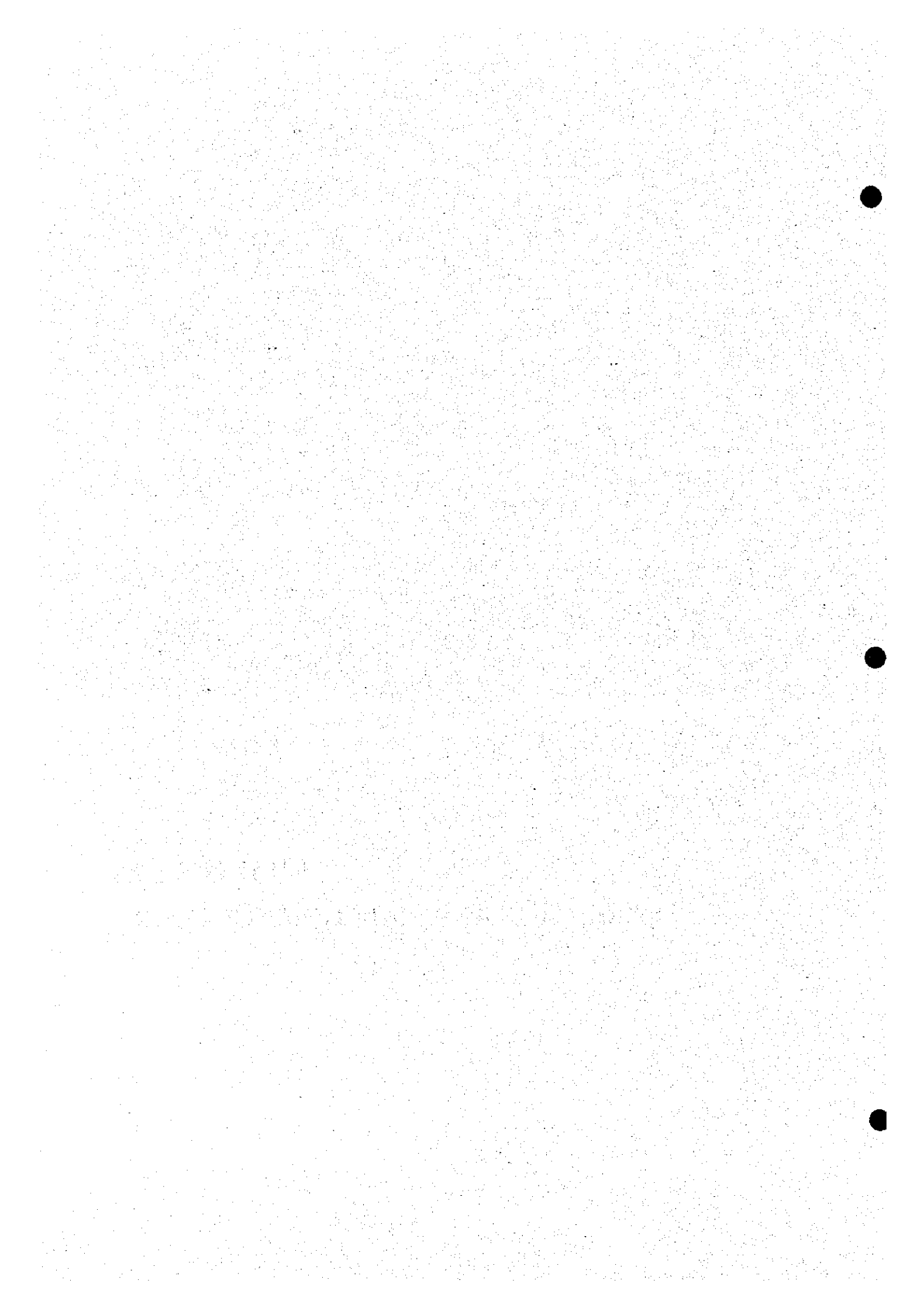


CHAPTER 10
OPERATION AND MAINTENANCE PLAN



10.4.1 Maintenance and Operation Cost

1. Design Wastewater Quantity: 100,000m³/day

Pipe Cleaning

Personal Expense	31 person	× 3,600 US\$/year =	111,600 US\$/year
Fuel Expense	56,025 l/year	× 0.5 US\$/l =	28,013 US\$/year
Water			0 US\$/year River Water
Sub-total			<u>139,613 US\$/year</u>

Sewage Treatment Plant

Personal Expense	25 person	× 3,600 US\$/year =	90,000 US\$/year
Electric Power	1,550 kw	× 0.03 US\$/kwh =	407,340 US\$/year
Chemicals	150 kg/day	× 2 US\$/kg =	109,500 US\$/year
Repair and Wear Cost	1 %	=	60,000 US\$/year
Sub-total			<u>666,840 US\$/year</u>

Total			<u>806,453 US\$/year</u>
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2. Design Wastewater Quantity: 50,000m³/day

Pipe Cleaning

Personal Expense	31 person	× 3,600 US\$/year =	111,600 US\$/year
Fuel Expense	56,025 l/year	× 0.5 US\$/l =	28,013 US\$/year
Water			0 US\$/year River Water
Sub-total			<u>139,613 US\$/year</u>

Sewage Treatment Plant

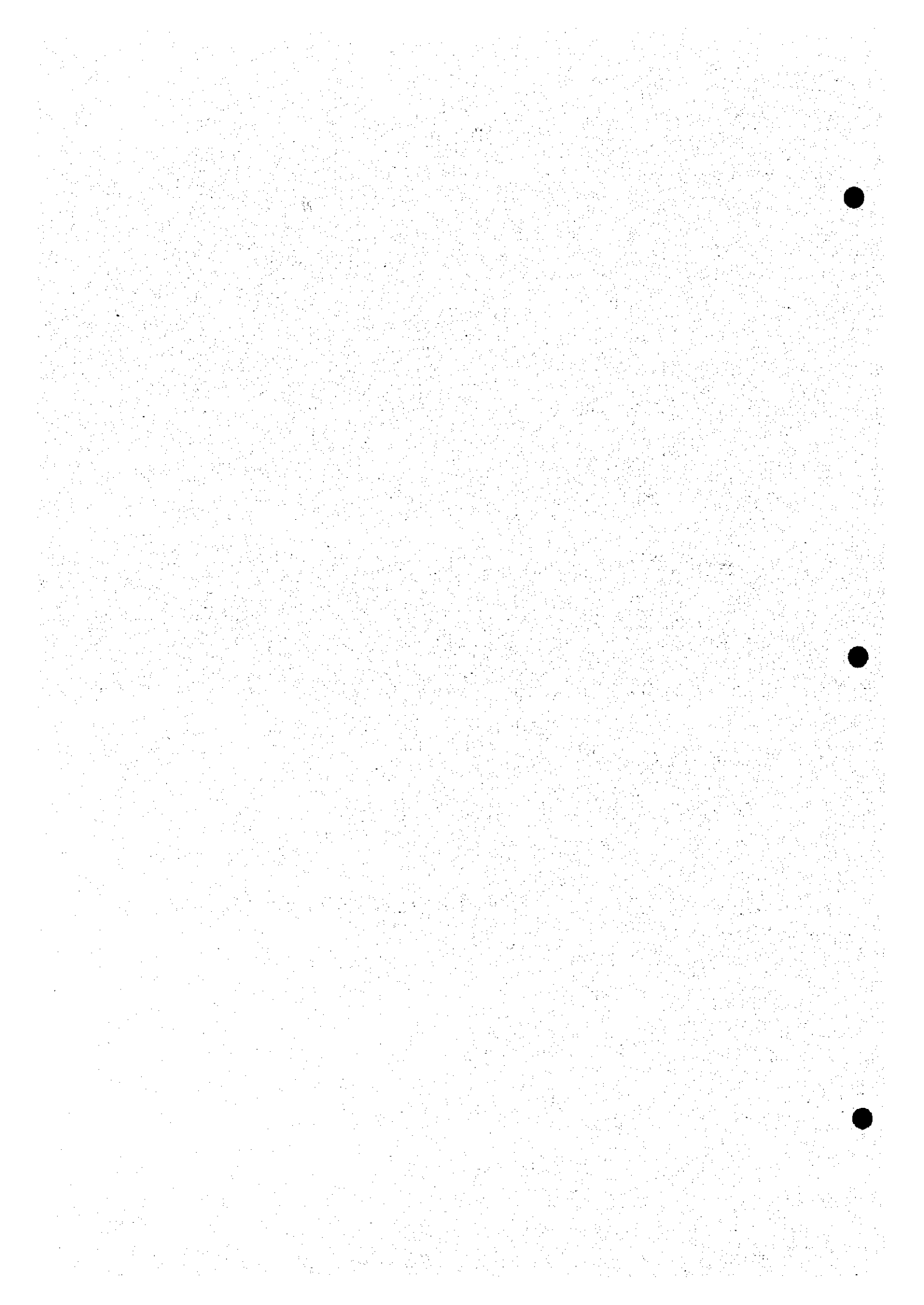
Personal Expense	18 person	× 3,600 US\$/year =	64,800 US\$/year
Electric Power	800 kw	× 0.03 US\$/kwh =	210,240 US\$/year
Chemicals	75 kg/day	× 2 US\$/kg =	54,750 US\$/year
Repair and Wear Cost	1 %	=	32,000 US\$/year
Sub-total			<u>361,790 US\$/year</u>

Total			<u>501,403 US\$/year</u>
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3. Pipe Cleaning Cost

Personal Expense		US\$/year			US\$/year
			31 人 ×	3,600 =	<u>111,600</u>
Fuel Expense					
High-pressure Cleaning	m/day	day/year	party		m/year
Working Volume	200 ×	250 ×	2 =		100,000
Sludge Volume	5 m ³ /day/party				
	l/hr	hr/day	day/year	party	l/year
High-pressure Cleaning Car	4.4 ×	6 ×	250 ×	2 =	13,200
Sludge Vacuum Car	6.1 ×	6 ×	250 ×	2 =	18,300
Water Wagon	4.5 ×	6 ×	250 ×	2 =	<u>13,500</u>
Total					<u>45,000</u>
Storm-water Inlet Cleaning	piece/day		day/year	party	piece/year
Working Volume	150 ×		250 ×	2 =	75,000
Sludge Volume	7.5 m ³ /day/party				
	l/hr	hr/day	day/year	party	l/year
Midget High-pressure Cleaning Machi	0.9 ×	6 ×	250 ×	2 =	<u>2,700</u>
Total					<u>2,700</u>
Dump Truck	m ³ /day		hr/m ³	party	hr/day
High-pressure Cleaning Car	5 ×	0.75 ×	0.35 ×	2 =	2.6
Storm-water Inlet Cleaning	7.5 ×	0.75 ×	0.57 ×	2 =	6.4
Total					9.0
	l/hr	hr/day	day/year	party	l/year
	3.7 ×	9 ×	250	=	8,325
					l/year
Total					<u>56,025</u>
Water	m ³ /day		day/year	party	m ³ /year
High-pressure Cleaning Car	22.5 ×		250 ×	2 =	11,250
Power Suction	9 ×		250 ×	1 =	2,250
Storm-water Inlet Cleaning	1.8 ×		250 ×	2 =	900
Total					<u>14,400</u>

CHAPTER 11
IMPLEMENTATION PROGRAM



11.3.1 Specifications for EIA Study

SECTION 2 SPECIFICATIONS

2.1 OBJECTIVES

The Environmental Impact Assessment (hereinafter referred to as the "EIA") Study aims at:

- (1) Assessment of magnitude and degree of anticipated environmental impact/s which may be caused by the implementation of the proposed Project,
- (2) Preparation of recommendations and proposed countermeasures to mitigate the assessed environmental impact/s for smooth implementation and successful achievement of the objectives of the proposed Project.

2.2 TARGET AREA

The overall target area of the EIA Study is the planned sewerage service area of Metropolitan Tirana in the target year of 2010 and its surrounding area as shown in Figure 2.1.

The major attention of the EIA Study shall be paid to the proposed Site of the Tirana Sewage Treatment Plant and its vicinity as shown in Figure 2.2.

2.3 SCOPE OF PROJECT

- (1) Overall Scope of the Proposed Project

The magnitude and description of the proposed projects are summarized in Tables 2.1 and 2.2, respectively.

Table 2.1 Overall Scope of the Proposed Project

Item	Phase 1 (2001)	Phase 2 (2010)
Areas to be Served	842.2 ha	1,809.6 ha
Population to be Served	253,970	525,290
Planned Sewage Flow (daily average)	50,790 cu.m/day	105,060 cu.m/day

Table 2.2 Project Description

Item		Description
Project Name		Rehabilitation and Expansion of Sewerage System in Metropolitan Tirana in the Republic of Albania
Project Background		Tirana City, the national capital, has been suffered from inundation and degradation of sanitary conditions due to deterioration of superannuated sewer system
Objective of the Project		Urgent improvement of urban sanitation and rehabilitation of existing sewer system
Project Location		Metropolitan Tirana
Executing Agency		Ministry of Public Works, Tourism and Territory Adjustment (MOPWT)
Number of Beneficiaries		525,200 persons to be served by sewerage system in 2010
Scope of Project	Type of Project	Rehabilitation & Expansion
	Project Area	Area: 1,817.9 ha, Planned Population: 525,200 persons, Planned Sewage Flow: 105,058 cu.m/day (Daily Average)
	Sewage Collection Method	Separate Sewer System
	Sewage Treatment Plant	Treatment Method: Aerated Lagoon, Treatment Capacity: 105,058 cu.m/day
	Sludge Treatment/Disposal	Sun Drying at Sedimentation Basin, Landfill
	Sewer Pipeline	Underground Pipeline, No Pumping Station
	Effluent Disposal	Discharge Point: Tirana River, Effluent Quality: BOD 25 mg/L

(2) **Phased Implementation of the Project**

The proposed Project will be implemented by two phases: Phase 1 by target year of 2001 for the urgent rehabilitation/improvement of the existing sewerage system, and Phase 2 by target year of 2010 for the overall improvement and expansion of the sewerage system.

