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DEPARTMENT OF STATE
AGENCY FOR INTERNATIONAL DEVELOPMENT
Washington, D.C. 20523

PROJECT PAPER

EGYPT: CANAL CITIES WATER AND SEWERAGE

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PROJECT PAPER FACESHEET

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 A ADD
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 2. DOCUMENT CODE
 3

3. COUNTRY ENTITY
Arab Republic of Egypt

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5. PROJECT NUMBER (7 digits)
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Canal Cities Water and Sewerage

8. ESTIMATED FY OF PROJECT COMPLETION
 FY **82**

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

10. ESTIMATED COSTS (\$000 OR EQUIVALENT \$1 LE 70)

A. FUNDING SOURCE	FIRST FY			LIFE OF PROJECT		
	B. FX	C. L C	D. TOTAL	E. FA	F. C	G. TOTAL
AID APPROPRIATED TOTAL:						
GRANT						
LOAN	60,000		60,000	96,000		96,000
OTHER						
U.S.						
HOST COUNTRY		57,143	57,143		71429	71429
OTHER DONORS						
TOTALS	60,000	57,143	117,143	96,000	71429	167429

11. PROPOSED BUDGET APPROPRIATED FUNDS (\$000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	PRIMARY TECH. CODE		E. 1ST FY 78		H. 2ND FY 79		K. 3RD FY	
		F. GRANT	G. LOAN	F. GRANT	G. LOAN	GRANT	J. LOAN	L. GRANT	M. LOAN
1) SSA	729		540		60,000	36,000			
2)									
3)									
4)									
TOTALS					60,000	36,000			

A. APPROPRIATION	N. 4TH FY		Q. 5TH FY		LIFE OF PROJECT		12. IN-DEPTH EVALUATION SCHEDULED
	O. GRANT	P. LOAN	R. GRANT	S. LOAN	T. GRANT	U. LOAN	
1) SA					36,000	60,000	
2)							
3)							
4)							
TOTALS					36,000	60,000	

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

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14. ORIGINATING OFFICE CLEARANCE

SIGNATURE: *[Signature]*

TITLE: **Donald S. Brown, Dir. USAID/Egypt**

DATE SIGNED: **9/27/78**

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EGYPT: CANAL CITIES' WATER AND SEWER

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METRIC-ENGLISH UNIT EQUIVALENT

1 cubic metre	= 264.2 U.S. gallons
	= 220.1 Imp. gallons
	= 35.32 cubic feet
1 cubic metre/second	= 22.8 million gallons (US) per second
1,000 cubic metres/day	= 0.264 million gallons (US) per day
1 cubic metre/square metre day	= 24.5 gallons (US) per square per day
1 cubic metre/metre day	= 80.5 gallons (US) per foot per day

EGYPT- CANAL CITIES WATER AND SEWERAGE

SUMMARY AND RECOMMENDATION

1. Borrower: The Government of Egypt (GOE).
2. Executing Entity: Ministry of Housing.
3. Amount of Loan: \$96,000,000 (Ninety Six Million Dollars)
\$60 Million in FY 78 and \$36 Million in
FY79.
4. Loan Terms: Forty (40) years, including a ten (10)
years grace period, on the repayment
of principal with interest at 2% per
annum during the grace period and 3%
per annum thereafter.
5. Project Description: This project provides for urgently
needed interim improvements, including
rehabilitation and expansion, for the
water and wastewater systems in the
Suez Canal Cities of Port Said, Ismailia
and Suez. Project elements include
improvements to water and wastewater
treatment plants, water distribution
and wastewater collection systems, the
latter including sewer cleaning, con-
struction of new water and wastewater
pumping stations and the construction
of a new 42 km long water transmission
pipe line extending southwest to the
AID financed Suez Cement Company.
6. Loan Application: The Government of Egypt has requested
AID to provide U.S. \$96 Million to
finance the foreign exchange costs of
the project.
7. Mission Views: USAID/Cairo has recommended authorization
for the proposed loan.
8. Source of U.S. Funds: FY 1978 Supporting Assistance.
9. Statutory Criteria: Satisfied: See statutory checklist,
Annex B.

10. Recommendation: That a loan in the amount of \$96,000,000 be authorized on terms and conditions set forth in the Draft Loan Authorization, Annex C.
11. Project Committee: USAID/Cairo
- Chairperson - Robert N. Bakley
Sanitary Engineer - Robert Theroux
Sanitary Engineer - Jack Snead
Loan Officer - Keith Brown
Legal Advisor - James Phippard

I. INTRODUCTION

1.01 The Government of the Arab Republic of Egypt (GOE) is presently engaged in a program to improve and expand water and wastewater utilities in five major cities. To assist the GOE, AID is financing the foreign exchange cost of feasibility studies and master planning of water facilities in Cairo, and water and wastewater facilities in Alexandria, Port Said, Ismailia and Suez. Additionally, AID is financing a study of Egypt's water and wastewater management and tariff structure. Interim recommendations from the Cairo and Alexandria studies resulted in project financing the rehabilitation and expansion of a water treatment plant in Cairo and the extension of the water system to low income residential homes (263-K-042) and the rehabilitation and expansion of Alexandria's Sewage System (263-K-044).

1.02 For the feasibility studies and master planning of water and wastewater facilities in the three Suez Canal cities of Port Said, Ismailia and Suez, Egypt's Ministry of Housing and Reconstruction (MOHR) contracted with the following firms:

<u>City</u>	<u>Consulting Engineering Firm</u>	<u>Date</u>
Port Said	Hazen and Sawyer	Oct. 27, 1977
Ismailia	Metcalf & Eddy Inc.	Oct. 21, 1977
Suez	Pirnie-Harris Int.	Sept. 8, 1977

These studies are not scheduled for completion until April, 1979. However, each contract required the consultant to submit special reports by May 15, 1978 identifying high priority projects for the water and wastewater systems of their respective cities. These special reports are now complete and include the feasibility studies for this project's design. In general, the systems suffered heavy damage during the 1967-73 war years and deteriorated due to non-use during this period when the cities were virtually abandoned. The systems presently are incapable of providing satisfactory service. Water distribution systems pressures fall to unsafe levels during periods of peak demand and water disinfection is erratic. Sewage backs up in dwellings and on streets, polluting surface waterways and lakes.

1.03 After a review of the special reports, the GOE formally requested AID assistance in financing the foreign exchange cost of certain urgently needed improvements to the water and wastewater systems of each of the three canal cities. (See Annex A). Therefore, this project is based on these high priority needs. The project's various elements are compatible with GOE planning and have a high probability of conformity with the master plans due in 1979.

1.04 The total foreign exchange cost for the high priority needs is \$96 million. This project was included in the FY 78 congressional presentation at \$60 million. We therefore are requesting that \$60 million be financed this year and the remainder of \$36 million financed in FY 1979 following a congressional notification. This paper, therefore, is written for the full \$96 million project. The project elements to be financed in FY 78 and those to be financed in FY 79 have been divided and are shown in the technical analysis and financial section of this paper. The GOE will finance all Egyptian currency costs.

II. THE CANAL CITIES

A. Description of the Canal Cities

2.01 The general locations of the Canal Cities (Port Said, Ismailia and Suez City) are shown in Figure 1. The present activities and future development of all three cities are basically related to the Suez Canal. The Canal cities suffered heavy damage and were evacuated during the war years between 1967 and 1973. They were re-opened in 1974, and have experienced rapid population growth to or beyond their pre-war levels.

2.02 Port Said is the northernmost city in the Canal Zone and is located on the Mediterranean Sea adjacent to the Suez Canal. The water and sewerage facilities of concern to this project are within the existing developed area of Port Said and Port Fouad, immediately across the Canal, and those areas of both cities which are proposed for reclamation and development. The study area is displayed in Figure 2. Lake Manzalah, which bounds the southern and western sides of Port Said, is shown in Figure 3. The area's 1978 population is estimated at 271,500, and the Port Said Master Plan targets a year 2000 population of 750,000.

2.03 The City of Ismailia lies on the west bank of the Suez Canal, approximately mid-way between Suez and Port Said. The present study area population is estimated at 243,000, and the Ismailia Master Plan forecasts a year 2000 population of 560,000. The study area for Ismailia includes the city itself, Lake Timsah, and the portions of the Suez Canal immediately north and south of the Lake. Figure 4 shows this area.

2.04 Suez City is located at the southern entrance to the Suez Canal, 124 km east of Cairo and 150 km south of Port Said. Suez has developed into an important sea port and center of heavy industry, with a present population estimated at 220,000. The Suez Master Plan, completed in 1976, envisions rapid growth to a year 2000 population of 1,000,000. Figure 5 shows the study area. The economic setting of Suez is dominated by industrial activities, navigation in the Suez Canal, quarrying and fishing.

B. Existing Water and Sewerage Systems

2.05 Annex E contains detailed descriptions of the existing Canal cities' water and sewerage systems, together with identifications of the systems' deficiencies. That information is summarized in the following paragraphs.

2.06 All of the cities obtain their raw water supplies from the River Nile via the Ismailia-Port Said-Sweetwater Canal system. Water treatment includes coagulation, sedimentation, filtration, and chlorination. The treatment plants are presently undergoing reconstruction to repair damage suffered during the war and the subsequent years of non-use. In addition, enlargements of the plants are under construction.

2.07 The water distribution systems obtain their water supplies and pressure almost entirely from storage tanks and pumping stations located at the treatment plants. Water is distributed through cast iron, ductile iron, and asbestos-cement pipes varying from 100 mm to 800 mm in diameter. About 70% of the population have water service into their dwellings, with the balance served by public fountains.

2.08 The Canal cities' sewage collection systems, due to the flat topography, consist of short gravity sewers leading to pumping stations from which force mains deliver the sewage to treatment plants, surface drains, or adjacent water bodies. Approximately 60% of the residents have sewer service. Sewers are vitrified clay pipe, 180 mm to 600 mm in diameter, and have mortar joints. Because house connections are made only at manholes, manhole spacing is close about 30 meters.

2.09 The Mazrah sewage treatment facility at Port Said includes three separate plants - primary clarifiers, trickling filters, and activated sludge, all of which are being bypassed while war damage is being repaired. Plant effluent (presently raw sewage) discharges into Lake Manzalah. Ismailia has a high rate trickling filter plant, which is presently under repair and in partial operation. Plant effluent discharges into a drain leading to Lake Timsah. Suez has a primary sewage treatment plant which is in partial operation. This plant does not have any construction activity underway, pending completion of the master planning work. Plant effluent is used for local irrigation or discharged via a drainage channel into Suez Bay.

2.10 The most serious deficiencies in the existing water systems are insufficient raw and finished water pumping capacity, inadequate chemical feed and coagulation, haphazard chlorination, overloaded distribution pipes, and excessive water leakage and wastage.

2.11 The sewerage systems' deficiencies are even more serious. The sewers are partially clogged, pumping station wet wells are too small, many of the pumps are inoperative, and the force mains

are broken or undersized. The result is raw sewage backing up into dwellings and onto streets. Much of the sewage never arrives at the treatment plants, making its way by surface or piped flow to Lake Manzalah, the Suez Canal, Lake Timsah, or Suez Bay. What sewage does get to the plants receives little effective treatment before discharge into those same water bodies.

C. Organization, Management and Labor

2.12 The organizations directly involved in this project and their functions are:

- The Suez Canal Authority (SCA):
Designs, constructs, operates and maintains the water systems in all three Canal cities.
- The General Organization for Sewerage and Sanitary Drainage (GOSSD):
Designs and constructs the sewerage systems in all three Canal cities.
- The Governorates of Port Said, Ismailia and Suez:
Operate and maintain the sewerage systems in their respective cities.

1. Comments on Organizations

2.13 The principal activity of the SCA is the operation and maintenance of the Suez Canal. The SCA also has a number of subsidiary functions one of which is the planning, design, construction, operation and maintenance of the potable water systems serving the urban areas of Port Said, Ismailia and Suez. The SCA originally went into the water business to service its canal operations and to convenience its own employees. It would prefer to be relieved of its water activities, or at least avoid enlarging them. This circumstance is not compatible with long-range planning needs, especially for an area which is anticipated to triple in population by the year 2000.

2.14 The SCA organization chart is shown in Annex F. The water organization includes 22 managers and professionals, 138 mechanics and laborers assigned to the distribution system, and 162 assigned to the treatment plants. Some management personnel are sent abroad for training but there is no top-to-bottom organized training program. SCA does not have adequate drawings and maps of its facilities, tools, or spare parts. SCA's water

tariffs are set by the governorates. The tariffs are such that they provide less than half the revenues required to operate and maintain the facilities. The SCA covers the deficit from its profitable canal operations, thus reducing the net proceeds which the SCA turns over to the GOE.

2.15 The management, professional staff and water system operations of SCA are motivated and competent, and are doing an excellent job under adverse circumstances.

2.16 GOSSD plans, designs, and constructs sewerage systems throughout all of Egypt, and also operates and maintains the systems serving Alexandria, Cairo and Helwan. Its organization chart is shown in Annex G. GOSSD employs some 12,000 people, many of whom are under-utilized having been employed under a GOE policy assuring university graduates a position in public enterprise regardless of need. The technical competence of GOSSD's staff is difficult to assess. Design details in the existing canal cities' sewerage system appear to be poorly conceived, and GOSSD's operation and maintenance of the Cairo and Alexandria systems are far from perfect. GOSSD has no organized training program.

2.17 The Governorates of Port Said, Ismailia and Suez operate and maintain their respective sewerage systems. Their organization charts are shown in Annexes H, I and J respectively. Their staffs include managers, engineers, technicians, skilled laborers, unskilled laborers, drivers, guards and clerks. The aggregate employment is as follows:

TABLE II-1

GOVERNORATES SEWERAGE SYSTEM STAFF

Port Said	-	400
Ismailia	-	203
Suez	-	<u>235</u>
Total	-	838

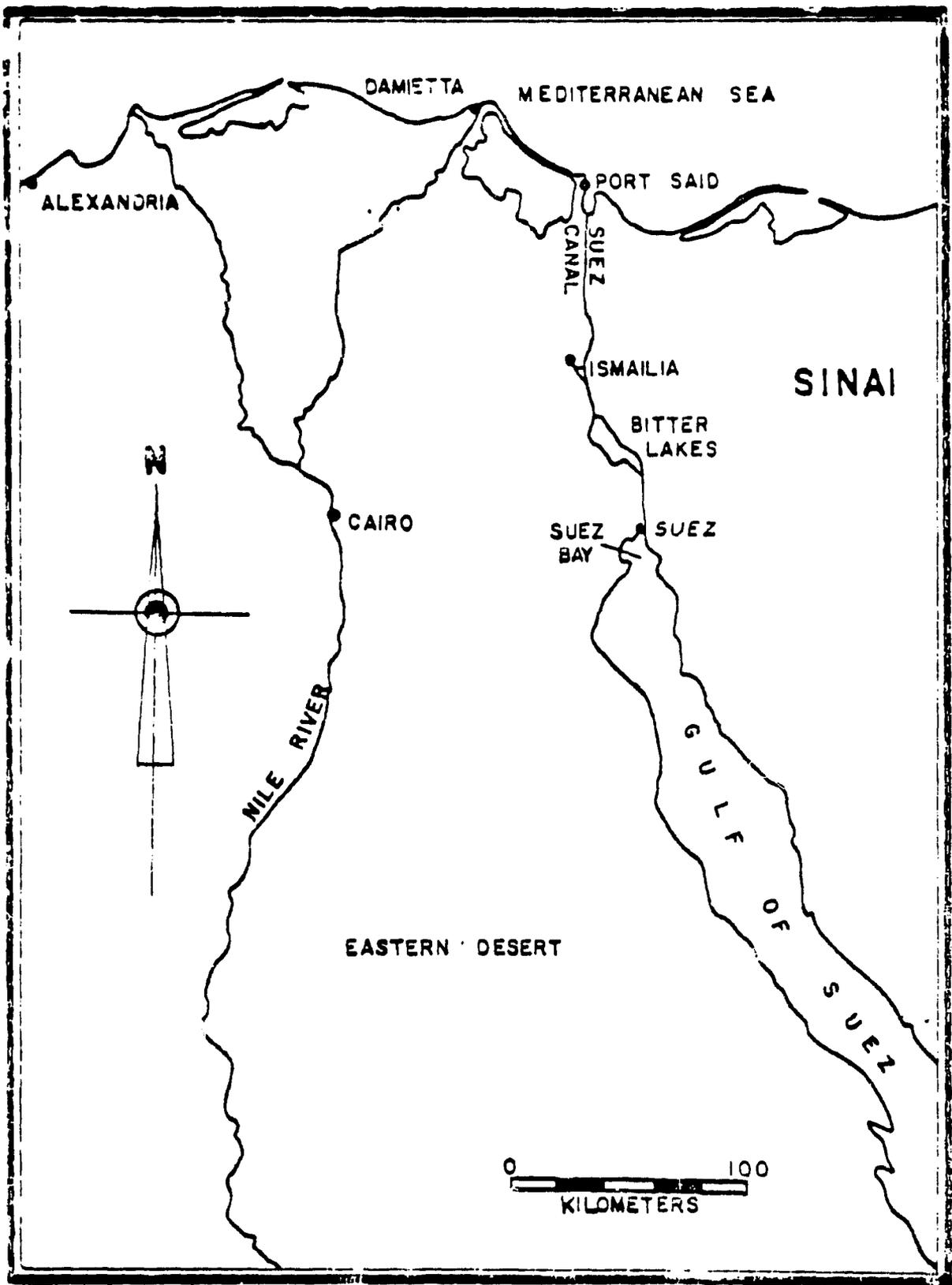
2.18 The governorates' sewage operations staff has exhibited considerable ingenuity in keeping their inadequate collection systems functioning, largely on a crisis-to crisis basis. There is little or no attempt to treat the collected sewage. Again, there is no organized training programs for personnel.

2.19 Sewerage funding is worse off than water. GOSSD constructs the facilities and the governorates operate and maintain them, all at no cost to the users whatever, except for connection

charges. Therefore, the sewerage system must compete at the central budget with all other operating and capital improvement needs of Egypt's public sector.

2. Management and Tariff Study

2.20 Given the chaotic conditions that exist in the organization, management and finance of the water and wastewater sector, the GOE requested AID assistance in financing an intensive study of this sector's management and tariff. A contract for this study was entered into between MOHR and a joint-venture consisting of Black & Veatch International and A.T. Kearney, Inc., two U.S. consulting firms. Interim reports are due on March 31, 1979 and draft final reports on June 30, 1979. The Scope of Work for this study is available from USAID/CDE or ME/PD files.



