Engineering Service Cost 2,776		
E. Engineering Service Cost 2,776	D. Physical Contingency	2,106
E. Engineering Service Cost 2,776		
	E. Engineering Service Cost	
(Sub-total of Ba Xa Drainage Basin Project) 25,942		and the second secon
	(Sub-total of Ba Xa Draina	ge Basin Project) 25.942
		B ,
	Total of II. NHUE RIVER	BASIN 206,698

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III. GRAND TOTAL

S ...

524,109

Note : 1994 price, excluding price contingencies

n at agus an star	alaan ka ahaa ka waxaa ka ahaa ka gala dagaa ahaa ahaa ahaa ahaa ahaa ahaa ah	e a construction de la construction La construction de la construction d	IF AT SITE PRICE		
GROUP	EQUIPMENT/SPECIFICATION	QUANTITY	(US\$ 1,000))	
			UNIT	AMOUNT	
3 (1) 40 ⁴ 10 40 4		ere par en a marca y gran a	9,950	19,900	
A-01	Swampdozer, 7t	2 units 2 units	9,930 11,250	22,500	
A-02	Excavator, grab bucket, 0.2 m3	날아님께 물질 것 같아요. 실망 하신	a she ta	22,500	
A-03	Working barge for the above	2 units	12,300 3,800		
A-04	Sludge hauling barge, 6 m3	4 units	5,800 650	15,200 5,200	
A-05	Sludge hauling barge, 2m3	8 units	The second second second	1	
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	1,59	
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	90	
C-03	Delivery hose, 150 mm dia. x 50 m	30 sets	140	4,20	
C-04	Delivery hose, 100 mm dia. x 50 m	45 sets	95	4,27	
C-05	Cabtyre cable, 100 m w/cable reel	30 sets	284	8,52	
C-06	Fuel and lubricant (for 1 year)	600 m3	,		
2.00	Sub-total:	000 1110		22,54	

COST OF EQUIPMENT AND MATERIALS REQUIRED Annex 3.5

Total:

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885,009

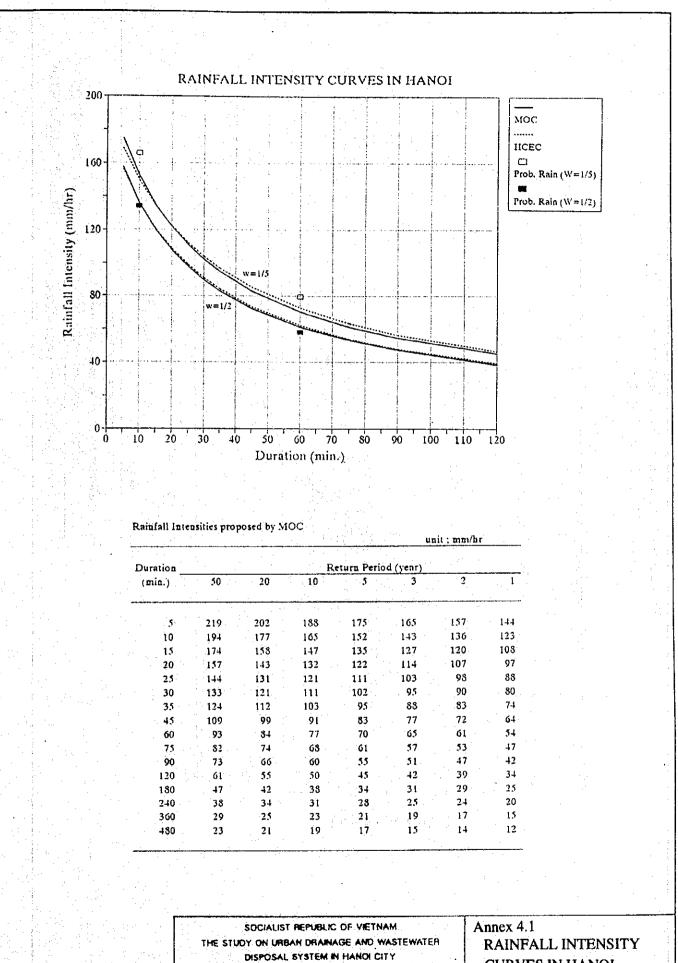
PROJECT COST FOR WASTEWATER DISPOSAL MASTER PLAN Annex 3.6