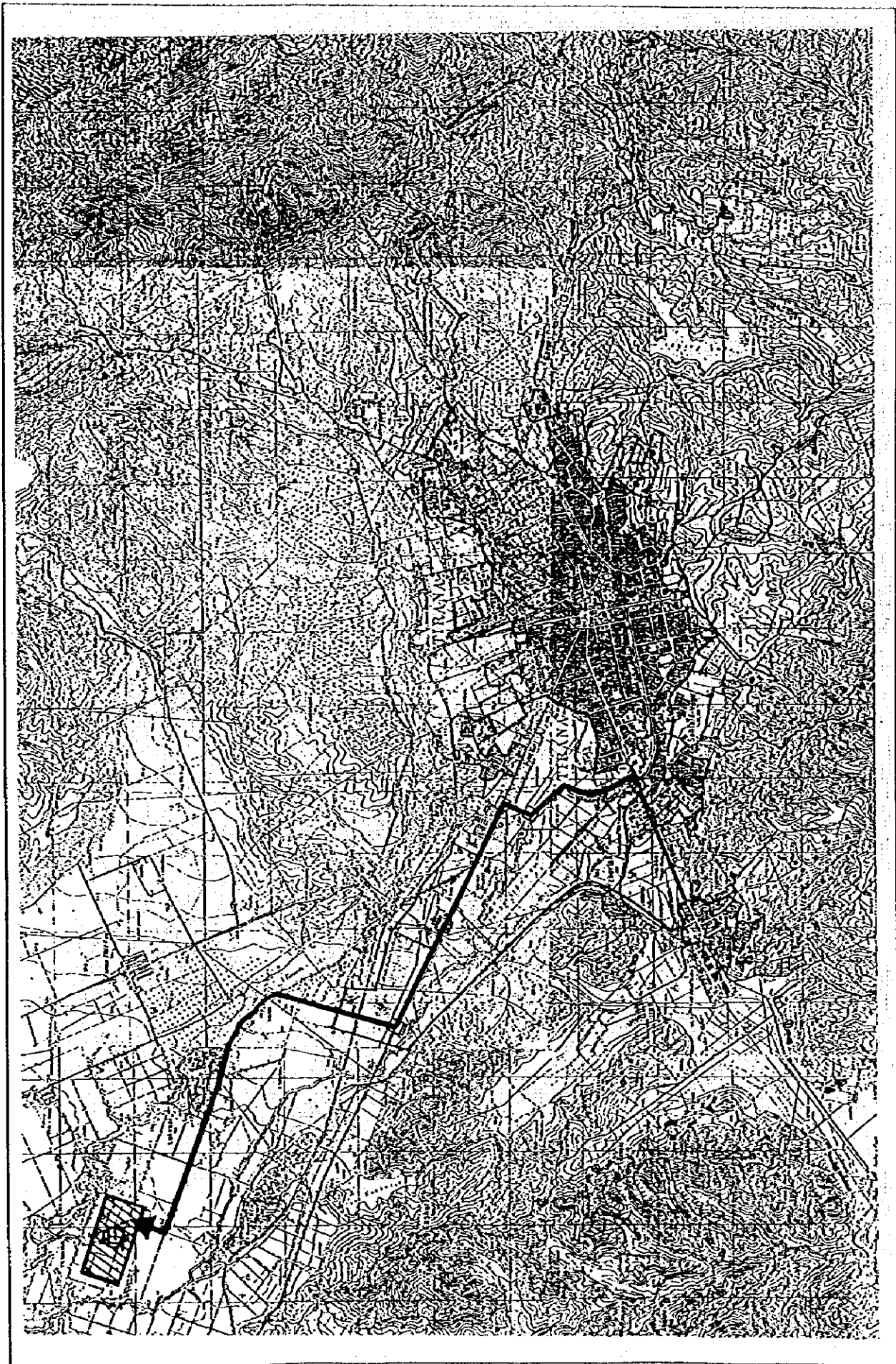


Figure 2.1 Target Area of EIA Study

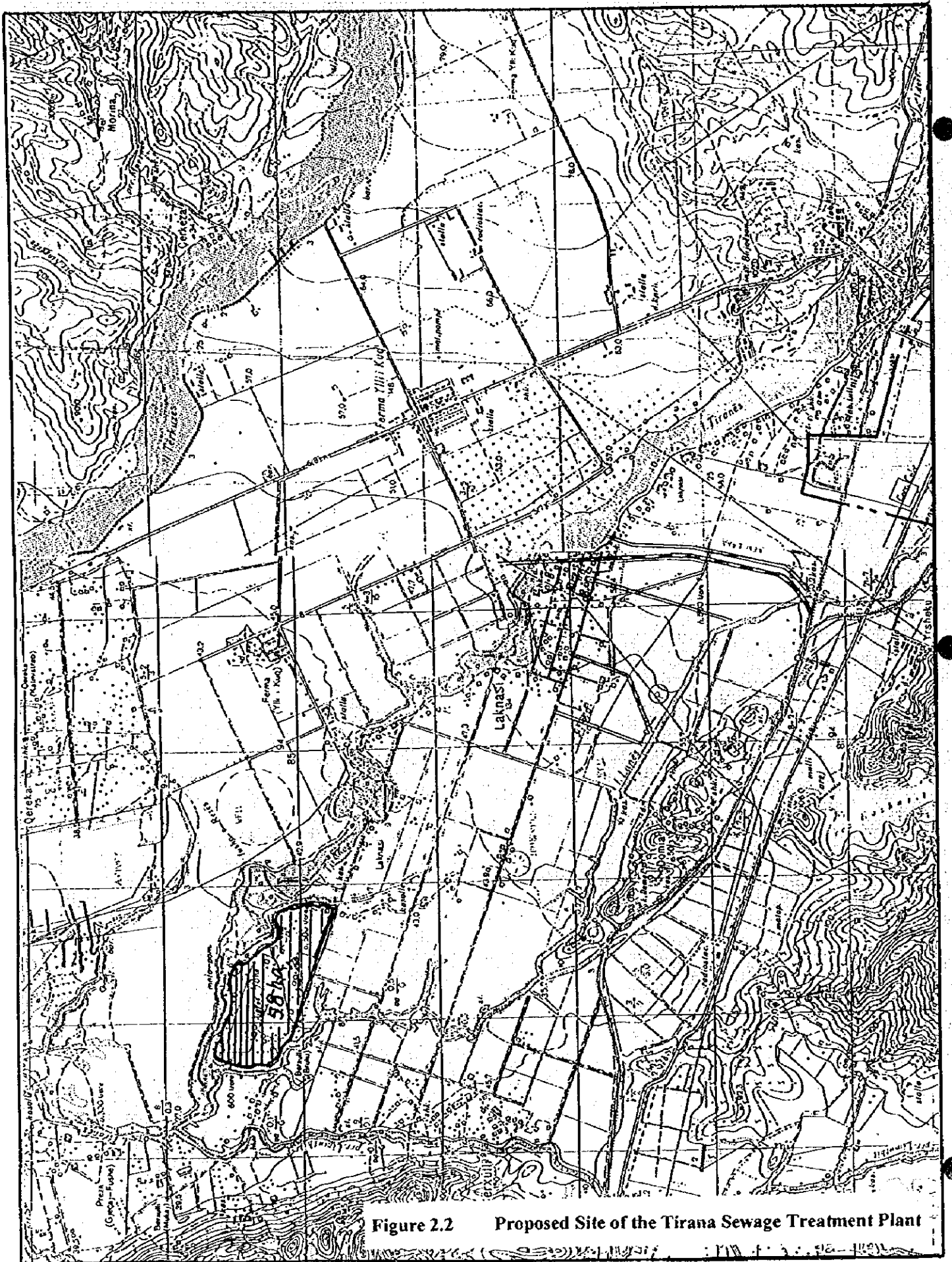


Figure 2.2 Proposed Site of the Tirana Sewage Treatment Plant

(3) Sewage Collection Method

Separate sewer system will be introduced in the proposed Project:

Sanitary sewer to collect domestic, commercial and industrial wastewater and to convey to the sewage treatment plant

Storm Sewer to collect rain water run-off and dispose to the river.

(4) Sewage Treatment Plant

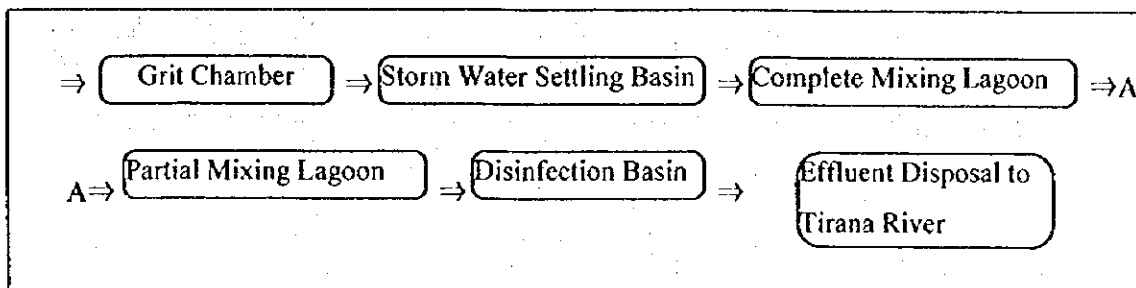
The collected sewage will be treated by aerated lagoon and final sedimentation basin at the proposed Tirana Sewage Treatment Plant. The general layout of the treatment facility is shown in Figure 2.3.

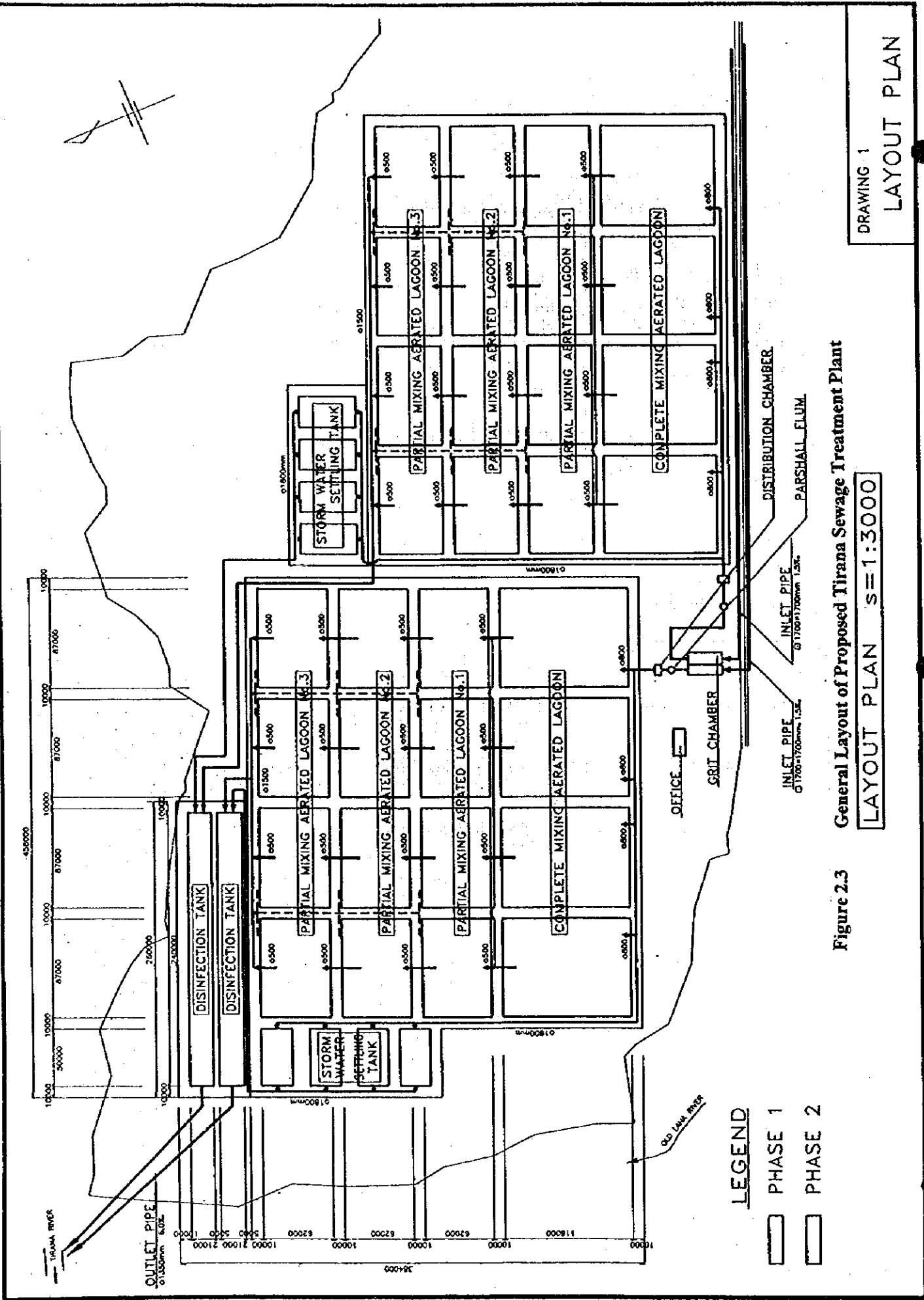
The sewage treatment plant is planned to have the following treatment efficiency:

	BOD	SS
Influent	200 mg/L	200 mg/L
Effluent	25 mg/L	35 mg/L

Treated effluent will be discharged into Tirana River. The proposed sewage treatment process is shown in Figure 2.4

Figure 2.4 Proposed Sewage Treatment Process





General Layout of Proposed Tirana Sewage Treatment Plant

Figure 2.3

LAYOUT PLAN S=1:3000

DRAWING 1
LAYOUT PLAN

2.4 ENVIRONMENTAL CONDITIONS OF THE PROJECT

The Environmental conditions of the proposed Project is summarized in Table 2.3.

Table 2.3 Environmental Conditions of the Project

Item		Description
Project Name		Rehabilitation and Expansion of Sewerage System in Metropolitan Tirana in the Republic of Albania
Social Environment	Local Residents (Inhabitants/aborigines/awareness of project)	Majority of local residents are private and government employees with their dependents and increasing tourists
	Land Use (City/agriculture/historic ruins/sightseeing spots/hospitals, etc.)	National capital city under expansion of urban area with rapid increase of population
	Economy/Transportation (Commerce/agro-fisheries/industrial estate/bus terminal)	Center of national economy and tourism with hotels
Natural Environment	Topography/Geology (Steep slope/loose foundation/swamp/faults)	Terrace of Tirana River, gently declining to western direction, consisting of Palaeogene carbonate formations and Paleogene flysch formations
	Conditions of Coastal Area (Erosion, sand deposits, tidal current, etc.)	Not Applicable
	Important Fauna & Flora (Natural park, endangered species, etc.)	Not identified
Public Nuisance	Status of Public Complaints (Noteworthy public nuisance)	Inundation, deterioration of sanitary conditions, water pollution
	Status of Adopted Countermeasures	Laws and regulations on environmental protection are under preparation.