CANAL CITIES LOCATION MAP - FIGURE 1

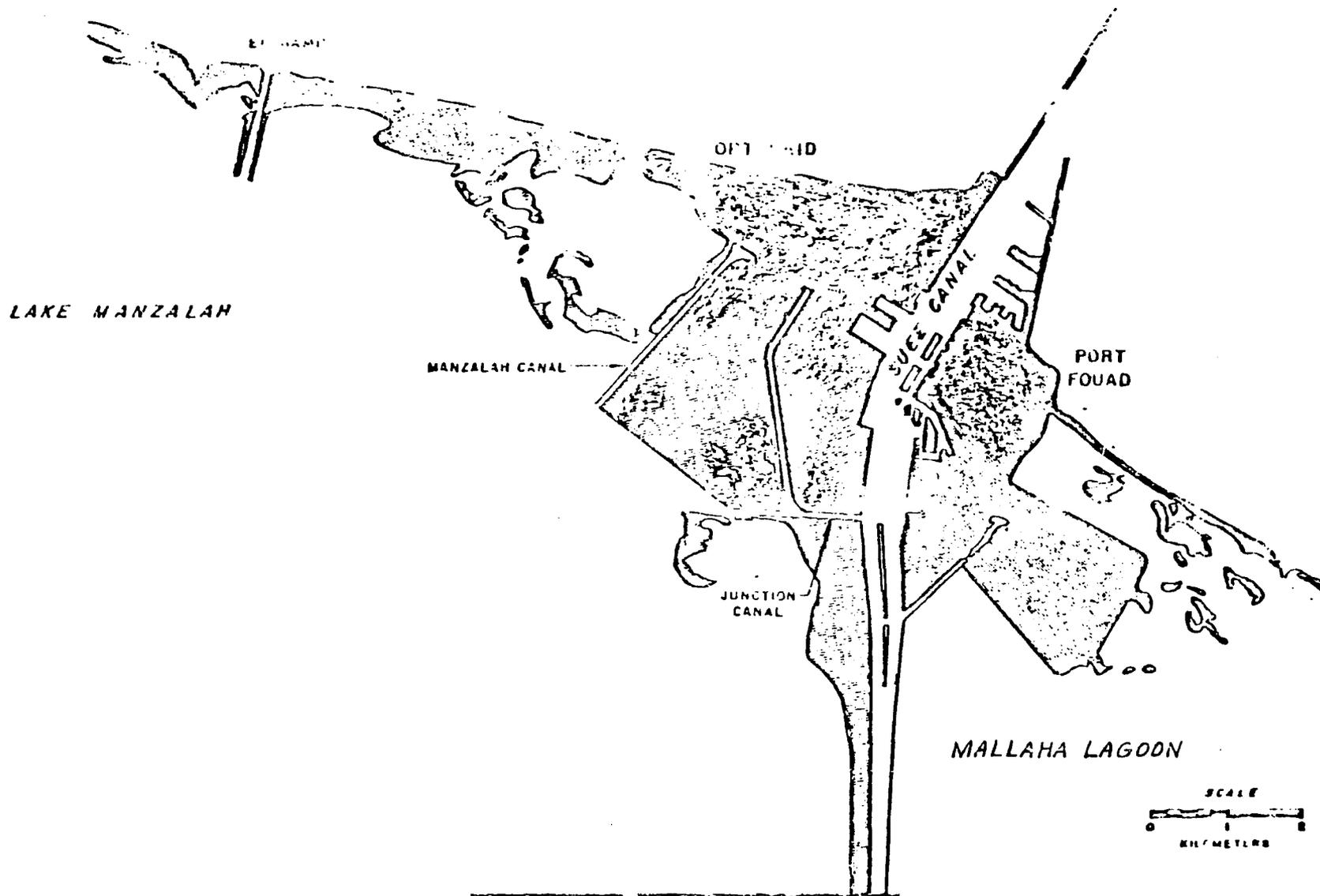
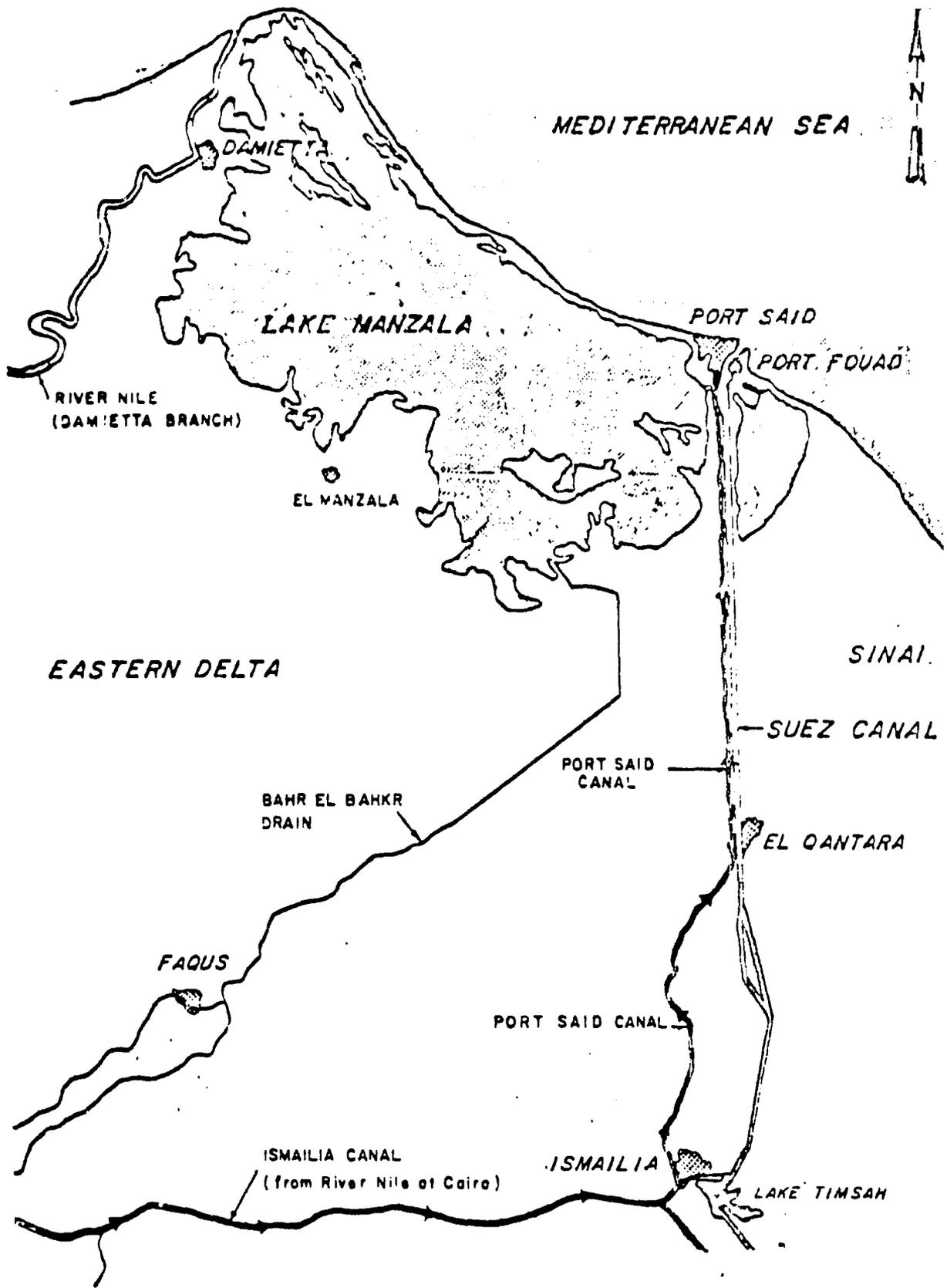
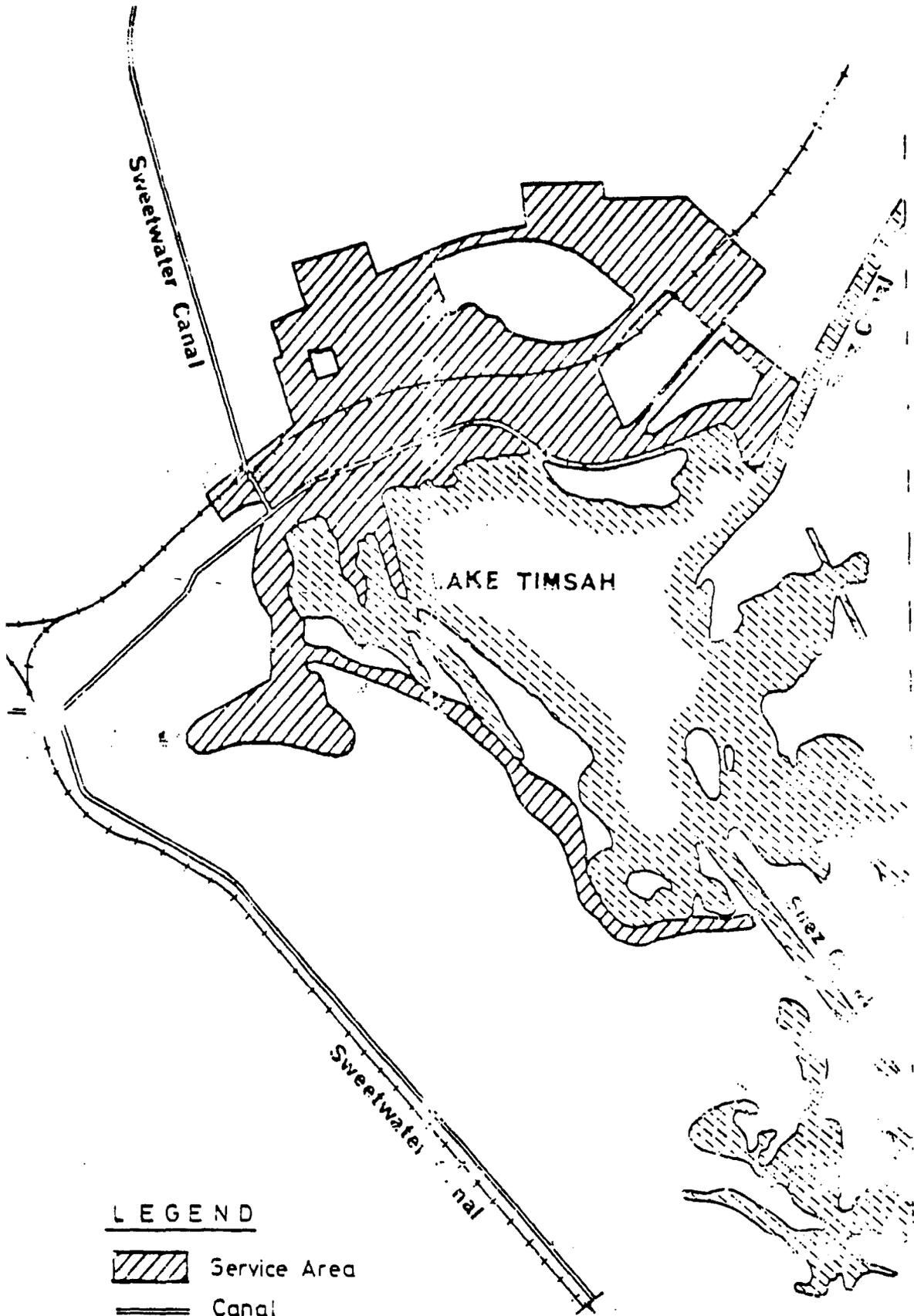


FIGURE 2
MAP OF PORT SAID

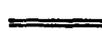
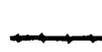


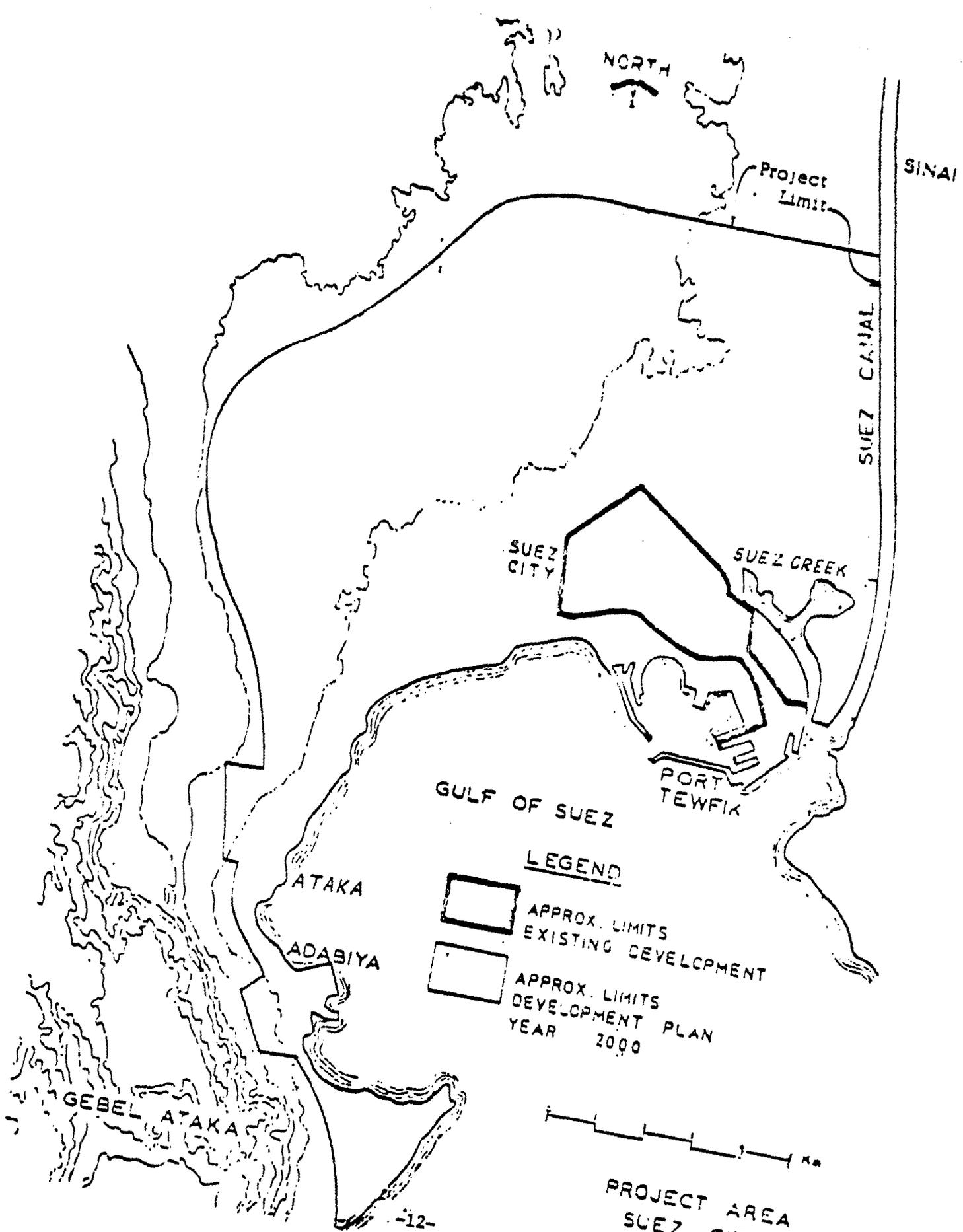
SCALE 1 : 500,000

MAP OF LAKE MANZALA - FIGURE 3



LEGEND

-  Service Area
-  Canal
-  Railroad



PROJECT AREA
SUEZ CITY
FIGURE 5

III. THE PROJECT

A. Goal and Purpose

3.01 The project goal is to improve the living conditions of the residents of the three canal cities by providing effective water and wastewater facilities. The project purpose is to provide urgently needed interim improvements to the water and sewerage systems of Port Said, Ismailia and Suez. A logical framework is included as Annex L.

B. Description

3.02 The project is based on the special reports submitted by the Canal cities' consultants on May 15, 1978 which identified the high priority works needed to restore water and sewage system reliability. Water system improvements for each city have been classified as treatment and as distribution system improvements. Similarly, sewerage system improvements for each city have been classified as treatment and as collection system improvements. All together there are 12 elements. The total costs are approximately \$96.0 million in foreign exchange and L.E.50.0 million in local costs. Following is a listing of each element, by city, with the estimated cost associated with that element. (Table III-1).

3.03 For the FY 78 program, project elements 1,3,7, 9 and 11 and portions of elements 5 and 10 will be funded. The remainder will be funded in FY 79. Following is a listing of those elements to be funded in FY 78, by city (Table III-2).

C. Beneficiaries:

3.04 The benefit to be derived from the project is correction of existing conditions which are adverse to the health, convenience, and safety of the Canal Cities' inhabitants. These conditions include insufficient water pressure at times of peak usage, unreliable water treatment and disinfection, inadequate water for fire demands, back-ups of sewage in buildings, overflows of sewage onto streets, discharge of raw sewage into surface drains and Lake Manzalah, Lake Timsah, and Suez Bay, and lack of the piped water service and sewers for approximately one third of the cities' residents.

3.05 The main thrust of the project is to restore to operable condition existing water and sewerage facilities which were damaged in the 1967 war or which subsequently deteriorated due to non-use while the cities were abandoned. Pending the April 1979 completion of the water and sewerage master planning studies now in progress, primary attention has been given to providing facilities to serve the present population plus that expected by 1982. In some cases, the

immediately required improvements will actually be adequate until 1990 or longer. Project elements have been limited to those which have a high probability of conformity with the anticipated year 2000 master plans. For this reason, the project does not include facilities for final disposal of sewage effluent beyond that now existing or required immediately for hydraulic relief since alternative disposal options (and their associated treatment requirements) are still under study.

3.06 The project will benefit 735,000 persons now residing in the Canal cities and the projected 1982 population of 998,000.

Table III - 1

Project Elements and Costs - All Years
(000) ¹

<u>A. Port Said</u>	<u>LE</u>	<u>\$US</u>	
1. Water Treatment	970	3,035	
2. Water Distribution	<u>619</u>	<u>1,428</u>	
Sub-Total	1,589		4,463
3. Sewerage Treatment	584	687	
4. Sewerage Collection	<u>4,203</u>	<u>6,512</u>	
Sub-Total	<u>4,787</u>		<u>7,199</u>
PORT SAID TOTAL	6,376		11,662
<u>B. Ismailia</u>			
5. Water Treatment	2,735	11,272	
6. Water Distribution	<u>3,567</u>	<u>6,189</u>	
Sub-Total	6,302		17,461
7. Sewerage Treatment	2,451	12,178	
8. Sewerage Collection	<u>14,172</u>	<u>17,235</u>	
Sub-Total	<u>16,623</u>		<u>29,413</u>
PORT ISMAILIA TOTAL	22,925		46,874
<u>C. Suez</u>			
9. Water Treatment	945	2,118	
10. Water Distribution	<u>8,254</u>	<u>26,035</u>	
Sub-Total	9,199		28,153
11. Sewerage Treatment	539	183	
12. Sewerage Collection	<u>11,389</u>	<u>8,804</u>	
Sub-Total	<u>11,928</u>		<u>8,987</u>
SUEZ TOTAL	<u>21,127</u>		<u>37,140</u>
GRAND TOTAL	50,428		95,676

¹ Exchange Rate: \$1.40 = L.E. 1.

Table III - 2

FY 78 Program
(000)

<u>Port Said</u>	<u>LE</u>	<u>SUS</u>	
Water Treatment	970	3,035	
Sewerage Collection	<u>4,203</u>	<u>6,512</u>	
Sub-Total			5,173 9,547
<u>Ismailia</u>			
Water Treatment	2,565	7,421	
Sewerage Collection	<u>14,172</u>	<u>17,215</u>	
Sub-Total			16,737 24,656
<u>Suez</u>			
Water Treatment	945	2,118	
Water Distribution	4,470	14,796	
Sewerage Collection	<u>11,389</u>	<u>8,804</u>	
Sub-Total			17,204 25,718
TOTAL			39,114 59,921
			<u><u>40,000</u></u> <u><u>60,000</u></u>
Rounded to:			40,000 60,000

IV. TECHNICAL ANALYSIS

A. Technical Problems:

4.01 A serious problem which affects both water and sewage flows is excessive water wastage; that is, water which enters private and public buildings via the water systems and subsequently leaves those buildings via the wastewater systems without having served any useful purpose. Such wastage is due to leaking faucets and toilet mechanisms, careless water use habits such as not bothering to shut off faucets, and possibly due to user attitudes that continuously flowing water is purer. Quantifying this wastage is difficult because many of the house water meters are missing or inoperative. However, the evidence available indicates that between 25% and 50% of the supplied water is so wasted. The problem is underlain by the very low water rates, which provide little incentive to conserve water.

4.02 Two approaches are expected to alleviate the water wastage problem. One is that the AID-financed management and tariff study, now in progress, will address the matter of realistic water rates. Presumably, the study will recommend increased water tariffs in order to obtain sufficient revenue for operation and maintenance and for a reasonable return on invested capital. This would provide incentive for water customers to repair leaking fixtures and to revise their water use habits.

4.03 The other approach is to improve the quality of plumbing fixtures manufactured in Egypt. The design of faucets and toilet mechanisms in common use in the canal cities are outmoded and the fixture are leak-prone. Both design and quality control could be improved by importing U.S. technology and manufacturing equipment. The most likely means of accomplishing this is through the Industrial Production Project which AID is proposing as a FY 78 project. This project would provide a \$50 million loan/grant to GOE for use by the Ministry of Industry to modernize manufacturing facilities and technologies. We believe that provision of a moderate amount of these funds to public sector manufacturers in the plumbing fixture product available to the public and helps to alleviate the area would significantly improve the quality of products available to the public and help to alleviate the leakage problem.

4.04 A problem which affects the sewerage systems is excessive infiltration. This^{is} a result of the high ground water level in the canal cities, combined with an inferior type of sewer pipe joint. Locally manufactured bell and spigot clay pipes are used, employing jute and mortar joints. Such joints eventually crack, allowing ground-water to enter the sewers. This situation increases the amount of flow in the sewers, in turn requiring larger collection systems and treatment plants. There is no practical solution for the sewers

already in place. However, new sewers should be constructed using modern pre-molded plastic or rubber joints. Such joints are now virtually universal in the U.S. They are fabricated by the pipe manufacturers, using various alternative detail designs. They simplify pipe installation in the sewer trench, in that the spigot end of one pipe is merely shoved into the bell end of the next, and no motoring is needed. This greatly reduces the chance of joints being poorly made or of cracking due to subsequent settlement of the pipe, and consequently leaking of joints is virtually eliminated.

Sewer pipes with performed joints are not manufactured in Egypt. Again, we propose to make use of the above-mentioned AID supported Industrial Production Project as a means of inducing Egyptian pipe manufacturers to expand their production capabilities to include pre-molded joints.

4.05 A problem which concerns the water systems is the adequacy of raw water supply. The canal cities obtain their water supplies from the River Nile via the Ismailia Canal from Cairo. An extension of the Ismailia Canal known as the Port Said Canal serves Port Said, and an extension called the Sweetwater Canal serves Suez. This canal system is under the jurisdiction of the Ministry of Irrigation (MOI) and serve many irrigation and industrial customers in addition to the canal cities.

4.06 The Port Said Canal water level occasionally falls too low to adequately feed the intake at Port Said's El Raswa water treatment plant. MOI sometimes uses the herbicide Mangacide H for weed control in its canal system, which contains acrolein. This substance is specifically prohibited for potable water sources in the U.S. Further, preliminary analyses indicate degradation of Sweetwater Canal water quality due to salinity increases as the water moves toward Suez.

4.07 The MOI has assured us that they plan to enlarge or parallel portions of their canal system to increase capacity and improve other water quality, that they will provide all water needed for the canal cities, and that they will avoid the use of prohibited herbicides. However, the exact nature and timing of MOI's planned physical improvements and operational changes have not been made available to us. We have taken steps to obtain further information in this regard, and will make assurance of satisfactory canal improvements a GOE covenant for this project.

B. Selection of Project Elements

4.08 For each of the three canal cities, the compelling objectives are:

- To eliminate ponding of sewage on streets and other surface areas, and sewage discharges into surface drainage systems.

- To provide adequate quantities of safe water at satisfactory pressure.
- To eliminate discharges of raw or inadequately treated sewage into Lake Manzalah, Lake Timsah, and Suez Bay.

The selection procedure was simple for some parts of the project elements which amounted to repair or replacement of broken or missing equipment. In such cases it was only necessary to determine that the restored item would be required for the satisfactory functioning of the system of which it was a part, and that the system itself had a high probability of conformity to the anticipated master plans. This was the case for most of the mechanical equipment at the water and sewage treatment plants, water distribution system repairs, sewer cleaning and repairs, and sewage pump station and force main repairs.

4.09 Other projects elements, or parts of project elements, involved providing new facilities to increase capacity, improve reliability or safety, or to extend service to existing and developing areas which do not presently have water and/or sewerage services.

C. Discussion of Project Elements

4.10 Element No.1. This element includes minor improvements to the existing Port Said water treatment plant, such as raw water intake screens, back wash pumps, weir repairs, flow meters, flow baffles, and chlorinators. Upon completion of this work plus major plant revisions and enlargements now under contract with CTE and Bamag (not part of this project), the entire plant will have a capacity of 211,000 m³/day. or 8,792 m³/hr. However, the raw water pumping capacity is only 5,160 m³/hr and the finished water 5,000 m³/hr. Therefore, this project element includes conversion of the existing station which houses both raw and finished water pumps to solely raw water pumping, and includes a new finished water pumping station. In both cases, the firm pumping capacity will be 9,000 m³/hr. Operation and maintenance training for the new equipment will be provided in the form of O and M manuals and on-the-job demonstrations. This element will be funded from FY 1978 funds.

4.11 Element No.2. This element includes repair and replacement of defective Port Said water distribution system valves, fire hydrants, and retail water meters, and provision of new maintenance tools and equipment. Because of consistently low water pressure in the north-west portion of the city, this project element also includes a new 3.5 km long 800 mm pipeline in the area north and west of the Manzala Canal. This element will be financed from FY 1979 funds.

4.11 Element No.3. This element includes sewer cleaning, TV inspection, and repairs to restore the Port Said sewers to their design capacity. The project also includes major rebuilding of several seriously deficient sewage pump stations and their related force mains, and eliminates seven existing pump stations by constructing deeper sewers. This change from pumping to gravity sewers where feasible will reduce operation cost and improve system reliability. This element will be financed from FY 1978 funds.

4.13 Element No.4. This element provides improvements to make the best use, on an interim basis, of Port Said's Mazrah sewage treatment plant, pending completion of studies of the capacities of Lake Manzalah and the Suez Canal to accept various amounts and qualities of sewage effluent. The improvements consist of revision of the flow patterns of the existing three treatment trains to maximize sedimentation capacity, restoration of the existing activated sludge units to provide some secondary treatment, construction of an anaerobic sludge lagoon followed by sludge drying beds, provision of basic sewage laboratory equipment and includes O and M manuals and on-the-job training. These relatively low-cost items have a high probability of compatibility with future increases of plant capacity and/or increased plant effluent requirements, and in the meantime will provide basic sewage treatment for the effluent being discharged into Lake Manzalah. This element will be financed from FY 79 funds.