			the second se								
Sewerage Zone	ZONE 1-1	ZONE I-2	ZONE 2-1	ZONE 2-2	ZONE 3	ZONE 4	ZONE 5	ZONE 6-1	ZONE 6-2	ZONE 7	Toatl
Cost Ilem											
							-				
A.Dhreet 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
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
1 Diversion Chamber	48,000		48,000		38,000	19,000					153,000
4 Relay Pumpine 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
6.1 are Water Ouality Improvement	1,760,000		3,879,000	•	1,835,000	2,356,000					9,830,000
Works	• • •		:		·		- -				
(West lake is not included)	: ; ;			······	• • •						
											0000000
B.L.and Acquisition Cost	2,982,000	361,000	2,505,000	1,253,000	15,200,000	11,419,000	2,755,000	718,000	040,000	410,000	000, 1464, 61
C.Engineering Services Cast (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 Confingency (20 % of A to D)	4,372,000		4,165,000 14,254,000	8,753,000	18,289,000	18,289,000 11,584,000	19,154,000	7,520,000	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	00 24.990.000 85.322.000 52.518.000 109.734.000 69.504.000 114.924.000 45.120.000 89.774.000 19.607.000 637.926.000	69,504,000	114,924,000	45,120,000	89,774,000	19,607,000	617,926,000
(Annual O&M Cost)		:									
Sewernge Zone Cost Item	ZONE I-1	ZONE 1-2	ZONE 2-1	ZONE 2-2	ZONE 3	ZONE 4	ZUNE 5	ZONE 6-1	ZONE 6-2	ZONE 7	Toatl
(US\$/ycar) A. Treatment Plant B. Collection Sewer System	414,000	253,000 26,000	1,065,000		1,121,000	873,000 27,000	944,000 138,000	472,000	683,000 116,000	1,136,000	7,484,000
Total	419,000		1,130,000		000'861'1	000'006	1,082,000	517,000	000'664	1,136,000	8,037,000
(Replacement cost)	-										
25 years after Construction	ZONE I-I	20NE 1-2 20NE 2-1	ZONE 2-1	ZONE 2-2	ZONE 3	ZONE 4	ZONE 5	ZONE 6-1	2-9 ENO2	ZONE7	Toal
(tsn)	9,200,000		25,699,000	4,550,000 25,699,000 12,613,000	25,736,000	25,736,000 18,441,000	21,606,000	11,227,000	21,606,000 11,227,000 15,917,000	12,076,384	157,065,384

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Annex 3.7 PROJECT COST DISBURSEMENT SCHEDULE

