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PROJECT PAPER

SYRIA: PROVINCIAL WATER SUPPLY

PROJECT 276- 0024

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## TABLE OF CONTENTS

I.	Summary and Recommendations	
II.	Project Background	
A.	Syrian Economy	3
B.	Project Region	5
C.	Rural Development Planning	6
D.	Rural Water Sector	8
	1. Water Sector Organization	8
	2. Water Rate Policy	9
	3. Rural Water Sector Planning	10
E.	Project Description	13
F.	Logical Framework	13
G.	Rationale for U.S. Assistance	13
H.	Other Donor Activities and Coordination	14
III.	Project Analysis	
A.	Technical Analysis	
	1. Project Description	15
	2. Design Standards	16
	3. Contracting Procedures	17
	4. Commodity Procurement	19
	5. Cost Estimate	20
B.	Technical Assistance	
	1. Purpose	20
	2. Rationale	20
	3. Approach	21
C.	Financial Analysis	
	1. Financial Plan	23
	2. Disbursement Schedule	24
	3. Reimbursement Plan and Procedures	26
	4. Technical Assistance Disbursement Plan	26
	5. Debt Service Capability	27
D.	Economic Analysis	
	1. Benefit-Cost Analysis	28
	2. Least-Cost Analysis	29
E.	Environmental & Social Soundness Analysis	
	1. Environmental Concerns	32
	2. Role of Women	35

IV.	Implementation	
A.	Administrative Arrangements for Construction	
1.	Implementing Agency	37
2.	SARG Responsibilities	39
3.	AID Responsibilities	39
B.	Administrative Arrangements for Technical Assistance:	
1.	Implementing Agency	40
2.	SARG Responsibilities	41
3.	AID Responsibilities	41
C.	Implementation Schedule	41
D.	Reporting Requirements	42
E.	Evaluation Plan	42
V.	Conditions and Covenants	
A.	Conditions Precedent	43
B.	Covenants	43
Annexes		
Annex A - Map of Project Area		
Annex B - Organization Charts		
Annex C - Project Authorization & Request For Allotment of Funds (Pts I and II)		
Annex D - Logical Framework		
Annex E - Design Criteria		
Annex F - Cost Estimate and Disbursement Plan		
Annex G - Least Cost Computations		
Annex H - Environmental and Social Soundness Analysis		
Annex I - Statutory Criteria		
Annex J - Section 611 (e) Determination		
Annex K - Borrower's Request		

## PROVINCIAL WATER SUPPLY

### I. SUMMARY AND RECOMMENDATIONS

A. Borrower: The Government of the Syrian Arab Republic (SARG).

B. The Loan: Not to exceed 17.6 million dollars to assist in financing the local costs of construction of four sub-projects for the provision of potable water in northeast Syria and the U.S. foreign exchange costs of a technical assistance program. The AID loan will provide 75 percent of project construction financing and 100 percent of the technical assistance financing.

(\$ Thousand)

	FX	Local Costs	Total
AID Loan	1,496	16,104	17,600
SARG	2,815	2,553	5,368
TOTAL	4,311	18,657	22,968

C. Terms: Repayable in U.S. dollars over a period of forty (40) years including a 10-year grace period with interest payments only. Interest is payable on the unpaid balance at an annual rate of two percent (2%) during the grace period and at an annual rate of three percent (3%) thereafter.

D. Disbursements: A modified Fixed Amount Reimbursement (FAR) method will be used to make direct reimbursement to the Borrower for the construction of each of the four sub-projects. Disbursement of technical assistance funds will be made by direct letter of commitment to the U.S. contractor who will provide or procure all services and equipment.

E. Description of Project: The project will provide free potable water to approximately 82,000 people in 86 villages located within four project areas in the northeast provinces of Raqqa, Deir Ezzor and Hasakah. Water will be provided from pumping stations or filtration wells located on the Euphrates and Khabour Rivers, treated, pumped through distribution mains, stored in ground reservoirs or elevated storage tanks and fed by gravity to public fountains.

F. Summary Findings: Free potable water will be provided by public fountain to approximately 82,000 rural people in northeast Syria. These people represent one of the poorer segments of the Syrian society with estimated income less than one-third the national average. By assisting the SARG in the construction of these four sub-projects, USAID will help achieve approximately ten percent of the Fourth Five Year Plan target for provision of water to the rural population. Least cost analysis suggests that the proposed water systems are generally several times more cost effective than the next best alternative. The provision of the water systems should have substantial positive effects on savings in time and expenditure in the procurement of water. In addition, it is expected that benefits in the reduction of water borne diseases will be forthcoming. No significant adverse environmental effects have been determined.

G. Statutory Criteria: The project meets all applicable statutory criteria and certifications (See Annexes I and J).

H. AID's Funding Source: Economic Support Fund.

I. Mission Views: The Ambassador and AID Mission Director strongly support the project.

J. Issues: None.

K. Recommendation: That a loan of \$17.6 million be authorized on the terms listed in paragraph C, above.

## II. PROJECT BACKGROUND

A. Syrian Economy: The Syrian Arab Republic has a land area of 185,180 square kilometers. Of this 7.9 million hectares are cultivable with approximately 9 percent of the area under irrigation during 1977. Irrigation projects are planned or underway, particularly in the Euphrates basin, to expand agricultural production. Syria's population of eight million is concentrated mainly along the coast and in the Aleppo to Damascus strip east of Lebanon. For the period 1970-76 urban population grew at about 5% per annum compared with an average annual growth rate in the rural population of about 2.2 %. Recent demographic surveys conducted by the Syrian Central Bureau of Statistics (CBS) indicates the natural increase in rural areas is approximately 4% per year and 3.3% in urban areas. The CBS projections indicate the population growth rate for the country as a whole could exceed 3.5% through 1990. Damascus is presently the main focus of internal migration, with some shift expected towards the north central region as various development schemes in the Euphrates Basin are expanded.

Since attaining independence in 1946, Syria has had several changes in regime, culminating in the dominance of the Baath Socialist Party beginning in 1963. There has been a concomitant shift of the economy from an essentially laissez-faire system to a largely publicly-owned and centrally regulated one. There has been a substantial continuity of emphasis on economic and social development policies and reforms together with a recent trend to economic pragmatism. Within this context and accompanied by sharp rises in petroleum export earnings, emigrant remittances and by substantial Arab and other economic assistance during the mid-1970's, significant economic growth has taken place.

Between 1970 and 1976, Syria's real gross domestic product increased by an annual average of 10 percent. Construction was particularly dynamic during this period with an average annual growth rate of 17 percent. Government expanded by 14 percent annually, and trade, finance and manufacturing each by 11-12 percent annually. The average annual growth rate in agriculture was 8 percent. This rapid expansion was accompanied by steep rises in budgetary outlays and double digit inflation. Fueled by large increases in foreign assistance,

total budgetary expenditures jumped from SP 3.3 billion in 1973 to SP 11.3 billion in 1976. During the same years, investment spending soared from SP 1.1 billion to SP 5.2 billion.<sup>1)</sup>

Since 1976, there has been a slow-down in all of the above economic indicators. Real economic growth may now be averaging about 5-7 percent annually, or at about the same rate as experienced in the decade before 1974. Actual government spending in most areas is going up very little. The slow-down is a reflection of the previous very high rates of growth which could not be sustained, combined with a leveling off in foreign assistance and with governmental efforts to restrain inflation and widening balance of payments gaps.

The Government's Fourth Five Year Plan (1976-1980) calls for total investment spending in the public sector of SP 53 billion during the plan period with SP 44.8 billion coming from domestic revenues and SP 8.1 billion coming from domestic and foreign credits. These are broken down into SP 32.3 billion in projects brought forward from the previous plan period and SP 20.5 billion in new projects. There are in addition SP 9.2 billion in "reserve projects" dependent upon additional financing becoming available. Allocated local revenues, principally from the surpluses of public entities, were originally projected to total SP 24 billion out of the SP 44.8 billion necessary to cover the local share of anticipated expenditures. Based, however, on past experience and new budgetary projections, it does not appear that such revenues will exceed SP 20 billion. The total of realized development credits may have been correctly anticipated at about SP 8 billion.

Actual investment expenditures have been running at SP 5-6 billion annually during 1976-78, with the total for the Fourth Plan (1976-1980) likely to fall short of SP 30 billion. Since investment spending is running at only some 53 percent of that envisaged under the Fourth Plan, there has accordingly been an emphasis on completing projects already underway rather than launching new ones.

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<sup>1)</sup> \$1 = SP 3.90

A sectoral breakdown of investment spending for the years 1976-79 is given in the table below.

Investment Expenditures 1976-1979				
(SP Millions)				
	1976	1977	1978	1979
	<u>Actual</u>	<u>Preliminary Actual</u>	<u>Budget</u>	<u>Budget</u>
Agriculture & Irrigation	636	551	1,441	1,654
Industry, Mining & Power	2,176	3,492	4,613	3,832
Transportation, Public Utilities & Public Works	1,068	1,224	1,990	2,058
Education	760	497	707	808
Social & Health	60	62	95	96
Other	<u>512</u>	<u>512</u>	<u>1,896</u>	<u>2,632</u>
TOTAL	5,212	6,339	10,742 <sup>2)</sup>	11,080

B. Project Region: The project region consists of the three provinces of Raqqa, Deir Ezzor and Hasakah, all located in northeast Syria.<sup>3)</sup> The three provinces together compose 41.0 percent of Syria's total land area and contain 15.5 percent of its population. The provinces are primarily rural in character with only 27 percent of their population considered urban compared with the national average of 52 percent.

2) The Embassy and USAID have received estimates that actual development spending during 1978 may have fallen below the level attained during the previous year.

3) The project region for Provincial Water Supply differs from the proposed Rural Roads and Rural Schools Projects because a fourth province, Aleppo, is included in the latter projects.

Although agriculture in Syria accounts for only 17 percent of GDP and 32 percent of employment and has steadily declined in importance during the last several years, it nevertheless remains the primary economic activity of these three provinces. The provinces contain 39.4 percent of the nation's cultivable area and most of its irrigation potential. At present the region is of primary importance in the production of food grains and cotton and an important producer of wool, dairy and meat products.<sup>4)</sup> It is not a significant producer of vegetable and tree crops.

Despite its agricultural preeminence the region is relatively poor when compared to the rest of the country. Although official income estimates are not available at the provincial level, per capita incomes in the rural areas of the three provinces appear to average about 30% of the national average.<sup>5)</sup>

There are other indicators of general welfare that strongly support the notion that this region is relatively poor compared to the rest of the nation. Forty-six percent of the population in the region is considered non-literate compared to 33 percent for all Syria. Crude death rates from 1.9 to 2.9 percent compared to 1.5 percent for the nation as a whole. The average number of persons per doctor, dentist or pharmacist range from 2 to almost 4 times the national average. Electrical consumption averages 44 percent of the national average, telephone service 43 percent. Together, these factors suggest a population low on the Syrian income scale and relatively short in its basic services.

C. Rural Development Planning: There is no explicitly articulated rural development plan for northeast Syria. However elements of a rural development strategy can be deduced from the Fourth Five Year Plan.

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4) The three provinces produce 53% of the wheat, 63% of the barley, 61% of the cotton, 38% of the wool, 37% of the dairy products and 27% of the meat products.

5) Based on average rural family income of SP 6,000 ÷ 6 compared to national per capita GDP of SP 3,315 (1977). Average rural family income and size are based on three AID financed studies: Asmon (1978), Chatty (1979), and Benedict and Lintner (1979). An independent study by Bakour (1976) also supports these findings.

Basically, the Fourth Five Year Plan sets extremely ambitious economic growth targets to be achieved in the context of an essentially egalitarian development framework. In addition, the Plan features the traditional Syrian objective of achieving economic autarchy or independence in production. The agricultural/rural sector is prominent in the Plan in that it represents both an important element in the Syrian drive toward self-sufficiency in production and a key segment of society in which greater equality in consumption is to be achieved.

Evidence of Syrian concern for the rural/agricultural sector is abundant. Prominently listed among the overall objectives of the Plan are:

- (i) evolution of the economic structure toward agro-industry;
- (ii) geographical distribution of development projects to ensure work opportunities, improve living conditions, and secure basic services for rural areas;
- (iii) mobilization of rural manpower for the exploitation of unemployed agricultural resources, and for the general development of rural areas; and
- (iv) self-sufficiency in principal food and clothing commodities.

Additional evidence of Government concern occurs in the social services sector of the Plan which lists among its general objectives the review and development of regulations covering Rural Development Centers that will provide (i) social and family services, (ii) rural industries, and (iii) children's nurseries. There is also a pledge for the continuation of material support to labor and peasant movements.

Finally, the Fourth Plan contains references to many other objectives relating to the rural sector including the following:

- to introduce new carpet industry to rural areas.
- to increase the number of women working in rural industries.
- to extend health services and to raise their level in centers of Muhafazats and rural areas.

- to make available pure drinking water to all villages with a population of 150 or more in Muhafazats of Dier Ezzor, Raqqa, and Hasakah and 200 persons in other Muhafazats.
- to construct cheap and economic roads in agricultural areas.

It is clear from the above that many of the elements of a traditional rural development strategy are present within the Fourth Five Year Plan. What is not so clear at this point is exactly how these elements fit together to form a coherent, integrated rural development plan.

#### D. Rural Water Sector

1. Water Sector Organization: The Ministry of Housing and Utilities (MHU) is responsible for all water supply and sewerage in urban and rural areas in Syria other than the eight major cities which have semi-autonomous water authorities.<sup>6)</sup> The MHU prepares most project designs and provides guidance and assistance as needed on technical problems during construction. In large municipalities the MHU's responsibility is principally advisory but in the rural areas the responsibility extends to supervision of construction and operation and maintenance of the system. Thus, for rural water systems, the MHU's responsibility extends from conceiving and designing a water system to supervising its construction and its subsequent operation and maintenance.

The MHU, located in Damascus, is divided into three directorates: water supply, mechanical and electrical equipment, and sewerage. The Directorate of Water Supply (DWS) is responsible for all aspects of water system design (except mechanical, electrical and water fountain placement) including source of supply, treatment plants, main distribution lines and storage reservoirs. The DWS also provides some supervision of construction, particularly for large projects, and continual support on technical questions that they arise during construction. The Mechanical Directorate within MHU is responsible for design of the mechanical and electrical component of the water distribution and treatment plant system. This primarily consists of pumps, motors and electrical systems.

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6) Even in the large cities MHU provides technical supervision and guidance except for Damascus and Aleppo.

The MHU maintains a Directorate of Housing and Utilities (DHU) in each of the 13 administrative provinces (Muhafazats) in Syria. Each DHU has responsibility for construction and maintenance<sup>7)</sup> and operation of the rural water systems in each Muhafazat. Thus, the MHU, either through the DWS and Mechanical Directorate in Damascus or the DHU located in each Muhafazat, has complete responsibility for planning, design, implementation, operation and maintenance of rural water systems in Syria.

2. Water Rate Policy: Syria has a sequential three-tier approach to water rate policy. In the first stage water is provided through public fountains at no charge to the consumer. The water system is funded out of central Government revenues. At the second stage (at some point following the provision of public fountains) house connections are offered at a one-time fee sufficient to pay for the costs involved in making the connection (+ SP 275) and with a water use fee (50 piasters/m<sup>3</sup>)<sup>8)</sup> sufficient to cover operation and maintenance of the system. To qualify for house connections the village must form a water authority to administer the system out of funds generated by the metered connections. At the third stage the water authority attempts to raise rates to the point where some recovery of capital or replacement cost is possible.

At present no water system in Syria charges rates sufficient to recover capital investment with which to replace or expand existing systems. As a consequence all systems, including the large semi-autonomous water authorities, are heavily dependent on central Government financing for new capital investment. The four rural water systems considered in this project proposal are all first stage water projects. The water will be provided at no charge from public fountains with capital and all operating and maintenance costs provided from central Government budget transfers to the Muhafazats.

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7) This is strictly true for rural water systems served by public fountains. Systems with house connections must form a municipal water authority that takes over operation and maintenance of their portion of the water system. However, the DHU stands ready to provide assistance to the municipal authority and takes care of any major maintenance problems.

8) M<sup>3</sup> = cubic meter of water or 1000 liters. 1 SP = 100 piasters.

The limitations of present water rate policies as partially intimated above are known to the Syrian Government and have been amply emphasized by various IBRD missions.<sup>9)</sup> Briefly, the limitations are twofold. First, the absence of a water rate reflecting true costs will tend to misallocate the water resource. Secondly, the absence of water revenues implies a continuing dependence and growing strain upon the central Government budget. A change to pricing systems that recover capital as well as operating and maintenance costs is considered unlikely to occur within the near future. The prevailing philosophy is to provide water first and to worry about its price later. This view reflects popular social and political sentiment which regards the right to water as unquestionable and a charge for its use as secondary. Any change in this attitude, official or otherwise, is expected to occur slowly.

3. Rural Water Sector Planning: Potable water supply has been the focus of Syrian Government attention for many years and has resulted in a relatively high percentage of the population having access to safe drinking water. The focus of this attention has dramatically intensified in recent years.

a. Third Plan: By the beginning of the Third Five Year Plan (1970-75) an estimated 45% of the rural population has access to safe drinking water. The Third Five Year Plan proposed to raise this percentage to 65% by providing water to villages with population in excess of 400, provided that per capita cost did not exceed SP 60 (\$15.38). The Plan budgeted 52% of its total water budget or SP 111 million (\$28.5 million) for the task. Actual expenditures appear to have been in excess of 75% of the Plan budget although rural population having access to safe water rose to only one-half the Plan target to 55%.<sup>10)</sup> It is estimated that

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9) See Water Supply and Sewerage Sector Report, IBRD, Report No. 1566-SRY dated September 1977 and the project appraisal reports dated January 1977 for Damascus Water Supply and June 1977 for Aleppo Water Supply.

10) Approximately 500 large villages were provided water during the Third Plan.

55% of the rural population and 90% of the urban population had reasonable access to safe water by 1975 and that 70% of the urban population had house connections. All of these service levels are high for developing countries and are considered above average in the Middle East.

b. Fourth Plan: Fourth Plan (1976-80) targets were even more ambitious. The Government proposed to provide public water facilities to all villages with a population of 150 or more in the northeast provinces of Raqqa, Deir Ezzor and Hasakah and all villages of 200 or more in the remainder of Syria. This implied the ultimate provision of water to 2400 villages with a population of approximately one million by the end of the Plan. In addition, the Plan called for the extension or renewal of water systems involving another 500 villages and 300,000 people. An estimated 75% of the rural population would have access to safe water by 1980, if these targets were achieved.