4.14 Element No.5A. This sub element provides improvements to Ismailia's existing water treatment plant consisting of new intake screens, metering, clarifier launders, valves and gates. This sub element will be funded in FY 79.

4.15 Element No.5B. This sub element provides chlorination, chemical and coagulation equipment, together with a new high service pump station to replace the existing facility, which will have inadequate capacity beyond year 1980 and whose pumping equipment has served its useful life. The new pump station will include standby diesel generators. O and M manuals and on-the-job training are included. This sub element will be financed from FY 78 funds.

4.16 Element No.6. This element improves Ismailia's water distribution system by providing repair equipment, a meter testing and repair shop, interconnection of existing water mains, and replacement of 10 km of old and/or undersized pipelines. The work also includes a booster pumping station and 10,000 m³ ground storage reservoir at Sheikh Zayed, and pipelines to improve service to the developing areas at El Hekr, Abu Atwa, Manshaat

Shohada, Corporation Beach, and the west Ring Road Industrial area. These areas at present have insufficient pipeline capacity or are served only by public fountains. This element will be financed from FY 1979 funds.

4.17 Element No.7. This element includes cleaning, TV inspection, and repair of Ismailia's sewers and provision of sewer maintenance equipment. It also replaces five sewage pump stations which have inadequate wet well and pump capacity, and four force mains which are undersized and/or in poor structural condition. The work includes providing service for unsewered areas of El Hekr, Batini, and Manshaat Shohada. This element will be financed from FY 1978 funds.

4.18 Element No.8. This element provides rehabilitation and improvements to Ismailia's existing sewage treatment plant. Included are cleaning of trickling filter media and underdrains, repair of filter distribution arms, reconstruction of damage concrete clarifiers, repair of clarifier mechanisms, new bar screen, repair of operations building and laboratory, revised chlorine storage and feeding facilities, repair of recirculation pumps, sludge piping changes, a unit to screen and aerate truck-delivered septage for subsequent discharge into the sewage treatment plant, an additional effluent outfall, and a perimeter security fence. O and M manuals and on-the-job training are also included. The revised plant will have a capacity of 47,000 m³/day vs. present capacity of about 18,000 m³/day. This element will be financed from FY 1979 funds.

4.19 Element No.9. This element provides certain improvements to Suez existing water treatment plant, over and above those now under construction by CTE and Bamag (which are not part of this project). These additional improvements include flow meters, chlorination facilities, replacement of existing diesel-driven raw water pumps with 71,000 m³/day electrically-driven pumps, a new 112,000 m³/day finished water pumping plant, diesel generator units to provide standby power for 50% of the plant's needs, are related O and M manuals and training. This element will be financed from FY 1978 funds.

4.20 Element No. 10A. This sub element augments Suez's water distribution system by providing extensions of the transmission mains so that adequate pressures and flows can be maintained, replaces a number of undersized and tuberculated distribution pipes, provides water mains to developed and developing areas not now served, and provides system maintenance equipment. This sub element will be financed from FY 79 funds.

4.21 Element No. 10B. This sub element is the southwest transmission main. This 400 mm to 900 mm pipeline extends from the water treatment plant for 42 km south and west to the AID financed portland cement plant now under construction by the Suez Cement Company. The pipeline, including its associated pumping stations and storage tanks, will serve the cement plant and the developing area between Adabiyah and Ein Sukhna. This transmission line will also supply water for Adabiyah port and cold storage facilities which are to be improved as part of the Port of Suez development which AID is proposing to finance as an FY 78 project. This sub element will be financed from FY 78 funds.

4.22 Element No. 11. This element provides for cleaning and inspection of 40 km of existing Suez sewers, and their repair or replacement to the extent required following inspection. Also included is repair, re-equipping, or enlargement of three sewage pumping stations and provision of new related force mains. In addition, the work includes gravity sewers to serve existing developed and developing areas within and along the western side of the existing city area, sewerage of industrial areas west of the city, and a major pumping station and force main to serve a portion of the presently unsewered areas. This element will be financed from FY 78 funds.

4.23 Element No. 12. This element restores and enlarges Suez' sewage treatment plant. The work will include adding two new primary clarifiers to the existing two, providing control structures, flow metering equipment, electrical work, laboratory equipment, and access road improvements, the enlarged plant will provide about 56,000 m³/day of capacity for primary treatment only. Following master plan investigations now in progress, the need for secondary treatment can be determined to comply with the final recommendations concerning effluent disposal into Suez Bay or to land area. In any event, the primary treatment provided by this project element will be necessary. O and M manuals and on-the-job training are also included. This element will be financed from FY 1979 funds.

D. Cost Estimate

4.24 The dollar portion of each element is the estimated cost of U.S. manufactured products delivered to Egypt plus U.S. professional engineering, technical supervision, and training services. The LE portion of each element is the estimated cost of Egyptian products, construction work, transportation of U.S. products within Egypt, and Egyptian technical services.

4.25 The cost estimates assume that the U.S. engineering firms who are preparing the water and sewerage master plans for each city will provide the detailed designs, construction supervision, and training services, since they are already familiar with the project areas and the existing systems. This work was estimated at 15% of construction cost.

4.26 A contingency item of 20% of construction costs has been added to allow for unknown items, necessary because of the preliminary level of the engineering performed to date, the lack of reliable as-built drawings of the existing works, and the nature of the work which is largely rehabilitation or add-ons to existing facilities.

Cost escalation factors have been applied based on 10% per year for dollar costs and 25% per year for LE costs, extended to the estimated dates when the costs will be incurred.

4.27 The above items - engineering, contingencies, and escalation, are included in the estimated cost for each project element shown in Table III-1 so that the total cost of each element can be considered separately. Detailed cost estimates are included in the consultants special reports and are available in the project files.

E. Technical Assistance:

4.28 The various elements which comprise this project have been developed by the U.S. consulting engineering firms assigned to the three respective canal cities with appropriate coordination with SCA, GOSSD and the governates. These same firms will prepare equipment purchase specifications and construction plans and specifications, review bids, provide construction management including inspection, supervise initial operation of the new facilities and instruct operation and maintenance personnel. All of this activity will be monitored by USAID/Cairo project officers and engineers. The continuous supervision by U.S. specialists, acting as advisors to SCA and GOSSD, is necessary to assure that the project will be completed correctly and on schedule.

4.29 The type of technology required by this project is fully within the capabilities of large U.S. firms specialized in water and sewerage engineering. In fact, it is our intention to avoid any advanced or sophisticated facilities which would unduly complicate procurement and construction and which would probably prove to be beyond the operation and maintenance skills of the user organizations' staffs.

4.30 It is recognized that the U.S. firms and AID cannot implement the project without the active cooperation of GOE, SCA, GOSSD, and the governates in the areas of finance, administration, and technical decisions. The assurance of such cooperation will be spelled out in the conditions precedent and the covenants.

V. ENVIRONMENTAL ASSESSMENT

A. Introduction

5.01 A "Threshold Decision Based On Initial Environmental Examination" was approved by the USAID/Egypt Mission Director on January 31, 1978 and it recommended the preparation of an environmental assessment (Annex M). The consultants for the respective cities conducted environmental assessments as they pertain to the high priority works and a presentation of their findings and conclusions is presented below. The project provides for major construction and repair in order to rectify deficiencies in the water and wastewater systems under a master plan that will allow for the sustained improvement and growth of the Canal Cities. The execution of the project can result in very significant improvements in environmental health with few long-term adverse effects.

B. Background

1. Sewage

5.02 The residents of the Canal cities, Port Said, Ismailia and Suez, in anticipation of prolonged peace in the area, have renewed their demands for potable water and proper sewage disposal. War damage, and neglect during the intervening years, have resulted in major deficiencies in the systems. The cities are faced with rapid population growth and a need to provide all basic services to the inhabitants. The deficiencies within the sewerage and water systems act as serious impediments to the improvement of the quality of life and future growth of the Canal Cities.

5.03 Common sights in all three cities include puddles of wastewater blocking roadways and ingress to houses, open manholes, and discharge of raw sewage from residences through uncovered drains. The pools of sewage cause odors and provide breeding grounds for flies, mosquitoes and other insects. Many residents use streets or other open spaces in place of indoor facilities for elimination. Wastes discharged to open drains are easily accessible to children, as well as pedestrians. The broken sewers, construction debris and solid waste accumulations provide ideal habitat for rats which may transmit diseases. Dead rats are frequently seen on the streets.

5.04 The sewage pump stations are frequently out of service. Portable pumps are used to lift wastewater from wet wells to force mains. Open manholes and portable pumps create a hazard to residents, particularly children. They are a hindrance to the free flow of traffic and result in noise and unsightly esthetics.

5.05 Raw or inadequately treated sewage is discharged into drainage channels, canals or directly into the Suez Canal, Lake Manzalah, Lake Timsah, and Suez Bay, creating nuisance and health dangers.

2. Water

5.06 The water distribution systems and the water treatment plants are generally in better condition than the sewerage systems. However, low pressures in some areas and interruptions of service provide opportunities for contamination of the water supply by back siphonage. Inadequate chlorination facilities cause finished water disinfection to be erratic.

5.07 About 30% of the cities' population is serviced primarily by standpipes. Stand-pipes are often vandalized, and may leak continuously creating pools of water. The number of stand-pipes is insufficient to serve all the residents' needs. In some areas shallow private wells also constitute a source of supply of uncertain quality.

5.08 The water supply systems include an agglomeration of treatment facilities - rapid filters, slow filters, coagulation, chlorination, and other processes having been contributed by one or another contractor since the 1920's. Operation of the systems is complex and pipelines may parallel one another in the same area with clogging, defective valves, or other flow interference as well as a sometimes insufficient source of supply. At Port Said, for example, seven separate water treatment systems are either under construction or operating in parallel to contribute to the single total water treatment plant system for potable water. The supply of incoming water is at present only marginally adequate through the canal system from the Nile.

C. Alternatives

1. Maintain the Present System

5.09 Raw sewage currently is discharged directly into the nearest adjacent water: Suez Bay, the Suez Canal, drainage channels, or lakes adjacent to the cities. This would be the most economical option. Sewage pipes could be required and unclogged to move the water off the streets and away from immediate contact with humans. As a first step in disposal, this alternative is better than living in the accumulated waste. On the other hand, a large number of persons use the waters adjacent to the towns for recreation, fish production, or other uses and a health hazard would persist as long as the untreated sewage is available in the vicinity of humans.

2. Remove Wastes to Deep Water

5.10 A second option available at Suez and Port Said, but not at

Ismailia, is to enclose the sewage in pipelines and pump it well into the Mediterranean or the Red Sea. If piped for a sufficient distance and permitted to diffuse into sea water, the pathogenic organisms would die and the nutrients would be available for possible improvement of fishery production. It would be impossible to assure that there would be zero contamination of fishes in such a case since fish in the area could eat raw sewage and be quickly caught by fishermen. It would be possible for the sewer outfall to be identified on maps and for deep water fishing to be discouraged in the area. Fishes are migratory, but by the time they would be caught elsewhere, decontamination should have occurred. If the wastes included industrial products, such as mercury, it would be possible to have the pollutant reconcentrated in food fishes at concentrations harmful to humans.

3. Remove Sewage To Sand Desert and Permit Evaporation or Seepage Into the Ground

5.11 This alternative might require long, expensive pipelines and a series of pump stations but would not require that the sewage be treated before disposal. Since there would be plenty of sand to filter out pathogens and particles, some of the water would be added to the useful groundwater supply and could assist in renewal of well water in irrigated areas. Suitable disposal areas are not available near Port Said. However, they may be available at some distance from Ismailia or Suez. There would be a potential hazard to nomads or tame or wild animals that happen to be passing through the area and need water. Thus, it would be possible for human contamination to occur either directly or indirectly.

4. Partially Treated Water Pumped for Use On Irrigated Crops

5.12 After minimal treatment at a collecting sewage plant, the water could be pumped and distributed for use in irrigation or in the development of new crop land. Particularly, this would be a viable option if there were a water shortage. Water would have to be pumped at considerable expense, however, and less expensive irrigation water is likely to already be available from the Nile River canals. There does not appear to be a need for the more expensive water. The need for irrigation water is seasonal and the sewage water would flow continuously. There would have to be large holding areas or alternative disposal when water was not needed; again these would be very expensive.

5. Discharge of Treated Water

5.13 Properly treated, the wastewater would be beneficial to the environment. It could be discharged after treatment into seas or lakes and diffused to provide nutrients for increased fish production. The Mediterranean and Red Seas, as well as the nearby lakes are fished at near the limits of their productivity. The

addition of nutrients as fertilizer should be beneficial in increased fish harvest. The GOE gives high priority to aquaculture and properly treated sewage wastes could add to the productivity of fish ponds.

6. Ponding for Self Purification

5.14 A part of the sewage treatment process often involves holding waste waters for self purification through biologic reactions. An alternative disposal method would be to build dikes in the shallow lakes and use them as holding ponds for sufficient water purification. Eventually, the water could be permitted to enter the other portion of the lake through drainage or pumping. Partially completed dikes already exist in Lake Manzala near Port Said. It would be difficult to avoid human contact with such ponds either directly or indirectly and there would be both objectionable odors and unesthetic views for adjacent property owners. This alternative would be relatively inexpensive.

7. Sewage Treatment Plants

5.15 There are existing secondary sewage plants at Port Said and Ismailia, and a primary plant at Suez. These plants have been inoperative or only partially operative since the mid 1960's, and are being renovated and enlarged. Although the costs will be substantial, this is the only solution that assures relatively complete protection of human health. This alternative would provide water for re-use, if appropriate. However, it is anticipated that as long as an adequate supply of water is available from Nile River canals, river water will continue to be the choice of the population.

5.16 Rather than continue the haphazard development of various technologies in sewage treatment and disposal (trickling filters, activated sludge, land disposal, ocean disposal, re-use, etc.) it is highly desirable for a master plan to be developed and followed to provide integrated systems.

5.17 It must be recognized that insufficient information is available at this time to determine a "final" solution to the sewage treatment effluent disposal problem. Scientific data gathering and studies of Lakes Manzalah and Timsah, Suez Bay, and the Suez Canal are presently in progress to determine their assimilative capacities. The treatment plant restoration and enlargement work now underway or proposed in this project are limited to basic interim facilities which are almost certain to be needed regardless of final decisions which will be made regarding the fate of the effluents. In the meantime, substantial reduction of pollution will result from the effective operation of these interim facilities.

D. Impacts

5.18 The area of greatest concern is that of public health. In Egypt 20-25 percent of the population die before the age of five and enteric disease accounts for possibly 50 percent of infant and young deaths. The relationship between the incidence of enteric diseases and the quantity of good quality drinking water and safe disposal of wastewater is well demonstrated. It can readily be appreciated that there exist serious threats and there is a potential for increased risks in the canal cities due to deficiencies in both the water and sewerage systems.

5.19 The project will provide reliable drinking water and remove sewage wastes from the human environment. Replacement or improvement of sewage pump stations will generate significant beneficial impacts by eliminating the overflows of raw wastewater. This will substantially reduce exposure of residents to fecal contamination. Noise and odors, as well as unsightly views and traffic obstructions from present operations at the pump stations, will also be reduced significantly. Discharge of raw wastewater to surface waters will be reduced which will result in a decrease in odors, bacterial contamination, and stress on the aquatic environment.

5.20 The interim improvements and additions at the wastewater treatment plants will improve treatment efficiency and reduce loadings to the surface water bodies to a substantial extent. Monitoring of effluent water quality from the treatment plants will be used to assure that the systems are working properly.

5.21 Regarding the potable water system, elimination of leaks, modifications to treatment processes and operations, and system modifications including extension of service to new areas and to existing populated areas not now served by street mains, and improved metering capacity are included within the project.

From a public health standpoint, the provision of street mains to serve individual houses is extremely beneficial; it lessens the dependence on less reliable and poorer quality sources. The incidence of enteric disease can be expected to be less when water is taken directly from a tap in the house as opposed to a standpipe. Drinking water taken from standpipes or wells is often kept in porous earthen coolers. These can harbor a heavy bacterial population due to fecal contamination on hands that dipped water from them. Taps within the home reduce contamination of water from handling and also facilitate the pre-use washing of fruits and vegetables, eating utensils and the house. Moreover, water within individual units promotes better personal hygiene and can reduce the incidence of diseases other than those considered waterborne.

5.22 At the water treatment plant, bacteriological testing, chlorination control, and improved coagulation will contribute to the assurance of an acceptable pathogen-free supply. Improved laboratory facilities will allow for greater process control which can result in savings in energy and chemicals, as well as assist in maintaining a consistently treated supply.

5.23 In areas where is not practical to provide distribution pipes to serve all houses, additional standpipes will be provided to meet demands until such time as both water and sewer service can be extended to these areas. However, a considerable portion of presently unserved population will be provided with direct access to water and sewerage.

2. Construction Impacts

5.24 A short-term adverse effect resulting from construction activity will involve disruption of traffic and localized degradation of air quality. In the sewer cleaning program the construction related effects are significant, particularly because of the temporary presence of sewage sludge on the streets during the operation. This problem will be mitigated to a large extent by efficient handling of the residual wastes. The contractors involved should be required to remove accumulated construction debris on a continuing schedule.

3. Land Use

5.25 Sewers and water mains will, for the most part, be built in existing roadways, and no significant land takings are expected. Construction proposed at the existing water and sewage treatment plants can be undertaken without any land takings. The construction of water lines and sewers in alleys and narrow streets may necessitate the removal of some dwellings where their locations do not conform to regular patterns.

5.26 There may be need for location of land sites for sludge disposal, particularly if the sludge is contaminated with toxic industrial wastes. The GOE should identify a site for chemical disposal and initiate use of this site by chemical companies, in waste clean up activities, and for disposal of toxic sludge.

4. Socio-Economic

5.27 The project represents a considerable irretrievable commitment of moneys which will not be available for other beneficial socio-economic progress. However, the impact on the human environment will be direct and immediate on completion of the project. The project will benefit low income groups, and many of the very poorest will receive improved sanitation as well as

employment opportunities through work generated by project construction. As considerable time is spent by women in carrying water, the water distribution projects will benefit women in particular, allowing them to participate in other activities. On the other hand, provision of water and sewer service to areas not now served can be expected to increase rents.

5. Atmospheric

5.28 It is not expected that the project will become a direct cause of air pollution other than temporarily during construction. A marked permanent improvement in air quality in the settled areas would be expected from proper wastewater disposal. Warm air and water temperatures promote on-site degradation of sewage, causing a notable stench in many inhabited areas, as well as from ponded sewage and at outfall areas along the coast.

6. Water

5.29 The water supply projects directly, and the sewage projects indirectly will encourage an increase in the use of water. Considering the vastness of the source (the River Nile) little impact on water resources can be attributed to the project.

7. Cultural

5.30 Because the project area has been inhabited since at least Pharaonic times, the presence of significant cultural artifacts can be expected. Any construction project involving excavation may unearth artifacts, but if this occurs the appropriate authorities will be notified.

The recent wars have resulted in the destruction of many buildings, including some of historic interest. Furthermore, the evacuation of the population and its resettlement elsewhere in Egypt for seven or more years, presented opportunities for cultural disruption that dwarf any conceivably forthcoming from the project.

8. Esthetics

5.31 The reduction of sewer overflows and improvement in treatment will result in significant reduction in odors and unsightly visual esthetics. The general improvement in the cities' esthetic character will further their development for tourism, and contribute to a general sense of well-being among their residents. Use of the adjacent water for swimming without health hazard will be restored to the areas.

E. Conclusion

5.32 The project will provide intact, functioning water and wastewater systems. Plans for future improvements and additions which will be identified in the master plans now in preparation, rely heavily on this project. Failure to proceed with the work would result in further deterioration of social and health standards in the future. The projected rapid population increase would intensify the problems. Economic growth and tourism potential are likely to be diminished if no action is taken. The adverse effects of not implementing the project will be far more detrimental than the anticipated minor or temporary adverse effects of its implementation. On balance, there is no reasonable alternative to the project and the environmental impact will be favorable.

VI. FINANCIAL ANALYSIS

A. Water

1. Tariffs

6.01 The SCA has a published water tariff schedule outlining charges according to water usage and/or end user. The rate schedule is shown in Annex MC. With the exception of charges for certain industrial users outside the city limits and for ships transiting the Suez Canal, the same rates have been in effect since December 1926, the result of an agreement between the GOE and the French Company then operating the Suez Canal. The tariffs provide less than half the revenues required to operate and maintain the water facilities and none for capital improvements.

6.02 The rate for general public water use is 18 milliemes a cubic meter. ^{1/} This rate is reduced by as much as 75 percent for washing streets and political party buildings, 66 percent for government buildings, schools, cemeteries, public fountains and religious institutions, and 50 percent for youth hostels, public centers and SCA offices. There are maximum usage quantities at these reduced rates and all water used in excess of these limits are charged at the 18 millime rate. The SCA has attempted to obtain general increases in water rates to at least cover operating and maintenance expenses and discourage wastage of water but to date have been unsuccessful.

6.03 SCA also generates revenue from new consumer connections. As opposed to the subsidized water charges, for new connections the consumer is required to pay the full costs associated with the connection. SCA contracts out this work. Two to three connections are made per day. The charges range from LE 52 to LE 135 based on the size of the main or trunk line and the connection of this line. Present connection charges are shown in Annex N.

2. Operating Costs

6.04 Annex O shows the actual costs of operating the water systems during the period 1975-1977. During this period operating costs increased yearly by 39 percent - from LE 574,360 in 1975 to LE 1,104,077 in 1977. Miscellaneous costs including replacement

^{1/} There are 1000 milliemes in one Egyptian pound. At the parallel market exchange rate (LE.70=\$1.00) a cubic meter of water would cost about 2.5 U.S. cents or about 9.5 U.S.cents per 1000 gallons. For comparison in 1977 the rate for 1000 gallons of water in Fairfax Country, Virginia was 87.5 U.S. cents.

parts, contractors' fees and general and administrative expenses have averaged about 46 percent of total operating costs over the 1975-77 period. Labor costs, electricity, fuel and chemicals have increased yearly on the average of 14, 57, 11 and 37 percent respectively. The large cost increases in electricity and chemicals is attributed to the greater quantities of electricity to run pumps previously not used and the additional chemicals for annually treating greater volumes of water.

3. Capital Investment Program

The SCA has made substantial efforts to repair war damage to the existing systems and to expand them to provide for future growth in the Canal cities population. Expenditures have averaged LE 2.3 million a year during the 1975-77 period with 93 percent going into water treatment. SCA is presently constructing new treatment plants in each of the Canal cities totalling more than 200,000 m³/day in water treatment capacity.