Image: independent		L Urbers I	Ľ I	L				<u> </u>	1.7			(i) 2-1	(3) Zone 4	14	<u> </u>	2.65	(6) Zone 5	8	2	8	(10) Zone 7	
10.6 10.6 10.9 20.0 <th< th=""><th></th><th>Drainage Plan</th><th>o Lich River</th><th>Jat Stage</th><th>Ted Stage</th><th>These River</th><th>Co New</th><th>Vry Dieh</th><th>k Tá</th><th>X</th><th>are Disposed Plan</th><th></th><th>+</th><th></th><th>**2-2</th><th>## 6- 1</th><th>#e.5</th><th>₩c 6-2</th><th>me 1 - 1</th><th>•• 1-2</th><th></th><th></th></th<>		Drainage Plan	o Lich River	Jat Stage	Ted Stage	These River	Co New	Vry Dieh	k Tá	X	are Disposed Plan		+		** 2-2	## 6- 1	#e.5	₩c 6-2	me 1 - 1	•• 1- 2		
(1) (1) <td>-</td> <td>524,107</td> <td>317,409</td> <td>160,470</td> <td>156,939</td> <td>206,698</td> <td>86,218</td> <td>40,950</td> <td>53,588</td> <td>25,942</td> <td>926'169</td> <td>15,522</td> <td>69,504</td> <td>109,734</td> <td>52,518</td> <td>45,120</td> <td>114,924</td> <td>89.77.4</td> <td>26,233</td> <td>24.990</td> <td>109'61</td> <td></td>	-	524,107	317,409	160,470	156,939	206,698	86,218	40,950	53,588	25,942	926'169	15,522	69,504	109,734	52,518	45,120	114,924	89.77.4	26,233	24.990	109'61	
197 198 200 200 201	2661	8,150	8,150	0,150																		
196 206 <td>×.</td> <td>+——</td> <td></td> <td>+</td> <td></td> <td></td> <td> </td> <td></td> <td></td> <td></td> <td>3.991</td> <td>1,134</td> <td>2,457</td> <td> </td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	×.	+——		+			 				3.991	1,134	2,457									
1968 2001 2003 2004 <th< td=""><td>166]</td><td></td><td></td><td>+</td><td> </td><td></td><td> </td><td></td><td></td><td></td><td>5,038</td><td>KI,I</td><td>3.045</td><td></td><td></td><td> </td><td></td><td></td><td>8</td><td> </td><td></td><td></td></th<>	166]			+	 						5,038	KI,I	3.045						8			
2000 2001 2004 <th< td=""><td>8661</td><td></td><td></td><td>ŧ</td><td></td><td></td><td>1</td><td></td><td>}</td><td> </td><td>106'5</td><td>1.670</td><td>3,848.</td><td>ŀ</td><td></td><td></td><td></td><td></td><td>215</td><td></td><td>-</td><td></td></th<>	8661			ŧ			1		}		106'5	1.670	3,848.	ŀ					215		-	
2001 2002 2004 <th< td=""><td>3665</td><td></td><td>27,568</td><td>27,568</td><td>1</td><td></td><td></td><td><u> </u></td><td></td><td></td><td>98</td><td>ELSTE .</td><td>R</td><td>ł</td><td>ļ</td><td></td><td></td><td></td><td></td><td>144</td><td></td><td></td></th<>	3665		27,568	27,568	1			<u> </u>			9 8	ELSTE .	R	ł	ļ					144		
2002 2004 <th< td=""><td>3000</td><td></td><td></td><td>4,1889</td><td>10,01</td><td></td><td>1.00</td><td></td><td> -</td><td></td><td></td><td></td><td>546</td><td>1,619</td><td></td><td></td><td></td><td></td><td>2.50</td><td></td><td></td><td></td></th<>	3000			4,1889	10,01		1.00		 -				546	1,619					2.50			
2003 2004 <th< td=""><td>2001</td><td></td><td></td><td></td><td>ŧ</td><td></td><td></td><td></td><td></td><td></td><td>· · · · · · · · · · · · · · · · · · ·</td><td>÷</td><td>546</td><td>8</td><td></td><td>1</td><td> </td><td></td><td>1.474</td><td></td><td>\$</td><td></td></th<>	2001				ŧ						· · · · · · · · · · · · · · · · · · ·	÷	546	8		1	 		1.474		\$	
2004 2005 2004 <th< td=""><td>2002</td><td>57,422</td><td></td><td></td><td>21,62</td><td></td><td></td><td></td><td> .</td><td></td><td></td><td></td><td>8,358</td><td>2,720</td><td></td><td>: .</td><td></td><td></td><td>1.474</td><td></td><td>3</td><td></td></th<>	2002	57,422			21,62				 .				8,358	2,720		: .			1.474		3	
2006 2006 2001 2003 2013 2014 <th< td=""><td>3003</td><td>53.534</td><td>46,341</td><td></td><td>114'94</td><td>6693</td><td>6.693</td><td></td><td></td><td></td><td>36,350</td><td>EFL'EZ</td><td>831.8</td><td>2738</td><td></td><td> . .</td><td></td><td></td><td>1.474</td><td></td><td>\$</td><td></td></th<>	3003	53.534	46,341		1 14 '94	6693	6.693				36,350	EFL'EZ	831.8	2738		 . .			1.474		\$	
2006 2007 2008 2010 2011 2012 2013 2016 2017 2011 2011 91,3005 2013 2013 36.91 14.003 55.95 61.66 5.447 7 7 7 91,3005 2013 2011 14.003 55.95 61.66 5.447 7 7 7 91,3005 20243 2013 2014 14002 5.659 61.66 5.447 7 7 7 91,3005 2.345 2.040 2.041 14.002 5.659 61.66 5.447 7 7 7 91,3015 2.342 2.341 14.023 5.659 61.66 5.447 7 7 7 91,201 2.349 9.100 5.559 61.66 5.447 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	2004	33.17	396,346		346.91	5,871	5,871					00	3.275	98			1		1,474		E.	+
2001 2008 2010 2011 3012 2013 2014 <th< td=""><td>2005</td><td>21,962</td><td></td><td></td><td></td><td>21,962</td><td>21,962</td><td></td><td></td><td>•••••••</td><td>20,668</td><td></td><td>17,473</td><td>1,619</td><td></td><td></td><td></td><td></td><td>1,474</td><td></td><td>8</td><td>•</td></th<>	2005	21,962				21,962	21,962			••• • •••	20,668		17,473	1,619					1,474		8	•
2008 2009 2010 2011 2012 2014 2014 2014 2011 <th< td=""><td>2006</td><td></td><td>2.2 2.2</td><td></td><td></td><td>÷</td><td></td><td>3,000</td><td>5,348</td><td></td><td></td><td></td><td>£47-21</td><td>10.739</td><td></td><td>681</td><td>1.1</td><td></td><td>1424</td><td>5</td><td>1,912</td><td></td></th<>	2006		2.2 2.2			÷		3,000	5,348				£47-21	10.739		681	1.1		1424	5	1,912	
2009 2010 2011 2013 2014 2014 2015 <th< td=""><td>2007</td><td></td><td>19 19 19</td><td>8</td><td>1477 1747</td><td></td><td>20'892</td><td>2,336</td><td>-</td><td></td><td></td><td></td><td>2,778</td><td></td><td>H.</td><td>1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1</td><td>н на 1911 г. 1911 г.</td><td>* 13 *</td><td>1.474</td><td>â</td><td>1.912</td><td></td></th<>	2007		19 19 19	8	1477 1747		20'892	2,336	-				2,778		H.	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	н на 1911 г. 1911 г.	* 13 *	1.474	â	1.912	
2010 2011 2012 2013 2014 2015 2014 2017 2016 20611 18,002 5,629 6,166 5,447 201 201 201 20611 18,002 5,629 6,166 5,447 201 201 20611 18,002 5,629 6,166 5,447 201 201 20611 18,002 5,629 6,166 5,447 201	000						7,342	8 ,916	11,587						533	i Sili	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1		¥2.8'1	3,423	1,912	
2011 2012 2013 2014 2015 2011 2013 2014 <th< td=""><td>5006</td><td></td><td></td><td></td><td></td><td></td><td></td><td>9.645</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>011.1</td><td>- <u>-</u></td><td></td><td>1.474</td><td>10 10 10</td><td>1,912</td><td><u> </u></td></th<>	5006							9.645								011.1	- <u>-</u>		1.474	10 10 10	1,912	<u> </u>
2013 2014 2015 2016 2017 2014 5.5529 6.166 5.447 2013 2014 5.5529 6.166 5.447 2013 2014 9.5529 6.166 5.447 2013 2020 9.5529 6.166 5.447 2030 20320 9.5529 6.166 5.447 20320 20320 20320 9.5529 6.166 5.447 20320 20320 20320 20320 20320 20320 20320 20320 20320 20320 20320 20320 20320 20320 20320 20320 20320 20320 20320 20303 20300 20300 20300 20300 20300 20300 20300 20300 20300 20300 20300 20300 20300 20300 203000 203000 203000		· · · ·				<u> </u>		8,937	·	1.336	<u> </u>		•		h	<u>F</u>				3		<u> </u>
2013 2014 2015 2017 2013 2014 <th< td=""><td></td><td>· · ·</td><td></td><td></td><td></td><td><u> </u></td><td></td><td>368°2</td><td>6,10</td><td></td><td></td><td></td><td></td><td>527.1</td><td>ļ</td><td></td><td><u> </u></td><td></td><td> </td><td></td><td></td><td>÷ - •</td></th<>		· · ·				<u> </u>		368°2	6 ,1 0					527.1	ļ		<u> </u>					÷ - •
2014 2015 2016 2017 2018 5.447 5.447 5.447 5.447 <td< td=""><td>:</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td> </td><td></td><td></td><td></td><td></td><td>···</td><td>1.17</td><td></td></td<>	:														 					···	1.17	
2015 2016 2017 2018 2013 2014 2014 2014 2014 2014 2014 2014 2015 2014 2014 2014 2014 2014 2014 2014 2014 2014 2014 2014 2014 2014 2014 2014 2014 2014 2014 2014 2014 2014 2014 2014 2014 2014 2014 2014 2014 2014 2014 2014 2014 2014 2014 2014 2014 2014 2014 2014 2015 2014 21044 21044 2014 21044 21044 21044 2014 21044 21044 21044 2014 21044 21044 21044 2014 21044 21044 21044	<u></u>					· · · ·		-		· · · · ·					616					<u> </u>	1	
2014 2017 2014						47				447 			<u></u>					1		s 3	12.5	
2011 2014																ğ	<u> </u>		242	735	3	•
2014 2014 2014 2014 2014 2014 2014 2014						- 1 3 - 14 																· ~
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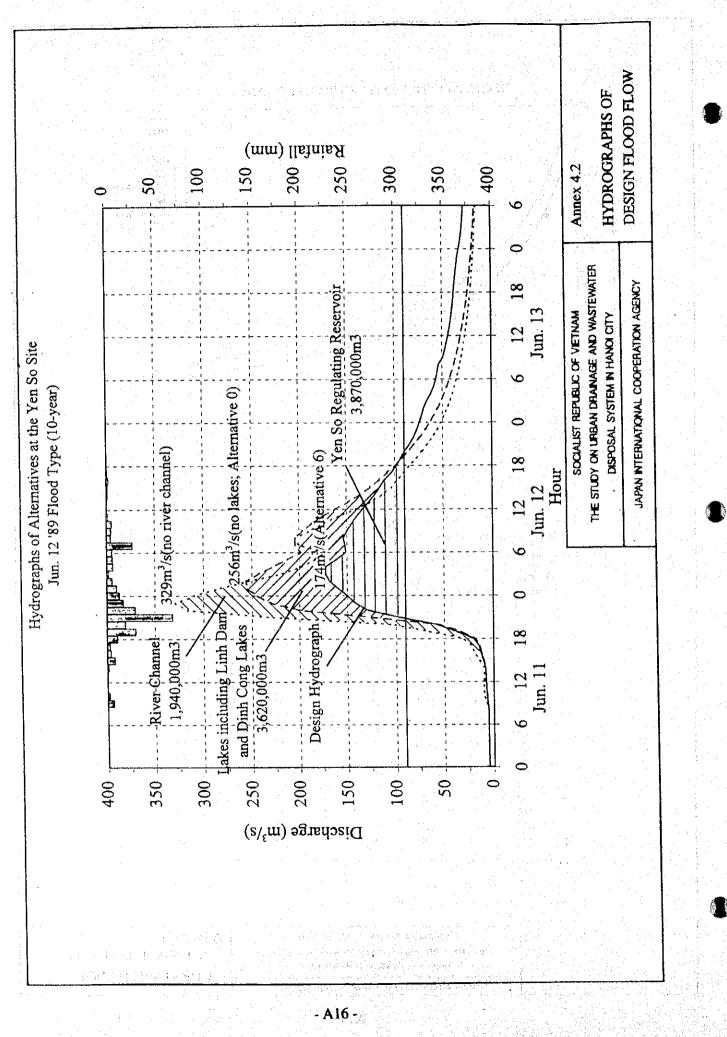


