Ireed SA7

UNITED STATES GOVERNMENT

memorandum

DATE September 13, 1979

REPLY TO ATTN OF NE/PD/SJIL, Robert F. Fedel

SUBJECT Jordan: Amman Water and Sewerage PP Amendment, Loan 278-K-023 ($10.5 million)

PD-AAF-432-B1

TO SEE DISTRIBUTION

The subject project paper amendment is scheduled for NEAC review at 9:30 AM, Tuesday, September 18, 1979 in Room 6439 NS.

Any questions on the attached project paper amendment should be addressed to the Chairperson.

DISTRIBUTION

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Buy U.S. Savings Bonds Regularly on the Payroll Savings Plan

OPTIONAL FORM NO. 10
(REV. 7-76)
GSA FPMR (41 CFR) 101-11.6
5010-112

UNCLASSIFIED

PROJECT PAPER

JORDAN: AMMAN WATER AND SEWERAGE

Loan No. 278-K-023

UNCLASSIFIED

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D. Draft Loan Authorization
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AGENCY FOR INTERNATIONAL DEVELOPMENT

PROJECT PAPER FACESHEET

1. TRANSACTION CODE: C (A = ADD, C = CHANGE, D = DELETE)

PP

2. DOCUMENT CODE: 3

3. COUNTRY/ENTITY: Jordan

4. DOCUMENT REVISION NUMBER: 1

5. PROJECT NUMBER (7 digits): 278-0220

6. BUREAU/OFFICE: A. SYMBOL: NE; B. CODE: 3

7. PROJECT TITLE (Maximum 40 characters): Amman Water and Sewerage

8. ESTIMATED FY OF PROJECT COMPLETION: FY 83

9. ESTIMATED DATE OF OBLIGATION: A. INITIAL FY 78; B. QUARTER 4 (Enter 1, 2, 3, or 4); C. FINAL FY 79

10. ESTIMATED COSTS ($000 OR EQUIVALENT $1 –)

A. FUNDING SOURCE	FIRST FY B. FX	FIRST FY C. L/C	FIRST FY D. TOTAL	LIFE OF PROJECT E. FX	LIFE OF PROJECT F. L/C	LIFE OF PROJECT G. TOTAL
AID APPROPRIATED TOTAL	16,300	12,200	28,500	24,300	14,700	39,000
(GRANT)	( )	( )	( )	( )	( )	( )
(LOAN)	(16,300)	(12,200)	(28,500)	(24,300)	(14,700)	(39,000)
OTHER U.S. 1.						
OTHER U.S. 2.						
HOST COUNTRY	7,400	20,000	27,400	109,565	58,894	168,459
OTHER DONOR(S)	21,000	12,100	33,100	21,000	12,000	33,100
TOTALS	25,800	44,300	89,000	154,865	85,694	240,559

11. PROPOSED BUDGET APPROPRIATED FUNDS ($000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	PRIMARY TECH. CODE C. GRANT	PRIMARY TECH. CODE D. LOAN	E. 1ST FY 78 F. GRANT	E. 1ST FY 78 G. LOAN	H. 2ND FY 79 I. GRANT	H. 2ND FY 79 J. LOAN	K. 3RD FY ___ L. GRANT	K. 3RD FY ___ M. LOAN
(1) SA	B 720				28,500		10,500		
(2)									
(3)									
(4)									
TOTALS									

A. APPROPRIATION	N. 4TH FY ___ O. GRANT	N. 4TH FY ___ P. LOAN	Q. 5TH FY ___ R. GRANT	Q. 5TH FY ___ S. LOAN	LIFE OF PROJECT T. GRANT	LIFE OF PROJECT U. LOAN
(1)						39,000
(2)						
(3)						
(4)						
TOTALS						

12. IN-DEPTH EVALUATION SCHEDULED: MM YY

13. DATA CHANGE INDICATOR. WERE CHANGES MADE IN THE PID FACESHEET DATA, BLOCKS 12, 13, 14, OR 15 OR IN PRP FACESHEET DATA, BLOCK 12? IF YES, ATTACH CHANGED PID FACESHEET.

2 (1 = NO, 2 = YES) Primary Purpose Code

14. ORIGINATING OFFICE CLEARANCE

SIGNATURE: Edgar C. Harrell

TITLE: Director, USAID/Jordan

DATE SIGNED: MM 09 DD 08 YY 79

15. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION: MM DD YY

AID 1330-4 (3-78)

SUMMARY AND RECOMMENDATIONS

1. Background

In August 1978 AID approved a loan for $39 million, $28.5 million to be funded from FY 1978 funds and $10.5 million to be funded in FY 1979. The loan will assist in funding procurement of construction services, selected materials and engineering services for the Amman Water and Sewerage Project. The FY 1978 loan ($28.5 million) was obligated in a loan agreement signed between AID and the Hashemite Kingdom of Jordan on August 28, 1978. After the loan was approved, the Government decided, for environmental considerations and reasons of water quality, to change the source of water for the project. This amendment to the project paper describes the consequences of that decision, modifies certain conditions and covenants of the FY 1978 loan for $28.5 million and requests approval to obligate $10.5 million of the FY 1979 funds authorized for the project.

2. Borrower: The Government of the Hashemite Kingdom of Jordan (GOJ).

3. The Loan: The FY 1979 obligation of an amount not to exceed Ten Million Five Hundred Thousand Dollars ($10,500,000) to complete funding of the FY 1978 authorized loan totaling $39.0 million.

4. Loan Terms: Repayable in U.S. dollars over a period of forty (40) years, including a 10 year grace period for principal payments and interest at an annual rate of two percent (2%) during the grace period and of three percent (3%) thereafter.

5. Description of Project: The project, as revised to reflect the change in the source of water, will consist of the following elements:

The project as revised to reflect the change in the source of supply will consist of the following elements:

----An increase in the total supply of water to Amman through the construction of a treatment plant and transmission line from EGMC to Amman. This element of the project should be completed about mid-1983. In the interim AWSA will draw water from springs at Azraq and wells south of Amman at the rate of about 9 to 13 MCM/a to partially alleviate the urgent needs of Amman.

----Expansion of the water distribution and sewerage systems within Amman.

----Improvements to the existing sewage treatment plant serving Amman.

The FY 1979 loan for $10.5 million will finance the expansion of the water distribution and sewerage systems within Amman. There have been no changes in these elements of the Project. The FY 1978 loan for $28.5 million included $4.0 million for improvements to the sewage treatment plant; work on this element of the project can proceed as soon as the modified conditions are met. The FY 1978 loan also included $24.5 million for construction and engineering services relating to the Water Supply element based on the use of the King Talal Reservoir as the source of water. The Government has decided, primarily for environmental reasons, not to use King Talal as a source of drinking water for Amman. The alternate source is the East Ghor Main Canal in the Jordan Valley. A feasibility study on this sub-project was submitted by Stanley Consultants, Inc. on August 27, 1979 - too late for a meaningful analysis for this amendment to the Project Paper. No AID funds will be disbursed for the Water Supply element of the Project until the alternate EGMC/Amman sub-project has been appraised and approved for financing (in the second quarter of FY 80).

AWSA is evaluating bids for the construction of a pipeline and pumping stations to bring an interim supply of 6 to 10 MCM/a from springs at Azraq to Amman and expects to award contracts in September 1979. It is also making arrangements for the supply of about 3 MCM/a from wells at Qastal and South Amman. Development of these interim supplies will be financed by GOJ from its own resources.

6. Summary Findings

(a) Technical Analysis. The technical feasibility of the Water Distribution, Sewerage and Sewage Treatment elements of the Project was established in the Project Paper. The interim supplies of 9-13 MCM/a from Azraq and the wells as Qastal and South Amman will provide water for the water distribution system one year earlier and in quantities equal to or greater than expected

from the King Talal sub-project in its early years of operation. The technical feasibility of the EGMC/Amman sub-project will be evaluated before any funds are disbursed for Water Supply.

(b) Economic and Financial Analysis. The Project Paper established the economic and financial feasibility of the Water Distribution, Sewerage and Sewage Treatment elements of the Project. Detailed analyses showing the effects of the Water Supply element will be undertaken in the appraisal of the EGMC/sub-project and submitted for AID approval prior to any expenditure of the $24.5 million of loan funds authorized for the water supply element of the Project.

(c) Social Analysis. The project beneficiaries remain the same as those identified in the Project Paper. The problems affecting the poor that were identified were covered in Special Covenants Section 6.5 (Access of Lower Income Families), which remains in force, and Section 6.8 (Rate Structure), which is being amended to take into account social considerations as well as financial viability.

(d) Environmental Considerations. Most of the avoidable adverse effects of the Project identified in Environmental Assessment are covered by covenants in the Loan Agreement or no longer apply because King Talal Reservoir is no longer used as a source of drinking water. For the EGMC/Amman sub-project, Stanley Consultants, Inc. have prepared an Environmental Assessment, which describes sensitivities, anticipated effects and provisions that have been made to mitigate the minimal adverse effects of the sub-project.

7. Statutory Checklist: Unchanged.

8. AID Funding Sources: Economic Support Fund, FY 1979.

9. Mission's Views: The USAID Mission supports the Project fully.

10. Issues: There are no issues on the elements of the Project to be financed by the FY 1979 loan for $10 5 million. The issues relating to the disbursement of funds for Water Supply will be addressed in the appraisal of the EGMC/Amman sub-project.

11. Recommendation: That the $10.5 million of unobligated funds in the loan be authorized from the FY 1979 alpropriation subject to terms and conditions as modified from FY 1978 loan terms and shown in the draft loan authorization (Annex D).

I. BACKGROUND

The availability of adequate quantities of water of acceptable quality for municipal, industrial and agricultural uses is one of the serious problems facing Jordan at this time, particularly the more densely settled and developed northern region. Most critical is the supply of water for the city of Amman. During the last two decades, Amman had quadrupled in population to an estimated 700,000 in 1978. This rapid growth can be attributed to significant rural-urban migration and the inflow of refugees. As a result of rapid population growth, heavy pressure has been placed on water supply, water distribution, sewerage and sewage treatment and the need for expansion of the overall system continues to accelerate.

