

J. Vič's ORGANIZATION DATA



APPENDIX J. VIK'S ORGANIZATION DATA

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Table J.1 HUMAN RESOURCE REQUIREMENT AND DEPLOYMENT.....	J - 2
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210	Technical Preparation	Technician in preparation					1								1	1	0
210	Technical Preparation	Driver							5						5	3	2
210	Technical Preparation	Dispatcher							1						1	1	0
210	Technical Preparation	Administration treatment of official factors								1					1	0	1
210	Technical Preparation	Storehouses man								1					1	1	0
210	Technical Preparation	Office boy									2				2	2	0
211	Sewer, Network Cleaning and Emergency Case	Technician					1								1	1	0
211	Sewer, Network Cleaning and Emergency Case	Main Chief for Maintenance					2								2	1	1
211	Sewer, Network Cleaning and Emergency Case	Main Co-ordinator							4						4	4	0
211	Sewer, Network Cleaning and Emergency Case	Chief					4								4	3	1
211	Sewer, Network Cleaning and Emergency Case	Driver for Special Cars I					7								7	6	1
211	Sewer, Network Cleaning and Emergency Case	Driver for Special Cars II					14								14	12	2
211	Sewer, Network Cleaning and Emergency Case	Driver I									5				5	5	0
211	Sewer, Network Cleaning and Emergency Case	Canal Cleaner									11				11	10	1
211	Sewer, Network Cleaning and Emergency Case	Canal Cleaner										4			4	3	1
211	Sewer, Network Cleaning and Emergency Case	Messenger										6			6	1	5
212	WWTP Cleaning	Main Co-ordinator					1								1	1	0
212	WWTP Cleaning	Technician					1								1	0	1
212	WWTP Cleaning	Main Co-ordinator					2								2	2	0
212	WWTP Cleaning	Driver for Special Cars I						2							2	0	2
212	WWTP Cleaning	Driver for Special Cars II					3								3	3	0
212	WWTP Cleaning	Driver for Special Cars III								9					9	4	5
212	WWTP Cleaning	Driver I									2				2	2	0
212	WWTP Cleaning	Canal Cleaner									8				8	8	0
212	WWTP Cleaning	Canal Cleaner										8			8	2	6
212	WWTP Cleaning	Worker										6			6	6	0
213	Repairs and Reconstruction of Sewer Network	Main Chief for Maintenance					1								1	1	0
213	Repairs and Reconstruction of Sewer Network	Main coordinator								3					3	2	1
213	Repairs and Reconstruction of Sewer Network	Chief I					2								2	1	1
213	Repairs and Reconstruction of Sewer Network	Chief						1							1	1	0
213	Repairs and Reconstruction of Sewer Network	Electrician					1								1	1	0
213	Repairs and Reconstruction of Sewer Network	Bricklayer					1								1	0	1
213	Repairs and Reconstruction of Sewer Network	Driver of excavator								1					1	1	0
213	Repairs and Reconstruction of Sewer Network	Technician for repairing								4					4	3	1
213	Repairs and Reconstruction of Sewer Network									2					2	2	0
213	Repairs and Reconstruction of Sewer Network									1					1	0	1
213	Repairs and Reconstruction of Sewer Network									3					3	3	0
213	Repairs and Reconstruction of Sewer Network										2				2	1	1
213	Repairs and Reconstruction of Sewer Network										3				3	3	0
213	Repairs and Reconstruction of Sewer Network	Electro-mechanic									1				1	1	0
213	Repairs and Reconstruction of Sewer Network	House Painter									1				1	0	1
213	Repairs and Reconstruction of Sewer Network	Driver									4				4	3	1
213	Repairs and Reconstruction of Sewer Network	Installer									1				1	1	0
213	Repairs and Reconstruction of Sewer Network	Operator for generators with pumps									1				1	0	1
213	Repairs and Reconstruction of Sewer Network										2				2	1	1
213	Repairs and Reconstruction of Sewer Network										1				1	0	1
213	Repairs and Reconstruction of Sewer Network	Carpenter									1				1	0	1
213	Repairs and Reconstruction of Sewer Network	Bricklayer									1				1	0	1
213	Repairs and Reconstruction of Sewer Network	Worker										3			3	3	0
213	Repairs and Reconstruction of Sewer Network	Cleaner for channel											17		17	17	0
22	Mechanical and Vehicle Maintenance	High Official					1								1	1	0
220	Technical Preparation	High Official					1								1	1	0
220	Technical Preparation	Referent Leader						1							1	1	0
220	Technical Preparation	Clerk for technical right							1						1	1	0
220	Technical Preparation	Traffic clerk (safety)							1						1	1	0
220	Technical Preparation	Administrativ clerk								2					2	1	1
220	Technical Preparation	Driver								1					1	1	0
220	Technical Preparation	Referent								1					1	1	0
221	Special Vehicle Repair Workshop	Main worker					1								1	1	0
221	Special Vehicle Repair Workshop	Auto mechanic								1					1	1	0
221	Special Vehicle Repair Workshop	Manager						1							1	1	0
221	Special Vehicle Repair Workshop	Car Mechanician						1							1	0	1
221	Special Vehicle Repair Workshop	Car Electrician						1							1	1	0
221	Special Vehicle Repair Workshop	Driver								1					1	0	1
221	Special Vehicle Repair Workshop	Locksmith									1				1	1	0
221	Special Vehicle Repair Workshop	Locksmith weld man									1				1	1	0
221	Special Vehicle Repair Workshop	Tyre man										2			2	1	1
221	Special Vehicle Repair Workshop	Car plumber									1				1	0	1
222	Vehicle Maintenance Workshop	Main coordinator					1								1	1	0
222	Vehicle Maintenance Workshop	Storage man					1								1	1	0
222	Vehicle Maintenance Workshop	Chief						2							2	2	0
222	Vehicle Maintenance Workshop	Auto mechanic									1				1	1	0
222	Vehicle Maintenance Workshop	Machin Locksmith									1				1	1	0
222	Vehicle Maintenance Workshop	Tool man										1			1	1	0
222	Vehicle Maintenance Workshop	Worker Assistant										1			1	1	0
222	Vehicle Maintenance Workshop	Cleaner Grease man										2			2	2	0
222	Vehicle Maintenance Workshop	Blocksmith										2			2	0	2

222	Vehicle Maintenance Workshop	Car plumber								1					1	1	0
222	Vehicle Maintenance Workshop	Car Vanisher								1					1	1	0
222	Vehicle Maintenance Workshop	Car Electrician								2					2	1	1
222	Vehicle Maintenance Workshop	Cleaner Grease man												1	1	1	0
222	Vehicle Maintenance Workshop	Assistant worker												1	1	0	1
23	WWTP Restoration	Main Co-ordinator			1										1	1	0
23	WWTP Restoration	Machin Locksmith								2					2	1	1
23	WWTP Restoration	Electric-technician								2					2	2	0
23	WWTP Restoration	Electro-mechanician							1						1	1	0
23	WWTP Restoration	Electro-mechanician													3	3	0
23	WWTP Restoration	Machine operator								1					1	1	0
23	WWTP Restoration	Worker												2	2	2	0
23	WWTP Restoration	Cleaner Grease man												2	2	2	0
30	Technology and Mechanical Services	Director	1												1	1	0
301	General Affairs	Secretary								2					2	1	1
301	General Affairs	Driver									2				2	2	0
31	Water Supply	Manager	1												1	1	0
31	Water Supply	Main engineer	1												1	1	0
311	Connection	Chief	1												1	0	1
311	Connection	Technician for connection			1										1	1	0
311	Connection	Clerk I				1									1	1	0
311	Connection	Clerk II				1									1	1	0
311	Connection	Administrativ clerk								2					2	2	0
311	Connection	Higer supervision								2					2	2	0
312	Plan and Land Office	Engineer for water network and connection	1												1	0	1
312	Plan and Land Office	Chief			1										1	1	0
312	Plan and Land Office	Clerk for under-ground and Innovable property offices			1										1	0	1
312	Plan and Land Office	Clerk for water network and agreement				4									4	4	0
312	Plan and Land Office	Administrativ clerk								2					2	0	2
312	Plan and Land Office	Plates fitter									1				1	1	0
312	Plan and Land Office	Plates fitter									2				2	0	2
312	Plan and Land Office	Figure man												6	6	6	0
313	Supervision	Chief			1										1	1	0
313	Supervision	Independent clerk real estate			2										2	1	1
313	Supervision	Supervisor I								10					10	6	4
313	Supervision	Georneter								10					10	7	3
313	Supervision	Administrativ clerk								2					2	0	2
313	Supervision	Supervisor II								1					1	1	0
32	Sewerage	Manager	1												1	1	0
32	Sewerage	Main engineer	1												1	1	0
321	Connection	Clerk			1										1	0	1
321	Connection	Manager	1												1	0	1
321	Connection	Chief I			1										1	1	0
321	Connection	Chief II				1									1	0	1
321	Connection	Chief III								2					2	1	1
322	Plan and Land Office	Leader Worker			1										1	1	0
322	Plan and Land Office	Engineer for sewerage network and connection	1												1	0	1
322	Plan and Land Office	Clark for sewerage network and agreement			2										2	1	1
322	Plan and Land Office	Clark for connection								3					3	1	2
322	Plan and Land Office	Figure man									1				1	0	1
322	Plan and Land Office	Figure man												4	4	2	2
323	Supervision	Geometer			1										1	1	0
323	Supervision	Technolog engineer	1												1	0	1
323	Supervision	Chief			3										3	1	2
323	Supervision	Supervisor								2					2	2	0
323	Supervision	Higher Technician								4					4	2	2
323	Supervision	Technician								4					4	3	1
323	Supervision	Technic Draftsman									1				1	1	0
33	Development	Manager	1												1	0	1
33	Development	Higher skilled assistant for water supply system	1												1	1	0
33	Development	Higher skilled assistant for sewerage system	1												1	1	0
33	Development	Engineer for water balance	1												1	0	1
33	Development	Engineer for hydraulic analysis	2												2	1	1
33	Development	Engineer for water supply network	2												2	1	1
33	Development	Engineer for sewerage network	2												2	0	2
33	Development	Engineer for maps	1												1	0	1
33	Development	Technician	2												2	2	0
33	Development	Technician								2					2	1	1
33	Development	Operator								3					3	1	2
33	Development	Supervisor								1					1	1	0
33	Development	Technician for supervisor								1					1	0	1
34	Construction Project	Manager	1												1	1	0
341	Water Supply	Manager	1												1	1	0
341	Water Supply	Leader Planner	1												1	1	0
341	Water Supply	Main Planner	3												3	1	2
341	Water Supply	Independent planner of 1 group	3												3	0	3
341	Water Supply	Planner I	2												2	0	2

44	Planing and Analyst	Clerk for analisis		1												1	1	0
44	Planing and Analyst	Niger skilled assistant			1											1	0	1
44	Planing and Analyst	Clerk for analisis						1								1	0	1
44	Planing and Analyst	Statistic man						1								1	0	1
45	Legal Affairs	Manager		1												1	1	0
45	Legal Affairs	Skilled asistant for law works		2												2	1	1
45	Legal Affairs	Higher expert for construction works		3												3	1	2
45	Legal Affairs	Clerk for properties,law works and contracts		1												1	0	1
45	Legal Affairs	Higher expert for economic works		1												1	0	1
45	Legal Affairs	Analyst clerk			4											4	0	4
45	Legal Affairs	Executive clerk			1											1	1	0
45	Legal Affairs	Clerk for working relation						1								1	1	0
45	Legal Affairs	Statistician								1						1	1	0
45	Legal Affairs	Administration clerk									1					1	0	1
46	General Affairs and Welfare	Manager		1												1	1	0
461	General Affairs	Leader worker of standard works		1												1	1	0
461	General Affairs	Journalist		1												1	1	0
461	General Affairs	Doctor Specialist Consultant		1												1	0	1
461	General Affairs	Clerk for housing questions		1												1	1	0
461	General Affairs	Clerk for standard														1	0	1
461	General Affairs	Clerk for social questions														1	1	0
461	General Affairs	Archivist								1						1	0	1
461	General Affairs	Typist								1						1	1	0
461	General Affairs	Clerk for protocol								1						1	1	0
461	General Affairs	Head of rest home								1						1	1	0
461	General Affairs	Photographer								1						1	0	1
461	General Affairs	Medicin Technician								1						1	0	1
461	General Affairs	Technic Secretary								5						5	3	2
461	General Affairs	Caffe cooker I									6					6	4	2
461	General Affairs	Driver									5					5	3	2
461	General Affairs	Janitor of business offices									2					2	3	-1
461	General Affairs	Janitor of buildings									1					1	0	1
461	General Affairs	Telephonist										3				3	2	1
461	General Affairs	Worker for copying materials										3				3	2	1
461	General Affairs	Cleaning Lady										3				3	3	0
461	General Affairs	Archivist										1				1	1	0
461	General Affairs	Caffe cooker II											3			3	3	0
461	General Affairs	Cleaning Worker											12			12	13	-1
462	Welfare	Main security worker		1												1	1	0
462	Welfare	Clerk for defence I						1								1	0	1
462	Welfare	Clerk for phisycal security control								2						2	0	2
462	Welfare	Clerk for defence II									2					2	1	1
462	Welfare	Security worker									57					57	53	4
47	Collection	Manager		1												1	1	0
471	Charge Collection	Chief		1												1	1	0
471	Charge Collection	Expert collaborator		2												2	0	2
471	Charge Collection	Operator for informatic center			1											1	1	0
471	Charge Collection	Expert collaborator														1	1	0
471	Charge Collection	Clerk for payment														4	3	1
471	Charge Collection	Clerk for payment														2	2	0
471	Charge Collection	Controller of account														3	2	1
471	Charge Collection	Clerk for account														2	2	0
471	Charge Collection	clerk of cash documents														2	2	0
471	Charge Collection	Inspector of profit-amount documents														7	7	0
471	Charge Collection	Inspector for profit data's KDS-a														2	2	6
471	Charge Collection	Supply of bills														7	7	-1
472	Payment and Complaint	Expert collaborator														1	1	0
472	Payment and Complaint	Main cashier														1	1	0
472	Payment and Complaint	Main liquidator														1	1	0
472	Payment and Complaint	Clerk for advertsing and informations I														1	1	0
472	Payment and Complaint	Liquidator														7	7	0
472	Payment and Complaint	Cashier														7	7	2
472	Payment and Complaint	Clerk for advertsing and informations II														2	2	0
472	Payment and Complaint	Clerk for calculate														1	1	0
473	Evidence	Work leader														1	0	1
4731	Evidence and control of Evidence	Main worker														1	1	0
4731	Evidence and control of Evidence	Administrative clerk														1	1	0
4731	Evidence and control of Evidence	Water meter evidentist														1	1	0
4731	Evidence and control of Evidence	Meter reader														23	23	0
4732	Control of Evidence	Chief III														1	1	0
4732	Control of Evidence	Main controller														1	1	0
4732	Control of Evidence	Controller														3	3	0
4732	Control of Evidence	Man for evidencing water meter														7	6	1



K. ViK's FINANCIAL DATA

Zbog obilnih padavina snijega

Rad u veoma teškim uslovima

K.J.K.P. "VODOVOD I KANALIZACIJA"



VIK

INFORMATIVNO GLASILO • Januar-februar 1999. • br. 157



Svakodnevno čišćenje snijega

U januaru i februaru napreduju radovi na izgradnji i popravci kanalizacijske i vodovodne mreže u veoma teškim uslovima zbog iznimno velikih količina i obilnih padavina snijega. Izradu i popravke planiranih objekata u ovom mjesecu nastavljaju radnici u veoma teškim uslovima. U ovom mjesecu nastavljaju raditi na popravku i izgradnji objekata u veoma teškim uslovima. U ovom mjesecu nastavljaju raditi na popravku i izgradnji objekata u veoma teškim uslovima.

Služba naplate potraživanja:

U DECEMBRU REKORDNA NAPLATA

Str. 4



Na Bušije:

STIGLI JAPANCI

Str. 5

NA UREDAJ ZA PREČIŠĆAVANJE OTPADNIH VODA

STIGLI JAPANCI

POČINJE RAD NA PROJEKTIRANJU I IZGRADNJI SANACIJE OBJEKTA

Služba naplate potraživanja u ovom mjesecu nastavljaju raditi na popravku i izgradnji objekata u veoma teškim uslovima. U ovom mjesecu nastavljaju raditi na popravku i izgradnji objekata u veoma teškim uslovima.