JAPAN INTERNATIONAL COOPERATION AGENCY

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CURVES IN HANOI



Annex 4.3 FLOODGATES AND CONTROL GATES

	1 00000	Dimoce	Decido Discharde	Dimensions	Gate Tvpe
	LOCATION		(m3/s)		
					Stard rollor rate
1. Thanh Liet Floodgate	T 0.4 K		O4		SIGO INICI AUG
		Hiver and to secure natural drainage to		/ ເຫ ເຫດີຍ x ∠ ບໍ່ສາຮະ	
					- - -
2. Hoa Binh Floodgate	K 1.1 K	To prevent backwater through the Hoa		5 m wide x 3 m high	- op -
		Binh channel, and to secure irrigation			··· ·
		water to the channel.			. <u>.</u> .
3. Van Dien Floodgate	K 3.7 K	To prevent backwater through the Old		5 m wide x 3 m high	- op -
		To Lich River, and to secure irrigation			
		water to the river			
Whent I also Control Octo (A)		To contain floodwater from the bacin	10	4 m wide x 3 m high	- qp -
4. WEST LARE CUITIN GALE (A)		× · ·		v 2 matae	
		ariu lo release lije waler arter lite hou.		7 F 94103	
				o m uido y o m hinh	
5. West Lake Control Gate (B)	West	I o contain floodwater from the basin,	1		- 20 -
	West Lake	and to secure irrigation water to the			
		downstream reaches.			-
	- - - -				-
6 1 u River Control Gate	L 32 K	To divert floodwaters toward the Lu-Set		3 m wide x 3 m high	- op -
		floodway and to release maintenance			
		motor to the Lewer Li Direr when			
		necessary			
7. Nghia Do Control Gate	T3.A Drainage	To prevent backwater from the Nhue	1	3 m wide x 3 m high	- op -
	Channel 1.6 K	River basin, and to intake irritation			
	· · ·				
-					