Reflecting the Government's commitment to this sector, the rural water budget in the Fourth Five Year Plan was over eight times that of the Third Plan budget level. Even so, only 35% of the Fourth Plan water investment budget, or SP 910 million (\$233.3 million) out of a total water budget of SP 2616 million (\$670.8 million) was set aside for the MHU and its rural water projects. The essential priority of the urban sector is reflected in its increase from 48% of the total water budget in the Third Plan to 65% of the Fourth Plan budget.

Estimates of actual progress in meeting Fourth Plan potable water targets vary between 40 and 60%. An IBRD report dated September 1977 suggests that about 60% of overall water sector targets will be met but not more than 60% of the rural population will have access to safe water by the end of the Plan in 1980. This would be equivalent to meeting slightly less than one-half the Fourth Plan rural potable water target.

c. Constraints on Fourth Plan Progress in the Water Sector  
Failure to keep pace with Fourth Plan potable water targets can be attributed to three important sources: overall budget short fall, rampant inflation and shortage of skilled manpower in the sector. As the result of a number of political and economic events, the Syrian Government has been forced to revise downward

its ambitious Fourth Plan investment program.<sup>11)</sup> This is reflected in the unofficial policy of generally limiting new investment expenditures to the completion of on-going projects. In the case of rural water projects, actual expenditure has been limited to 51.7% of planned expenditure during the first two years of the Plan.

Inflation has been an equally serious factor for rural water projects. Although the increase in the official wholesale price index has ranged between 7.2% and 12.4% per year in the period 1975-1977, neither IMF nor IBRD accepts the indices as adequate indicators because of extensive price control and subsidy programs in the Syrian economy. Actual annual inflation is thought to have been more in the 15 to 20% range. Construction costs have risen even more rapidly, judging by cost estimates prepared for specific rural water projects at the beginning of the Fourth Plan (1975) that have now more than doubled in terms of 1978 prices.

The shortage of skilled professional manpower to carry out the Fourth Plan water sector program would tend to remain as the binding constraint if the present financial constraint were to be lifted. It should be clear, however, that it is a relative shortage rather than an absolute lack of skilled manpower that poses the constraint. Present manpower levels are judged adequate by USAID both in competence and number to carry out currently planned project levels. (See Section II, B, Technical Assistance.)

4. Water Project Selection: Rural water projects for the Fourth Five Year Plan were initially selected at the Muhafazat (province) level in 1975 by a planning committee based on technical and budgetary considerations and framed within the overall goals set down by the Five Year Plan, i.e., to provide water to all villages of 150 or more population in northeast Syria and villages of 200 or more in the rest of Syria.

The water projects proposed by the Muhafazats were reviewed by the DWS and State Planning Commission and their recommendations forwarded to the Minister of Housing and Utilities, the Council of Ministers and the High Committee on Planning. The recommendations of the Council of Ministers on overall plan budget and sector priorities was submitted to the People's Council for its consideration. The results of this deliberation were presented to the president for his approval and the Fourth Five Year Plan came into being.

<sup>11)</sup> These events are discussed fully in the recent IMF report dated November 3, 1979 (SM/78/268).

Funds for projects included in the Fourth Five Year Plan are appropriated annually based on budget requests prepared and submitted by the Muhafazats. Only projects included in the Fourth Five Year Plan are eligible for central financing and any exceptions must be approved by the Prime Minister. Funding for on-going Fourth Five Year projects is given priority over the provision of funds for the initiation of new projects included in the Plan. Projects must be fully designed and the costs estimated before they can be included in the annual budget request for the allocation of funds for construction. Once projects are approved for funding, work must commence within the same year. Any funds allocated but not expended by the end of the fiscal year, are not carried over.

E. Project Description: The provincial water supply project consists of two components, construction and technical assistance. The construction component of the project will provide free potable water to 86 villages located within four project areas in the northeast provinces of Raqqa, Ezzor, and Hasakah. Approximately 82,000 people will benefit from the construction projects and this number is expected to more than double during the life of the water systems. Water will be provided from pumping stations or filtration wells located on the Euphrates and Khabour rivers. The water will be treated, pumped through distribution mains, stored in ground reservoirs or elevated storage tanks and fed by gravity to public water fountains. Each fountain will be centrally located within 500 meters distance of households and serve not more than 500 persons. System design capacity is based on 120 to 175 liters per capita per day, plus an allowance for livestock and wastage, projected over the 30 year life of the system.

The technical assistance component of the project will provide consultants, short-term training and equipment to the MHU Directorate of Water Supply (DWS) in order to increase the level of technical capability and productivity of the water projects design staff. The technical assistance program will be carried out over a two-year period and will be located at DWS in Damascus.

F. Logical Framework: The logical framework is contained in Annex D.

G. Rationale for U.S. Assistance: Roughly 45% of rural Syria does not have access to safe drinking water. Nor does it have access to many of the other basic services such as health, education, power and roads. It appears that rural incomes in the selected water project areas are less than one-third the national average.

This project carries out the Mission Country Development Strategy Statement (CDSS) with regard to assistance to the poorer sectors of Syrian society. The project is complementary to other proposed USAID activities, including school and road projects designed to reach the rural poor of northeast Syria.

Equally important, CDSS objectives fit SARG priorities in the Fourth Five Year Plan to deliver basic services to the rural poor, particularly the provision of potable water to an estimated 75% of the rural population by 1980. By assisting these four water projects, AID will enable the SARG to achieve approximately 10% of Fourth Plan water supply targets.

H. Other Donor Activities and Coordination: At present, there are no other donors active in financing rural potable water supply.<sup>12)</sup> The IBRD Water Supply and Sewerage Sector Report 1977 recommends village water supply among possible projects for study, particularly in the Kalamoun and Deir Ezzor regions. However, to date no such studies have been undertaken or are currently planned. UNICEF was also reported to have expressed interest in rural water supply in villages above and below the Euphrates, but no activities are planned at present.

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12) The IBRD has been active in urban water supply in both Aleppo and Damascus. Based on discussions with IBRD officials and the 1977 Sector Report the IBRD will largely confine its efforts to urban water and sewerage systems within the foreseeable future.

### III. PROJECT ANALYSIS

#### A. Technical Analysis

1. Project Description:<sup>13)</sup> The Provincial Water Project consists of a water system construction component and a technical assistance component. The technical assistance portion of the project is discussed in Section III.B. The construction component is discussed below.

The construction phase of the project will consist of four water supply systems located in the rural portion of the three northeastern provinces of Syria. The estimated cost of construction is \$21.5 million. The systems are Mansura in Raqqa province; Abu Kamal and Suwar in Deir Ezzor province; and Rumeilan/Um Madfah located in Hasakah province. In total, the project will include the construction of two treatment plants, one filtration system and four distribution systems which will include 233 kilometers (kms) of main pipe lines, 44 kms of laterals, 72 elevated water reservoirs (tanks), eight ground reservoirs, public fountains to serve the people and watering troughs to serve the livestock. For design purposes the project is based on a 30 year useful life with an eventual population of over 200,000. Metered house connections may be installed later in the life of the project if groups of villages form a municipal water authority and if individuals agree to pay for the cost of connections and a user-fee of 50 piasters per M<sup>3</sup> of water. The components of each subproject are summarized in Annex E-2.

Mansura: The Mansura subproject is located 20 kms southwest of the provincial capital of Raqqa, on the southern bank of the Euphrates River and will serve a population presently estimated at 21,500. Filtration wells located near the river will provide safe water which will be pumped into the system reservoirs from which it will flow, by gravity, to the public fountains and troughs. The system will include five elevated tanks and one ground reservoir, over 18 kms of main pipeline, 2 kms of laterals, distribution pipe, public fountains and troughs. The cost estimate is \$2.0 million. (See MAP, Annex A)

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13) All statistics including costs, distances and population are rounded.

Abu Kamal: The Abu Kamal subproject is located north of the city of Abu Kamal on the right bank of the Euphrates River which is the source of water for the system. A rapid sand filter treatment plant, which is under construction, will provide treated water for the system. The treatment plant, presently 80% complete, will not be funded by this project. The system will serve a population presently estimated at 25,000 and is estimated to cost \$3.5 million. The system includes 39 kms of pipe mains, 7 kms of laterals, 13 elevated tanks, 1 ground reservoir, distribution pipe, public fountains and troughs.

Suwar: The Suwar water supply system is located 42 kms northeast of the city of Deir Ezzor. The rapid sand filter treatment plant will be located near the village of Suwar and will draw its water from the Khabour. The subproject will also include 70 kms of water mains, 1 kms of laterals, 19 elevated tanks, distribution pipe, public fountains and troughs. The system will serve a population presently estimated at 20,000 and will cost an estimated \$7.1 million.

Rumeilan/Um Madfah: The Rumeilan/Um Madfah treatment plant will be located on the Hasakah-Deir Ezzor highway, 47 kms south of Hasakah. The source of water will be the Khabour River which is located 5 kms east of the plant. The rapid sand filter treatment plant is estimated to cost \$3.4 million.

The Rumeilan distribution system extends from the treatment plant to the village of Rumeilan which is located 16 kms south of the plant site. The system will serve population presently estimated to be 2,800 and is estimated to cost \$0.9 million. The system will include 13 elevated tanks, 3 ground reservoirs, 31 kms of water mains, 9 kms of laterals, distribution pipe, public fountains and troughs.

The Um Madfah distribution system extends from the treatment plant to the village of Um Madfah, which is located 35 kms west of the plant site. The present estimated population of the service area is 13,100 and the estimated cost is \$4.5 million. The system will include 75 kms of water mains, 26 kms of laterals, 22 elevated tanks and three ground reservoirs, distribution pipe, public fountains and troughs.

2. Design Standards: Syrian design standards for water supply design and construction have evolved, historically, from European standards. They have been, and continue to be, changed as required to meet current conditions. World Health Organization Standards are used for treated water. The Government standard specifications for water supply systems have been reviewed by AID engineers and are considered acceptable.

Design criteria are provided in Annex E-1. The criteria for human consumption varies from 125 to 200 liters per capita per day (lcd). The figure used in a particular design depends on the population of the village as follows:

<u>Population</u>	<u>lcd</u>
0 - 3,000	125
3,000 - 5,000	150
5,000 - 10,000	175
over - 10,000	200

The population growth factor varies from 3% to 4%. The 4% figure is used by the Government in areas where it is believed the provision of water will encourage previous inhabitants to return.

The reservoir and rapid sand filter plants are usually based on standard plans, altered as required for each particular case, and of tried and proven reliability. The figure of 18 lcd for animals is based on sheep and corresponds to the figure generally used in the U.S. (5 gpd).

Except for the rural aspects of the design standards mentioned above, the standards used are the same as those approved on two earlier AID loans for Damascus Water Supply projects.

3. Contracting Procedures: Contracts for the construction of rural water supply systems are let in the Muhafazats by the local DHU and approved in Damascus by the High Committee on Planning, chaired by the Prime Minister. Once detailed plans and costs estimates have been completed and a request made for budgetary funds, the work is offered to the Government water supply construction company, GECOP. If GECOP accepts, the final cost is negotiated and the contract signed by the Muhafez (Governor) and the company representative. GECOP generally does not accept rural water supply work costing under SP 5 million although they are

quite active in the construction of rural water projects. GECOP has a good reputation for both quality and speed in construction.<sup>14)</sup>

Should the Government company not accept the work, invitations for bids are advertised in the Damascus, Aleppo and local newspapers. Two forms of invitations are used. The Government may issue a cost estimate and request prospective bidders to state that they will contract to perform the work described in the plans for a plus or minus percentage of the Government's cost estimate. Offers are accepted or rejected on this basis; they are not negotiated. The Government may reject all offers if it believes the lowest offer is too high. This type of invitation is generally used for simple types of construction such as small civil works which can be carried out by contractors located in the provinces.

Work costing around SP 5 million or more, or work of a more complex nature such as mechanical and electrical work or civil work for a treatment plant, is usually contracted on the basis of a cost estimate and bid prepared by the contractors. The Government's undisclosed cost estimate is used to verify the reasonableness of the offer. Under these circumstances the Government can negotiate the final amount of the contract with the bidders, or reject all bids if they are considered too high.

In either case a minimum of three bids is required. Signed contracts are sent to Damascus for final approval by the High Economic Committee prior to issuing a notice to proceed to the contractor. The committee, chaired by the Prime Minister, is made up of representatives from various ministries including State Planning, Finance, Economics, Local Government and the concerned ministry.

Advertising, receiving bids and awarding of bids is handled by committees in the Muhafazat. The Muhafez, or Governor, as chairman of the executive council for the province, signs the contract for the Government. Major

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14) Of the ten contracts expected to be let for the construction of the four water projects, one has already been signed with GECOP and two have been approved and will be signed with private companies. Three of the remaining contracts appear likely to go to GECOP. It is unknown who will receive the last four contracts although it is considered unlikely that GECOP will be interested.

points in the process for execution of the contract are as follows. The contractor agrees to a fine of 0.1 percent of the contract amount for every day of delay in completion. The contractor is paid on a monthly basis according to work completed, less 5 percent retention to be returned after a one-year warranty period. The contractor provides a 5 percent "Final Deposit" prior to starting construction; this is returned on "Provisional Acceptance" of the work, i.e., when work is completed and before final acceptance at the end of the warranty period. Sub-contracts, if any, must be approved by the Government.

The DHU is designated as the administrator for the purpose of inspection. The DHU director is designated as the finance officer for the purpose of payment. Off-shore procurement may be handled by a Government procurement agency, by the MHU or by the contractor depending on the terms of the contract. If handled by the contractor, the contractor is responsible for all costs including advertising for bids and inspection for off-shore procurement. In every case the foreign exchange required must be authorized by the exchange control section in the Ministry of Finance. Authorization of foreign exchange is based on the annual budget allotted to the ministry involved.

USAID has reviewed SARG contracting procedures and finds them acceptable.

4. Commodity Procurement: AID loan funds will finance local costs of the construction projects. Although a small portion of project costs are expected to require direct foreign exchange for the importation of equipment and materials (13 percent or less), these costs will be met from the SARG's own free foreign exchange and attributed to the SARG share of the total project costs. The loan funds will finance indigenous goods and services having their source and origin in Syria and "shelf items" defined by Handbook I, Supplement B, Chapter 18.

Total value of imported shelf items will not exceed 25% of the total cost of the commodity element of the project. Imported shelf items represent a relatively small portion of the total project costs, not more than 3 to 4 percent. Imported shelf items tend to be items such as rebar, steel pipe and fittings, electrical components, small motors and other small hardware.

Commodity procurement, whether for indigenous or imported items, will be the ultimate responsibility of local

Syrian contractors or GECOP, the Government water construction company. These companies have their normal commercial practices of soliciting two or more quotations before purchasing materials and equipment from local outlets.

USAID has reviewed commodity procurement policies and procedures and finds them adequate.

5. Cost Estimates: Cost estimates were prepared by the engineering staff of the DHUS and in some cases by the DWS in Damascus. In three cases where contracts had been awarded, actual contract amounts were used. USAID staff have reviewed the cost estimates, including the contract amounts, and have found them reasonable. In addition to the construction costs as estimated by the SARG, USAID has provided an amount for design and engineering, construction supervision, and contingency. The total estimated cost of construction including design, supervision and contingency is \$21.5 million. See Annex F-1 for details.

#### B. Technical Assistance

1. Purpose: Technical assistance is proposed under the Provincial Water Project to increase the design capabilities of the MHU Directorate of Water Supply by improving the expertise and productivity of its staff.

2. Rationale: Design capacity, to a greater extent than budget, presently appears to be the ultimate constraint on the number of water systems that can be constructed in Syria during a given year. This is clearly evidenced by the total absence of an inventory of designed water systems awaiting construction. Water systems in Syria are constructed as rapidly as designs are completed and budgets can be approved. There are always more water systems proposed for design in a given year than can be designed. It is not surprising, therefore, that probably not more than 50 to 60 percent of Fourth Plan targets for providing rural water to 2400 villages will have been designed by the end of the Plan. Even these targets would not have been achieved without the advisory assistance of approximately 13 designers provided to the DWS by the Government of Bulgaria.

There is a more subtle aspect to the design capacity constraint, however, and that is the simple, smaller more difficult to design projects, which tend to be more expensive on a per capita basis, have been left to last. Combined with this is the implication that projects in the following Five-Year Plan (1981-1985) will attempt to reach even smaller villages, implying even greater need for new

technical and economic solutions to the problem of low density population water supply design.

Thus, the design constraint has two facets: (i) the physical number of systems that can be designed per unit of time, and (ii) the increasing technical and economic difficulties posed by the water systems remaining to be designed. The technical assistance program will focus primarily on introducing new techniques to solve the latter problem. The program should have a positive impact on the first problem as well by increasing staff productivity both through training and the introduction of labor saving equipment. Evaluation of management procedures may also provide scope for further productivity increases. Nevertheless, the need for increased staff is evident and DWS is taking current steps to recruit and increase its professional staff. The focus of the technical assistance program will be on providing new solutions to increasingly difficult design problems. Increased staff productivity will tend to be a natural spin-off of this process.<sup>15)</sup>

3. Approach: The technical assistance requested by the Ministry of Housing and Utilities will consist of three components. It will include U.S. consultants working with teams of DWS engineers; short term training in the U.S. for DWS engineers; and equipment chosen in large part on its direct effect on staff productivity.

Consultants: The consulting team will include four members with expertise in the areas of water treatment, water distribution systems, construction, applied hydraulics and water resources. Three of the consultants will work full time with DWS staff in developing designs for new proposed water projects. The projects chosen for design will reflect a variety of conditions and technical problems in order to provide the widest possible exposure to new design technique possibilities. Particular attention will be focused on design alternatives for low density population water supply systems. The three consultants will also give periodic staff seminars on the use of the new equipment and on the introduction of new techniques as the need arises.

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<sup>15)</sup> To the extent that improved design techniques can be introduced, there is substantial scope for savings in water system construction costs. A conservative estimate of the cost to provide water to the remaining villages in rural Syria would run to several hundred million dollars.

The fourth consultant will serve as team leader and be responsible for administration, designing and arranging the short-term training component, identification and procurement of needed equipment, review and recommendations on DWS organization and management procedures. The team leader will also participate in staff seminars to the extent possible.

The consulting team will be expected to work in Syria for two years. In addition, one man year of short-term consulting for additional specialties can be provided as the need is identified. The consulting team is expected to identify these needs during the course of their work.

Training: In order to minimize disruption of the normal work output of the DWS staff, the training component of the project will be limited to short-term non-academic training of 12 weeks in the U.S. The training programs will be designed and arranged for the DWS by the consulting team leader during the first six months of the contract. The programs will take place in the consultant's home office, federal or state water authority and involve on-the-job training in design. To the extent possible, water supply systems in areas of the U.S. with problems and setting similar to Syria will be included in the site visits. Funds will be provided for twelve trainees to spend 12 weeks each in groups of three over a period of 18 months.