In response to this need, the Government of the Hashemite Kingdom of Jordan (GOJ) acting through the Amman Water and Sewerage Authority (AWSA) developed a project to increase the supply of water to Amman, expand the water distribution and sewerage system, and improve the sewage treatment plant. The total cost of the 1978-81 expansion program was estimated in 1977 to be approximately $100 million. The World Bank approved a $14.0 million IDA Credit to assist in financing the expansion of water distribution and sewerage systems. The Saudi Fund provided approximately $20.0 million for increasing the supply of water to Amman.

AID made a Loan of $28.5 million in FY 78 to assist in financing an increase in the water supply, and improvements to the sewage treatment plant. AID also approved $10.5 million to be obligated in FY 79 to assist in improving and expansion of the water distribution and sewerage systems. The purpose of this Paper is to explain developments which have taken place subsequent to the obligation of the $28.5 million in FY 78 and to justify amending conditions of the FY 78 Loan and obligating the $10.5 million approved for obligation in FY 79.

The water supply element of the project, as described in the PP[1/], involved the pumping of about 17 million cubic meters per year (MCM/a) from the reservoir impounded by the newly completed King Talal Dam.

At the time the PP was prepared, the King Talal reservoir seemed to be the only viable alternative that could provide an adequate quantity of water to Amman in the short-term. It was recognized, however, that the capacity of the King Talal source had to be

1/ Amman Water and Sewerage, AID/BAS-032, July 25, 1978

limited to about 17 MCM/a because it was felt that recycling could present problems of water quality and of other adverse environmental consequences, particularly in years of drought. The most plentiful source of water in Jordan, the Yarmouk River, was not deemed to be available for Amman, since at the time of project evaluation, almost all of this resource, that would be controlled by the Maqarin Dam, had been allotted to agriculture in the Jordan Valley (except for 20 MCM/a for municipal and industrial (M & I) requirements in the Jordan Valley and the Irbid Governorate).

At a water symposium in Amman, in March 1978, sponsored by the Government of Jordan (GOJ), the need for additional municipal and industrial water supplies for Amman (in addition to those available from King Talal and groundwater in the Amman-Zarqa Basin) was highlighted. The potential financers of the Maqarin project, meeting in Amman in April, 1978, recommended that GOJ study the allocation of a larger amount of water from the Yarmouk to M & I uses in North Jordan. In March 1979, the Jordan Valley Authority's (JVA) consultant on the Maqarin Dam, Harza Overseas Engineering Corporation, submitted a report that concluded that about 120 MCM/a could be allocated to M & I uses in North Jordan (30 MCM/a to the region north of the Zarqa River and 90 MCM/a to the region south of the river), if the irrigated area in the Jordan Valley were reduced from 36,000 hectares to about 30,000 hectares.

Given the limited capacity of the King Talal Reservoir and the uncertainties about the use of recycled water, the Government decided not to use this reservoir as a source of drinking water for Amman. The reasons for the Government's decision are given in a letter to USAID from the National Planning Council (Annex A). JVA was ordered to prepare a feasibility study for the treatment and transmission of water from the East Ghor Main Canal to Amman. The firm of Stanley Consultants, Inc., in association with Boyle Engineering Corporation was selected to prepare the study and it submitted its feasibility report to JVA on August 27, 1979. '41'

The proposed new supply would provide for ultimately pumping 90 MCM/a of water from the East Ghor Main Canal[1/] in the Jordan Valley for municipal and industrial requirements of the southern region of the North Jordan (between the Zarqa River in the North to the Wadi Walla in the South). The feasibility report

1/ Principal source of water for EGMC is the Yarmouk River.

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recommended that the pipeline be designed for the ultimate capacity of 90 MCM/a and that the intake structure, treatment plant, pumping stations and terminal reservoir be designed to provide a capacity of 45 MCM/a initially to serve the immediate needs of the Amman-Zarqa conurbation. JVA has asked the consultant to prepare alternate designs based (a) on a pipeline capacity of 90 MCM/a and (2) on a pipeline capacity of 45 MCM/a. JVA would be responsible for design and construction and would operate the system as a bulk supplier of water to the communities in the region.

The proposed sub-project for water supply must be viewed as the first step in the Government's long-range strategy for the optimum development of limited water resources to meet the municipal and industrial requirements of North Jordan (North Jordan Domestic Water Project). It will probably be followed by a second sub-project to use the 30 MCM/a from the Yarmouk River that has been allotted for the region north of the Zarqa River. The total North Jordan Domestic Water Project will be further defined by Stanley Consultants in subsequent phases of its contract with JVA. As now envisaged, bringing these bulk supplies to the population centers of North Jordan will make it possible to optimize the conjunctive use of surface and ground waters to take full advantage of seasonal availabilities for both agricultural and M & I uses.

The current water year (October 1978-September 1979) has been the fifth consecutive year of drought in Jordan. To alleviate seasonal water shortages until an assured supply is available from the Yarmouk River, the Government plans to bring water (6 to 10 MCM/a) from springs at Azraq, about 120 kilometers from Amman. In addition a total of about 3 MCM/a will be drawn from wells that were recently drilled at Qastal and from wells in Amman that are now serving areas south of Amman. These and other groundwater sources will become integral parts of the North Jordan Domestic Water Supply See Figure 1.

Immediate implementation of improvements to the water distribution system will provide considerable relief to those low income groups (particularly in Wahdat and Sheileh), who now depend on truck deliveries for their supplies. Figure 2, which illustrates the seasonal demand for water, indicates that if water distribution were in place, AWSA could perhaps deliver enough water during the low demand periods from the existing sources and meet most of the peak summer demands from the added interim supplies to greatly reduce the need for expensive deliveries by tank truck.

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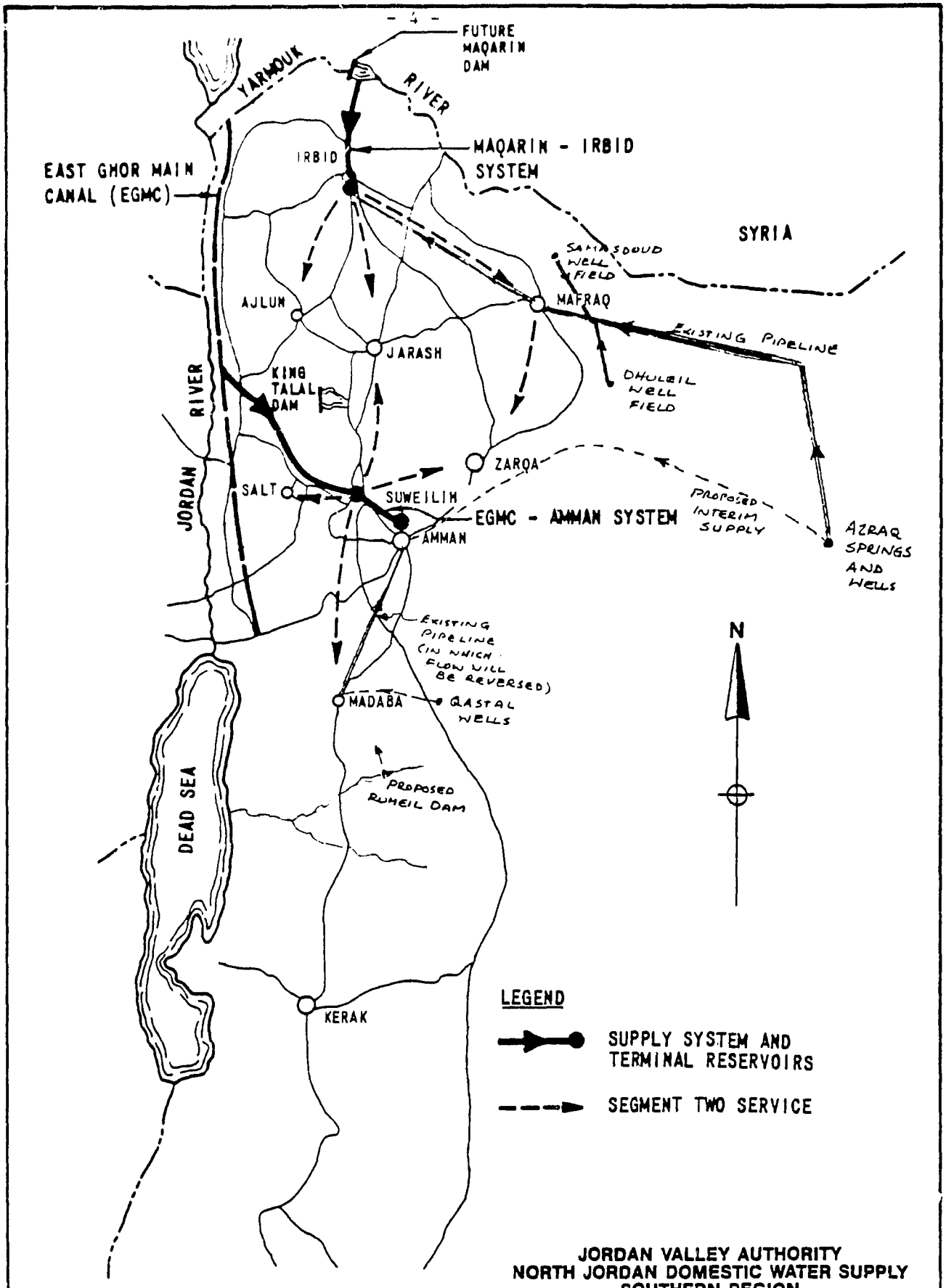