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Annex 4.4 LAKE IMPROVEMENT

		_	<u> </u>							÷ .					• • •	:		•	:	۰.				÷	1.
	Recent	Dredging	D HPC			×	×			×	-				1 1 - 14	×			•					4	
	Accessability				Easy	Easy in future	Easy	Easy	Possible	Easy	Easy	Hard	Easy	Hard	Easy	Easy	Hard	Hard	Hard	Hard	Easy	Easy			
istics	Quality of	Environment	Surrounding		High	Medium	High	Low	High	High	Low	Low	High *3	Medium	Low	High	Low	Low	Low	Low	Medium	Medium			
Character	Flood	Control	Effect		Large	Medium	Medium	Smail	Large	Medium	Medium	Small	Medium	Medium	Small	Large	Medium	Small	Large	Small	Large	Medium		I	
Proposed Characteristics	Type of	Improv-	ment *2		<	æ	×	6	ß	4	6	Ê	ω	ပ ်	U	¥	<u>၂</u>	C	ပ	ပ	4	ß].
Ground Dimensions of Dredging	Volume		(1,000 m3)		168	72	91	48	223	78	20	27	7	20	0	347	33	10	106	18	102	4		1.596	
Dimensions	Depth *1		(m)		2.0	1.6	.4	1.7	1.2	1.5	1.7	1.8	4	1.0	1.0	1.5	0.7	1.0	0.8	0.5	1.2	1.2		-	
Ground	Level		EL (m)		6.2	5.9	6.0	5.8	5.6	6.2	5.7	5.6	5.9	5.3	5.2	5.9	5 4	5.4	5.0	5.0	6.2	6.2	- -	1	
er Level	Season	2	Proposed		3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5			
Low Water	in Rainy Season	(m) ET			5.5	5.1	4.9	5.2	47	5.0	5.2	5.3	4 9	4.5	4.5	5.0	4.2	4.5	4.3	4.0	4.7	4.7		1	
Perimeter			(km)			0.9	1.2	0.5	1.8	0.8	0.8	0.6	0.9	1.2	0.6	2.0	1.1	0.9	1.4	0.6	1.2	0.8	:	18.4	
Area			(ha)	,	8.4	4.5	6.5	2.8	18.6	5.2	4	1.5	5.1	5.6	1 9	23.1	. 4.7	6.1	13.2	3.6	8.5	4.0		123.2	
Lake		Name			7 Giang Vo	8 Ngoc Khanh	Thanh Cong	10 Hao Nam	Dong Da	16 Nghia Do 1	Van Chuong			Phuong Liet 1	L12 Phuong Liet 2	2 Bay Mau	Trai Ca	Lang Tam	Thanh Liet	Dam Set	Thanh Nhan 1	Thanh Nhan 2	· · ·	Total	
		Ö.			T 7	T 8	T 9	T10	T13	T16	С С	4	9 7	L 11	L12	S 2		ŝ	S J	8 0	К С	X 4			

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*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.

Annex 4.5 PROJECT COST FOR TO LICH RIVER BASIN DRAINAGE SYSTEM

								Unit: US \$ 1	Unit: US \$ 1,000 equivalent	4
<u>L</u>	Item	First Si	Stage Construction	uction	Second	Second Stage Construction	truction		Total	
		F.C.	LC.	Total	F.C.	LC.	Total	F.C.	L. L.	Total
	1 Construction Works	88,771	24,616	113,387	906 69	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	006	9,650	¢	0		8,750	006	9,650
<u> </u>	2 Administration Cost	0	3,401	3,401	0	3,048	3,048	0	6,449	6,449
<u> </u>	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

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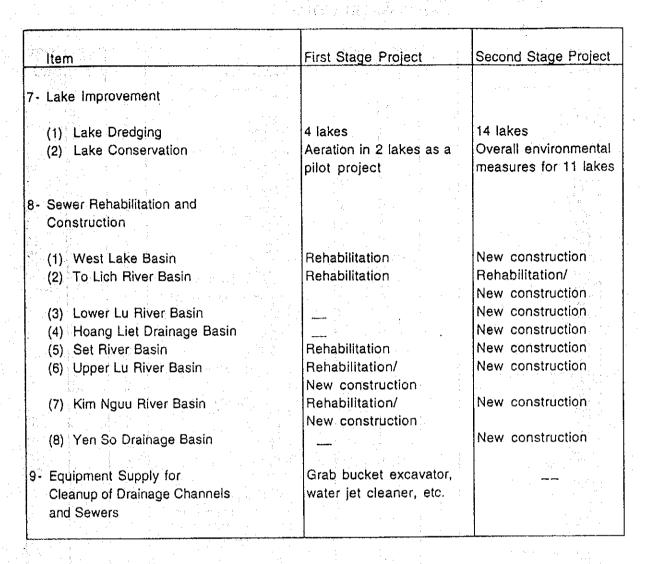
Annex 4.6