Equipment: Engineering office equipment, water testing equipment, materials testing equipment, and vehicles will be provided as the third component of the technical assistance program.

The Directorate of Water Supply presently lacks even the simplest of equipment such as metal filing cabinets for design blue prints, reproduction equipment, programmable calculators, portable field equipment for soil and water testing, etc. Not only will the proper equipment enable the consulting team to carry out its task more effectively, it is expected that noticeable improvement will occur in DWS staff productivity simply because less professional staff time will be necessary for repetitive or essentially unnecessary tasks. The direct effect on staff productivity and qualitative improvement of presently conducted functions will generally dictate the choice of equipment. The consulting team will work with DWS to develop lists of equipment needed in the early stages of the project. The consulting team leader will be responsible

for their procurement and shipment. The MHU will be responsible for receiving these commodities and delivery to DWS. DWS will be responsible for storage, use and maintenance. An illustrative list of equipment needs as identified by the DWS Director is included in Annex E-3. The estimated cost of this equipment is \$488,000.

4. Inputs

Consultants:

4 @ \$10,000 per pm x 96 pm	=	\$ 960,000
1 man year short-term	=	<u>\$ 120,000</u>
Total		\$1,080,000

Equipment:

Planning and Design	=	\$ 125,000
Water Resources Lab	=	<u>\$ 183,000</u>
Total		\$ 308,000

Training:

12 people @ \$3000/mo x 3	=	<u>\$ 108,000</u>
Total		\$ 108,000

GRAND TOTAL \$1,496,000

C. Financial Analysis

1. Financial Plan: Total estimated project construction costs and technical assistance costs and sources of financing are as follows:

( \$ Thousand )

	<u>SARG FINANCING</u>		<u>AID FINANCING</u>		
	<u>LC</u>	<u>FX</u>	<u>LC</u>	<u>FX</u>	<u>TOTAL</u>
<b>Construction Projects:</b>					
Abu Kamal	761	120	2,645	0	3,526
Suwar	585	1,197	5,344	0	7,126
Rumeilan/Um Madfah	880	1,321	6,604	0	8,805
Mansura	<u>327</u>	<u>177</u>	<u>1,511</u>	<u>0</u>	<u>2,015</u>
Sub Total	\$2,553	\$2,815	\$16,104	0	\$21,472
Technical Assistance, Training & Equipment	<u>0</u>	<u>0</u>	<u>0</u>	<u>1,496</u>	<u>1,496</u>
Total Project Costs	\$2,553	\$2,815	\$16,104	\$1,496	\$22,968

The \$17.6 million AID loan will be used to finance a portion of the local currency costs for construction (\$16,104,000 equivalent) and all of the foreign exchange cost for the technical assistance, training, and equipment (\$1,496,000). The SARG will finance the foreign exchange costs for off-shore procurement of mechanical and electrical equipment (\$2,815,000) and all other local currency costs over and above that financed by the AID loan. In order to standardize the electrical and mechanical equipment with similar equipment already in use, the SARG will use its own free foreign exchange to purchase the electrical and mechanical equipment from European sources. The \$17.6 AID loan will finance approximately 77% of the direct project costs and the SARG will finance the remaining 23%. However, indirect recurring costs and direct costs for maintenance, replacement parts, and land acquisition will increase the SARG contribution to at least 25%.

2. Disbursement Schedule: Project disbursements are expected to begin in FY 80 and terminate in FY 82. The estimated disbursement schedule shown below is based on the detailed payments shown in Annexes F-3 and F-4.

Estimated AID Loan Disbursement Schedule  
(\$ Thousands)

	FY 80				FY 81				FY 82				Total
	I	II	III	IV	I	II	III	IV	I	II	III	IV	
Abu Kamal	193	193	193	193	193	193	193	193	549	552			2,654
Suwar	407	407	407	407	407	407	407	785	855	855			5,344
Rumeilan/ Um Madfah	520	520	520	598	842	724	724	793	250	250	718	145	6,604
Mansura		103	103	103	103	103	103	209	209	239	236		1,511
	<u>1,120</u>	<u>1,223</u>	<u>1,223</u>	<u>1,301</u>	<u>1,545</u>	<u>1,427</u>	<u>1,427</u>	<u>1,980</u>	<u>1,863</u>	<u>1,896</u>	<u>954</u>	<u>145</u>	<u>16,104</u>
Technical Assistance	<u>0</u>	<u>0</u>	<u>0</u>	<u>200</u>	<u>352</u>	<u>282</u>	<u>165</u>	<u>142</u>	<u>115</u>	<u>120</u>	<u>120</u>	<u>0</u>	<u>1,496</u>
TOTAL	1,120	1,223	1,223	1,501	1,897	1,709	1,592	2,122	1,978	2,016	1,074	145	17,600
Total by FY				5,067				7,320				5,213	17,600

3. Reimbursement Plan and Procedures: A modified Fixed Amount Reimbursement (FAR) method will be followed in financing the four sub-projects. Prior to the release of any project funds, the SARG will be required to submit final designs and cost estimates. If the designs and cost estimates are acceptable, AID will agree to finance an amount not to exceed 75% of the total cost of an individual sub-project. Reimbursement will be made for each sub-project upon notification by SARG of the percentage of construction completed and upon receiving a request for reimbursement. Construction progress and adherence to agreed upon plans will be verified by a USAID engineer who will make regular site inspections and will review the monthly and quarterly statements prepared by the DHU project engineer. Based on this monitoring and inspection, USAID will certify the work completed for payment and will request direct reimbursement to the Ministry of Finance for that portion of the work completed. The Ministry will open and maintain a special account into which the AID funds will be deposited. The Ministry of Finance will be responsible for making funds available to the implementing agency in the muhafazats (DHU) in accordance with their normal budgetary process when and as required. All sub-project components will have 10 percent of the AID fixed amount reimbursement withheld until safe water flows from public fountains within the sub-project. The FAR schedule of reimbursements for each sub-project component are shown in Annex F-3.

4. Technical Assistance Disbursement Plan and Procedures: Disbursements will be made by direct letter of commitment to the contractor.

5. Debt Service Capability: During the period 1974-1977, Syria's balance of payments deficit on goods and services account widened from a modest \$294 million to \$1.4 billion.

(\$ Million)

	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>
Exports (f.o.b.)	783	943	1,065	1,077
Imports (f.o.b.)	1,122	1,561	2,270	2,625
Trade Balance	-339	-618	-1,205	-1,548
Goods & Services Balance	-294	-621	-1,226	-1,411

The worsening in the trade gap has come about through rapid increases in imports in both the development and consumption areas not matched by corresponding increases in the

value of exports. The growth in exports has been almost entirely a function of higher prices for crude petroleum. There has been virtually no expansion in export volumes. Because the prospects for export growth appear relatively meager, the Syrian government has made a determined effort since late 1977 to restrict imports. Imports in 1978 were in fact very close to the 1977 level. Should import growth continue at a low rate and some export expansion is obtained from the opening of some export-oriented industries during the early 1980's, the trade gap would be below \$2.5 billion in 1985. The re-opening of the Iraqi pipeline through Syria in March 1979 should permit the deficit on the goods and services balance to stay in the \$2 billion range during the early and mid-1980's.

An important source for financing these deficits has been the remittances from the 100,000 or so Syrians working in the Gulf. The official figures indicate that these remittances rose from \$45 million in 1974 to \$93 million in 1977. The great bulk of the remittances do not go through official channels, however, and a conservative estimate for the total of recorded and unrecorded remittances during 1977 would be \$300 million. The year 1977 might well have been the peak year for remittances from the Gulf so that a reasonable figure for 1985 might be \$200 million or allowing for inflation, not more than \$300 million in 1985 dollars.

Well over half of Syria's foreign assistance comes from neighboring oil exporting countries in the form of general budgetary grants or development loans. Substantial developmental assistance also comes from Eastern Europe, the United States and multilateral institutions. Temporary political factors have often affected the timing of Syria's foreign assistance. Average annual foreign loans and grants in the 1979-85 period may approximate that of the 1974-78 period, or about some \$600-\$800 million per year.

Net disbursed foreign debt at the end of 1977 owed to foreign governments or multilateral institutions was \$1.0 billion. An additional \$1.2 billion of foreign loans committed over the previous decade remained undisbursed at the end of 1977.

Annual debt service payments continue to rise sharply. They amounted to \$47 million in 1973 and \$105 million in 1976 and are scheduled to rise to \$270 million in 1979 and

to \$425 million in 1983. The debt service ratio during this same period is projected to rise from 7.9 to 13 percent. With a debt service ratio rising in this fashion, Syria clearly needs to manage the assumption of new debt obligations to keep the repayment burden within reasonable limits. Under these circumstances, concessional loan terms are clearly in order.

#### D. Economic Analysis

1. Benefit-Cost Analysis: Improved health is generally considered the primary benefit accruing to the beneficiaries of potable water projects. In the case of rural water projects in northeast Syria, however, there are several additional benefits when compared with present methods of obtaining water.

The principal benefits can be summed up in terms of convenience and economy. For most villagers the provision of potable water through public water fountains translates into less hours spent in hauling water and/or less income spent in its purchase. A good feeling for what present methods of obtaining water entails can be found in the social soundness and environmental analysis in Annex H-1.

The direct benefits that will accrue to beneficiaries of the four proposed potable water projects can be classified under the following headings:

(i) Improved health: The frequency of water borne disease should diminish and some improvement in the child mortality rate should occur.

(ii) Decreased hours: There should be significant to dramatic reductions in the hours spend each week by women and children obtaining household water and a significant savings in time spent watering animals.

(iii) Decreased expenditures: Depending on the project, as much as ten percent of annual family income may now be spent in obtaining woefully inadequate amounts of water. Water is purchased for both human and animal consumption depending on the time of year and location.

(iv) Increased quantities: Possibly as important as providing convenient no cost water, is the provision of large quantities of it. There are amenities as well as additional health effects from having larger quantities of water available for bathing, food preparation and household cleaning.

Besides the four direct effects noted above there may be other beneficial but less direct effects from the provision of rural water. Chief among these are the potential effects on decreasing annual migration and possibly slowing or even reversing permanent urban migration. The SARG policy of providing rural services is, in part, predicated on this strategy. It has also been postulated that agricultural production will increase because of the greater stability of the rural population.

It does not appear, other than some minor environmental drawbacks, that social costs are imposed beyond the obvious costs for construction, maintenance and operation. Although the Syrian economy is subject to numerous controls (the impact of which are far beyond the immediate scope of the project paper), there does not appear to be a surplus of labor nor a foreign exchange rate much out of alignment with a free exchange rate. In short, it appears either unnecessary or impracticable to indulge in shadow pricing.

No benefit-cost analysis has been prepared for the provincial water projects. Although it is clear there are both benefits and costs, it is simply not reasonable, and in some cases possible, to measure the benefits. In particular, the measurement of health benefits has been shown to be essentially impossible to attribute to the provision of potable water supply alone.<sup>16)</sup> An attempt to measure the other benefits mentioned above would prove no less futile given the data requirements for such an analysis.

2. Least-Cost Analysis: In lieu of a benefit-cost analysis, modified least-cost analysis has been prepared for the four rural water projects and the next best alternative, government tank trucks. Details of the calculations,

16) Measurement of the Health Benefits of Investments in Water Supply, IBRD, P.U. Report No. PUN 20, January 1976.

including assumptions, are shown in Annex G-3. A summary of results, including comparison with two other methods of obtaining water are shown in the following table.

Comparison of Estimated Costs  
(SP/M<sup>3</sup>)<sup>17)</sup>

	<u>Treated Water</u>		<u>Untreated Water</u>		Woman Hours/M <sup>3</sup> 20)
	<u>Proposed Water Systems</u> <sup>18)</sup>	<u>Government Tank Trucks</u>	<u>Small Private Haulers</u> <sup>19)</sup>		
Abu Kamal	1.54 (1.10)	15.94	10		6.9
Suwar	2.73 (1.82)	15.94	10		6.9
Rumeilan/ Um Madfah	6.89 (3.53)	15.94	50		20.8
Mansura	0.98 (0.82)	15.94	15		10.4

In interpreting the results in the above table the derivation of average costs for the four proposed water systems and the competing alternative, government tank trucks, is of

17) SP/M<sup>3</sup> = Syrian pounds/cubic meter of water (1000 liters).

18) Average cost when estimated consumption of animals is included shown in brackets.

19) Costs for Mansura and Rumeilan/Um Madfah are from Chatty (1979). Costs for Abu Kamal and Suwar are estimated on basis of proximity of river, although little privately hauled water is sold in these project areas.

20) Woman hours are estimated on basis of two donkeys per woman carrying two 37 liter tanks per donkey = 144 liters/trip. The number of round trips (1000 ÷ 144) multiplied by the average time required per trip equals woman hours/M<sup>3</sup> of water. The estimates of time required for a project area average trip are very rough but give an order of relative magnitude. Estimated donkeys per rural family are 0.58 in Raqqa, 0.66 in Deir Ezzor and 0.10 in Hasakah.

prime interest.<sup>21)</sup> The average cost for each of these alternatives has been computed on the basis of the water rate that would need to be charged in order to obtain a 10 percent internal rate of return. This, in a rough sense, allows us to compare the cost of water provided by the proposed water systems and government tank trucks with the cost imposed by small private haulers.

A second point of interest is the cost figures shown in brackets under "proposed water systems". These show average costs per cubic meter of water when greater volumes of water are used to water animals. This is a particularly important factor in the Rumeilan/Um Madfah system where it cuts costs by almost one-half.

It is clear from the above table that the proposed water systems are cost effective when compared with government tank trucks. The differences in cost are so great that severe restrictions could be placed on the assumptions underlying the proposed water systems' costs without changing the basic conclusions. The proposed water systems are similarly cost effective when compared with the cost of small private haulers. Finally, although the estimated average hours required to haul water by donkey are very rough they nevertheless indicate the low productivity of such an endeavor when compared with costs of the proposed water systems.

There are five additional factors which argue for the superiority of the proposed water systems over the three cited alternatives. They are (i) relative vulnerability to inflation, (ii) size of initial required investment, (iii) potential need for additional treatment plants to service government tank trucks, (iv) treated versus untreated water, and (v) relative convenience. A comparison of alternatives is made in the following matrix.

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<sup>21)</sup> The best alternative to the proposed water systems, were it available, would be ground water exploited by tube wells. Although this system is used extensively in some parts of Syria, it is not possible in the proposed project areas because the ground water is contaminated with gypsum and salt and/or because it is not available in sufficient quantities.

	<u>Vulnera-</u> <u>bility to</u> <u>Inflation</u>	<u>Size</u> <u>Initial</u> <u>Investment</u>	<u>Need For</u> <u>Additional</u> <u>Treatment</u> <u>Plants</u>	<u>Safe</u> <u>Water</u>	<u>Relative In-</u> <u>Convenience</u>
Water Systems	low	low	no	yes	lowest
Tank Trucks	high	high	probably	yes	low
Private Haulers	highest	highest	n/a	no	low
Women w/donkeys	lowest	lowest	n/a	no	highest

The proposed water systems are generally superior on all accounts. They are vastly superior to government tank trucks except in the case of treated versus untreated water which is neutral. (Annex G-4 shows investment requirements and the relative exposure to inflation of the proposed water systems and government tank trucks.) Private haulers fare no better in comparison and worse in some categories, i.e. private haulers generally use untreated water. Only when compared with hauling water by donkey do the proposed water systems fail to be superior or neutral in all categories. Both initial capital investment and relative vulnerability to inflation will be greater for the proposed water systems compared with hauling water by donkey. Nevertheless, in terms of convenience and safe drinking water the water systems are an outstanding value.

In conclusion, it is not possible to make strict comparisons between the above alternatives because they do not offer the same product (safe, convenient drinking water) nor do they have the same exposure to increased costs. However, it is clear that all of these factors work in favor of the four proposed water projects and against the alternatives.

#### E. Environmental and Social Soundness Analysis

##### 1. Environmental Concerns

An environmental and social soundness analysis prepared by Peter Benedict, senior behavioral science advisor and Steven F. Lintner, senior environmental coordinator, Bureau of Near East AID/W is contained in Annex H-1. Their analysis strongly supports the project.

The environmental evaluation identified the four following concerns:

ITEM 1

Problem: Pooled waste water and deep mud characterize conditions in the vicinity of many existing water stands. This is a direct result of the absence of a drainage system for the water stands.

Resolution: The Mission has reviewed the Government's water stand designs to be used for this project. These designs do provide for adequate drainage for waste water. If these designs are formally submitted to AID for final approval and the water stands constructed according to those designs, this will satisfactorily resolve this issue. Water stands which are not constructed in accordance with the approved designs will not be financed under the loan.

ITEM 2

Problem: The Government should develop a water stand siting strategy which will ensure the treated water is conveniently distributed without creating adverse health conditions. The absence of such a strategy could result in an increase in the density of users at a water stand and cause (a) an over concentration of water use activities such as food processing, clothes washing, etc. and the increase in the amount of waste water for disposal; (b) long waiting periods which may cause a decrease in per capita consumption and serve as an incentive to use untreated water from irrigation ditches; and (c) increase the possibility of illicit tapping of both water stands and distribution pipes and increase the need for more maintenance.

Resolution: The local DHU is responsible for fountain placement which is done in consultation with the village council. The criteria for fountain placement is to centrally locate the fountains within a village after considering such factors as convenience, village configuration, and drainage. One spigot is allowed for every 100 people with a maximum of 5 spigots per fountain .

In practice the Government estimates there are seldom more than two to three hundred people per public fountain in rural villages because the village dwellings tend to be scattered rather than concentrated. This is generally true for the villages in the project areas. Therefore, a water stand with a maximum of 5 spigots and adequate drainage should not create environmental or public health problems.

Fountains are generally located within 500 meters of the population to be served. Government placement attempts to meet two conflicting goals i.e. provide reasonable access to treated water without destroying the incentive for house connections. Since the Government policy is ultimately to move from non-revenue producing public fountains to revenue producing house connections, the dilemma is to make treated water convenient enough so that alternative untreated water is not used and yet not so convenient that the incentive to pay for future house connections is destroyed. Consultations with the village leaders usually results in a compromise solution which meets the needs of the villagers as well as the Government's policy objectives.

### ITEM 3

Problem: The proposed construction of animal water troughs at the base of village towers.

Resolution: Animal troughs are not generally provided by the Government but when they are they are located outside the village, preferably on Government land. Drainage, access and availability of land are considered in locating troughs. No troughs are located near water reservoirs which are fenced off to keep both the public and animals out of the area. Trough construction will be monitored to ensure no troughs are constructed near the villages. Troughs constructed too near inhabited areas will not be eligible for reimbursement under the project.