6.06 The capital budget for the water system is an integral part of SCA's total capital budget. When SCA receives its annual capital budget from the central government, a portion is allotted to the water system. SCA's capital budget for the water system for the next five years is shown in Annex Q. Based on projected capital needs, the budget shows a shortfall of approximately LE 43 million. Since expenditures for the Suez Canal itself takes precedence over expenditures for the water system, the water system budget suffers first during periods of fiscal constraints.

B. Sewerage

1. Tariffs

6.07 Tariffs are not charged by GOSSD nor by the Governorates for sewerage service. GOSSD receives construction funds and the Governorates receive operating and maintenance funds from the Central GOE budget. The only other revenue received is by the Governorates for house connections. The customer pays in advance for the installation based on an estimate, which is subsequently adjusted to an actual cost basis. This is a one time charge equal to the cost of installing the connection, therefore, no net revenue is generated.

2. Operating Costs

6.08 Each Governorate is provided with a budget for the operation and maintenance of the respective sewerage system by the GOE as part of the Governorates overall operating budget. As a result, various expenditures such as salaries, electricity, fuel and truck operations are not allocated to specific functions/operations such as the sewerage system. It does however appear that the

funds allocated to the sewerage system are low for the size of the operating system. The Governorates inform us that they have been requesting larger budgets annually but each year the level of appropriations decreases causing severe financial constraints on all of their operations.

3. Capital Investment Program

6.09 GOSSD relies on funds received from the GOE for its sewerage construction program. Total outlays in the canal cities for capital improvements from 1974 through mid-1978 totalled LE 3.5 million. Of this amount, 79 percent has been spent on rehabilitating and expanding the sewage collection system, 20 percent on the rehabilitation and construction of pumping stations and less than one percent on sewage treatment plants. GOSSD's five-year capital budget is shown in Annex U and projects expenditures totalling approximately LE 74.0 million. This budget includes the value of the high priority projects recommended in this Project Paper

C. Financial Plan

6.10 The project financial plan, for all years and for FY 1978, is shown on Tables VI-I and VI-2.

TAB. V-1

CANAL CITIES - WATER AND SEWERAGE FINANCIAL PLAN - ALL YEARS
(000)

<u>Applications</u>	<u>PORT SAID</u>		<u>ISMAILIA</u>		<u>SUEZ</u>		<u>TOTAL</u>	
	<u>\$</u>	<u>LE</u>	<u>\$</u>	<u>LE</u>	<u>\$</u>	<u>LE</u>	<u>\$</u>	<u>LE</u>
Water:								
Treatment	3,035	970	11,272	2,735	2,118	945	16,425	4,650
Distribution	1,428	619	6,189	3,567	26,035	8,254	33,652	12,440
Sewerage:								
Collection	6,512	4,203	17,235	14,172	8,804	11,389	32,551	29,764
Treatment	<u>687</u>	<u>584</u>	<u>12,178</u>	<u>2,451</u>	<u>183</u>	<u>539</u>	<u>13,048</u>	<u>3,574</u>
Total	<u>11,662</u>	<u>6,376</u>	<u>46,874</u>	<u>22,925</u>	<u>37,140</u>	<u>21,127</u>	<u>95,676</u>	<u>50,428</u>
Sources								
AID Loan	11,662	-	46,874	-	37,140	-	95,676	-
Suez Canal Auth.	-	1,509	-	6,302	-	9,199	-	17,090
GOSSD	<u>-</u>	<u>4,787</u>	<u>-</u>	<u>16,623</u>	<u>-</u>	<u>11,928</u>	<u>-</u>	<u>33,338</u>
Total	<u>11,662</u>	<u>6,376</u>	<u>46,874</u>	<u>22,925</u>	<u>37,140</u>	<u>21,127</u>	<u>95,676</u>	<u>50,428</u>

CANAL CITIES - WATER AND SEWERAGE FINANCIAL PLAN - FY 78
(000)

<u>Applications</u>	<u>PORT SAID</u>		<u>ISMAILIA</u>		<u>SUEZ</u>		<u>TOTAL</u>	
	<u>\$</u>	<u>LE</u>	<u>\$</u>	<u>LE</u>	<u>\$</u>	<u>LE</u>	<u>\$</u>	<u>LE</u>
Water:								
Treatment	3,055	970	7,421	2,565	2,118	945	12,574	4,480
Distribution	-	-	-	-	14,796	4,870	14,796	4,870
Sewerage:								
Collection	6,512	4,203	17,235	14,172	8,804	11,389	32,551	29,764
Treatment	-	-	-	-	-	-	-	-
Total	<u>9,547</u>	<u>5,173</u>	<u>24,656</u>	<u>16,737</u>	<u>25,718</u>	<u>17,204</u>	<u>59,921</u>	<u>39,114</u>
Sources								
AID Loan	9,547	-	24,656	-	25,718	-	59,921	-
Suez Canal Auth.	-	970	-	2,565	-	5,815	-	9,350
GOSSD	-	<u>4,203</u>	-	<u>14,172</u>	-	<u>11,389</u>	-	<u>29,764</u>
Total	<u>9,547</u>	<u>5,173</u>	<u>24,656</u>	<u>16,737</u>	<u>25,718</u>	<u>17,204</u>	<u>59,921</u>	<u>39,114</u>

VII ECONOMIC ANALYSIS

A. General

7.01 The economic justification of most development projects rests on a comparison of the quantifiable economic benefits with costs. However, for water and sewerage improvement projects, the primary benefits include medical and hospitalization cost savings attributable to reduced waterborne infection and improved hygiene as a result of improved water supply and sewage disposal. Similarly, there are consequential gains in productive man-days. As is typically the case for such projects, statistics do not exist that would permit a quantification of these benefits for this project. In addition, since customers are not charged the full cost of water supply and are not charged at all for sewerage services in Egypt, actual payments cannot be used as an indicator of the value of benefits.

B. Per Capital Cost

7.02 Some relationship should exist between the capital cost of water and sewerage facilities and the number of people served. Using the estimated 1982 combined populations of the canal cities of approximately 1,000,000, the cost of the water systems portion of the project (\$plus LE) is about \$75,000,000 or \$75 per person. The sewerage portion of the project is about \$93,000,000 or \$93 per person.

7.03 By way of comparison, a first class water system in the U.S. can be expected to cost about \$200 per person, and a sewerage system \$300 per person. The value of the existing canal cities' water and sewerage systems is not known, and Egyptian systems should be less expensive than U.S. systems because of greater population densities. However, the above-mentioned values of \$75 and \$93 per person for the project improvements appear to be reasonable.

C. Least Cost Analysis

7.04 This project will design and develop improvements to the existing water and sewerage systems. The methods to be used in carrying out these activities are technically the least cost method available. Given the inappropriateness of carrying out a standard economic project assessment, as discussed above, the justification for individual project activities is based on these least cost assessments.

VIII SOCIAL ANALYSIS

A. General

8.01 The principal purpose of this project is to improve public health in the canal cities. Existing conditions which are adverse from the public health standpoint and which will be corrected or mitigated by the project are low and erratic water pressure, uncertain water quality, sewage back-ups in dwellings and on street surfaces, sewage discharge in to surface drains, raw or inadequately treated sewage discharges into surface bodies, and lack of piped water supply and sewer systems in some of the project areas.

B. Target Group

8.02 The project will benefit all of the present and near-future residents of the canal cities by providing safe water supply and safe sewage disposal. Special benefits will accrue to many of the 200,000 of the very poorest people who do not now have piped water service and/or sewer service in their areas. Because of irregular street widths, alignments and grades, it will not be practical to provide water lines and sewer for all of these disadvantaged people, but about half will be so served by the project. In other cases, improved standpipe service will be provided. Within this group who will obtain local water and sewer service, the most affected will be the women, who carry most of the water from stand pipes to their homes, and young children, who are the most susceptible to enteric disease.

C. Cultural and Socio-Economic Effects

8.03 The project will increase the availability and quality of water for personal hygiene, food preparation, and home cleaning. It will reduce reliance on unsafe sources of water, exposure to waste matter simply thrown into the streets, backed-up sewage, and raw or inadequately treated sewage in surface drains and water bodies.

8.04 Provision of water and sewer service to developing areas will facilitate construction of residential units and encourage industrial development. Improvement of the esthetic environment will enhance tourism business.

8.05 Provision of water and sewer service to areas not now served or inadequately served, will improve the quality of life within the affected neighborhoods. Such improvements in areas where rental

units are predominant, however, may allow building owners to raise rents of the poorly paid tenants. Improved conditions and appearance may attract higher paid workers who have the extra income to pay the higher rents. Therefore, the potential exists for the displacement of existing low economic classes by the improvement of living conditions. The probability, however, is that if such displacement it would affect only a small portion of the people to be served by this project.

IX. IMPLEMENTATION

A. Contracting Procedure

9.01 The "Commerce Business Daily" notice, the Terms of Reference and the resulting contracts for the Canal Cities' Water and Wastewater feasibility studies/master plans specifically require that the consulting engineering firms selected for the work prepare final engineering designs, construction plans, detailed cost estimates, and construction schedules for the high priority projects. Construction supervision was not included in the required additional services. A cost estimate of these additional services is not included in the present contracts of the respective firms, only estimates for identifying the high priority projects and other master planning efforts. These additional services are to be financed through amending the existing contract.

9.02 Rather than amend the existing contracts which are financed from the Technical and Feasibility Studies Grant (AID Grant No. 263-0025), we propose that these services be performed under a separate contract financed from the proposed loan. We also propose to include construction supervision services to avoid fragmentation of the work and responsibilities. Supervision of construction by the same consulting firm is imperative to ensure engineering continuity and the timely completion of the project.

9.03 Given the fragmentation of responsibility that now exists in the Canal Cities' Water and Sewerage System, and the real possibility that authority and responsibility will be changed as a result of the management and tariff study, the consultants' new contracts for the high priority works will again be with the Ministry of Housing (MOH). The Ministry will form a committee consisting of one member from the SCA, one member from GOSSD, one member from the respective Governorate and one member from MOH, who will be the Chairman. Upon the reorganization of the Canal Cities' Water and Sewerage Organizations, the contracts would either be assigned to the responsible organizations or retained as is with an appropriate adjustment in the committee.

9.04 The management and tariff study will, inter alia, recommend financial structures for Egypt's water and sewage authorities. Therefore, passing on the A.I.D. loan to the SCA and GOSSD, for any term at any interest rate, would be academic. Therefore, the GOE will defer the re-lending of the A.I.D. loan until the completion of aforementioned study. At that time, the the structures and the terms and conditions of the relending agreement, will be subject to AID approval.

9.05 Procurement of all goods and materials will be of U.S. source and origin. Installation of goods and materials will be carried out by the respective organizations (SCA, GOSSD and the Governorates), Egyptian contractors and American contractors as appropriate.

B. Schedule

9.06 Annex V shows a project schedule for the project's design, bidding, purchasing, manufacturing, and construction activities. It indicates a span of 42 months will be required to complete the project following the "start date" -- the date by which the consulting engineering firms will start their detailed design work. The start date is estimated to be January 1, 1979. The 42 months is admittedly an optimistic schedule, but is believed advisable due to the urgent need for the project, and practical because the project is made up of many separate elements. This allows the concurrent design, procurement, manufacture, and construction of largely independent elements by several engineering firms and by even more manufacturers and construction contractors.

9.07 One of the first activities of the consulting engineers will be to assist SCA and GOSSD in preparing CPM/PERT networks for the execution of each project element. Pending the completion of these networks, we estimate the implementation schedule as follows:

<u>Item</u>	<u>Date</u>
Loan authorization	Sept. 20, 1978
Loan and grant agreements signed	Sept. 30, 1978
Initial conditions precedent met	Jan. 31, 1979
Formation and initial meeting of Project Committee	Nov. 1, 1978
Consulting engineers start work (start date)	Feb. 1, 1978
CPM/PERT detailed implementation plan complete	Mar. 31, 1979
Additional conditions precedent met	Mar. 1, 1979
Advertise first procurement contracts	April 1, 1979
Advertise first construction contracts	July 1, 1979
Complete construction	May 1, 1982
Complete facilities check-outs and training	July 1, 1982

C. Control and Monitoring Measures

9.08 A Project Manager will be assigned whose full-time duties will be the monitoring of this project plus the related Canal Cities' feasibility studies and master plans.

9.09 Monthly reports will be required from the Ministry of Housing, who will chair the GOE's project committee, and from the consulting engineering firms. Frequent site inspections will be made. All contracts, Invitations for Bid, etc., will be reviewed and approved by USAID.

D. Terminal Dates

9.10 The Terminal Date for meeting Conditions Precedent to Disbursement will be January 31, 1979, primarily because the Agreement will require ratification by the People's Assembly which will not reconvene until November 1978. The Terminal Date for requesting Letters of Commitment will be January 31, 1982. The Project completion date will be July 1, 1982.

E. Evaluation

9.11 The purpose of this project is to rehabilitate and make modest extensions of the existing water and sewerage systems which serve Port Said, Ismailia, and Suez.

9.12 Project evaluation will be made at two or possibly three levels. The first level will be an annual evaluation of all project elements based on review of the consulting engineers' monthly reports, site visits, and the monthly meetings of the Project Committees. This effort will be documented by USAID/Cairo as a major monitoring report.

9.13 The second level evaluation will be carried out by USAID/Cairo working with SCA and GOSSD. It will consist of determining the completion of each project element in accordance with the project schedule and as further defined by the CPM/FERT networks developed by the consulting engineers. It is anticipated that at least each of the 12 project elements (four for each city) will be so evaluated, and it may prove practical to evaluate the completion of possible sub-elements as well.

9.14 The possible third level of project evaluation is that the Mission may do an overall impact evaluation of A.I.D.-financed water and sewerage projects in Egypt at some future date. The Mission considers that the presently available information is not adequate to decide on the usefulness of or the design of such an evaluation. As we develop a larger base of information from the Water and Sewerage Master Plans, from feasibility studies for specific projects, from the Management and Tariff Study, and from implementation of ongoing projects, we will be able to make a more informed judgment concerning the usefulness of such an impact evaluation.

X. RECOMMENDATIONS, CONDITIONS AND COVENANTS

A. Recommendations

10.01 Subject to the conditions and covenants listed below, we recommend that A.I.D. approve a loan to the GOE in the amount of \$96.0 million for rehabilitation and expansion of the water treatment plants, water distribution systems, sewage collection systems, and sewage treatment plants of Port Said, Ismailia, and Suez. Due to the limited availability of FY 78 funds, it is recommended that \$60,000,000 be authorized in FY 78 and the balance, \$36,000,000 be authorized in FY 79. We further recommend that loan terms to the GOE require the loan principal be repaid in forty (40) years, including a ten (1) year grace period, with interest at two percent (2%) per annum during the grace period, and three percent (3%) per annum thereafter; and that the GOE not be required to relend the funds to the implementing entities until completion of the A.I.D.-financed management and tariff study, but to pass the use of these funds through to the Ministry of Housing until such time as there is a reorganization of the Canal Cities' Water and sewage Organization and the new organization(s) is established with which appropriate reloan terms and conditions can be negotiated. Procurement of equipment and services will be of United States source and origin.

B. Conditions Precedent to Disbursement

10.02 We recommend that the Conditions Precedent to Disbursement be segregated into two groups. The first, or initial, set would be those conditions which must be satisfied before the employment of plant and equipment for the improvements to the Port Said, Ismailia, and Suez water and sewerage facilities.

10.03 Conditions Precedent to Initial Disbursement are:

- a. An opinion of the Egyptian Minister of Justice, or other legal counsel satisfactory to A.I.D., that the Loan Agreement has been duly authorized by, and executed on behalf of the Borrower, MOH, The Suez Canal Authority (SCA), and The General Organization for Sewage and Sanitary Disposal (GOSSD), and that it constitutes a valid and legally binding obligation in accordance with its terms.
- b. A statement of the names of the persons who will act as the representatives of the Borrower, MOH, SCA and GOSSD, together with a specimen signature of each.
- c. Evidence that the loan funds will be administered by the MOH on behalf of Borrower and made available to SCA, GOSSD and the Governates of Port Said, Ismailia and Suez, until such time that reloan agreement(s), satisfactory to A.I.O., can be negotiated with the existing or successor organizations responsible for the Canal Cities' water/wastewater facilities.

- d. Executed contracts acceptable to A.I.D. with consulting engineering firms acceptable to A.I.D. for services relating to the Project.

10.04. Additional Conditions Precedent to Disbursement are:

- a. A financial and physical plan for each of the project elements
- b. A detailed implementation plan, CPM/PERT form, for the rehabilitation and expansion of the water treatment plants, water distribution systems, sewage collection systems, and sewage treatment plants of Port Said, Ismailia, and Suez.

C. Covenants

10.05 The GOE, SCA, and GOSSD will be required to covenant:

a. Execution of the Project

- i. To cause the project to be carried out with due diligence and efficiency, and in conformity with sound engineering, construction financial and administrative practices.
- ii. To cause the project to be carried out in conformance with all plans, specifications, contracts, schedules, and other arrangements, and with all modifications therein approved by A.I.D. pursuant to the Agreement.
- iii. To submit for A.I.D. approval prior to implementation, issuance, or execution, all plans, specifications, construction schedules, bid documents, documents concerning solicitation of proposals relating to eligible items, contracts, and all modifications to these documents.

b. Funds and Other Resources To Be Provided

To make available on a timely basis any Egyptian currency and any foreign currency in addition to the loan for the punctual and effective carrying out of construction, maintenance, repair and operation of the project.

c. Operation and Maintenance

To operate, maintain and repair the project in conformity with sound engineering, financial and administrative practice and in such manner as to ensure the continuing and successful achievement of the purposes of the project.

d. Management

To provide qualified and experienced management for the project and to train such staff as may be appropriate for the maintenance and operation of the project.

e. Continuing Consultation

To cooperate fully with A.I.D. to assure that the purpose of the Loan will be accomplished. To this end, the GOE, SCA, GOSSD and A.I.D. shall, from time to time, at the request of any party, exchange views through their representatives with regard to the progress of the project, the performance of the GOE, SCA, and GOSSD of its obligations under the Loan Agreement, obligations under the Loan Agreement, the performance of consultants, contractors, and suppliers engaged on the project, and other matters relating to the project. The GOE, SCA, and GOSSD shall specifically review and discuss with A.I.D. the recommendations of the Management and Tariff Study consultants and shall implement the recommendations agreed as a result of such discussions.

f. Financing

(1) In form and substance satisfactory to A.I.D., the GOE shall assure adequate long-term financing for SCA's and GOSSD's expansion programs which has been authorized and modifications and adaptations to such program. No later than April 30, 1980, the financing so provided will be divided between equity contribution and loans in such a manner that after including the A.I.D. loan as equity the debt to equity ratio will be no greater than 1.5:1. Also, no later than April 30, 1980, SCA tariffs shall be set at a level high enough to produce a reasonable rate of return of average net fixed assets in operation, appropriately valued and revalued from time to time.

(2) To execute at the earliest practicable time after the completion of the Management and Tariff Study, a reloan agreement or agreements with the organization(s) receiving the reloan from the GOE. The reloan agreement shall contain the terms of payment including interest and repayment of interest, acceptable to AID.

g. SCA Successor

In the event that either GOSSD, SCA or the Governates of Port Said, Ismailia and Suez are succeeded by other

entities having responsibilities for the Canal Cities' Water/Wastewater systems, either before or after the project is completed, the then value of the A.I.D. loan shall be re-lent and the facilities attributable to the loan shall be made available to the successor organizations, on terms and conditions acceptable to A.I.D.

h. Raw Water Supply

To provide all physical and operational improvements, satisfactory to A.I.D., needed to assure that an adequate quantity and quality of raw water supply from the Ismailia - Port Said - Sweetwater canal system operated by the Ministry of Irrigation will be available for the purposes of this project.

UNCLASSIFIED
Department of State

INCOMING
TELEGRAM

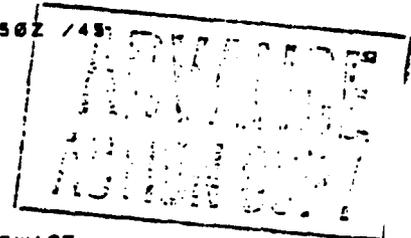
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AIDAC

E. O. 11852: N/A
SUBJECT: FY 78 PROJECT - CANAL CITIES WATER AND SEWAGE

NE
C-1

1. SUBJECT LOAN APPLICATION RECEIVED BY MISSION VIA LETTER DATED SEPT. 16, 1978, FROM GAMAL EL NAZER, DEPUTY CHAIRMAN FOR INVESTMENT AUTHORITY, IN CHARGE OF AMERICAN AIDS TO EGYPT, TO DIRECTOR BROWN. LETTER TEXT FOLLOWS:

"THE GOVERNMENT OF THE ARAB REPUBLIC OF EGYPT HAS PLACED AN EXTREMELY HIGH PRIORITY ON CERTAIN SOCIAL REQUIREMENTS WHICH ENHANCE THE QUALITY OF LIFE FOR OUR CITIZENS. WITH THIS IN MIND, WE HAVE REVIEWED THE FOLLOWING REPORTS WHICH WERE PREPARED UNDER AID GRANT FUNDING:

- "PORT SAID WATER AND WASTEWATER MASTER PLAN-INTERIM ACTION PRIORITY WORKS", BY HAZEN AND SAWYER.
- "ISMAILIA WATERWORKS AND WASTEWATER FACILITIES MASTER PLAN-INTERIM ACTION REPORT NO. 1, HIGH PRIORITY PROJECTS" BY METCALF & EDDY, INC.
- "SUEZ WATER AND WASTEWATER, FACILITIES MASTER PLAN-INTERIM ACTION REPORT NO. 1, HIGH PRIORITY PROJECTS", BY PIRNIE-HARRIS INTERNATIONAL.

THESE REPORTS RECOMMEND CONSTRUCTION OF URGENTLY NEEDED IMPROVEMENTS TO THE WATER AND SEWERAGE SYSTEMS OF PORT SAID, ISMAILIA, AND SUEZ. THE IMPROVEMENTS WILL RELIEVE PRESENT DANGERS TO THE PUBLIC HEALTH DUE TO INSUFFICIENT WATER SUPPLY AND INADEQUATE SEWAGE DISPOSAL. THEREFORE, THE GOE REQUESTS THAT AID MAKE AVAILABLE A U. S. DOLLAR LOAN TO COVER THE FOREIGN EXCHANGE COSTS FOR THE RECOMMENDED IMPROVEMENTS.

THE ESTIMATED FOREIGN EXCHANGE COST FOR THIS PROJECT IS U. S. \$96.0 MILLION. OUR GOVERNMENT WILL PROVIDE THE EGYPTIAN POUNDS, ESTIMATED TO BE ABOUT L. E. 50.0 MILLION, REQUIRED TO MEET THE LOCAL COSTS OF THE PROJECT."