WORK ITEMS OF IST AND 2ND STAGE PROJECTS (1/2)

ltem		First Stage Project	Second Stage Project
Yen So Pumping	Station		
- Ten oo Tumping .			
(1) Pumping Sta	lion	Q = 45 m3/s	Q = 45 m3/s
(2) Inlet Structur		B = 200 m	
(3) Inlet Channel		L = 1,200 m	
		L = 1,900 m	
(4) Ordinary Drai	•	A = 30 m2	$A = 30 m^2$
(5) Outlet Sluice		L = 1,600 m	
(6) Outlet Chann			
2- Yen So Regulating	g Reservoir		
(1) Regulating R	eservoir	A = 203ha (130ha)	이 같은 것은 것을 알려졌다. 같은 것은 것을 알 것은 것을 가지 않는
(2) Yen So Chan		L = 3,400 m	
(3) Spoil Bank		A = 40 ha	
3 - Linh Dam and Dir	h Cong Lakes		
(1) Linh Dam Ch	the second se	L = 1,000 m	4 107 5
(2) Linh Dam La	A CONTRACT OF		A = 107 ha
(3) Dinh Cong C	hannel		L = 400 m
(4) Dinh Cong L	ake		A = 25 ha
	$ = \sum_{i=1}^{n} \left\{ \frac{1}{2} \left\{ $		
4- Floodgates and C	Control Gates	7 places	
5- River Improveme	nt		
	 Algebra March 1999 (1999) Algebra March 1999 (1999) 		
(1) To Lich and	Lower Lu River System		
		(Lower Lu = 3.2 km)	
(2) Set and Upp	er Lu River System	L = 7.5 km	$\{ f_{ij} : i \in \mathcal{F}_{ij} \} \in \mathcal{F}_{ij} $
	la de la composición de la composición Composición de la composición de la comp	(Upper Lu = 3.1 km)	
(3) Kim Nguu R	iver System	L = 3.4 km	
6- Drainage Chann	el Improvement		
(1) To list and	Lower Lu River Basin	Bridges/Box Culverts	Channel Works
(I) IO LICH and	Lower Lu niver basin	(21 places)	(L = 16.4 km) and
			Bridge/Box Culverts
			(24 places)
(0) 0	as Lu Diver Desia	Bridges/Box Culverts	Channel Works
(2) Set and Upp	ber Lu River Basin	(13 places)	(L = 3.7 km) and
А. А.		(10 hignes)	Bridge/Box Culverts
			(2 places)
		D-ideon/Roy Culuate	Channel Works
(3) Kim Nguu F	liver Basin	Bridges/Box Culverts	(L = 10.7 km) and
	and the second secon	(20 places)	Bridge/Box Culverts
1			(1 places)

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Annex 4.6 WORK ITEMS OF IST AND 2ND STAGE PROJECTS (2/2)



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Annex 4.7 WORK QUANTITIES OF SEWER REHABILITATION AND CONSTRUCTION

Wate true	Unit	STAGE I	STAGE 3
Walt kan	. VIII	Owner	Ounstity
West Lake Basis (935 hz)		(WI.035)	(W2.15016)
Rehabilitation of Existing Combined System	<u>.</u>		
Pice	1.1		
D 1000	, 🚔	260	0
0 100 0 560	1 2	480	
Box Cwivert	. 7		l su the T
13*12m	m]	407	1
Server Converted from Open Changel			1
		1.00	No. 0
Newly Installed Separate Sewer		• ·	le e
Truck Sever			
D 1000			1,900 930
D 1200 Secondary Server	*	1. "	730
D 900	, A		- 700
D 200 D 709	· •		1,000
D 600	.	ة	1.700
9,500	•	· •	2.000
Box Culvet 1.3*1.2 m	= 3		900
15*1.2 m	#U	ļ į	3,766
o Lich River Basis (2009 ha)		(TI:130 he	17.73,74,756.
Rehabilitation of Existing Combined System		#T5e:1943w)	T6,T7,T8 & T9)
Npe .		1 - 1	
D 1200		630	
D 1900		420	
D 600	-	3,190	
Box Celvert 1.5*).30 m	n)	1,4%	2,580
1.5*1.90m 2.8*1.05	- 1	330	
Server Converted from Open Channel 1.60°1.2 m	 3		7,760
1.45*1.0 m	 #3	- 1. č	
 Manager and the second sec second second sec			1 . Ph
Newly Installed Separate Sewer Trusk Sewar		1 · · ·	
D 1090	, 1 1	1	7,800
D 1200		<u>ر</u>	5.24
Secondary Server			2,700
D 900		1	4,100
D 700 D (00	я. я	1.1.1.1.1	
D 500	. .	1. 6	
Bot Culvel			
1.5*1.2 m 1.8*1.2 m	m3 m3		3.66 ⁴ 15.21
(spor Lu River Basin (587 ha)		(LE213 54)	D.D.A.L.
Rehabilitation of Existing Combined System	l i se si	1.	1.1.1
Ripe .	1		
D 1200 D 1000		72	
0100		3.18) (
D 600 Box Culturet	•	2,12	1. 1
Box Culvert 1.3*1.2 m	m)	1,69	
1.3*1.1 m	ໜັ	41	
Sever Converted from Open Channel		1	1
1.8*1.4 m	" 3	4,1	
1.5*1.4 m	m3	1,67	
Newly Installed Separate Sewer	ļ	1	1
Tjunk Šewe		1	1
D 1000. D 1200	<u> </u>		0 2,20 0 1,52
Secondary Server	1 .	1	7
D 900		1.	ol - 50
D 800 D 700			0 140 0 1.90
10 600			
D 500	•	1	0 2.30 0 2,90
Box Culvert LS*LS ne	m 3	1	0 1.36
2.0*2.0 m	m3		0 1.36 0 5.20
Lower Lu River Basin (433 he)			
Rehabilitation of Existing Combined System		1	
	1		
Sewer Converted from Open Chennel	1	ł	
Newly Installed Separate Sewer	1 .	1	1
Trunk Server	1	1	
D 1000 D 1200		1.	0 2.60 0 1.67
Secondary Sewer	1 -	1	1
D 900		1	0 1,10
D 800		1	0 1,10 0 1,40 0 2,10 0 2,70 0 3,20
D 600		1	Q 2.7
D 500	- •	1	ol 3.30
) Box Culvert			