JORDAN VALLEY AUTHORITY
NORTH JORDAN DOMESTIC WATER SUPPLY
SOUTHERN REGION

TOTAL SYSTEM LAYOUT

STANLEY CONSULTANTS

FIGURE 1

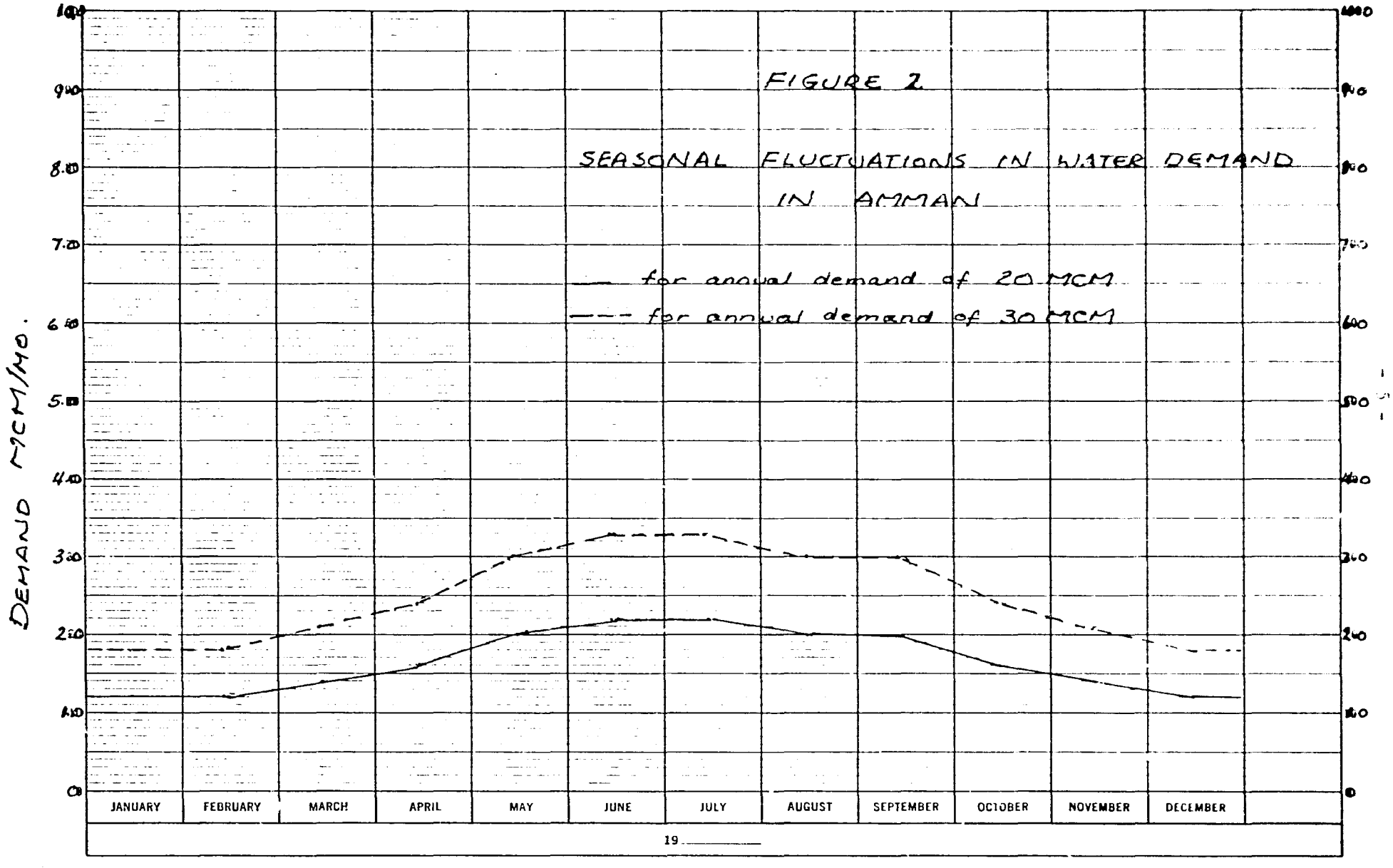
FIGURE 2
SEASONAL FLUCTUATIONS IN WATER DEMAND IN AMMAN
for annual demand of 20 MCM
for annual demand of 30 MCM
DEMAND MCM/MO.
JANUARY
FEBRUARY
MARCH
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER
NOVEMBER
DECEMBER

It has been recognized for some time that water resource planning has not been adequately coordinated and that water resource management has been the responsibility of a number of competing entities. At a review of the water situation in July 1979 King Hussein ordered that a National Water Authority be established as soon as possible. It is expected that the law establishing such an authority will be approved by the end of 1979. If asked, AID is prepared to provide technical and other assistance for the establishment of such an authority.

II. DETAILED PROJECT DESCRIPTION

A. INTRODUCTION

The project as revised to reflect the change in the source of supply will consist of the following elements:

- An increase in the total supply of water to Amman through the construction of a treatment plant and transmission line from EGMC to Amman. This element of the project should be completed about mid 1983. In the interim AWSA will draw water from springs at Azraq and wells south of Amman at the rate of about 9 to 13 MCM/a to partially alleviate the urgent needs of Amman.

- Expansion of the water distribution and sewerage systems within Amman.

- Improvements to the existing sewage treatment plant serving Amman.

The plans for expansion of water distribution and sewerage and improvements to the sewage treatment plant remain essentially unchanged. This section describes the current status of these elements as well as the changes in the water supply element.

B. WATER SUPPLY

1. East Ghor Main Canal to Amman (EGMC/Amman)

This sub-project is the first of several that will be developed by JVA to use 120 MCM/a that will be allotted for municipal and industrial requirements from the Yarmouk River and from the reservoir at the Maqarin Dam. About 90 MCM/a will be allotted to the southern region of North Jordan (Amman/Zarqa and communities south of the Zarqa River) and the balance to Irbid and other communities in the northern region (see Figure 1). The sub-project involves an intake structure with low-lift pumps adjacent to the EGMC south of Deir Alla, a treatment plant on high ground nearby, a pipeline with five pumping stations to lift the water to a terminal reservoir on the outskirts of Amman and a gravity pipeline to an existing reservoir in Amman. A synopsis of the proposed sub-project, abstracted from Stanley's report, is included in Annex B. The ultimate capacity of the system will be 90 MCM/a with an initial capacity of 45 MCM/a installed by 1983. Staged construction is proposed for all major structures; however, the consultant recommends that the

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pipeline be built initially with adequate capacity for the full 90 MCM/a. According to the consultant, optimum pipeline size is 1.7 meters, based on an economic evaluation including energy and other operating costs. JVA has, however, asked the consultant to prepare alternate designs based on (a) a pipeline capacity of 90 MCM/a and (b) on a pipeline capacity of 45 MCM/a.

Capital costs and annual operation, maintenance replacement and operation costs, as developed by the consultants for the initial stage (for a pipeline capacity of 90 MCM/a), are summarized as follows:

Capital Costs	- $190,800,000
Annual Operating Costs and Debt Service	- $ 23,001,000

Because of the urgent need for water in Amman, JVA has instructed the consultants to proceed with design of the non-controversial aspects of the sub-project. The consultants have been asked, however, to re-study a number of technical items such as the pipeline route, location of the terminal reservoir and the connection to the existing Amman system. They have also been asked to re-study the construction costs, which both JVA and USAID feel are overestimated.

It is anticipated that the $23.4 million already obligated for water supply construction in the existing AID loan of $28.5 million will finance a portion of the foreign exchange costs of the treatment plant and pumping stations of the EGMC/Amman sub-project. The existing loan also includes $1.1 million for engineering services (see Section II-E-1). These funds will also be available for the revised water supply project. The Government is determined to proceed with construction of the EGMC Amman sub-project in 1980 but has not yet had an opportunity to approach other donors to arrange financing. Thus it is not yet possible to review properly the entire water supply sub-project as now proposed.

The funds obligated in the Loan for water supply should remain in place since they will be needed for construction that is expected to start in 1980. A condition for their disbursement will be the review and approval by AID of the entire water supply sub-project. A formal appraisal of that sub-project will be made and submitted to AID/W in the second quarter of FY 80.

2. Interim Water Supplies

(a) Azraq

In the study entitled "Water Use Strategy North Jordan", the consultant, Howard Humphreys and Sons, estimated that 10 to 15 MCM/a of good quality water could be safely abstracted

for use in Amman-Zarqa. As an emergency measure to meet the current shortage in Amman, the Government decided in July 1979 to pump water at the rate of 6 to 10 MCM/a from Azraq to Amman. Humphreys was selected as the consultant for the project and invitations for bids were issued to international contractors who had been low bidders on previous pipeline work in Jordan. Bids were opened on September 1. Although the bids have not yet been evaluated, it is our understanding that the low bid will be between JD 8 and 9 million ($26.7 to $30.0 million). The project will take a part of the overflow of the springs at Azraq. The water will be pumped 120 km. to two existing AWSA reservoirs in Amman through a 500 mm pipeline. AWSA expects that the project will be completed by July 1980.

(b) Qastal and Wells in South Amman

In an arrangment with the Water Supply Corporation AWSA plans to take water at the rate of about 1.5 MCM/a from the Qastal area which is 25 km south of Amman. The wells recently drilled at Qastal will serve primarily the city of Madaba, some villages in the area and the new International Airport south of Amman. At present Madaba is served at the rate of about 1.5 MCM/a from wells in Amman. Under the proposed arrangement the wells at Qastal will supply Madaba's needs and provide about 1.5 MCM/a for Amman through the existing Amman to Madaba pipeline (by reversing the direction of flow). In addition the wells that now supply 1.5 MCM/a to Madaba would be tied into the AWSA system. Thus the total addition to Amman's water supply will be about 3 MCM/a. AWSA expects the project will be completed early in 1980.