2.5 SCOPE OF EIA STUDY

(1) Initial Environmental Evaluation

The initial environmental evaluation of the proposed project was carried out by the JICA Study Team through screening and scoping of the anticipated environmental impacts as shown in Table 2.4. The EIA Study shall be carried out for those which identified as scores "A" and "B" in his evaluation.

Table 2.4 Results of Initial Environmental Evaluation

	Item	Score	Description
Social Environment	1	B	Relocation of Local Residents
	2	D	Economic Activity
	3	B	Transportation & Social Facilities
	4	D	Separation of Local Society
	5	D	Ruins & Cultural Assets
	6	D	Water Right & Right of Common
	7	B	Public Hygiene
	8	B	Wastes from Project
	9	D	Natural Disaster
Natural Environment	10	D	Topography & Geology
	11	D	Soil Erosion
	12	D	Groundwater
	13	B	River, Lake & Pond
	14	D	Coast & Sea
	15	D	Flora & Fauna
	16	D	Climate
	17	D	Scenery
Public Nuisance	18	D	Air Pollution
	19	B	Water Pollution
	20	B	Soil Pollution
	21	B	Noise and vibration
	22	D	Land subsidence
	23	B	Odor

Note: Score; A-Significant impact anticipated.

B-Slight impact anticipated

C-Unknown (subject to further verification)

D-Almost no impact anticipated and not subject for IEE (Initial Environmental Evaluation) and EIA (Environmental Impact Assessment)

(2) **Scope of Work**

The following scope of work shall be undertaken by the Contractor in the course of EIA Study:

1) **Laws and regulations on EIA, environmental protection and sewerage project**

The existing laws and regulations pertaining to the EIA, environmental protection and sewerage project shall be reviewed and legislative requirements shall be clarified. This particular study shall cover not only the existing laws and regulations, but also such requirements under consideration or proposed for the government approval.

2) **Itemized assessment of environmental impact/s**

Based on the results of the initial environmental evaluation, itemized assessment of environmental impact/s with their magnitudes shall be carried out for those identified impact items.

3) **Preparation of recommendations and proposed countermeasures**

For those identified impact item/s, recommendations and proposed countermeasures to mitigate environmental impact/s shall be prepared.

(3) **Preparation of EIA Report**

The EIA Report shall be prepared covering the above mentioned scope of work. Supporting data and information, reference materials shall be attached to the EIA Report.

2.6 SCHEDULE OF EIA STUDY

The EIA Study shall be completed within three (3) weeks upon signing and approval of the Contract.

CHAPTER 13
FINANCIAL PLAN FOR
SEWERAGE SYSTEM

13.5 Financial Performance

13.5.1 FIRR Calculation

FIRR (Grant & Loan) 3/5 - Phase 1 & Phase 2

Case C:

Month	EXPENDITURE						RECEIPT BY EXPECTED COLLECTION RATIO						NET CASH FLOW IN (OUT) & FIRR											
	80		100		120		140		160		180		200		220		240		260		280		300	
	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%
FIRR	-13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1999	-370	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2000	-1,250	49	61	74	86	98	111	123	135	147	160	172	184	196	208	220	232	244	256	268	280	292	304	316
2001	-1,192	50	62	74	87	99	112	124	137	149	161	173	185	197	209	221	233	245	257	269	281	293	305	317
2002	-62	50	63	75	88	100	113	125	138	150	163	175	188	200	212	224	236	248	260	272	284	296	308	320
2003	-62	51	63	76	89	101	114	126	139	152	164	177	189	201	213	225	237	249	261	273	285	297	309	321
2004	-62	51	64	77	89	102	115	128	140	153	166	178	191	203	215	227	239	251	263	275	287	299	311	323
2005	-62	52	64	77	90	103	116	129	142	155	167	180	192	204	216	228	240	252	264	276	288	300	312	324
2006	-179	52	65	78	91	104	117	130	143	156	169	181	194	206	218	230	242	254	266	278	290	302	314	326
2007	-62	52	66	79	92	105	118	131	144	157	170	183	195	207	219	231	243	255	267	279	291	303	315	327
2008	-352	53	66	79	93	106	119	132	145	158	171	184	196	208	220	232	244	256	268	280	292	304	316	328
2009	-1,047	53	67	80	93	107	120	133	147	160	173	186	199	211	223	235	247	259	271	283	295	307	319	331
2010	-1,052	67	84	101	118	134	151	168	185	202	218	235	252	269	286	303	320	337	354	371	388	405	422	439
2011	-142	75	94	113	132	151	170	189	208	226	245	264	283	302	321	340	359	378	397	416	435	454	473	492
2012	-241	75	94	113	132	151	170	189	208	226	245	264	283	302	321	340	359	378	397	416	435	454	473	492
2013	-133	76	95	114	133	152	171	190	209	228	247	266	285	304	323	342	361	380	399	418	437	456	475	494
2014	-133	76	95	114	133	152	171	190	209	228	247	266	285	304	323	342	361	380	399	418	437	456	475	494
2015	-157	76	95	114	133	153	172	191	210	229	248	267	286	305	324	343	362	381	400	419	438	457	476	495
2016	-464	77	96	115	134	153	172	191	210	229	248	267	286	305	324	343	362	381	400	419	438	457	476	495
2017	-133	77	96	115	134	154	173	192	211	230	250	269	288	307	326	345	364	383	402	421	440	459	478	497
2018	-241	77	96	116	135	154	173	193	212	231	250	269	288	307	326	345	364	383	402	421	440	459	478	497
2019	-133	77	97	116	135	155	174	193	213	232	251	270	289	308	327	346	365	384	403	422	441	460	479	498
2020	-141	78	97	116	136	155	175	194	213	233	252	271	290	309	328	347	366	385	404	423	442	461	480	499
2021	-157	78	97	117	136	156	175	195	214	234	253	272	291	310	329	348	367	386	405	424	443	462	481	500
2022	-130	78	98	117	137	156	176	195	215	234	254	273	292	311	330	349	368	387	406	425	444	463	482	501
2023	-128	78	98	118	137	157	176	196	216	235	255	274	293	312	331	350	369	388	407	426	445	464	483	502
2024	-234	79	98	118	138	157	177	197	217	236	256	275	294	313	332	351	370	389	408	427	446	465	484	503
2025	-413	79	99	118	138	158	177	197	217	237	256	275	294	313	332	351	370	389	408	427	446	465	484	503
2026	-132	79	99	118	138	158	177	197	217	237	256	275	294	313	332	351	370	389	408	427	446	465	484	503
2027	-136	79	99	118	138	158	177	197	217	237	256	275	294	313	332	351	370	389	408	427	446	465	484	503
2028	-119	79	99	118	138	158	177	197	217	237	256	275	294	313	332	351	370	389	408	427	446	465	484	503
2029	-117	79	99	118	138	158	177	197	217	237	256	275	294	313	332	351	370	389	408	427	446	465	484	503
2030	-231	79	99	118	138	158	177	197	217	237	256	275	294	313	332	351	370	389	408	427	446	465	484	503
2031	-444	79	99	118	138	158	177	197	217	237	256	275	294	313	332	351	370	389	408	427	446	465	484	503
2032	-111	79	99	118	138	158	177	197	217	237	256	275	294	313	332	351	370	389	408	427	446	465	484	503
2033	-124	79	99	118	138	158	177	197	217	237	256	275	294	313	332	351	370	389	408	427	446	465	484	503
2034	-107	79	99	118	138	158	177	197	217	237	256	275	294	313	332	351	370	389	408	427	446	465	484	503
2035	-114	79	99	118	138	158	177	197	217	237	256	275	294	313	332	351	370	389	408	427	446	465	484	503
2036	-221	79	99	118	138	158	177	197	217	237	256	275	294	313	332	351	370	389	408	427	446	465	484	503
2037	-101	79	99	118	138	158	177	197	217	237	256	275	294	313	332	351	370	389	408	427	446	465	484	503
2038	-99	79	99	118	138	158	177	197	217	237	256	275	294	313	332	351	370	389	408	427	446	465	484	503
2039	-113	79	99	118	138	158	177	197	217	237	256	275	294	313	332	351	370	389	408	427	446	465	484	503
2040	1,603	79	99	118	138	158	177	197	217	237	256	275	294	313	332	351	370	389	408	427	446	465	484	503
	2,919	3,049	4,379	5,108	5,836	6,568	7,298	8,028	8,757	9,487	10,217	10,947	11,677	12,407	13,137	13,867	14,597	15,327	16,057	16,787	17,517	18,247	18,977	19,707

FIRR (Grant & Loan) 4/5 - Phase 1 & Phase 2

Case D:

Month	EXPENDITURE				RECEIPT BY EXPECTED COLLECTION RATIO						NET CASH FLOW IN (OUT) & FIRR							
	80	100	120	140	160	180	200	220	240	80	100	120	140	160	180	200	220	240
	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%
1998	-13	0	0	0	0	0	0	0	0	0	-13	-13	-13	-13	-13	-13	-13	-13
1999	-370	0	0	0	0	0	0	116	126	137	-1,207	-1,197	-1,186	-1,176	-1,165	-1,155	-1,144	-1,133
2000	-1,250	42	53	64	74	84	95	105	116	126	137	-1,207	-1,197	-1,186	-1,176	-1,165	-1,155	-1,144
2001	-1,192	43	55	67	79	91	103	115	127	139	151	-1,149	-1,139	-1,128	-1,117	-1,107	-1,096	-1,085
2002	-62	43	54	65	76	87	98	109	120	131	142	-18	-7	3	14	24	34	44
2003	-62	43	54	65	76	87	98	109	120	131	142	-18	-7	3	14	24	34	44
2004	-62	44	55	66	77	88	99	110	121	132	143	-17	-6	4	15	26	37	48
2005	-62	44	55	66	77	88	99	110	121	132	143	-17	-6	4	15	26	37	48
2006	-179	45	56	67	78	89	100	111	122	133	144	-17	-6	4	15	26	37	48
2007	-62	45	56	67	78	89	100	111	122	133	144	-17	-6	4	15	26	37	48
2008	-352	45	57	68	79	91	102	113	125	136	147	-307	-295	-284	-273	-261	-250	-239
2009	-1,047	46	57	69	80	91	103	114	126	137	149	-1,001	-989	-978	-967	-955	-944	-932
2010	-1,052	58	72	86	101	115	130	144	158	173	187	-995	-980	-966	-952	-937	-923	-908
2011	-142	64	81	97	113	129	145	161	177	193	210	-176	-160	-144	-127	-111	-95	-79
2012	-241	65	81	97	114	130	146	162	178	194	210	-176	-160	-144	-127	-111	-95	-79
2013	-133	65	81	97	114	130	146	162	178	194	210	-176	-160	-144	-127	-111	-95	-79
2014	-133	65	81	97	114	130	146	162	178	194	210	-176	-160	-144	-127	-111	-95	-79
2015	-157	65	82	98	115	131	147	163	179	195	212	-68	-51	-35	-19	-3	13	30
2016	-464	66	82	99	116	132	148	165	181	197	214	-67	-51	-34	-18	-1	15	32
2017	-133	66	83	99	116	132	148	165	181	197	214	-67	-51	-34	-18	-1	15	32
2018	-241	66	83	99	116	132	148	165	181	197	214	-67	-51	-34	-18	-1	15	32
2019	-133	66	83	99	116	132	148	165	181	197	214	-67	-51	-34	-18	-1	15	32
2020	-141	66	83	100	116	133	150	166	183	199	216	-75	-58	-41	-25	-8	8	25
2021	-157	67	83	100	117	133	150	167	183	200	217	-90	-74	-57	-40	-24	8	25
2022	-130	67	84	100	117	134	151	167	184	201	218	-63	-46	-30	-13	4	21	37
2023	-128	67	84	101	118	134	151	168	185	202	218	-61	-44	-27	9	23	40	57
2024	-234	67	84	101	118	135	152	168	185	202	219	-167	-150	-133	-116	-99	-82	-65
2025	-413	68	85	101	118	135	152	169	186	203	220	-346	-329	-312	-295	-278	-261	-244
2026	-132	68	85	101	118	135	152	169	186	203	220	-64	-47	-31	-14	3	20	37
2027	-136	68	85	101	118	135	152	169	186	203	220	-68	-51	-34	-18	-1	16	33
2028	-119	68	85	101	118	135	152	169	186	203	220	-51	-34	-17	-1	17	34	51
2029	-231	68	85	101	118	135	152	169	186	203	220	-49	-32	-15	2	19	36	52
2030	-444	68	85	101	118	135	152	169	186	203	220	-163	-146	-129	-113	-96	-79	-62
2031	-111	68	85	101	118	135	152	169	186	203	220	-376	-359	-342	-326	-309	-292	-275
2032	-124	68	85	101	118	135	152	169	186	203	220	-43	-26	-9	7	24	41	58
2033	-107	68	85	101	118	135	152	169	186	203	220	-57	-40	-23	-6	11	28	45
2034	-114	68	85	101	118	135	152	169	186	203	220	-89	-73	-57	-41	-25	-9	79
2035	-221	68	85	101	118	135	152	169	186	203	220	-46	-29	-12	5	22	39	55
2036	-101	68	85	101	118	135	152	169	186	203	220	-153	-136	-119	-102	-85	-68	-52
2037	-99	68	85	101	118	135	152	169	186	203	220	-34	-17	0	17	34	51	68
2038	-113	68	85	101	118	135	152	169	186	203	220	-32	-15	2	19	36	52	69
2039	-1663	68	85	101	118	135	152	169	186	203	220	-45	-28	-12	5	22	39	56
2040	-2,466	68	85	101	118	135	152	169	186	203	220	-1,731	-1,748	-1,764	-1,781	-1,798	-1,815	-1,832
		2,502	3,128	3,753	4,379	5,004	5,630	6,255	6,881	7,506	8,132	-6,744	-6,119	-5,493	-4,868	-4,242	-3,617	-2,991