Predstavljamo rukovodilce: J. Drešković

LJUBAV PREMA FINANSIJAMA, SPORTU I SINU ISMARU

Str. 6

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1. VIK'S FINANCIAL DATA

Table K.1 Fixed Assets Owned by Each Department

As of March 1999

Sredzene gradjevine podjeljene po svakom pogonu

(KM)

Plant and buildings	Gradevine	Net value Neto vrijednost	Water supply Vodovod	Sewage Kanalizacija
Concrete tank	Kaptaze	69,372	69,372	
Wells	Bunari	31,371,502	31,371,502	
Reservoirs	Rezervoari	77,810,791	77,810,791	
Pumping stations	Pumpne stanice	36,823,821	36,823,821	
Filters	Filteri	1,188,908	1,188,908	
Water network	Vodovodna mreza	269,417,885	269,417,885	
Sewage network	Kanalizaciona mreza	465,065,639		465,065,639
Concrete shelter	Betonska sklonista	55,540	55,540	
WWTP	Uredjaj za preciscavanje	182,079,922		182,079,922
Bridges	Mostovi	247,557		247,557
Roads	Putevi	14,998,644	2,757,978	12,240,667
Streamlets	Potoci	5,895,477	5,895,477	
Administration buildings	Upravne zgrade	10,284,319	6,515,216	3,769,103
Barrack	Barake	493,801	387,011	106,790
Civil objects of power plant	Gradj. Objekti energetskih postrojenja	3,868,240	3,868,240	
Underground cable, sewage telemetry	Podzemna kabl.kanal telemetrija	5,932,057		5,932,057
Total plant & equipment	Ukupno gradevine	1,105,603,475	436,161,739	669,441,735
		100%	39%	61%
Equipment	Oprema	Net value	Water supply	Sewage
Machines	Masine	4,464,467	3,048,785	1,415,683
Transport means	Transportna sredstva	4,532,505	2,065,803	2,466,702
Labaratory equipment and medical apparatus	Labaratorijska oprema i medicinski aparati	8,005	8,005	
Instruments	Instrumenti	1,892,627	1,814,279	78,347
Power inventory	Pogonski inventar	80,399	66,358	14,041
Business inventory	Poslovni inventar	1,999,708	1,564,971	434,737
Imported equipment at water supply dept.	Uvozna oprema iz "ZCS" Vodovod	1,730,660	1,730,660	
Imported equipment at sewage dept.	Uvozna oprema iz "ZCS" Kanalizacija	14,732,619		14,732,619
Domestic equipment at sewage dept.	Domaca oprema iz "ZCS" Kanalizacija	505,723		505,723
Total equipment	Ukupno oprema	29,946,712	10,298,861	19,647,851
		100%	34%	66%
Total plant, buildings and equipment	Ukupno gradevine i oprema	1,135,550,186	446,460,600	689,089,587
		100%	39%	61%

Source: VIK

Table K.2 Capital Investments in 1996 / Kapitalna ulaganja u 1996

Project name Ime Projekta	Fund source Izvor fondiranja
Water work equipment (2 vehicle Citroen C15)	French Government
Different material for maintainence	ODA -Sarajevo
Gas chlorine 4.000 kg.	MVV"Vodovod"-Manhajm, Germany
Vehicle DAIMLER-BENZ 2L	Austrian Gouvernment through Company SEBA
Excavator JCB	Trust fond through DORS
Diesel agregat 5,4kw	
Diesel agregat 11,2kw	
Vehicle for dumping pit	
Vehicle for transport of workers	
Vehicle for transport of workers and material	
Combined vehicle	
Vehicle for suction apparatus	
Different Material for maintainence	Austrian Gouvernment through Company SEBA
Material for PS"Bacevo"	UMCOR-Sarajevo
Replacement 80 m of water network in Sipska street	UMCOR-Sarajevo
Vehicle CITROEN C 15	French Government
Material, tools	ICRC-Sarajevo
Instalation of pumps and el. material on PS"Pogledine"	UMCOR-Sarajevo
Different material for maintenance	ODA-Sarajevo
NISSAN PATROL/89	Barcelona Water Company
NISSAN PATROL/90	Spain
Vehicle CANAL JET	Trust fund through DORS
Water pumps for PS"Center" and "Podhrastovi"	UNICEF-Sarajevo
Different material for maintenance	UNICEF-Sarajevo
Works on filter station "Moscanica"	UMCOR-Sarajevo
Different material for maintenance	Austrian Government through Company SEBA
Fiat panda	Public Company
Fiat comby	"ACEA"-Roma-Italy
Fiat cistern	
Fiat iveco	
Fiat -lorry	
Fiat antonelifalcon	
Fiat iveco	
Money fond for gas chlorine	UMCOR-Sarajevo
Chlorinators	UMCOR-Sarajevo
Excavator BENAT 2000	Public Comp. "ACEA"-Roma
Money fund for gas chlorine	IFOR-ARCC
Payment of bills for reparing of water pumps	ICRC,IFOR-ARC,UMCOR
Water meters control	UNICEF-Sarajevo
Payment of bills for reparing of water pumps	ICRC-Sarajevo
Mobile hand-radio station 2 pcs.	ODA/EEU-Sarajevo
Electrical material for PS Bacevo necessities	IMG-Sarajevo
Works on cleaning of sewage network	Trust fund through DORS
Equipment for service for reparing of water pumps	UNICEF-Sarajevo
Different material for maintenance	French Government through SOGEA Company
Compressor	Austiran Government through SEBA Company
Pipe connections	
Water work material for maintenance	Austiran Government through SEBA Company
Rehabilitation of "Kanalizacija" building	Trust fond throught DORS
Computer equipment	Austiran Government through SEBA Company
Total	4,784,000 DM

Table K.3 Capital Investments in 1997 / Kapitalna ulaganja u 1997

Project name Ime Projekta	Amount (KM) Vrijednost (KM)	Fund source Izvor fondiranja
Bacevo spring rebuilding	3,000,000	EU
Bacevo spring demining	950,000	EU
Water supply analysis	2,000,000	EU
Water network distribution program	9,300,000	EU
Reconstruction of P.S. Alipasin Bridge	3,000,000	Danish Gov.
Rehabilitation of source Moscanica(old)	690,524 161,098 5,663 57,902	Trust f. Canton ViK Electrodistrib.
Rehabilitation of P.S. Bogusevac	120,000	Canton
Rehabilitation of P.S. Vlakovo	30,000	UMCOR and IMG
Rehabilitation of P.S. Lukavac	30,000	Trust f.
Pipeline reconstruction Vlakovo	200,000	Trust f.
Rehabilitation of P.S. Faletici	93,000	UMCOR
Pipeline reconstruction Moscanica-Skaljica Brdo	80,000	GRC
Pipeline reconstruction Pofalici	250,000	GRC
Rehabilitation of roof on source facility Bacevo	150,000	UMCOR
Rehabilitation of bridge A.Most	20,000 5,000	Canton ViK
Reconstruction of laboratory with equipment	1,000,000	Trust f.
Supplying of vehicles	150,000	ACEA
Rehabilitation of P.S. Kromolj	30,000	Trust f.
Leak repairing on water network-supplying of material	250,000	Sarajevo Canton
Garage rehabilitation in Sibenik street	50,000	ViK
Rehabilitation of house for workers Hrasno	159,820	ViK
Rehabilitation of ambulance	30,000	ViK
Rehabilitation on reservoir Mojnilo	23,000	ViK
Repairing of pumps	34,000	Sarajevo Canton
Source Sokolovici-finishing	400,000	Sarajevo Canton
Rehabilitation of objects within waterworks on Moscanica	4,000	ViK
Rehabilitation of R.Hladivode	22,000	Sarajevo Canton
Dislocation of plant Miljacka. End of 1997 execution of project and dismantling works	1,500,000	USAID
Reconstruction of pipeline Dobrosevici-1,2 km	250,000	BiH water company
Demining for new water penetration in Moscanica	6,200	ViK
Building service for repairing of pumps-I faze	203,000	Sarajevo Canton
Works will be transfered in 1998	31,435	ViK
Rehabilitation of P.S. Bojnik	40,000	BiH water company
Electrical project for Bojnik	2,500	ViK
Rehabilitation of filter station Moscanica	91,000	UMCOR
Rehabilitation P and PS Igman	15,000	BiH water company
Repairing of leaks on water network, supplying of material, equipment	1,400,000	Sarajevo Canton
Pipeline Brus-Hrid-works will be transformed to 1998	400,000	ICRC
Adaptation of "kutic"(part for cash service)	20,000	ViK
Reconstruction of engine-room within ViK	21,900	ViK
Reconstruction of concrete chamber on pipe FI 500 mm on K.Glava	13,700	ViK
Service for PS Bacevo, Konaci, Bunari, Igman and grounding	19,000	ViK
Adaptation of working space in A.Sacirbegovic street	188,950	ViK
Rehabilitation of roof on PS Center	20,714	ViK
Delivery and assembly of plant for continuously feeding	17,096	ViK
Total	7,221,315	

Table K.4 Capital Investments in 1998 / Kapitalna ulaganja u 1998

Project name Ime Projekta	Amount (KM) Vrijednost (KM)	Fund source Izvor fondiranja
Bacevo spring rebuilding	3,000,000	EU
Bacevo spring demining	800,000 15,000	EU UMCOR
Water supply analysis	2,000,000	EU
Reconstruction of PS.A bridge	3,500,000 21,000	Danish Gov. VIK
Dislocation of Treatment plant from Miljacka to Vogosca	1,500,000 300,000	USAID Sarajevo Canton
Reconstruction of Water Network in Section I	2,277,000	Finnish Gov.
Water network rehabilitation of Velesici, Pofalici, Hum	264,000 294,000	UMCOR Sarajevo Canton
Sewerage system reconstruction	475,000	Finnish Gov.
Reconstruction of BRUC-HRID water network	400,000	ICRC
Information system reconstruction project	700,000 100,000	Finnish Gov. VIK
Partial reconstruction of Grdonj, Sedrenik, Cebedzije, and PS area	200,000 15,000	UMCOR VIK
Infiltration Konaci program	50,000	UMCOR
PS Vrelo Bosne rehabilitation	40,000	USAID
Researching works and B8a water well building	120,000	UMCOR
Dobrosevici-II phase pipe network building	250,000	BIH Water Company
A. Brauna and Dzidzikovac streets sewerage reconstruction	115,000	Finnish Gov.
Repairing of the city network pipe damage	6,000,000	Sarajevo Canton
Reconstruction of 21 km water network	9,000,000	Sarajevo Canton
Sokolovic water management supply project	7,000,000	Sarajevo Canton
Moving out water entrance Moscanica	1,300,000	Sarajevo Canton
Building services for repairing pumps - I phase	75,000 34,000	Sarajevo Canton VIK
Reconstruction of worker's houses in Hrasno and Kovacima	120,000 330,000	Sarajevo Canton VIK
Sewerage in Faletici	250,000	Sarajevo Canton
Expansion and storing objects in Terezija	361,000	VIK
Purchasing and building of some three phases	104,000	VIK
Building lift in dispatcher center	78,000	VIK
Works on protecting equipment	54,000	VIK
Rehabilitation of destroyed garages in Sibenska street	184,000	VIK
Rehabilitation of business offices in A. Sacirbegovica street	25,000	VIK
Purchasing dredges	220,000	VIK
Project GIS-a	62,000	VIK
Rehabilitation of dispatcher center and PS Center	270,000	VIK
Total	41,903,000	

Table K.5 Capital Investment Needs in 1999 / Lista potreba kapitalnih ulaganja u 1999

Project name Ime Projekta	Amount (KM) Vrijednost (KM)	Fund source Izvor fondiranja	Finance Finansirano
Rehabilitation of water distribution network	5,000,000	Sarajevo Canton	Likely
Supplying of pipes and FF peaces according Contract between Canton Gov. and Thyssen Comp.-Credit means 25%	8,000,000	Sarajevo Canton	Likely
Water distribution reconstruction and sewage network	7,500,000	Sarajevo Canton	Likely
Reconstruction of main pipeline from PS"Aqlipasin Bridge" to R. "Kobilja Glava"	2,800,000	Sarajevo Canton	Likely
Inclusion of water from source "Peracko Vrelo" into water system of Sarajevo	1,500,000	Sarajevo Canton	
Realization of other works(under the point 2.)	500,000	Sarajevo Canton	Likely
Reconstruction of joining-pipeline R"Pogledine"-PS"Hambina Car."	2,000,000	Sarajevo Canton	
Construction of new reservoir space(R"Kobilja Glava", "Kromolj", "Vitkovac", "Hum")	3,000,000	Sarajevo Canton	
Construction of sewage network on area Vruci, Vrelo Bosne, Vreocce	500,000	Sarajevo Canton	Likely
Construction of sewage network in area Faletici	600,000	Sarajevo Canton	
Rehabilitation of water treatman plan-I faze	6,000,000	Sarajevo Canton	
preparation work	1,000,000	Sarajevo Canton	
Rehabilitation of source Bacevo (Tender WSS1)	800,000	EU	Likely
Construction of house-business facilities in Terazija street 38	415,000	ViK	Likely
Construction of workers house in Hrasno and Kovacici	270,000	ViK	Likely
Delivery, montage and seeting free in function of telemetric and computer equipment for sub-center "Center"	27,000	ViK	Likely
Construction of treatment plant component on source Bacevo (well B-6)	42,000	ViK	Likely
Construction of programs for protection of water sources in Sarajevsko Polje	29,000	ViK	Likely
Rehabilitation works on source " Moscanica"-security house	80,000	ViK	Likely
Supplying of excavator and fork lift truck-credit	164,000	ViK	Likely
Protection from water hammer in PS A. Most	52,000	ViK	
Protection from water hammer in in PS Centar	46,000	ViK	
Reconstruction of hydrotechnic and electro equipment in PS Hrasno, supplying and assembling of equipment	280,000	ViK	
Construction of new building instead of old ambulance	300,000	ViK	
Replacement of low-tension closet on wells	300,000	ViK	
Replacement of high-tension plant on wells	170,000	ViK	
Replacement of NN plant Stup	50,000	ViK	
Construction of main controle project	30,000	ViK	
Replacement of NN plant Stari Pofalici and Buca Potok	30,000	ViK	Likely
Replacement of NN plant Hambina Carina	15,000	ViK	Likely
Reparing of signal-cable	25,000	ViK	Likely
Supplying of electric-motor valves on wells o 300, 16 bars	160,000	ViK	Likely
Measuring equipment in PS Center	60,000	ViK	Likely
Measuring equipment Hrasno	45,000	ViK	
Measuring equipment wells Bacevo, flow meters, level meters, pressure equip.	180,000	ViK	Likely
Measuring equipment Skenderija	30,000	ViK	
Moscanica old filter, compresor	25,000	ViK	
Monitoring			
Bacevo, Mojmiilo, A.Most, Igman, Hrasnica, V.Bosne, Sokolovici, Bacevo-Konaci	200,000	ViK	
Compenzation of energy on objects of Vodovod	150,000	ViK	
Telemetry and measure-regulation equipment for Igman and Bjelasnica	200,000	ViK	Likely
Cathode protection of pipeline K. Glava-Vogosca	40,000	ViK	
Rehabilitation of signal cable R. Hladivode- Ps Medjureservoir	15,000	ViK	Likely
Cathode protection wells Sokolovici	35,000	ViK	
Measuring equipment on pumping stations and reservoirs:			
PS Kovacici	PS Pofalici, new and old		
R Vraca	R Bakarevac, Hum I and Hum II		
PSH Carina	R. Kobilja glava		
Pogledine	R Vogosca I and II		
Hrid	PS Brijesce		
R Lukavac	R Vitkovac		
r Hladivode	PS Vlakovo with reservoir		
PS Stup with wells	spring Nahorevo		
PSB Potok with reservoirs	plant Moscanica	650,000	ViK
Electrical conection on objects			
Spring Crnil, R Bakarevac, Hum I and Hum II, R Hum	15,000	ViK	Likely
Searching works	330,000	ViK	
Study construction for two new wells on source Sokolovici	90,000	ViK	
Study construction for water engagement	150,000	ViK	
Construction of two wells on source Sokolovici	600,000	ViK	
Works on equipping of absorbent wells in exploatacion on source Bacevo	800,000	ViK	Likely

Construction of invest technical documentation for :			
second chamber R. Kobilja Glava reservoir Kromolj	water work for area Mojnilo reconstruction of pumping station		
water work for area Hum	changing og absorbent wells into exploitation	170,000	VIK Likely
Continuation of works on service for reparing of pumps-Stup and construction and adaptation of storage for chlorine bottle		220,000	VIK Likely
Expense for introduction of system on ISO 9000 standards		30,000	VIK Likely
Construction and reconstruction of sewage network: Total	6,447,400		
Jasarevica farma		60,000	VIK Likely
Velesici		700,000	VIK Likely
Velesici- in direction to barracs		400,000	VIK Likely
Kobilja Glava -Hotonj		305,000	VIK Likely
Vogosca		500,700	VIK Likely
Brijesce-ato base Centrotrans		15,000	VIK Likely
Sewage between schools-Vogosca		65,000	VIK Likely
Left side of river Miljacka		1,400,000	VIK Likely
Sifon Bendbasa		25,000	VIK Likely
Sulejman Ef. Musica		108,000	VIK Likely
Sewage Alipasina for bouth side		1,343,800	VIK Likely
Blazuj colector from Karamusica till Mostar cross road		950,000	VIK Likely
Igman colector		105,000	VIK Likely
Soukbunar		32,000	VIK Likely
Sirokaca-Hadziabdnicica-Mjedenica		86,000	VIK Likely
Mlade Bosne		85,000	VIK Likely
Bardakdzije nearly by student house		4,300	VIK Likely
Bardakdzije bus station		4,300	VIK Likely
Vijechnica		7,200	VIK Likely
Velesici		4,300	VIK Likely
Bistrik		5,800	VIK Likely
Vrbanjusa-Sagardije-Logavina		2,900	VIK Likely
Bohnicka-Stjepana Tomica-Visnjik		4,300	VIK Likely
Vratnik Mejdan		11,500	VIK Likely
Adema Buce by Zrak		10,800	VIK Likely
H.Kresevljakovica-Safeta Hadzica		2,900	VIK Likely
Mladih Muslimana way-Huremusa		4,300	VIK Likely
Gradacacka		4,300	VIK Likely
Outbuilding of ilegal sowege network		200,000	VIK Likely
Reparing of objects for cleaning of waste waters Butlie : Total	737,200		
Engine-room		30,100	VIK Likely
Pressdeg		30,700	VIK Likely
Energetic object		36,300	VIK Likely
Pumping station		7,400	VIK Likely
Digestori		345,700	VIK Likely
Administration building		32,100	VIK Likely
Rehabilitation of fence		35,000	VIK Likely
Reconstruction of outside sewage		81,900	VIK Likely
Construction of temporarily drains		45,000	VIK Likely
Roofs works on building Terazija		30,000	VIK Likely
Supplying of hangar in storage Brijesce		48,000	VIK Likely
Setling of new fence on entrance doors		15,000	VIK Likely
Adaptation of existing working space in Kolodvorska street		12,000	VIK Likely
Adaptation of restorant in administration building Terazija		25,000	VIK Likely
Fixing of space in Administration building Terazija		120,000	VIK Likely
Construction of working house in Faletici		200,000	VIK
Adaptation association space in J. Cernija street		100,000	VIK Likely
Rehabilitation of storage in Stup		50,000	VIK Likely
Aspahlling of road to storage Stup		60,000	VIK Likely
Construction of storage space for chlorine bottle Faletici-Butila		100,000	VIK Likely
Conservation of working space in construction-Kolodvordka street		70,000	VIK
Rehabilitation of working space in Paromlinska str.		400,000	VIK
Adaptation of working resting house in Srebreno		500,000	VIK
Maintaining of network LAN and Wan on all locations		40,000	VIK Likely
Maintaining of software aplication, PIS and MONV-making of contract		60,000	VIK Likely
Training of staff for VIK for FORMS;REPORTS, administration base ORACLE, DESIGNER2000		8,500	VIK Likely
Connecting of all location in J.Cernija street with optical server		30,000	VIK Likely
Supplying PSION-WORKABOUT for readers		25,000	VIK Likely
Construction of roofs on administration building in J.Cernija str.		150,000	VIK Likely
Construction of memories drinking-fountain in J.Cernija str.		30,000	VIK Likely
Total		54,885,100	Total 'Likely' 36,042,100