(c) Effect of Interim Water Supplies

The interim supplies from Azraq and from wells south of Amman will add from 9 to 13 MCM/a within a year to Amman's existing available groundwater resources of about 16 to 20 MCM/a. AWSA's total resources will therefore be about 25 to 33 MCM/a from 1980 until about 1984 when a supply from EGMC will become available. The projected water production, on which the Project was originally justified, is given in Table B-1 of the PP. It shows that, with King Talal as source, production would increase from 20 MCM/a in 1980 to 26.7 MCM/a in 1984. In these projections King Talal's contribution would be 3.5 MCM/a in 1982, 5.2 MCM/a in 1983 and 6.7 MCM/a in 1984. Thus the interim water supplies will provide additional water to Amman one year sooner than King Talal would have and should provide quantities of water, until EGMC comes on line in 1984, that are equal or greater than those projected in the PP.

C. WATER DISTRIBUTION AND SEWERAGE

1. AID Financed Subprojects

(a) Contracts 1S and 5WS

Eight construction contractors, including one U.S., have been prequalified for the work and the bid documents are ready for issuance. The scope of the subprojects has not changed. The cost estimates are still considered reasonable given the lower-than-expected bids on four IDA-financed contracts (see below).

(b) Wahdat and Shelieh

AWSA has nearly completed the engineering design and the preparation of contract documents for water mains and sewers at Wahdat and Shelieh. A.I.D. will review the plans, specifications and contract documents when completed. AWSA expects to be able to prequalify contractors and award contracts early in 1980.

2. IDA-Financed Subprojects

The four IDA-financed sub-projects are under construction. The status of the subprojects is given in the following table:

TABLE II-I

STATUS OF PROJECTS - IDA CREDIT

Sub Project	Contract Dates Start	End	% Completion August 1979	Contract Amount (In U. S. $ 000) Estimated*	Actual	Percentage Actual/ Estimated
2S	9/19/78	3/19/80	80	3,158	2,057	65
3WS	2/25/79	9/01/80	9	2,637	2,667	101
4WS	2/18/79	8/18/80	25	3,558	3,951	111
6WS	2/28/79	9/01/80	25	2,819	2,070	73
				12,172	10,745	88

*From PP Table II-3 (Not including physical and price contingencies)

3. Financing Plan

The financing plan shown below for water distribution and sewerage is unchanged from that presented in the project paper. Although there has been a reduction in the construction costs of the sub-projects financed from the IDA Credit, the effect of this reduction will not be known until all the contracts for equipment have been awarded.

TABLE II-2
FINANCING PLAN: WATER DISTRIBUTION AND SEWERAGE
(In U.S. $ 000)

SOURCE	LC	FX	TOTAL
A.I.D.	2,721	7,779	10,500
I.D.A.	3,800	10,200	14,000
G.O.J.	12,948	6,137	19,085
TOTALS	19,469	24,116	43,585

D. SEWAGE TREATMENT PLANT

The FY 78 loan of $28.5 million includes $4.0 million for improvements to the sewage treatment plant. These funds could not be used because their expenditure was tied to initial conditions precedent that involved the King Talal water supply subproject. By the amendments to the loan agreement proposed herein, the funds for the improvements to the sewage treatment plant should become available by December 31, 1979 (see Implementation Actions - Section IV-B-1).

The estimates in the project paper were based on dewatering sewage sludge on drying beds. At the the time the paper was prepared, AWSA was reviewing the possible use of mechanical dewatering equipment rather than sludge drying beds. The cost estimate in the project paper was based on the construction of drying beds. A decision was taken to dewater the sludge using filter belt presses and to build two sludge digestion tanks instead of one. The revised cost estimate follows:

TABLE II - 3

REVISED COST ESTIMATE - SEWAGE TREATMENT PLANT
(In U.S. $ 000)

Item	LC	FX	Total
A. Sewage Treatment Plant			
1. Sludge Digestion Tanks	1,470	1,833	3,303
2. Sludge Dewatering	320	1,017	1,337
3. Miscellaneous Equipment	90	273	363
(Subtotal)	1,880	3,123	5,003
Contractor Mobilization	207	183	390
Contingencies	210	330	540
(Subtotal Plant)	2,297	3,636	5,933
B. Supervision (U.K. Consultant under contract)	133	103	236
TOTAL	2,430	3,739	6,169

The total estimated cost of improvements to the sewage treatment plant has thus increased by $1.169 million. A.I.D.'s total contribution, however, remains unchanged. The revised financing plan follows:

TABLE II - 4

REVISED FINANCING PLAN - SEWAGE TREATMENT PLANT
(In U.S. $ 000)

Source	LC	FX	Total
A.I.D.	364	3,636	4,000
G.O.J.	2,066	103	2,169
TOTAL	2,530	3,739	6,169

AWSA has issued invitations for bids on mechanical improvements to 15 prequalified contractors. Eight firms (7 of which U.S.) purchased bidding documents. Bids will be opened on October 15. The documents for the civil works will be available for bidding soon thereafter.

E. OTHER PROJECT ELEMENTS

1. Technical Assistance

The authorized loan of $28.5 million includes funds to provide project construction management services to AWSA to assist in effective project implementation. This assistance was based on the premise that AWSA would need help to manage the activities of three separate non-U.S. consulting engineering firms activities at least ten separate construction contracts financed by three international donor agencies. Under the revised program, water supply has become the responsibility of JVA. Thus AWSA will not have to manage the two large King Talal contracts and the numbers of consulting firms. AWSA seems to be managing the implementation of the IDA construction contracts without such assistance and is believed to be similarly capable of managing the AID-financed contracts. Therefore the funds ($1.1 million) allotted for the construction management contract will remain in place and may be used to partially finance the foreign exchange costs of the contract for the design of the EGMC/Amman subproject.

AWSA has obtained the services of two advisors: a water supply engineer financed by the British Ministry of Overseas Development and wastewater engineer financed by The Netherlands Government.

JVA has asked USAID to help it find and finance from the TSFS Grant one sanitary engineer to provide general assistance for water supply activities (including Jordan Valley activities) and is also discussing the availability of such services with the Germans.

2. Training

The IDA Credit includes $180,000 for the foreign exchange cost of AWSA staff training. AWSA has submitted a training plan and will have further discussions on implementation of the plan with a World Bank team scheduled to arrive in Amman in September 1979. USAID has also been discussing with AWSA the possibility of providing training in rate analysis from the Participating Training Grant.

3. Maintenance

Under the IDA Credit, AWSA has placed orders for about $400,000 worth of equipment for routine and preventive maintenance of sewers. Delivery is expected in FY 80.

4. Water Meters

According to the Project Paper and the IDA Appraisal Report, the greatest determinant of unaccounted-for-water is the large number of consumer-owned meters on house services that under-register. AWSA has purchased 14,000 water meters with funds from the IDA Credit and had installed 4852 by the end of August 1979.

F. CONSOLIDATED PROJECT COST ESTIMATES

TABLE II - 5

CONSOLIDATED PROJECT COST ESTIMATE
(In U.S. $ 000)

	LC	FX	Total
1. Water Supply	63,795	127,010	190,805
2. Water Distribution System	19,469	24,116	43,585
3. Improvement to Sewage Treatment Plant	2,430	3,739	6,169
TOTAL	85,694	154,865	240,559

G. ALLOCATION OF AID LOAN FUNDS

Table II-6 provides an illustrative allocation of AID loan funds to the project.

TABLE II-6

ILLUSTRATIVE ALLOCATION OF AID LOAN FUNDS 1/

(In U.S. $000)

	A.I.D.			G.O.J. 2/			TOTAL		
	LC	FX	TOTAL	LC	FX	TOTAL	LC	FX	TOTAL
Water Supply 3/	-	24,500	24,500	63,795	102,510	166,305	63,795	127,010	190,805
Water Distribution and Sewerage 4/									
- Contract 1S	1,276	2,324	3,600	377	-0-	377	1,653	2,324	3,977
- Contract 5WS	-0-	3,500	3,500	3,588	169	3,757.0	3,588	3,669	7,257.0
- Contract Shilieh & Wahdat	1,445	1,955	3,400	393	-0-	393	1,837	1,955	3,792
Sewage Treatment Plant 4/	261	3,739	4,000	2,169	-0-	2,169	2,430	3,739	6,169
Total	2,982	36,018	39,000	70,322	102,679	173,001	73,303	138,697	212,000

1/ Foreign exchange and local currency were estimated on basis of U.S. or eligible third-country contractors, but if Jordan contractors are used, the ratios of foreign exchange and local currency may change.

2/ Including other sources.

3/ Includes engineering services, interest during construction and contingency.

4/ Includes engineering services and contingency.

III. PROJECT ANALYSIS

A. TECHNICAL FEASIBILITY

1. Water Supply

The feasibility study by Stanley Consultants has demonstrated the overall technical feasibility of the EGMC/ Amman subproject. It should be noted, however, that the report for this major activity was prepared in less than 50 days. In a joint review with JVA, it was decided that a number of details, such as the pipeline route and the location of certain facilities, need further study, to improve the operation of the system and perhaps to reduce costs. A covenant will be included in the First Amendment to the Loan Agreement requiring additional information on which to base further technical analysis.

2. Water Distribution

The expansion of the water distribution system proposed in the loan would be required even if there were no total increase in water supply - if only more equitably to share the shortage among all users, particularly the poor who depend on more costly supply from trucks. With development of 9 to 13 MCM/a of interim supplies from Azraq and wells south ofAmman, the water produced could range from 25 to 33 MCM/a starting in 1980. (The project Paper in Table C-2 conservatively estimated that the amount of water produced in 1984 would be 26.7 MCM/a; with accelerated AWSA use of King Talal water (Table C-4), it would be 30 MCM/a in 1983 and 35 MCM/a in 1984).

3. Sewerage

The expansion of the sewerage system is needed urgently for environmental and health reasons. Overflowing cesspools are a nuisance and a health hazard. Wastewater from cesspools seeps into the aquifer from which water is pumped into the distribution system. This recycling of wastewater has increased the level of nitrates above acceptable international limits. High nitrates are a cause of methemoglobinemia in infants. Although statistics on the incidence of this condition are not available, the potential for illness exists. Therefore, the extension of the sewerage system is critical and fully justified.