FIRR (Grant & Loan) 5/5 - Phase 1 & Phase 2

Case E:

	EXPENDITURE:						RECEIPT BY EXPECTED COLLECTION RATIO						NET & FIRR								
	80	100	120	140	160	180	200	220	240	260	80	100	120	140	160	180	200	220	240	260	
Monthly tariff																					
Collection rates	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
FIRR	-13	0	0	0	0	0	0	0	0	0	-6.93%	-6.36%	-5.80%	-5.26%	-4.72%	-4.20%	-3.69%	-3.18%	-2.69%	-2.20%	-1.73%

FIRR (Grant) 1/5 - Phase 1 & Phase 2

Case A:	EXPENDITURE					RECEIPT BY EXPECTED COLLECTION RATIO										NET CASH FLOW IN (OUT) & FIRR									
	Monthly tariff	80	100	120	140	160	180	200	220	240	260	80	100	120	140	160	180	200	220	240	260				
		90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%			
FIRR	-13	0	0	0	0	0	0	0	0	0	0	-13	-13	-13	-13	-13	-13	-13	-13	-13	-13	-13			
1998	-370	0	0	0	0	0	0	0	0	0	0	-370	-370	-370	-370	-370	-370	-370	-370	-370	-370	-370			
1999	-1,250	63	79	95	111	126	142	158	174	190	205	-1,186	-1,171	-1,155	-1,139	-1,123	-1,107	-1,092	-1,076	-1,060	-1,044	-1,028			
2000	-1,192	64	80	96	112	128	144	160	176	192	207	-1,128	-1,112	-1,096	-1,080	-1,064	-1,048	-1,032	-1,016	-1,000	-984	-968			
2001	-62	64	81	97	113	129	145	161	177	193	209	3	19	35	51	67	83	99	116	132	148	164			
2002	-62	65	81	98	114	130	146	163	179	195	211	3	20	36	52	68	85	101	117	133	150	166			
2003	-62	66	82	98	115	131	148	164	180	197	213	4	20	37	53	70	86	102	119	135	152	168			
2004	-62	66	83	99	116	132	149	166	182	199	215	5	21	38	54	71	87	104	120	137	154	170			
2005	-179	67	84	100	117	134	150	167	184	200	217	-112	-96	-79	-62	-45	-29	-12	5	21	38	54			
2006	-62	67	84	100	117	134	150	167	184	200	217	6	23	39	56	73	90	107	124	141	157	174			
2007	-352	68	85	102	119	135	152	169	185	202	219	-284	-267	-250	-233	-216	-199	-182	-165	-148	-131	-114			
2008	-1,037	69	86	103	120	137	154	171	189	206	223	-968	-951	-934	-917	-899	-882	-865	-848	-831	-814	-797			
2009	-1,024	86	104	121	138	155	173	190	208	225	242	-957	-916	-874	-832	-790	-748	-706	-664	-622	-580	-538			
2010	-1,04	97	121	145	169	193	218	242	266	290	314	-8	-8	17	41	65	89	113	138	162	186	210			
2011	-202	97	122	146	170	194	218	243	267	291	315	-105	-81	-57	-33	-8	16	40	64	88	112	136			
2012	-95	98	122	147	171	195	220	244	269	293	318	3	28	52	76	100	125	149	173	198	222	246			
2013	-119	98	123	147	172	196	221	245	270	294	319	3	28	52	76	100	125	149	173	198	222	246			
2014	-426	98	123	148	172	197	221	246	271	295	320	-327	-303	-278	-254	-229	-204	-180	-155	-131	-106	-81			
2015	-95	99	124	148	173	197	222	247	272	296	321	4	29	53	78	103	128	152	177	202	226	251			
2016	-202	99	124	149	173	198	223	248	272	297	322	-103	-79	-54	-29	-4	20	45	70	95	120	145			
2017	-103	99	124	149	174	199	224	249	273	298	323	5	30	54	79	104	129	154	179	204	228	253			
2018	-120	100	125	150	175	199	224	249	274	299	324	-3	22	47	72	96	121	146	171	196	221	246			
2019	-95	100	125	150	175	200	225	250	275	300	325	-20	5	30	55	80	105	130	155	180	205	230			
2020	-65	100	126	151	176	201	226	251	276	301	326	6	31	56	81	106	131	156	181	206	231	256			
2021	-95	101	126	151	176	201	226	251	276	301	326	6	31	56	81	106	131	156	181	206	231	256			
2022	-202	101	126	152	177	202	227	252	277	302	327	6	31	56	81	106	131	156	181	206	231	256			
2023	-384	101	127	152	177	202	227	252	277	302	327	-101	-76	-51	-26	-1	24	49	74	99	124	149			
2024	-104	101	127	152	177	202	227	252	277	302	327	-282	-257	-231	-206	-181	-155	-130	-105	-79	-54				
2025	-110	101	127	152	177	202	227	252	277	302	327	-9	17	42	67	92	117	142	167	192	217	242			
2026	-95	101	127	152	177	202	227	252	277	302	327	7	32	57	82	107	132	157	182	207	232	257			
2027	-95	101	127	152	177	202	227	252	277	302	327	7	32	57	82	107	132	157	182	207	232	257			
2028	-211	101	127	152	177	202	227	252	277	302	327	7	32	57	82	107	132	157	182	207	232	257			
2029	-426	101	127	152	177	202	227	252	277	302	327	-109	-84	-59	-33	-8	17	43	68	93	118	143			
2030	-95	101	127	152	177	202	227	252	277	302	327	-324	-299	-274	-248	-223	-198	-172	-147	-122	-96				
2031	-110	101	127	152	177	202	227	252	277	302	327	7	32	57	82	107	132	157	182	207	232	257			
2032	-95	101	127	152	177	202	227	252	277	302	327	7	32	57	82	107	132	157	182	207	232	257			
2033	-95	101	127	152	177	202	227	252	277	302	327	7	32	57	82	107	132	157	182	207	232	257			
2034	-103	101	127	152	177	202	227	252	277	302	327	7	32	57	82	107	132	157	182	207	232	257			
2035	-212	101	127	152	177	202	227	252	277	302	327	-111	-85	-60	-35	-9	16	42	67	92	117	142			
2036	-95	101	127	152	177	202	227	252	277	302	327	7	32	57	82	107	132	157	182	207	232	257			
2037	-95	101	127	152	177	202	227	252	277	302	327	7	32	57	82	107	132	157	182	207	232	257			
2038	-110	101	127	152	177	202	227	252	277	302	327	7	32	57	82	107	132	157	182	207	232	257			
2039	-1,664	101	127	152	177	202	227	252	277	302	327	1,765	1,791	1,816	1,841	1,867	1,892	1,918	1,943	1,968	1,994	2,019			
2040	-8,443	3,753	4,691	5,630	6,568	7,506	8,445	9,383	10,321	11,259	12,198	-4,690	-5,752	-6,814	-7,875	-8,937	-9,999	-11,061	-12,123	-13,185	-14,247	-15,309			

FIRR (Grant) 3/5 - Phase 1 & Phase 2

Case C:

	EXPENDITURE				RECEIPT BY EXPECTED COLLECTION RATIO				NET CASH FLOW IN (OUT) & FIRR												
	80	100	120	140	160	180	200	220	240	260	80	100	120	140	160	180	200	220	240	260	
Monthly tariff	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	
Collection rates	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	
FIRR	-13	0	0	0	0	0	0	0	0	0	-5.29%	-4.52%	-3.78%	-3.06%	-2.36%	-1.68%	-1.01%	-0.36%	0.27%	0.90%	
1998	-13	0	0	0	0	0	0	0	0	0	-13	-13	-13	-13	-13	-13	-13	-13	-13	-13	
1999	-370	0	0	0	0	0	0	0	0	0	-370	-370	-370	-370	-370	-370	-370	-370	-370	-370	
2000	-1,250	49	61	74	86	98	111	123	135	147	160	-1,200	-1,188	-1,176	-1,164	-1,151	-1,139	-1,127	-1,114	-1,102	-1,090
2001	-1,192	50	62	74	87	99	112	124	137	149	161	-1,142	-1,130	-1,117	-1,105	-1,093	-1,080	-1,068	-1,055	-1,043	-1,031
2002	-62	80	63	75	88	100	113	125	138	150	163	-12	1	14	26	39	51	64	76	89	101
2003	-62	51	63	76	89	101	114	126	139	152	164	-11	2	14	27	40	52	65	77	90	103
2004	-62	51	64	77	89	102	115	128	140	153	166	-11	2	15	28	40	53	66	79	92	104
2005	-62	52	64	77	90	103	116	129	142	155	167	-10	3	16	29	41	54	67	80	93	106
2006	-179	52	65	78	91	104	117	130	143	156	169	-127	-114	-101	-88	-75	-62	-49	-36	-23	-10
2007	-62	52	66	79	92	105	118	131	144	157	170	-9	4	17	30	43	56	69	83	96	109
2008	-352	53	66	79	93	106	119	132	145	159	172	-299	-286	-272	-259	-246	-233	-219	-206	-193	-180
2009	-1,037	53	67	80	93	107	120	133	147	160	173	-883	-870	-857	-843	-830	-817	-803	-790	-777	-763
2010	-1,024	67	84	101	118	134	151	168	185	202	218	-956	-940	-923	-906	-889	-872	-856	-839	-822	-805
2011	-104	75	94	113	132	151	169	188	207	226	245	-29	9	27	46	65	84	103	121	140	140
2012	-202	75	94	113	132	151	170	189	208	227	246	-19	0	19	38	57	76	95	114	133	152
2013	-95	76	95	114	133	152	171	190	209	228	247	-19	0	19	38	57	76	95	114	133	152
2014	-95	76	95	114	133	152	171	190	209	228	247	-19	0	19	38	57	76	95	114	133	152
2015	-119	76	95	114	133	153	172	191	210	229	248	-42	-23	-4	15	34	53	72	91	110	129
2016	-426	77	96	115	134	153	172	191	210	230	249	-349	-330	-311	-292	-273	-254	-234	-215	-196	-177
2017	-95	77	96	115	134	154	173	192	211	230	250	-18	1	21	40	59	78	97	117	136	155
2018	-202	77	96	116	135	154	173	193	212	231	250	-125	-106	-87	-68	-48	-29	-10	9	29	48
2019	-95	77	97	116	135	155	174	193	213	232	251	-17	2	21	41	60	79	99	118	137	157
2020	-103	78	97	116	136	155	175	194	213	233	252	-25	-6	13	33	52	72	91	110	130	149
2021	-120	78	97	117	136	156	175	195	214	234	253	-42	-22	-3	16	36	55	75	94	114	133
2022	-95	78	98	117	137	156	176	195	215	234	254	-17	3	23	42	62	81	101	120	140	159
2023	-95	78	98	118	137	157	176	196	216	235	255	-16	3	23	42	62	82	101	121	140	160
2024	-202	79	98	118	138	157	177	197	217	237	256	-124	-104	-85	-65	-45	-26	-6	14	33	53
2025	-384	79	99	118	138	158	177	197	217	237	256	-305	-285	-265	-246	-226	-206	-186	-167	-147	-127
2026	-104	79	99	118	138	158	177	197	217	237	256	-25	-6	14	34	54	73	93	113	132	152
2027	-110	79	99	118	138	158	177	197	217	237	256	-31	-12	8	28	48	67	87	107	127	146
2028	-95	79	99	118	138	158	177	197	217	237	256	-16	4	24	43	63	83	103	122	142	162
2029	-95	79	99	118	138	158	177	197	217	237	256	-16	4	24	43	63	83	103	122	142	162
2030	-211	79	99	118	138	158	177	197	217	237	256	-132	-112	-93	-73	-53	-33	-14	6	26	46
2031	-426	79	99	118	138	158	177	197	217	237	256	-347	-327	-307	-288	-268	-248	-229	-209	-189	-169
2032	-95	79	99	118	138	158	177	197	217	237	256	-16	4	24	43	63	83	103	122	142	162
2033	-110	79	99	118	138	158	177	197	217	237	256	-31	-12	8	28	48	67	87	107	127	146
2034	-95	79	99	118	138	158	177	197	217	237	256	-16	4	24	43	63	83	103	122	142	162
2035	-103	79	99	118	138	158	177	197	217	237	256	-24	-4	15	35	55	74	94	114	134	153
2036	-212	79	99	118	138	158	177	197	217	237	256	-133	-113	-94	-74	-54	-35	-15	5	25	44
2037	-95	79	99	118	138	158	177	197	217	237	256	-16	4	24	43	63	83	103	122	142	162
2038	-95	79	99	118	138	158	177	197	217	237	256	-16	4	24	43	63	83	103	122	142	162
2039	-110	79	99	118	138	158	177	197	217	237	256	-31	-12	8	28	48	67	87	107	127	146
2040	1,664	79	99	118	138	158	177	197	217	237	256	-1,743	-1,763	-1,782	-1,802	-1,822	-1,841	-1,861	-1,881	-1,901	-1,920
	-8,443	2,919	3,649	4,379	5,108	5,838	6,568	7,298	8,028	8,757	9,487	-5,524	-4,795	-4,065	-3,335	-2,605	-1,875	-1,146	-416	314	1,044

FIRR (Grant) 4/5 - Phase 1 & Phase 2

Case D:

	EXPENDITURE						RECEIPT BY EXPECTED COLLECTION RATIO						NET CASH FLOW IN (OUT) & FIRR											
	80	100	120	140	160	180	200	220	240	260	60%	60%	60%	60%	80	100	120	140	160	180	200	220	240	260
Monthly tariff																								
Collection rates	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%
FIRR																								
1998	-13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-13	-13	-13	-13	-13	-13	-13	-13	-13
1999	-370	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-370	-370	-370	-370	-370	-370	-370	-370	-370
2000	-1,250	42	53	63	74	84	95	105	116	126	137	147	157	167	-1,207	-1,197	-1,186	-1,176	-1,165	-1,155	-1,144	-1,134	-1,123	
2001	-1,192	43	53	64	74	85	96	106	117	128	138	149	159	169	-1,149	-1,139	-1,128	-1,117	-1,107	-1,096	-1,086	-1,075	-1,064	
2002	-62	43	54	64	75	86	97	107	118	129	140	151	162	173	-19	-8	3	14	24	35	46	57	67	
2003	-62	43	54	65	76	87	98	108	119	130	141	152	163	174	-18	-7	3	14	25	36	47	58	68	
2004	-62	44	55	66	77	88	99	109	120	131	142	153	164	175	-18	-7	4	15	26	37	48	59	70	
2005	-62	44	55	66	77	88	99	110	121	132	143	154	165	176	-17	-6	5	16	27	38	49	60	71	
2006	-179	45	56	67	78	89	100	111	122	133	144	155	166	177	-134	-123	-112	-101	-90	-79	-68	-57	-45	
2007	-62	45	56	67	79	90	101	112	124	135	146	157	168	179	-17	-5	6	17	28	39	51	62	73	
2008	-352	45	57	68	79	91	102	113	125	136	147	158	169	180	-306	-295	-284	-272	-261	-250	-238	-227	-216	
2009	-1,037	46	57	69	80	91	103	114	126	137	149	161	173	185	-991	-979	-968	-957	-945	-934	-922	-911	-899	
2010	-1,024	58	72	86	101	115	130	144	158	173	187	201	215	229	-966	-952	-937	-923	-908	-894	-880	-865	-851	
2011	-104	64	81	97	113	129	145	161	177	193	210	226	242	258	-40	-24	-8	9	25	41	57	73	89	
2012	-202	65	81	97	114	130	146	162	178	194	210	226	242	258	-30	-13	3	19	35	51	68	84	100	
2013	-95	65	81	97	114	130	146	162	179	195	211	227	243	259	-30	-13	3	19	36	52	68	85	101	
2014	-95	65	81	98	114	130	147	163	179	195	212	228	244	260	-29	-13	3	19	36	52	68	85	101	
2015	-119	65	82	98	114	131	147	163	180	196	212	228	244	260	-29	-13	3	19	36	52	68	85	101	
2016	-426	66	82	98	115	131	148	164	180	197	213	229	245	261	-360	-344	-327	-311	-295	-278	-262	-245	-228	
2017	-95	66	82	99	115	132	148	165	181	197	214	229	245	261	-29	-12	4	21	37	53	70	86	103	
2018	-202	66	83	99	116	132	149	165	182	198	215	230	246	262	-136	-120	-103	-87	-70	-54	-37	-21	-4	
2019	-95	66	83	99	116	133	149	166	182	199	215	231	247	263	-28	-12	5	21	38	54	71	88	104	
2020	-103	66	83	100	116	133	150	166	183	199	216	232	248	264	-37	-20	-3	13	30	47	63	80	97	
2021	-120	67	83	100	117	133	150	167	183	200	217	233	249	265	-53	-36	-20	-3	14	30	47	64	80	
2022	-95	67	84	100	117	134	151	167	184	201	218	234	250	266	-28	-11	6	23	39	56	73	89	106	
2023	-95	67	84	101	118	134	151	168	185	202	219	235	251	267	-27	-11	6	23	40	56	73	90	107	
2024	-202	67	84	101	118	135	152	168	185	202	219	235	251	267	-135	-118	-101	-85	-68	-51	-34	-17	-0	
2025	-184	68	85	101	118	135	152	169	186	203	220	236	252	268	-316	-299	-282	-265	-248	-231	-215	-198	-164	
2026	-104	68	85	101	118	135	152	169	186	203	220	236	252	268	-37	-20	-3	14	31	48	65	82	99	
2027	-110	68	85	101	118	135	152	169	186	203	220	236	252	268	-43	-26	-9	8	25	42	59	76	93	
2028	-95	68	85	101	118	135	152	169	186	203	220	236	252	268	-27	-10	7	24	41	57	74	91	108	
2029	-95	68	85	101	118	135	152	169	186	203	220	236	252	268	-27	-10	7	24	41	57	74	91	108	
2030	-211	68	85	101	118	135	152	169	186	203	220	236	252	268	-143	-126	-109	-93	-76	-59	-42	-25	-8	
2031	-426	68	85	101	118	135	152	169	186	203	220	236	252	268	-358	-341	-324	-307	-291	-274	-257	-240	-206	
2032	-95	68	85	101	118	135	152	169	186	203	220	236	252	268	-27	-10	7	24	41	57	74	91	108	
2033	-110	68	85	101	118	135	152	169	186	203	220	236	252	268	-43	-26	-9	8	25	42	59	76	93	
2034	-95	68	85	101	118	135	152	169	186	203	220	236	252	268	-27	-10	7	24	41	57	74	91	108	
2035	-103	68	85	101	118	135	152	169	186	203	220	236	252	268	-35	-19	-2	13	32	49	66	83	100	
2036	-212	68	85	101	118	135	152	169	186	203	220	236	252	268	-144	-128	-111	-94	-77	-60	-43	-26	-9	
2037	-95	68	85	101	118	135	152	169	186	203	220	236	252	268	-27	-10	7	24	41	57	74	91	108	
2038	-95	68	85	101	118	135	152	169	186	203	220	236	252	268	-27	-10	7	24	41	57	74	91	108	
2039	-110	68	85	101	118	135	152	169	186	203	220	236	252	268	-43	-26	-9	8	25	42	59	76	93	
2040	1,664	68	85	101	118	135	152	169	186	203	220	236	252	268	1,732	1,749	1,765	1,782	1,799	1,816	1,833	1,850	1,867	
	-8,443	2,502	3,128	3,753	4,379	5,004	5,630	6,255	6,881	7,506	8,132	8,757	9,383	10,008	-5,941	-5,316	-4,690	-4,065	-3,439	-2,814	-2,188	-1,563	-937	

FIRR (Grant) 5/5 - Phase 1 & Phase 2

Case #:	EXPENDITURE						RECEIPT BY EXPECTED COLLECTION RATIO						NET CASH FLOW IN (OUT) & FIRR												
	80		100		120		140		160		180		200		220		240		260		280		300		
	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	
Monthly maint																									
Collection rates																									
FIRR	-13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-13	-13	-13	-13	-13	-13	-13	-13	-13	
1998	-370	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-370	-370	-370	-370	-370	-370	-370	-370	-370	
1999	-1,250	35	44	53	61	70	79	88	97	105	114	122	130	138	146	-1,179	-1,179	-1,179	-1,179	-1,179	-1,179	-1,179	-1,179	-1,179	
2000	-1,192	35	44	53	62	71	80	89	98	106	115	123	131	139	147	-1,121	-1,121	-1,121	-1,121	-1,121	-1,121	-1,121	-1,121	-1,121	
2001	-62	36	45	54	63	72	81	89	98	107	116	124	132	140	148	1	10	19	28	37	46	55	64	73	
2002	-62	36	45	54	63	72	81	89	98	107	116	124	132	140	148	1	10	19	28	37	46	55	64	73	
2003	-62	36	45	54	63	72	81	89	98	107	116	124	132	140	148	1	10	19	28	37	46	55	64	73	
2004	-62	36	45	54	63	72	81	89	98	107	116	124	132	140	148	1	10	19	28	37	46	55	64	73	
2005	-62	36	45	54	63	72	81	89	98	107	116	124	132	140	148	1	10	19	28	37	46	55	64	73	
2006	-179	37	46	56	65	74	84	93	102	111	120	129	138	147	156	-105	-105	-105	-105	-105	-105	-105	-105	-105	
2007	-62	37	47	56	66	75	84	94	103	112	121	130	139	148	157	4	13	23	32	41	51	60	70	80	
2008	-352	38	47	57	66	76	85	94	104	113	122	131	140	149	158	-267	-267	-267	-267	-267	-267	-267	-267	-267	
2009	-1,037	38	48	57	67	76	86	95	105	114	124	133	142	151	160	-941	-941	-941	-941	-941	-941	-941	-941	-941	
2010	-1,024	48	60	72	84	96	108	120	132	144	156	168	180	192	204	-960	-960	-960	-960	-960	-960	-960	-960	-960	
2011	-104	54	67	81	94	107	121	134	148	161	175	189	202	216	229	14	14	14	14	14	14	14	14	14	
2012	-202	54	67	81	94	108	121	135	148	162	176	189	203	217	230	0	0	0	0	0	0	0	0	0	
2013	-95	54	68	81	95	109	123	136	149	163	176	189	203	217	230	-108	-108	-108	-108	-108	-108	-108	-108	-108	
2014	-95	54	68	81	95	109	123	136	149	163	176	189	203	217	230	-108	-108	-108	-108	-108	-108	-108	-108	-108	
2015	-119	54	68	82	95	109	123	136	150	163	177	190	203	217	230	23	23	23	23	23	23	23	23	23	
2016	-426	55	68	82	96	109	123	137	150	164	178	191	204	218	231	-303	-303	-303	-303	-303	-303	-303	-303	-303	
2017	-98	55	69	82	96	110	123	137	151	165	178	192	205	219	232	1	1	1	1	1	1	1	1	1	
2018	-202	55	69	83	96	110	124	138	151	165	179	192	206	219	233	-106	-106	-106	-106	-106	-106	-106	-106	-106	
2019	-95	55	69	83	97	110	124	138	152	166	179	193	206	220	233	2	2	2	2	2	2	2	2	2	
2020	-103	55	69	83	97	111	125	139	152	166	180	193	207	220	234	-6	-6	-6	-6	-6	-6	-6	-6	-6	
2021	-120	56	70	83	97	111	125	139	153	167	181	194	208	221	235	3	3	3	3	3	3	3	3	3	
2022	-95	56	70	84	98	112	126	140	154	168	182	195	209	222	236	-11	-11	-11	-11	-11	-11	-11	-11	-11	
2023	-95	56	70	84	98	112	126	140	154	168	183	196	210	223	237	-118	-118	-118	-118	-118	-118	-118	-118	-118	
2024	-202	56	70	84	98	112	126	140	154	168	183	197	210	224	238	-313	-313	-313	-313	-313	-313	-313	-313	-313	
2025	-384	56	70	85	99	113	127	141	155	169	183	197	211	224	239	-34	-34	-34	-34	-34	-34	-34	-34	-34	
2026	-104	56	70	85	99	113	127	141	155	169	183	197	211	225	239	-20	-20	-20	-20	-20	-20	-20	-20	-20	
2027	-110	56	70	85	99	113	127	141	155	169	183	197	211	225	240	4	4	4	4	4	4	4	4	4	
2028	-95	56	70	85	99	113	127	141	155	169	183	197	211	225	240	-10	-10	-10	-10	-10	-10	-10	-10	-10	
2029	-95	56	70	85	99	113	127	141	155	169	183	197	211	225	240	-10	-10	-10	-10	-10	-10	-10	-10	-10	
2030	-211	56	70	85	99	113	127	141	155	169	183	197	211	225	240	-140	-140	-140	-140	-140	-140	-140	-140	-140	
2031	-426	56	70	85	99	113	127	141	155	169	183	197	211	225	240	-341	-341	-341	-341	-341	-341	-341	-341	-341	
2032	-95	56	70	85	99	113	127	141	155	169	183	197	211	225	240	-24	-24	-24	-24	-24	-24	-24	-24	-24	
2033	-110	56	70	85	99	113	127	141	155	169	183	197	211	225	240	-10	-10	-10	-10	-10	-10	-10	-10	-10	
2034	-95	56	70	85	99	113	127	141	155	169	183	197	211	225	240	-40	-40	-40	-40	-40	-40	-40	-40	-40	
2035	-103	56	70	85	99	113	127	141	155	169	183	197	211	225	240	-33	-33	-33	-33	-33	-33	-33	-33	-33	
2036	-212	56	70	85	99	113	127	141	155	169	183	197	211	225	240	-142	-142	-142	-142	-142	-142	-142	-142	-142	
2037	-95	56	70	85	99	113	127	141	155	169	183	197	211	225	240	-24	-24	-24	-24	-24	-24	-24	-24	-24	
2038	-95	56	70	85	99	113	127	141	155	169	183	197	211	225	240	-38	-38	-38	-38	-38	-38	-38	-38	-38	
2039	-110	56	70	85	99	113	127	141	155	169	183	197	211	225	240	-54	-54	-54	-54	-54	-54	-54	-54	-54	
2040	1,664	56	70	85	99	113	127	141	155	169	183	197	211	225	240	1,734	1,734	1,734	1,734	1,734	1,734	1,734	1,734	1,734	
-8,443	2,063	2,606	3,128	3,649	4,170	4,691	5,213	5,734	6,255	6,776	7,297	7,818	8,339	8,860	9,381	-5,837	-5,837	-5,837	-5,837	-5,837	-5,837	-5,837	-5,837	-5,837	