2. REQUEST CONFIRMATION OF RECEIPT BY NE/PD. MATTHEWS

ANNEX A

UNCLASSIFIED

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5C(2) - PROJECT CHECKLIST

Listed below are, first, statutory criteria applicable generally to projects with FAA funds, and then project criteria applicable to individual fund sources: Development Assistance (with a sub-category for criteria applicable only to loans); and Security Supporting Assistance funds.

CROSS REFERENCES: IS COUNTRY CHECKLIST UP TO DATE? IDENTIFY. HAS STANDARD ITEM CHECKLIST BEEN REVIEWED FOR THIS PROJECT?

A. GENERAL CRITERIA FOR PROJECT.1. App. Unnumbered; FAA Sec. 653(b)

(a) Describe how Committees on Appropriations of Senate and House have been or will be notified concerning the project;
(b) is assistance within (Operational Year Budget) country or international organization allocation reported to Congress (or not more than \$1 million over that figure plus 10%)?

An "Advice of Program Change" has been prepared for transmittal to the appropriate committees of Congress. Obligations under this amendment will not take place prior to 15 days after the date of delivery of this notification. The intended obligation is within the level of funds appropriated for Egypt for FY 1978.

2. FAA Sec. 611(a)(1). Prior to obligation in excess of \$100,000, will there be (a) engineering, financial, and other plans necessary to carry out the assistance and (b) a reasonably firm estimate of the cost to the U.S. of the assistance?

(a) Yes
(b) Yes

3. FAA Sec. 611(a)(2). If further legislative action is required within recipient country, what is basis for reasonable expectation that such action will be completed in time to permit orderly accomplishment of purpose of the assistance?

No further legislative action is required to implement the project.

4. FAA Sec. 611(b); App. Sec. 101. If for water or water-related land resource construction, has project met the standards and criteria as per Memorandum of the President dated Sept. 5, 1973 (replaces Memorandum of May 15, 1972; see Fed. Register, Vol 38, No. 174, Part III, Sept. 10, 1973)?

Yes

5. FAA Sec. 611(e). If project is capital assistance (e.g., construction), and all U.S. assistance for it will exceed \$1 million, has Mission Director certified the country's capability effectively to maintain and utilize the project?

The Mission Director has so certified. See Annex C.

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A.

6. FAA Sec. 209, 619. Is project susceptible of execution as part of regional or multi-lateral project? If so why is project not so executed? Information and conclusion whether assistance will encourage regional development programs. If assistance is for newly independent country, is it furnished through multi-lateral organizations or plans to the maximum extent appropriate?

No

7. FAA Sec. 601(a); (and Sec. 201(f) for development loans). Information and conclusions whether project will encourage efforts of the country to: (a) increase the flow of international trade; (b) foster private initiative and competition; (c) encourage development and use of cooperatives, credit unions; and savings and loan associations; (d) discourage monopolistic practices; (e) improve technical efficiency of industry, agriculture and commerce; and (f) strengthen free labor unions.

The project is designed to improve the existing water and sewerage systems of Port Said, Ismailia, and Suez. It will not have any significant impact on items (a) through (f)

8. FAA Sec. 601(b). Information and conclusion on how project will encourage U.S. private trade and investment abroad and encourage private U.S. participation in foreign assistance programs (including use of private trade channels and the services of U.S. private enterprise).

Most of the goods and services for this project will be purchased from private U.S. concerns.

9. FAA Sec. 612(b); Sec. 636(h). Describe steps taken to assure that, to the maximum extent possible, the country is contributing local currencies to meet the cost of contractual and other services, and foreign currencies owned by the U.S. are utilized to meet the cost of contractual and other services.

The Agreement will so provide.

10. FAA Sec. 612(d). Does the U.S. own excess foreign currency and, if so, what arrangements have been made for its release?

Yes. Release by the GOE is not a problem at present.

B. FUNDING CRITERIA FOR PROJECT

1. Development Assistance Project Criteria

a. FAA Sec. 102(c); Sec. 111; Sec. 281a. Extent to which activity will (1) effectively involve the poor in development, by extending access to economy at local level, increasing labor-intensive production, spreading investment out from cities to small towns and rural areas; and (b) help develop cooperatives, especially by technical assistance, to assist rural and urban poor to help themselves toward better life, and otherwise encourage democratic private and local governmental institutions?

Not applicable

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3. FAA Sec. 103, 103A, 104, 105, 106, 107. is assistance being made available: [include only applicable paragraph -- e.g., a, b, etc. -- which corresponds to source of funds used. If more than one fund source is used for project, include relevant paragraph for each fund source.]

- (1) [103] for agriculture, rural development or nutrition; if so, extent to which activity is specifically designed to increase productivity and income of rural poor; [103A] if for agricultural research, is full account taken of needs of small farmers;
- (2) [104] for population planning or health; if so, extent to which activity extends low-cost, integrated delivery systems to provide health and family planning services, especially to rural areas and poor;
- (3) [105] for education, public administration, or human resources development; if so, extent to which activity strengthens nonformal education, makes formal education more relevant, especially for rural families and urban poor, or strengthens management capability of institutions enabling the poor to participate in development;
- (4) [106] for technical assistance, energy, research, reconstruction, and selected development problems; if so, extent activity is:
 - (a) technical cooperation and development, especially with U.S. private and voluntary, or regional and international development, organizations;
 - (b) to help alleviate energy problem;
 - (c) research into, and evaluation of, economic development processes and techniques;
 - (d) reconstruction after natural or manmade disaster;
 - (e) for special development problem, and to enable proper utilization of earlier U.S. infrastructure, etc., assistance;
 - (f) for programs of urban development, especially small labor-intensive enterprises, marketing systems, and financial or other institutions to help urban poor participate in economic and social development.

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(5) [107] by grants for coordinated private effort to develop and disseminate intermediate technologies appropriate for developing countries.

c. FAA Sec. 110(a); Sec. 208(e). Is the recipient country willing to contribute funds to the project, and in what manner? or will it provide assurances that it will provide at least 25% of the costs of the program, project, or activity with respect to which the assistance is to be furnished (or has the latter cost-sharing requirement been waived for a "relatively least-developed" country)?

d. FAA Sec. 110(b). Will grant capital assistance be disbursed for project over more than 3 years? If so, has justification satisfactory to Congress been made, and efforts for other financing?

e. FAA Sec. 207; Sec. 113. Extent to which assistance reflects appropriate emphasis on; (1) encouraging development of democratic, economic, political, and social institutions; (2) self-help in meeting the country's food needs; (3) improving availability of trained worker-power in the country; (4) programs designed to meet the country's health needs; (5) other important areas of economic, political, and social development, including industry; free labor unions, cooperatives, and Voluntary Agencies; transportation and communication, planning and public administration; urban development, and modernization of existing laws; or (6) integrating women into the recipient country's national economy.

f. FAA Sec. 281(b). Describe extent to which program recognizes the particular needs, desires, and capacities of the people of the country; utilizes the country's intellectual resources to encourage institutional development; and supports civic education and training in skills required for effective participation in governmental and political processes essential to self-government.

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g. FAA Sec. 201(b)(2)-(4) and -(8); Sec. 201(e); Sec. 211(a)(1)-(3) and -(8). Does the activity give reasonable promise of contributing to the development: of economic resources, or to the increase of productive capacities and self-sustaining economic growth; or of educational or other institutions directed toward social progress? Is it related to and consistent with other development activities, and will it contribute to realizable long-range objectives? And does project paper provide information and conclusion on an activity's economic and technical soundness?

n. FAA Sec. 201(b)(6); Sec. 211(a)(5), (6). Information and conclusion on possible effects of the assistance on U.S. economy, with special reference to areas of substantial labor surplus, and extent to which U.S. commodities and assistance are furnished in a manner consistent with improving or safeguarding the U.S. balance-of-payments position.

2. Development Assistance Project Criteria
(Loans on y)

a. FAA Sec. 201(b)(1). Information and conclusion on availability of financing from other free-world sources, including private sources within U.S.

Not applicable

b. FAA Sec. 201(b)(2); 201(d). Information and conclusion on (1) capacity of the country to repay the loan, including reasonableness of repayment prospects, and (2) reasonableness and legality (under laws of country and U.S.) of lending and relending terms of the loan.

c. FAA Sec. 201(e). If loan is not made pursuant to a multilateral plan, and the amount of the loan exceeds \$100,000, has country submitted to AID an application for such funds together with assurances to indicate that funds will be used in an economically and technically sound manner?

d. FAA Sec. 201(f). Does project paper describe how project will promote the country's economic development taking into account the country's human and material resources requirements and relationship between ultimate objectives of the project and overall economic development?

e. FAA Sec. 202(a). Total amount of money under loan which is going directly to private enterprise, is going to intermediate credit institutions or other borrowers for use by private enterprise, is being used to finance imports from private sources, or is otherwise being used to finance procurements from private sources?

f. FAA Sec. 620(d). If assistance is for any productive enterprise which will compete in the U.S. with U.S. enterprise, is there an agreement by the recipient country to prevent export to the U.S. of more than 20% of the enterprise's annual production during the life of the loan?

Project Criteria Solely for Security Supporting Assistance

FAA Sec. 531. How will this assistance support promote economic or political stability?

Additional Criteria for Alliance for Progress

[Note: Alliance for Progress projects should add the following two items to a project checklist.]

a. FAA Sec. 251(b)(1), -(8). Does assistance take into account principles of the Act of Bogota and the Charter of Punta del Este; and to what extent will the activity contribute to the economic or political integration of Latin America?

b. FAA Sec. 251(b)(8); 251(h). For loans, has there been taken into account the effort made by recipient nation to repatriate capital invested in other countries by their own citizens? Is loan consistent with the findings and recommendations of the Inter-American Committee for the Alliance for Progress (now "CEPCIES," the Permanent Executive Committee of the OAS) in its annual review of national development activities?

This project provides safe water and sewerage service to areas now not served or inadequately served. Much of the area is occupied by urban poor. Consequently, the project will improve the quality of life and promote economic and political stability in the canal cities.

Not applicable

5C(3) - STANDARD ITEM CHECKLIST

Listed below are statutory items which normally will be covered routinely in those provisions of an assistance agreement dealing with its implementation, or covered in the agreement by exclusion (as where certain uses of funds are permitted, but other uses not).

These items are arranged under the general headings of (A) Procurement, (B) Construction, and (C) Other Restrictions.

A. Procurement

- | | |
|--|--|
| 1. <u>FAA Sec. 602</u> . Are there arrangements to permit U.S. small business to participate equitably in the furnishing of goods and services financed? | Procurement of goods and services will be pursuant to established AID regulations. |
| 2. <u>FAA Sec. 604(a)</u> . Will all commodity procurement financed be from the U.S. except as otherwise determined by the President or under delegation from him? | Yes |
| 3. <u>FAA Sec. 604(d)</u> . If the cooperating country discriminates against U.S. marine insurance companies, will agreement require that marine insurance be placed in the U.S. on commodities financed? | Yes |
| 4. <u>FAA Sec. 604(e)</u> . If offshore procurement of agricultural commodity or product is to be financed, is there provision against such procurement when the domestic price of such commodity is less than parity? | Not applicable |
| 5. <u>FAA Sec. 608(a)</u> . Will U.S. Government excess personal property be utilized wherever practicable in lieu of the procurement of new items? | Consideration will be given to the use of excess property when practical. |
| 6. <u>MMA Sec. 901(b)</u> . (a) Compliance with requirement that at least 50 per centum of the gross tonnage of commodities (computed separately for dry bulk carriers, dry cargo liners, and tankers) financed shall be transported on privately owned U.S.-flag commercial vessels to the extent that such vessels are available at fair and reasonable rates. | Contracts for commodities will so stipulate. |
| 7. <u>FAA Sec. 521</u> . If technical assistance is financed, will such assistance be furnished to the fullest extent practicable as goods and professional and other services from private enterprise on a contract basis? If the facilities of other Federal agencies will be utilized, | Technical assistance, to the greatest extent practical, will be from private enterprise on a contract basis. |

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are they particularly suitable, not competitive with private enterprise, and made available without undue interference with domestic programs?

E. International Air Transport. Fair Competitive Practices Act, 1974

Yes

If air transportation of persons or property is financed on grant basis, will provision be made that U.S.-flag carriers will be utilized to the extent such service is available?

B. Construction

1. FAA Sec. 601(d). If a capital (e.g., construction) project, are engineering and professional services of U.S. firms and their affiliates to be used to the maximum extent consistent with the national interest?

Yes

2. FAA Sec. 611(c). If contracts for construction are to be financed, will they be let on a competitive basis to maximum extent practicable?

Yes

3. FAA Sec. 620(k). If for construction of productive enterprise, will aggregate value of assistance to be furnished by the U.S. not exceed \$100 million?

Not applicable

C. Other Restrictions

1. FAA Sec. 201(d). If development loan, is interest rate at least 2% per annum during grace period and at least 3% per annum thereafter?

Not applicable

2. FAA Sec. 301(d). If fund is established solely by U.S. contributions and administered by an international organization, does Comptroller General have audit rights?

Not applicable

3. FAA Sec. 520(h). Do arrangements preclude promoting or assisting the foreign aid projects or activities of Communist-Bloc countries, contrary to the best interests of the U.S.?

No

4. FAA Sec. 636(i). Is financing not permitted to be used, without waiver, for purchase, long-term lease, or exchange of motor vehicle manufactured outside the U.S. or guaranty of such transaction?

Yes

5. Will arrangements preclude use of financing:
- a. FAA Sec. 114. to pay for performance of abortions or to motivate or coerce persons to practice abortions? **yes**
 - b. FAA Sec. 620(g). to compensate owners for expropriated nationalized property? **yes**
 - c. FAA Sec. 660. to finance police training or other law enforcement assistance, except for narcotics programs? **yes**
 - d. FAA Sec. 662. for CIA activities? **yes**
 - e. App. Sec. 103. to pay pensions, etc., for military personnel? **yes**
 - f. App. Sec. 106. to pay U.N. assessments? **yes**
 - g. App. Sec. 107. to carry out provisions of FAA Sections 209(d) and 251(h)? (transfer to multilateral organization for lending). **yes**
 - h. App. Sec. 501. to be used for publicity or propaganda purposes within U.S. not authorized by Congress? **yes**

AGENCY FOR INTERNATIONAL DEVELOPMENT
PROJECT AUTHORIZATION AND REQUEST
FOR ALLOTMENT OF FUNDS PART I

1. TRANSACTION CODE

A

A ADD
C CHANGE
D DELETE

PAF

2. DOCUMENT CODE
5

COUNTRY ENTITY

ARAB REPUBLIC OF EGYPT

4. DOCUMENT REVISION NUMBER

0

5. PROJECT NUMBER (7 digits)

263-0048

6. BUREAU OFFICE

A SYMBOL

B CODE

NE

03

7. PROJECT TITLE (Maximum 40 characters)

CANAL CITIES WATER AND SEWERAGE

8. PROJECT APPROVAL DECISION

ACTION TAKEN

A

A APPROVED
D DISAPPROVED
DL DEAUTHORIZED

9. EST. PERIOD OF IMPLEMENTATION

YRS 01

QTRS 0

10. APPROVED BUDGET AID APPROPRIATED FUNDS (\$000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	PRIMARY TECH. CODE		E. 1ST FY 78		H. 2ND FY 79		K. 3RD FY	
		C GRANT	D LOAN	F GRANT	G LOAN	I GRANT	J. LOAN	L GRANT	M. LOAN
(1) SSA	729	540	540		60,000	36,000			
(2)									
(3)									
(4)									
TOTALS									

A. APPROPRIATION	N. 4TH FY		O. 5TH FY		LIFE OF PROJECT		11. PROJECT FUNDING AUTHORIZED		A. GRANT	B. LOAN
	P. GRANT	Q. LOAN	R GRANT	S LOAN	T GRANT	U. LOAN	ENTER APPROPRIATE CODE(S)	1 - LIFE OF PROJECT		
(1) SSA					36,000	60,000	2 - INCREMENTAL LIFE OF PROJECT		1	1
(2)										
(3)										
(4)										
TOTALS										
					36,000	60,000	C. PROJECT FUNDING AUTHORIZED THRU		FY 79	

12. INITIAL PROJECT FUNDING ALLOTMENT REQUESTED (\$000)

A. APPROPRIATION	B. ALLOTMENT REQUEST NO	
	F GRANT	D LOAN
(1) SSA		60,000
(2)		
(3)		
(4)		
TOTALS		

13. FUNDS RESERVED FOR ALLOTMENT

TYPED NAME (NAME, NUMBER, FUND)

SIGNATURE

DATE

14. SOURCE ORIGIN OF GOODS AND SERVICES

000

361

LOCAL

OTHER

15. FOR AMENDMENTS NATURE OF CHANGE PROPOSED

FOR PRC/BIAS USE ONLY	16. AUTHORIZING OFFICE SYMBOL	17. ACTION DATE	18. ACTION REFERENCE (Optional)	ACTION REFERENCE DATE
		MM DD YY		MM DD YY

DEPARTMENT OF STATE
AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON

DEPUTY
THE/ADMINISTRATOR

LOAN NO. 263-K-050

PROJECT AUTHORIZATION
AND REQUEST FOR ALLOTMENT OF FUNDS

PART II

Name of Country: Arab Republic
of Egypt

Name of Project: Canal Cities' Water
and Sewerage

Number of Project: 263-0048

Pursuant to Part II, Chapter 4, Section 532 of the Foreign Assistance Act of 1961, as amended, I hereby authorize a loan to the Arab Republic of Egypt (the "Cooperating Country") of not to exceed Sixty Million United States Dollars (\$60,000,000) (the "Authorized Amount") to help in financing certain foreign exchange costs of goods and services required for the project as described in the following paragraph.

The project consists of assistance to the Government of the Arab Republic of Egypt for improvements to the water and sewerage systems in Port Said, Ismailia, and Suez (hereinafter referred to as the "Project"). Loan funds will be passed through to the Ministry of Housing (MOH) until such time that a reloan agreement, satisfactory to A.I.D., can be negotiated with the responsible successor organization(s) of the present Canal Cities' Water/Wastewater organizations.

I approve the total level of A.I.D.-appropriated funding planned for this project of not to exceed Ninety-Six Million United States Dollars (\$96,000,000), of which \$60,000,000 is authorized above, during the period FY 1978 through FY 1979. I approve further increments during that period of loan or grant funding of up to \$36,000,000, subject to the availability of funds in accordance with A.I.D. allotment procedures.

I hereby authorize the initiation of negotiation and execution of the Project Agreement by the officer to whom such authority has been delegated in accordance with A.I.D. regulations and Delegations of Authority subject to the following essential terms and covenants and major conditions; together with such other terms and conditions as A.I.D. may deem appropriate:

a. Interest Rate and Terms of Repayment

The Cooperating Country shall repay the Loan to A.I.D. in United States Dollars within forty (40) years from the date of first disbursement

of the Loan, including a grace period of not to exceed ten (10) years. The Cooperating Country shall pay to A.I.D. in United States Dollars interest from the date of first disbursement of the Loan at the rate of (a) two percent (2%) per annum during the first ten (10) years, and (b) three percent (3%) per annum thereafter, on the outstanding disbursed balance of the Loan and on any due and unpaid interest accrued thereon.

b. Source, Origin and Nationality of Goods and Services

Except as A.I.D. may otherwise agree in writing, goods and services financed by A.I.D. under the project shall have their source, origin and nationality in the United States.

c. Conditions Precedent to Initial Disbursement

Prior to any disbursement, or the issuance of any commitment documents under the Project Agreement, Borrower shall, except as A.I.D. may otherwise agree in writing, furnish in form and substance satisfactory to A.I.D.:

- (1) An opinion of the Egyptian Minister of Justice, or other legal counsel satisfactory to A.I.D., that the Loan Agreement has been duly authorized by, and executed on behalf of the Borrower, MOH, The Suez Canal Authority (SCA), and The General Organization for Sewage and Sanitary Disposal (GOSSD), and that it constitutes a valid and legally binding obligation in accordance with its terms.
- (2) A statement of the names of the persons who will act as the representatives of the Borrower, MOH, SCA and GOSSD, together with a specimen signature of each.
- (3) Evidence that the loan funds will be administered by the MOH on behalf of Borrower and made available to SCA, GOSSD and the Governates of Port Said, Ismailia and Suez, until such time that reloan agreement(s), satisfactory to A.I.D., can be negotiated with the existing or successor organizations responsible for the Canal Cities' water/wastewater facilities.
- (4) Executed contracts acceptable to A.I.D. with consulting engineering firms acceptable to A.I.D. for services relating to the Project.

d. Additional Conditions Precedent

Prior to any disbursement, or the issuance of any commitment documents under the Project Agreement to finance any costs other than of

consulting engineering services, Borrower shall, except as A.I.D. may otherwise agree in writing, furnish in form and substance satisfactory to A.I.D.:

- (1) A financial and physical plan for each of the project elements.
- (2) A detailed implementation plan, CPM/PERT form, for the rehabilitation and expansion of the water treatment plants, water distribution systems, sewage collection systems, and sewage treatment plants of Port Said, Ismailia, and Suez.

e. Covenants

The Borrower, SCA, MOH and GOSSD will be required to covenant:

(1) Execution of the Project

- (a) To cause the project to be carried out with due diligence and efficiency, and in conformity with sound engineering, construction, financial and administrative practices.
- (b) To cause the project to be carried out in conformance with all plans, specifications, contracts, and other arrangements, and with all modifications therein approved by A.I.D. pursuant to this Agreement.
- (c) To submit for A.I.D. approval prior to implementation, issuance, or execution, all plans, specifications, construction schedules, bid documents concerning solicitation of proposals relating to eligible items, contracts, and all modifications in these documents.

(2) Funds and Other Resources To Be Provided

- (a) To make available on a timely basis any Egyptian currency and any foreign currency in addition to the loan, for the punctual and effective carrying out of construction, maintenance, repair and operation of the project.

(3) Operation and Maintenance

- (a) To operate, maintain and repair the project in conformity with sound engineering, financial and administrative practices and in such manner as to ensure the continuing and successful achievement of the purposes of the project.

(4) Management

- (a) To provide qualified and experienced management for the project and to train such staff as may be appropriate for the maintenance and operation of the project.

(5) Continuing Consultation

To cooperate fully with A.I.D. to assure that the purpose of the loan will be accomplished. To this end, the Borrower, SCA, GOSSD and A.I.D. shall, from time to time, at the request of any party, exchange views through their representatives with regard to the progress of the project, the performance of the Borrower, SCA and GOSSD of its obligations under the Loan Agreement, the performance of consultants, contractors and suppliers engaged on the project, and other matters relating to the project. The Borrower, SCA and GOSSD shall specifically review and discuss with A.I.D. the relevant recommendations of the management and tariff consultant and shall implement the recommendations agreed as a result of such discussions.