### ITEM 4

Problem: The construction of water treatment and distribution systems will increase domestic water use and will generate substantial amounts of waste water. In villages waste water is traditionally disposed of by direct dumping

on the ground. This tends to form shallow pools within the immediate vicinity of residences. Unless the pooling of increased waste is properly controlled through village level public health education/community sanitation programs there will be an unavoidable (small to moderate) increase in the number of village disease vectors (flies, mosquitoes) through the creation of increased breeding habitats. There will also be non-determinable increases in water-borne and water-washed infections.

Resolution: Given the importance of health education with respect to water projects, the loan agreement will contain a covenant to the effect that the Government will carry out health education programs in the project areas through the public health doctors, district health committees and schools. The Government will be encouraged to use project funds or funds from the technical services/feasibility studies grant to finance the services of a short term consultant to assist with the design of a health education program.

## 2. Role of Women

In the project areas all members of the household participate in the procurement of potable water supplies. As indicated in Annex B distances to water sources vary from irrigation ditches running along the perimeters of settlements to rivers as distant as 3-5 kilometers for villagers and 20-25 kilometers for nomadic Bedouin. Men are generally responsible for long-distance hauling involving barrels on carts drawn by donkeys or large galvanized containers on pickups or even with inter-town buses. For the most part, however, it is women and children who supply the household through numerous daily trips utilizing galvanized tins or sacks made of used tire rubber transported by donkey or more generally on the top of the head.

The amount of time devoted to hauling water is related to variables such as family size (supply of labor and demand for consumption), season of the year (greatly reduced in the winter), and periodicity of source (irrigation canals are often dry, sources become polluted and must be changed). During summer months an average family of 6 or 7 can require up to 8 hours per day/per woman in time devoted to water (see also Page 28 footnote 20 where time calculated in women hours/m<sup>3</sup> is provided).

The project will dramatically lessen the burden on many elements of the community. Economic costs will be eliminated during the period water is a free publicly supplied good. Social costs will also be reduced in terms of time expended, health and nutritional status adversely affected by low quantity and quality of hauled water, to say nothing of the physical hardship previously involved. The impacts of free treated highly accessible potable water on the household are numerous. It is expected that a health education component will eventually be developed within each project site. More difficult to measure will be the potential use of freed time for women. Currently there are few opportunities for women to move into the agricultural sector which is now highly mechanized and devoted to irrigated and rainfed barley. Freed time could be applied to garden crops or production activities such as poultry production or other complementary investments in agriculture.

#### IV. IMPLEMENTATION

##### A. Administrative Arrangements for Construction

1. Implementing Agency: The Ministry of Housing and Utilities (MHU) will have overall responsibility for the implementation of the four rural water projects. The Directorate of Water Supply (DWS), located within the MHU in Damascus, will provide designs, advice, technical assistance and general backstopping to the Directorate of Housing and Utilities (DHU) located in each Muhafazat. Each of these levels have had extensive experience with the design and implementation of small rural water projects similar to those proposed for AID financing. The DHU in each Muhafazat is responsible for the supervision of construction, project disbursements and maintenance and operation. (See Organization Charts, Annex B )

The Directorate (DHU) in the Muhafazats of Raqqa, Deir Ezzor and Hasakah have professional technical staffs numbering 7, 21, and 9 respectively as shown in the table below. In addition to the technical personnel currently on the job, there are 7 engineers in military service who are due to return to their positions in the provincial offices during the life of the project.

##### Directorate of Housing and Utilities

	<u>Raqqa</u>	<u>Deir Ezzor</u>	<u>Hasakah</u>
Engineers	2	4	4
Architects	1	-	1
Technicians	4	15	4
	<u>7</u>	<u>21</u>	<u>9</u>
Engineers (Military)	2	4	1
Total	<u>9</u>	<u>25</u>	<u>10</u>

The Directorate of Water Supply (DWS) in Damascus provides backup technical support to the provincial offices when necessary. The DWS has a staff of 39 experienced professionals consisting of engineers, geologists, topographers, and other specialists who are capable of assisting the provincial offices with any design or construction problems which might arise during implementation of the project.

a. Supervision of Construction: The DHU has direct responsibility for supervision of construction in its Muhafazat. This function is carried out by the DHU project engineer who has responsibility for daily monitoring and inspections on the larger construction sites. The project engineer reviews work progress, procurement documents, materials delivered, invoices, etc. Construction is also inspected by the DHU director, who is also an engineer, on a bi-weekly basis or as required. Larger and more complex work is supported by engineers from Damascus who make periodic trips to the site. Neighboring Muhafazats can also loan engineers to each other to assure adequate coverage.

The project engineer has complete responsibility for the quality of construction work. All technical questions or problems must be resolved to his satisfaction or otherwise submitted to arbitration should the contractor disagree. Critical stages in construction, such as the placement of steel reinforcing bar before a concrete pour, must be inspected before work can proceed to the next stage. In addition, materials are tested against specifications and equipment, such as pumps or generators, are tested before acceptance. All records are maintained and kept available until final acceptance of the system. When a system component, such as a treatment plant or distribution system is completed, it is tested and given a provisional acceptance. During the following year, any defects found must be corrected by the contractor. Otherwise they will be corrected by the government and paid for from a 5% retention fund withheld from the contractor until final acceptance at the end of one year.

b. Disbursements: Once a month a "temporary statement" which contains the details of work performed, including materials purchased, is prepared by the DHU project engineer. The report is checked by the DHU accountant and by the DHU director who certifies the correctness of the work completed, the materials purchased and the expenses incurred by the contractor. On the basis of the temporary statement a disbursement order is prepared by the DHU director and a check is issued to the contractor. Five percent is withheld from each disbursement until final acceptance of the project by the DHU. The contractor is required to sign the disbursement order and is given the opportunity to make written comments. A central Government auditing staff reviews accounting records on an annual basis.

c. Maintenance and Operation: The DHU in each province is essentially responsible for maintaining and operating all rural water systems. The exception to this rule are villages who form a local water authority in order to obtain house connections. In this case, the local authority, with assistance as required from the DHU, operates and maintains the incorporated system from revenues generated from a 50 piaster per cubic meter of water user fee. In all systems served exclusively by public fountains, the DHU has sole responsibility for maintenance and operation. Routine maintenance is carried out by the DHU staff. Major maintenance is contracted out and the work supervised by the DHU technical staff. The cost of maintenance and operation is provided by central Government budget to the DHU. While it seems certain that maintenance could be improved by additional staff and budget, Dr. I. Asmon in a USAID financed study of the northeast (1978) found "maintenance standards of existing water projects are high" and the level of operation and maintenance "superior to the prevailing one in many developing countries."

2. SARG Responsibilities: The SARG, through its implementing agency (MHU), is responsible for:

- a. provision of plans and designs
- b. contracting and procurement
- c. supervision of construction
- d. disbursements to contractors
- e. certification of satisfactory project
- f. subsequent operation and maintenance
- g. notification and certifications as required under the periodic FAR reimbursement process, including notification of contractors' notice to proceed.

In addition, the SARG will be responsible for implementing a complementary health education program in the sub-project areas through health centers, schools, and village health committees, dealing particularly with water contamination by the user, food preparation and waste water disposal.

3. AID Responsibilities: The USAID is responsible for:

- a. Periodic monitoring and inspection of sub-project construction to assure that construction is according to the agreed upon designs and plans.
- b. Certification for payment, upon proper notification and certification by SARG, and an on-site inspection and review of DHU progress reports.

Project implementation management and monitoring of the AID input for the proposed loan will be the responsibility of the Office of Capital Development. A member of the Office of Capital Development will be assigned as the Mission Project Manager for the direct monitoring of the project. The Chief Capital Development Officer will represent the Mission in loan negotiations and the Chief Engineer of the Mission on technical matters. USAID will have access to all pertinent project reports and other documents issued by the implementing agency, project management office and the construction contractors that relate to project progress and problems. USAID will monitor all activities, including quality control measures, that relate to reimbursement of local currency cost and field inspections as required.

B. Administrative Arrangements for Technical Assistance

1. Implementing Agency: The Ministry of Housing and Utilities (MHU) will have overall responsibility for the implementation of the technical assistance project. The Directorate of Water Supply (DWS), located within the MHU in Damascus, will be the principal implementing office within the MHU and will provide office space and counterpart engineering staff. The expected working relationship between the consulting contractor and the DWS is described in Section III.B. Host country contracting will be used to procure commodities and equipment through a consulting contractors.

2. SARG Responsibilities: The SARG through its implementing agency (MHU) is responsible for:

- a. contracting with consulting firm
- b. provision of office space
- c. provision of counterpart staff
- d. assisting consulting firm in identifying equipment needs and in designing short-term training program
- e. approval of contractor's request for disbursement

3. AID Responsibilities: The USAID is responsible for:

- a. monitoring of the project
- b. certification for payment upon proper documentation and request for disbursement.

USAID responsibilities for technical assistance will be managed similar to the procedures for the construction projects.

C. Implementation Schedule

1. Schedule of Major Events:

<u>Action</u>	<u>Event</u>	<u>Date</u>
1.	Project paper submitted to AID/W	04/15/79
2.	Project paper approved by AID/W	06/01/79
3.	Project authorization issued	07/01/79
4.	Loan agreement signed	07/15/79
5.	Implementation letter No. 1 issued covering project implementation procedures	07/20/79
6.	Conditions precedent met	08/15/79
7.	First disbursement under loan submitted to AID	11/15/79
8.	RFP issued for consulting services	11/15/79
9.	Contract signed for consulting services	06/15/80
10.	Baseline evaluation data gathered	10/30/81
11.	First water project completed	12/31/81
12.	Project completed	04/30/82
13.	Terminal date for disbursements	09/30/82
14.	First project evaluation begins	10/30/82
15.	Second project evaluation begins	04/30/84

D. Reporting Requirements: Although the FAR method involves monitoring and inspections USAID will make exception reporting only to AID/W.

E. Evaluation Plan: With the assistance of a sociologist under contract with the Mission, baseline data will be assembled on sub-project areas prior to completion of the project. A sample survey will be conducted within 6 months of sub-project completion to be followed by a second survey 2 years after completion. The initial survey will be designed to develop data in order to evaluate the achievement of the following social objectives:

1. Decrease in or elimination of user economic cost in obtaining water (% of per annum income expended for water purchases by community served.)
2. Decrease in time/labor expended on obtaining, treating, and storing water (comparison).
  - a) average time saved by new community water system
  - b) optional uses of time/labor by women and children
3. Increased water consumption
  - a) hanging pattern of water usage (human, animal, household, gardens)
  - b) measurement of l/h/d/ use
4. Improved health status of residents
  - a) infant mortality
  - b) incidence of water-related diseases
  - c) average no. of sick days
  - d) household sanitation
5. Nutrition
  - a) changes in food preparation
6. Community perception of welfare
  - a) attitude toward beneficial use of water
  - b) % of residents who understand relation between improved water and personal and environmental health

V. CONDITIONS AND COVENANTS

A. Conditions Precedent

1. In addition to the standard requirements for a legal opinion and statement of the Borrower's Authorized Representatives, the loan agreement will require the Government to submit final designs and cost estimates as conditions to the release of loan funds to finance construction costs.

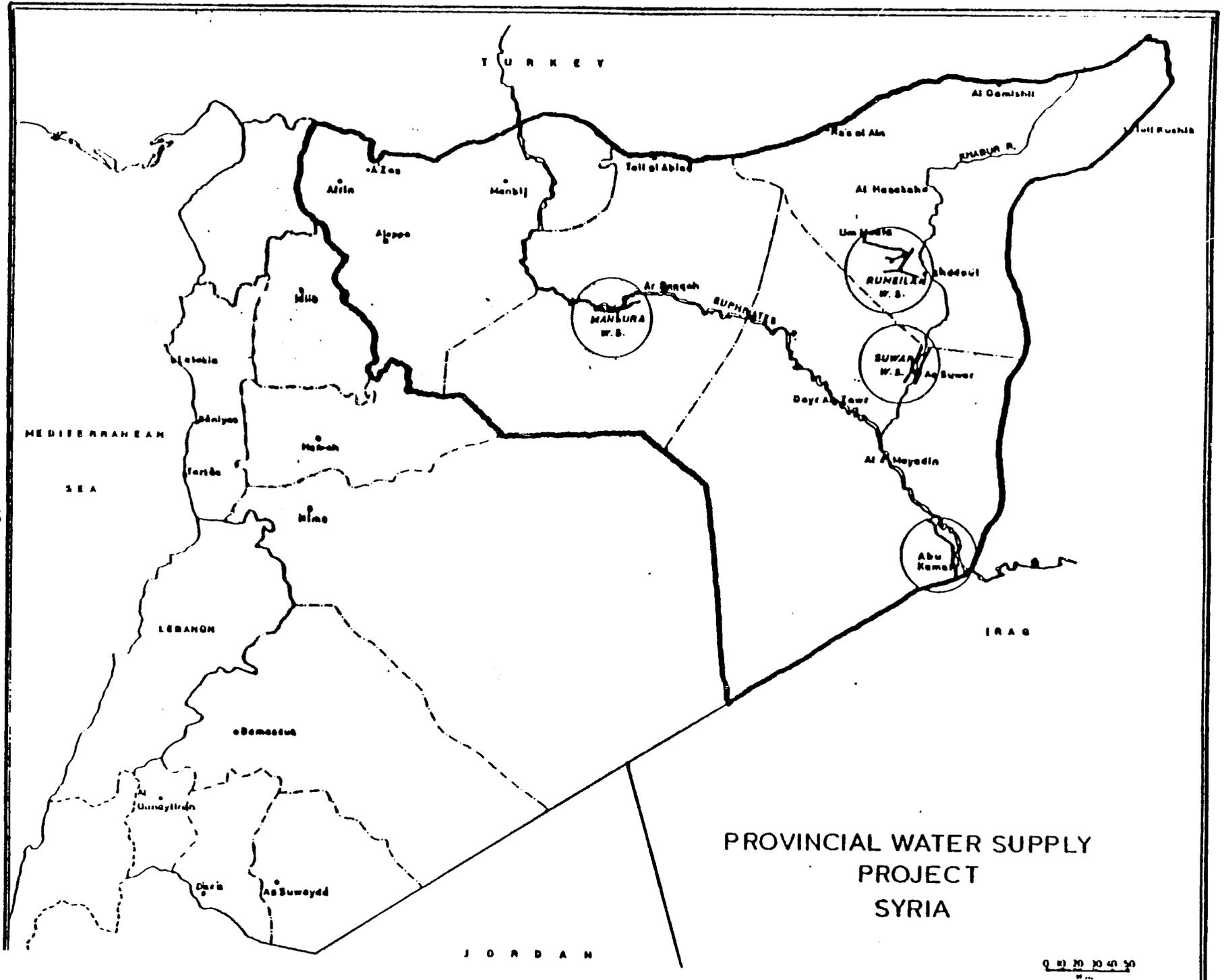
2. Prior to the release of funds for services, the Government will be required to submit an executed contract with a U.S. firm acceptable to AID.

3. Prior to the release of funds for the purchase of equipment or training costs, the Government will be required to submit a detailed equipment list and training program.

B. Covenants

1. The Borrower warrants that complementary health education programs through health centers, schools and village health committees will be conducted in the four sub-project areas either prior to project completion or shortly thereafter.

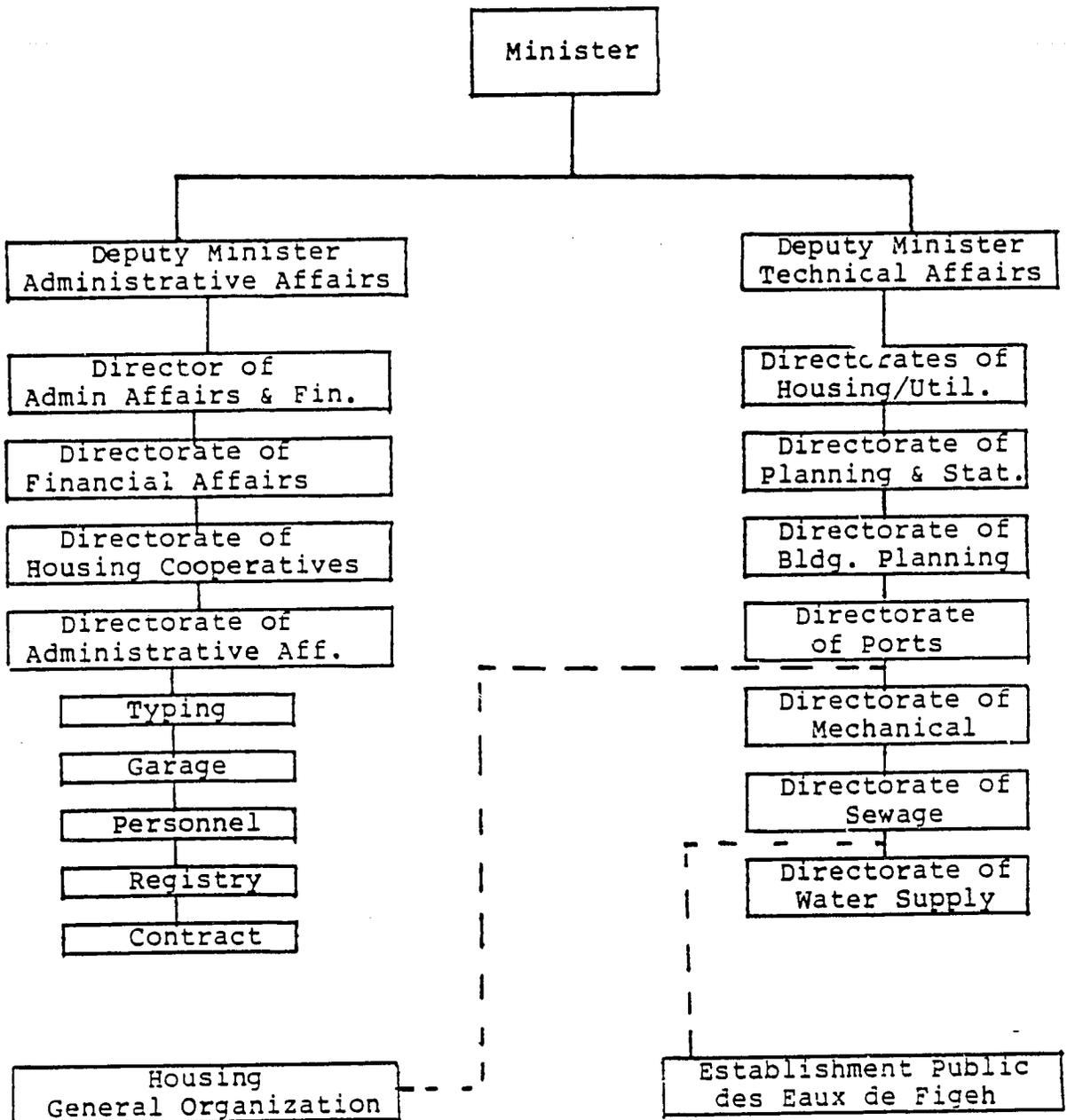
2. The Borrower warrants that all contracts awarded after the signing of the loan agreement will be made on the basis of competitive bidding procedures.