4. Sewage Treatment Plant

The most immediate problem at the sewage treatment plant is inadequate capacity for digesting and dewatering sewage sludge. The proposed improvements to the sewage treatment plant include the construction of two additional sludge digesters, equipment for mechanical dewatering of digested sludges and minor equipment that will help upgrade the sewage treatment process. These immediate improvements will ameliorate the existing unsatisfactory situation, in which partially-digested sludge is being hauled to the municipal dump. It is critical that the required equipment be installed as soon as possible. A less pressing but equally important requirement will be expansion of the treatment facilities to handle the increasing amounts of sewage that will reach the plant as new connections are made to the existing system, the rate of which will increase after the installation of the sewers that are being financed from A.I.D. Loan and the I.D.A. credit. The expansion of treatment facilities is a covenant in the loan and will be addressed in a study of waste-water disposal in the Greater Amman area, for which U.S. consultants will submit proposals by September 30, 1979 (See Progress on Special Covenants - Annex C).

5. Conclusions:

The technical feasibility of the water distribution, sewerage and sewage treatment plant in the PP remains valid. As noted above, the overall technical feasibility of the water supply sub-project has been demonstrated.

B. ECONOMIC AND FINANCIAL FEASIBILITY ANALYSIS

The economic and financial feasibility of the water distribution and sewerage sub-projects (for which the incremental authorization of $10.5 million, already approved, is being requested) has been demonstrated in the project paper. As a result of the interim supplies being developed, the quantities of water produced and available for sale are roughly the same as those projected in Annex C of the PP. AWSA in compliance with the covenant in the Loan Agreement and in its agreement with IDA has recently raised its rates (see Annex C Status of Covenants). Thus the financial and economic analysis contained in the PP remain valid for the purposes of obligating the FY 79 Assistance to AWSA.

The changed source of water supply will provide a longer term solution to the water needs of Amman and its surrounding areas and utilizes the only large source of suitable water to meet the needs. The economic cost of ignoring these needs is great. Therefore, we believe that the water supply element of the project is economically justifiable. The present shortage of water and lack of adequate distribution causes a large number of people, particularly during the summer months, to pay as much as JD 1.5 per cubic meter of water. This basic human need must be priced to the consumer so as to allow him to afford adequate amounts of water. Thus the estimated cost of the investments for the water supply will require major policy decisions concerning the method by which the GOJ will recover the cost. We have therefore included a Condition Precedent in the draft First Amendment to the Loan Agreement regarding this issue, which must be met prior to disbursement of funds for water supply.

C. SOCIAL ANALYSIS

Intended project beneficiaries will remain the same as those identified in the original PP (see page 27 ff), except that, when the supply from the EGMC is in place, the number of potential beneficiaries will be substantially increased. An obvious potential difficulty with maintaining the levels of access to water outlined there, particularly in terms of the amount of water which lower income residents can afford, will be the increased costs of water. The proposal to pump water from the EGMC instead of from King Talal Dam will entail significantly higher capital and operating costs.

To maintain the previously envisaged degree of access to lower-income residents, the Loan Agreement Amendment will include a covenant pledging the Borrower to insure that water rates for the lower consumption blocks of the tariff schedule will not increase at a rate faster than the income of the low-income population.

GOJ officials involved with water supply have indicated that they are considering various means of increasing revenues to repay investments. In addition to revenue from sale of water at bulk rates to be established, a selective property tax in the service area may be implemented. It is expected that such a property tax would have the effect of increasing the cross subsidization rate, because the ownership of land in general, and of higher-valued land in particular, is concentrated among the better-off segments of society. Because about half of the annual costs of supplying water from the EGMC system are expected to be capital costs, such a taxation scheme, if implemented, should allow the authorities to maintain wholesale rates to retail organizations at relatively

low levels while providing for investments for supply to the areas which would result in an ability to serve others at a relatively small incremental costs.

As discussed in the original PP, a full view of the ability to pay involves looking not only at the levels of regular water (and sewer) rates but also at connection charges, which can often be substantial. During the year since the signing of the original Loan Agreement at the end of August, 1978, AWSA has had under constant review the question of devising connection charges which are affordable to lower-income residents. Copies of the Social Soundness Analysis prepared for this project, which discusses the problem of affordability of connection charges to lower-income residents in detail, have been distributed to involved officials and reports indicate that it has been extensively referred to during their deliberations on the problem. As was anticipated, the rent control laws have proven a major impediment to instituting a system for longer-term financing of connection charges because they bar landlords from passing on such costs -- over a period -- in the form of increased rents. AWSA has instituted a system of installment payments for connection charges, with ability to pay being the criterion for extension of the facility. The Mission plans to continue reviewing on a regular basis the status of the GOJ's development of a program to alleviate the burden of connection charges to lower-income residents.

D. ENVIRONMENTAL ANALYSIS

The environmntal assessment of the project was prepared by Stanley Consultants, Inc. Most of the avoidable adverse effects that were identified in that assessment are covered by covenants in the Loan Agreement or no longer apply because the King Talal Reservoir will not be used as a source of drinking water. Data on which to base minimum quality standards for industrial discharge into the Zarqa River will be developed in a hydrological and water quality study of the Zarqa River Basin expected to be financed by the British Ministry of Overseas Development. The subject will also be addressed in two proposed feasibility studies to be financed by A.I.D.: (a) the Zarqa Water Distribution, Sewerage and Sewage Treatment Project and (b) Greater Amman Wastewater Project.

In addition, Stanley has completed an Environmental Assessment of the proposed EGMC/Water Supply Project, as part of the technical and financial assessment of the Project (copy available in NE/PD). The report describes sensitivities, anticipated effects and provisions that have been made to mitigate the minimal adverse effects.

IV. PROJECT IMPLEMENTATION AND EVALUATION

A. PROJECT IMPLEMENTATION SCHEDULE

Table IV-1 is a revised summary schedule for the implementation of the AID-financed components of the Project.

B. LOAN SCHEDULE

1. Implementation Actions

Loan Signed ($28.5 million)	August 26, 1978
Loan Amended (adding $10.5 million)	September 26, 1979
Initial CPs met	November 30, 1979
CP's for Water Distribution and Sewerage and Improvements to Sewage Treatment Plant met	December 31, 1979
Appraisal of Revised Water Supply and CPs for Water Supply Met	March 31, 1980
PACD	June 30, 1983

2. Disbursements

LOAN DISBURSEMENT SCHEDULE (In U.S. $000)

	1980	1981	1982	1983
1. Water Supply	1.0	10.0	11.5	2.0
2. Water Distribution and Sewerage	1.5	7.0	2.0	-
3. Sewage Treatment	1.0	2.0	1.0	-
Total	3.5	19.0	14.5	2.0

C. HOST COUNTRY IMPLEMENTATION

1. Amman Water and Sewerage Authority

Project management and implementation of the water distribution, sewerage and sewage treatment elements of the project

TABLE IV-1

AID-FINANCED CONTRACT IMPLEMENTATION SCHEDULE

ACTIVITIES/CONTRACTS

	Water Supply 1/ System	Contract 1S	Contract 5WS	Sewage Treatment Plant	Wahdat & Shelleh
I. Pre-Implementation					
CBD Notice for Construction Prequalification Published	12/79	Published	Published	Published	1/80
Draft Construction Bid Documents Submitted	2/80	In hand	In hand	1/80	3/80
Qualified Construction Contractors Selected	2/80	Selected	Selected	Selected	3/80
Contract Documents issued to Qualified Construction Firms	3/80	10/79	11/79	2/80	4/80
II. Implementation					
Construction Bid Opening	6/80	12/79	1/80	4/80	6/80
Construction Contracts Approved	8/80	2/80	3/80	6/80	8/80
NTP to Construction Contractors Issued	10/80	3/80	4/80	7/80	9/80
Construction Completed	4/83	9/81	12/81	12/81	4/82

1/ Stanley Consultants & Boyle Engineering Corporation were selected and contracted with by JVA from an A.I.D. approved short-list of prequalified firms to provide engineering services for this aspect of the Project.

will be the responsibility of AWSA. Within AWSA, administrative responsibility will be vested in the Director General and technical responsibility, in the Deputy Director General. A Project Manager, who is now responsible for the IDA-financed subprojects, will also coordinate day-to-day activities on the AID-financed subprojects. He will also be responsible for coordinating the construction of the interim water supply subprojects from Azraq and from Qastal and South Amman. We therefore conclude that the original determination that AWSA is capable of implementing this project remains valid.

2. Jordan Valley Authority

Project management and implementation of the EGMC/Amman water supply project will be the responsibility of JVA. Overall responsibility will be vested in the President and Senior Vice-President. A Project Manager will be appointed to coordinate day-to-day construction activities.

The JVA already has a large workload. However, we believe, it has the managerial capability to rapidly increase its staff to implement this project. JVA has requested general technical assistance (as discussed elsewhere in this paper) and has been discussing staff required, including interviewing people qualified to be the project manager. In addition JVA and USAID have had a number of discussions regarding the training of personnel to operate and maintain this system. These discussions between JVA and USAID will continue and USAID anticipates providing training assistance through its Participant Training Program. We therefore, conclude that the JVA has, or will obtain, the necessary staff to properly administer, implement and operate the water supply sub-project.

3. Project Engineering Consultants

(a) Final Design and Supervision (AWSA)

Supervision of construction of the water distribution and sewerage subprojects (Contracts 1S and 5WS) will be carried out by the Sewedish firm, VBB, which prepared the feasibility study and design. Supervision of improvements to the sewage treatment plant will be carried out by the British firm, Binnie and Partners, who also did the feasibility study and design. The feasibility study of water distribution and sewerage subproject at Wahdat and Shelieh was prepared by VBB but the design is being completed by AWSA. Supervision of construction may be performed by a Jordanian engineering firm, if AWSA and USAID so determine. The British firm, Howard Humphreys and Sons, will supervise construction of the Azraq interim water supply subproject.