(6) Financing

- (a) In form and substance satisfactory to A.I.D., the Borrower shall assure adequate long-term financing for SCA's and GOSSD's expansion program which has been authorized and modifications and adaptations to such program. No later than April 30, 1980, the financing so provided will be divided between equity contributions and loans in such a manner that after including the A.I.D. loan the debt to equity ratio will be no greater than 1.5:1. Also, no later than April 30, 1980, SCA tariffs shall be set at a level high enough to produce a reasonable rate of return on average net fixed assets in operation, appropriately valued and revalued from time to time.
- (b) To execute at the earliest practicable time after the completion of the Management and Tariff Study a reloan agreement or agreements with the organization(s) who will be recipients of the reloan from the Borrower containing the terms of payment, including interest and repayment of interest acceptable to A.I.D.

(7) SCA Successor

In the event that either GOSSD, SCA or the Governates of Port Said, Ismailia and Suez are succeeded by other entities having responsibilities for the Canal Cities' Water/Wastewater systems, either before or after the project is completed, the then value of the A.I.D. loan shall be re-lent and the facilities attributable to the loan shall be made available to the successor organizations, on terms and conditions acceptable to A.I.D.

(8) Raw Water Supply

To provide all physical and operational improvements, satisfactory to A.I.D., needed to assure that an adequate quantity and quality of raw water supply from the Ismailia Port Said Sweetwater Canal system operated by the Ministry of Irrigation will be available for the purposes of this project.

DATA center

9/29/75

Date



UNITED STATES AGENCY for INTERNATIONAL DEVELOPMENT

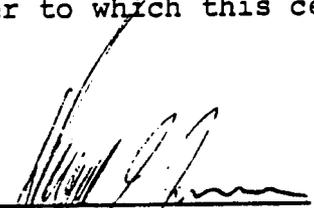
CAIRO, EGYPT

ANNEX D
Page 1 of 1

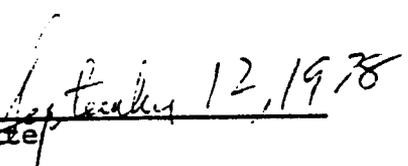
CERTIFICATION PURSUANT TO SECTION
611 (e) OF FAA 1961 AS AMENDED

1. Donald S. Brown, Director, the principal officer of the Agency for International Development in Egypt, having taken into account, among other things, the maintenance and utilization of projects in Egypt previously financed or assisted by the United States, do hereby certify that in my judgment Egypt has both the financial capability and the human resources to effectively install, maintain and utilize the capital assistance to be provided for the Canal cities water and sewerage project.

This judgment is based upon general considerations discussed in the capital assistance paper to which this certification is to be attached.



Donald S. Brown
Director



Date

ANNEX E

Description and Deficiencies of Canal Cities' Existing Water and Sewerage Systems

A. Descriptions of Existing Water and Sewerage Systems

1. Port Said's water is obtained from the Port Said Canal and is processed at the El-Raswa Treatment Plant near the junction canal between Lake Manzalah and the Suez Canal. Treatment includes coagulation, sedimentation, filtration, and chlorination. The plant consists of raw water screening and pumping facilities, one rapid sand filtration flow train (existing Bamag) and five slow sand filtration flow trains, filtered water storage, disinfection facilities, filtered water pumping facilities and elevated storage. Two of the slow sand filter flow trains are currently being converted to rapid sand filtration. The conversions were designed by and are being constructed under direction of Compagnie Europeenne de Traitment des Eaux (CTE). It is expected that these conversions will be completed by January 1979. The nominal capacity of the plant upon completion of the CTE conversions will be 141,000 m³/day. In addition, a new rapid sand filtration section with a capacity of 70,000 m³/day is to be added to the plant by 1982 under a current contract between Bamag and SCA. Present average-day water demand is estimated at 90,000 m³/day, increasing to 181,000 m³/day by 1990. Chlorine is applied to a portion of the finished water before or after clear-well storage.

The plant includes three raw water and three finished water pumping stations. The latter provide all distribution system pressure, as there are no distribution booster pumping stations. The firm capacities are 5160 m³/hr for raw water and 5000 m³/hr for finished water.

The water distribution system is divided into two sections: one supplying Port Said, the other Port Fouad. The Port Said system is connected to the El-Raswa Treatment Plant by two 600 mm, and one 800 mm, and one 400 mm transmission mains. Port Fouad is supplied by two 500 mm inverted siphons under the Suez Canal.

Two new 600 mm fiberglass siphons are being constructed near El-Raswa to replace the southern siphon to Port Fouad, which functions poorly. Two new 800 mm siphons will be installed across the interior canal to serve Port Said.

The water distribution mains vary from 300 mm to 800 mm. Most of the mains are cast-iron. The more recent additions are cement-lined ductile iron or asbestos-cement. About 25% of the Port Said pipe is asbestos-cement. All the Port Fouad system is cast-iron.

2. Port Said is served by a combined storm and sanitary sewerage system extending to all presently built-up areas, except the SCA area and the Kabbuti fishing village. Within the sewerage area, however, approximately 2,500 buildings are not connected to the sewer system.

The sewerage area in Port Said is divided into fourteen drainage areas, each of which is served by a pumping station. Nine of these pumping stations discharge to the main pumping station which delivers the sewage to the Treatment Plant at Mazrah, via a single force main, 2.5 km long. Three other stations pump directly to Mazrah through individual force mains and the fourteenth station discharges directly to Lake Manzalah.

Local drains in the SCA area and the Kabbuti village discharge through numerous small outfalls to the Suez Canal and Lake Manzalah, respectively.

Approximately two-thirds of Port Fouad is served by a gravity sewer system which discharges to the Suez Canal through three known outfalls. Buildings in other areas of the city are served by individual septic tanks.

Gravity sewers are vitrified clay pipe with jute and mortar joints. The standard practice has been to encase the pipes in concrete since much of the system is below the groundwater table. The clay pipe is of local manufacture. Most laterals are either 180 mm or 230 mm. Collector and trunk sewers are 300 mm, 380 mm and 450 mm. In a few areas short runs of trunk lines near pumping stations reach 500 mm or 600 mm diameter.

GOSSD indicates the following standard minimum slopes have been used for sewers:

<u>Diameter-mm</u>	<u>Slope</u>
180	1:150
230	1:250
300	1:350
360	1:450
450	1:550

Manholes on lateral sewers are closely spaced since the practice is to have all house leaders feed in at manholes. Manholes are of cast-in-place concrete. Building leaders are connected by knocking a hole in the wall of the manhole, inserting a pipe and patching the hole with mortar. Leaders are normally 100 mm and are encased like the sewers. Building leaders originate at boxes (1m sq x 0.5m deep) located at the foot of the building waste stacks.

The standard sewage pump station consists of a circular caisson, five meters in diameter and approximately four meters deep. A wall, offset from the centerline, divides the wet and dry wells. Each station has two two-speed vertical centrifugal pumps rated at 40 l/sec on low speed and 80 l/sec on high speed. The floor level of the wet and dry wells are the same. The pump suction is located about 20 cm off the floor and the influent sewer about 1 m above the floor. A screen is installed horizontally across the well slightly above the pump suction.

The main pumping station and four other stations have substructures similar to but larger than the standard stations, and equipped with three pumps. Each of these stations includes a superstructure which houses the above-ground pump motor drives. In addition to the installed electrically driven pumps, each pump station has one or two engine driven portable pumps to supplement pumping capacity.

Sewage from 70 percent of Port Said is pumped to the vicinity of the Mazrah wastewater treatment plant and then directed into Lake Manzalah. The remainder of Port Said sewage is sent directly to the lake or to the Suez Canal. Wastewater from Port Fouad is discharged to the canal except for that which is treated in individual septic tanks. The present amount of sewage generated in Port Said plus Port Fouad is estimated at 52,000 m³/day, increasing to 138,000 m³/day by 1990. The Mazrah plant is being bypassed while it is undergoing rehabilitation. The plant consists of three parallel treatment trains as follows:

Primary settling tanks and trickling filters without final settling tanks.

Activated sludge plant including primary and final settling tanks.

New primary treatment system (this system is still under construction--has never been used).

The plant includes grit chambers, manually cleaned bar screens, and underdrained drying beds for raw sludge.

Upon completion of the rehabilitation work now in progress, the primary treatment capacity of the existing trickling filter and activated sludge portions of the plant will be 32,000 m³/day, plus 12,000 m³/day of capacity in the new primary treatment tanks now under construction. Secondary treatment capacity will be approximately 22,000 m³/day.

3. Ismailia's water is obtained from the Ismailia Canal, and is processed at a facility located at the northwest end of Lake Timsah. This facility includes three essentially separate treatment plants, as follows:

<u>Plant</u>	<u>Capacity</u>
Slow Sand	18,000 m ³ / day
Semi-rapid Sand	25,000 m ³ / day
Rapid Sand	20,000 m ³ / day

SCA, through a contract with CTE, is now designing a new 80,000 m³/ day rapid sand filter plant which will replace the existing slow sand filter plant by the end of 1980. The existing rapid sand filter plant was heavily damaged during the war, and is now undergoing repairs which are scheduled for completion before the end of 1978. These repairs should restore the plant to its original design capacity of 50,000 m³/ day.

Water treatment consists of flash mixing, coagulation, sedimentation, filtration, and chlorination. Clearwell storage totals 8,600 m³/day and the combined rating of the two finished water pumping stations is 103,500 m³/day. The present water demand is estimated at 49,000 m³/day, increasing to 88,000 m³/day by 1990.

A water system consists of a single pressure zone with ground elevations ranging distribution from zero to 16 m. System pressure is controlled by the discharge pressure at the water treatment plant and varies from 34 to 38 m at the semi-rapid and low sand high service pump station and from 26 to 32 m at the rapid sand high service pump station.

The pipe network consists of mains ranging from 60 to 600 mm in size. The 600 mm pipes for the most part are located near the water treatment plant. The majority of the trunk mains, including a ring main which circles the city, are 400 mm. Two recently constructed parallel 600 mm mains lead from the rapid sand filter plant high service pump station to Sheikh Zayed, located in the northeast part of the city.

There are over 151 km of mains of all sizes in the system. All pipes installed prior to 1965 were unlined cast-iron. Pipes installed after this date, 400 mm and smaller, are cement-asbestos.

System storage consists of 8600 m³ of treated water storage at the water treatment plant and three small elevated storage tanks-- two of 500 m³ each on the east side in Abu Rakham and a 250 m³ tank at the SCA hospital on the north shore of Lake Timsah.

A new tank is under construction at Sheikh Zayed which, when complete, will have a capacity of 590 m³. Total treated water storage at the water treatment plant after completion of the new rapid sand treatment plant will be 12,100 m³.

Approximately 100 fire hydrants provide fire protection throughout the system. Fire hydrants are located in below ground vaults.

4. Of the Ismailia area's current population of nearly 250,000, approximately 132,000 are connected to the city's sewerage system. Sewered areas are the districts of Abhasa, Arashia, Mecca, Sheikh Zayed, Timsha, and a small section of Abu Atwa. The present sewage flow is estimated at 17,000 m³/day, increasing to 34,000 m³/day by the year 1990.

Due to the area's flat topography and the elevated position of the wastewater treatment plant in Abu Atwa, it is necessary to pump the collected wastewater to the plant. Four pump stations currently discharge to the main booster pump station which in turn discharges to the treatment plant. A fifth pump station, Sheikh Zayed, will be connected directly to the plant when construction of the station is completed.

Ismailia has approximately 68 kilometers of sewers, varying in diameter from 7 in. to 24 in., and are constructed from one meter long spigot and socket clay pipes with joints of tarred gasket and mortar. It is reported that the pipes are bedded and haunched on concrete and when laid below the water table the pipes are also surrounded or enveloped in concrete.

With the exception of large trunk sewers, manholes are spaced about 30 meters apart and house connections to the sewers must be made at manholes. The manholes are circular and constructed of cast-in-place concrete. Cast-iron covers and frames are used but are easily displaced from manholes in unpaved streets.

Each of the six sewage pump stations is of a standard circular design. The stations have a flat bottom wet well with the inlet sewer entering the well through a sluice gate approximately 1.3 m above the floor. The wastewater passes through hand-cleaned screens that are installed horizontally below the inlet pipe and inclined against the pump room wall. The screens have 25 mm openings between bars. A 0.6 m wide platform is located above the screens around the perimeter of the wet well to provide access for cleaning and screens. This platform has no handrail. Access to the wet well is via a hatch at ground level and manhole steps. No ventilation or lighting is provided in the wet well.

The pumps draw wastewater through a 45 degree flared elbow and discharged through a check valve to the station discharge header. Isolation valves are furnished on the suction and discharge of each pump and on the discharge header. Pump suction and discharge pipe sizes are the same size as the pump connections. Increases and reducers are not used.

The pumps are of the enclosed shaft type, directly connected to the motor located on the ground floor. The pumps are furnished with water seals.

A small sump pit is located in the pump room and a single, manually-controlled enclosed shaft sump pump draws from the pump room and discharges to the wet well. Access to the pump room is via an open hatch and a very steep ladder. Air is exhausted from the pump room by a fan located adjacent to the hatch.

The motor room is a rectangular building built on top of the circular station. The motors, electrical control equipment, and seal water systems are located in this room. An overhead manual bridge crane is provided for lifting the pumps. The stations were designed for either automatic or manual control of the pumps.

Force mains leading from the pump stations vary from 965 meters to 7,250 meters in length, and from 200 to 500 mm in diameter.

The Ismailia wastewater treatment plant provides primary and secondary treatment through the high rate trickling filter process. The design capacity is 18,000 m³/day. Located south of the city on a knoll in Abu Atwa, the plant discharges effluent to El Mahsama drain which flows into the West Lagoon of Lake Timsah. Waste sludge from the treatment plant is dried on drying beds and sold to farmers as fertilizer.

The facility consists of two grit and screen chambers, two primary sedimentation tanks, four trickling filters, two final sedimentation tanks, a recirculation pump station, 160 sludge drying beds, and an operations building.

5. Suez City is furnished water from the SCA water treatment plant located at the present northern edge of the city adjacent to the Suez Sweetwater Canal. There are five additional smaller water treatment plants located within Suez or in nearby areas. Three of these plants are operated by MOHR to furnish water to separate distribution systems in outlying areas north of Suez. The other two plants supply treated water to local industries, one to Suez Fertilizer Factory and the other to the Suez Oil Processing Company (SOPC).

The average daily delivery rate from the SCA plant during the past year was 47,700 m³/day, with a maximum day of 59,400 m³/day. At this plant, raw water is pumped to a distribution box used to feed clariflocculators. Mechanically-induced flocculation takes place in the center of each unit, with settling accomplished in the outer section. The clarified water flows over weirs and is conducted by gravity to either rapid sand filters or slow sand filtration units. The rapid sand filters are single media. Slow sand filtration units consist of two-step gravel filters followed by slow sand filters. Filtered water flows to either a reservoir under the filters or to a separate underground reservoir. The reservoirs are connected to the suction wells of the finished water pumping stations.

Alum and polymer are added to the water before it enters the clariflocculators. Currently, chlorine is added either to the finished water reservoirs or to the finished water pumping station suction wells. Finished water storage totals 11,600 m³.

In addition to the treatment units, the SCA water treatment plant has administration buildings, storage areas and various maintenance shops. A new laboratory is under construction. Extensive laboratory equipment is in storage pending laboratory completion.

A three-phase improvement program for the repair, modification and extension of the water treatment plant is being undertaken by the SCA. Under the first phase, war damage is being repaired as much as is economically feasible to increase production. Work under this phase is nearly complete. The second phase of the construction program consists of modifications, expansions and rehabilitation work to meet immediate short-term needs. The French firm, Chabal, recommended and designed the work to be accomplished, and construction is being carried out under a turnkey contract by the related French contracting of Compagnie Europeenne de Traitement de Eaux (CTE). This phase of the work is currently under way and is scheduled for completion in 1978. For the third phase, SCA has recently entered into a contract with Bamag of West Germany for extensions to the existing plant. This phase of the work also is under way and is scheduled for completion in the early 1980's.

Upon completion of the three construction phases, the SCA water treatment plant will consist of three essentially independent treatment trains, with a total capacity of 239,000 m³/day. The year 1990 maximum day demand is projected to be 246,000 m³/day.

The existing transmission and distribution system consists of a single pressure zone at elevation 30 m measured at the water treatment plant.

Pipelines are of cast-iron and asbestos-cement ranging in size from 100 mm to 500 mm. The majority of the transmission mains are 400 mm, and the majority of the distribution mains are 100 mm.

The major portion of the area served is enclosed by transmission mains along Nasser Road, El Galaa Street and Coastal Road, Port Said and El Kornesh Streets, Suez Sweetwater Canal, Maghrabi Canal and the Road to Cairo. There is a 600 mm asbestos-cement main along the road to Cairo to supply water to Feisal and Sabah Cities; two 400 mm mains, one cast-iron and one asbestos-cement, extending to Port Tewfik; and a 300 mm cast-iron main running southwesterly along Coastal Road.

There are no booster pumps nor storage tanks in the transmission and distribution system.

The SCA currently is replacing the older cast-iron pipe in the distribution system. As a general policy, asbestos-cement pipe is utilized for new and/or replacement mains up to and including 400 mm diameter. Ductile iron pipe is used for larger mains. Asbestos-cement pipe is manufactured in A.R.E. but ductile pipe is not and must be imported. Line and branch valves located in the distribution systems are either equipped with valve boxes or are installed in manholes or vaults.

Fire hydrants connected to the distribution system are located in metal boxes below ground level with the covers at sidewalk or ground level. The outlets of these flush-type hydrants are generally of 60 mm diameter. Coupling hose connections of various types are carried by the fire department.

At the present time, there are approximately 6,250 water service connections to the distribution system.

6. Suez is served by ten sewerage districts, each of which has a separate system of collection sewers and a pump station, from which sewage is sent via force mains to the existing treatment facility located west of the city.

The system contains approximately 80 kilometers of gravity sewers, varying from 175 mm to 450 mm in diameter. Manhole spacing averages 27 meters.

All of the existing stations installed for the ten districts, except for one temporary station, are of the standard GOSSD design. These consist of a circular substructure which is segmented by a partition wall to provide a wet well and a dry well. Vertical access

is provided to each. The wet well is provided with screens which are manually cleaned. The dry well is equipped with vertical centrifugal pumps and shafting, a sump pump and all attendant piping. A super-structure is provided to house the sewage pump motors, the seal water system, ventilating equipment and electrical switchgear.

All of the pump stations are 8 meters in diameter, except for one 6 meter and one 10 meter unit. They each contain two or three centrifugal pumps.

The sewerage system includes 10 force mains, varying from 200 mm to 450 mm, which are constructed of cast-iron pipe except for one asbestos-cement pipe.

The existing sewage treatment facility is located on a 45 hectare site about 3 kilometers west of the present urban area. The facility was initially commissioned in the late 1920's and consisted of two primary sedimentation tanks, the effluent of which was used for on-site irrigation. Drying beds were provided for disposal of solids removed in the sedimentation process. The facility reportedly performed satisfactorily until at least the early 1960's.

In the early 1960's, plans were implemented to pump the sewage to a new and larger disposal site located about 3.5 km to the northwest of the present site. The work consisted of the construction of a new booster station at the present site and a force main to convey the sewage to the new site. Construction was interrupted by the war in 1967. At the time, the pump station was substantially completed but reportedly never operated. The station sustained little, if any, damage during the war and is apparently structurally sound and fully equipped. The functional condition of the equipment has not been determined because there is no electric service on the site. Although the equipment appears to be in good condition, disassembly, cleaning, and replacement of some parts would certainly be required, as a minimum, to restore it to operating condition after an idle period of about nine years. The status of the force main is unclear. It was never completed and reportedly sections have since been removed and used for other purposes.

Recently, plans were implemented to construct two additional primary tanks, one on either side of the existing tanks, and to install two 600 mm diameter asbestos-cement gravity lines to convey the primary effluent to Suez Bay. Construction was started but discontinued pending completion of master planning. Only the excavation for the two tanks was completed.

Treatment consists of primary sedimentation only, using the two originally constructed settling tanks. Each of these tanks is about 50 meters long by 8 meters wide. Their combined volume and surface area is about 2,340 m³ and 700 m², respectively. Only one of the tanks is currently in operation, which is adequate because only about 20% of the estimated 44,000 m³/day of sewage generated in Suez reaches the plant at present. Sewage flow is estimated to increase to 168,000 m³/day by the year 1990.

The plant effluent stream is split, with a portion discharged to local irrigation areas and the remainder conveyed to Suez Bay by way of an adjacent surface drainage channel. Settled solids are withdrawn hydraulically from hoppers provided in the bottom of the tanks and conveyed to manually cleaned sludge drying beds. Because of the sewage septicity, a large amount of sludge floats to the tank surface, from which it is manually removed to the sludge drying beds.

B. Deficiencies of Existing Water and Sewerage Systems

1. The Port Said water system has numerous problems which diminish its present and near-future effectiveness. The treatment plant has non-level weirs, lack of metering, inadequate baffles, poor access to filter underdrains, unsuitable bar racks, inadequate backwash pumps, and inoperative rapid mixers. There is no central chlorination facility and no means of storing, lifting, and weighing chlorine cylinders, resulting in uncertain chlorine feed rates and danger to operators. Both the raw and finished water pumping stations will be inadequate to handle the peak flows upon completion of the CTE conversions to rapid sand filtration, which are now under construction. The pumps and their motors are of a wide variety of makes and ages, and the supply of spare parts is poor.

Regarding the water transmission and distribution system, low water pressure is experienced regularly in the northwest area of the city, indicating need for additional transmission capacity to that area. Isolating valves are of a variety of makes and styles, and some are inoperative or leaking. Fire hydrants are installed flush with the ground surface, and many leak or are inoperative. Preliminary evidence indicates that a significant amount of leakage or wastage exists in the water system. Many of the water service meters are inoperative, and the meter test and repair facility is inadequate.

2. Port Said's sewage collection system is seriously deficient, resulting in back-ups onto streets and in buildings. The above-mentioned boxes at the upstream ends of building leaders accumulate trash until it plugs the outlets. The top slabs of the boxes are frequently broken or missing, perhaps removed by residents to prevent

sewage from backing up into ground floor apartments. With the covers off, the boxes make convenient solid waste receptacles. The added trash load results in even more frequent clogging and overflows. Another problem is that the displacement in the wet wells--between the minimum level needed to maintain pump suction submergence and the maximum level possible without surcharging the sewers--is inadequate for control of constant speed pumps. Hence it is impossible to avoid surcharging the sewers over at least part of each pump cycle. Actually, the pumps in most stations are unable to keep up with peak flows so the tributary sewers remain surcharged over much of the day. Such surcharging results in deposition of solids and plugging of sewers.