Table K.6 Summary of Capital Investment Needs in 1999

Tabela K.6 suma potreba kapitalnih ulaganja u 1999

Types of capital investments and financial sources <i>Tipovi kapitalnih ulaganja i finansijskih izvora</i>	Amount (KM) <i>Vrijednost (KM)</i>
Investment works financed by Canton <i>Investicioni radovi finansirani od strane Kantona</i>	38,400,000
Reconstruction of water-network financed by EC <i>Rekonstrukcija vodovodne mreze-finansirani od strane EC</i>	1,000,000
Projects carried over from year 1998 <i>Prebaceni projekti i 1998</i>	1,827,000
ViK's own investment <i>ViK licna ulaganja</i>	5,487,000
Acquisition of basic equipment financed by various sources <i>Glavna oprema finansirana iz vise izvora</i>	1,500,000
Total capital investment needs <i>Ukupne potrebe kapitalnih ulaganja</i>	48,214,000

Source: ViK

Table K.7 Expected Source to Finance Operating Costs in 1999

Tabela K.7 Ocekivani izvori za finansiranje operacionih troskova u 1999

Types of operating expenses and its sources <i>Tipovi djelotvornih aktivnosti i njihovi izvori</i>	Amount (KM) <i>Vrijednost (KM)</i>
Water and sewage service charge collected from customers <i>Prikupljene naplacene usluge od potrosaca za vodu i kanalizaciju</i>	23,800,000
Grants from Canton for salaries <i>Sredstva od Kantona za plate</i>	9,234,000
Grants from Canton for leak repair <i>Sredstva od Kantona za opravku kvarova</i>	5,000,000
Additionally expected grants <i>Dodatna ocekivana sredstva</i>	2,000,000
Total operating expenses without depreciation <i>Ukupni djelotvorni troskovi bez amortizacije</i>	40,034,000

Source: ViK

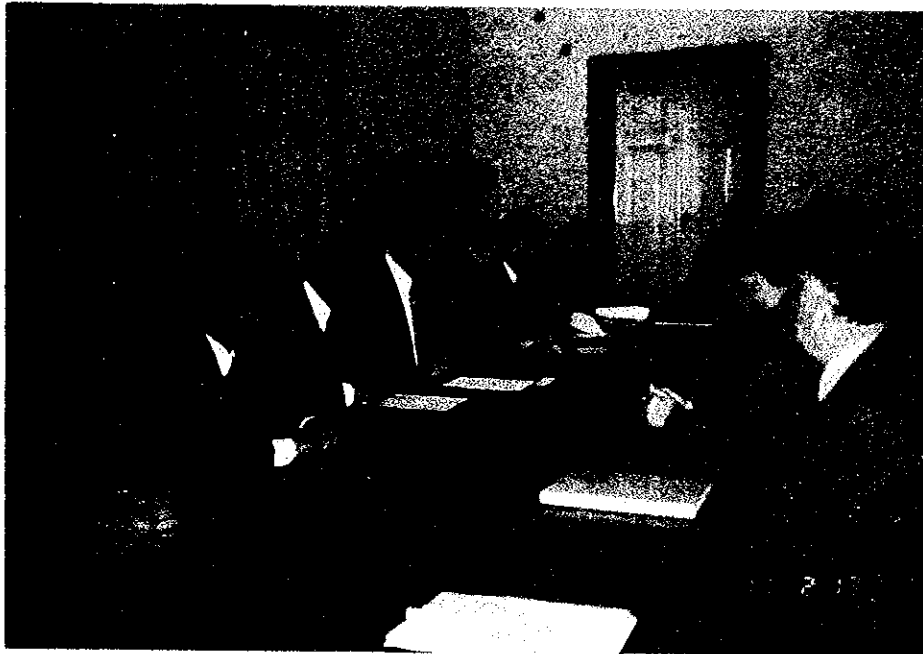
Table K.8 Major Facilities and Equipment

(As of Dec. 31, 1998)

Facilities and Equipment	Acquisition Value <i>Bruto</i>	Accumulated Depreciation <i>Amortizacija</i>	Net Value <i>Neto</i>
<i>Gradevine i Oprema</i>			
Facilities			
WWTP	206,432,170	24,532,125	181,900,045
Collector V Transfersale-M.Dvor	88,437,240	22,768,315	65,668,925
Collector XII Trans.-Vogosca	77,458,396	19,929,097	57,529,298
Pipeline Bacevo-A.Most	48,133,855	39,636,348	8,497,507
Collector Grbavica-Hrasno	45,591,424	11,733,186	33,858,238
Collector Marijin Dvor-Vijecnica	38,244,497	9,845,295	28,399,202
Collector Hrasnica-Ilidza	34,548,038	8,894,180	25,653,858
Collector XII transversale	34,267,055	8,819,767	25,447,288
Pipeline Bacevo-Mojmilo	27,201,953	13,921,271	13,280,682
Collector Ilidza -Plant	22,718,652	5,838,973	16,879,679
Sewerage network in M.Tita street	21,316,280	5,499,392	15,816,888
Reservoir Mojmilo	20,586,320	7,585,170	13,001,150
PUT-bridge for plant	20,047,847	7,807,181	12,240,667
Pipeline PS Hrasno	19,780,069	6,492,607	13,287,462
Pipeline Breka-Grdonj	15,848,792	7,117,170	8,731,622
Reservoir Skenderija	14,985,226	3,953,376	11,031,850
PS Bacevo	14,589,293	4,959,262	9,630,031
Water network Hrid-Komatín-Cicin H.	13,804,527	7,102,115	6,702,412
Reservoir A.Most	13,533,852	7,974,154	5,559,698
Sewerage network of A.Polje area	11,872,296	4,001,257	7,871,039
Water network Kobilja Glava	10,009,614	5,130,864	4,878,751
Reservoir K.Glava	9,970,283	4,464,391	5,505,892
Distribution lines Reservoir Mojmilo	9,628,898	3,158,814	6,470,084
Pipeline PS Bacevo-Luzani	8,711,177	2,857,591	5,853,586
PS Hrasno	8,481,583	1,583,804	6,897,779
Reservoir Igman-new	8,267,699	1,871,316	6,396,383
Reservoir Crni Vrh	8,203,216	4,897,260	3,305,955
Reservoir Bacevo	7,710,182	3,933,247	3,776,935
Reservoir Centar	7,709,409	4,127,650	3,581,759
Sewerage network Ilidza road	7,671,808	1,950,988	5,720,820
Collector Bosna river	7,103,456	1,547,594	5,555,861
Collector from street 1.Maj	6,467,022	1,422,746	5,044,276
Sewerage network Dobrinja-ZGP	5,948,604	1,578,111	4,370,493
Sewerage network cross road Poljice	5,923,548	1,571,444	4,352,103
Reservoir Podhrastovi	5,923,486	1,553,608	4,369,878
Pipeline Vogosca-Semizovac	5,698,318	3,210,264	2,488,053
Sewerage network X transv.	5,502,764	1,459,834	4,042,930
Direction building-Terazije	5,376,114	2,214,059	3,162,055
Sewerage network Mladicko Polje	5,110,158	1,355,679	3,754,479
Distribution zone Reservoir Lukavac	5,095,589	1,672,893	3,422,696
Equipment			
Motors on gas and oil-equipment	5,901,706	3,216,179	2,685,526
Motors on gas and oil-equipment	4,876,439	2,190,913	2,685,526
Electromechanic equipment	1,278,143	1,185,198	92,944
Total	945,966,994	286,564,686	659,402,308

Source: VIK

L. MINUTES OF MEETINGS

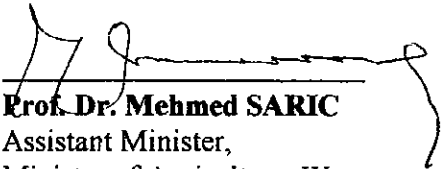


APPENDIX L. MINUTES OF MEETINGS

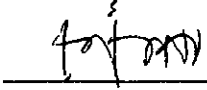
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**MINUTES OF MEETING OF INCEPTION REPORT
FOR
THE FEASIBILITY STUDY ON SEWERAGE SYSTEM
OF
SARAJEVO IN BOSNIA AND HERZEGOVINA
AGREED UPON BETWEEN
SARAJEVO
AND
JICA STUDY TEAM**


Sarajevo, February 12, 1999



Prof. Dr. Mehmed SARIC
Assistant Minister,
Ministry of Agriculture, Water
Management and Forestry of
Federation of Bosnia and Herzegovina

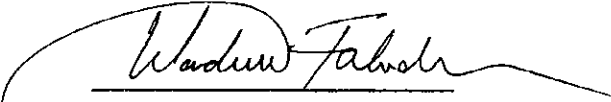


Mr. Kaoru SUZUKI
Team Leader
JICA Study Team




Mr. Munib BULJINA
Minister,
Canton Ministry of Urban Planning,
Housing and Utilities in Sarajevo

Witnessed by



Mr. Pilavdzic FAHRUDIN
General Manager,
Canton Public Communal Company,
"Water Supply and Sanitation"



Mr. Mihovil MALBASIC
Assistant Minister,
Bosnia and Herzegovina,
Ministry of Foreign Affairs,
Department for Multilateral Relations

2. The Study Team explained the scheme on training of the counterpart to the Bosnia and Herzegovina side with full understanding from them. The Study Team noted the request of the Bosnia and Herzegovina side for one personnel to undergo the counterpart training programme in Japan.

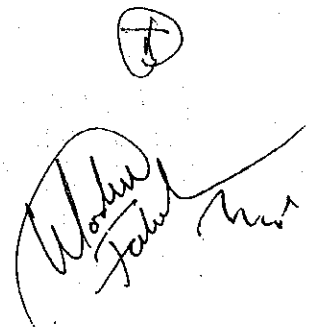
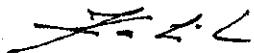
3. The Bosnia and Herzegovina side agreed to provide adequate office space, furniture and electricity to the Study Team.

4. The Bosnia and Herzegovina side also agreed to the request of the Study Team to provide them for utilities such as water and power supply necessary for the site survey at the WWTP.

5. Regarding the water quality equipment as listed in Appendix C of IC/R, the Study Team has arranged to deliver the above mentioned equipment to the place to be designated. In this regard, the Bosnia and Herzegovina side will arrange exemption to Customs duties.

6. The Bosnia and Herzegovina side agreed that all Study Reports would be open for disclosure.

7. The Study Team raised the concern about ethnic conflict issue that could affect the smooth implementation of the Study. The Bosnia and Herzegovina side assured that no negative impact arise to that effect, and that, in case any negative impact occur, the Bosnia and Herzegovina side will take full responsibility.

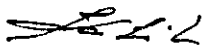


In accordance with the Scope of Work agreed between the Council of Ministers of the Bosnia and Herzegovina and Japan International Cooperation Agency (JICA) on August 26, 1998, JICA selected a study team for the Study on The Feasibility Study on Sewerage System of Sarajevo in Bosnia and Herzegovina and dispatched the Study Team to the Bosnia and Herzegovina side to commence the Study.

The Study Team submitted 20 copies of the Inception Report (IC/R) for the Feasibility Study on the Wastewater Treatment Plant (WWTP) of Sarajevo City to the Bosnia and Herzegovina and had a series of discussions on the report from February 10 to 12, 1999.

The participants of meeting are listed in the Attachment. The IC/R was in principle accepted and agreed by the Bosnia and Herzegovina side with the following comments.

1. The Bosnia and Herzegovina side and the Study Team fully agreed the contents of the IC/R, with further explanations from the JICA Study Team on such issues as follows;
 - a) The procedure of site survey for Sarajevo WWTP was presented in order to realize the present status of WWTP.
 - b) The Study Team requested the Bosnia and Herzegovina side to designate the counterpart personnel to cover the aspects on Civil, Architectural, Mechanical, and Electrical works and Management that will collaborate the Study Team in the duration of the Study.



ATTENDANCE LIST

Bosnia and Herzegovina Side:

Bosnia and Herzegovina, Ministry of Foreign Affairs

Mr. Mihovil MALBASIC	Assistant Minister, Department for Multilateral Relations
Mr. Mithat PASIC	Head of Unit, Department for Multilateral Relations, Unit for Reconstruction
Mr. Aziz HADZIMURATOVIC	Counselor, Department for Multilateral Relations,
Ms. Jasna CEHIC	International Aid Coordinator, Department for Multilateral Relations, Unit for Reconstruction

Ministry of Agriculture, Water Management and Forestry of Federation of Bosnia and Herzegovina

Prof. Dr. Mehmed SARIC	Assistant Minister
Mr. Stjepan BAGARIC	The Head Inspector of Water Management of Federation of Bosnia and Herzegovina

Cantonal Ministry of Urban Planning, Housing and Utilities in Sarajevo

Mr. Nusret CAUSEVIC	Deputy Minister
Mr. Karamehmedovic SALIH	Public Utility Department Assistant

Public Water Management Enterprise Bosnia and Herzegovina

Mr. Mirsad LONCAREVIC	Deputy Director
-----------------------	-----------------

Canton Public Communal Company, "Water Supply and Sanitation"

Mr. Pilavdzic FAHRUDIN	General Manager
Mr. Drace ZULFIKAR	Higher Advisor of the Director
Mr. Biscevic MIDHAT	Director
Mr. Hasanovic HIKMET	Technical Director

Japanese Side:

JICA Study Team

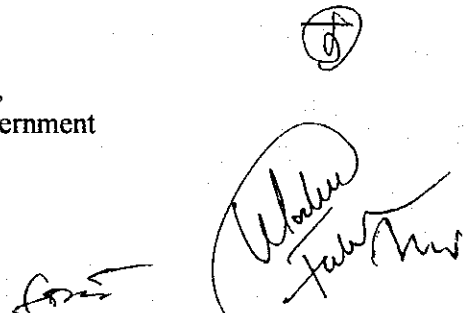
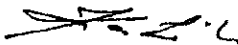
Mr. Kaoru SUZUKI	Team Leader
Mr. Renato Q. CRISOSTOMO	Facility Design
Mr. Mitsuhiro DOYA	Economist

Advisory Committee

Mr. Kazunori KOINUMA	Department of Sewerage, Tokyo Metropolitan Government
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JICA Headquarters

Mr. Takayuki NAKAGAWA	Task Management
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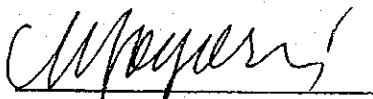


**MINUTES OF MEETINGS OF INTERIM REPORT
FOR THE FEASIBILITY STUDY
ON THE WASTEWATER TREATMENT PLANT
OF SARAJEVO CITY IN BOSNIA AND HERZEGOVINA
AGREED UPON BETWEEN
THE MINISTRY OF FOREIGN AFFAIRS, FEDERAL MINISTRY OF
AGRICULTURE, WATER MANAGEMENT AND FORESTRY, CANTONAL
MINISTRY OF URBAN PLANNING, HOUSING AND UTILITIES
IN SARAJEVO
AND
JICA STUDY TEAM**

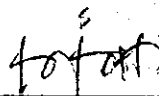
Sarajevo, May 31, 1999



Za **Prof. Dr. Mehmed SARIĆ**
Assistant Minister,
Ministry of Agriculture, Water
Management and Forestry of
Federation of Bosnia and Herzegovina

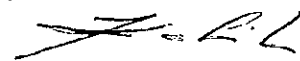


Stjepan BAGARIĆ
General Water Inspector for
the Federation of BiH



Mr. Kaoru SUZUKI
Team Leader
JICA Study Team

Za



Mr. Munib BULJINA
Minister,
Canton Ministry of Urban Planning,
Housing and Utilities in Sarajevo

Witnessed by



Mr. Fahrudin PILAVDŽIĆ
General Manager,
Canton Public Communal Company,
"Water Supply and Sanitation"



Mr. Mihovil MALBAŠIĆ
Assistant Minister,
Bosnia and Herzegovina,
Ministry of Foreign Affairs,
Department for Multilateral Relations

In accordance with the Scope of Work agreed between the Council of Ministers of the Bosnia and Herzegovina and Japan International Cooperation Agency (JICA) on August 26, 1998, the Study Team submitted 20 copies of the Interim Report (IT/R) for the Feasibility Study on the Wastewater Treatment Plant (WWTP) of Sarajevo City to the Bosnia and Herzegovina and had a series of discussions on the report from May 26 to 28, 1999.

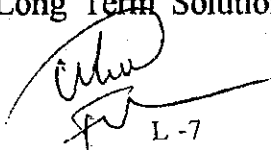
The participants of meeting are listed in the Attachment. The IT/R was in principle accepted by the Bosnia and Herzegovina side with the following comments.

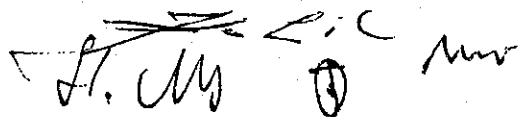
1. The BiH side and the Study Team fully agreed to the contents of the IT/R, with further explanations by the Study Team on following issues;

a)The Study Team explained to the BiH side the findings of the Study to date and assured that two parties have the same understanding in terms of the purpose and basic idea of rehabilitation plan.

b)The procedure of the second site survey for Sarajevo WWTP was presented in order to carry out the detail survey of WWTP. Waterworks and Sewerage Company of Sarajevo (ViK) confirmed that they have arranged necessary cooperative measures such as a site office, laboratory, personnel, and other required actions. The Study Team has made a site survey contract with the local contractor to carry out the detail survey.

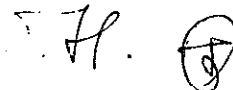
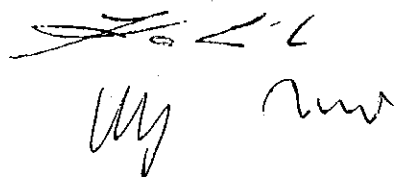
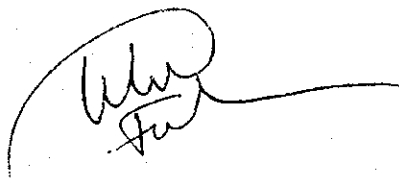
c)The Study Team has identified the other sewerage projects for Sarajevo Sewerage System that have been assisted by foreign countries and international agencies. The Study Team has also confirmed that only this Study as a JICA's technical cooperation is aimed for the reconstruction program of Sarajevo WWTP. The Study Team explained that they consider the "Kuwait Fund Long Term Solutions of Water Supply and Wastewater


L-7


①

Drainage and Treatment in the Canton Sarajevo” as a superordinate program and may refer to the “Compilation and Implementation of the Master Plan for the Restoration of the Sarajevo Wastewater Treatment Plant” to determine the framework and design criteria for the Feasibility Study. The BiH side agreed the proposed framework and design criteria.