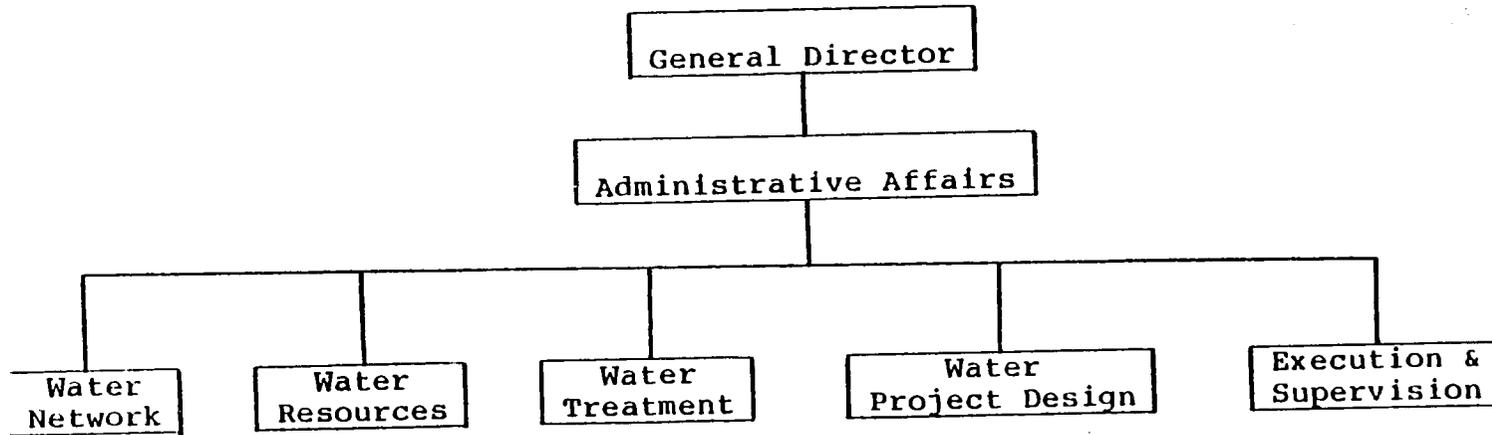
PROVINCIAL WATER SUPPLY  
PROJECT  
SYRIA

Annex A

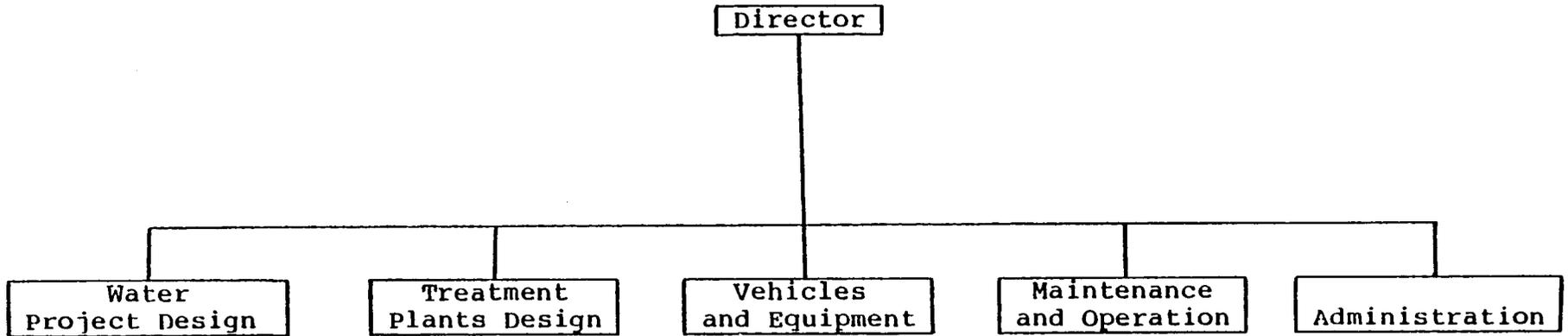
## MINISTRY OF HOUSING AND UTILITIES



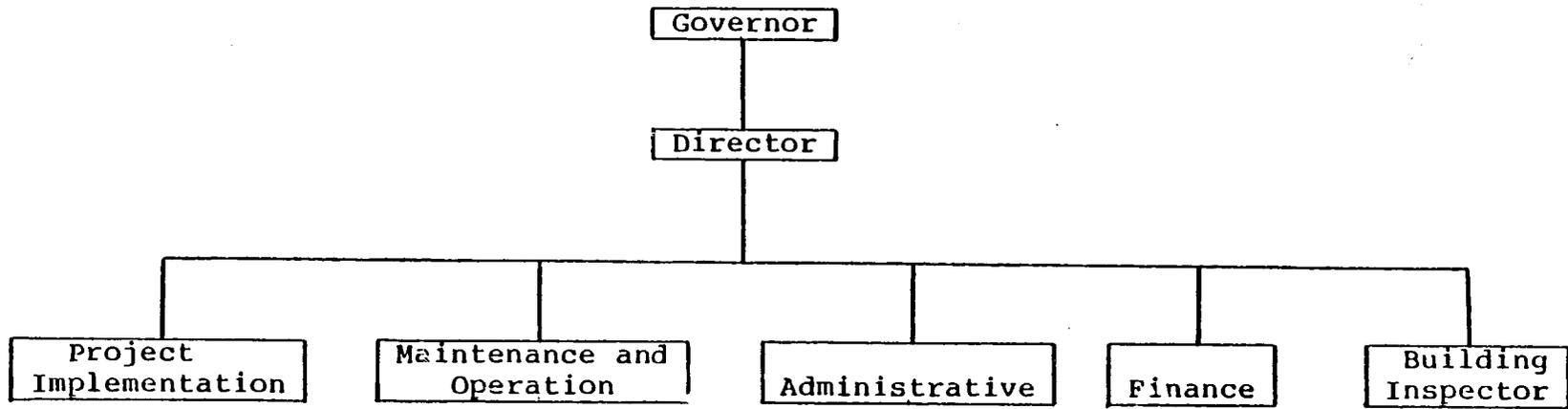
DIRECTORATE OF WATER SUPPLY



Mechanical Directorate



Directorates of Housing and Utilities  
(Raqqa, Deir Ezzor, Hasakah)



AGENCY FOR INTERNATIONAL DEVELOPMENT <b>PROJECT AUTHORIZATION AND REQUEST                  FOR ALLOTMENT OF FUNDS PART I</b>				1. TRANSACTION CODE <input type="checkbox"/> A    A = ADD <input type="checkbox"/> C    C = CHANGE <input type="checkbox"/> D    D = DELETE		PAF 2. DOCUMENT CODE 5					
3. COUNTRY ENTITY Syria				4. DOCUMENT REVISION NUMBER <input type="checkbox"/>							
5. PROJECT NUMBER (7 digits) <input type="text" value="276-0024"/>		6. BUREAU/OFFICE A. SYMBOL    B. CODE 4 <input type="checkbox"/> ESF		7. PROJECT TITLE (Maximum 40 characters) <input type="text" value="Provincial Water Supply Systems"/>							
8. PROJECT APPROVAL DECISION <input type="checkbox"/> A    A = APPROVED <input type="checkbox"/> D    D = DISAPPROVED <input type="checkbox"/> DE    DE = DEAUTHORIZED				9. EST. PERIOD OF IMPLEMENTATION YRS. <input type="text" value="0"/> <input type="text" value="2"/> QTRS. <input type="text" value="1"/>							
10. APPROVED BUDGET AID APPROPRIATED FUNDS (\$000)											
A. APPROPRIATION		B. PRIMARY PURPOSE CODE		PRIMARY TECH. CODE		E. 1ST FY <u>79</u>		H. 2ND FY _____		K. 3RD FY _____	
						F. GRANT    G. LOAN		I. GRANT    J. LOAN		L. GRANT    M. LOAN	
(1) ESF		500				545				17.6	
(2)											
(3)											
(4)											
TOTALS										17.6	
A. APPROPRIATION		N. 4TH FY _____		Q. 5TH FY _____		LIFE OF PROJECT		11. PROJECT FUNDING AUTHORIZED		A. GRANT    B. LOAN	
		O. GRANT    P. LOAN		R. GRANT    S. LOAN		T. GRANT    U. LOAN		(ENTER APPROPRIATE CODE(S)) 1 = LIFE OF PROJECT 2 = INCREMENTAL LIFE OF PROJECT			
(1) ESF								17.6			
(2)											
(3)											
(4)											
TOTALS								17.6		C. PROJECT FUNDING AUTHORIZED THRU <input type="text" value="8"/> <input type="text" value="2"/>	
12. INITIAL PROJECT FUNDING ALLOTMENT REQUESTED (\$000)				13. FUNDS RESERVED FOR ALLOTMENT							
A. APPROPRIATION		B. ALLOTMENT REQUEST NO. _____		TYPED NAME (Chm/, NRR/FM/PSD)  SIGNATURE _____  DATE _____							
		C. GRANT    D. LOAN									
(1) ESF		17.6									
(2)											
(3)											
(4)											
TOTALS						17.6					
14. SOURCE/ORIGIN OF GOODS AND SERVICES <input checked="" type="checkbox"/> 000 <input type="checkbox"/> 341 <input checked="" type="checkbox"/> LOCAL <input type="checkbox"/> OTHER _____				15. FOR AMENOMENTS, NATURE OF CHANGE PROPOSED							

FOR PRC/PIAS 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, D. C. 20523

OFFICE OF  
THE ADMINISTRATOR

PROJECT AUTHORIZATION  
AND REQUEST FOR ALLOTMENT OF FUNDS

PART II

Name of Country: Syria

Name of Project: Provincial  
Water Supply  
Systems

Number of Project: 276-0024

Pursuant to Part II, Chapter 4, Section 531 of the Foreign Assistance Act of 1961, as amended, I hereby authorize a Loan to Syria (the "Cooperating Country") of not to exceed Seventeen Million Six Hundred Thousand United States Dollars (\$17,600,000) (the "Authorized Amount") to help in financing the foreign exchange and local currency costs of goods and services required for the project as described in the following paragraph.

The project consists of four water systems (sub-projects) which will provide free potable water to 86 villages located in three northeastern provinces of Syria (hereinafter referred to as the "Project").

The entire amount of the A.I.D. financing herein authorized for the Project will be obligated when the Project Agreement is executed.

I hereby authorize the initiation and negotiation 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 terms and covenants and major 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

- 2 -

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 three percent (3%) per annum thereafter, on the outstanding balance of the Loan and on any due and unpaid interest accrued thereon.

b. Source and Origin of Goods

Goods and services financed by A.I.D. under the Project shall have their source and origin in the United States or in the Cooperating Country except as A.I.D. may otherwise agree in writing.

c. Conditions Precedent

(1) Prior to any disbursement to finance construction costs of a sub-project, or the issuance of any commitment documents under the Project Agreement for such disbursement, the Cooperating Country shall, except as A.I.D. may otherwise agree in writing, submit, in form and substance satisfactory to A.I.D., designs and costs estimates for that sub-project.

(2) Prior to any disbursement to finance technical services, or the issuance of any commitment documents under the Project Agreement for such disbursement, the Cooperating Country shall, except as A.I.D. may otherwise agree in writing, submit a signed contract for such services with a United States firm acceptable to A.I.D.

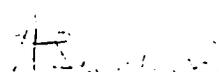
(3) Prior to any disbursement to finance the purchase of equipment, or the issuance of any commitment documents under the Project Agreement for such disbursement, the Cooperating Country shall, except as A.I.D. may otherwise agree in writing, submit, in form and substance satisfactory to A.I.D., a detailed equipment list and a cost estimate.

(4) Prior to any disbursement to finance training costs, or the issuance of any commitment documents under the Project Agreement for such disbursement, the Cooperating Country shall, except as A.I.D. may otherwise agree in writing, submit, in form and substance satisfactory to A.I.D., a training plan.

d. Covenants

(1) The Cooperating Country warrants that complementary health education programs will be reviewed with A.I.D. and initiated in the four sub-project areas either prior to project completion or shortly thereafter.

(2) The Cooperating Country further warrants that, to the maximum extent practicable, all construction contracts awarded after the Project loan agreement is signed will be made on the basis of competitive bidding procedures.

  
\_\_\_\_\_  
Alexander Shakow  
Acting Deputy Administrator

7/ - - 7  
\_\_\_\_\_  
Date



PROJECT DESIGN SUMMARY  
LOGICAL FRAMEWORK

Life of Project: \_\_\_\_\_  
From FY 79 \_\_\_\_\_ to FY 82 \_\_\_\_\_  
Total U.S. Funding: \$17.6 million  
Date Prepared: 4/16/1979

Project Title & Number: Provincial Water Supply 276-0024

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p>Project Purpose: (B-1)</p> <p>To provide reasonable access to potable water supply in 86 villages located within four project areas in the provinces of Raqqa, Deir Ezzor, and Hasakah.</p>	<p>Conditions that will indicate purpose has been achieved: End-of-Project status. (B-2)</p> <p>(i) Functioning public water fountains located within 500 meters of the target populations not to exceed 500 people per fountain</p> <p>(ii) WHO water purity standards attained in project areas</p> <p>(iii) Satisfactory maintenance, operation and water testing program</p>	<p>(B-3)</p> <p>(i) Physical inspection by AID</p> <p>(ii) Certification by SARG water-testing authority (DHU)</p> <p>(iii) Physical inspections and review of each muhafazat's program within six months of project completion followed by 2nd inspection and review two years after completion</p>	<p>Assumptions for achieving purpose: (B-4)</p> <p>(i) Criteria for fountain placement are followed by DHU's</p> <p>(ii) Staff, budget and desire to carry out maintenance, operation and water-testing provided by SARG to DHU's</p>
<p>TA:</p> <p>To increase water system design capabilities of MIU Directorate of Water Supply (DWS)</p>	<p>(i) Greater numbers of water systems designed per unit of time</p> <p>(ii) Increased numbers of difficult to design systems produced per unit of time</p>	<p>(i) Review DWS designs to three years prior to initiation of program and compare with designs during and two years after completion of the program. Analyze for qualitative and quantitative changes.</p>	<p>(i) SARG maintains DWS staff at levels equal or greater than present levels.</p>

PROJECT DESIGN SUMMARY  
LOGICAL FRAMEWORK

Life of Project: \_\_\_\_\_ to FY 82  
From FY 79 \_\_\_\_\_  
Total U. S. Funding \$17.6 million  
Date Prepared: 4/16/1979

Project Title & Number: Provincial Water Supply 276-0024

PAGE 3

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p>Project Outputs: (C-1)</p> <p>Complete village water distribution systems including:</p> <ul style="list-style-type: none"> <li>(i) Source of supply/structure</li> <li>(ii) Pumping stations</li> <li>(iii) Treatment facilities (where necessary)</li> <li>(iv) Distributions systems (mains and laterals)</li> <li>(v) Reservoirs/elevated tanks</li> <li>(vi) Distribution lines w/ public fountains</li> </ul>	<p>Magnitude of Outputs: (C-2)</p> <ul style="list-style-type: none"> <li>(i) 3 intake structures, 3-4 filtration wells</li> <li>(ii) 7 pumping stations</li> <li>(iii) 2 treatment plants</li> <li>(iv) 233 Km (mains), 44 Km (laterals)</li> <li>(v) 8 ground reservoirs, 72 elevated tanks</li> <li>(vi) 115 Km dist lines, 200 fountains</li> </ul>	<p>(C-3)</p> <p>Certification by SARG + Inspection by AID</p>	<p>Assumptions for achieving outputs: (C-4)</p> <ul style="list-style-type: none"> <li>(i) Timely availability of construction materials</li> <li>(ii) SARG completes Abu Kemal treatment plant as schedule</li> <li>(iii) Contracts are let on timely basis</li> <li>(iv) SARG budgetary transfers to DHU's are timely and sufficient</li> <li>(v) qualified contractors are used</li> </ul>
<p>A: (i) Well equipped DWS engineering design offices</p> <ul style="list-style-type: none"> <li>(ii) Improved mobile laboratory facilities</li> <li>(iii) Better trained DWS design staff</li> </ul>	<ul style="list-style-type: none"> <li>(i) Six offices comparably equipped to U.S. engineering design offices</li> <li>(ii) One mobile laboratory equipped for soil and water testing</li> <li>(iii) Minimum twelve engineers participate as counterparts to U.S. consulting team over two year period and take three month short-term training course in U.S.</li> </ul>	<ul style="list-style-type: none"> <li>(i) Confirmed by AID inspection and certification by SARG</li> </ul>	<ul style="list-style-type: none"> <li>(i) DWS maintains staffing assignments as required to accomplish program over the two year period</li> </ul>

PROJECT DESIGN SUMMARY  
LOGICAL FRAMEWORK

Life of Project:  
From FY 79 to FY 82  
Total U.S. Funding \$17.6 million  
Date Prepared: 4/16/1979

Project Title & Number: Provincial Water Supply 276-0024

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p>Project Inputs: (D-1)</p> <p>(i) AID Project Loan (ii) Syrian budget support (iii) DWS staff, equipment and designs (iv) DHU staff and equipment (v) AID inspection</p>	<p>Implementation Target (Type and Quantity)</p> <p>(i) \$16.1 million 7/79-10/82 (ii) \$5.4 million from central budget 7/79-10/82 (iii) ten completed designs for system components (iv) DHU project engineer and project manager for each of four project sites w/transpt (v) 1/4 man year aid direct hire engineer w/transport. 7/79-10/82 (vi) SARG covenant to provide land</p>	<p>(D-3)</p> <p>(i) signed loan agreement (ii) notification by SARG of amount and timing of budgetary transfers to the three muhafazate (iii) AID direct hire verifies assignment of DHU/DWS staff in context of normal monitoring and inspection (iv) SARG certification that rights to land use obtained</p>	<p>Assumptions for providing inputs: (D-4)</p> <p>(i) None (ii) SARG able and willing to provide their share of project cost (iii) DHU/DWS has sufficient staff and budget to provide project engineers and directors</p>
<p>TA: (i) AID Project Loan (ii) Long-term consultants (iii) Short-term consultants (iv) Equipment (v) Short-term training (vi) Office space (vii) SARG counterparts</p>	<p>(i) \$1.5 million 7/79-10/82 (ii) Four water system design engineers for two years each (iii) One man year various design specialties (iv) Design section and laboratory equipment (v) Twelve people for three months each in U.S. consultants' office (vi) Space for 6 offices</p>	<p>(i) signed loan agreement (ii) signed consulting contract (iii) signed contracts (iv) delivery confirmed by consultants (v) confirmed by consulting firm (vi) ditto (vii) ditto</p>	<p>(i) None (ii-v) Host country contracting done on timely basis (v, vii) Counterparts provided by DWS for participation</p>

Design Criteria\*

Annex E-1

<u>General</u>	<u>Rural</u>
Design Period - Gravity Systems	30 years
- Pump Systems	15 years
Assumed Average Daily Human Demand	125-200 lcd
Assumed Average Daily Animal Demand	18 lcd
Maximum Day Demand	1.35 x average
Maximum Hourly Demand	2.4 x average
Growth Factor	3-4%
Storage - Total	50% x average demand
- Elevated	25-30% x average demand
System Design Pressure	2-3 atmospheres

Transmission and Distribution

Friction Coefficient (based on Colebrook Formula at 12°C)  
asphalt lined

K = 0.025 for/Asbestos Cement Pipe

K = 0.05 for Ductile Iron, Cement lined

K = 0.1 for Reinforced Concrete

Velocity: 0.4 to 1.2 m/sec.