(b) Final Design and Supervision (JVA)

JVA has a contract with Stanley Consultants, Inc., in association with Boyle Engineering Corporation, for feasibility studies, design, construction, supervision, and operations and maintenance supervision. AID has approved the contract and is financing the study phase of the Project from the Technical Services and Feasibility Studies Grant (Project 278-0224). Loan funds will be used to finance a portion or all of the foreign exchange costs of this contract for the water supply element. GOJ will finance the balance of the costs.

D. PROJECT MONITORING

1. USAID Mission

No change in the arrangements for project monitoring, except that now the Mission has available the services of a Regional Legal Advisor.

2. Project Procurement

Procurement under the AID Loan will be handled by host-country contracting in conformity with AID Handbook 11.

3. Project Evaluation

There will be no change in project evaluation.

V: CONDITIONS COVENANTS AND NEGOTIATING STATUS

A. Conditions Precedent to Disbursements:

The Conditions Precedent to disbursements have been modified from the conditions in the PP. These conditions are fully described in Annex D draft Authorization and Annex E draft First Amendment to Loan Agreement.

B. Special Covenants:

The status of special covenants contained in the Loan Agreement is discussed in Annex C. All remain applicable except for Section 6.6 (Annual Withdrawal from King Talal Reservoir) and Section 6.8 (Rate Structure). Changes to the Special Covenants are reflected in Annex D draft Authorization and Annex E draft First Amendment to the Loan Agreement.

C. Negotiating Status

The change to the conditions and covenants have been discussed in detail with the GOJ. We anticipate no difficulty in the negotiation of the loan agreement.

VI. RECOMMENDED LOAN TERMS

The existing Loan Agreement provides $19.0 million to be repaid on standard AID terms (40 years with 10 years grace) and 9.5 million be repaid within 30 years including a grace period not to exceed 10 years. We recommended that the FY 79 increment of $10.5 million be added to the $19.0 million which provides for repayments on standard loan terms. Annex D draft Authorization and Annex E draft First Amendment of Loan Agreement reflect this recommendation.

VII. PROJECT CHECKLIST

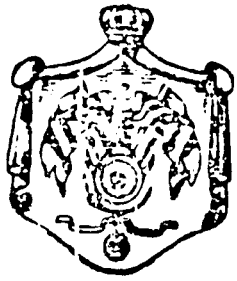
The statutory criteria included in the Project Checklist (Annex H to the PP) remain valid for the water distribution, sewerage and improvement to the sewage treatment plant elements of the Project. Section 611.(a) and 611.(b) were valid for the original water supply element of the Project and for the funds obligated in FY 78 which were allocated to assist in financing the supply. However, with the change in the source of supply, additional analysis will be required to assure validity of these criteria. Funds will not be disbursed for the water supply until these criteria are satisfied. We have no doubt that JVA can provide sufficient information to allow a positive determination of the requirements to be made.

VIII. RECOMMENDATION

The Mission strongly recommends approval to negotiate and execute the First Amendment to the Loan Agreement (Annex E).

بسم الله الرحمن الرحيم

THE HASHEMITE KINGDOM
OF JORDAN
NATIONAL PLANNING COUNCIL
AMMAN
Tel. 44[illegible] - 44470
P. O. B. 555
Teleg. NPC - Amman



المملكة الأردنية الهاشمية
المجلس القومي للتخطيط
عمان
الهاتف : ٤٤٤٦٦ - ٤٤٤٧٠
ص.ب ٥٥٥

No. 129/22/5654
Date 12/7/1979
Ref.

JUL 14 1979

ACTION TAKEN		
	DATE	INITIAL
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RSTOR		

USAID	ACT	INF	INIT
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CD	✓		
ADM			
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TAY			
G.O			
C/D			
Other			
DUE	7/23		

الرقم
التاريخ
الموافق

Mr. Edgar Harrell
Director
USAID/J
American Embassy
Amman

Dear Mr. Harrell,

AID Loan 278-K-023, Amman Water and Sewerage Project

I am writing to you concerning the Loan Agreement signed on August 28, 1978 between the United States of America and the Hashemite Kingdom of Jordan to advise you of a decision taken by the Government of Jordan which affects the implementation of the project financed under this loan agreement. This decision relates to the change of the source of the water supply to Amman from the King Talal Reservoir to the East Ghor Canal.

The King Talal Dam Transmission Sub-Project, as you know, consisted of intake, transmission, pumping, and reservoir facilities, all to have been designed and constructed for delivery of up to 17 million MCM of water per annum to the water distribution network of AWSA starting each calendar year after 1981, following the completion of the on-going extension of AWSA water distribution and sewerage network partly financed under this Loan Agreement.

The decision to change the source of water supply to Amman was predicated on the following reasons:

1. Pollution: The environmental assessment undertaken early in 1978 by Stanley Consultants in connection with the proposed abstraction of water from the King Talal Reservoir indicated that the level of abstraction should not exceed 17 MCM per year. A follow-up assessment was undertaken by Stanley Consultants in February 1979, to re-check the water quality at the King Talal Reservoir, after another year of inflow into the reservoir. The assessment confirmed that the water was polluted by phosphate deposits in the Zarqa river basin, nitrates from sewage and heavy metals from industrial waste. Furthermore, the growth of algae exceeded expectations. Consequently the water from the King Talal Reservoir would have required sophisticated operation of the treatment plant and continuous monitoring of water quality before and after treatment. While the treatment plant proposed by AWSA's consultants (SOGREAH) would have treated the water to a level fit for human consumption, the Government was concerned that such sustained sophisticated operation and continuous monitoring might not be attained.

2. Quality of Water: The Stanley study also reported that the chemical and biological composition of the water at the King Talal Reservoir was such that, although it could be safely treated, it would have an unrectifiably strong odour and taste during certain periods of the year, which might lead to its rejection for drinking and other domestic purposes.

3. Quantity of Water: It was known that the amount of water available from King Talal Reservoir was limited by environmental considerations, according to the findings of the first Stanley study, and the initial phase was designed for the withdrawal of 17 MCM per annum. The experience of the first two years of the operation of the reservoir indicates that even this amount may not be attainable. The King Talal Reservoir has not been able to fill up to its ultimate capacity of 50 MCM because of unusually dry weather conditions prevailing in Jordan during the last several years. It has so far impounded only 26 MCM or about one-half of its total capacity, thus aggravating the pollution problem.

Given the conditions described above, it was essential to look at other possible sources of water of acceptable quantity and quality. The only known, assured, long-term source of water that meets the quantity and quality is the East Ghor Canal.

The East Ghor Canal Transmission Sub-Project in the initial stage could provide water to the Amman Water Supply network at a rate of 35-40 MCM per year. A contract for technical and financial assessment (Phase A), for preparation of final design and tender documents (Phase B), and for the supervision of construction (Phase C) of the project was signed on June 14, 1979 between JVA and Stanley Consultants Inc. (USA) working in association with Boyle Engineering Corporation (USA). Phase A is expected to take 2 months from the date of contract signature. Phase B will take an additional 8 months and Phase C some 20-30 months. Since the proposed timing would imply a gap of about 12 months between the physical completion of the water and sewerage network and the commencement of operations of the East Ghor Canal Transmission Sub-Project, AWSA has undertaken to secure emergency supplies of water into its system from Suwaqa, Qastal and Baq'a to alleviate partially the serious water situation. In addition, the Amman Municipality is undertaking a water conservation publicity campaign.

Under these circumstances, we believe that the East Ghor Canal Transmission Sub-Project represents the best overall investment to provide water supply to the area. Based on the Harza Study entitled "Jordan National Water Carrier", dated March 1979, it is estimated that the cost of the East Ghor Canal Transmission to Amman will exceed US$ 75 million. As you know this project consists of (a) the water supply for Amman, (b) improvements to the Ain Ghazal sewage treatment plant, and (c) water distribution and sewage collection systems in selected areas of the City. The existing loan for US$ 28.5 million will be increased by US$ 10.5 million per Section 3.2 of the Agreement. It would be appreciated if the necessary steps are taken to allow us to utilize the total amount of US$ 39 million for the project. In addition, since the water supply sub-project investment will now be greater than for the limited supply from King Talal Reservoir you are kindly requested to make available an additional US$ 7.0 million no later than FY 1980 to assist us in realizing early implementation of all elements of the Project.

Furthermore, the other elements of this project, namely (b) and (c) referred to in the previous paragraph and which pertain to the implementation of the treatment works, water distribution and sewage collection systems, are at an advanced stage of preparation and must proceed as rapidly as possible. We estimate that by proceeding now with contracting arrangements for these elements we will need to commit funds to contractors by about November 1st, 1979. Because of the inability to meet the Condition Precedent, these elements can not yet be financed. You are kindly requested to take the necessary action to assure the availability of funds before the end of your FY79.

We are currently in the process of writing to the Saudi Fund for Development to inform them formally of the Government's decision to change the source of water supply to Amman and to ask them to transfer the funds originally earmarked for this project to the alternative project which has been conceived to bring water from the East Ghor Canal. I am confident of receiving a positive response from them in due course.

I trust our proposals are acceptable to you and I look forward to hearing from you soonest so that implementation of this vital project can proceed.

With best regards,

Yours sincerely,

Hanna Odeh
President

cc. H.E. President, JVA

cc. H.E. Director General, AWSA

DESCRIPTION OF EGMC/AMMAN WATER SUPPLY PROJECT*

This study prepared for the Jordan Valley Authority (JVA) addresses the pressing water shortage problem in North Jordan. Areas south of the Zarqa River, including Amman, Zarqa, and other regional population centers are included in the Southern Region. Intermediate water needs have been identified at a capacity level of 90 million cubic meters per year and can be met from the East Ghor Main Canal. One half of this design capacity will be installed initially (by 1983); attention has been given to facility expansion for full resource development at a later date. Maqarin Dam, which is currently under design, will provide a stable supply of water from the Yarmouk River to the East Ghor Main Canal (EGMC).