2. In accordance with the discussion of February 1999, JICA will accept one counterpart personnel for a training program in Japan, to be held for one month starting in the mid August 1999.
3. The BiH side confirmed that the Mine Clearance Project in Sarajevo WWTP, Phase I had been completed and no obstacle is expected for a smooth execution of the site survey. The BiH side also reassured that full responsibility of mine clearance lies with the BiH side, and confirmed that they request to the responsible organization the earliest issue of a mine clearance certificate of the whole project area.
4. The BiH side expressed their interest for the project implementation through Japanese ODA. The Study Team reassured that they would make utmost effort to finalize the Study together with the BiH side. The Study Team also indicated that the BiH side’s early decision making to apply Japanese ODA is important for the Project to be smoothly implemented. Incidentally the Study Team explained that Japanese ODA includes provision of a Japanese Yen loan and that JICA is not mandated for its approval.



ATTENDANCE LIST

Bosnia and Herzegovina Side:

Bosnia and Herzegovina, Ministry of Foreign Affairs

Mr. Mihovil MALBAŠIĆ	Assistant Minister, Department for Multilateral Relations
Mr. Mithat PAŠIĆ	Head of Unit, Department for Multilateral Relations, Unit for Reconstruction
Ms. Jasna ČEHIĆ	International Aid Coordinator, Department for Multilateral Relations, Unit for Reconstruction

Ministry of Agriculture, Water Management and Forestry of Federation of Bosnia and Herzegovina

Prof. Dr. Ahmed SMAJIĆ	Minister
Prof. Dr. Mehmed SARIĆ	Assistant Minister
Mr. Stjepan BAGARIĆ	The General Water Inspector for the Federation of BiH

Cantonal Ministry of Urban Planning, Housing and Utilities in Sarajevo

Mr. Nusret ČAUŠEVIĆ	Deputy Minister
Mr. Salih KARAMEHMEDOVIĆ	Public Utility Department Assistant

Public Water Management Enterprise Bosnia and Herzegovina

Mr. Mirsad LONČAREVIĆ	Deputy Director
-----------------------	-----------------

Canton Public Communal Company, "Water Supply and Sanitation"

Mr. Fahrudin PILAVDŽIĆ	General Manager
Mr. Tarik BADNJEVIĆ	Vice General Manager
Mr. Jakub DREKOVIĆ	Financial Manager
Mr. Zulfikar DRAČE	Higher Advisor of the Director
Mr. Osman SULJAGIĆ	Director of Rehabilitation and Development Sector
Mr. Midhat BIŠČEVIĆ	Director
Mr. Hikmet HASANOVIĆ	Technical Director

Japanese Side:

JICA Study Team

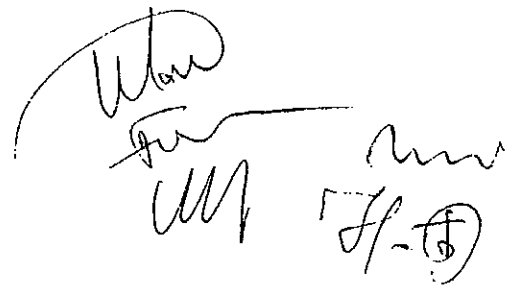
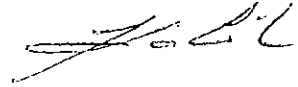
Mr. Kaoru SUZUKI	Team Leader
Mr. Renato Q. CRISOSTOMO	Facility Design
Mr. Robert DESPAULT	Structure Design / Facility Design
Mr. Hajime Sakai	Mechanical Design / Plant Design
Mr. Koichi OTA	Electrical Design / Plant Design
Mr. Mitsuhiro DOYA	Economist
Mr. Koichi YAMASHITA	Supporting Staff

Advisory Committee
Mr. Kazunori KOINUMA

Chief Advisor

JICA Headquarters
Mr. Takayuki NAKAGAWA

Task Management



3. Minutes of Meeting between ViK and JICA Study Team

**THE FEASIBILITY STUDY
ON THE
WASTEWATER TREATMENT PLANT
OF SARAJEVO**

**MINUTES OF MEETING
BETWEEN
VODOVOD I KANALIZACIJA (ViK)
AND
JICA STUDY TEAM**

1. DATE: 17 June 1999

TIME: 1:00 PM

2. VENUE: ViK Office, Terezija

3. ATTENDANCE LIST

3.1 Mr. M. Biscevic	Vodovod I Kanalizacija (ViK) – Director
3.2 Mr. Z. Drace	Vodovod I Kanalizacija (ViK) - Director
3.3 Mr. J. Rudalija	Vodovod I Kanalizacija – WWTP Superintendent
3.4 Mr. K. Suzuki	JICA Study Team – Team Leader
3.5 Mr. R. Crisostomo	JICA Study Team – Facility Design/O&M Planning
3.6 Mr. R. Despault	JICA Study Team – Facility/Structure Design
3.7 Mr. S. Kugaprasatham	JICA Study Team – Environment/Water Quality

4. MINUTES OF MEETING

4.1 Mr. K. Suzuki opened the meeting with a short briefing regarding the progress of the 2nd Site Survey of the Sarajevo WWTP in Butila.

4.2 The following important issues were discussed

- **Treated Effluent Quality**
- **Sludge Disposal from the WWTP**
- **Preliminary Evaluation of Sludge Treatment Processes and Disposal Alternatives**

4.3 **Treated Effluent Quality.** The Study Team presented the following treated effluent criteria that will be adapted for the study.

Parameter	Concentration (monthly average)
BOD ₅ , 20°C	20
SS	30
pH	6-8
FC (Fecal coliform count), No./100ml	200

The BOD and SS values are the same values that were adopted during the design of the WWTP in 1985, and concern was raised by the Study Team since these values do not satisfy the Class III River Quality Standards of the Bosnia River during very low flow. Satisfying the above standards, require tertiary treatment, which is considered to be an extreme financial burden for the rehabilitation work. The Study Team requests confirmation of this issue with The Ministry of Agriculture, Water Management and Forestry.

Another concern raised by the Study Team is the limitation of the Nematode, eggs No./L to be less than 1 and fecal coliform standard as set in the report "Long-term Solutions for the Water and Wastewater Drainage and Treatment in Canton Sarajevo, 1999" that require additional treatment. The Study Team proposed that fecal coliform standards which require disinfection be evaluated as an option. Due to some effects of chlorine and other disinfectant, ViK has suggested that they will consult with the authorities particularly with The Ministry of Agriculture, Water Management and Forestry on this matter and will liase with the Study Team.

- 4.4 Sludge Disposal from WWTP.** The Study Team has raised the concern on the compliance to existing regulations regarding disposal of sludge from the WWTP. ViK suggested that since there is no existing regulations about sludge disposal in Bosnia and Herzegovina, it might be helpful to the Study Team to refer to some European Standards for guidance.

Previously, there had been an agreement entered between ViK and the management of the Sarajevo Sanitary Landfill regarding sludge disposal, but suggestion has been made to make preparations for a new agreement to be made to that effect, where necessary.

ViK will arrange a meeting with the local transportation company and sanitary landfill authorities responsible with the transport and disposal of sludge cakes and other wastes.

- 4.5 Preliminary Evaluation of Sludge Treatment Processes and Disposal Alternatives.** A draft (please see attached) has been presented by the Study Team to the ViK for discussion and information. A brief explanation on the basis of selection such as, compliance to regulation requirement, flexibility of operation, energy requirement, and ease in operation have been used in the

preliminary evaluation of the options presented. Final evaluation will be made on the 3 selected option based on their economic viability will be made.

5. Other Matters.

5.1 Influent Wastewater Quality. The Study Team has presented to the ViK management for confirmation the following influent wastewater quality.

Parameter	Concentration	Remarks
BOD ₅ , 20°C, mg/l	200	60 g BOD/person in 2000 75 g BOD/person in 2015
SS, mg/l	270	80 g SS/person in 2000 95 g SS/person in 2015
NH ₄ -N, mg/l	23	Proportion to BOD concentration.
T-P (Total Phosphorous), mg/l	8	
COD _{cr} , mg/l	350	

Note: NH₄-N, T-P and COD values shown in the Interim Report are corrected

The ViK management has no objection to the above data presented, however suggestion was made to present the same to The Ministry of Agriculture, Water Management, and Forestry for action/approval.

5.2 ViK clarified that the current rehabilitation works being done to the WWTP facilities through in-house budget are just minor repairs to the buildings to prevent them from further deterioration.

5.3 The main laboratory building (Facility 25) was used to be under the responsibility of The Ministry of Agriculture, Water Management, and Forestry. The Study Team requested ViK to clarify the status of the building whether it should be included in the rehabilitation works of the WWTP.

5.4 There is an existing, underground, high voltage transmission line with a capacity of 3.2 megawatts from the Azici S/S that used to supply the WWTP. Another emergency power supply source is coming from Rajlovac S/S at capacity of 1.5 megawatts to be used only in case of power outages from Azici. In case the power requirement exceeds 3.2 megawatts, a new transmission line has to be laid parallel to the Azici transmission line under the WWTP responsibility.

6. **NEXT MEETING:** To be announced later.

Decision variables	Advantages	Disadvantages	Application	Selected for evaluation
Non-stabilized, thickened liquid sludge	<ul style="list-style-type: none"> - Does not require expensive treatment process. 	<ul style="list-style-type: none"> - Health and environmental implications of pathogenic organism - Vector attraction at disposal site - Increased mass & volume add to hauling cost 	<ul style="list-style-type: none"> - Disposal of non-stabilized liquid sludge in landfills is prohibited in most countries - The European Union (EU) countries will prohibit discharge to landfill of all sewage sludge by 2005. 	<ul style="list-style-type: none"> - no
Non-stabilized de-watered sludge	<ul style="list-style-type: none"> - easier to handle than liquid sludge 	<ul style="list-style-type: none"> - Health & environmental implications of pathogenic organisms - Vector attraction at disposal site 	<ul style="list-style-type: none"> - Sludge cannot be land applied - Landfilling requires careful control of leachate, runoff and daily cover. - Feasible but not recommended because future EU regulations will prohibit discharge of bio-solids to landfill site. 	<ul style="list-style-type: none"> - no
Stabilized liquid sludge	<ul style="list-style-type: none"> - reduced pathogenic content - reduced odor potential - no expensive de-watering process - stabilized liquid sludge can be land applied by injecting below the surface 	<ul style="list-style-type: none"> - disposal of liquid sludge to landfill can increase vector attraction - potential increase in risk of ground/surface water contamination, and odor potential. - mass and volume of liquid sludge adds to disposal costs 	<ul style="list-style-type: none"> - Feasible but there is no experience with land application of liquid sludge in Bosnia. - Liquid sludge for land application must meet stringent requirements for attenuation of pathogenic content, and site specific application conditions. - This option is also rejected because it is difficult to implement, control and monitor. 	<ul style="list-style-type: none"> - no
Stabilized de-watered sludge	<ul style="list-style-type: none"> - reduced pathogenic content - reduced odor potential - high beneficial re-use potential - greatest reduction in volume & mass - easier to handle than liquid sludge 	<ul style="list-style-type: none"> - de-watering is potentially expensive and difficult to operate 	<ul style="list-style-type: none"> - High re-use potential for de-watered bio-solids - Feasible, beneficial re-use has been popular in the past - This option meets existing regulatory requirements and provides flexibility for enhancing level of treatment if more stringent requirements for biosolids are required 	<ul style="list-style-type: none"> - yes

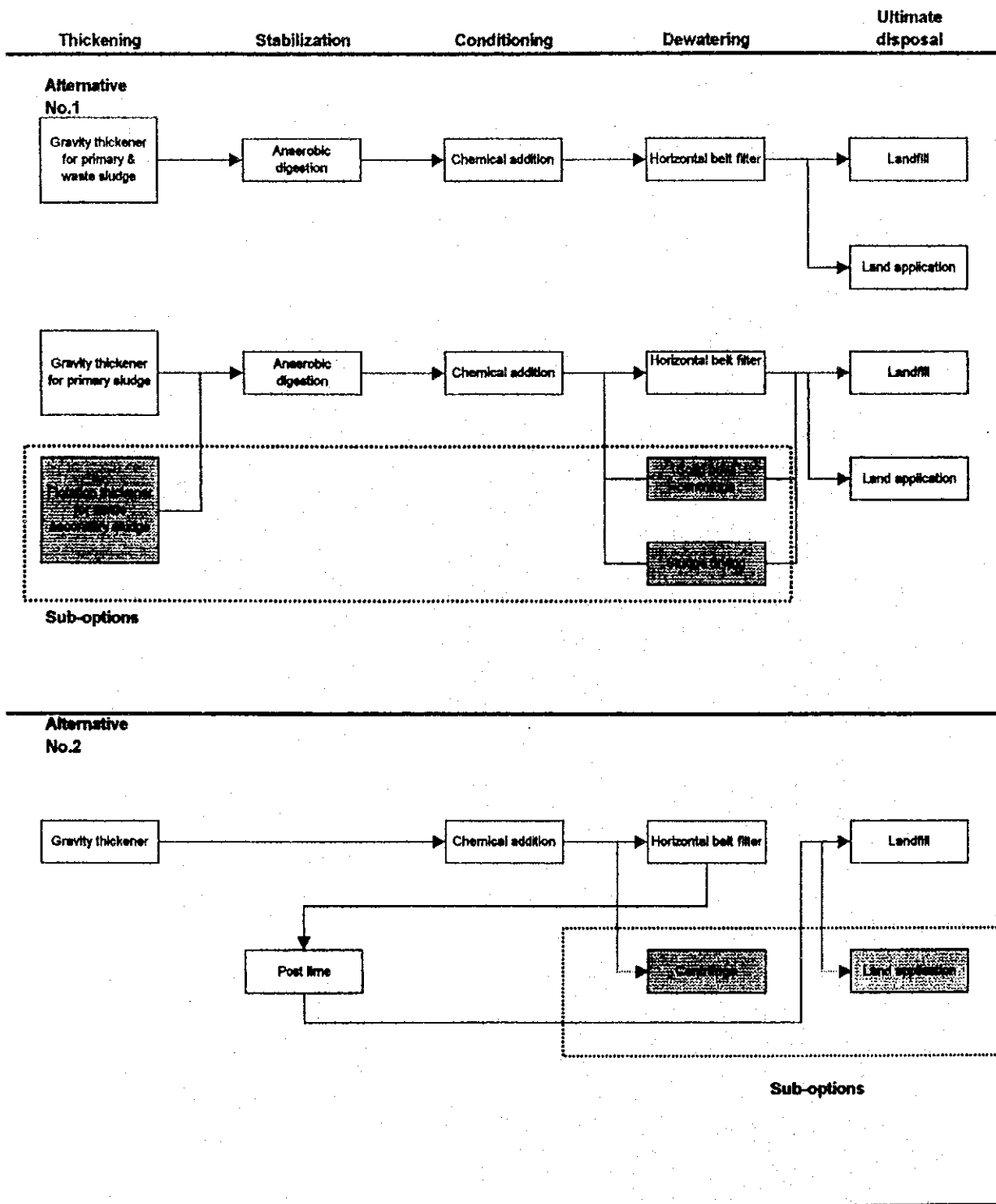
Process	Advantages	Disadvantages	Application	Selected for evaluation
Anaerobic digestion	<ul style="list-style-type: none"> Good reduction of volatile suspended solids and total sludge mass Operating costs can be reduced if gas is used to generate electricity Bio-solids suitable for agricultural use Low net energy requirements 	<ul style="list-style-type: none"> requires skilled operators high initial cost process is sensitive to loading and temperature variations recovers slowly from upset cleaning is difficult (scum & grit) 	<p>Almost always preferred for plants with flows > 19,000 m³/d. This method is considered for further evaluation.</p>	Yes
Aerobic digestion	<ul style="list-style-type: none"> Low initial cost simple operational control reduces total sludge mass 	<ul style="list-style-type: none"> high energy costs lower volatile suspended solids destruction bio-solids are typically difficult to de-water by mechanical means cold temperatures adversely affect performance 	<p>Typical for small plants Q < 19,000 m³/d. This method is rejected because of the high energy costs required for large flows.</p>	no
Composting (in-vessel)	<ul style="list-style-type: none"> high quality product suitable for land application can be combined with other processes high initial cost 	<ul style="list-style-type: none"> requires 18 to 30% de-watered solids requires bulking agent requires forced air system and temperature control high operational costs for power, labor and chemicals requires carbon source co-generation of electricity is not possible 	<p>used to convert sludge into high quality fertilizer capacity ranges from 5 to 45 dry tons per day. This method is rejected because the large quantities of daily sludge exceed practical limits of application.</p>	no
Lime stabilization	<ul style="list-style-type: none"> low capital cost easy operation good as interim or emergency stabilization method 	<ul style="list-style-type: none"> bio-solids not always suitable for land application chemical intensive volume of bio-solids to be disposed of is increased co-generation of electricity is not possible 	<p>Typical for small plants, can be practical for large applications. This method is rejected because it cannot allow direct reuse of liquid process effluents, does not produce a suitable fertilizer, and requires the most expensive chemical agents. It is not generally available.</p>	Yes
Sludge drying	<ul style="list-style-type: none"> substantially reduces volume produces high quality product excellent pathogen reduction can be started quickly retains nutrients can use gas from anaerobic digestion as source of energy 	<ul style="list-style-type: none"> some dryers could be labor intensive produces an off-gas that must be treated 	<p>This method eliminates the need for expensive and troublesome dewatering and thus produces a very high quality bio-solids for re-use.</p>	Yes