Treatment

Rapid sand filtration rate (max.): 5-6m<sup>3</sup>/m<sup>2</sup>/hr.)

Sedimentation retention time (min.): 4 hrs.

Flocculation time: 30 min.

Chemical: Aluminum Sulfate and Lime

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\* These are unpublished criteria obtained in discussions with officials in the Ministry of Housing and Utilities.

**Provincial Water Supply**

**Sub-Project Components**

<u>Project Title</u>	<u>Intake Structure</u>	<u>Pumping Stations</u>	<u>Treatment Plants</u>	<u>Filtration Wells</u>	<u>Pipe Mains Kms.</u>	<u>Pipe Laterals Kms.</u>	<u>Water Towers</u>	<u>Ground Reservoirs</u>	<u>No. of Villages &amp; Farms</u>	<u>Present Population X 1000</u>	<u>Est. Pop. Yr. 2007 X 1000</u>	<u>Total Est. Cost (Million) S.P.</u>	<u>Cost \$</u>
Abu Kamal <sup>1</sup>	-	-	-	-	38.5	6.9	13	1	11	25.0	52.6	13.75	3.526
Suwar	1	1	1	-	(70.1)	(.92)	(19)	-	19	20.0	48.5	27.79	7.126
Branch 1.					15.45	0.31	5						
Br. 2					19.3	0.25	6						
Br. 3					15.0	0.37	4						
Br. 4					20.38	0.09	4						
Um Madfa <sup>2</sup>	-	1 + (3)	-	-	(75)	(25.8)	(22)	(3)	28	13.1	42.6	17.48	4.482
Br. B		+ 1			30.5	7.6	10	-					
Br. C		+ 2			35.8	18.2	9	3					
Br. D					8.7		3	-					
Rumailan	1	1	1	-	31.14	8.75	13	3	23	2.8	9.0	16.86	4.323
Manoura	1	1	-	3 - 4	18.15	1.65	5	1	5	21.5	52.2	7.86	2.015
<b>Totals</b>	<b>3</b>	<b>7</b>	<b>2</b>	<b>3 - 4</b>	<b>232.9</b>	<b>44.1</b>	<b>72</b>	<b>8</b>	<b>86</b>	<b>82.4</b>	<b>204.9</b>	<b>83.74</b>	<b>21.472</b>

<sup>1</sup>The intake structure, pumping station and treatment plant for Abu Kamal is presently under construction and is estimated to be 80 percent complete.

<sup>2</sup>Um Madfa shares the same intake, pumping and treatment facilities with Rumailan.

The Technical and Scientific Equipment  
Needed for the Directorate of Water Supply  
Damascus

Planning and Design Section List

1. Office equipment and facilities for AID and SARG engineers, metallic drawers for filing folders and plans, air conditioning and lighting (6 offices).
2. Programmable computer (water supply programs) (8 computers).
3. Library including the latest technical and scientific books and reference concerning water supply projects, treatment plants, structures, and soil mechanics.
4. Complete drawing-office equipment: drawing tables, chairs and tools. (4 offices).
5. Complete topographic-office equipment with the latest topographic equipment (for 2 working groups).
6. Equip the Directorate of Water Supply with:
  - Photocopy machine
  - Duplicating and printing (plans) machine
  - Arabic typing machine
  - English typing machine
  - Binding machine
  - Microfilm equipment to photograph and expose documents
7. Complete stationary for the expert engineers and draftsmen offices.
8. Air conditioned car for field and topographic work.

Water Resources and Laboratory Section List

1. Mobile laboratory for chemical and bacterial analysis as well as other equipment.
2. Equipment to measure the depth of a well and water levels.

3. Geophysical equipment for ground water detection.
4. Equipment to measure the turbidity of water.
5. Equipment to measure the water PH.
6. Any new technical applications pertaining to water supply projects, that AID deem necessary

Director of D.W.S.

Eng. Hilal Yusfi

September 11, 1978

PROVINCIAL WATER SUPPLY  
Sub-Project Cost Estimates  
(SP Million)

	<u>Abu Kamal</u>	<u>Suwar</u>	<u>Rumeilan/(R) Um Madfah(U)</u>	<u>Mansura</u>
<b>1. Construction Costs:</b>				
a. Distribution System	8.17	10.82	2.30(R) 12.68(U)	4.34
b. Network w/Fountains	3.01	0.59	0.66(R) 1.53(U)	0.25
c. Treatment Plant-Civil	0	6.38	5.45	0
d. Treatment Plant-M&E	0	4.80	5.30	0
e. Filtration Wells & Pump Stations	<u>0</u>	<u>0</u>	<u>0</u>	<u>1.8</u>
Sub Total <sup>1)</sup>	11.18	22.59	27.92	6.39=68.
<b>2. Design and Engineering</b>				
@ 3%	.34	.68	.84	.19
<b>3. Supervision @ 5%</b>				
@ 5%	.56	1.13	1.40	.32
<b>4. Congingency @ 15%</b>				
@ 15%	<u>1.67</u>	<u>3.39</u>	<u>4.18</u>	<u>.96</u>
Total	13.75	27.79	34.34	7.86=83.

Total Sub-Project SP 83.74 million or \$21,472,000

Construction Costs	\$21,472,000
Technical Assistance	1,308,000
Equipment	308,000
Training	<u>108,000</u>
Total Project Cost	\$22,968,000

<sup>1)</sup> Cost estimates include inflation factor of 20% per annum.

PROVINCIAL WATER SUPPLY

CONSTRUCTION SCHEDULE

Construction Period (Mo.)	NTP	1) FY 79				FY 80				FY 81				FY 82			
		IV	I	II	III	IV	I	II	III	IV	I	II	III	IV			
<u>Deir Ezzor</u>																	
Abu Kamal																	
- Distribution System	30	6/79	.	.	.	.	.	.	.	.	.	.	.	.			
- Network w/Fountains	6	6/81												.			
<u>Suwar</u>																	
- Distribution System	30	6/79	.	.	.	.	.	.	.	.	.	.	.	.			
- Treatment Plant - Civil	30	3/79	.	.	.	.	.	.	.	.	.	.	.	.			
- Treatment Plant - M&E	9	3/81												.			
- Network w/Fountains	6	6/81												.			
<u>Hasakah</u>																	
Rumellan/Um Madfah	14		.	.	.	.	.	.	.	.	.	.	.	.			
- Distribution System (R)	34	4/79	.	.	.	.	.	.	.	.	.	.	.	.			
- Distribution System (U)	24	5/79	.	.	.	.	.	.	.	.	.	.	.	.			
- Treatment Plant - Civil	12	4/79	.	.	.	.	.	.	.	.	.	.	.	.			
- Treatment Plant - M&E	6	6/80												.			
- Networks w/Fountains		3/80 (R)												.			
		3/82 (U)												.			
<u>Raqqa</u>																	
Mansura																	
- Distribution System	30	9/79	.	.	.	.	.	.	.	.	.	.	.	.			
- Filtration Wells & Pumping Station	12	3/81												.			
- Network w/Fountains	6	9/81												.			

1) NTP = Estimated date notice to proceed with construction

PROVINCIAL WATER SUPPLY

ESTIMATED CONSTRUCTION DISBURSEMENT SCHEDULE

(\$ Thousand)

	FY 79	FY 80				FY 81				FY 82				Total Disbursed
	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	
<u>Deir Ezzor</u>														
Abu Kamal														
- Distribution Systems		193	193	193	193	193	193	193	193	193				1,737
- Network w/Fountains										356	285			641
Final Payment											267			267
														(2,645)
Suwar														
- Distribution System		256	256	256	256	256	256	256	256	256				2,304
- Treatment Plant - Civil		151	151	151	151	151	151	151	151	151				1,359
- Treatment Plant - M&E									378	378	265			1,021
- Network w/Fountains										70	56			126
Final Payment											534			534
														(5,344)
<u>Hasakah</u>														
Rumeilan/Um Madfah														
- Distribution System (R)		109	109	109	109	54								490
- Distribution System (U)		250	250	250	250	250	250	250	250	250	200			2,700
- Treatment Plant - Civil		161	161	161	161	161	161	161	32					1,159
- Treatment Plant - M&E						313	313	313	188					1,127
- Network w/Fountains					78	64						181	145	142 (R) 326 (U)
Final Payment									323		337			660
														(6,604)
<u>Raqqa</u>														
Mansura														
- Distribution System			103	103	103	103	103	103	103	103	103			927
- Filtration Wells & Pumping Station									106	106	106	63		381
- Network w/Fountains											30	23		53
Final Payment											150			150
														(1,511)
	0	1120	1223	1223	1301	1545	1427	1427	1980	1863	1896	954	145	16,104

**PROVINCIAL WATER SUPPLY**  
**ESTIMATED TECHNICAL ASSISTANCE DISBURSEMENT SCHEDULE**  
(\$ Thousand)

	<u>FY 79</u>	<u>FY 80</u>				<u>FY 81</u>				<u>FY 82</u>				<u>Total Disbursed</u>
	<u>IV</u>	<u>I</u>	<u>II</u>	<u>III</u>	<u>IV</u>	<u>I</u>	<u>II</u>	<u>III</u>	<u>IV</u>	<u>I</u>	<u>II</u>	<u>III</u>	<u>IV</u>	
<b><u>Consultants:</u></b>														
Long-Term					100	100	100	100	100	100	100	100		800
Short-Term							15	15	15	15	20	20		100
<b><u>Equipment:</u></b>														
Planning Design					100	75	40							215
Water Resources Lab						150	100	23						273
<b><u>Training:</u></b>														
Short-Term						<u>27</u>	<u>27</u>	<u>27</u>	<u>27</u>					<u>108</u>
	0	0	0	0	200	352	282	165	142	115	120	120	0	1,496

Provincial Water Projects  
Estimated Human and Animal Population

1981

	<u>1981 Adjusted Population</u>	<u>Population Migration</u>	<u>Estimated No. Families</u>	<u>Avg. Sheep Per Family</u>	<u>Estimated No. Sheep</u>	<u>Time @ Villag</u>
Abu Kamal	33,758	10% (3 mo.)	5,626	80	450,106	9 mo.
Suwar	27,012	50% (3 mo.)	4,502	100	450,200	9 mo.
Rumeilan/Um Madfah	21,508	70% (8 mo.)	2,868	80	229,418	4 mo.
Mansura	29,038	25% (6 mo.)	4,839	60	293,380	6 mo.

Notes:

- (i) Human population is based on 1977 estimates by Lintner/Benedict (Annex H-1) adjusted upwards by 20 percent for estimated underreporting and updated to 1981 with a 3% growth factor.
- (ii) Temporary migration, average number of sheep per family and amount of time sheep spend at village are based on reports by Chatty (1979) and Lintner/Benedict (1979).
- (iii) Estimated number of families and estimated number of sheep were derived from above data plus estimates of average family size contained in Chatty (1979) and Lintner/Benedict (1979).

- 1) Direct beneficiaries - taken from Annex G-1 for 1981. Thereafter, assumed to grow at 3 percent per annum.
- 2) Liters/head/day (l/h/d) - Consumption levels beginning in 1981 are based on derived IBRD estimates for rural population with access to potable water for 1980. Consumption levels are assumed to increase in the eleventh year because house connections are assumed to be provided at that time. (100 to 125 l/h/d)
- 3) Direct beneficiary consumption - projected population times daily consumption converted to 1000 cubic meters per year.
- 4) Indirect beneficiary consumption - the population within 20 kms of the water projects. Assumed to be 25% of direct beneficiaries on basis of Asmon (1978). Consumption levels are assumed at 30 l/h/d. Indirect beneficiaries are assumed to have own water systems after tenth year.
- 5) Adjusted for Migration - Direct plus indirect beneficiary consumption is reduced for estimated effect of annual migration. Annex G-1 shows the estimated proportion of the population and amount of time spent away from the village.
- 6) Animals - Animal consumption is estimated on the size of flocks shown in Annex G-1 for 1981, assumed to grow thereafter at 3 percent per annum. Estimated water consumption is based on 18 l/h/d (Syrian standard: U.S. - 18.9 l/h/d) converted to an annual basis and adjusted for the actual time spent in the village. See Annex G-1. For three of the projects, Mansura, Suwar and Abu Kamal, the consumption figure is further reduced to 25 percent of the migration adjusted figure to make allowance for the proximity of irrigation and river water that is likely to be used even in the presence of animal troughs provided under the proposed projects. For Rumeilan/Um Madfah no adjustment is made because the river ranges from 5 kms to 35 kms away.
- 7) Tank Trucks - 10 percent of adjusted for migration consumption is assumed to be trucked to population beyond 20 kms of the projects. Syrian planners have made allowance for this and animal consumption in designing system capacity.
- 8) Total consumption - sum of columns for "adjusted for migration", animals and tank trucks. Human consumption is everything except for animals.

Least Cost Analysis: Methodology & Assumptions

Methodology: A modified least cost analysis has been prepared in the sense that we have asked what water rate per cubic meter of water (M3) would need to be charged to insure a 10 percent internal rate of return on investment. By posing the question in this manner we are able to make reasonable comparisons of the proposed water projects and the government tank truck alternative with the rates charged by private haulers.

We have assumed that government tank trucks will deliver potable water to the sub-projects which requires that they haul water from the nearest treatment plant, generally the provincial capital.

Assumptions:Government Tank Trucks

- 1) Capital Cost = SP 200,000/17½ ton truck
- 2) Operating costs = SP 133/day  
(fuel, driver and maintenance)
- 3) One round-trip per day to nearest treatment plant (Raqqa, Deir Ezzor, Abu Kamal, Hasakah) and for delivery. Review indicated nothing greater is practically possible.
- 4) Water delivered = 17.5 M3/day x 300 days = 5,520 M3/yr.
- 5) Life of truck = 5 years with 10% salvage value

Assumptions for government tank trucks are based on Asmon (1978). Other data available results in even higher costs/M3.

Provincial Water Sub-Projects

- 1) Consumption levels for human and animal are obtained from Annex G-2. See assumptions thereto.
- 2) Capital costs and their distribution are obtained from Annex F-3 and adjusted for the SARG contribution.

- 3) An estimated 60 percent of the initial mechanical and electrical component must be replaced in the fifteenth year.
- 4) House connections @ SP 275/each are made in the tenth year of the project for each household. No further amounts are shown for additional connections that are assumed to be required at the rate of population growth.
- 5) Operating and maintenance costs are based on an estimate of SP 500,000 per year rounded. Twenty-five percent of operating and maintenance costs are assumed to vary directly with population growth.
- 6) Project Life = 30 years.

General

- 1) Discount rate = 10%
- 2) Constant costs. No allowance for inflation.
- 3) \$1 = SP 3.9
- 4) M3 = cubic meter = 1000 liters
- 5) No sensitivity analysis of discount rate is used because lower rates would simply favor the proposed water projects and higher rates would have to be unrealistically high to affect project choice.