		STACET	STAGE 1
Work Kenn	Uni	Quantity	Quantity
Set River Besis (710 hs)		(SI:2171a)	(\$2,5) & 54)
Rehabilitation of Existing Combined System	i .		
Fips	lie te		
D 1200		620	
D 800		2,750	
D 600	. • .	1.830	· .
Box Culvart J.8*1.4 m	1	2,000	
Server Converted from Open Cimmel 1,80*1.40 m			3.600
1.60°1.25 m	m)		1,890
1.25*1.15 =		1. ·	
Newly Installed Separate Sewer	1.3		1.1.1.1.1.1
Trank Sewer D 1900			3,900
D 1200	1 1 1 1		2,250
Secondary Sever D 900	1	a	
D 800		0	1,400
D 700	1. 🖷		2,900
D 600 D 500		0	3,600
Box Curvert	1.5	And A	1 A A
1.4*1.2 m 2.20*1.55 m	ະ ຄ.) ສ.)		1,944
Cim Nguu River Basin (K1:347 Jas)		(K1:347 ha)	(K2,K),
Rehabilitation of Existing Combined System		1	- K4 & K5)
Kipe in the second s		1	
D 1209 D 1000	n H	2,390	2
D \$00		1,600	0 Q
D 600 Rox Culvert	•	E	0
1.8*1.4 m	al	7,900	6
1.5*1.5 m	m 3	0	o
Server Converted from Open Channel	at esta		
1.9*1.4 m	m3	40	2,400
1.3*1.4 m 1.4*1.2 m	=3 =3	540	600
Newly Installed Separate Sewer	11 - 124-	1.11	
D 1000	• 1 2		8,400
D 1200 Secondary Server		. 0	5,550
D 900		0	3,500
D 800 D 700	1 B	0	5,200
D 600	- A	0	8,700
D 500 Box Culvert	199 .	0	10. 50 0
LS+1.5 m	e mJ	0	6,210
.0*2.0 m comg Lint Drainage Rimin	<u></u>	0	16.800
	n a fa		1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -
Rehabilitation of Existing Combined System		1.2.2	2.1
Sewar Converted from Open Channel		1 . A.	
Newly Installed Separate Sewer	1.11	1.1.1	
Trunk Seven		1	
D 1000 D 1200	- H		4,700 3,060
Secondary Sever	-	j. "	1 A A
D 900 D 900	기름이		1,900
D 700		1 0	3,900
D 600 D 100		0	4,900
lios Culvert	•	1 · · *	4,100
1.2*1.2 m on So Dennage Baim	m 3		5.590
		1	
Reliabilitation of Existing Combined System	•		1.0
Sewer Converted from Open (Tanna)			
Newly Installed Separate Sewer		1	1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -
Trunk Sewer		1 · · · ·	
D 1000	• • ·	. 0	300
D 1200 Secondary Server	- -	1: 0	160
D 900 D 900		. 0	100
14 B.F.	, a	0	200
9 700 D 600			300
0 700		0 0 0 0	

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<u>.</u>	Vara	Const Cost	O&M Cost	Cost	Benefit	(US\$1,000) B-C
10.	Year	Const. Cost	UCCIMI COST		Total	D-C
	1005			Total 5,994	0	5 004
1	1995	5,994		f	0	-5,994
2	1996	23,867		23,867		-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		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	2020	0	1,143	1,143	37,940	36,797
36	2029	0	1,143	1,143	37,940	36,797
30	2030	0	1,143	1,143	37,940	36,797
37	2031	0	1,143	1,143	37,940	36,797
39	2032	0	1,143	1,143	37,940	36,797
	2033	0	1 1 4 2	1,143	37,940	36,797
40 41	2034	0	1,143	1,143	37,940	36,797
	2035	0	1,143	1,143	37.940	36,797
42 43	2036	0	1,143	1,143	37,940	36,797
43	2037	0	1,145	1,143	37,940	36,797
44 45		0	1,143	1,143	37,940	36,797
· · · · ·	2039	0	1,143	1,143	37,940	36,797
46	2040		1,143	1,143	37,940	36,797
47	2041	0	1 1 4 2	1,143	37,940	36,797
48	2042	0	the second s	1,143	37,940	36.797
49	2043	0	1,143		37,940	36,797
50	2044	0 179.287	1,143 51,206	1,143 230,493	1,460,276	1,229,783

Annex 4.8 (1/3) COST BENEFIT STREAM OF URBAN DRAINAGE (TO LICH RIVER - 1ST)