Comparison of sludge-dewatering methods

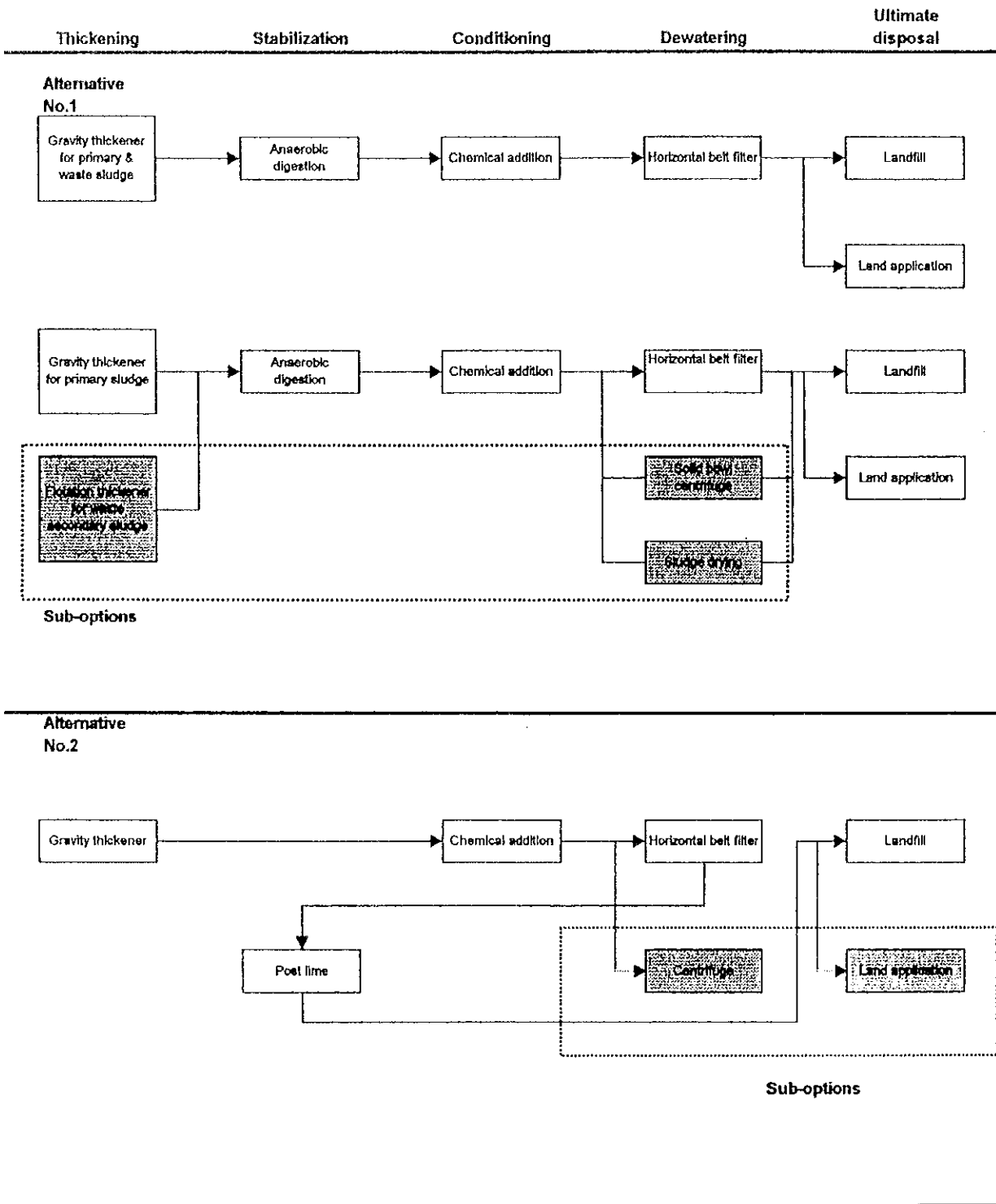
Draft for discussion

Process	Advantages	Disadvantages	Application	Selected for Evaluation
Vacuum filter	<ul style="list-style-type: none"> - Skilled personnel is not required - Maintenance requirements are low for continuously operating equipment 	<ul style="list-style-type: none"> - Highest energy consumer per unit of sludge - Continuous operator attention required 	<ul style="list-style-type: none"> - Rejected because of high energy & operational requirement 18 to 25% sludge cake 	- No
Solid bowl centrifuge	<ul style="list-style-type: none"> - clean and minimal odor problems - easy to install - fast start-up and shutdown capabilities - produces relatively dry sludge cake 15-20% - low capital cost-to-capacity ratio - chemical conditioning may not be required - easy to install - fast start-up and shutdown capabilities - very flexible in meeting process requirements not affected by grit - excellent results for difficult sludge - low energy requirements - relatively low capital and operating costs - less complex mechanically and easier to maintain 	<ul style="list-style-type: none"> - small wear is a high maintenance problem. requires good grit removal and possibly a sludge grinder in the feed stream to kill maintenance personnel required - produces high suspended solids in the recirculate - limited size capability - except for vacuum filters, consumes more energy per unit of sludge de-watered - for easily de-watered sludge, has highest capital cost-to-capacity ratio - significantly high recycle loads - hydraulically limited throughput - requires sludge grinder in feed stream - wet solids wet during sludge feed - plant operation - short machine life - automatic operation generally not advised 	<ul style="list-style-type: none"> - considered for further evaluation - high cost machines are capable of producing very dry cake 	<ul style="list-style-type: none"> - Yes
Imperforate basket centrifuge	<ul style="list-style-type: none"> - chemical conditioning may not be required - easy to install - fast start-up and shutdown capabilities - very flexible in meeting process requirements not affected by grit - excellent results for difficult sludge - low energy requirements - relatively low capital and operating costs - less complex mechanically and easier to maintain 	<ul style="list-style-type: none"> - high equipment cost - high labor cost - large floor area required for equipment - special support structure required - skilled maintenance personnel required - additional solids due to large chemical addition 	<ul style="list-style-type: none"> - rejected because of low cake solids. For most sludges, produces lowest cake solids concentration 8 to 14% 	- No
Plate filter press	<ul style="list-style-type: none"> - highest cake solids concentration 20 to 25% 	<ul style="list-style-type: none"> - high equipment cost - high labor cost - large floor area required for equipment - special support structure required - skilled maintenance personnel required - additional solids due to large chemical addition 	<ul style="list-style-type: none"> - rejected because of high capital, O&M costs. 	- No
Heat Drying	<ul style="list-style-type: none"> - inherently reduces volume - produces high quality product - excellent pathogen reduction - can be started manually - high temperatures - can use gas from anaerobic digestion as source of energy 	<ul style="list-style-type: none"> - some dryers require labor intensive - produces high gas dust that can be treated - energy intensive if digester gas is not available 	<ul style="list-style-type: none"> - this option produces a good quality sludge that can be further processed as fertilizer 	<ul style="list-style-type: none"> - Yes
Sludge drying beds	<ul style="list-style-type: none"> - lowest capital cost method where land is readily available - small amount of operator attention and skill required - low energy consumption - higher solids content than mechanical methods 	<ul style="list-style-type: none"> - requires large area of land - design requires consideration of climatic effects - sludge removal is labor intensive - potential for odor and vector problems - potential for groundwater pollution - design requires consideration of climatic effects 	<ul style="list-style-type: none"> - rejected because of unfavorable climatic conditions. 	- No
Sludge lagoons	<ul style="list-style-type: none"> - low energy consumption - no chemical consumption - low capital cost where land is available - least amount of operator skill required for operation 	<ul style="list-style-type: none"> - rejected because of unfavorable climatic conditions. 	<ul style="list-style-type: none"> - rejected because of unfavorable climatic conditions. 	- No

Sludge treatment and disposal options



Sludge treatment and disposal options



THE JICA STUDY TEAM OFFICE
FOR THE REHABILITATION OF
THE SEWERAGE SYSTEM
OF CANTON SARAJEVO
VODOVOD I KANALIZACIJA
Tel.:++387-71-458-630
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Date : 25.06.99

To Prof. Dr. Mehmed SARIC
Assistant Minister,
Ministry of Agriculture, Water Management and
Forestry of Federation of Bosnia Herzegovina (MOAWMF),
St. Hamdije Kresevljakovic 3,
Sarajevo 71000
Bosnia i Herzegovina
Tel : ++387-71-443-338
Fax :++387-71-663-659

Re: Report for Meeting with Vodovod i Kanalizacija (ViK) regarding the
Sarajevo WWTP Project in Butila

Dear Sir,

The Study Team had commenced the second site survey for the Feasibility Study of the Sarajevo WWTP. As per our discussion during the meeting held on 26 to 28 May 1999, the activities of our team stationed in ViK office at Terezija and WWTP site at Butila, are now in full swing.

The study team and ViK had a meeting regarding the fundamentals of this project for preliminary design on 17 June 1999. We have confirmed several important issues as per our Minute of Meeting (M/M). We, however, were directed to ask MOAWMF the important matters in order to finalize for proceeding this Project towards the next Project phase. The Study Team would like to confirm the following:

1. Are there any "National Treated Effluent Standards", as mentioned in the "Long Term Solutions Report"?
2. Consent of the Water Management Authority to renew discharge permit for WWTP effluent to Bosna River. Effluent quality for the design of WWTP is as follows:

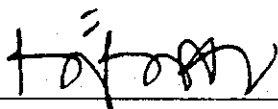
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Flow rate 196,000 m³/d (dry weather flow, year 2015)
BOD5 20 mg/l
S.S. 30 mg/l
pH 6-8

3. Industrial effluent standards to the public sewerage system as shown in IT/R as per page 4-7 & 8 and its adoption for future legislation and implementation.
4. Consent of the Canton Sarajevo to accept digested dewatered sludge cake for final disposal at landfill site. Estimated dewatered sludge cake quantity and mass are as follows:
Quantity : 144 m³/day
Mass : 160,000 kg/day
5. Does MOAMF have any reconstruction programme of "Main Laboratory" building?

Awaiting for your prompt reply and thank you very much indeed.

Sincerely yours,



Kaoru SUZUKI
Team Leader,
JICA Study Team

encl.: As above.

c.c. 1. Mr. Fahrudin PILAVZIC
General Manager,
Canton Public Communal Company,
Vodovod i Kanalizacija
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counted...../3

2. Mr.Midhat BISCEVIC
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3. Mr.Zulfikar DRACE
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Fax : ++387-71-204-574

**THE FEASIBILITY STUDY
ON THE
WASTEWATER TREATMENT PLANT
OF SARAJEVO**

**MINUTES OF MEETING
BETWEEN
THE MINISTRY OF AGRICULTURE, WATER
MANAGEMENT AND FORESTRY,
VODOVOD I KANALIZACIJA
AND
JICA STUDY TEAM**

1. DATE: 16 July 1999

TIME: 11:00 AM

2. VENUE: VIK Conference Room, Terezija 38

3. ATTENDANCE LIST

3.01 Prof. Dr. M. SARIC	Ministry of Agriculture, Water Management and Forestry (MOAWMF) – Assistant Minister
3.02 Mr. S. BAGARIC	Ministry of Agriculture, Water Management and Forestry – BiH General Water Inspector
3.03 Mr. F. PILAVDZIC	Vodovod I Kanalizacija (ViK) – General Manager
3.04 Mr. Z. DRACE	Vodovod I Kanalizacija – High Advisor
3.05 Mr. J. DREKOVIC	Vodovod I Kanalizacija – Director
3.06 Mr. M. AVDIC	Vodovod I Kanalizacija – Section Chief
3.07 Mr. K. ARIFHODZIC	Vodovod I Kanalizacija – Section Chief
3.08 Mr. F. ASCIC	Vodovod I Kanalizacija – Section Chief
3.09 Mr. K. SUZUKI	JICA Study Team – Team Leader
3.10 Mr. R. CRISOSTOMO	JICA Study Team – Facility Design/O&M Planning
3.11 Mr. R. DESPAULT	JICA Study Team – Facility/Structure Design
3.12 Mr. Y. TAKADA	JICA Study Team – Structure/Architectural Design
3.13 Mr. H. SAKAI	JICA Study Team – Structure/Mechanical Design
3.14 Mr. K. OTA	JICA Study Team – Structure/Electrical Design
3.15 Dr. S. KUGAPRASATHAM	JICA Study Team – Environment/Water Quality
3.16 Mr. M. DOYA	JICA Study Team – Management/Finance/ Economic Analysis/Institution/Organization

4. PURPOSE: Presentation of the Proposed Plan of the WWTP.

5. MINUTES OF MEETING

5.1 Mr. K. Suzuki opened the meeting at 11.00 A.M. by stating the purpose of the meeting to provide highlights of the Study Team's progress and findings to date. Mr. Suzuki presented the following agenda.

- **Progress of the Second On-site Work**
- **Alternatives for the WWTP Rehabilitation**
- **Proposed Plan & Layout (Conceptual)**
- **Water Quality and Environment**
- **Economic & Financial Aspects**
- **Schedule and Activities for the Final Report**

5.2 Progress of the Second On-site Work.

The Study Team presented the activities and progress of the second field survey and assessment of the WWTP facilities in all aspects both done by the Study Team and the local contractor, USB Kedly Doo.

5.3 Alternatives for the WWTP Rehabilitation.

The Study Team presented to the MOAWMF and ViK the alternatives for the rehabilitation including repair/replacement of equipments, repair and reconstruction of buildings and facilities, upgrading/replacement of treatment facilities. The Study Team also discussed the selection criteria and the advantages and disadvantages to show the feasibility of each alternative. Further elaboration on the following alternatives were done.

- a.) Aerators. The existing surface aerators can be utilized provided they will be rehabilitated. The Study Team is evaluating an option to replace the existing aerators with more energy-efficient technology using fine bubble air diffusers. A final recommendation will be made based on the results of cost comparison and financial evaluation.
- b.) Sludge Treatment. The existing anaerobic digesters will be rehabilitated since other treatment options are not feasible.
- c.) Sludge Dewatering. At the request of ViK, the Study Team evaluated the use of centrifuges for dewatering. Investment cost for centrifuges are found to be about 2.5 times higher than the filter presses, polymer consumption is double, and utilises about 415 kW more energy. Therefore, the Study Team recommends the use of new filter presses for dewatering.

The construction of new pre-treatment and pre-screening facilities is recommended to address the serious operational problems caused by grit. Operational and maintenance problems previously encountered are also addressed by providing winter protection covers to facilities such as grit removal and screening facilities

and raising the operational level of the facilities for flood prevention.

For proper site planning, the Study Team introduced options include effluent chlorination, and odour control. These are not required for the year 2000 , but could be implemented in the future to meet new regulatory requirements.

The Study Team accepted the request of ViK for an investigation/alternative option for the floating cover of the Gas Holding Tank.

5.4 Proposed WWTP Site Plan.

The Study Team presented the Proposed Plan and Layout (Conceptual) of the WWTP for the year 2000 and 2015.

5.5 Water Quality and Environment

The Study Team presented and discussed the results of the water quality tests for the river and raw sewage samples taken at different sampling points for June/July in comparison with that taken last March. The Study Team recommended that discharge of raw sewage to Miljacka River be stopped for the protection of the receiving rivers.

The Study Team recommended to ViK the need to coordinate with RAD in regards to the disposal of sludge cake from the WWTP.

The Study Team also recommended the monitoring and control of industrial wastewater discharge into the sewerage system.

5.6 Economic and Financial Analysis

The Study Team presented and discussed the results of the survey on industrial, commercial, and institutional consumers of ViK. It was stressed that, generally the companies and institutions surveyed are willing to pay about 42% for the cost of wastewater treatment in addition to their current sewerage bill.

5.7 Schedule and Activities of the Final Report

The Study Team presented the schedule and activities in relation to the fulfilment of the Final Report and possible loan application.

6. OTHER MATTERS

5.1 The ViK clarified to the Study Team that the current rehabilitation works being done to the WWTP facilities through in-house budget are just minor repairs to the buildings to prevent them from further deterioration.

7. NEXT MEETING: 3 August 1999 at 11:00 AM, ViK Conference Room

Prof. Dr. Mehmed SARIC
Assistant Minister,
Ministry of Agriculture,
Water Management and
Forestry

MR. Fahrudin PILAVDZIC
General Manager,
Vodovod I Kanalizacija

Mr. Kaoru SUZUKI
Team Leader,
JICA Study Team



KANTONALNO JAVNO KOMUNALNO PREDUZEĆE

"VODOVOD I KANALIZACIJA" SARAJEVO

PREDUZEĆE ZA PROIZVODNJU I DISTRIBUCIJU VODE, ODVOĐENJE I TRETMAN OTPADNIH VODA

Sjedište: ul. Jaroslava Černija br. 8, tel: 531-655, 447-741; fax: 440-658

**THE MANAGING DIRECTOR
SOCIAL DEVELOPMENT STUDY DEPARTMENT
JAPA INTERNATIONAL COOPERATION AGENCY**

RE: **REQUEST FOR TRANSFER OF EQUIPMENT – THE FEASIBILITY STUDY ON THE
WASTEWATER TREATMENT PLANT OF SARAJEVO CITY IN BOSNIA AND HERZEGOVINA**

We hereby have the honour to confirm a request for transfer of the equipment supplied by Japan International Cooperation Agency (JICA) to the Water and Sanitation Company ("Vodovod i Kanalizacija") after the completion of survey work in Sarajevo in relation the above study.


Water and Sanitation Company ("Vodovod i Kanalizacija") will be responsible for control and storage of the equipment in order to facilitate them duly the development studies on wastewater management.

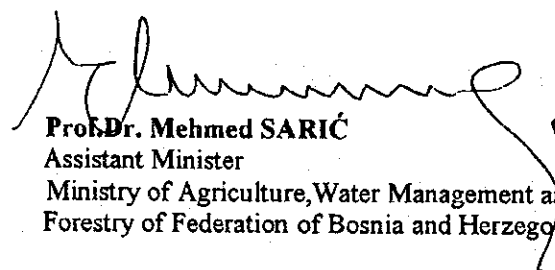
Enclosed is a list of the equipment under the custody of JICA for the above mentioned Study in Sarajevo.

We presume that this list will be clarified in detail, if the request of Bosnia and Herzegovina counterparts is approved positively.

Water and Sanitation Company ("Vodovod i Kanalizacija") will organize donation ceremony on the 22.09.1999.g. at 13,00 in Butila – laboratory.

Sarajevo, 16.07.1999.g.