Provincial Water Supply

Annex G-3

17 1/2 Ton Government Tank Truck

(\$)

Year	Costs			Hypothetical Revenues	
	Maintenance & Operation	Capital Costs	Present Value @ 10% Discount	Revenue @ 15.94 SP/M3	Present Value @ 10% Discount
1	-	-	-	-	-
2	-	-	-	-	-
3	-	-	-	-	-
4	10,230	51,282	46,215	21,455	16,120
5	10,230		6,987	21,455	14,654
6	10,230		6,352	21,455	13,322
7	10,230		5,775	21,455	12,111
8	10,230		5,250	21,455	11,010
9	10,230	46,154	23,912	21,455	10,008
10	10,230		4,338	21,455	9,099
11	10,230		3,944	21,455	8,271
12	10,230		3,586	21,455	7,520
13	10,230		3,260	21,455	6,836
14	10,230	46,154	16,332	21,455	6,214
15	10,230		2,694	21,455	5,650
16	10,230		2,449	21,455	5,136
17	10,230		2,226	21,455	4,669
18	10,230		2,024	21,455	4,245
19	10,230	46,154	10,141	21,455	3,859
20	10,230		1,673	21,455	3,508
21	10,230		1,521	21,455	3,190
22	10,230		1,382	21,455	2,899
23	10,230		1,257	21,455	2,636
24	10,230	46,154	6,297	21,455	2,396
25	10,230		1,039	21,455	2,178
26	10,230		944	21,455	1,980
27	10,230		858	21,455	1,800
28	10,230		780	21,455	1,637
29	10,230	46,154	3,910	21,455	1,488
30	10,230		645	21,455	1,353
31	10,230		526	21,455	1,229
32	10,230		533	21,455	1,118
33	10,230	(5,128)	242	21,455	1,017
	306,900	276,924	167,152	643,650	167,153

Provincial Water Supply

Annex G-3

Rumeilan/Um Madfah Project

(\$ Thousand)

Year	Costs			Hypothetical Revenue	
	Maintenance & Operation	Capital Cost	Present Value @ 10% Discount	Revenue @ 6.89 SP/M3	Present Value @ 10% Discount
1	-	2,512	2,512	-	-
2	-	4,809	4,372	-	-
3	-	1,484	1,226	-	-
4	128		96	871	655
5	129		88	896	612
6	130		81	923	573
7	131		74	951	536
8	132		68	980	503
9	133		62	1,009	470
10	134		57	1,039	441
11	135		52	1,071	413
12	136		48	1,075	376
13	138	264	128	1,137	362
14	139		40	1,360	394
15	140		37	1,401	369
16	142		34	1,444	346
17	143		31	1,487	324
18	144	1,003	227	1,531	303
19	150		27	1,578	284
20	151		25	1,625	266
21	153		23	1,673	248
22	154		21	1,724	233
23	156		19	1,776	218
24	158		18	1,829	204
25	159		16	1,885	192
26	161		15	1,942	179
27	163		14	1,994	168
28	165		13	2,057	157
29	167		12	2,121	147
30	169		11	2,184	138
31	171		10	2,250	130
32	173		9	2,316	121
33	175		8	2,387	113
	4,459	10,072	9,474	46,516	9,475

Provincial Water Supply

Annex G-3

Mansoura Project

(\$ Thousand)

Year	Costs			Hypothetical Revenue	
	Maintenance & Operation	Capital Cost	Present Value @ 10% Discount	Revenue @ 0.98 SP/M3	Present Value @ 10% Discount
1	-	341	341	-	-
2	-	341	310	-	-
3	-	1,333	1,102	-	-
4	128		96	281	207
5	129		88	284	194
6	130		81	293	182
7	131		74	301	170
8	132		68	310	159
9	133		62	320	149
10	134		57	329	140
11	135		52	339	131
12	136		48	349	123
13	138	445	186	360	115
14	139		40	431	125
15	140		37	443	117
16	142		34	457	109
17	143		31	471	102
18	144	150	58	485	96
19	150		27	500	90
20	151		25	515	84
21	153		23	529	79
22	154		21	546	74
23	156		19	562	69
24	158		18	579	65
25	159		16	596	61
26	161		15	614	57
27	163		14	633	53
28	165		13	651	49
29	167		12	671	47
30	169		11	691	44
31	171		10	712	41
32	173		9	734	38
33	175		8	756	36
	4,459	2,610	3,006	14,742	3,006

Provincial Water Supply

Annex G-3

Abu Kamal Project

(\$ Thousand)

Year	Costs			Hypothetical Revenue	
	Maintenance & Operation	Capital Cost 1/	Present Value @ 10% Discount	Revenue @ 1.54 SP/M3	Present Value @ 10% Discoun
1	-	644	644	-	-
2	-	1,865	1,695	-	-
3	-	2,171	1,794	-	-
4	128		96	503	378
5	129		88	519	354
6	130		81	534	331
7	131		74	550	310
8	132		68	567	291
9	133		62	584	272
10	134		57	600	255
11	135		52	619	239
12	136		48	637	223
13	138	518	209	657	209
14	139		40	787	228
15	140		37	811	213
16	142		34	835	200
17	143		31	859	187
18	144	450	118	885	175
19	150		27	912	164
20	151		25	939	153
21	153		23	967	144
22	154		21	996	135
23	156		19	1,026	126
24	158		18	1,057	118
25	159		16	1,089	111
26	161		15	1,121	103
27	163		14	1,155	97
28	165		13	1,190	91
29	167		12	1,225	85
30	169		11	1,262	79
31	171		10	1,300	75
32	173		9	1,339	70
33	175		8	1,379	65
	4,459	5,648	5,469	26,904	5,481

1/ Assumed one half treatment plant costs @ 9 million SP allocated to project including 50% of replacement M&E. Capital cost allocated equally in year 2 & 3. The Abu Kamal treatment plant is being built by the SARG to serve both city of Abu Kamal and the project area.

Provincial Water Projects

Annex G-4

Comparison of Capital Investment Requirements

(\$ Thousand)

	<u>Systems</u>	<u>Equivalent Gov't Tank 1st Yr.</u>	<u>Capacity Trucks 30th Yr.</u>	<u>Index of Exposure to Inflation</u>
Abu Kamal	4,680	17,856	46,916	1.16
Suwar	7,126	15,375	40,068	0.81
Rumeilan/Um Madfah	8,805	9,719	24,762	0.65
Mansura	2,015	13,040	34,852	2.51
Gov't Tank Trucks	-	-	-	10.38

Note: Exposure to inflation is a ratio designed to show the relative magnitude of future costs (priced at current prices) compared to initial capital investment. All future costs including maintenance, operation and replacement capital costs are divided by initial capital investment. The higher the resulting ratio the greater the exposure to inflation. It is obvious that the use of government tank trucks is highly susceptible to cost increases via inflation compared to the proposed water systems simply because, relatively, most of the government tank truck costs occur in the future.

ENVIRONMENTAL AND SOCIAL SOUNDNESS ANALYSIS

The following section provides an integrated analysis of the environmental impacts (physical, social, and economic) and social soundness (benefit and equity incidence) of the project. It is based on field investigations and office research conducted during February and March 1979 by Peter Benedict, senior behavioral science advisor and Stephen F. Lintner, senior environmental coordinator, Bureau for Near East, AID/W, supplemented by AID contracted social soundness studies by Asmon (1978) and Chatty (1979).

1. SUMMARY OF PROBLEM

An assessment of the probable impact of improved potable water supply can be suggested by summarizing the range of current social costs related to inadequate quality and quantity of accessible water, and the types of benefits expected to accrue from improvements in supply. Due to the lack of extensive research data on current health conditions, user perceptions of water and detailed information on the economics of water procurement, many observations presented here are qualitative in nature.

Given the character of water deficit for the target populations in the project areas major social costs can be characterized as follows: cost in capital, time, and labor in obtaining water; health cost from water-related diseases; cost in terms of constraints on agriculture and animal production; cost in promoting out-migration; and costs vis-a-vis other patterns of water usage forgone due to severity of water deficit. Analysis of target populations indicate that an improved supply of water will in the short-term both transfer capital costs to the government which will subsidize improvements, dramatically reduce social costs in obtaining water, modify some behavior related to water usage, and most likely over time reduce health hazards to the community.

The concentration of public water stands within nucleated communities will result in some unavoidable, minor adverse environmental impacts such as excess spill water, trash, and mud in the vicinity of water stands and the concentration of greater numbers of livestock closer to population centers with resultant intensified grazing. Unless the pooling of increased waste water is properly

controlled through village level public health education/community sanitation programs there will be an unavoidable small to moderate increase in the number of village disease vectors (flies, mosquitoes) through the creation of increased breeding habitat.

The following sections briefly characterize each of the four systems in terms of beneficiaries served, and examine more closely several selected issues.

## 2. PROFILES

### A. Mansoura Scheme, Raqqah (Chatty, 1979, Benedict/Lintner 1979)

Settlement: This system is comprised of 5 settlements ranging in size from 1,000 to 7,500 in population located between the semi-arid plateau of the Badiat-ish-Sham and the Euphrates river (see Table ). Consisting of nucleated hamlets aligned along the river on both sides of the Raqqah-Aleppo highway, dwellings are a mixture of mudbrick and concrete block. In Mansoura proper there are several small manufacturing and retail activities. Households, averaging 6 members within the project area, are almost exclusively segments of the Wulda tribe who settled this area nearly 80 years ago. Villages peripheral to the scheme in the Badia proper are of the Abu Khamis and Fadla tribes. Aside from the highway settlements, all other communities are connected via dirt tracks.

Livelihood: Mansoura has a mixed economy of irrigated wheat, barley cotton and some sugar beet with an average farm size of 7 hectares. Sheep production is a dominant activity particularly of remote settlements 25-60 km southwest of the river. The pattern is to migrate into the Badia from February to early summer, then return to graze on harvested fields. Off-farm employment exists but has not been measured. Average annual income from all sources is 6,000 SP (i.e. 3,000 SP from 20 donum of irrigated crops and 3,000 from an average herd of 60 sheep).

Services: The project area consists of 21,500 people however Mansoura district as a whole consists of 20 villages, with 15 primary schools, several secondary schools, specialized commercial outlets, and a government health clinic.

Potable water sources: Settlements within 15 km of the river obtain water directly from the river with galvanized containers carried by donkey. Settlements deeper into the Badia purchase water from Mansoura or are periodically served by government tankers. Private hauliers of water charge generally 3 SP per barrel (200 liters) and the quality is poor. Capital expenditure for water averages 8% of annual household income dropping in winter when rain water is periodically available. For Bedouin communities distant from the project scheme large purchases of water in the summer at 2 SP a barrel are required for sheep. A herd of 300 sheep requires 50 barrels (10,000 liters) per week or about 10% expenditure of annual income. For communities located near the river consumption is estimated at 35-40 l/h/d for all household purposes except the weekly family laundry. Quality of river water is a major year around problem.

B. Suwar Scheme, Dayr az Zawr (Benedict/Lintner, 1979)

Settlement: The project scheme includes 19 small settlements ranging in size from 50 to 3,000 in population aligned along both sides of the Khabour river for a total distance of 30 km within a semi-arid plain. The main Hasakah - Dayr az Zawr highway passes through the central village of Suwar and other hamlets are inter connected by dirt tracks. Many settlements are fairly recent consisting of remnants of various Bedouin tribes, some settlements moved from the edge of the river to the edge of the river terrace following the flood of 1968. Many settlements within the scheme of 20,000 population are located within 1 km of the river, however, annually as many as 600 Bedouin encamp adjacent to project villages to graze herds and to obtain drinking water from irrigation canals.

Livelihood: Agricultural production is limited to irrigated wheat 30%, barley 20%, cotton 40%, and sugar beet 10%. With the exception of cotton and sheep products, there is little marketable surplus. Sheep herds are large and account for as much as 80% of income and auto consumption. Over half of the community move to pasturage during February-April. Ex-community employment, similar to other such communities, includes seasonal farm wage labor, and casual labor in large provincial towns. Average annual income is reputed to be 5,000 SP plus probably 2,000 - 3,000 SP in auto consumption of crops and animal products.

Services: Services were not inventoried, however, most larger settlements had a primary school and a medical clinic is under construction.

Potable water sources: Most settlements derive their potable water from nearby irrigation ditches which pump from the river or, in summer when such ditches are dry, directly from the river. In the hot months the level of the river drops and the quality of the water is low. Wells are saline and used only for washing and for animals. Private tankers are infrequent and charge 1 SP for 20 liters. Rain water is negligible. In summer months water consumption rises but also water must be hauled from the river. Household consumption is estimated to be 20 l/h/d. No capital expenditure estimates were available for purchased water.

C. Abu Kamal, Dayr az Zawr (Benedict/Lintner 1979)

Settlement: This scheme involves principally 11 settlements ranging in size from 700 to 5,000 in population aligned 36 km along the Euphrates river in a relatively broad indented valley. Large scale land leveling and the construction of cement-lined irrigation works are in evidence. Settlements are relatively large and consist of both mudbrick and cement block dwellings. Some commercial and retail activities exist along the main asphalt road. Access roads from settlements to the Dayr az Zawr - Iraqi border highway consist of dirt tracks. The nearby town of Abu Kamal is an economically active market town 5 km from the Iraqi border. This scheme is the largest at 25,000 population size.

Livelihood: Agriculture is characterized by river irrigated wheat 30%, barley 10%, cotton 40%, and the balance consisting of sugar beet, melons and vegetables. Animal husbandry is important but not as dominant as for the other water projects. Only 10% of the population reputedly migrate to pasturage in the Badia during February-April. Marketed surplus consists essentially of cotton for government purchase and melons and vegetables to Abu Kamal. Household income from crops and animals is reputed to be 7,000 SP annually of which 60-70% is derived from animal production.

Services: Although services were not inventoried, the proximity of the highway, volume of travel, and the high level of

economic activity in Abu Kamal proper would suggest the availability of primary and secondary schools, medical services in Abu Kamal, and agricultural and animal production cooperatives.

Potable water sources: Sources are similar to other settlements located in close proximity to a river. Most potable water during the winter is obtained from field irrigation ditches. Wells, tankers, and rain run-off are negligible sources. During the summer, water is hauled from the river often 4 times daily as opposed to a lower winter consumption. Best estimates of household water consumption are 20 l/h/d in summer and 10-15 l/h/d during the colder months.

D. Um Madfah - Rumeilan Scheme, Hasakah (Chatty, 1979)

Settlement: This system encompasses 51 relatively small settlements ranging in size from 20 to 3,300 in population located with the semi-arid Jezirah plain (see Table ). Fixed dwellings consist of mudbrick houses and black goathair tents constituting large extended family units of essentially the Ugeidat and Baggara Bedouins. As elsewhere in the region households average 7-8 members and polygamous units are not uncommon. Dispersed hamlets are connected by dirt tracks and an occasional stabilized gravel road making the area inaccessible after periodic winter rains. The Rumeilan area is particularly more isolated, and more Bedouin in character.

Livelihood: Agriculture is restricted to the dry farming of winter barley. Production is at a subsistence level and cultivators largely rent the government-owned land from entrepreneurs who charge 20-25% of crop yield as rent. Sheep production accounts for over 60% of income and is the major resource of subsistence. An estimated 70% of the population migrate to grazing land with sheep herds from late spring to late autumn.

Services: The double project area consisting of a combined population of 22,166 has 7 primary schools, a police outpost, and production cooperatives for livestock and agriculture. There are no medical or other social services.

Potable water sources: Settlements in the project area range from 2 to 25 km from the Khabour river. Winter rain, however minimal, is impounded and utilized. Wells are saline and little used except with sodium treatment. For settlements within 10 km women and children haul water with carts and donkeys requiring 2-3 trips per week of 3 hour duration each. At settlements over 10 km from the river, men rent trucks and haul 200 liter barrels 3-4 times a month at a charge of 10 SP per barrel. Capital expenditure on purchase of water amounts to 9% of annual family income.

### 3. ISSUES

#### A. Rural Welfare

By all comparative indicators the target groups of the four water projects, with the exception of some of the Bedouin population, are among the poorest of Syria's rural poor. The settlements at Mansoura and Abu Kamal in the Euphrates valley, and at Suwar in the Khabour valley represent, at present, examples of marginal livelihoods derived from modest irrigated outputs of cotton and sugar beet for cash and wheat and barley for subsistence. Incomes everywhere are supplemented by sheep as a vital part of household resources, and occasional wage labor during the cotton harvest. The combined total of cash income and imputed value of production of crops and animals consumed in a good year averages 7,000 SP for a household of 7, or about \$250 per capita. Subsistence at Um Madfah on the semi-arid Jezirah plain is more uncertain and more dependent on animal husbandry. Recent years of drought throughout Syria have resulted in declining yields of rainfed crops, contraction of adequate pasturage, declining rural incomes, and a resultant rural to urban migration particularly from the semi-arid plains. Averaging poor years with good, rural incomes are probably closer to \$150 per capita. Most all communities face major deficits in rural infrastructure, services, and effective local institutions to improve agricultural and animal production. Deficits in potable water is one of the most pervasive and serious of all deficits in basic needs in these communities.

#### B. Water Sources

All four project areas currently derive potable water

either directly from the Euphrates or Khabour river or from irrigation ditches which, during five months of the year (December-May), are fed by these rivers. Groundwater is rarely used due to its salt content from gypsum soils, and ponded rainwater when available is seldom used for internal consumption. A few sweetwater wells exist deep in the Badia desert and are of little value to settlements aligned along the two river basins. The quality of all sources is poor. Both rivers are increasingly becoming polluted from municipal wastes particularly in the vicinity of large towns and more saline due to returned irrigation water. The Khabour especially during peak summer months is low in discharge and the water becomes high in suspended clays, locally stagnant and odorous. Both low quality water hauled from the rivers or obtained from irrigation ditches is the epidemiological basis for many of the endemic and epidemic diseases common to the population.

### C. Obtaining Water

Distances to sources within the river basins vary from 500 meters to the nearest irrigation ditch, to 2-3 km from peripheral villages to the river. For villages located in the semi-arid plains flanking river valleys the distance to the river can be as much as 30 km without the benefit of hard surfaced roads. Generally within 10 km water is hauled by donkeys in galvanized containers of 20-35 liters each, in rubber sacks of smaller volume and occasionally in 200 liter oil drums. Generally, women and children haul water by donkey, and men haul water drums on carts pulled either by donkeys or tractors. Labor and time devoted to hauling water depends on source and season. During the growing season, households obtain water from nearby irrigation ditches and increase their consumption to 30-40 l/h/d from an average of 20-25 l/h/d. If ditches are dry an average household of 7 might require 2-3 round trips to the river which can be 2-3 km distant. Up to 8 hours per day per woman/child can be devoted to hauling water during such periods of deprivation.

For plains' villages, infrequent government water tankers and/or outside private sellers are the only sources of water. Occasionally a village-owned pick-up will haul 4-5 drums from the river at a time on demand and at a fee. Such containers are often contaminated and seldom at the source is water obtained from mid-channel. Such low quality water can only be stored a short time (2-3 days) before it becomes odorous (sulfur gases) and aesthetically undrinkable.

### D. Water Consumption and Patterns of Usage

A case study from Mansoura of a family of six living close to the river indicates a daily usage of 160-240 liters or 30-40 l/h/d. River water was used for drinking, cooking, tea and the bathing of females and children weekly. Children are generally all bathed with a partially filled drum of 40 liters. Adult females individually utilize 40 liters. Adolescent boys and adult men bathe in either irrigation ditches and/or the river. River water is further used for household animals and weekly about 80 liters is specially brought for family laundry and to clean the house. In contrast, a case study from the Um Madfa area where trucked water is purchased shows a market decline in consumption. Here a family of 7 might purchase 2-3 200 liter drums at 10 SP per drum 3-4 times per month. Measured consumption levels average 7-10 l/h/d. Over the course of a year expenditures for water could amount to 9% of household income. Food preparation occurs less often (food is cooked in bulk and stored), and water available for bathing is much reduced (all children share the same 25 liters permitted weekly). Saline well water is used for animals, laundry, and housecleaning. Periodic government tankers provide water gratis which constitutes not more than an additional 2 l/h/d.

### E. Water Costs

In addition to the heavy social costs (time, labor) and health costs related to exploitation of untreated river and irrigation water for human consumption, cash expenditures are considerable. Both Chatty and Asmon's estimates of consumption for plateau settlements are similar but estimates of annual water expenditures vary from 9% to 25% depending on how income is calculated. Maximizing the contribution of livestock to household income, particularly for plains' villagers, would suggest that current expenditures on water are about 10% of annual income. Interviews indicate that if publicly subsidized piped water were available consumption for people would increase to 50 l/h/d and, adding livestock, probably to 100 l/h/d.

Interviews also suggest that in areas such as Um Madfah where both physical and economic access to water are serious, people would regard piped water at a rate of 0.50 SP per 200 liters a major benefit. With the Euphrates and Khabour valleys the amenity cost would probably also be an incentive to pay for

pipd water. Insofar as piped water is more cost effective for recipients than purchased trucked water regardless of the tariff established, if at all, any savings are increases in real income.