Preliminary water quality investigations indicate that water from the EGMC will be treatable using standard unit processes. Local activities along the canal have been noted to be causing higher than desirable biological contamination; remedial action is being undertaken. Sampling and testing will continue during the design period to determine fluctuations in the water characteristics and to perfect treatment plant loadings and other criteria.

Data on seismic activity throughout the geographical location of the project have been reviewed. A provision will be made to include earthquake loadings for sound structural engineering design.

Several alternative pumping and pipeline arrangements have been studied in arriving at an optimum supply system. An intake structure with low-lift pumps is proposed adjacent to the canal, south of Deir Alla, to deliver water across the Zarqa River to the treatment plant site. Pretreatment of the raw water will include screening and chemical addition for taste and odor control at the intake structure. The water treatment plant will provide regulating reservoirs, rapid mixing of coagulants, flocculation, setting and filtration. It is planned that finished water at the clearwell will meet WHO standards of quality under varying conditions of raw water quality.

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* This is an excerpt from "Domestic Water Project North Jordan, Part 1 - Southern Region, Technical and Financial Assessment", by Stanley Consultants, Inc., in association with Boyle Engineering, August, 1979. This study is being reviewed by JVA and may be modified.

Five pumping stations will be used to convey treated water to a terminal reservoir site near Suweileh. Horizontal multistage centrifugal pumps have been selected to handle the 275-meter head for each station. Intermediate storage tanks with 45 minutes capacity will be provided at each pump station to balance pumping rates and to minimize the impact of hydraulic transients.

Pipeline studies have evaluated routings, pipe size, materials, installation, supports, and staged construction. The recommended alignment rises out of the Jordan Valley up the steep slope encountered in the first (easterly) 2.5 kilometers. Above-ground supported pipe will be utilized for this rugged application. The remainder of the pipeline will be buried, except for wadi crossings. Welded steel is the recommended material, although prestressed concrete will be given additional consideration in the design memorandum as a bidding alternative. Staged construction is proposed for all major structures; however, the pipeline should be built initially with adequate capacity for the full 90 MCM per year. Optimum pipeline size is 1.7 meters, based on economic evaluation including energy and other operating costs.

The terminal reservoir will be reinforced concrete construction and rectangular in shape. Two-day storage capacity will be provided in the buried reservoir. Initial delivery of water from this system will be through a 1.2-meter pipeline by gravity flow to the terminal reservoir in Amman. Adequate excess head is available in this pipeline to justify installation of head recovery using a hydroelectric turbine.

Power for the pump stations and other uses will be supplied by the Jordan Electricity Authority (JEA). Substantial power demand (about 45 MW) results from pumping requirements for first stage development. A new 132 KV line will be provided with a substation within a few kilometers of the electrical loads. Additional 33 KV transmission lines and substations will be designed as a part of this project. Master controls for the water supply system, using both multiconductor cable and other microwave or multichannel VHF, will be located at the water treatment plant. Individual pump stations will be designed to function automatically to maintain optimum reservoir levels over a range of water demands.

An environmental assessment has been completed for the project. This report describes sensitivities, anticipated effects, and provisions which have been made to mitigate adverse effects in so far as is practicable.

Detailed capital and operating cost estimates for the project have been prepared and identify investment dimensions. Operating costs are highly sensitive to power rates and demand charges, which are under discussion between JVA and JEA. Twenty-four hour operation has been determined to be optimum from the water supply standpoint. A base energy rate of 18 fils per KW hour is used for computing operating costs. Capital and operating costs are summarized as follows:

Capital Costs

Initial 45 MCM/a	U.S. $ 190,800,000
Expansion to 90 MCM/a	91,776,000

Annual Operation, Maintenance, and Replacement Costs

Initial 45 MCM/a	U.S. $ 23,001,000
Expansion to 90 MCM/a	22,050,000

The expected cost of water at reservoir R-14 north of Amman is 287 fils per cubic meter for the first stage development, supplying 45 MCM per year. This is expected to reduce 249 fils per cubic meters for the total project, as supply levels reach 90 MCM per year.

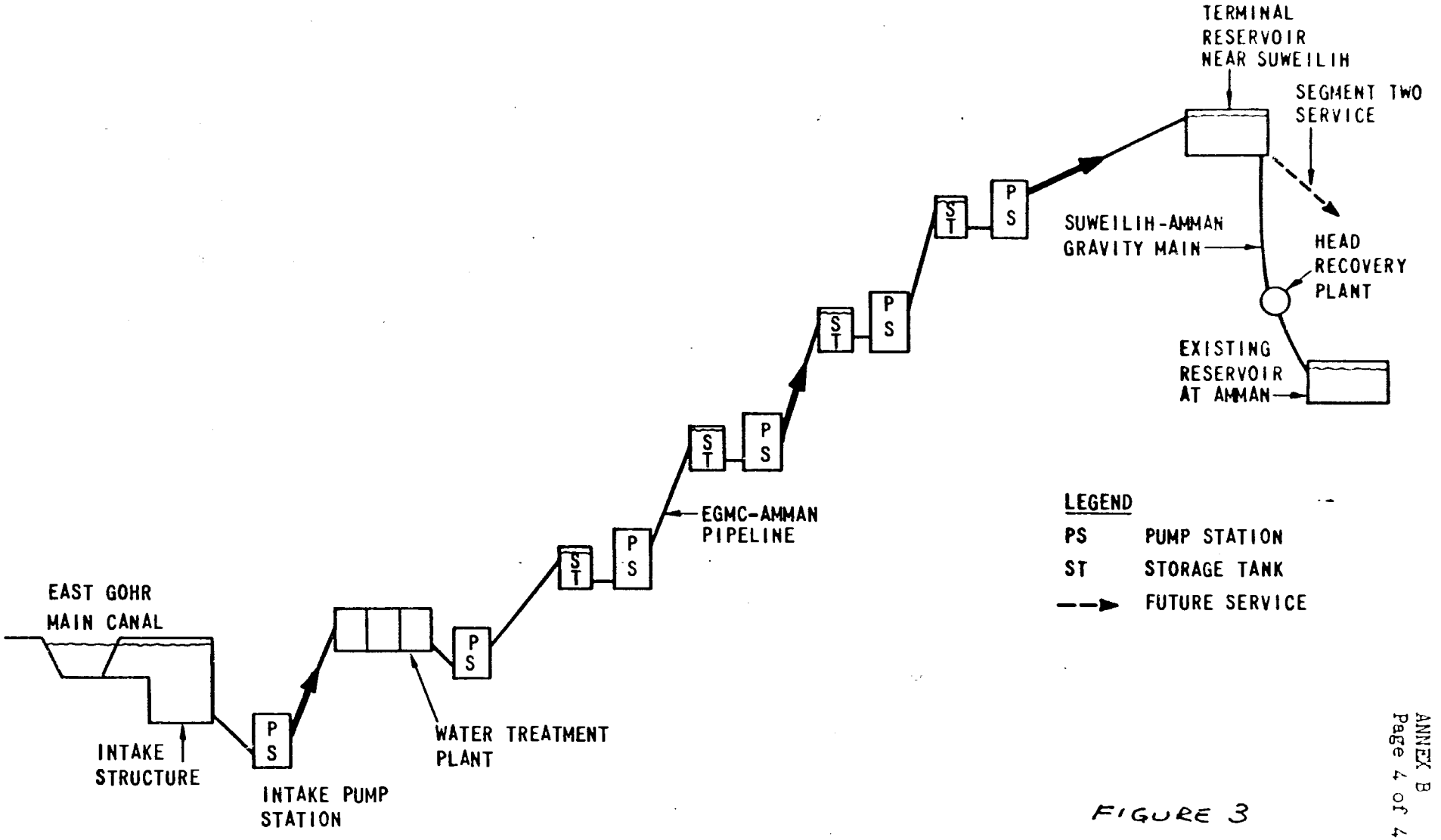

FIGURE 3

JORDAN VALLEY AUTHORITY
NORTH JORDAN DOMESTIC WATER SUPPLY
SOUTHERN REGION

STANLEY CONSULTANTS

FIRST SEGMENT SCHEMATIC

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PROGRESS AND APPLICABILITY OF EXISTING SPECIAL COVENANTS

(ARTICLE 6 OF LOAN AGREEMENT)

Section 6.1. Project Evaluation. Not yet scheduled. Applicable.

Section 6.2. Water Monitoring System. Agreement in principle has been reached between the Government and the British Ministry of Overseas Development on the scope of a study of the hydrological regime of the Zarqa River Basin to determine the proportion of consumption in Amman that is returned to the hydrological system, the distribution of return flows as between surface and groundwater, the time required for useful groundwater recharge to occur, the main sources of pollution within the system and the quality of the water at various stages of the cycle and its variation with time. A water monitoring system will be established to permit the GOJ to continue the program after the study is completed. Applicable.

Section 6.3. Sludge Disposal. The sludge drying beds at the sewage treatment plant have insufficient capacity, which means that a considerable amount of wet sludge is dumped with the municipal garbage and solid wastes. AWSA has experimented with various means of disposing dried sludge, from making it available at the plant free of charge to hauling it to farms. Because of seasonal demand and inadequate storage space, these methods have not worked. One of the options being considered by the British consultant on solid waste disposal (Section 6.7) is the composting of sewage sludge with solid wastes. The problem of sludge disposal will also be considered as part of the study on Greater Amman Wastewater (Section 6.4). Applicable.

Section 6.4. Increased Sewage Treatment. NPC has requested proposals from nine prequalified U.S. consultants for a "Preliminary Study and Master Plan for Wastewater Disposal for Greater Amman Area and Technical and Economic Feasibility Studies, Final Design and Supervision of Construction of the Facilities in the Initial Investment Program". Proposals are due on September 30, 1979. The initial investment program will undoubtedly include the expansion of the existing sewage treatment plant and possibly the construction of additional plants to channel efficiently the increasing return flows of wastewater for use in the Jordan Valley. Applicable.