Mr. Fahrudin PILAVDŽIĆ
General Manager,
Water and Sanitation Company
("Vodovod i Kanalizacija")

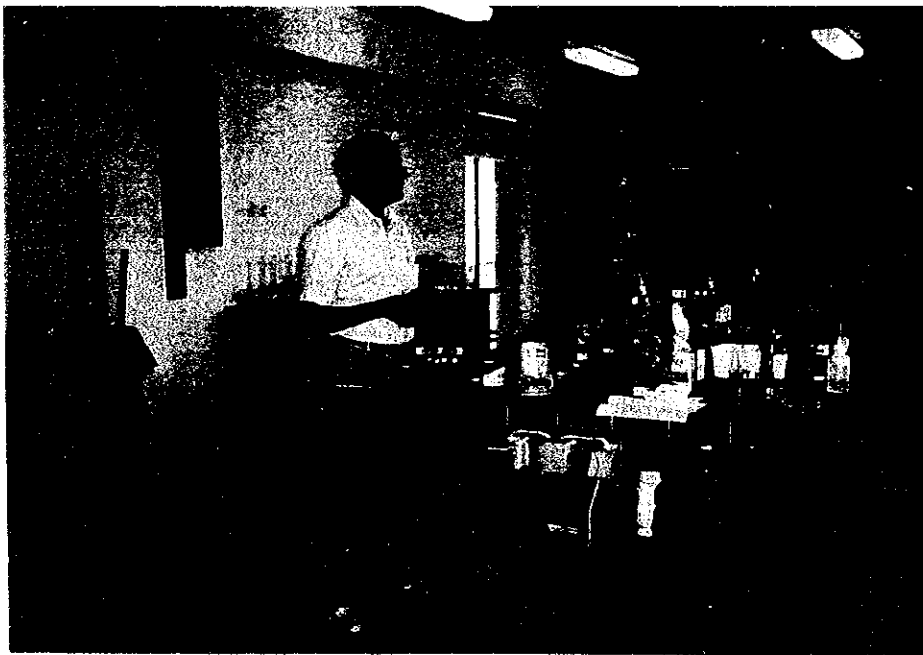
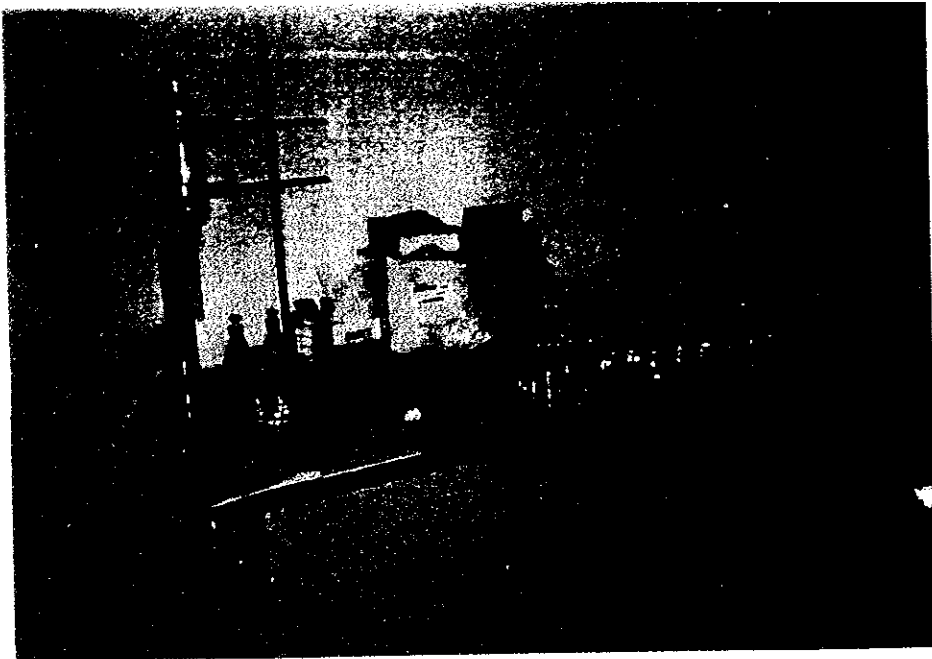

Prof. Dr. Mehmed SARIĆ
Assistant Minister
Ministry of Agriculture, Water Management and
Forestry of Federation of Bosnia and Herzegovina

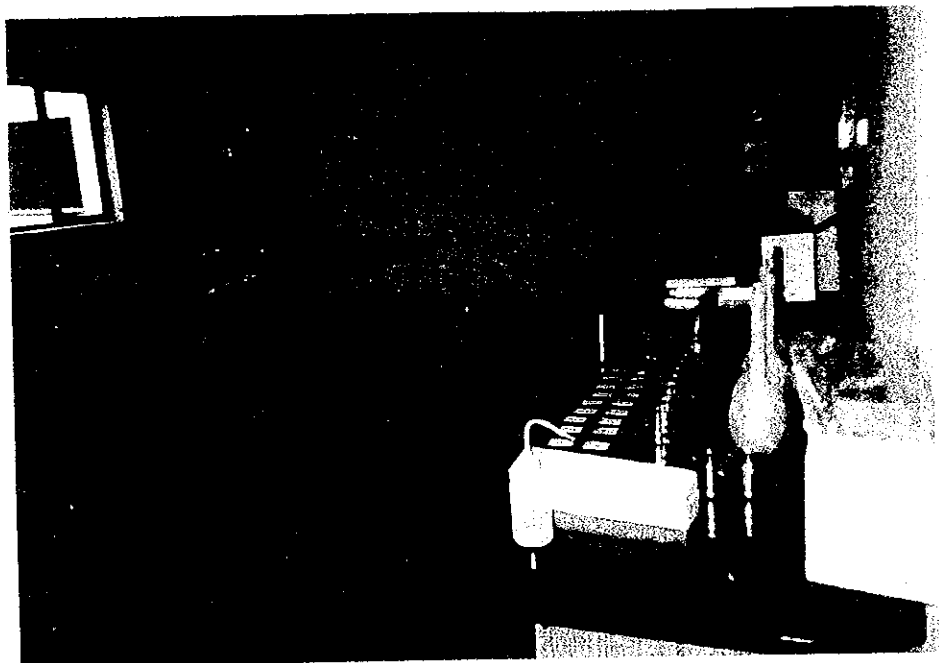
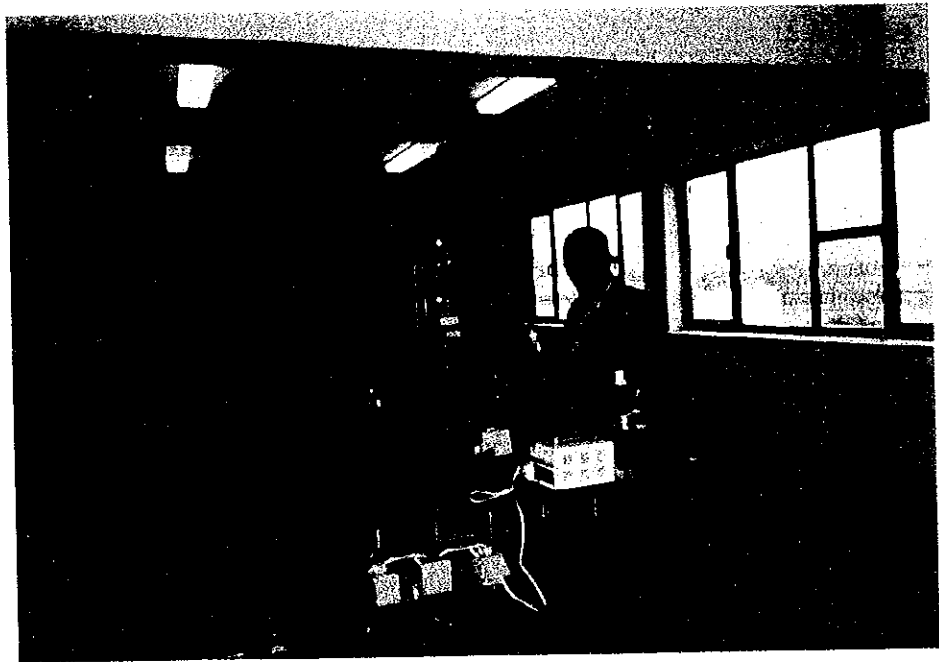
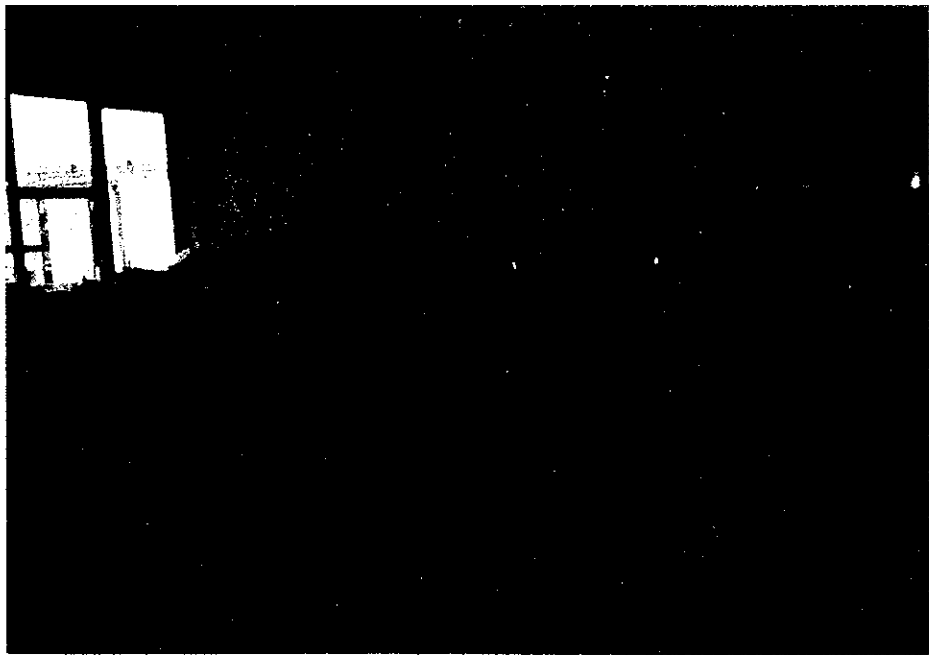
Co.

1. **Mr. Keiji MIURA**
Charge d' Affairs,
Embassy of Japan
Sarajevo, Bosnia and Herzegovina
2. **Mr. Kouji OTABE**
First Secretary
Embassy of Japan
Vienna, Austria
3. **Mr. Ikufumi TOMIMOTO**
Resident Representative,
JICA Austria Office

**LIST OF EQUIPMENT
FOR
THE FEASIBILITY STUDY ON THE WASTEWATER TREATMENT PLANT
OF
SARAJEVO CITY
IN
BOSNIA AND HERZEGOVINA**

ITEM	TYPE	QUANTITY
(a) Analytical Balance	HM-200	1
(b) pH Meter	IOL-30	1 set
(c) DO Meter	DOL-40	1 set
(d) BOD ₅ Tester (Winkler Method)	8053-02	1 set
(e) Incubator for BOD ₅	IS400	1 set
(f) SS (suspended solids) Tester	SS-064	1 set
(g) Drying Oven (for SS)	DV-400	1 set
(h) Water distiller	WS-23	1 set
(i) Water sampler	8052-251	1 set
(j) Electrical transformers (220 V => 110 V)	SU-550,1000,1500	1 set
(k) Schmitt Concrete Test Hammer		2
(l) Test Anvil		1
(m) Micro Pipette	Juster 1100DG	1 set
(n) Thermometer	Alcoholic Liquid	2
(o) Kim Wipe	S-200	1 box
(p) Sample Bottle	No.1800	1 set
(q) Pipette, Volumetric		1 set
(r) Flask, Volumetric		1 set
(s) Spatula	SUS	1 set
(t) Weighing Paper		1 set
(u) Cylinder, Volumetric		1 set
(v) Cooler Boxes		1 set
(w) Refrigerator		1





**THE FEASIBILITY STUDY
ON THE
WASTEWATER TREATMENT PLANT
OF SARAJEVO**

**MINUTES OF MEETING
BETWEEN
THE MINISTRY OF AGRICULTURE, WATER
MANAGEMENT AND FORESTRY,
VODOVOD I KANALIZACIJA
AND
JICA STUDY TEAM**

1. DATE: 03 August 1999

TIME: 12:00 PM

2. VENUE: VIK Conference Room, Terezija 38

3. ATTENDANCE LIST

3.01 Mr. F. PILAVDZIC	Vodovod I Kanalizacija (ViK) – General Manager
3.02 Mr. Z. DRACE	Vodovod I Kanalizacija – High Advisor
3.03 Mr. M. BISCEVIC	Vodovod I Kanalizacija – Director
3.04 Ms. H. BUSULADZIC	Vodovod I Kanalizacija – Director
3.05 Mr. J. DREKOVIC	Vodovod I Kanalizacija – Director
3.06 Mr. H. HASANOVIC	Vodovod I Kanalizacija – Director
3.07 Mr. T. BADNJEVIC	Vodovod I Kanalizacija – Director
3.08 Mr. M. AVDIC	Vodovod I Kanalizacija – Section Chief
3.09 Mr. F. ASCIC	Vodovod I Kanalizacija – Section Chief
3.10 Mr. R. JASMIN	Vodovod I Kanalizacija – WWTP Superintendent
3.11 Mr. K. SUZUKI	JICA Study Team – Team Leader
3.12 Mr. R. CRISOSTOMO	JICA Study Team – Facility Design/O&M Planning
3.13 Mr. R. DESPAULT	JICA Study Team – Facility/Structure Design
3.14 Mr. Y. TAKADA	JICA Study Team – Structure/Architectural Design
3.15 Mr. H. SAKAI	JICA Study Team – Structure/Mechanical Design
3.16 Mr. K. OTA	JICA Study Team – Structure/Electrical Design
3.17 Dr. S. KUGAPRASATHAM	JICA Study Team – Environment/Water Quality

4. PURPOSE: Presentation of the Proposed Rehabilitation Plan of the WWTP.

5. MINUTES OF MEETING

5.1 Today's meeting, which is a continuation of last July 16th was opened by Mr. K. Suzuki at 12.00 P.M. by reiterating its purpose. Mr. Suzuki presented the following agenda.

- **Contents of the Draft Final Report (DF/R)**
- **Drawings of the Preliminary Design**
- **Project's Cost Estimate**
- **Procedure for OECF Loan Application**

5.2 Contents of the DF/R

The Study Team presented to the ViK management the contents of the DF/R to include as follows:

Volume I	Summary Report (Written in English Language)
Volume II	Main Report
Volume III	WWTP Assessment Work Report (Done by the Contractor, USB Kedly Doo and the Study Team)
Volume IV	Supporting Report (Appendix)
Volume V	Summary Report (Written in Japanese Language)

5.3 Preliminary Design Drawings.

The Study Team presented the preliminary design drawings, which are categorised into general, civil, architectural, mechanical and electrical aspects. Although the drawings presented are incomplete as per the attached list, completion of outstanding drawings will be done in Tokyo and will be compiled in the DF/R.

5.4 Project's Cost Estimate

The Study Team presented and discussed the preliminary project's cost estimate, a total sum of DEM 77.55M. The total construction cost (DEM 65.50M), categorised as civil, architectural, mechanical, and electrical works is broken down into the local and foreign component at DEM 21.34M and DEM 44.16M, respectively. The engineering services cost and contingency cost (10%) amounted to DEM 5.00M and DEM 7.05M, respectively. A direct cost on works such as the high voltage transmission cable to be undertaken by BiH side is valued at DEM 1.0M. All of these costs are preliminary estimate based on International Competitive Bidding (ICB) and are subject to change after the final review in Tokyo.

A preliminary cost estimate on Operation and Maintenance (O&M) was also presented valued at DEM 5.77M annually. The computed cost will again be reviewed in Tokyo.

5.5 Procedure for OECF Loan Application

The Study Team presented the OECF Loan Information that include the Procedure for Application of Japan's Yen Credit Loan. Due to the absence of Dr. M. SARIC or any of the representative from the Ministry of Agriculture, Water Management and Forestry, the Study Team suggested to ViK to take the initial steps in reminding the Ministry of taking the necessary formalities in the realisation of the OECF loan application.

The ViK in behalf of the BiH side expressed their thanks and appreciation to the Japanese government and to the JICA Study Team in particular for their sincere cooperation and assistance to the WWTP project.

The ViK further explained the importance of the project in the protection of the environment, but the current economic condition does not warrant them to be burdened with paying a credit loan of such magnitude. If however, there will be funds available, it will be used instead to a more priority projects since the WWTP project is not in the top priority list of the Sarajevo Canton government. The BiH side will be more grateful if the project will be financed by grant aid.

After a brief discussion on the project, the ViK realised the significance of the WWTP in the improvement of the sanitary condition and the protection of the environment.

7. NEXT MEETING: 3rd Field Survey in mid-September 1999 during the presentation of the DF/R.

Mr. Fahrudin PILAVDZIC
General Manager,
Vodovod I Kanalizacija

Mr. Kaoru SUZUKI
Team Leader,
JICA Study Team

5. Record Note of Main Laboratory

ZAVOD ZA VODOPRIVREDU SARAJEVO

FAX COVER SHEET

TO	JICA Study team	ATTN:	Mr. Drače Mrs. Takada and Suzuki
COPIES to			
FAX NO.	668 258		

FROM	Zavod za vodoprivredu	NAME	Adnan Bijedic
DATE	23.6.1999.	FAX REF.	
FAX NO.	213 858	No of pages.	2, uklj. prvu

SUBJECT.	Main Laboratory and Administration Building
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If problems occur during transmission please call tel no. 387 71 213 858

MESSAGE:

Dear Mr. Suzuki,

Thank you for your fax message which you sent to us on 21st of June.

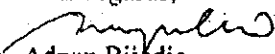
Regarding the matter: Main Laboratory and Administration Building, please find our comment:

- Detailed drawings of the building are in Public Enterprise Vodoprivreda, and can be presented with estimation and programme for rehabilitation. Some kind of rehabilitation is completed, such as roofing and windows installing.
- At the moment we have no detailed programme for the Main Laboratory, but we can inform you that this kind of institute is necessary in scope of water pollution controlling. In this view, we would recommend water and waste water analyse as very starting activity. Attached is the main information about laboratory from pre war period;

We would be very glad if you can fixed a meeting, where we can discuss this subject. For us, the best date could be next week, after 27th of June, respectively.