F. Health and Nutrition

Consultant reports and field observations for the four water sites indicate the high prevalence of water-related disease and illness. There are a number of environmental commonalities between sites which underlie the conditions of disease. High temperature, density of people within household and within nucleated settlement, density of people per water source (wells, irrigation ditches), distance to water points (facilitating contamination), container pollution, source pollution (irrigation ditches, rivers particularly near towns and during the low flow periods in summer) are some factors which determine the epidemiological basis for disease. Primary problems reported are classic water-based and water-multiplied infections, and water-related insect vectors (Saunders and Warford, 1976). Local doctors interviewed report prevalence of cholera, typhoid, bacillary and amebic dysentery, gastroenteritis, ascariis, skin sepsis, trachoma, eye inflammation and schistosomiasis (rectal or urinary is uncertain). All of these could be reduced in severity from 50-90% with improved water supplies (White; Bradley; White, 1972). In only Suwar was schistosomiasis a factor.

The water systems as planned will effect both an increase in volume, which alone can decrease morbidity to a point, and an increase in quality. Interviews at Asharah (southeast of Dayr az Zawr) and Tel Timar (northwest of Hasakah), sites where piped treated water have been in effect for 3-4 years, indicate substantial declines in specific infections (Benedict and Lintner, 1979). At the same time these established clinics in areas with new water systems also have improved immunization programs combined with some school health education.

Conveniently located public water stands will, villagers report, permit more frequent use of water in food preparation, obviate the need to store water pending usage in household, and perhaps encourage more frequent bathing (particularly to change bathing practices away from polluted irrigation canals where insect vectors are numerous). Chatty (1979) reports dietary shifts from quality animal products such as samneh (clarified butter) laban (yogurt), and cheese to increased use of tea, .

coffee and sugar. Given the narrow agricultural resource base it is unlikely that improved water supply will affect the character of dietary practices beyond that of the improved quality of water utilized.

#### 4. ESTIMATION OF BENEFICIARIES

The project areas include a diversity of livelihoods and settlement forms ranging from year around settled cultivators, transhumance of probably one half of village populations and nomadic Bedouins. Broadly, livelihood is derived from the irrigated wheat/barley/cotton/sugar beet complex of river basin communities and rainfed barley of the semi-arid plateau communities. Per capita income including auto consumption probably ranges from \$150 per annum to \$200 depending on individual circumstances.

Due to the unreliability of population data estimates provided in Table are tenuously used as a basis for calculating direct beneficiaries which total 82,500 for all projects. Under-reporting in the project area during the 1970 census of settled communities plus the lack of a count of nomadic Bedouin both seriously reduce the value of figures provided. A check on local estimates vs. government estimates for Sharqi-Kokab and El Hol areas of Hasakah by Asmon (1978) indicates a variation of 30%. If applied equally to the four project areas this would increase the number of total direct beneficiaries to 107,146. This figure would still not include nomadic Bedouin who will seasonally utilize the new water system at village water stands now designed to serve a minimum of 20 households and a maximum of 100 households per facility.

The new system will also service tanker trucks at the filtration/treatment plants which will provide free water to settlements outside the project area in the Badia. The number to be served cannot be estimated, however, 10% of the production of the system is to be allocated to tanker service.

Additionally, the system will serve an undetermined number of animals both village household and Bedouin herds. Animal consumption will equal and probably rival that of human consumption on a per capita basis.

## Annex H-1

During the construction of the systems a number of unskilled local laborers will be employed. An average for each distribution system is 30-100 individuals during construction if government contracted or if private contracted 40-50. Construction of the treatment plant will average 50 workers. The 1979 average daily wage for laborers is 20-25 SP. By experience maintenance crews for completed systems do not consist of local residents.

Non-residential beneficiaries include categories such as medical clinics, schools, mosques, government offices and particularly in areas where the distribution lines parallel the highway, commercial and mechanic facilities. Mansoura and Abu Kamal are likely candidates for a "stringer" development of functionally specific shops along the main road.

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## Annex II-1

NUMBER OF BENEFICIARIES\* BY PROJECT AND BY SETTLEMENT SIZE  
(EST. 1977)

SIZE OF SETTLEMENT	UM HADFA					TOTAL		%
	MANSURA	SUWAR	ABU KAHAL	UM HADFA	RUMETLAN	NO. SETTLEMENTS	POPULATION**	
2,501 +	3	2	3			8	35,733	63.4
2,301 - 2,500			1			1	2,498	3.0
2,101 - 2,300		1				1	2,200	2.7
1,901 - 2,101	1	2	2	1		6	12,096	14.7
1,701 - 1,900		1	2	1		4	7,167	8.8
1,501 - 1,700			2			2	3,165	3.8
1,301 - 1,500				2		2	3,000	3.6
1,101 - 1,300						-	-	-
901 - 1,100	1					1	1,000	1.2
701 - 900		3	1	1		5	4,036	4.8
501 - 700		1		1		2	1,300	1.5
301 - 500		2		1	3	6	2,800	3.4
201 - 300		3		2	3	8	2,280	2.8
101 - 200		3		13	5	21	3,690	4.5
0 - 100		1		6	12	19	1,455	1.8
<b>Total Population (Est. 1977)</b>	<b>21,500</b>	<b>20,000</b>	<b>24,995</b>	<b>13,140</b>	<b>2,785</b>		<b>82,420</b>	<b>100.0</b>
<b>Average Settlement Size</b>	<b>4,300</b>	<b>909</b>	<b>2,272</b>	<b>438</b>	<b>173</b>			
<b>No. of Settlements</b>	<b>5</b>	<b>19</b>	<b>11</b>	<b>28</b>	<b>23</b>	<b>86</b>		
<b>Projected Population (2007)***</b>	<b>52,185</b>	<b>48,544</b>	<b>52,551</b>	<b>42,607</b>	<b>9,026</b>			

\* Beneficiaries are defined here as a function of census data, i.e. settled village population not including Bedouin and migrant labor mobile populations who will also utilize project water.

\*\* Estimated 1977 population using the 1970 census as a base and annual population growth as follows: Raqqa 3.1; Deir Ezzor 2.8; and Hassakah 2.8%.

\*\*\* Estimated 2007 population using SARG multiplier of 2.42% over 30 years.

SYRLA - Provincial Water Supply

276-0024

## SC(2) - PROJECT CHECKLIST

Listed below are statutory criteria applicable generally to projects with FAA funds and project criteria applicable to individual fund sources: Development Assistance (with a subcategory for criteria applicable only to loans); and Economic Support Fund.

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

A. GENERAL CRITERIA FOR PROJECT

1. FY 79 App. Act Unnumbered; FAA Sec. 653(b); Sec. 634A.

(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)?

(a) The amount of the Loan is in excess of the amount contained within the fy '79 C.P. and therefore Congress will be notified in accordance with Agency procedures.

(b) Yes.

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 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 necessary,

4. FAA Sec. 611(b); FY 79 App. Act Sec. 101. If for water or water-related land resource construction, has project met the standards and criteria as per the Principles and Standards for Planning Water and Related Land Resources dated October 25, 1973?

The Principles and Standards are designed primarily for studies and assessments of regional or river basin planning of water and land resources. To the extent applicable, the economic, social, environmental, technical and financial criteria have been met.

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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 and Regional Assistant Administrator taken into consideration the country's capability effectively to maintain and utilize the project? Yes. See Annex J of Project Paper.
6. FAA Sec. 209. Is project susceptible of execution as part of regional or multilateral project? If so why is project not so executed? Information and conclusion whether assistance will encourage regional development programs. Project is not so susceptible. Project will not directly encourage regional development programs.
7. FAA Sec. 601(a). 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 will improve the technical efficiency of agriculture by reducing rural-urban migration and increasing rural productivity.
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). The project assistance will be used to finance local costs for construction and foreign exchange for technical assistance.
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. Syria will contribute approximately 25% of the costs of construction including all foreign exchange costs. The U.S. owns no foreign currencies which will be utilized in the project.

10. FAA Sec. 612(j). Does the U.S. own excess foreign currency of the country and, if so, what arrangements have been made for its release?
11. FAA Sec. 601(e). Will the project utilize competitive selection procedures for the awarding of contracts, except where applicable procurement rules allow otherwise?
12. FY 79 App. Act Sec. 608. If assistance is for the production of any commodity for export, is the commodity likely to be in surplus on world markets at the time the resulting productive capacity becomes operative, and is such assistance likely to cause substantial injury to U.S. producers of the same, similar or competing commodity?

The U.S. owns no excess foreign currency of Syria which may be released for this project.

The project will utilize the procurement procedures of Syria in accord with AID regulations. Syria's procedures allow for competitive selection of goods and services. Goods and services shall be procured competitively to the maximum extent practicable.

The project does not involve the production of any commodity for export.

#### FUNDING CRITERIA FOR PROJECT

##### Project Criteria Solely for Economic Support Fund

a. FAA Sec. 531(a). Will this assistance support promote economic or political stability? To the extent possible, does it reflect the policy directions of section 102?

b. FAA Sec. 533. Will assistance under this chapter be used for military, or paramilitary activities?

(a)1. The assistance will support the economic stability of Syria by supplying potable water to 82,000 persons in rural areas. Such water resources will encourage better health habits and discourage rural-urban migration.  
2. The project reflects the policy directions of section 102 by providing basic service for approximately 82,000 poor people.

(b) No assistance through this project will be used for military or paramilitary activities.

300) - COUNTRY CHECKLIST

ed below are, first, statutory criteria applicable generally to FAA  
s, and then criteria applicable to individual fund sources: Development  
stance and Economic Support Fund.

AL CRITERIA FOR COUNTRY  
BILITY

FAA Sec. 116. Can it be demonstrated  
that contemplated assistance will  
directly benefit the needy? If not,  
has the Department of State determined  
that this government has engaged in  
a consistent pattern of gross  
violations or internationally  
recognized human rights?

FAA Sec. 481. Has it been  
determined that the government of  
recipient country has failed to take  
adequate steps to prevent narcotic  
drugs and other controlled substances  
(as defined by the Comprehensive  
Drug Abuse Prevention and Control  
Act of 1970) produced or processed,  
in whole or in part, in such  
country, or transported through  
such country, from being sold  
illegally within the jurisdiction  
of such country to U.S. Government  
personnel or their dependents,  
or from entering the U.S. unlawfully?

FAA Sec. 620(b). If assistance is  
to a government, has the Secretary  
of State determined that it is  
not controlled by the international  
Communist movement?

FAA Sec. 620(c). If assistance is to  
a government, is the government  
liable as debtor or unconditional  
guarantor on any debt to a U.S.  
citizen for goods or services  
furnished or ordered where (a) such  
citizen has exhausted available  
legal remedies and (b) debt is not  
denied or contested by such  
government?

It can be demonstrated that the  
contemplated assistance will directly  
benefit the needy. The Department  
of State has not determined that  
the Syrian government has engaged  
in a consistent pattern of gross  
violations of internationally  
recognized human rights.

No such determination has been  
made

The Secretary has determined that  
Syria is not controlled by the  
international Communist movement.

At present there are no claims which  
require that assistance be terminated  
pursuant to this section.

FAA Sec. 620(e)(1). If assistance is to a government, has it (including government agencies or subdivisions) taken any action which has the effect of nationalizing, expropriating, or otherwise seizing ownership or control of property of U.S. citizens or entities beneficially owned by them without taking steps to discharge its obligations toward such citizens or entities?

Syria has taken such actions in the past. However, It has been determined that Syria is taking appropriate steps to discharge its obligations.

FAA Sec. 620(a), 620(f); FY 79 App. Act Sec. 108, 114 and 606. Is recipient country a Communist country? Will assistance be provided to the Socialist Republic of Vietnam, Cambodia, Laos, Cuba, Uganda, Mozambique, or Angola?

Syria is not a Communist country.  
No.

FAA Sec. 620(1). Is recipient country in any way involved in (a) subversion of, or military aggression against, the United States or any country receiving U.S. assistance, or (b) the planning of such subversion or aggression?

No.

FAA Sec. 620(1). Has the country permitted, or failed to take adequate measures to prevent, the damage or destruction, by mob action, of U.S. property?

There is no reason to believe that Syria will fail to take adequate measures to prevent the recurrence of mob action which may result in damage or destruction to U.S. property in Syria.

FAA Sec. 620(1). If the country is failed to institute the investment guaranty program for the specific risks of expropriation, convertibility or confiscation, is the AID Administrator within the past year considered denying assistance to such government for any reason?

An investment guaranty agreement for the specific risks of expropriation, inconvertibility or confiscation was concluded with Syria on August 9, 1976.

FAA Sec. 620(o) Fishermen's Protective Act of 1967, as amended, Sec. 5. If country has seized, or imposed any penalty or sanction against, any U.S. fishing activities in international waters,

Not applicable.

a. has any deduction required by the Fishermen's Protective Act been made?

b. has complete denial of assistance been considered by AID Administrator?

FAA Sec. 620; FY 79 App. Act Sec. 603.

(a) No.

(a) Is the government of the recipient country in default for more than six months on interest or principal of any AID loan to the country?

(b) Is country in default exceeding one year on interest or principal on U.S. loan under program for which App. Act appropriates funds?

(b) No.

FAA Sec. 620(s). If contemplated assistance is development loan or from Economic Support Fund, has the Administrator taken into account the percentage of the country's budget which is for military expenditures, the amount of foreign exchange spent on military equipment and the amount spent for the purchase of sophisticated weapons systems? (An affirmative answer may refer to the record of the annual "Taking Into Consideration" memo: "Yes, as reported in annual report on implementation of Sec. 620(s)." This report is prepared at time of approval by the Administrator of the Operational Year Budget and can be the basis for an affirmative answer during the fiscal year unless significant changes in circumstances occur.)

Yes, as reported in the FY 1977 620 report to Congress, approved on August 11, 1978. It has been determined that there has been no significant change which would affect the conclusion of that report.

- (1) increase in agricultural productivity through small-farm labor intensive agriculture,
- (2) reduced infant mortality,
- (3) control of population growth,
- (4) equality of income distribution,
- (5) reduction of unemployment, and
- (6) increased literacy.

b. FAA Sec. 104(d)(1). If appropriate, is this development (including Sahel) activity designed to build motivation for smaller families through modification of economic and social conditions supportive of the desire for large families in programs such as education in and out of school, nutrition, disease control, maternal and child health services, agricultural production, rural development, and assistance to urban poor?

b. Not applicable

ECONOMIC SUPPORT FUND COUNTRY CRITERIA.

a. FAA Sec. 502B. - Has the country engaged in a consistent pattern of gross violations of internationally recognized human rights?

a. No.

b. FAA Sec. 533(b). Will assistance under the Southern Africa program be provided to Mozambique, Angola, Tanzania, or Zambia? If so, has President determined (and reported to the Congress) that such assistance will further U.S. foreign policy interests?

b. No

c. FAA Sec. 609. If commodities are to be granted so that sale proceeds will accrue to the recipient country, have Special Account (counterpart) arrangements been made?

c. No commodities will be granted under this project.

FAA Sec. 620(t). Has the country severed diplomatic relations with the United States? If so, have they been resumed and have new bilateral assistance agreements been negotiated and entered into since such resumption?

Syria severed diplomatic relations with the United States in 1967. Diplomatic relations have been resumed and new bilateral assistance agreements are currently being negotiated.

FAA Sec. 620(u). What is the payment status of the country's U.N. obligations? If the country is in arrears, were such arrearages taken into account by the AID Administrator in determining the current AID Operational Year Budget?

Syria has fully paid its U.N. obligations as of September 30, 1978.

FAA Sec. 620A, FY 79 App. Act, Sec. 607. Has the country granted sanctuary from prosecution to any individual or group which has committed an act of international terrorism?

Syria has itself been the object of terrorist attacks. We know of no recent case in which Syria has granted sanctuary to individuals or groups in connection with acts of international terrorism.

FAA Sec. 666. Does the country object, on basis of race, religion, national origin or sex, to the presence of any officer or employee of the U.S. there to carry out economic development program under FAA?

No.

FAA Sec. 669, 670. Has the country, after August 3, 1977, delivered or received nuclear enrichment or reprocessing equipment, materials, or technology, without specified arrangements or safeguards? Has it detonated a nuclear device after August 3, 1977, although not a "nuclear-weapon State" under the nonproliferation treaty?

No.

No.

#### INDING CRITERIA FOR COUNTRY ELIGIBILITY

##### Development Assistance Country Criteria.

a. FAA Sec. 102(b)(4). Have criteria been established and taken into account to assess commitment progress of country in effectively involving the poor in development, on such indexes as:

a. Not applicable.



EMBASSY OF THE  
UNITED STATES OF AMERICA  
AGENCY FOR INTERNATIONAL DEVELOPMENT  
DAMASCUS, S.A.R.

PROVINCIAL WATER SUPPLY

PROJECT NO. 276-0024

CERTIFICATION PURSUANT TO SECTION 611(e) OF THE  
FOREIGN ASSISTANCE ACT OF 1961, AS AMENDED

I, Miles G. Wedeman, Director of the Agency for International Development in Syria, having taken into account, among other things, the maintenance and utilization of projects in Syria previously financed or assisted by the United States, do hereby certify that in my judgement Syria has both the financial capability and the human resources capability to effectively maintain and utilize the Provincial Water Supply capital assistance project.

This judgement is based upon general considerations discussed in the project paper to which this certification is attached.

A handwritten signature in cursive script, reading "Miles G. Wedeman", is written over a horizontal line.

Miles G. Wedeman  
Director

SYRIAN ARAB REPUBLIC

Chairmanship of the Council of Ministers  
State Planning Commission

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Directorate of Planning for Economic  
Scientific and Technical Relations

2442/F2/3757

To: U.S. AID/Damascus, Director

Referring to the several discussions we had with your  
responsibles concerning the preparation of Rural Development  
projects (Rural Water) to be financed under U.S.AID Loans  
for the year 1979; and;

Supporting these discussions, we hereby agree in principle  
with the project, to be financed under a F.A.R. process. Acting  
on behalf of the Syrian Arab Republic we hereby request U.S.AID,  
to provide a \$ 17,6 million Loan, from the 1979 Loans program,  
to finance the Rural Water project in the Rural region under  
the above mentioned procedure (F.A.R.)

Thanking you for your cooperation

Damascus 4/23/1979

Minister of State for Planning  
Affairs

Dr. George Horaniyeh

cc:

- Office of Deputy Prime Minister for Economic Affairs
- " " " " " " for services Affairs
- " " the Minister
- " " " Deputy Minister
- " " " Advisor
- Ministry of Foreign Affairs (Economic Directorate)
- Directorate for Local Planning and Services
- Directorate for Planning Economic U.S.Affairs
- C & R