Port Said sewage treatment plant deficiencies, beyond those now being corrected by the current rehabilitation project include:

- Excessive fine aggregate in the trickling filters.
- Small trickling filter underdrains.
- Flow-restricting compartments in the new primary clarifiers as designed.
- Inadequate hydraulic capacity in some sewage and sludge conduits.
- Low elevation of sludge drying beds, resulting in poor drying.

3. The Ismailia water treatment plant has the following deficiencies which reduce its efficiency and reliability:

- Manually cleaned raw water intake screens.
- Inadequate chemical storage, feeding, and mixing facilities
- Insufficient flocculation.
- Inoperative filter level control valves.
- Inadequate chlorine storage and feeding system.
- Insufficient finished water pumping capacity.
- Lack of laboratory equipment.
- Inoperative or insufficient flow metering.

The Ismailia water distribution system is deficient as follows:

- Approximately 40% of the area's residents are not served by water connections to their homes, and, therefore, use public fountains or private wells.
- Unaccounted for water is 56% of water production, indicating wide-spread leakage and wastage.
- Capacity to provide service to rapidly growing peripheral areas will soon be insufficient.
- Many of the transmission and distribution mains are not interconnected.
- Fire hydrant distribution is inadequate, and many hydrants are inoperative.
- Meter testing and repair facilities are inadequate.
- System storage is insufficient to balance out peak demands, provide for fire demand, and provide for emergency outages.

4. The Ismailia sewage collection system is not performing satisfactorily due to the following problems:

- The sewers are partially clogged, due to residents depositing trash in manholes and due to operating the pump stations at surcharge levels.
- Excessive infiltration due to high groundwater and the type of sewer joints.
- A number of sewers and force mains are broken.
- The pump stations have numerous inoperative pumps, have insufficient useful storage in wet wells, have no convenient provisions for cleaning of bar screens, and the pumps are incorrectly sized for present flows.

At Ismailia's sewage treatment plant, one primary sedimentation tank, two trickling filters, two final sedimentation tanks, and the operations building are not in service due to war damage or design/construction deficiencies. Specific deficiencies include:

- Broken, spalled, and cracked concrete structural elements.
- Defective wiring and motors.
- Inadequate piping and distribution channels to the sludge drying beds.
- Missing nozzles and guy rods on trickling filter distributors.
- Plugged media and underdrains in the trickling filters.
- Missing scum skimmers and weirs on clarifiers.
- No fresh water supply for seal water pumps and general clean-up uses.
- No laboratory facilities.

5. The Suez water treatment plant is deficient in the following respects:

- Insufficient chlorine contact time.
- The raw and finished water diesel-driven pumps require excessive maintenance.
- Chemical feed facilities are inadequate with no means of measuring dosage.
- Flow metering is insufficient.

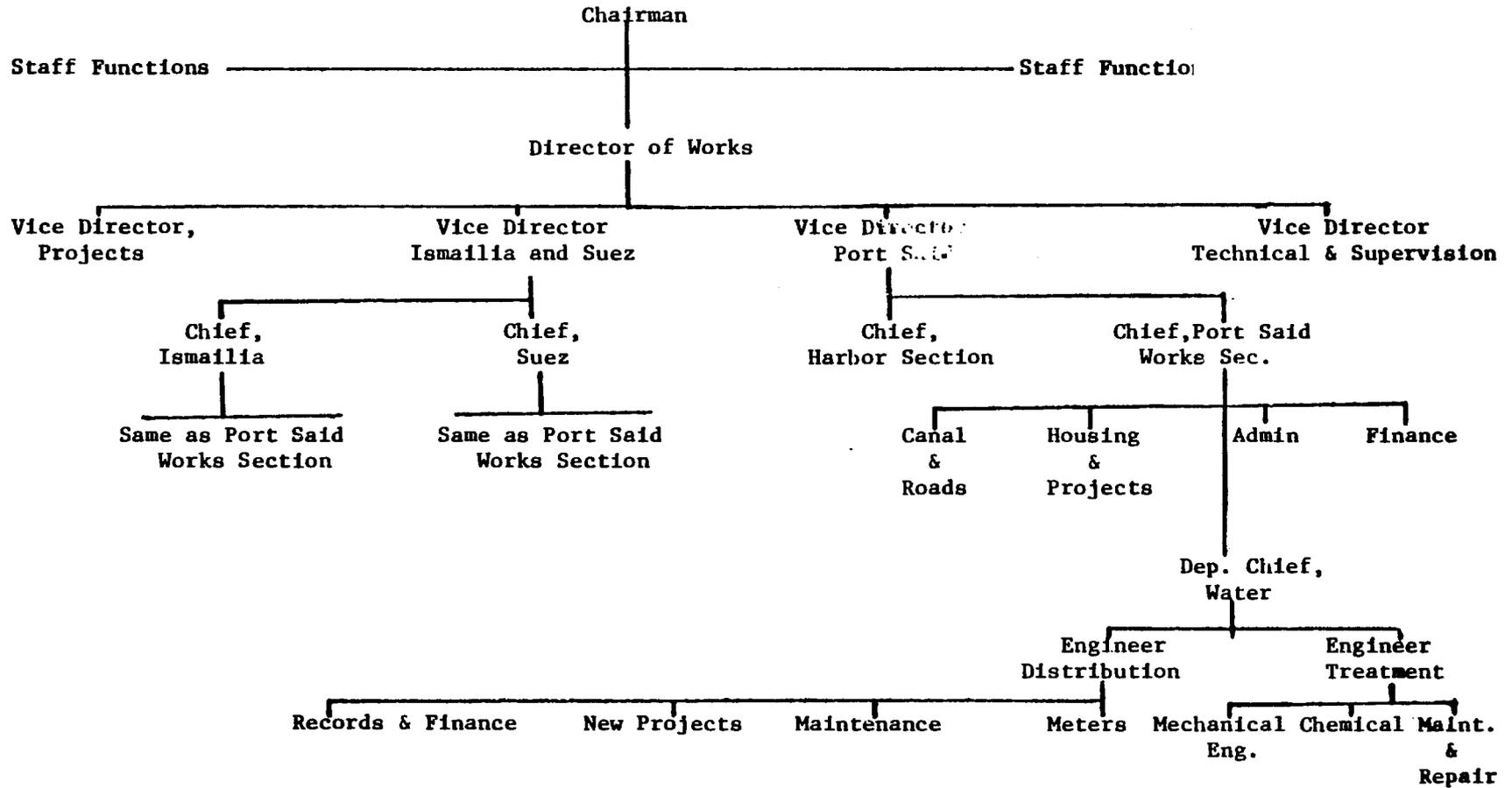
The Suez water transmission and distribution system contains a number of under-sized and tuberculatated mains which cause low pressure problems. In addition, approximately 14,000 dwellings in Suez are without water service. Some of the distribution system valves are inoperative. There is also a lack of waterworks maintenance equipment. About 40% of the retail water service connections do not have meters.

6. In the Suez sewage collection system, all of the main collectors are surcharged due to unsatisfactory downstream pump plant operations, and sewage back-ups and overflows on streets are common. Some of the sewers are war-damaged, particularly in the Port Tewfik area. Most of the sewers are heavily silted.

The pump stations have inadequate wet well capacity, and the bar screens are difficult to clean. Many of the pumps are inoperative, and in several instances submersible pumps are being used. There is virtually no operable flow control or measurement equipment. Several of the force mains are war-damaged, undersized, or experience frequent pipe breaks.

At the Suez Sewage treatment plant, no flow measurement device has been provided. The access road to the plant site is in poor condition, and there is no flow measurement facility. At the present time there is no electrical service to the site. The plant has capacity to provide primary treatment for about 28,000 m³/day, which is adequate for the amount of flow generated in Suez at present. However, once the existing sewers, pump stations, and force mains are fully restored and operating, and even a modest amount of population growth occurs, the treatment plant will become overloaded.

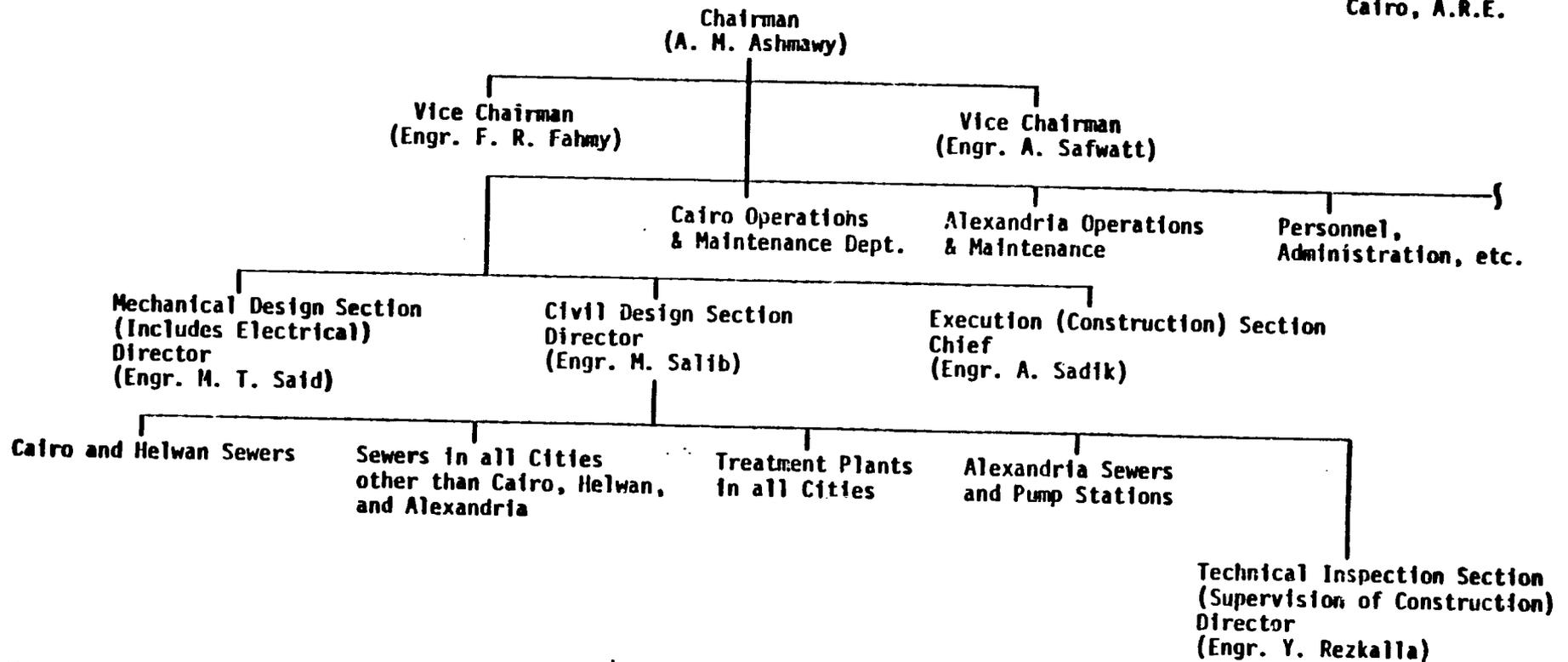
SCA ORGANIZATION CHART



GENERAL ORGANIZATION FOR SEWERAGE AND SANITARY DRAINAGE (GOSSD)

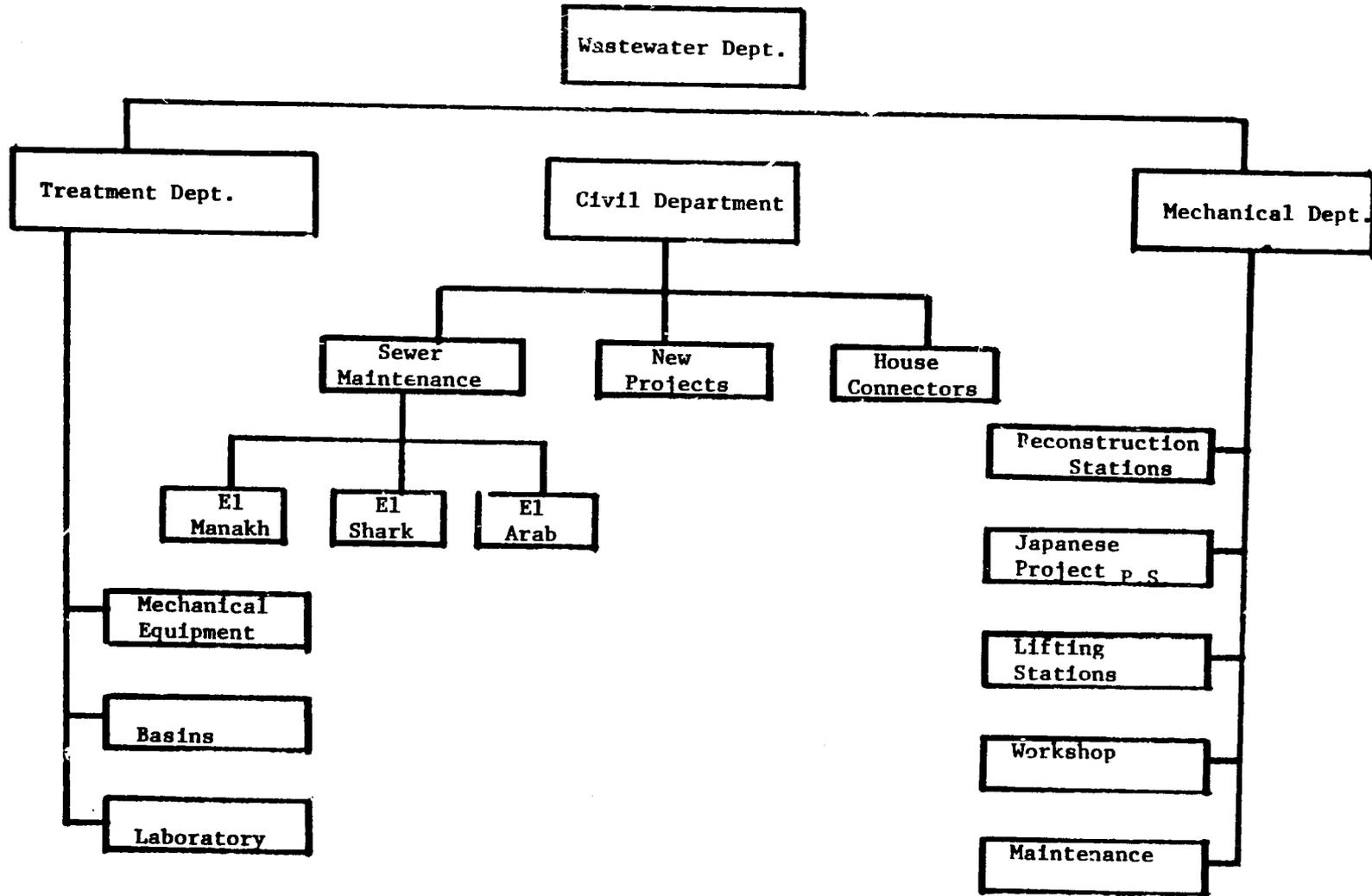
ORGANIZATION CHART

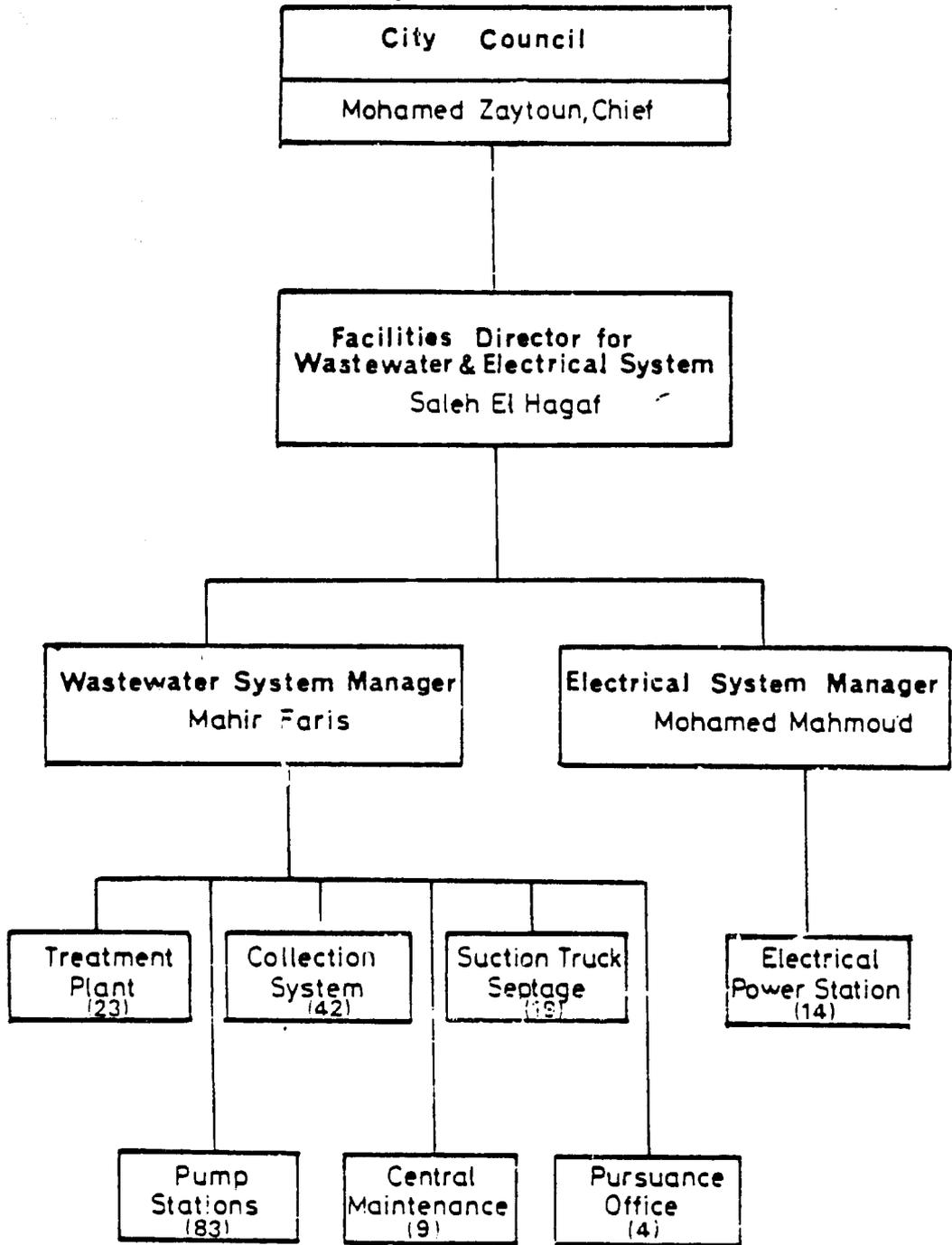
Address: Hogaama Bldg.
Midan El Tahrir
6th Floor
Cairo, A.R.E.



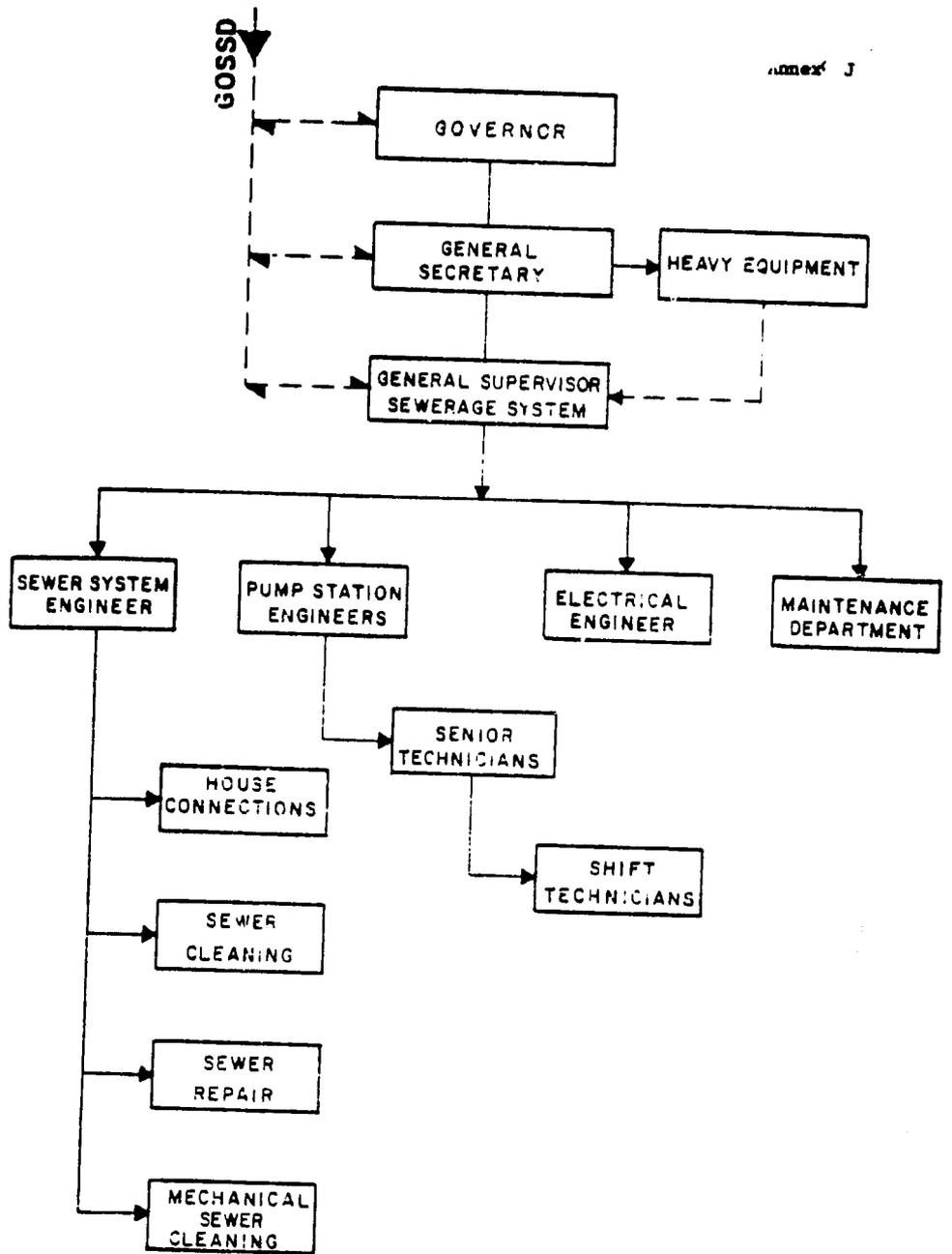
The GOSSD is in charge of planning, design and supervision of construction (most of which is done by private contractors) in all of Egypt, and for operations and maintenance of the sewerage systems for Alexandria and the Greater Cairo areas only.