Expenditure for FIRR - Phase 1 & Phase 2

Year	Total Expenditure: (Capital Expenditures, Operating & Maintenance Expenditures, and Terminal Value): By Type of Financial Sources											
	Case # 1: Loan Only			Case # 2: Grant Aid (Phase # 1) & Loan (Phase # 2)			Case # 3: Grant Aid			Total (M)		
	Capital Expend	Op. & Maint	Terminal Value	Capital	Op. & Maint	Terminal	Capital	Op. & Maint	Terminal			
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	
1998	0	13	13	0	13	0	13	0	13	0	13	13
1999	371	0	371	370	370	0	370	0	370	0	370	370
2000	1,231	11	1,231	1,238	1,238	11	1,238	1,238	1,238	11	1,250	1,250
2001	1,166	62	1,228	1,130	1,130	62	1,192	1,130	1,130	62	1,192	1,192
2002	47	62	109	0	62	0	62	0	62	0	62	62
2003	47	62	109	0	62	0	62	0	62	0	62	62
2004	47	62	109	0	62	0	62	0	62	0	62	62
2005	47	62	109	0	62	0	62	0	62	0	62	62
2006	155	71	226	108	108	71	179	108	108	71	179	179
2007	47	62	109	0	62	0	62	0	62	0	62	62
2008	338	62	399	290	290	62	352	290	290	62	352	352
2009	1,032	62	1,094	985	985	62	1,047	975	975	62	1,037	1,037
2010	1,035	64	1,099	988	988	64	1,052	960	960	64	1,024	1,024
2011	84	104	188	38	104	38	142	104	104	38	142	142
2012	190	95	284	146	146	95	241	146	146	95	241	241
2013	79	95	174	38	95	38	133	95	95	38	133	133
2014	77	95	172	38	95	38	133	95	95	38	133	133
2015	90	103	193	54	103	54	157	103	103	54	157	157
2016	394	104	498	360	360	104	464	360	360	104	464	464
2017	70	95	165	38	95	38	133	95	95	38	133	133
2018	175	95	270	146	146	95	241	146	146	95	241	241
2019	63	95	160	38	95	38	133	95	95	38	133	133
2020	63	103	166	38	103	38	141	103	103	38	141	141
2021	75	104	179	53	104	53	157	104	104	53	157	157
2022	55	95	150	35	95	35	130	95	95	35	130	130
2023	51	95	146	33	95	33	128	95	95	33	128	128
2024	155	95	249	139	139	95	234	139	139	95	234	234
2025	324	103	426	310	310	103	413	310	310	103	413	413
2026	38	104	143	28	104	28	132	104	104	28	132	132
2027	50	95	144	41	95	41	136	95	95	41	136	136
2028	30	95	124	24	95	24	119	95	95	24	119	119
2029	25	95	120	22	95	22	117	95	95	22	117	117
2030	129	103	232	128	128	103	231	128	128	103	231	231
2031	340	104	444	340	340	104	444	340	340	104	444	444
2032	16	95	111	16	95	16	111	95	95	16	111	111
2033	30	95	124	30	95	30	124	95	95	30	124	124
2034	12	95	107	12	95	12	107	95	95	12	107	107
2035	11	103	114	11	103	11	114	103	103	11	114	114
2036	116	104	221	116	116	104	221	116	116	104	221	221
2037	7	95	101	7	95	7	101	95	95	7	101	101
2038	5	95	99	5	95	5	99	95	95	5	99	99
2039	18	95	113	18	95	18	113	95	95	18	113	113
2040	282	103	-2,048	282	282	103	-2,048	282	282	103	-2,048	-1,664
Total	8,639	3,600	10,191	7,694	3,600	3,600	9,246	6,891	3,600	3,600	-2,048	8,443

Capital (Loan) - Phase 1 & Phase 2

Year (A)	Foreign Aid in the form of Loans				Interest 2.10%	Foreign Aid form of Grants (G)	Internal Fund		Total Disbursement (J)	Total Capital Expenditure (D+F+G+J) (K)
	Opening Balance (B)	Transactions	Ending Balance (E)	Subsequent Replacement (I)			Initial (Land, etc.) (H)			
	Repayment (C)	Borrowing (D)								
1998	0	0	0	0	0	0	0	0	0	0
1999	0	0	60	60	1	0	310	0	310	371
2000	60	1,116	1,176	13	13	0	122	0	122	1,251
2001	1,176	1,067	2,243	36	36	0	63	0	63	1,166
2002	2,243	0	2,243	47	47	0	0	0	0	47
2003	2,243	0	2,243	47	47	0	0	0	0	47
2004	2,243	0	2,243	47	47	0	0	0	0	47
2005	2,243	0	2,243	47	47	0	0	0	0	47
2006	2,243	0	2,243	47	47	0	108	0	108	155
2007	2,243	0	2,243	47	47	0	0	0	0	47
2008	2,243	39	2,282	48	48	0	251	0	251	338
2009	2,282	873	3,157	57	57	0	100	0	100	1,032
2010	3,157	905	4,062	76	76	0	55	0	55	1,033
2011	4,062	-112	3,950	84	84	0	0	0	0	84
2012	3,950	-112	3,837	82	82	0	108	0	108	190
2013	3,837	-112	3,725	79	79	0	0	0	0	79
2014	3,725	-112	3,613	77	77	0	0	0	0	77
2015	3,613	-112	3,501	75	75	0	16	0	16	90
2016	3,501	-112	3,389	72	72	0	322	0	322	394
2017	3,389	-112	3,277	70	70	0	0	0	0	70
2018	3,277	-112	3,165	68	68	0	108	0	108	175
2019	3,165	-112	3,052	65	65	0	0	0	0	65
2020	3,052	-112	2,940	63	63	0	0	0	0	63
2021	2,940	-203	2,737	60	60	0	16	0	16	73
2022	2,737	-203	2,534	55	55	0	0	0	0	55
2023	2,534	-203	2,331	51	51	0	0	0	0	51
2024	2,331	-203	2,128	47	47	0	108	0	108	155
2025	2,128	-203	1,925	43	43	0	281	0	281	323
2026	1,925	-203	1,722	38	38	0	0	0	0	38
2027	1,722	-203	1,519	34	34	0	16	0	16	50
2028	1,519	-203	1,315	30	30	0	0	0	0	30
2029	1,315	-203	1,112	25	25	0	0	0	0	25
2030	1,112	-203	909	21	21	0	108	0	108	129
2031	909	-91	818	18	18	0	322	0	322	340
2032	818	-91	727	16	16	0	0	0	0	16
2033	727	-91	637	14	14	0	16	0	16	30
2034	637	-91	546	12	12	0	0	0	0	12
2035	546	-91	455	11	11	0	0	0	0	11
2036	455	-91	364	9	9	0	108	0	108	116
2037	364	-91	273	7	7	0	0	0	0	7
2038	273	-91	182	5	5	0	0	0	0	5
2039	182	-91	91	3	3	0	16	0	16	18
2040	91	-91	0	1	1	0	281	0	281	282
Total		-4,062	-4,062	1,747	1,747	0	901	1,929	2,830	3,639

Capital (Grant & Loan) - Phase 1 & Phase 2

Year	Foreign Aid in the form of Loans				Interest 2.10%	Foreign Aid form of Grants	Internal Fund		Total Capital Expenditure (D+F+G+J)	
	Opening Balance	Transactions	Ending Balance	Initial (Land, etc.)			Subsequent Replacement	Total Disbursement		
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)
1998	0	0	0	0	0	0	0	0	0	0
1999	0	0	0	0	0	38	283	0	283	370
2000	0	0	0	0	0	1,228	10	0	10	1,238
2001	0	0	0	0	0	1,120	10	0	10	1,130
2002	0	0	0	0	0	0	0	0	0	0
2003	0	0	0	0	0	0	0	0	0	0
2004	0	0	0	0	0	0	0	0	0	0
2005	0	0	0	0	0	0	0	0	0	0
2006	0	0	0	0	0	0	108	108	108	108
2007	0	0	0	0	0	0	0	0	0	0
2008	0	0	39	39	0	0	251	0	251	290
2009	39	873	914	914	10	10	100	0	100	985
2010	914	903	1,819	1,819	29	29	55	0	55	988
2011	1,819	0	1,819	1,819	38	38	0	0	0	38
2012	1,819	0	1,819	1,819	38	38	0	108	108	146
2013	1,819	0	1,819	1,819	38	38	0	0	0	38
2014	1,819	0	1,819	1,819	38	38	0	0	0	38
2015	1,819	0	1,819	1,819	38	38	16	16	16	54
2016	1,819	0	1,819	1,819	38	38	322	322	322	360
2017	1,819	0	1,819	1,819	38	38	0	0	0	38
2018	1,819	0	1,819	1,819	38	38	0	108	108	146
2019	1,819	0	1,819	1,819	38	38	0	0	0	38
2020	1,819	0	1,819	1,819	38	38	0	0	0	38
2021	1,819	-91	1,728	1,728	37	37	16	16	16	53
2022	1,728	-91	1,637	1,637	35	35	0	0	0	35
2023	1,637	-91	1,546	1,546	33	33	0	0	0	33
2024	1,546	-91	1,455	1,455	32	32	108	108	108	139
2025	1,455	-91	1,364	1,364	30	30	281	281	281	310
2026	1,364	-91	1,273	1,273	28	28	0	0	0	28
2027	1,273	-91	1,182	1,182	26	26	16	16	16	41
2028	1,182	-91	1,091	1,091	24	24	0	0	0	24
2029	1,091	-91	1,000	1,000	22	22	0	0	0	22
2030	1,000	-91	909	909	20	20	108	108	108	128
2031	909	-91	818	818	18	18	322	322	322	340
2032	818	-91	727	727	16	16	0	0	0	16
2033	727	-91	637	637	14	14	16	16	16	30
2034	637	-91	546	546	12	12	0	0	0	12
2035	546	-91	455	455	11	11	0	0	0	11
2036	455	-91	364	364	9	9	108	108	108	116
2037	364	-91	273	273	7	7	0	0	0	7
2038	273	-91	182	182	5	5	0	0	0	5
2039	182	-91	91	91	3	3	16	16	16	18
2040	91	-91	-0	-0	1	1	281	281	281	282
Total		-1,819	1,819		803	2,436	708	1,929	2,637	7,694

Capital (Grant) - Phase 1 & Phase 2

Year (A)	Foreign Aid in the form of Loans			Foreign Aid form of Grants (G)	Internal Fund		Total Capital Expenditure (D+F+G+J)
	Opening Balance (B)	Transactions Repayment (C)	Ending Balance (E)		Initial (Land, etc.) (H)	Subsequent Replacement (I)	
1998	0	0	0	0	0	0	0
1999	0	0	0	88	283	0	370
2000	0	0	0	1,228	10	0	1,238
2001	0	0	0	1,120	10	0	1,130
2002	0	0	0	0	0	0	0
2003	0	0	0	0	0	0	0
2004	0	0	0	0	0	0	0
2005	0	0	0	0	0	0	0
2006	0	0	0	0	108	108	108
2007	0	0	0	0	0	0	0
2008	0	0	0	70	220	0	290
2009	0	0	0	963	10	0	973
2010	0	0	0	950	10	0	960
2011	0	0	0	0	0	0	0
2012	0	0	0	0	108	108	108
2013	0	0	0	0	0	0	0
2014	0	0	0	0	0	0	0
2015	0	0	0	0	16	16	16
2016	0	0	0	0	322	322	322
2017	0	0	0	0	0	0	0
2018	0	0	0	0	108	108	108
2019	0	0	0	0	0	0	0
2020	0	0	0	0	0	0	0
2021	0	0	0	0	16	16	16
2022	0	0	0	0	0	0	0
2023	0	0	0	0	0	0	0
2024	0	0	0	0	108	108	108
2025	0	0	0	0	281	281	281
2026	0	0	0	0	0	0	0
2027	0	0	0	0	16	16	16
2028	0	0	0	0	0	0	0
2029	0	0	0	0	0	0	0
2030	0	0	0	0	108	108	108
2031	0	0	0	0	322	322	322
2032	0	0	0	0	0	0	0
2033	0	0	0	0	16	16	16
2034	0	0	0	0	0	0	0
2035	0	0	0	0	0	0	0
2036	0	0	0	0	108	108	108
2037	0	0	0	0	0	0	0
2038	0	0	0	0	0	0	0
2039	0	0	0	0	16	16	16
2040	0	0	0	0	281	281	281
Total				4,420	543	1,929	2,471
							6,891

Initial - Phase 1 & Phase 2

Year	Initial Investment Amounts				Loan			Grant Aid			External fund (Balances)			
	Land Acquisition (B)	Local Administration (C)	Construction (D)	Procurement Equipment (E)	Engineering Service (F)	Total Investment (G)	Internal fund (15% of total investment) and admin (H)	Other portion (I)	Total (J)	External fund (85% of total) (K)		and admin (L)	Other portion (M)	Total (N)
1998														
1999	260	10			100	370	270	40	310	60	270	13	283	88
2000		10	1,080	108	40	1,238	10	112	122	1,116	10		1,228	
2001		10	1,080		40	1,130	10	53	63	1,067	10		1,120	
2002														
2003														
2004														
2005														
2006														
2007														
2008	210	10			70	290	220	31	251	39	220		220	70
2009		10	910	16	40	975	10	90	100	875	10		10	965
2010		10	910		40	960	10	45	55	905	10		10	950
2011														
2012														
2013														
2014														
2015														
2016														
2017														
2018														
2019														
2020														
2021														
2022														
2023														
2024														
2025														
2026														
2027														
2028														
2029														
2030														
2031														
2032														
2033														
2034														
2035														
2036														
2037														
2038														
2039														
2040														
Total	470	60	3,980	123	330	4,963	530	371	901	4,062	550	13	543	4,420

Replacement - Phase 1 & Phase 2

Year (A)	Construction					Total B+C+D+E+F+G (H)	Procurement of maintenance equipment			Grand Total (J+K) (L)	Subtraction Initial Disbursements (M)	Subsequent Disbursement (L+M) (N)	
	Structure (1) 50 (B)	Engineering (1) 50 (C)	Machinery (1) 15 (D)	Engineering (2) 50 (E)	Machinery (2) 15 (G)		Vehicles (1) 6 (J)	Vehicles (2) 6 (K)	Total (J+K) (L)				
1998						100					100	-100	0
1999		100				1,120					1,228	-1,228	0
2000	1,080	40				1,120			108		1,120	-1,120	0
2001	759	40	322								0	0	0
2002						0					0	0	0
2003						0					0	0	0
2004						0					0	0	0
2005						0					0	0	0
2006						0			108		108	0	108
2007						0					0	0	0
2008						70					70	-70	0
2009				910		950			16		965	-965	0
2010				629		950		281			950	-950	0
2011						0					0	0	0
2012						0			108		108	0	108
2013						0					0	0	0
2014						0					16	16	16
2015						0			16		16	0	322
2016						322					322	0	0
2017						0			108		108	0	108
2018						0					0	0	0
2019						0					0	0	0
2020						0					16	16	16
2021						0					0	0	0
2022						0					0	0	0
2023						0					0	0	0
2024						0			108		108	0	108
2025						281					281	0	281
2026						0					0	0	0
2027						0			16		16	0	16
2028						0					0	0	0
2029						0					0	0	0
2030						0			108		108	0	108
2031						322					322	0	322
2032						0					0	0	0
2033						0			16		16	0	16
2034						0					0	0	0
2035						0					0	0	0
2036						0			108		108	0	108
2037						0					0	0	0
2038						0					0	0	0
2039						0					0	0	0
2040						281					281	0	281
Total	1,839	180	965	1,538	150	5,514	93	755	848	6,361	-4,433	1,929	