Section 6.5. Access of Lower Income Families. AWSA is allowing poorer families, on a case-by-case basis, to pay sewer connection charges on the instalment plan. For a discussion of this issue, see the section on Social Analysis. Applicable.

Section 6.6. Annual Withdrawal from King Talal Reservoir - No longer applicable.

Section 6.7. Solid Waste Disposal. The Government has entered into a contract with a British firm to undertake a study of solid waste disposal within Amman. The report of the consultants is due shortly. Applicable.

Section 6.8. Rate Structure. There have been no formal discussions between AWSA and A.I.D. on rate schedules. AWSA raised its water rates on June 1, 1979. The old and new rates are as follows:

Water Tariff

Consumption per quarter-m^3	Fils/m^3 Old	New
0-20	60	80
21-40	80	120
41-100	180	250
Over 100	260	350

It is believed that this rate increase was set on an ad-hoc basis. A.I.D. will review with AWSA possible rate schedules for water and sewerage service during the implementation phase of the project. In the amendment to the Agreement this covenant will be revised to reflect social considerations as well as financial viability.

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PROJECT APPROVAL

AND REQUEST FOR ALLOTMENT OF FUNDS

(FIRST AMENDMENT)

PART II

Name of Country: Jordan

Name of Project: Amman Water Water and Sewerage

Number of Project: 278-0220

The following sections are hereby amended:

(a) Interest Rate and Terms of Repayment

Delete the words "$19.0 Million (Loan Part A)" and substitute therefor "$29.5 Million (Loan Part A)"

(c) Initial Conditions Precedent

Delete the entire section and substitute the following therefor:

"(c.) Conditions Precedent for Water Supply

Prior to any disbursement made under the Loan for Water Supply or to the issuance of any commitment document under the Loan for such disbursement, the Borrower shall, except as A.I.D. may otherwise agree in writing, furnish in form and substance satisfactory to A.I.D.:

(a) A firm cost estimate and financing plan for the Water Supply System, including but not limited to both

a confirmation of the amounts to be provided by each participating donor institution for the Capital Costs and including a statement of principle by Borrower on recovery of costs.

(b) An economic, financial and technical analysis of the Water Supply System.

(c) A statement from Borrower that J.V.A. has been selected as the implementing agency for the Project and assurances that funds allocated under this Loan will be made available for the Water Supply System.

(d) An implementation schedule for the construction of the Water Supply System.

(e) An organization chart showing a schedule of the requirements and availability of personnel for the operation of the Water Supply System including the appointment of key personnel.

(f) Assurances satisfactory to A.I.D. that J.V.A. has the right-of-way necessary for the installation, operation and maintenance of the Water Supply.

(g) Assurances that an adequate supply of electric power will be made available for purposes of the Project on a timely basis .

(h) A statement of principle, satisfactory to A.I.D. by which J.V.A. will make available sufficient water for the Water Supply System;

(i) An agreement between J.V.A. and A.W.S.A. defining terms and conditions under which J.V.A. will made available treated water to A.W.S.A.

(d) Additional Conditions Precedent to Disbursement for Construction Services for the King Talal Water Transmission System

Delete the entire section and substitute the following therefor:

"(d) Conditions Precedent for Water Distribution and Sewage and for the Improvement to the Sewage Treatment Plant

Prior to any disbursement for Water Distribution and Sewage and for the Improvement to the Sewage Treatment Plant, or to the issuance by A.I.D. of documentation pursuant to which any such disbursement will be made, Borrower will, except as the Parties may otherwise agree in writing, furnish to A.I.D. in form and substance satisfactory to A.I.D. an executed and delivered Reloan Agreement between Borrower and AWSA by which the Borrower agrees to make available to AWSA the proceeds of the loan allocated for the Water Distribution and Sewage and for the Improvement to the Sewage Treatment Plant."

(e) Special Covenants

Delete Covenant (e)(5) in its entirety and substitute the following therefor:

"Borrower agrees that it will comply with the principle as established as a condition to the Loan that JVA will make available sufficient water for the Water Supply System."

Covenant (e) (7) is amended by deleting the period after the world "viable" and adding the following:

"and assures that rates at the lower end of the structure will not increase at a faster rate than income of the low-income population."

_____

_____
Date

Clearance:

_____

_____

_____

_____

_____

FIRST AMENDMENT

TO

LOAN AGREEMENT

BETWEEN

THE UNITED STATES OF AMERICA

AND

THE HASHEMITE KINGDOM OF JORDAN

FOR

AMMAN WATER AND SEWERAGE

First Amendment dated between the Hashemite Kingdom of Jordan (Borrower) and the United States of America, acting through the Agency for International Development ("A.I.D.").

WHEREAS on August 28, 1978, the Hashemite Kingdom of Jordan entered into an agreement known as A.I.D. Loan No. 278-K-023A and No. 278-K-023B ("Loan Agreement") providing for a total of Twenty eight million five hundred thousand United States Dollars ($28,500,000) to assist the Hashemite Kingdom of Jordan in carrying out the Amman Water and Sewerage Project; and

WHEREAS, the parties now wish to amend that Loan Agreement to provide an additional ten million five hundred thousand dollars ($10,500,000)for the purposes set out in that Agreement and this Amendment thereto;

NOW THEREFORE, in consideration of the premises and covenants contained herein, the parties do hereby agree that:

1. Section 3.1 is amended by deleting the words "Twenty eight million five hundred thousand United States ("U.S.") dollars ($28,500,000) ("Loan")" and substituting therefore the words "Thirty Nine Million United States ("U.S.") dollars ($39,000,000) ("Loan")".

2. Section 3.2 is deleted in its entirety and the present Section 3.3 is renumbered as Section 3.2.

3. Section 3.4(a) is amended by deleting "November 31, 1981" and substituting therefor "June 30, 1983".

4. Section 4.1 is amended by deleting the words "$19.0 million (Loan Part A)" and substituting therefor the words "29.5 Million (Loan Part A)".

5. Section 5.1(a) is amended by adding the words "and First Amendment" after the Word"Agreement" and changing the word "has" to "have".

6. Section 5.1 is further amended by deleting subsections (c), (d), (e), (f), and (g) in their entirety.

7. Section 5.2 is deleted in its entirety, and the following is substituted therefor:

"Prior to any disbursement made under the Loan for Water Supply or to the issuance of any commitment document under the Loan for such disbursement, the Borrower shall, except as A.I.D. may otherwise agree in writing, furnish in form and substance satisfactory to A.I.D.:

(a) A firm cost estimate and financing plan for the Water Supply System, including but not limited to both

a confirmation of the amounts to be provided by each participating donor institution for the Capital Costs and a statement of principle by Borrower on recovery of costs.

(b) An economic, financial and technical analysis of the Water Supply System;

(c) A statement from Borrower that J.V.A. has been selected as the implementing agency for the Water Supply System and assurances that funds allocated under this Loan will be made available for the Water Supply System.

(d) An implementation schedule for the construction of the water supply system.

(e) An organization chart showing a schedule the requirements and availability of personnel for the operation of the Water Supply System including the appointment of key personnel

(f) Assurances satisfactory to A.I.D. that J.V.A. has the right-of-way necessary for the installation , operation and maintenance of the Water System;

(g) Assurances that an adequate supply of electric power will be made available for purposes of the Water Supply System on a timel basis;

(h) A statement of principle, satisfactory to A.I.D., by which JVA will make available sufficient water for the Water Supply System;

(i) An agreement between J.V.A. and A.W.S.A. defining terms and conditions under which J.V.A. will make available treated water to A.W.S.A.

7. Section 5.3 is deleted in its entirety and the following is substituted therefor:

"Prior to any disbursement for Water Distribution and Sewage and for the Improvement to the Sewage Treatment Plant, or to the issuance by A.I.D. of documentation pursuant to which any such disbursement will be made, Borrower will, except as the Parties may otherwise agree in writing, furnish to A.I.D. in form and substance satisfactory to A.I.D. an executed and delivered Reloan Agreement between Borrower and AWSA by which the Borrower agrees to make available to AWSA the proceeds of the loan allocated for the Water Distribution and Sewage and for the Improvement to the Sewage Treatment Plant."

8. Section 5.5(b) is deleted in its entirety and the following is substituted therefore:

"(b) If all of the Conditions specified in Sections 5.2 have not been met within 180 days from the date of this First Amendment and if the condition in Section 5.3 has not been met within 90 days from the date of the First Amendment or such later date as A.I.D. may agree in writing, A.I.D., at its option,may cancel the then undisbursed balance of the Loan to the extent not irrevocably committed to third parties, and may terminate this Agreement by written notice to the Borrower. In the event of such termination, the Borrower will repay immediately the Principal then outstanding and any accrued interest; on receipt of such payments in full, this Agreement and all obligations of the Parties hereunder will terminate".

9. Section 6.6 is deleted in its entirety the following is substituted therefor:

"Section 6.6. Borrower agrees that it will comply with the principle as established pursuant to Section 5.2(h) that JVA will make available sufficient water for the Water Supply System".

10. Section 6.8 is amended by deleting the period after the word "viable" and adding the following: "and assures that rates at the lower end of the structure will not increase at a faster rate than income of the low-income population."

11. Except as specifically amended hereby, the Loan Agreement dated August 28, 1978 between Borrower and A.I.D. shall remain in full force and effect.

IN WITNESS WHEREOF, the Hashemite Kingdom of Jordan and the United States of America, each acting through its duly authorized representative, have caused this First Amendment to the Loan Agreement to be signed in their names and delivered as of the date and year first above written.

HASHEMITE KINDOM OF JORDAN

By: _____

Title: _____

UNITED STATES OF AMERICA

By: _____

Title: _____