If you have any kind of comments, please don't hesitate to contact us.

With regards,



Adnan Bijedic

Zavod za vodoprivredu, Sarajevo

The main information's about laboratory of the Public Enterprise

Vodoprivreda BiH from period before the last war

1. Number of employees:

20

(3 Ph.D., 3 M.Sc., 1 B.Sc. of technology, 4 B.Sc. of biology,
2 B.Sc. of chemistry, 7 assistance's);

2. Scope of activity

a) Analyses of waste water and specific pollutant according standard American methods

- issuing certificates for all kind of treatment plants;
- maintaining and controlling the process of town's waste water treatment plant;
- giving technological solutions;
- determination of the Ekvivalent Number of Inhabitants;

b) Water analyses

- Natural water analyses;
- giving technological solutions;
- bacteriological analyses according the methods recommended by WHO;
- toxic analyses using fishes, daphnias etc.;

3. Laboratory equipment

- atomic absorber, (AAS);
- gas chromatograph;
- thermostat, range 20-37 °C;
- vessels for samples;
- fridges;
- precise analytical scaling weight, type Sartorius Meler, up to 200 g;
- technical analytical digital scaling weight, up to 1000 g;
- equipment WTW for determination of dissolved oxygen;
- field equipment for determination of dissolved oxygen;
- turbidity meter;
- conductivity meter;
- pH meter, laboratory and field device;
- devices for distillation and re-distillation of water;
- pumps for samples taking
- set for samples taking with 24 bottles;
- device for Kjeldal nitrogen determination;
- spectrophotometer;
- device for determination of Chemical Oxygen Demand;
- laboratory heaters;
- centrifugal device;
- drying device;
- glowing device up to 1100°C;
- device for Jaar testing;
- aquarium for testing organisms;
- PC equipment;
- 4 cars, four wheel drive;

ZAVOD ZA VODOPRIVREDU d.d. SARAJEVO
(enterprise for research, studies, design and consulting)

JICA STUDY TEAM
Sarajevo Wastewater Treatment Project

SARAJEVO

(Attn. Mr. Kaoru SUZUKI)

Re: Rehabilitation of the central laboratory of Vodoprivreda

Dear Sir,

According to conclusions from our last meeting, which we have had in our office, please find our short Programme of the Central Laboratory activities in two phases:

1. Phase one, as very beginning phase;
 - Determination of the Equivalent Number of Inhabitants for industrial and municipal pollutants, what is obligation by our law;
 - An investigation activity for potential water sources, rivers, ground waters and wastewater. These investigations would cover physical, chemical and microbiological analyses;
 - Supervising and monitoring of existing, or new, treatment plants in Federation of Bosnia and Herzegovina;
 - Monitoring and controlling of natural water quality of rivers, lakes and ground water, in Federation;

2. Phase two;
 - Preparation of the Studies of general development regarding the protection and organization of natural water resources;
 - Water quality management for catchment area of the main rivers in Federation;
 - Development and application of the new information systems for multidisciplinary approach in scope of environment protection, specially for water quality protection;


Pre-condition for realization of these two phases needs rehabilitation of laboratory building, as well as providing of necessary equipment.

Attached to this letter is: Programme of Vodoprivreda's laboratory rehabilitation, prepared in 1998. Programme is still valid and comprising civil works and required equipment. In the mean time some activities are conducted, such as roofing and outside windows installing, so these items have to be neglected in attached Programme.

Programme is on Bosnian language, and needs to be translated. If it is problem for your translator, let us know. We can try to arrange translation work.

If you have any kind of questions, please contact us.

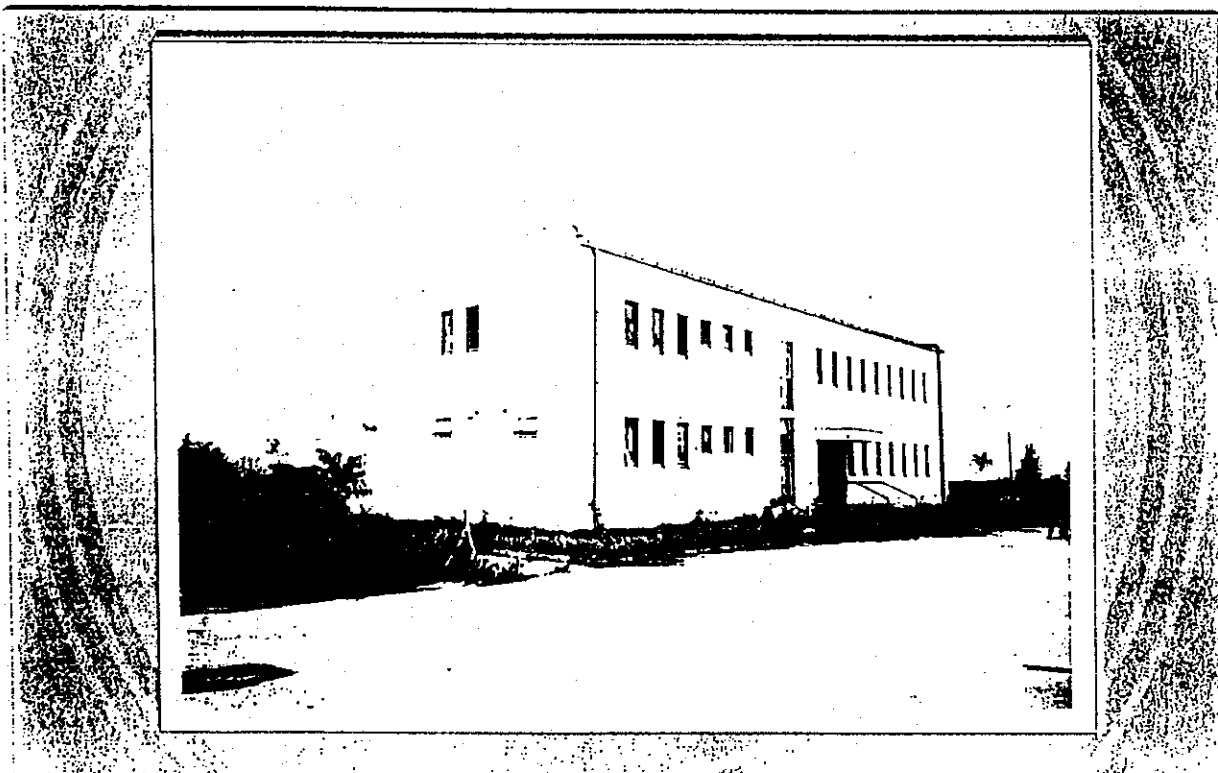
Yours truly,


A. Bijedic
Zavod za vodoprivredu

Sarajevo, 1th July 1999



ELABORAT O SANACIJI *Impulsi*
VODOPRIVREDNE LABORATORIJE
U BUTILAMA



THE JICA STUDY TEAM OFFICE
FOR THE REHABILITATION OF
THE SEWERAGE SYSTEM
OF SARAJEVO CITY
VODOVOD I KANALIZACIJA
Tel.:++387-71-458-630
Fax:++387-71-458-630
Mobile:++387-90-160-190
Date : 01st July, 1999

To Mr. A. BIJEDIC
Zavod za Vodoprivreda d.d. Sarajevo,
Brace Begic 42-46,
Sarajevo 71000
Bosnia i Hercegovina
Tel : ++387-71-213-863
Fax :++387-71-213-858

Re: Report of Meeting with Vodovod i Kanalizacija (ViK) Regarding The
Sarajevo WWTP Project in Butila

Dear Sir,

This is to follow-up our previous correspondence dated 25 June 1999 regarding the above-mentioned subject, in which one of the issues (Item No.5) considered is the status Main Laboratory Building (Facility No.25) located of the WWTP site.

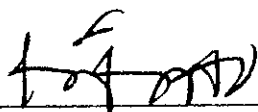
We received a letter dated 01st July 1999, and a copy of "Elaborate Rehabilitation Programme of the Central Laboratory of Vodoprivreda" by hand. Thank you very much indeed for your quick response. We, then, have gone through this rehabilitation programme.

Based on the our observation from the programme, the Study Team may study and consider the possibility of funding sources for your rehabilitation costs of the Main Laboratory building for the preliminary design of JICA study. You are kindly requested to inform us the funding of this programme. We would like only to know whether VBH is able to manage to fund by your own finance or not.

Awaiting your prompt reply, we remain

counted...../2

Sincerely yours,



Kaoru SUZUKI
Team Leader,
JICA Study Team

encl.: As above.

- c.c. 1. Prof. Dr. Mehmed SARIC
Assistant Minister,
Ministry of Agriculture, Water Management and
Forestry of Federation of Bosnia Herzegovina (MOAWMF),
St. Hamdije Kresevljakovic 3,
Sarajevo 71000
Bosnia i Herzegovina
Tel : ++387-71-443-338
Fax : ++387-71-663-659
2. Mr. Midhat BISCEVIC
Director,
Canton Public Communal Company,
"Vodovod i Kanalizacija",
Tel : ++387-71-668-260
Fax : ++387-71-204-574
3. Mr. Zulfikar DRACE
High Advisor,
Canton Public Communal Company,
"Vodovod i Kanalizacija",
Tel : ++387-71-668-260
Fax : ++387-71-204-574

FACSIMILE COVER PAGE

Date: 7/2/99
Time: 12:30:18
Pages: 2

To: Mr. Kaoru SUZUKI
Company: The JICA Study Team Office Sarajevo
Fax #: 458 630

From: Adnan Bijedic
Title: User
Company: Home
Address: Grbavicka 14 B
Sarajevo, FBiH 71000
BiH

Fax #: 522243
Voice #: 522243

Message:

Dear Mr. Suzuki,

Please find attached our comments for your letter, from 1st July 99, regarding the Central Laboratory rehabilitation,

Regards,

A. Bijedic

ZAVOD ZA VODOPRIVREDU d.d. Sarajevo
(enterprise for research, studies, design and consulting)

JICA STUDY TEAM
Sarajevo Wastewater Treatment Project

Sarajevo
(Attn. Mr. Kaoru Suzuki)

Dear Sir,

Regarding the your letter, dated 1st of July 1999, whereas you are requesting information about funding programme of Central Laboratory of Vodoprivreda, please find our comments:

- Our company, Zavod za vodoprivredu, as owner of the Laboratory building, has no available funds for rehabilitation programme;
- All relevant organizations, such as: "Vodoprivreda". (the correct titles are: Public enterprise for catchment area of Sava river, and Public enterprise for catchment area of Adriatic sea), responsible ministry, and of course Zavod za vodoprivredu, are interested, to have one central Laboratory which could serve Federation of Bosnia and Herzegovina;
- In financial programme of Vodoprivreda, for 1999, there is no planned funds for rehabilitation of Central Laboratory. The same situation is with financial plans of other relevant organizations;

Hope that these information are good enough for your purposes.

With regards

A. Bijedic
Zavod za vodoprivredu

THE JICA STUDY TEAM OFFICE
FOR THE REHABILITATION OF
THE SEWERAGE SYSTEM
OF SARAJEVO CITY

VODOVOD I KANALIZACIJA

Tel:++387-71-458-630

Fax:++387-71-458-630

Mobile:++387-90-160-190

Date : 05th July, 1999

To Mr.Faruk SABETA
Director,
Public Water Management Enterprise,
"Vodoprivreda Bosnia i Hercegovina" (VBH),
H.Cemerlica 25,
Sarajevo 71000
Bosnia i Hercegovina
Tel : ++387-71-651-646
Fax : ++387-71-664-861

Re: Report of Meeting with "Zavod za Vodoprivreda d.d. Sarajevo" Regarding
The Sarajevo WWTP Project in Butila

Dear Sir,

This is to follow-up our previous meeting with above institute dated 28th June, 1999 regarding the above-mentioned subject, in which one of the issues (Item No.5, kindly see attached sheets) considered is the status of the Main Laboratory Building (Facility No.25) located of the WWTP site.

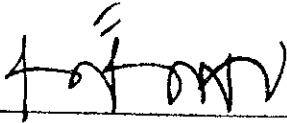
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Based on the our observation from the programme, the Study Team may study and consider the possibility of funding sources for rehabilitation costs of the Main Laboratory building for the preliminary design of JICA study. You are kindly requested to inform us the funding of this programme. We would like only to know whether VBH is able to manage to fund by your own finance or not.

Awaiting your prompt reply, we remain.

counted...../2

Sincerely yours,



Kaoru SUZUKI
Team Leader,
JICA Study Team

encl.: As above.

- c.c. 1. Prof. Dr. Mehmed SARIC
Assistant Minister,
Ministry of Agriculture, Water Management and
Forestry of Federation of Bosnia Herzegovina (MOAWMF),
St. Hamdije Kresevljakovic 3,
Sarajevo 71000
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High Advisor,
Canton Public Communal Company,
"Vodovod i Kanalizacija",
Tel : ++387-71-668-260
Fax : ++387-71-204-574

06-07-1999

JAVNO PREDUZEĆE ZA
"VODNO PODRUČJE SLIVOVA RIJEKE SAVE"
SARAJEVO

Adresa: ul. H. Černiћа 25, 71000 Sarajevo

FAX PORUKA

DATUM/DATE: 05.07. 1999. godino VRIJEME/TIME: 13:00
PRIMA/TO: THE JICA STUDY TEAM
n/r Kaoru SUZUKI FAX: 458 - 630

ŠALJE/FROM: JP "VODNO PODRUČJE PHONE: ++387 71 61 62 07
SLIVOVA RIJEKE SAVE" DIREKTOR: ++387 71 65 16 46; 65 57 59
SARAJEVO FAX: ++387 71 66 46 61

RE: Predmet/Subject: *Main Laboratory Building*
CC: Ime/Name:

Droj strana uključujući i naslovnu/Number of pages including cover sheet: 1

Dear Mr. Suzuki

Regarding your letter from 05th July 1999, we send you answer as follows:

1. World Bank financed urgent works on the Main Laboratory Building in amount of 36.000 DEM for the rehabilitation of roof cover, doors and windows, in order to prevent further deterioration of the facility.
2. In previous period we tried to find donor to finish rehabilitation of Main Laboratory Building, but without success so far.
3. This facility is of great importance for Vodoprivreda in F BiH so we consider it should be put into function as soon as possible (to complete reconstruction and procure necessary equipment).
4. Our company doesn't have own funds to realise this project, so we propose that you consider the possibility of finding the sources of finance for the rehabilitation of the Main Laboratory Building.

With respect,



Šabeta
Šabeta, dipl.inž.grad.

6. Minutes of Meeting between Electric Distribution Sarajevo,
ViK and JICA Study Team

**THE FEASIBILITY STUDY
ON THE
WASTEWATER TREATMENT PLANT
OF SARAJEVO**

**MINUTES OF MEETING
BETWEEN
ELECTRIC DISTRIBUTION SARAJEVO,
VODOVOD I KANALIZACIJA
AND
JICA STUDY TEAM**

1. DATE: 09 June 1999

TIME: 9:00 AM

2. VENUE: ViK Office, Terezija

3. ATTENDANCE LIST

a.) Mr. K. Suzuki	JICA Study Team – Team Leader
b.) Mr. K. Ota	JICA Study Team – Electrical/Plant Design
c.) Mr. R. Crisostomo	JICA Study Team – Facility Design/O&M Planning
d.) Mr. M. Biscevic	Vodovod I Kanalizacija (ViK) – Director
e.) Mr. J. Rudalija	Vodovod I Kanalizacija – WWTP Superintendent
f.) Mr. M. Brajlovic	Electric Distribution Sarajevo (EDS) – Chief, Energy Department

4. MINUTES OF MEETING

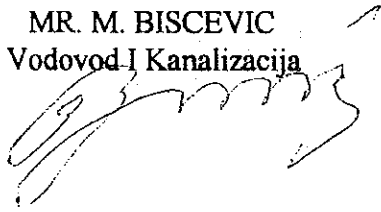
The meeting was opened by Mr.K. Suzuki with a brief introduction of the project. Mr. M. Brajlovic (EDS) answered and clarified all issues as per the Questionnaire Sheet prepared by Mr. K. Ota as follows:

- a.) A map (Fig.1) was presented showing the location of the existing electric power supply sources to the Sarajevo WWTP, the 10kV power transmission lines and the schematic diagram (Fig. 2) showing the boundary limit between the WWTP and the EDS responsibility.
- b.) When the WWTP was still in operation, EDS supplies electric power to the WWTP from 2 sources as follows:
 - Azici Sub-Station -- 3.2 megawatts maximum capacity due to the limitation of the 10kV transmission line.


- Rajlovac Sub-Station – 1.5 megawatts and is reduced during winter season. Power supply from this source is only switch on by EDS in case of power outages from the Azici S/S.
- c.) A new transmission line parallel to the existing has to be laid (part of the WWTP responsibility) in case the power requirement of the plant exceeds 3.2 megawatts. The additional power supply would come only from Azici S/S.
- d.) A copy of the 1998 Annual Report for the Public Electric Company will be delivered to the ViK office as soon as it will become available.
- e.) Information and diagram showing the power grid lines of Canton Sarajevo will be delivered to the Vik Office as soon as they will become available.
- f.) The organization structure of the Public Electric Company, which includes EDS, is presented in Figure 3.


5. **NEXT MEETING:** To be announced later as the need arises.