Operating & Maintenance - Phase 1 & Phase 2

Year (A)	Sewer Cleaning			Wastewater Treatment plant							Admin. Planning (L)	Audit fee (M)	Total (N)
	Payroll (B)	Fuel (C)	Total (D)	Payroll (E)	Electro (F)	Chemical (G)	Repairs (H)	Overhead #1 (I)	Overhead #2 (J)	Total (K)			
1998	0		0							0	13	0	13
1999	0		0							0		0	0
2000	0	0	0	0						0	6	5	11
2001	11	3	14	6	21	5	3			36	6	5	62
2002	11	3	14	6	21	5	3			36	6	5	62
2003	11	3	14	6	21	5	3			36	6	5	62
2004	11	3	14	6	21	5	3			36	6	5	62
2005	11	3	14	6	21	5	3			36	6	5	62
2006	11	3	14	6	21	5	3	10		46	6	5	71
2007	11	3	14	6	21	5	3			36	6	5	62
2008	11	3	14	6	21	5	3			36	6	5	62
2009	11	3	14	6	21	5	3			36	6	5	62
2010	11	3	14	6	21	5	3			36	9	5	64
2011	11	3	14	9	41	11	6	10		76	9	5	104
2012	11	3	14	9	41	11	6			67	9	5	95
2013	11	3	14	9	41	11	6			67	9	5	95
2014	11	3	14	9	41	11	6			67	9	5	95
2015	11	3	14	9	41	11	6			67	9	5	95
2016	11	3	14	9	41	11	6	10		76	9	5	104
2017	11	3	14	9	41	11	6			67	9	5	95
2018	11	3	14	9	41	11	6			67	9	5	95
2019	11	3	14	9	41	11	6			67	9	5	95
2020	11	3	14	9	41	11	6		8	75	9	5	103
2021	11	3	14	9	41	11	6	10		76	9	5	104
2022	11	3	14	9	41	11	6			67	9	5	95
2023	11	3	14	9	41	11	6			67	9	5	95
2024	11	3	14	9	41	11	6			67	9	5	95
2025	11	3	14	9	41	11	6		8	75	9	5	103
2026	11	3	14	9	41	11	6	10		76	9	5	104
2027	11	3	14	9	41	11	6			67	9	5	95
2028	11	3	14	9	41	11	6			67	9	5	95
2029	11	3	14	9	41	11	6			67	9	5	95
2030	11	3	14	9	41	11	6		8	75	9	5	103
2031	11	3	14	9	41	11	6	10		76	9	5	104
2032	11	3	14	9	41	11	6			67	9	5	95
2033	11	3	14	9	41	11	6			67	9	5	95
2034	11	3	14	9	41	11	6			67	9	5	95
2035	11	3	14	9	41	11	6		8	75	9	5	103
2036	11	3	14	9	41	11	6	10		76	9	5	104
2037	11	3	14	9	41	11	6			67	9	5	95
2038	11	3	14	9	41	11	6			67	9	5	95
2039	11	3	14	9	41	11	6			67	9	5	95
2040	11	3	14	9	41	11	6		8	75	9	5	103
Total	446	112	558	335	1,402	383	212	67	50	2,480	356	205	3,600

Depreciation - Phase 1 & Phase 2

Year	Construction			Total	Procurement of maintenance equipment			Grand Total
	Structure (1) 50 (B)	Machinery (1) 15 (C)	Structure (2) 50 (D)		Machinery (2) 15 (E)	Vehicles (1) 6 (G)	Vehicles (2) 6 (H)	
1998				0				0
1999				0				0
2000				0		18		18
2001				0		18		18
2002	40	21		62	18			80
2003	40	21		62	18			80
2004	40	21		62	18			80
2005	40	21		62	18			80
2006	40	21		62	18			80
2007	40	21		62	18			80
2008	40	21		62	18			80
2009	40	21		62	18			80
2010	40	21		62	18			82
2011	40	21	34	114	18		3	135
2012	40	21	34	114	18		3	135
2013	40	21	34	114	18		3	135
2014	40	21	34	114	18		3	135
2015	40	21	34	114	18		3	135
2016	40	21	34	114	18		3	135
2017	40	21	34	114	18		3	135
2018	40	21	34	114	18		3	135
2019	40	21	34	114	18		3	135
2020	40	21	34	114	18		3	135
2021	40	21	34	114	18		3	135
2022	40	21	34	114	18		3	135
2023	40	21	34	114	18		3	135
2024	40	21	34	114	18		3	135
2025	40	21	34	114	18		3	135
2026	40	21	34	114	18		3	135
2027	40	21	34	114	18		3	135
2028	40	21	34	114	18		3	135
2029	40	21	34	114	18		3	135
2030	40	21	34	114	18		3	135
2031	40	21	34	114	18		3	135
2032	40	21	34	114	18		3	135
2033	40	21	34	114	18		3	135
2034	40	21	34	114	18		3	135
2035	40	21	34	114	18		3	135
2036	40	21	34	114	18		3	135
2037	40	21	34	114	18		3	135
2038	40	21	34	114	18		3	135
2039	40	21	34	114	18		3	135
2040	40	21	34	114	18		3	135
Total	1,575	836	1,013	3,424	719		799	4,784
Cost	2,019	322	1,888	4,310	108		16	4,433
Acc Dep	-1,575	-193	-1,013	-2,781	-72		-3	-2,855
NPV	444	643	875	1,962	36		13	1,978
								470
								2,048

Revenue - Phase 1 & Phase 2

Year	Volume of Wastewater	Collection Fee Rate	Tariff Revenue Net of Collection Fee to Water-Supply Enterprise before considering possible write-off															
			Break Down by Monthly Tariff Rate															
			80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	
1998	0	3.00%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1999	0	3.00%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2000	63,230	3.00%	70	88	105	123	140	158	176	193	211	228	246	264	282	300	318	
2001	63,865	3.00%	71	89	106	124	142	160	177	195	213	231	249	267	285	303	321	
2002	64,459	3.00%	72	89	107	125	143	161	179	197	215	233	251	269	287	305	323	
2003	65,053	3.00%	72	90	108	126	145	163	181	199	217	235	253	271	289	307	325	
2004	65,646	3.00%	73	91	109	128	146	164	182	200	219	237	255	273	291	309	327	
2005	66,240	3.00%	74	92	110	129	147	166	184	202	221	239	257	275	293	311	329	
2006	66,834	3.00%	74	93	111	130	148	167	186	204	223	241	259	277	295	313	331	
2007	67,428	3.00%	75	94	112	131	150	169	187	206	225	243	261	279	297	315	333	
2008	68,022	3.00%	76	94	113	132	151	170	189	208	227	246	264	282	300	318	336	
2009	68,616	3.00%	76	95	114	133	152	171	191	210	229	248	266	284	302	320	338	
2010	69,210	3.00%	76	96	114	134	152	171	191	210	229	248	266	284	302	320	338	
2011	69,804	3.00%	76	96	114	134	152	171	191	210	229	248	266	284	302	320	338	
2012	70,398	3.00%	76	96	114	134	152	171	191	210	229	248	266	284	302	320	338	
2013	70,992	3.00%	76	96	114	134	152	171	191	210	229	248	266	284	302	320	338	
2014	71,586	3.00%	76	96	114	134	152	171	191	210	229	248	266	284	302	320	338	
2015	72,180	3.00%	76	96	114	134	152	171	191	210	229	248	266	284	302	320	338	
2016	72,774	3.00%	76	96	114	134	152	171	191	210	229	248	266	284	302	320	338	
2017	73,368	3.00%	76	96	114	134	152	171	191	210	229	248	266	284	302	320	338	
2018	73,962	3.00%	76	96	114	134	152	171	191	210	229	248	266	284	302	320	338	
2019	74,556	3.00%	76	96	114	134	152	171	191	210	229	248	266	284	302	320	338	
2020	75,150	3.00%	76	96	114	134	152	171	191	210	229	248	266	284	302	320	338	
2021	75,744	3.00%	76	96	114	134	152	171	191	210	229	248	266	284	302	320	338	
2022	76,338	3.00%	76	96	114	134	152	171	191	210	229	248	266	284	302	320	338	
2023	76,932	3.00%	76	96	114	134	152	171	191	210	229	248	266	284	302	320	338	
2024	77,526	3.00%	76	96	114	134	152	171	191	210	229	248	266	284	302	320	338	
2025	78,120	3.00%	76	96	114	134	152	171	191	210	229	248	266	284	302	320	338	
2026	78,714	3.00%	76	96	114	134	152	171	191	210	229	248	266	284	302	320	338	
2027	79,308	3.00%	76	96	114	134	152	171	191	210	229	248	266	284	302	320	338	
2028	79,902	3.00%	76	96	114	134	152	171	191	210	229	248	266	284	302	320	338	
2029	80,496	3.00%	76	96	114	134	152	171	191	210	229	248	266	284	302	320	338	
2030	81,090	3.00%	76	96	114	134	152	171	191	210	229	248	266	284	302	320	338	
2031	81,684	3.00%	76	96	114	134	152	171	191	210	229	248	266	284	302	320	338	
2032	82,278	3.00%	76	96	114	134	152	171	191	210	229	248	266	284	302	320	338	
2033	82,872	3.00%	76	96	114	134	152	171	191	210	229	248	266	284	302	320	338	
2034	83,466	3.00%	76	96	114	134	152	171	191	210	229	248	266	284	302	320	338	
2035	84,060	3.00%	76	96	114	134	152	171	191	210	229	248	266	284	302	320	338	
2036	84,654	3.00%	76	96	114	134	152	171	191	210	229	248	266	284	302	320	338	
2037	85,248	3.00%	76	96	114	134	152	171	191	210	229	248	266	284	302	320	338	
2038	85,842	3.00%	76	96	114	134	152	171	191	210	229	248	266	284	302	320	338	
2039	86,436	3.00%	76	96	114	134	152	171	191	210	229	248	266	284	302	320	338	
2040	87,030	3.00%	76	96	114	134	152	171	191	210	229	248	266	284	302	320	338	
Total			4,170	5,213	6,255	7,298	8,340	9,383	10,425	11,468	12,510	13,553	14,595	15,638	16,680	17,723	18,765	

Wastewater Volume - Phase 1 & Phase 2

Year	(A)	Domestic			Wastewater Volume (E)	Non-Domestic Wastewater (F)	Total Wastewater Volume (G)	Maximum Treatment Capacity (H)	Capacity Allowance (H-G) (I)
		Estimated Population (B)	Daily Water Consumption (C)	Leakage ratio (D)					
1998	0	0	0.170	0.20	0	0			
1999	0	0	0.170	0.20	0	0			
2000	354,629	0	0.170	0.20	48,230	15,000	50,000	-13,230	
2001	359,300	0	0.170	0.20	48,865	15,000	50,000	-13,865	
2002	363,667	0	0.170	0.20	49,459	15,000	50,000	-14,459	
2003	368,033	0	0.170	0.20	50,053	15,000	50,000	-15,053	
2004	372,400	0	0.170	0.20	50,646	15,000	50,000	-15,646	
2005	376,767	0	0.170	0.20	51,240	15,000	50,000	-16,240	
2006	381,133	0	0.170	0.20	51,834	15,000	50,000	-16,834	
2007	385,500	0	0.170	0.20	52,428	15,000	50,000	-17,428	
2008	389,867	0	0.170	0.20	53,022	15,000	50,000	-18,022	
2009	394,233	0	0.170	0.20	53,616	15,000	50,000	-18,616	
2010	525,200	0	0.170	0.20	71,427	15,000	86,427	3,237	
2011	527,667	0	0.170	0.20	71,763	25,000	96,763	100,000	
2012	530,133	0	0.170	0.20	72,098	25,000	97,098	100,000	
2013	532,600	0	0.170	0.20	72,434	25,000	97,434	100,000	
2014	535,067	0	0.170	0.20	72,769	25,000	97,769	100,000	
2015	537,533	0	0.170	0.20	73,105	25,000	98,105	100,000	
2016	540,000	0	0.170	0.20	73,440	25,000	98,440	100,000	
2017	542,467	0	0.170	0.20	73,775	25,000	98,775	100,000	
2018	544,933	0	0.170	0.20	74,111	25,000	99,111	100,000	
2019	547,400	0	0.170	0.20	74,446	25,000	99,446	100,000	
2020	549,867	0	0.170	0.20	74,782	25,000	99,782	100,000	
2021	552,333	0	0.170	0.20	75,117	25,000	100,117	100,000	
2022	554,800	0	0.170	0.20	75,453	25,000	100,453	100,000	
2023	557,267	0	0.170	0.20	75,788	25,000	100,788	100,000	
2024	559,733	0	0.170	0.20	76,124	25,000	101,124	100,000	
2025	562,200	0	0.170	0.20	76,459	25,000	101,459	100,000	
2026	562,200	0	0.170	0.20	76,459	25,000	101,459	100,000	
2027	562,200	0	0.170	0.20	76,459	25,000	101,459	100,000	
2028	562,200	0	0.170	0.20	76,459	25,000	101,459	100,000	
2029	562,200	0	0.170	0.20	76,459	25,000	101,459	100,000	
2030	562,200	0	0.170	0.20	76,459	25,000	101,459	100,000	
2031	562,200	0	0.170	0.20	76,459	25,000	101,459	100,000	
2032	562,200	0	0.170	0.20	76,459	25,000	101,459	100,000	
2033	562,200	0	0.170	0.20	76,459	25,000	101,459	100,000	
2034	562,200	0	0.170	0.20	76,459	25,000	101,459	100,000	
2035	562,200	0	0.170	0.20	76,459	25,000	101,459	100,000	
2036	562,200	0	0.170	0.20	76,459	25,000	101,459	100,000	
2037	562,200	0	0.170	0.20	76,459	25,000	101,459	100,000	
2038	562,200	0	0.170	0.20	76,459	25,000	101,459	100,000	
2039	562,200	0	0.170	0.20	76,459	25,000	101,459	100,000	
2040	562,200	0	0.170	0.20	76,459	25,000	101,459	100,000	