- A23 -

EIRR = 11.7%

-	<u> </u>		· · · · · · · · · · · · · · · · · · ·			(US\$1,000)
0.	Year	Const. Cost	O&M Cost	Cost	Benefit	B-C
				Total	Total	
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	and the second of second s	-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
3	2007	0	579	579	13,666	13,087
4	2007	0	579	579	14,759	14,180
5	2009	0	579	579	15,939	15,360
16	2009	0	579	579	17,215	16.636
17	2010	0	579	579	18,592	18,013
18	2011	0	579	579	20,079	19,500
10	2012	0	579	579	21,685	21,106
	2013	0	579	579	23,420	22,841
20		the second s	579	579	25,294	24,715
21	2015	0				24,715
22	2016	0	579	579	25,294	
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		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		0	579	579	25,294	24,715
47		0	579	579	25,294	24,715
48		0	579	579	25,294	24,715
40		0	579	579	25,294	24,715
50	-+	0	579	579	25,294	24,715
	Total	155,179	23,623	178,802	936,984	758,182

Annex 4.8 (2/3) COST BENEFIT STREAM OF URBAN DRAINAGE (TO LICH RIVER - 2ND)

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EIRR = 11.4%

lo.	Year	Const	. Cost	O&M Cost	Cost		Benefit	(US\$1,	B-C
		1st Stage	2nd Stage		Total	1st Stage	2nd Stage	Total	D-C
1	1995	5,994		<u>}</u>	5,994	0	0	0	-5,99
2	1996	23,867			23,867	0	0	0	-23,86
$\frac{2}{3}$	1997	38,330		<u> </u>	38,330	0	0	0	-25,80
4	1998	46,161	<u></u>	0	46,161	0	0	0	
5	1999	27,568		342	27,910	3,321	0	3,321	-46,16
+			7,282	572	12,743	5,979	0	5,979	-24,58
6	2000	4,889	15,221	1	16,364	12,917	0	12,917	-6,76
7	2001	0	······································	1,143		13,950	Ö Ö	13,950	-3,44
8	2002	0	50,204	1,143	51,347	15,066	3,012	13,930	-37,39
9	2003	0	46,841	1,317	48,158		5,425		
10	2004	0	19,346	1,432	20,778	16,272		21,697	91
11	2005	0	0	1,722	1,722	17,573	11,716	29,289	27,56
12	2006	0	0	1,722	1,722	18,979	12,653	31,633	29,91
13	2007	0	0	1,722	1,722	20,498	13,666	34,163	32,44
14	2008	0	0	1,722	1,722	22,137	14,759	36,896	35,17
15	2009	0	0	1,722	1,722	23,908	15,939	39,848	38,12
16	2010	0	0	1.722	1,722	25,821	17,215	43,036	41,3
17	2011	. 0	0	1,722	1,722	27,887	18,592	46,479	44,7
18	2012	0	0	1,722	1,722	30,118	20,079	50,197	48,4
19	2013	0	0	1,722	1,722	32,527	21,685	54,213	52,49
20	2014	0.	0	1,722	1,722	35,129	23,420	58,550	56,82
21	2015	0	· 0	1,722	1,722	37,940	25,294	63.234	61,51
22	2016	0	0	1,722	1,722	37,940	25,294	63,234	61,51
23	2017	0	. 0	1,722	1,722	37,940	25,294	63,234	61,51
24	2018	0	0	1,722	1,722	37,940	25,294	63,234	61,51
25	2019	. 0	0	1.722	1,722	37,940	25,294	63,234	61,5
26	2020	0	0	1,722	1,722	37,940	25,294	63,234	61,5
27	2021	0	<u>•</u>	1,722	1,722	37,940	25,294	63,234	61,5
28	2022	0	0	1.722	1,722	37,940	25,294	63,234	61,51
29	2023	0	0	1,722	1,722	37,940	25,294	63,234	61,51
30	2024	0	0	1,722	1,722	37,940	25,294	63,234	61,5
31.	2025	32,478	0	1,722	34,200	37,940	25,294	63,234.	29,0
32	2026	0	: 0	1,722	1,722	37,940	25,294	63,234	61.5
33	2027	0	0	1,722	1,722	37,940	25,294	63,234	61.5
34	2028	0	. 0	1.722	1,722	37,940	25,294	63,234	61.5
35	2029	0	16,285	1,722	18,007	37,940	25,294	63,234	45,2
36	2030	0	0	1,722	1,722	37,940	25,294	63,234	61,5
37	2031	0	0	1,722	1,722	37,940	25.294	63,234	61,5
38	2032	0	0	1.722	1,722	37,940	25,294	63,234	61.5
39	2033	. 0	0	1,722	1,722	37,940	25,294	63,234	61,5
40	2034	0	0	1,722	1,722	37,940	25,294	63,234	61,5
41	2035	0	0	1,722	1,722	37,940	25,294	63,234	61,5
42	2036	0	0	1.722	1,722	37,940	25,294	63,234	61,5
.43	2037	0	0	1,722	1,722	37,940	25,294	63,234	61.5
44	2038	0	0	1,722	1,722	37,940	25,294	63,234	61,5
45	2039	0	0	1,722	1.722	37,940	25,294	63,234	61,5
46	2040	0	0	1,722	1,722	37,940	25,294	63,234	61,5
47	2041	. 0	0	1,722	1,722	37,940	25,294	63,234	61,5
48	2042	0	0	1,722	1,722	37,940	25.294	63,234	61,5
49	2043	0	0	1,722	1,722	37,940	25,294	63,234	61,5
50	2044	0	0		1.722	37,940	25,294	63,234	61.5
	Total	179,287	155,179	74,829	409,295	1,460,276 .	936,981	2,397,257	1.987.9

Annex 4.8 (3/3) COST BENEFIT STREAM OF URBAN DRAINAGE (TO LICH RIVER BASIN)

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