MR. M. BISCEVIC
Vodovod i Kanalizacija



MR. M. BRAJLOVIC
Electric Distribution Sarajevo




MR. K. SUZUKI
JICA Study Team

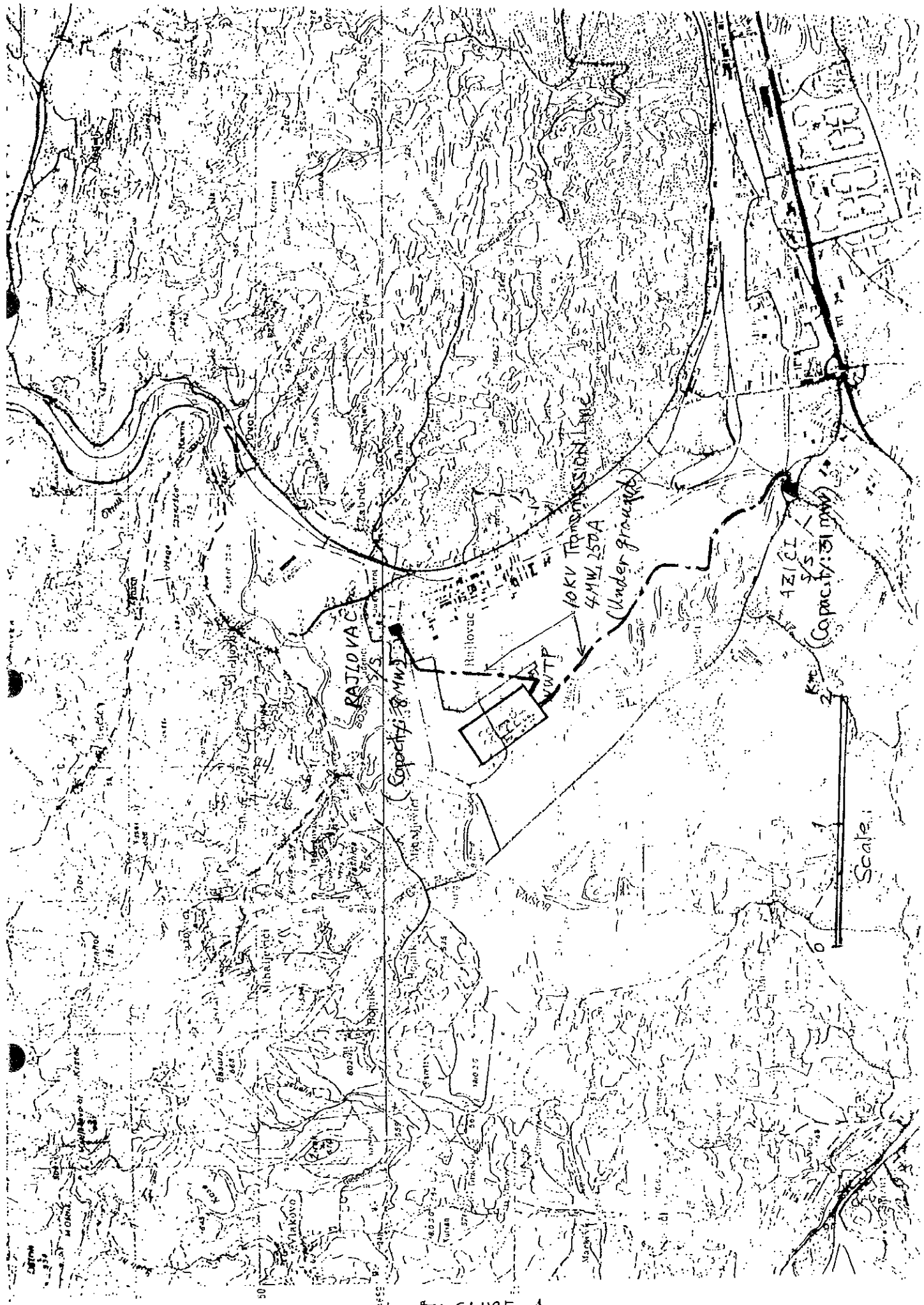


FIGURE 1

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FIGURE 2

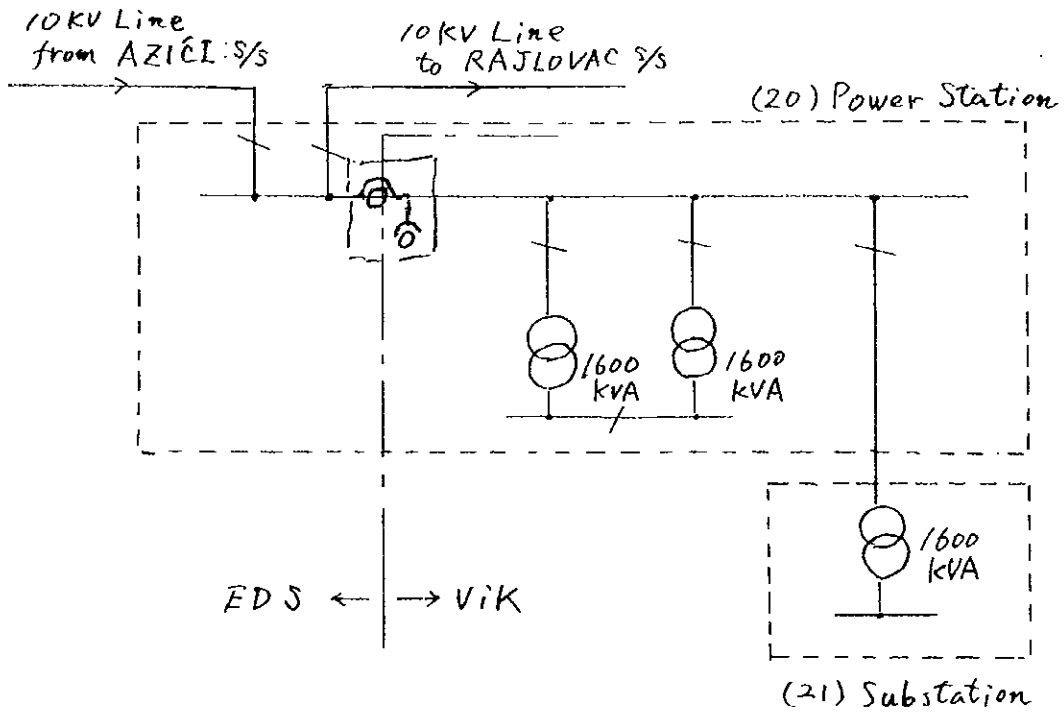
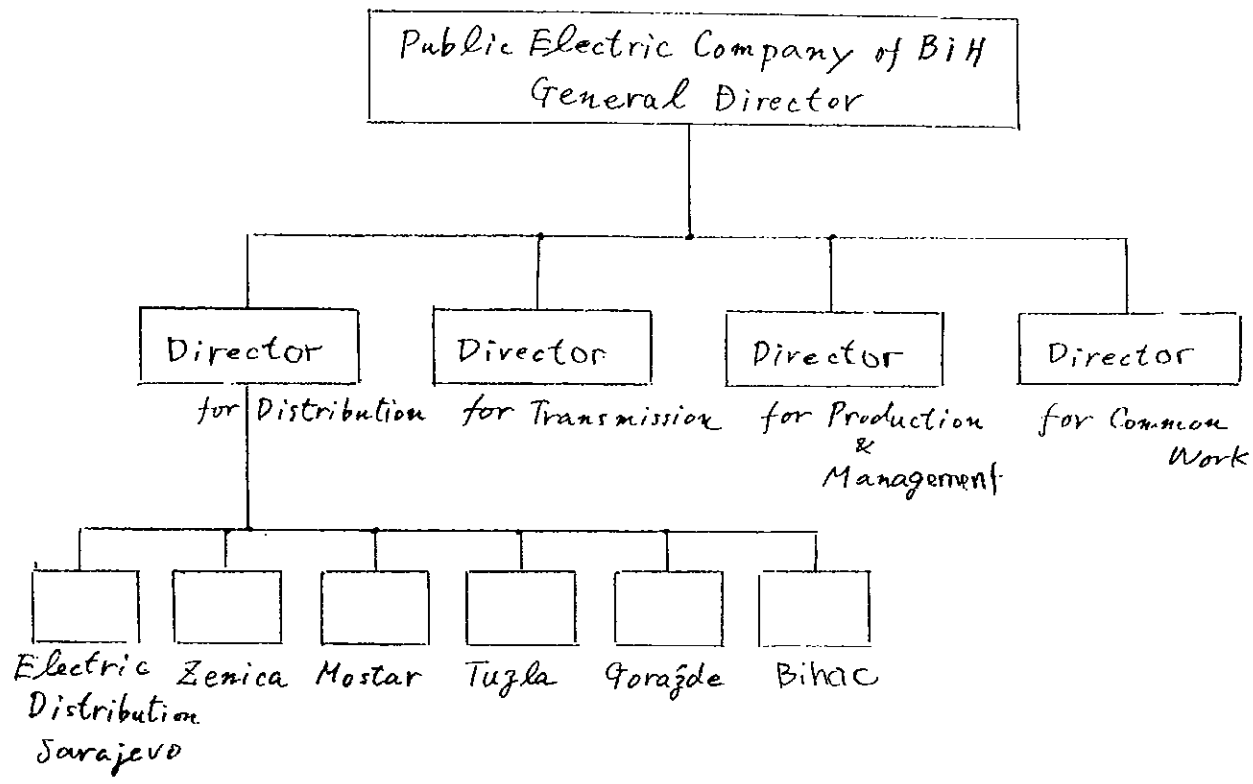


FIGURE 3



THE JICA STUDY TEAM OFFICE
FOR THE REHABILITATION OF
THE SEWERAGE SYSTEM
OF CANTON SARAJEVO
VODOVOD I KANALIZACIJA
Tel.: ++387-71-20 25 33
Fax: ++387-71-20 25 33

To Mr. Fahrudin PILAVZIC
General Manager,
Canton Public Communal Company,
Vodovod i Kanalizacija
8 J. Cernija St.
Sarajevo 71000
Bosnia i Hercegovina
Tel : ++387-71-447-741
Fax : ++387-71-440658

Re: Power supply to Sarajevo WWTP at Butila

Dear Sir,

The Study Team had commenced the second site survey for the Feasibility Study of the Sarajevo WWTP. As per our discussion during the meeting held on 26 to 28 May 1999, the activities of our team stationed in ViK office at Terezija and WWTP site at Butila, are now in full swing.

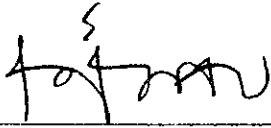
In order for us to get vital information about power supply to the WWTP, we would like to request your good office to arrange for us a meeting with pertinent officials and engineers of the Electric Power Company in Sarajevo. Attached herewith is our questionnaire sheet for their perused.

We would appreciate it very much if our meeting with them will be held the soonest possible.

Awaiting for your prompt reply.

Sincerely yours,

contd. to page 2



Kaoru SUZUKI
Team Leader,
JICA Study Team

c.c. 1. : Mr.Midhat BISCEVIC

Director,
Canton Public Communal Company,
"Water Supply and Sanitation"
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Fax : ++387-71-204-574

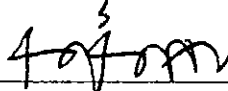
c.c.2. : Mr.Takayuki NAKAGAWA

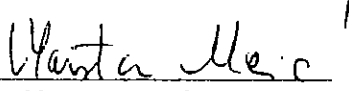
Second Development Study Department,
Japan International Cooperation Agency,
Tel : ++813-5352-5229
Fax : ++813-5352-5094

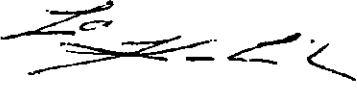
MINUTES OF MEETINGS
ON
THE DRAFT FINAL REPORT
FOR
THE FEASIBILITY STUDY ON THE WASTEWATER TREATMENT PLANT OF
SARAJEVO CITY IN BOSNIA AND HERZEGOVINA
AGREED UPON BETWEEN
FEDERAL MINISTRY OF AGRICULTURE, WATER MANAGEMENT & FORESTRY,
CANTONAL MINISTRY OF URBAN PLANNING, HOUSING & UTILITIES,
CANTON PUBLIC COMMUNAL COMPANY, "WATER SUPPLY AND SANITATION"
AND
JICA STUDY TEAM

Sarajevo, September 23, 1999



Prof. Dr. Mehmed SARIC
Assistant Minister,
Federal Ministry of Agriculture, Water
Management and Forestry, FBiH



Mr. Kaoru SUZUKI
Team Leader,
JICA Study Team


Ms. Vlasta MEIC
Technical Adviser,
Federal Ministry of Agriculture, Water
Management and Forestry, FBiH


Mr. Munib BULJINA
Minister,
Cantonal Ministry of Urban Planning,
Housing and Utilities, Sarajevo

Witnessed by:


Mr. Fahrudin PILAVDZIC
General Manager,
Canton Public Communal Company,
"Water Supply and Sanitation"


Mr. Mihovil MALBAŠIĆ
Assistant Minister,
Ministry of Foreign Affairs
Dept. of Multilateral Relations

In accordance with the Scope of Work agreed upon between concerned organizations of Bosnia and Herzegovina (BiH) and Japan International Cooperation Agency (JICA) on August 26, 1998, the Study Team submitted 20 copies of the Draft Final Report (DF/R) for The Feasibility Study on the Wastewater Treatment Plant of Sarajevo City in BiH.

A series of discussions were held from September 20 to 22, 1999. The participants of the meetings are listed in the *Attachment*. Based on the discussions, the DF/R was accepted by the BiH side and the following issues were agreed between the BiH side and the Study Team.

1. Contents of DF/R

The Study Team explained the details of the DF/R. The BiH side and the Study Team shared the same understanding on the urgent rehabilitation works.

(a) Urgent Rehabilitation Works include:

- Pre-treatment Facilities – this include the new construction of 3 rectangular, horizontal flow grit channels to remove heavier grit particles and 3 sets of coarse and medium screens;
- Existing Inlet Works – rehabilitation to the civil structures are necessary, such as repair of the expansion/construction joints, sealing of the cracks, application of appropriate protective layer to the exposed reinforcing bars and coating of the inside walls. The existing Screening Station will be modified with the installation of 4 sets of fine screens. Most of the electro-mechanical equipment will be newly replaced to include aeration and grit removal facilities as well as the motors;
- Secondary Treatment Facilities – the same method of rehabilitation works as above will be required for the civil structures of these facilities. However, new supplemental concrete slab and walls are essential to reinforce the deteriorated portion. Seventeen (17) new motors including gearboxes will be required for the surface aeration turbine and the rest of the 19 can be used;
- Sludge Treatment Facilities – the same manner of rehabilitation works as above will be done for the civil structures of these facilities. Appropriate heat-retaining insulation and anti frozen materials will be required for the digestion tanks and other sludge treatment facilities. New mechanical & electrical equipment for sludge dehydration, recirculation and gas collection systems are necessary to replace the heavily damaged existing equipment; and
- Building Facilities - rehabilitation works on the buildings should continue to complete what the ViK had started. A new building for the boilers & engine generators will be constructed close to the sludge digesters.

(b) The Study Team explained the breakdown of the estimated total project cost (DEM 76.0 million), the operation and maintenance cost (DEM 6.1 million annually) and the financial plan of the project.

(c) In order for the BiH side to fully understand the financial viability of the project, the Study Team elaborated various assumptions, emphasizing necessary rate increases and improvement of collection efficiency.

- (d) The Study Team assured that they would make utmost effort to finalize the Feasibility Study in cooperation with the BiH side. In order to finalize the Final Report (F/R), the Study Team reiterated to the BiH side the submission of their comments to the DF/R within one (1) month through the Embassy of Japan in Sarajevo.
- (e) The BiH side expressed their interest for the project implementation through Japan's ODA. The Study Team suggested that BiH should take early decision to apply for Japan's ODA, which is very important for the smooth implementation of the Project. In response, the BiH side stated that they would take the necessary procedure that includes taking the domestic consensus of the concerned organizations.

2. Counterpart Training

The JICA Study Team mentioned to the BiH side that the counterpart training is going on smoothly in Japan to last until the end of September. The BiH side expressed their appreciation and acknowledged the effort of the Japanese side in sharing with their wastewater treatment technology. In addition, the BiH side showed their intention to apply and maintain within their organization the technology and know-how learned from Japan.

3. Donation of Equipment

The ceremony for the donation of the Water Quality Equipment to Canton Public Communal Company, "Water Supply and Sanitation" was officially held on Wednesday, 22nd September 1999 at Wastewater Treatment Plant, in Butila. Prior to the ceremony, the JICA Study Team performed the final inspection of the equipment to make sure that all are properly maintained. The document for donation and the acceptance letter were handed over by both sides.

ATTENDANCE LIST

Bosnia and Herzegovina Side:

Ministry of Foreign Affairs
Bosnia and Herzegovina

Mr. Mihovil MALBAŠIC	Assistant Minister, Department of Multilateral Relations
Mr. Mithat PAŠIC	Head of Unit, Department of Multilateral Relations, Unit for Reconstruction
Mr. Aziz HADZIMURATOVIC	Counselor, Department of Multilateral Relations
Ms. Jasna CEHIC	International Aid Coordinator, Department of Multilateral Relations, Unit for Reconstruction

Ministry of Foreign Trade and Economic Relations
Bosnia and Herzegovina

Mr. Reuf HADZIBEGIC	Department Manager
Mr. Elmir CAJO	Senior Official

Ministry of Agriculture, Water Management and Forestry
Federation of Bosnia and Herzegovina (FBiH)

Prof. Dr. Ahmed SMAJIC	Minister
Prof. Dr. Mehmed SARIC	Assistant Minister
Ms. Vlasta MEIC	Technical Adviser

Federation of Bosnia and Herzegovina (FBiH)

Mr. Nedeljko DESPOTOVIC	Minister
Ms. Branka MEKIC	Technical Assistant

Sarajevo Canton Government

Mr. Beriz BELKIC	Prime Minister
Mr. Munib BULJINA	Minister, Cantonal Ministry of Urban Planning, Housing and Utilities
Mr. Salih KARAMEHMEDOVIC	Public Utility Department Assistant

Public Water Management Enterprise, Federation of Bosnia and Herzegovina

Mr. Munever IMAMOVIC	Director
Ms. Aida BEZDROB	Project Manager
Ms. Sabaheta HAFIZOVIC	Project Manager

Canton Public Communal Company, "Water Supply and Sanitation"

Mr. Fahrudin PILAVDZIC	General Manager
------------------------	-----------------

Mr. Jakub DREKOVIC
Mr. Zulfikar DRACE
Mr. Midhat BIŠCEVIC
Mr. Hikmet HASANOVIC
Mr. Ahmed BRKIC
Mr. Mirsad AVDIC

Financial Director
Higher Advisor to the General Manager
Director
Technical Director
Section Chief
Section Chief

Japanese Side:

JICA Study Team

Mr. Kaoru SUZUKI
Mr. Renato Q. CRISOSTOMO
Mr. Mitsuhiro DOYA

Team Leader
Facility Design/O&M Planning
Management, Finance, Economic Analysis

Advisory Committee

Mr. Kazunori KOINUMA

Chief Advisor

JICA Headquarters

Mr. Takayuki NAKAGAWA

Task Management