Local - Phase 1 & Phase 2

Year	Case # 1: Loan Only										Case # 2: Grant Aid (Phase # 1) & Loan (Phase # 2)										Case # 3: Grant Aid									
	Internal					Total	Internal					Total	Internal					Total	Internal					Total						
	Initial (A)	Subsequent (C)	O & M (D)	Repayment (E)	Interest (F)		Initial (H)	Subsequent (I)	O & M (J)	Repayment (K)	Interest (L)		Initial (N)	Subsequent (O)	O & M (P)	Repayment (Q)	Interest (R)		Initial (S)	Subsequent (T)	O & M (U)	Repayment (V)	Interest (W)							
1998	0	0	0	0	0	13	0	0	0	0	13	0	0	0	0	13	0	0	0	0	0	13	0	0	0	0	0	13		
1999	310	0	0	0	1	311	283	0	0	0	283	283	0	0	0	283	0	0	0	0	0	283	0	0	0	0	0	283		
2000	122	0	0	0	11	146	10	0	0	11	146	10	0	0	11	146	0	0	0	0	0	146	0	0	0	0	0	146		
2001	63	0	0	0	36	161	10	0	0	36	161	10	0	0	36	161	0	0	0	0	0	161	0	0	0	0	0	161		
2002	0	0	0	0	47	109	62	0	0	47	109	62	0	0	47	109	62	0	0	0	0	109	62	0	0	0	0	109		
2003	0	0	0	0	47	109	62	0	0	47	109	62	0	0	47	109	62	0	0	0	0	109	62	0	0	0	0	109		
2004	0	0	0	0	47	109	62	0	0	47	109	62	0	0	47	109	62	0	0	0	0	109	62	0	0	0	0	109		
2005	0	0	0	0	47	109	62	0	0	47	109	62	0	0	47	109	62	0	0	0	0	109	62	0	0	0	0	109		
2006	0	0	108	0	47	226	0	0	0	108	71	0	0	0	108	71	0	0	0	0	0	179	0	0	0	0	0	179		
2007	0	0	0	0	47	226	0	0	0	47	226	0	0	0	47	226	0	0	0	0	0	226	0	0	0	0	0	226		
2008	251	0	0	0	48	340	251	0	0	48	340	251	0	0	48	340	251	0	0	0	0	340	251	0	0	0	0	340		
2009	100	0	0	0	57	219	100	0	0	57	219	100	0	0	57	219	100	0	0	0	0	219	100	0	0	0	0	219		
2010	55	0	0	0	76	195	55	0	0	76	195	55	0	0	76	195	55	0	0	0	0	195	55	0	0	0	0	195		
2011	0	0	0	0	84	301	0	0	0	84	301	0	0	0	84	301	0	0	0	0	0	301	0	0	0	0	0	301		
2012	0	0	0	0	84	301	0	0	0	84	301	0	0	0	84	301	0	0	0	0	0	301	0	0	0	0	0	301		
2013	0	0	0	0	79	286	0	0	0	79	286	0	0	0	79	286	0	0	0	0	0	286	0	0	0	0	0	286		
2014	0	0	0	0	77	284	0	0	0	77	284	0	0	0	77	284	0	0	0	0	0	284	0	0	0	0	0	284		
2015	0	0	0	0	75	305	0	0	0	75	305	0	0	0	75	305	0	0	0	0	0	305	0	0	0	0	0	305		
2016	0	0	0	0	72	322	0	0	0	72	322	0	0	0	72	322	0	0	0	0	0	322	0	0	0	0	0	322		
2017	0	0	0	0	70	271	0	0	0	70	271	0	0	0	70	271	0	0	0	0	0	271	0	0	0	0	0	271		
2018	0	0	0	0	68	332	0	0	0	68	332	0	0	0	68	332	0	0	0	0	0	332	0	0	0	0	0	332		
2019	0	0	0	0	65	272	0	0	0	65	272	0	0	0	65	272	0	0	0	0	0	272	0	0	0	0	0	272		
2020	0	0	0	0	63	278	0	0	0	63	278	0	0	0	63	278	0	0	0	0	0	278	0	0	0	0	0	278		
2021	0	0	0	0	60	382	0	0	0	60	382	0	0	0	60	382	0	0	0	0	0	382	0	0	0	0	0	382		
2022	0	0	0	0	55	353	0	0	0	55	353	0	0	0	55	353	0	0	0	0	0	353	0	0	0	0	0	353		
2023	0	0	0	0	51	349	0	0	0	51	349	0	0	0	51	349	0	0	0	0	0	349	0	0	0	0	0	349		
2024	0	0	0	0	47	452	0	0	0	47	452	0	0	0	47	452	0	0	0	0	0	452	0	0	0	0	0	452		
2025	0	0	281	0	43	629	0	0	0	281	103	0	0	0	281	103	0	0	0	0	0	629	0	0	0	0	0	629		
2026	0	0	0	0	38	346	0	0	0	38	346	0	0	0	38	346	0	0	0	0	0	346	0	0	0	0	0	346		
2027	0	0	0	0	34	347	0	0	0	34	347	0	0	0	34	347	0	0	0	0	0	347	0	0	0	0	0	347		
2028	0	0	0	0	30	327	0	0	0	30	327	0	0	0	30	327	0	0	0	0	0	327	0	0	0	0	0	327		
2029	0	0	0	0	25	323	0	0	0	25	323	0	0	0	25	323	0	0	0	0	0	323	0	0	0	0	0	323		
2030	0	0	0	0	21	435	0	0	0	21	435	0	0	0	21	435	0	0	0	0	0	435	0	0	0	0	0	435		
2031	0	0	0	0	18	533	0	0	0	18	533	0	0	0	18	533	0	0	0	0	0	533	0	0	0	0	0	533		
2032	0	0	0	0	16	202	0	0	0	16	202	0	0	0	16	202	0	0	0	0	0	202	0	0	0	0	0	202		
2033	0	0	0	0	14	215	0	0	0	14	215	0	0	0	14	215	0	0	0	0	0	215	0	0	0	0	0	215		
2034	0	0	0	0	12	198	0	0	0	12	198	0	0	0	12	198	0	0	0	0	0	198	0	0	0	0	0	198		
2035	0	0	0	0	11	204	0	0	0	11	204	0	0	0	11	204	0	0	0	0	0	204	0	0	0	0	0	204		
2036	0	0	0	0	9	312	0	0	0	9	312	0	0	0	9	312	0	0	0	0	0	312	0	0	0	0	0	312		
2037	0	0	0	0	7	192	0	0	0	7	192	0	0	0	7	192	0	0	0	0	0	192	0	0	0	0	0	192		
2038	0	0	0	0	5	190	0	0	0	5	190	0	0	0	5	190	0	0	0	0	0	190	0	0	0	0	0	190		
2039	0	0	0	0	3	204	0	0	0	3	204	0	0	0	3	204	0	0	0	0	0	204	0	0	0	0	0	204		
2040	0	0	0	0	281	103	0	0	0	281	103	0	0	0	281	103	0	0	0	0	0	103	0	0	0	0	0	103		
Total	901	1929	3600	4062	1747	12239	208	0	0	208	1819	3600	1819	803	3658	803	3658	1929	3600	543	1929	3600	0	0	0	0	0	6071		

Funding (Detail) - Phase 1 & Phase 2

Year (A)	Case # 1: Loan Only										Case # 2: Grant Aid (Phase # 1) & Loan (Phase # 2)										Case # 3: Grant Aid									
	External					Internal					Grand Total					External					Internal					Grand Total				
	Initial (B)	Initial (C)	Subsequent (D)	O & M (E)	Sub-total (F)	Initial (G)	Initial (H)	Subsequent (I)	O & M (J)	Sub-total (K)	Initial (L)	Subsequent (M)	O & M (N)	Sub-total (O)	Initial (P)	Initial (Q)	Subsequent (R)	O & M (S)	Sub-total (T)	Initial (U)	Initial (V)	Subsequent (W)	O & M (X)	Sub-total (Y)	Initial (Z)	Subsequent (AA)	O & M (AB)	Sub-total (AC)		
1998	0	0	0	13	13	0	0	0	13	13	0	0	0	13	0	0	0	0	13	0	0	0	0	13	0	0	0	13		
1999	60	310	0	370	370	88	283	0	370	370	283	48	0	283	0	0	0	0	283	0	0	0	0	283	0	0	0	283		
2000	1,116	122	0	1,238	1,238	1,223	10	0	1,233	1,233	1,223	10	0	1,233	0	0	0	0	1,233	0	0	0	0	1,233	0	0	0	1,233		
2001	1,067	63	0	1,130	1,130	1,120	10	0	1,130	1,130	1,120	10	0	1,130	0	0	0	0	1,130	0	0	0	0	1,130	0	0	0	1,130		
2002	0	0	0	62	62	62	0	0	62	62	62	0	0	62	0	0	0	0	62	0	0	0	0	62	0	0	0	62		
2003	0	0	0	62	62	62	0	0	62	62	62	0	0	62	0	0	0	0	62	0	0	0	0	62	0	0	0	62		
2004	0	0	0	62	62	62	0	0	62	62	62	0	0	62	0	0	0	0	62	0	0	0	0	62	0	0	0	62		
2005	0	0	0	62	62	62	0	0	62	62	62	0	0	62	0	0	0	0	62	0	0	0	0	62	0	0	0	62		
2006	0	0	0	71	71	179	0	0	108	179	179	0	0	108	0	0	0	0	179	0	0	0	0	179	0	0	0	179		
2007	0	0	0	62	62	62	0	0	62	62	62	0	0	62	0	0	0	0	62	0	0	0	0	62	0	0	0	62		
2008	39	251	0	351	351	39	251	0	390	390	351	70	0	321	0	0	0	0	351	0	0	0	0	351	0	0	0	351		
2009	875	100	0	975	975	875	100	0	975	975	975	100	0	1,075	0	0	0	0	1,075	0	0	0	0	1,075	0	0	0	1,075		
2010	905	55	0	960	960	905	55	0	960	960	960	55	0	1,015	0	0	0	0	1,015	0	0	0	0	1,015	0	0	0	1,015		
2011	0	0	0	104	104	104	0	0	104	104	104	0	0	104	0	0	0	0	104	0	0	0	0	104	0	0	0	104		
2012	0	0	0	95	95	202	0	0	107	202	202	0	0	107	0	0	0	0	202	0	0	0	0	202	0	0	0	202		
2013	0	0	0	95	95	95	0	0	95	95	95	0	0	95	0	0	0	0	95	0	0	0	0	95	0	0	0	95		
2014	0	0	0	95	95	95	0	0	95	95	95	0	0	95	0	0	0	0	95	0	0	0	0	95	0	0	0	95		
2015	0	0	0	103	103	119	0	0	119	119	119	0	0	119	0	0	0	0	119	0	0	0	0	119	0	0	0	119		
2016	0	0	0	104	104	426	0	0	322	426	426	0	0	322	0	0	0	0	426	0	0	0	0	426	0	0	0	426		
2017	0	0	0	95	95	202	0	0	107	202	202	0	0	107	0	0	0	0	202	0	0	0	0	202	0	0	0	202		
2018	0	0	0	95	95	202	0	0	107	202	202	0	0	107	0	0	0	0	202	0	0	0	0	202	0	0	0	202		
2019	0	0	0	95	95	95	0	0	95	95	95	0	0	95	0	0	0	0	95	0	0	0	0	95	0	0	0	95		
2020	0	0	0	103	103	103	0	0	103	103	103	0	0	103	0	0	0	0	103	0	0	0	0	103	0	0	0	103		
2021	0	0	0	104	104	120	0	0	116	120	120	0	0	116	0	0	0	0	120	0	0	0	0	120	0	0	0	120		
2022	0	0	0	95	95	95	0	0	95	95	95	0	0	95	0	0	0	0	95	0	0	0	0	95	0	0	0	95		
2023	0	0	0	95	95	95	0	0	95	95	95	0	0	95	0	0	0	0	95	0	0	0	0	95	0	0	0	95		
2024	0	0	0	108	108	202	0	0	108	202	202	0	0	108	0	0	0	0	202	0	0	0	0	202	0	0	0	202		
2025	0	0	0	103	103	384	0	0	281	384	384	0	0	281	0	0	0	0	384	0	0	0	0	384	0	0	0	384		
2026	0	0	0	104	104	104	0	0	104	104	104	0	0	104	0	0	0	0	104	0	0	0	0	104	0	0	0	104		
2027	0	0	0	95	95	110	0	0	110	110	110	0	0	110	0	0	0	0	110	0	0	0	0	110	0	0	0	110		
2028	0	0	0	95	95	95	0	0	95	95	95	0	0	95	0	0	0	0	95	0	0	0	0	95	0	0	0	95		
2029	0	0	0	95	95	95	0	0	95	95	95	0	0	95	0	0	0	0	95	0	0	0	0	95	0	0	0	95		
2030	0	0	0	108	108	211	0	0	108	211	211	0	0	108	0	0	0	0	211	0	0	0	0	211	0	0	0	211		
2031	0	0	0	104	104	426	0	0	322	426	426	0	0	322	0	0	0	0	426	0	0	0	0	426	0	0	0	426		
2032	0	0	0	95	95	95	0	0	95	95	95	0	0	95	0	0	0	0	95	0	0	0	0	95	0	0	0	95		
2033	0	0	0	95	95	110	0	0	110	110	110	0	0	110	0	0	0	0	110	0	0	0	0	110	0	0	0	110		
2034	0	0	0	95	95	95	0	0	95	95	95	0	0	95	0	0	0	0	95	0	0	0	0	95	0	0	0	95		
2035	0	0	0	103	103	103	0	0	103	103	103	0	0	103	0	0	0	0	103	0	0	0	0	103	0	0	0	103		
2036	0	0	0	104	104	212	0	0	108	212	212	0	0	108	0	0	0	0	212	0	0	0	0	212	0	0	0	212		
2037	0	0	0	95	95	95	0	0	95	95	95	0	0	95	0	0	0	0	95	0	0	0	0	95	0	0	0	95		
2038	0	0	0	95	95	110	0	0	110	110	110	0	0	110	0	0	0	0	110	0	0	0	0	110	0	0	0	110		
2039	0	0	0	95	95	95	0	0	95	95	95	0	0	95	0	0	0	0	95	0	0	0	0	95	0	0	0	95		
2040	0	0	0	16	16	110	0	0	126	110	110	0	0	126	0	0	0	0	110	0	0	0	0	110	0	0	0	110		
Total	4,062	901	1,929	3,600	6,491	4,254	708	0	281	384	384	0	0	281	4,420	543	1,929	3,600	6,071	4,420	543	1,929	3,600	6,071	4,420	543	10,491			