PORT SAID ORGANIZATION CHART





ISMAILIA
ORGANIZATION CHART FOR
WASTEWATER FACILITIES



SUEZ WASTEWATER SYSTEM
ORGANIZATION CHART

SUMMARY OF MANAGEMENT/TARRIF STUDY

Management Study

The work is to culminate in a study recommending one or more programs for the staged development of the organizations or agencies needed to meet the current and future operational and management needs of the water and wastewater systems through the year 2000. The detailed portions of the studies and plans shall be restricted to the six cities of Cairo, Helwan, Alexandria, Suez, Ismailia and Port Said. The recommended management structures should, however, be flexible enough to accomodate future expansion and extension of service to new areas and adjacent to the cities or to more distant areas that may be economically served by the systems under study. The study is also expected to recognize two additional elements. Firstly, the recommendations will have implications in terms of national legislation and policies. Secondly, the recommended programs may form the model for utility management in other locations within Egypt.

The Study and Final Report shall cover the following areas of concern:

- 1) Organizational Environment
- 2) Organizational Structure
- 3) Personnel System
- 4) Procedures and Methods
- 5) Management Information System
- 6) Physical Assets
- 7) Data Processing
- 8) Organizational Manual

Tariff Study

The tariff study will prepare and recommend separate rate schedules, or tariffs for potable and non-potable water supply services and for sewage services and will recommend a comprehensive tariff system, covering all services, and including demand rates, services charges, use rates, special assessments and others, as appropriate; plus rules covering conditions of service with appropriate penalties for noncompliance. Alternative tariff schedules (based upon service or value received, general income level, etc.) and justification for his recommended approach including an explanation of methods used to determine the level of rates recommended will be set out. All schedules shall be based upon the principle of fully satisfying the gross annual revenue requirement.

The study will investigate the feasibility and advisability of using a "cost adjustment" clause in tariff schedules, which would provide for automatic adjustment of rates by operation of a formula.

Rate schedules are to be so designed that they can be placed in effect in stages. The interim period would extend from 1979 through no later than 1983. Thus, by 1984, at the latest, gross revenue requirements would be fully met. The study is to discuss the implementation of such interim rates, including the possibility of increasing rates to some customer classes or groups, while holding other customer groups (i.e., low income groups at or near the present rate level.)

The study is also to set forth a policy for the recovery of wastewater collection, treatment and disposal costs and recommend the level of surcharges to be applied to wastewater customers who discharge wastes into the sewers that require special treatment. Included in the tariff are to be such rules as may be needed to require pre-treatment of sewage by the customers in specified situations.

Project Title & Number Canal Cities' Water and Wastewater 263- 0048

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p>Project Objective: Improve the public health conditions of the general populace and aesthetic environment in the Suez Canal cities of Port Said, Ismailia and Suez</p>	<p>Measures of Goal Achievement</p> <ol style="list-style-type: none"> 1. Reduction in enteric diseases 2. Elimination of raw sewage from the human environment. 	<ol style="list-style-type: none"> 1. Ministry of Health records. 2. Visual inspection. 	<p>Assumptions for achieving objectives</p> <ol style="list-style-type: none"> 1. Negotiations leading to a political settlement will continue and warfare will not be resumed. 2. Population growth projections for respective cities are not exceeded.
<p>Project Purpose: Provide urgently needed improvements in the existing water and sewerage systems of the Canal Cities through rehabilitation and expansion.</p>	<p>Conditions that will indicate progress has been achieved:</p> <ol style="list-style-type: none"> 1. Good quality drinking water & extension of system to previous unserved areas. 2. Elimination of sewage on streets, other surface areas and into surface drainage systems. 3. Elimination of the discharge of untreated sewage into surrounding aquatic areas 	<ol style="list-style-type: none"> 1. Chemical analysis records of water treatment labs & random sampling of residential & industrial recipients. 2. Visual inspection of physical surroundings. 3. Treatment records at wastewater facilities. 	<p>Assumptions for achieving purpose</p> <ol style="list-style-type: none"> 1. Continued support of project by GOE. 2. Availability of required commodities and equipment in time frame prescribed. 3. Proper use and maintenance of equipment & commodities.
<p>Activities:</p> <ol style="list-style-type: none"> 1. Restore water treatment capacity and improve facilities. 2. Reduction of water leakage and wastage. 3. Extension of water distribution network. 4. Restore wastewater treatment capacity and improve facilities. 5. Extend wastewater service to existing and developing areas where not available now. 6. Improve management of both systems. 7. Improve equipment maintenance 	<p>Magnitude of Output</p> <ol style="list-style-type: none"> 1. 184,000 m³/day 2. Average rate of 50% down to at least 15%. 3. 42 km waterpipe line to Suez Cement Co. 4. 114,000 m³/day <p>Implementation Costs (in US Dollars)</p> <p>\$96 million in FX. LE 40 million in local currency</p>	<ol style="list-style-type: none"> 1. SCA records 2. GOSSD records 3. Records of the respective Governorates <ol style="list-style-type: none"> 1. GOE records <ul style="list-style-type: none"> a. SCA b. GOSSD c. Ministry of Housing 2. A.I.D. 	<p>Assumptions for achieving activities</p> <ol style="list-style-type: none"> 1. GOE will provide all local currency necessary to carry out project. 2. Trained assume positions for which they were trained. 3. Sufficient quantities of water will be made available for the respective water systems by Ministry of Irrigation. <p>Assumptions for providing activities</p> <ol style="list-style-type: none"> 1. Conditions precedent will be met. 2. Local equipment, commodities and construction services are available. 3. U.S. equipment manufacturers are willing to bid against tenders. 4. Qualified candidates for training will be available.
<p>Input</p> <ol style="list-style-type: none"> 1. Equipment 2. Commodities 3. Training 4. Consultant/Technical Services 5. Construction Services 			

USAID/CAIRO EGYPT
SURROUNDING ENVIRONMENTAL ASSESSMENT
INITIAL ENVIRONMENTAL EXAMINATION

Project Location: Suez, Ismailia and Matruh, Egypt

Project Title: Canal Cities Water and Sewerage (No. 263-0048)

Funding (Fiscal Year and Amount): FY 1978 \$60.0 Million

IEE Prepared By: Philip S. Lewis 1/25/78

Environmental Action Recommended: Environmental Assessment

Mission Decision:
(Approval/Disapproval of Environmental Action Recommended in the IEE)

Approved : [Signature]

Disapproved : _____

Date : 1/31/78

Clearances:
JRSnead Environmental Coordinator: [Signature]
Wakley Other Mission Offices: [Signature]

Date: 1/30/78
1/31/78

INITIAL ENVIRONMENTAL EXAMINATION
NARRATIVE DISCUSSION

1. Project Location: Suez, Ismailia and Port Said, Egypt
2. Project Title: Canal Cities Water and Sewage (No. 263-0048)
3. Funding (Fiscal Year and Amount): 1978, \$60.0 Million
4. IEE Prepared By: Philip S. Lewis Date: 1/25/78
5. Action Recommended: Environmental Assessment
6. Discussion of Major Environmental Relationships of Project Relevant to Attached Impact Identification and Evaluation Form:

This project will consist of the design and construction of improvements and/or expansions of the water and/or sewage systems in the three major Canal Zone cities. Repair and rehabilitation of existing system facilities may also be included in project. Specific system elements in project may include water intakes, treatment facilities and distribution networks; and sewage collection, treatment and disposal. In addition to the usual environmental factors associated with civil construction works, the significant environmental concerns involved in this project include: agricultural land or water pollution caused by the discharge of water-borne sanitary sewage and industrial waste effluents, land and water pollution resulting from solid waste disposal and land fills; air pollution by incineration of solid wastes; and ecological imbalance of Lake Timsah (near Ismailia) by sewage system effluent discharge. Concerning the Port Said system, if discharge of sewage into the Mediterranean Sea appears to be a viable alternative disposal method, an Environmental Impact Statement will be prepared for this possible project component. The scope of work of each of the three U.S. consultants now studying the cities' sanitary systems include the requirement for preparation of an Environmental Assessment. Such assessments will be presented in the consultants' final reports on the proposed projects and USAID's project reports.

IMPACT IDENTIFICATION AND EVALUATION FORM

Impact Areas and Sub-areas

Impact Identification and Evaluation/

A. LAND USE

- | | |
|--|---------------|
| 1. Changing the character of the land through: | |
| a. Increasing the population | _____ L _____ |
| b. Extracting natural resources | _____ N _____ |
| c. Land clearing | _____ N _____ |
| d. Changing soil character | _____ M _____ |
| 2. Altering natural defenses | _____ N _____ |
| 3. Foreclosing important uses | _____ L _____ |
| 4. Jeopardizing man or his works | _____ N _____ |
| 5. Other factors | |
| _____ | _____ |
| _____ | _____ |

B. WATER QUALITY

- | | |
|----------------------------------|---------------|
| 1. Physical state of water | _____ L _____ |
| 2. Chemical and biological state | _____ M _____ |
| 3. Ecological balance | _____ M _____ |
| 4. Other factors | |
| _____ | _____ |
| _____ | _____ |

- 1/N - No environmental impact
- L - Little environmental impact
- M - Moderate environmental impact
- H - High environmental impact
- U - Unknown environmental impact

IMPACT IDENTIFICATION AND EVALUATION FORM

Page 2

C. ATMOSPHERIC (Regarding Incineration)

- | | |
|--------------------|----------|
| 1. Air additives | <u>L</u> |
| 2. Air pollution | <u>M</u> |
| 3. Noise pollution | <u>N</u> |
| 4. Other factors | |

D. NATURAL RESOURCES

- | | |
|--|----------|
| 1. Diversion, altered use of water | <u>M</u> |
| 2. Irreversible, inefficient commitments | <u>L</u> |
| 3. Other factors | |

E. CULTURAL

- | | |
|------------------------------------|----------|
| 1. Altering physical symbols | <u>N</u> |
| 2. Dilution of cultural traditions | <u>N</u> |
| 3. Other factors | |

F. SOCIOECONOMIC

- | | |
|--|----------|
| 1. Changes in economic/employment patterns | <u>L</u> |
| 2. Changes in population | <u>L</u> |
| 3. Changes in cultural patterns | <u>N</u> |
| 4. Other factors | |

EFFECT IDENTIFICATION AND EVALUATION FORM

G. HEALTH

- 1. Changing a natural environment M
- 2. Eliminating an ecosystem element N
- 3. Other factors _____
- _____
- _____

H. GENERAL

- 1. International impacts (Mediterranean Sea sewage disposal) M
- 2. Controversial impacts N
- 3. Other factors _____
- _____
- _____

I. OTHER POSSIBLE IMPACTS (not listed above)

- _____
- _____
- _____

Prepared By: Philip S. Lewis Date: 1/25/78

Project Location: Suez, Ismailia and Port Said, Egypt

Project Title : Canal Cities Water and Sewage (No. 263-0048)

SCA TARIFF SCHEDULE
USAGE

<u>PRICE</u>		
3.8575	Mill	Washing streets
4.5	Mill	Syndicates, Public Offices, Political Party Bldgs.
6.0	Mill	Government Bldgs, Public Utilities, Schools, Universities, Hospitals, Charities, Cemeteries
6.0	Mill	Public Fountains <u>1/</u> , Religious Institutions <u>2/</u> , Suez Canal Clubs <u>3/</u>
9.0	Mill	Suez Canal Offices and Workshops, all other Clubs, Youth Hostels and Social/Athletic Public Centers
18	Mill	General Public Use, i.e., private homes, public housing (paid by Governorates), Hotels and private businesses.
30	Mill	Outside of Canal Cities City Limits.
35	Mill	Port Said Free Zone.
100	Mill	Suez Free Zone <u>4/</u> and Water Supplied to Ships transiting the Suez Canal. <u>5/</u>

1/ 8/m³ Daily at No Charge

2/ Maximum of 1,800 m³/year before being charged 18 mil rate

3/ Based on No. of members in Club and area of garden

4/ Rate is higher than for Port Said because of longer distance to transport the water.

5/ Water is actually sold to water boats who in turn sell to the transiting ships at prices much higher than 100 Mill.

ANNEX N

SCA WATER CONNECTION RATES^{1/}

Connection from 60 to 150 mm Main Line^{2/}

15 mm	LE	52
20		66
25		77
30		87
40		101
50		115
60		130

Connection from 500-600 mm Main Line^{3/}

15 mm:	LE	54
20		71
25		79
30		89
40		103
50		117
60		135

1/ - Reconstruction of roads and repavement are charged at cost

2/ Primarily Residential and Commercial Users

3/ Primarily Industrial

Note: 700 milliemes is charged for estimating the amount of work to be performed and this work is done on contractor basis.

SUEZ CANAL AUTHORITY
ANNUAL OPERATING & MAINTENANCE EXPENSES
 (LE)

Year	Category	Labor **	Electricity	Fuel	Chemicals	Miscellaneous*	Total
1975	Water Treatment	102,080	54,000	16,265	85,638	156,080	414,063
	Water Distribution	75,271	-	-	-	85,026	160,297
1976	Water Treatment	102,619	88,576	19,145	157,415	200,560	568,315
	Water Distribution	92,008	-	-	-	178,805	270,814
1977	Water Treatment	125,535	133,360	19,995	159,428	358,272	796,590
	Water Distribution	105,225	-	-	-	202,262	307,487

* Includes Replacement Parts plus Contractors

** Does not include:

1. Housing for laborers
2. Medical insurance
3. Social Expenses & Clubs
4. Pension obligations

SUEZ CANAL AUTHORITY

CAPITAL IMPROVEMENTS
(LE)

Year	Water Treatment	Water Distribution	Total
1975	1,581,170	228,830	1,810,000
1976	3,298,000	193,000	3,491,000
1977	1,583,000	98,000	1,681,000

SUEZ CANAL AUTHORITY
WORKS DEPARTMENT

BUDGET SCHEDULE
(All Values in LE)

Year	Category	F U N D E D			N O T F U N D E D			T O T A L
		Local C. +	Foreign C.	Sub-Total	Local C. +	Foreign C.	Sub-Total	
1978	Water Treatment	2,421,000	300,000	2,721,000	-	-	-	2,721,000
	Water Distribution	165,000	345,000	510,000	88,000	251,000	339,000	849,000
1979	Water Treatment	2,385,000	138,000	2,523,000	471,000	1,590,000	2,061,000	4,584,000
	Water Distribution	996,000	88,000	1,084,000	2,212,000	6,826,000	9,038,000	10,122,000
1980	Water Treatment	1,735,000	29,000	1,764,000	695,000	2,242,000	2,937,000	4,701,000
	Water Distribution	350,000	-	350,000	5,257,000	10,437,000	15,694,000	16,044,000
1981	Water Treatment	571,000	-	571,000	503,000	1,728,000	2,231,000	2,802,000
	Water Distribution	495,000	150,000	645,000	3,935,000	3,142,000	7,077,000	7,722,000
1982	Water Treatment	-	-	-0-	474,000	769,000	1,243,000	1,243,000
	Water Distribution	670,000	150,000	820,000	1,311,000	1,000,000	2,311,000	3,131,000
TOTAL		9,788,000	1,200,000	10,988,000	14,946,000	27,985,000	42,931,000	53,919,000

SUEZ CANAL AUTHORITY
WORKS DEPARTMENT

BALANCE SHEET AS FOR YEAR 1977
(LE)

<u>Assets</u>	
- Capital as of January 1, 1977.	34,592,430
- Capital improvement as of Dec. 31, 1977	1,681,000
- Direct Charges	703,642
- Cash on hand as of January 1, 1977	-
- Prepaid Expenses	-
- Account due (advance payment).	1,116,239
Total Assets	38,093,311
<u>Liabilities</u>	
- Account payable	2,785,077
- Depreciation	9,982,600
- Uncollected account	1,116,239
Total	13,883,916
- Net worth of system	26,290,830
	40,174,746
Deficit	2,081,435
Direct Contribution from S.C.A.	2,081,435
	0,000,000

ANNEX B

SUEZ CANAL AUTHORITY
WORKS DEPARTMENT

ANNUAL REVENUE (PROJECT + EQUIPMENT BUDGET)
(LE)

Year	Direct Charges	SCA Funds	Other	Total*
1975	420,458	1,389,542	-	1,810,000
1976	610,250	2,880,750	-	3,491,000
1977	703,642	977,358	-	1,681,000
		+ 1,116,239		1,116.239**

* N.B.: The Total does not include S.C.A. funds for Operation and Maintenance.

** Advance Payment

GOSSD Capital Expenditures in the Canal Cities
(L.E)

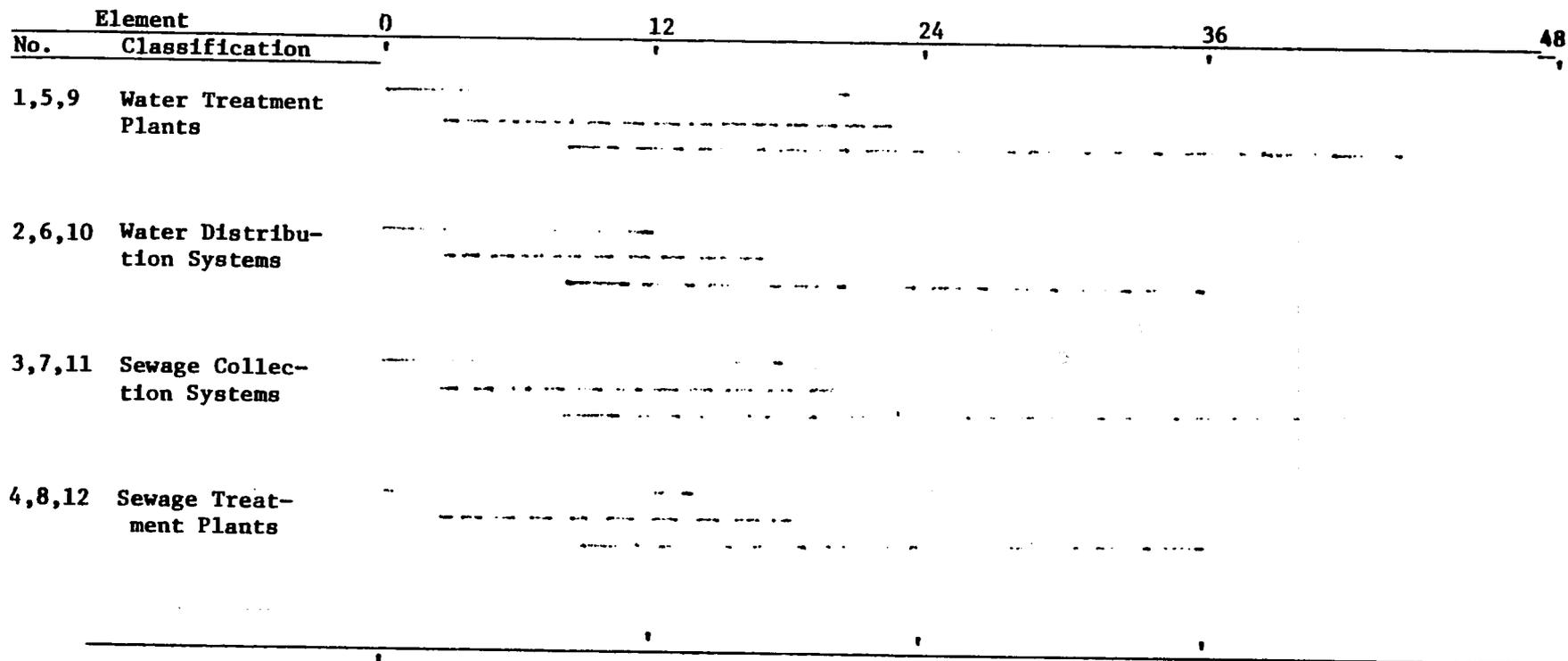
<u>City</u>	<u>Item</u>	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>Totals</u>
Suez	Sewage Network	264,165	223,606	149,998	129,465	165,448	932,720
	Pump Stations	46,910	43,417	129,615	86,415	86,340	392,695
	Treatment Plant	—	—	—	—	—	—
	Total	<u>311,075</u>	<u>267,023</u>	<u>279,613</u>	<u>215,880</u>	<u>251,828</u>	<u>1,325,419</u>
Ismailia	Sewage Network	106,220	248,514	218,657	133,815	115,514	822,720
	Pump Stations	4,720	11,335	48,365	24,624	1,260	90,305
	Treatment Plant	25,000	—	—	—	—	25,000
	Total	<u>135,940</u>	<u>259,849</u>	<u>267,022</u>	<u>158,439</u>	<u>116,774</u>	<u>938,025</u>
Port Said	Sewage Network	167,115	100,965	271,764	244,519	252,000	1,036,365
	Pump Stations	47,920	24,920	47,795	65,866	53,320	239,820
	Treatment Plant	—	—	5,864	—	—	5,865
	Total	<u>215,035</u>	<u>125,885</u>	<u>325,423</u>	<u>310,385</u>	<u>305,320</u>	<u>1,282,050</u>
Total	Sewage Network	537,500	573,085	640,419	507,779	533,002	2,791,805
	Pump Stations	99,550	79,672	225,775	176,905	140,920	722,822
	Treatment Plant	25,000	—	5,864	—	—	30,864
	Total	<u>662,050</u>	<u>652,757</u>	<u>872,058</u>	<u>684,704</u>	<u>673,922</u>	<u>3,545,491</u>

GOSSD Five Year Capital Budget Plan
(LE 000)

<u>1979</u>			
<u>City</u>	<u>Local</u>	<u>Foreign</u>	<u>Total</u>
Suez	405	-0-	405
Ismailia	525	-0-	525
Port Said	<u>575</u>	<u>-0-</u>	<u>575</u>
Total	1,505	00	1,505
<u>1980</u>			
Suez	2,000	2,000	4,000
Ismailia	2,000	7,000	9,000
Port Said	<u>2,000</u>	<u>7,000</u>	<u>9,000</u>
Total	6,000	16,000	22,000
<u>1981</u>			
Suez	2,095	2,000	4,095
Ismailia	2,000	7,000	9,000
Port Said	<u>2,000</u>	<u>7,000</u>	<u>9,000</u>
Total	6,095	16,000	22,095
<u>1982</u>			
Suez	2,000	1,500	3,500
Ismailia	2,000	6,500	8,500
Port Said	<u>2,000</u>	<u>6,600</u>	<u>8,600</u>
Total	6,000	14,600	20,600
<u>1983</u>			
Suez	2,000	-0-	2,000
Ismailia	2,475	-0-	2,475
Port Said	<u>2,825</u>	<u>-0-</u>	<u>2,825</u>
Total	<u>7,300</u>	<u>-0-</u>	<u>7,300</u>
GRAND TOTAL	26,900	46,600	73,500

PROJECT SCHEDULE

MONTHS



Legend

- Design, specifications, bid documents
- - - - - Advertising for construction or purchase, bid analysis, contract award
- Manufacture, delivery, construction, testing